

MAGNOLIACEAE

木兰科 mu lan ke

Xia Nianhe (夏念和)¹, Liu Yuhu (刘玉壶 Law Yu-wu)¹; Hans P. Nooteboom²

Trees or shrubs, evergreen or deciduous, usually with perfect flowers, rarely dioecious, monoecious, or andro-dioecious, usually with trichomes or rarely glabrous. Vegetative buds enclosed by hooded stipules. Stipules 2, connate and adnate to or free from petiole, splitting and caducous but with a remaining annular scar on twig or if adnate to petiole with scar on petiole. Leaves simple, spirally arranged, rarely distichous, sometimes fascicled on twig apex and becoming pseudoverticillate, petiolate; leaf blade pinnately veined, margin entire or rarely lobed. Flowers terminal or terminal on axillary brachyblasts, solitary, large, insect pollinated. Spatheaceous bracts 1 to several, basal to tepals. Tepals 6–9(–45), in 2 to many whorls, 3(–6) per whorl, usually fleshy, sometimes outer ones (perules) nearly leathery or reduced and sepal-like. Carpels and stamens many, distinct, spirally arranged on an elongated torus. Androecium usually at basal part of torus; filaments thick and short, sometimes elongated; connective usually exerted and forming a long or short tip; anthers linear, with 2 thecae, introrsely, laterally, or rarely extrorsely longitudinally dehiscing. Gynoecium at apical part of torus, sessile or with a gynophore; carpels folded, usually distinct, sometimes connate at base or rarely completely connate; ovules 2–14 per carpel, in 2 series on ventral sutures. Fruit apocarpous or sometimes syncarpous; mature carpels usually dehiscing along dorsal and/or ventral sutures, rarely connate and irregularly dehiscing or (in *Liriodendron*) indehiscent, samaroid, and adnate to seed endotesta. Seeds 1–12 per fruiting carpel, pendulous on a filiform elastic funiculus, exerted from mature carpels; testa fleshy, red; endotesta bony; embryo minute; endosperm copious, oily.

Seventeen or two genera and ca. 300 species: mainly in SE Asia and Central America, E and S North America, including Mexico and Antilles, and N South America; 13 (one introduced) or two genera and 112 or 108 species including two to eight hybrid species (66 or 62 endemic, four introduced) in China.

Several species in the Magnolioideae are grown for their dried flower buds, known as *xinyi* (辛夷), which are used medicinally. In addition, *Houpoëa officinalis* (*Magnolia officinalis*) is extensively grown for its medicinal bark. All species in the family are ornamental, and many are grown in public and private gardens throughout much of China and in other parts of the world.

One of the co-authors (Nooteboom) considers the Magnoliaceae to include two monogeneric subfamilies, with Magnolioideae containing the genus *Magnolia* and Liriodendroideae containing the genus *Liriodendron*. The reduction of the former genera of Magnolioideae to a single genus is based on DNA analysis (S. Kim et al., Amer. J. Bot. 88: 717–728. 2001; H. Azuma et al., J. Plant Res. 112: 291–306. 1999; H. Azuma et al., Proc. Int. Symp. Fam. Magnoliac. 1988, 219–227. 2000; H. Azuma et al., Amer. J. Bot. 88: 2275–2285. 2001; W. S. Judd et al., Pl. Syst. Phylogenet. Approach, 222–224. 1999) and morphology (R. B. Figlar, Proc. Int. Symp. Fam. Magnoliac. 1988, 14–25. 2000; R. B. Figlar & H. P. Nooteboom, Blumea 49: 87–100. 2004). In the present treatment, not only are previously recognized genera still included but additional new and/or reinstated segregate genera of Magnolioideae are recognized.

Nooteboom observes problems in the present treatment of segregate genera. An example of morphological similarity, which is strengthened by DNA results, is the similar fruit of *Michelia* species and *Yulania* (*Magnolia*) *stellata*. The present treatment distinguishes *Michelia* and *Yulania* on the basis of pseudoaxillary flowers in *Michelia*, but *Y. stellata* also has pseudoaxillary flowers. Furthermore, the emphasis given to fruit characters in order to separate genera is inconsistent, which renders the key to genera unworkable for specimens that lack fruit. *Michelia* (*Magnolia*) *baillonii* has fruit with connate carpels and is regarded as a *Michelia* species, although, even with fruit, it cannot be determined to *Michelia* and instead keys out as *Talauma*. The same character, fruit with connate carpels, is used to distinguish *T. (Magnolia) hodgsonii* from *Lirianthe*, even though, in the absence of fruit, it can hardly or not at all be distinguished from *L. (Magnolia) henryi*.

The following checklist is provided for the benefit of those who prefer to recognize Magnolioideae to include only the genus *Magnolia*. All the names in Magnolioideae accepted in the present treatment (in italics) are cross-referenced to the corresponding names in *Magnolia* (in boldface), with the latter followed by full bibliographic references. Except for treating Magnolioideae as monogeneric, the taxonomy at the specific and infraspecific levels in this checklist differs from the following main text of this treatment only in that one co-author (Nooteboom) considers that *Magnolia fordiana* var. *calcareae*, *M. fordiana* var. *forrestii*, *M. figo* var. *crassipes*, and *M. figo* var. *skimmeriana* should be recognized rather than be treated as species.

Alcimandra cathcartii = **Magnolia cathcartii**
Houpoëa obovata = **Magnolia obovata**
Houpoëa officinalis = **Magnolia officinalis**
Houpoëa rostrata = **Magnolia rostrata**
Lirianthe albosericea = **Magnolia albosericea**
Lirianthe championii = **Magnolia championii**
Lirianthe coco = **Magnolia coco**
Lirianthe delavayi = **Magnolia delavayi**
Lirianthe fistulosa = **Magnolia fistulosa**
Lirianthe fujianensis = **Magnolia xiana**

Lirianthe henryi = **Magnolia henryi**
Lirianthe odoratissima = **Magnolia odoratissima**
Magnolia ×alba (Candolle) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
Magnolia albosericea Chun & C. H. Tsoong, Acta Phytotax. Sin. 9: 117. 1964.
Magnolia amoena W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 9: 280. 1934.
Magnolia angustiblona (Y. W. Law & Y. F. Wu) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
Magnolia aromatica (Dandy) V. S. Kumar, Kew Bull. 61: 183. 2006.

¹ South China Botanical Garden, Chinese Academy of Sciences, 723 Xingke Road, Tianhe District, Guangzhou 510650, People's Republic of China. (Liu Yuhu died on 18 May 2004.)

² Nationaal Herbarium Nederland, Leiden University branch, P.O. Box 9514, 2300 RA Leiden, Netherlands.

- Magnolia baillonii** Pierre, Fl. Forest. Cochinch. 1: t. 2. 1880.
- Magnolia balansae** Aug. Candolle, Bull. Herb. Boissier, sér. 2, 4: 294. 1904.
- Magnolia biondii** Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 275. 1910.
- Magnolia campbellii** J. D. Hooker & Thomson, Fl. Ind. 1: 77. 1855.
- Magnolia cathcartii** (J. D. Hooker & Thomson) Nootboom, Blumea 31: 88. 1985.
- Magnolia cavaleriei** (Finet & Gagnepain) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia cavaleriei** var. **cavaleriei**
- Magnolia cavaleriei** var. **platypetala** (Handel-Mazzetti) Nootboom, **comb. nov.** Basionym: *Michelia platypetala* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 58: 89. 1921.
- Magnolia caveana** (J. D. Hooker & Thomson) D. C. S. Raju & M. P. Nayar, Indian J. Bot. 3: 171. 1980.
- Magnolia champaca** (Linnaeus) Baillon ex Pierre, Fl. Forest. Cochinch. 1: t. 3. 1880.
- Magnolia champaca** var. **champaca**
- Magnolia champaca** (Linnaeus) Baillon ex Pierre var. **pubinervia** (Blume) Figlar & Nootboom, Blumea 49: 96. 2004.
- Magnolia championii** Benth, Fl. Hongk. 8. 1861 [*“championi”*].
- Magnolia changhungtana** Nootboom, **nom. nov.** Replaced synonym: *Manglietia pachyphylla* Hung T. Chang, Acta Sci. Nat. Univ. Sunyatseni 1: 55. 1961, not *Magnolia pachyphylla* Dandy, Bull. Misc. Inform. Kew 1928: 186. 1928.
- Magnolia chapensis** (Dandy) Sima, Yunnan Forest. Sci. Technol. 2001(2): 29. 2001.
- Magnolia chevalieri** (Dandy) V. S. Kumar, Kew Bull. 61: 183. 2006.
- Magnolia coco** (Loureiro) Candolle, Syst. Nat. 1: 459. 1817.
- Magnolia compressa** Maximovicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 17: 417. 1872.
- Magnolia conifera** (Dandy) V. S. Kumar, Kew Bull. 61: 183. 2006.
- Magnolia coriacea** (Hung T. Chang & B. L. Chen) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia crassipes** (Y. W. Law) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia cylindrica** E. H. Wilson, J. Arnold Arbor. 8: 109. 1927.
- Magnolia dandyi** Gagnepain, Notul. Syst. (Paris) 8: 63. 1939.
- Magnolia dawsoniana** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 397. 1913.
- Magnolia decidua** (Q. Y. Zheng) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia delavayi** Franchet, Pl. Delavay. 1: 33. 1889.
- Magnolia denudata** Desrousseaux in Lamarck. Encycl. 3: 675. 1792.
- Magnolia doltsopa** (Buchanan-Hamilton ex Candolle) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia duclouxii** (Finet & Gagnepain) Hu in Hu & Chun, Icon. Pl. Sin. 2: 18. 1929.
- Magnolia elegantifolia** Nootboom, **nom. nov.** Replaced synonym: *Michelia elegans* Y. W. Law & Y. F. Wu, Bull. Bot. Res., Harbin 8(3): 71. 1988, not *Magnolia elegans* (Blume) H. Keng, Gard. Bull. Singapore 31: 129. 1978.
- Magnolia elliptigemmata** C. L. Guo & L. L. Huang, J. Wuhan Bot. Res. 10: 325. 1992.
- Magnolia ernestii** Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia ernestii** subsp. **ernestii**
- Magnolia ernestii** subsp. **szechuanica** (Dandy) Sima & Figlar, Yunnan Forest. Sci. Technol. 2001(2): 31. 2001.
- Magnolia figlarii** V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia figo** (Loureiro) Candolle, Syst. Nat. 1: 460. 1817.
- Magnolia figo** var. **figo**
- Magnolia figo** var. **crassipes** (Y. W. Law) Figlar & Nootboom, Blumea 49: 96. 2004.
- Magnolia figo** var. **skinneriana** (Dunn) Nootboom, **comb. et stat. nov.** Basionym: *Michelia skinneriana* Dunn, J. Linn. Soc., Bot. 38: 354. 1908.
- Magnolia fistulosa** (Finet & Gagnepain) Dandy, Notes Roy. Bot. Gard. Edinburgh 16: 124. 1928.
- Magnolia flaviflora** (Y. W. Law & Y. F. Wu) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia floribunda** (Finet & Gagnepain) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia fordiana** (Oliver) Hu, J. Arnold Arbor. 5: 228. 1924.
- Magnolia fordiana** var. **fordiana**
- Magnolia fordiana** var. **calcarea** (X. H. Song) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia fordiana** var. **forrestii** (W. W. Smith ex Dandy) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia fordiana** var. **hainanensis** (Dandy) Nootboom, **comb. et stat. nov.** Basionym: *Manglietia hainanensis* Dandy, J. Bot. 68: 204. 1930.
- Magnolia foveolata** (Merrill ex Dandy) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia fujianensis** (Q. F. Zheng) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia fulva** (Hung T. Chang & B. L. Chen) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia garrettii** (Craib) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia gioi** (A. Chevalier) Nootboom, **comb. nov.** Basionym: *Talauma gioi* A. Chevalier, Bull. Econ. Indochine, n.s., 21: 790. 1918.
- Magnolia glaucifolia** (Y. W. Law & Y. F. Wu) Nootboom, **comb. nov.** Basionym: *Manglietia glaucifolia* Y. W. Law & Y. F. Wu, Guihaia 6: 263. 1986.
- Magnolia globosa** J. D. Hooker & Thomson, Fl. Ind. 1: 77. 1855.
- Magnolia grandiflora** Linnaeus, Syst. Nat., ed. 10, 2: 1802. 1759.
- Magnolia grandis** (Hu & W. C. Cheng) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia guangdongensis** (Y. H. Yan, Q. W. Zeng & F. W. Xing) Nootboom, **comb. nov.** Basionym: *Michelia guangdongensis* Y. H. Yan, Q. W. Zeng & F. W. Xing, Ann. Bot. Fenn. 41: 491. 2004.
- Magnolia guangxiensis** (Y. W. Law & R. Z. Zhou) Sima, Yunnan Forest. Sci. Technol. 2001(2): 32. 2001.
- Magnolia henryi** Dunn, J. Linn. Soc., Bot. 35: 484. 1903.
- Magnolia hodgsonii** (J. D. Hooker & Thomson) H. Keng, Gard. Bull. Singapore 31: 129. 1976.
- Magnolia hongheensis** (Y. M. Shui & W. H. Chen) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia hookeri** (Cubitt & W. W. Smith) D. C. S. Raju & M. P. Nayar, Indian J. Bot. 3: 171. 1980.

- Magnolia insignis** Wallich, Tent. Fl. Nepal. 3. 1824.
- Magnolia iteophylla** (C. Y. Wu ex Y. W. Law & Y. F. Wu) Nootboom, **comb. nov.** Basionym: *Michelia iteophylla* C. Y. Wu ex Y. W. Law & Y. F. Wu, Acta Bot. Yunnan. 10: 337. 1988.
- Magnolia jigongshanensis** T. B. Chao et al., J. Henan Univ., Nat. Sci. 26: 62. 2000.
- Magnolia kachirachirai** (Kanehira & Yamamoto) Dandy, Bull. Misc. Inform. Kew 1927: 264. 1927.
- Magnolia kisopa** (Buchanan-Hamilton ex Candolle) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia kwangsiensis** Figlar & Nootboom, Blumea 49: 96. 2004.
- Magnolia kwangtungensis** Merrill, J. Arnold Arbor. 8: 5. 1927.
- Magnolia lacei** (W. W. Smith) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia laevifolia** (Y. W. Law & Y. F. Wu) Nootboom, Blumea 52: 562. 2007.
- Magnolia lanuginosa** (Wallich) Figlar & Nootboom, Blumea 49: 96. 2004.
- Magnolia leveilleana** (Dandy) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia liliiflora** Desrousseaux in Lamarck, Encycl. 3: 675. 1792.
- Magnolia longipedunculata** (Q. W. Zeng & Y. W. Law) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia lotungensis** Chun & C. H. Tsoong, Acta Phytotax. Sin. 8: 225. 1963.
- Magnolia lucida** (B. L. Chen & S. C. Yang) V. S. Kumar, Kew Bull. 61: 184. 2006.
- Magnolia macclurei** (Dandy) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia martini** H. Léveillé, Bull. Soc. Agric. Sarthe 39: 321. 1904.
- Magnolia masticata** (Dandy) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 23. 2000.
- Magnolia maudiae** (Dunn) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 23. 2000.
- Magnolia mediocris** (Dandy) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 23. 2000.
- Magnolia mirifolia** (D. L. Fu, T. B. Chao & Zhi X. Chen) Nootboom, **comb. nov.** Basionym: *Yulania mirifolia* D. L. Fu, T. B. Chao & Zhi X. Chen, Bull. Bot. Res., Harbin 24: 261. 2004.
- Magnolia multiflora** M. C. Wang & C. L. Min, Acta Bot. Boreal.-Occid. Sin. 12: 85. 1992.
- Magnolia nitida** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 212. 1920.
- Magnolia obovalifolia** (C. Y. Wu & Y. W. Law) V. S. Kumar, Kew Bull. 61: 185. 2006 [*"obovatifolia"*].
- Magnolia obovata** Thunberg, Trans. Linn. Soc. London 2: 336. 1794.
- Magnolia odora** (Chun) Figlar & Nootboom, Blumea 49: 97. 2004.
- Magnolia odoratissima** Y. W. Law & R. Z. Zhou, Bull. Bot. Res., Harbin 6(2): 139. 1986.
- Magnolia officinalis** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 391. 1913.
- Magnolia omeiensis** (W. C. Cheng) Dandy in S. Nilsson, World Pollen Spore Fl. 3(Magnoliaceae): 5. 1974.
- Magnolia opipara** (Hung T. Chang & B. L. Chen) Sima, Yunnan Forest. Sci. Technol. 2001(2): 34. 2001.
- Magnolia ovoidea** (Hung T. Chang & B. L. Chen) V. S. Kumar, Kew Bull. 61: 185. 2006.
- Magnolia patungensis** (Hu) Nootboom, **comb. nov.** Basionym: *Manglietia patungensis* Hu, Acta Phytotax. Sin. 1: 335. 1951.
- Magnolia pilocarpa** Z. Z. Zhao & Z. W. Xie, Acta Pharmacol. Sin. 22: 777. 1987.
- Magnolia rostrata** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 213. 1920.
- Magnolia rufibarbata** (Dandy) V. S. Kumar, Kew Bull. 61: 185. 2006.
- Magnolia sargentiana** Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 398. 1913.
- Magnolia shiluensis** (Chun & Y. F. Wu) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 23. 2000.
- Magnolia sieboldii** K. Koch, Hort. Dendrol. 4. 1853.
- Magnolia sinensis** (Rehder & E. H. Wilson) Stapf, Bot. Mag. 149: t. 9004. 1924.
- Magnolia sinica** (Y. W. Law) Nootboom, Blumea 31: 91. 1985.
- Magnolia ×soulangeana** Soulange-Bodin, Mém. Soc. Linn. Paris 1826: 269. 1826 [*"soulangiana"*].
- Magnolia sphaerantha** (C. Y. Wu ex Z. S. Yue) Sima, Yunnan Forest. Sci. Technol. 2001(2): 34. 2001.
- Magnolia sprengeri** Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 295. 1915.
- Magnolia stellata** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg, Sér. 3, 17: 418. 1872.
- Magnolia ventii** (N. V. Tiep) V. S. Kumar, Kew Bull. 61: 185. 2006.
- Magnolia viridula** (D. L. Fu, T. B. Chao & G. H. Tian) Nootboom, **comb. nov.** Basionym: *Yulania viridula* D. L. Fu, T. B. Chao & G. H. Tian, Bull. Bot. Res., Harbin 24: 263. 2004.
- Magnolia wilsonii** (Finet & Gagnepain) Rehder in Sargent, Pl. Wilson. 1: 395. 1913.
- Magnolia xanthantha** (C. Y. Wu ex Y. W. Law & Y. F. Wu) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 23. 2000.
- Magnolia xiana** Nootboom, **nom. nov.** [after N. H. Xia]. Replaced synonym: *Magnolia fujianensis* R. Z. Zhou, J. Trop. Subtrop. Bot. 12: 473. 2004, not *Magnolia fujianensis* (Q. F. Zheng) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.
- Magnolia xinganensis** Nootboom, **nom. nov.** Replaced synonym: *Manglietia oblonga* Y. W. Law, R. Z. Zhou & X. S. Qin, Ann. Bot. Fenn. 43: 64. 2006, not *Magnolia oblonga* (Wallich ex J. D. Hooker & Thomson) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 21. 2000.
- Magnolia yunnanensis** (Hu) Nootboom, Blumea 31: 88. 1985.
- Magnolia zenii** W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 8: 291. 1933.
- Magnolia zhengyiana** (N. H. Xia) Nootboom, **comb. nov.** Basionym: *Manglietia zhengyiana* N. H. Xia in C. Y. Wu, P. H. Raven & D. Y. Hong, Fl. China 7: 55. 2008.
- Manglietia aromatica* = **Magnolia aromatica**
- Manglietia calcarea* = **Magnolia fordiana** var. **calcarea**
- Manglietia caveana* = **Magnolia caveana**
- Manglietia chevalieri* = **Magnolia chevalieri**
- Manglietia conifera* = **Magnolia conifera**
- Manglietia crassipes* = **Magnolia crassipes**
- Manglietia dandyi* = **Magnolia dandyi**
- Manglietia decidua* = **Magnolia decidua**

- Manglietia duclouxii* = **Magnolia duclouxii**
Manglietia fordiana = **Magnolia fordiana**
Manglietia fordiana var. *hainanensis* = **Magnolia fordiana** var. **hainanensis**
Manglietia forrestii = **Magnolia fordiana** var. **forrestii**
Manglietia garrettii = **Magnolia garrettii**
Manglietia glaucifolia = **Magnolia glaucifolia**
Manglietia grandis = **Magnolia grandis**
Manglietia hongheensis = **Magnolia hongheensis**
Manglietia hookeri = **Magnolia hookeri**
Manglietia insignis = **Magnolia insignis**
Manglietia kwangtungensis = **Magnolia kwangtungensis**
Manglietia longipedunculata = **Magnolia longipedunculata**
Manglietia lucida = **Magnolia lucida**
Manglietia oblonga = **Magnolia xinganensis**
Manglietia obovalifolia = **Magnolia obovalifolia**
Manglietia ovoidea = **Magnolia ovoidea**
Manglietia pachyphylla = **Magnolia changhungtana**
Manglietia patungensis = **Magnolia patungensis**
Manglietia rufibarbata = **Magnolia rufibarbata**
Manglietia szechuanica = **Magnolia figlarii**
Manglietia ventii = **Magnolia ventii**
Manglietia zhengyiana = **Magnolia zhengyiana**
Michelia × *alba* = **Magnolia** × *alba*
Michelia angustiolonga = **Magnolia angustiolonga**
Michelia baillonii = **Magnolia baillonii**
Michelia balansae = **Magnolia balansae**
Michelia cavaleriei = **Magnolia cavaleriei**
Michelia cavaleriei var. *platypetala* = **Magnolia cavaleriei** var. **platypetala**
Michelia champaca = **Magnolia champaca**
Michelia champaca var. *pubinervia* = **Magnolia champaca** var. **pubinervia**
Michelia chapensis = **Magnolia chapensis**
Michelia compressa = **Magnolia compressa**
Michelia coriacea = **Magnolia coriacea**
Michelia crassipes = **Magnolia figo** var. **crassipes**
Michelia doltsopa = **Magnolia doltsopa**
Michelia elegans = **Magnolia elegantifolia**
Michelia figo = **Magnolia figo**
Michelia flaviflora = **Magnolia flaviflora**
Michelia floribunda = **Magnolia floribunda**
Michelia foveolata = **Magnolia foveolata**
Michelia fujianensis = **Magnolia fujianensis**
Michelia fulva = **Magnolia fulva**
Michelia gioi = **Magnolia gioi**
Michelia guangdongensis = **Magnolia guangdongensis**
Michelia guangxiensis = **Magnolia guangxiensis**
Michelia iteophylla = **Magnolia iteophylla**
Michelia kisopa = **Magnolia kisopa**
Michelia lacei = **Magnolia lacei**
Michelia leveilleana = **Magnolia leveilleana**
Michelia macclurei = **Magnolia macclurei**
Michelia martini = **Magnolia martini**
Michelia masticata = **Magnolia masticata**
Michelia maudiae = **Magnolia maudiae**
Michelia mediocris = **Magnolia mediocris**
Michelia odora = **Magnolia odora**
Michelia opipara = **Magnolia opipara**
Michelia shiluensis = **Magnolia shiluensis**
Michelia skinneriana = **Magnolia figo** var. **skinneriana**
Michelia sphaerantha = **Magnolia sphaerantha**
Michelia velutina = **Magnolia lanuginosa**
Michelia wilsonii = **Magnolia ernestii**
Michelia wilsonii subsp. *szechuanica* = **Magnolia ernestii** subsp. **szechuanica**
Michelia xanthantha = **Magnolia xanthantha**
Michelia yunnanensis = **Magnolia laevifolia**
Oyama globosa = **Magnolia globosa**
Oyama sieboldii = **Magnolia sieboldii**
Oyama sinensis = **Magnolia sinensis**
Oyama wilsonii = **Magnolia wilsonii**
Pachylarnax sinica = **Magnolia sinica**
Parakmeria kachirachirai = **Magnolia kachirachirai**
Parakmeria lotungensis = **Magnolia lotungensis**
Parakmeria nitida = **Magnolia nitida**
Parakmeria omeiensis Cheng = **Magnolia omeiensis**
Parakmeria yunnanensis Hu = **Magnolia yunnanensis**
Talauma hodgsonii = **Magnolia hodgsonii**
Woonyoungia septentrionalis = **Magnolia kwangsiensis**
Yulania amoena = **Magnolia amoena**
Yulania biondii = **Magnolia biondii**
Yulania campbellii = **Magnolia campbellii**
Yulania cylindrica = **Magnolia cylindrica**
Yulania dawsoniana = **Magnolia dawsoniana**
Yulania denudata = **Magnolia denudata**
Yulania elliptigemmata = **Magnolia elliptigemmata**
Yulania jigongshanensis = **Magnolia jigongshanensis**
Yulania liliiflora = **Magnolia liliiflora**
Yulania mirifolia = **Magnolia mirifolia**
Yulania multiflora = **Magnolia multiflora**
Yulania pilocarpa = **Magnolia pilocarpa**
Yulania sargentiana = **Magnolia sargentiana**
Yulania stellata = **Magnolia stellata**
Yulania × *soulangeana* = **Magnolia** × *soulangeana*
Yulania sprengeri = **Magnolia sprengeri**
Yulania viridula = **Magnolia viridula**
Yulania zenii = **Magnolia zenii**

- 1a. Leaf blade 4–10-lobed; anthers dehiscent extrorsely; mature carpels samaroid, indehiscent, deciduous, fruit axis persistent; testa thin and dry, adnate to endocarp (subfam. Liriodendroideae) 13. *Liriodendron*
- 1b. Leaf blade unlobed or rarely 2-lobed at apex; anthers dehiscent introrsely or latrorsely; mature carpels not samaroid but in various shapes such as globose, ovoid, ellipsoid, or terete, usually twisted because of abortion of some carpels, dehiscent or circumscissile; testa fleshy, free from fruit segments (subfam. Magnolioideae).
- 2a. Fruit cylindrical or terete; torus elongated in fruit.
- 3a. Flowers terminal on axillary brachyblasts 12. *Michelia*
- 3b. Flowers terminal.
- 4a. Plants evergreen; perules absent; anthers dehiscing introrsely 10. *Alcimandra*
- 4b. Plants deciduous; perules present; anthers dehiscing introrse-latrorsely 11. *Yulania*
- 2b. Fruit globose, ovoid, or ellipsoid; torus not elongated in fruit.
- 5a. Young leaves open in bud.
- 6a. Mature carpels dehiscing along ventral sutures 8. *Pachylarnax*
- 6b. Mature carpels dehiscing along dorsal sutures 9. *Parakmeria*
- 5b. Young leaves folded in bud.
- 7a. Mature carpels circumscissile 5. *Talauma*
- 7b. Mature carpels dehiscing along ventral or dorsal sutures.
- 8a. Flowers unisexual 7. *Woonyoungia*
- 8b. Flowers bisexual.
- 9a. Ovules 4 to many per carpel 1. *Manglietia*
- 9b. Ovules 2 per carpel.
- 10a. Flowers terminal; peduncle slender; leaves distichously arranged 6. *Oyama*
- 10b. Flowers terminal on terminal brachyblasts; peduncle with internodes of brachyblasts; leaves spirally arranged, ± fascicled, or pseudowhorled.
- 11a. Leaves pseudovercillate 4. *Houpoëa*
- 11b. Leaves spirally arranged or fascicled.
- 12a. Fruit ovoid 2. *Magnolia*
- 12b. Fruit ellipsoid 3. *Lirianthe*

1. MANGLIETIA Blume, Verh. Batav. Genootsch. Kunst. 9: 149. 1823.

木莲属 mu lian shu

Paramanglietia Hu & W. C. Cheng; *Sinomanglietia* Z. X. Yu & Q. Y. Zheng.

Trees, evergreen or rarely deciduous (only *Manglietia decidua*). Stipules adnate to petiole, leaving long or short scar on petiole. Leaves folded in bud; leaf blade leathery, margin entire. Flowers terminal or terminal on terminal brachyblasts, bisexual. Tepals usually 9–13, 3 per whorl, greenish or red, subequal, subleathery but 3 of outer whorl usually thinner. Filaments short and inconspicuous; connective exerted and mucronate; anthers linear, dehiscing introrsely. Gynoecium sessile; carpels numerous, spirally arranged, distinct, abaxially usually with 1 or several furrows at base, adaxially completely connate to torus; ovules 4 or more per carpel. Fruit apocarpous, globose, ovoid, terete, or ellipsoid-ovoid; torus not elongated between carpels; mature carpels subwoody or thickly woody, persistent, dehiscing along dorsal suture or sometimes also along ventral suture, apex usually beaked. Seeds 1 to more than 10 per fruit.

About 40 species: tropical and subtropical Asia; 29 or 27 species (17 or 15 endemic) in China.

“*Manglietia fadouensis* Y. W. Law & R. Z. Zhou,” “*M. guangnanica* D. X. Li & R. Z. Zhou,” “*M. pingjiangensis* Y. W. Law & D. X. Li,” “*M. microflora* Y. W. Law & R. Z. Zhou,” and “*M. tianchiensis* D. X. Li & Y. W. Law” (in Y. H. Liu, *Magnolias China*, 136, 148, 186, 198. 2004) are of uncertain identity and are probably the same as already published *Manglietia* species but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

- 1a. Mature carpels dehiscing along ventral sutures; torus dehiscent when fruit matured.
- 2a. Evergreen; tepals 9, in 3 whorls, white, outer ones obovate-elliptic, inner ones nearly obovate-spatulate 20. *M. calcarea*
- 2b. Deciduous; tepals 15 or 16, in 5 or 6 whorls, yellow, lanceolate to narrowly obovate 29. *M. decidua*
- 1b. Mature carpels dehiscing along dorsal sutures or rarely along ventral sutures; torus indehiscent when fruit matured.
- 3a. Brachyblasts or peduncles slender; fruit pendulous.
- 4a. Vegetative buds, young branches, petioles, leaf blade abaxial surfaces, and peduncles rust-colored tomentose or reddish brown erect villous.
- 5a. Vegetative buds, young branches, petioles, leaf blade abaxial surfaces, and peduncles reddish brown erect villous 25. *M. longipedunculata*
- 5b. Vegetative buds, young branches, petioles, leaf blade abaxial surfaces, and peduncles rust-colored tomentose.

- 6a. Gynoecium glabrous 23. *M. kwangtungensis*
 6b. Gynoecium with trichomes 24. *M. rufibarbata*
- 4b. Vegetative buds, young branches, petioles, leaf blade abaxial surfaces, and peduncles with sparse appressed trichomes or glabrous.
- 7a. Leaf blade abaxially glaucous 28. *M. glaucifolia*
 7b. Leaf blade abaxially grayish green.
- 8a. Stipular scar ca. 1/5 as long as petiole; inner tepals pure white 26. *M. conifera*
 8b. Stipular scar ca. 1/2 as long as petiole; inner tepals purplish 27. *M. ovoidea*
- 3b. Brachyblasts robust; fruit erect after flowering.
- 9a. Leaf blade apex obtuse to emarginate 10. *M. hongheensis*
 9b. Leaf blade apex acute, acuminate, cuspidate, or caudate.
- 10a. Fruit subglobose; mature carpels only base inserted on torus adaxially, dehiscing along ventral suture first and then partly along dorsal suture 2. *M. aromatica*
- 10b. Fruit ovoid-ellipsoid, subterete, or ovoid; mature carpels completely or mostly inserted on torus adaxially, dehiscing along dorsal suture first and then along ventral suture.
- 11a. Gynoecium with trichomes.
- 12a. Beak of mature carpel 5–7 mm 8. *M. ventii*
 12b. Beak of mature carpel less than 3 mm.
- 13a. Fruit cylindrical 7. *M. zhengyiana*
 13b. Fruit ellipsoidal or ovoid.
- 14a. Mature carpels abaxially tuberculate 11. *M. caveana*
 14b. Mature carpels not abaxially tuberculate.
- 15a. Leaf blade leathery, abaxially pale brownish pubescent, midvein white villous; fruit ovoid, 8–10 cm 13. *M. szechuanica*
 15b. Leaf blade thinly leathery, both surfaces glabrous; fruit ovoid-ellipsoid, 5–6 cm 15. *M. duclouxii*
- 11b. Gynoecium glabrous.
- 16a. Androecium with trichomes 1. *M. dandyi*
 16b. Androecium glabrous.
- 17a. Outer tepals abaxially with appressed reddish brown trichomes 19. *M. forrestii*
 17b. Outer tepals abaxially glabrous.
- 18a. Gynoecium or fruit ovoid.
- 19a. Tepals white; stipular scar nearly 1/6 as long as petiole 16. *M. crassipes*
 19b. Tepals pale red or purplish red; stipular scar 1/4–1/2 as long as petiole.
- 20a. Young branches and brachyblasts with rust-colored trichomes; stipular scar more than 1/2 as long as petiole 3. *M. lucida*
 20b. Young branches and brachyblasts glabrous; stipular scar nearly 1/4 as long as petiole 4. *M. grandis*
- 18b. Gynoecium or fruit terete or ellipsoid.
- 21a. Stipular scar more than 1/2 as long as petiole.
- 22a. Leaf blade elliptic to obovate, 18–34.5 × 8–12 cm, abaxially with dense fine brown trichomes (difficult to see even under hand lens); tepals purple to purplish red 5. *M. garrettii*
 22b. Leaf blade elliptic-obovate to narrowly obovate, 20–30 × 6–10 cm, abaxially glabrous; tepals white 6. *M. hookeri*
- 21b. Stipular scar less than 1/2 as long as petiole.
- 23a. Gynoecium terete.
- 24a. Leaf blade glabrous on both surfaces 12. *M. patungensis*
 24b. Leaf blade abaxially ± with trichomes.
- 25a. Stipular scar less than 1/3 as long as petiole; leaf blade abaxial midvein reddish brown pubescent or scattered appressed hispidulous 9. *M. insignis*
 25b. Stipular scar 1/10–1/5 as long as petiole; leaf blade abaxially with pale brownish red trichomes 14. *M. chevalieri*
- 23b. Gynoecium ovoid or long ovoid.
- 26a. Young branches glabrous; leaf blade obovate 21. *M. obovalifolia*
 26b. Young branches ± with trichomes; leaf blade elliptic or narrowly elliptic.
- 27a. Tepals of inner 2 whorls transversely wavy striate 22. *M. oblonga*
 27b. Tepals of inner 2 whorls smooth.
- 28a. Mature carpels abaxially furrowed but not tuberculate 17. *M. pachyphylla*
 28b. Mature carpels abaxially not furrowed but tuberculate 18. *M. fordiana*

1. *Manglietia dandyi* (Gagnepain) Dandy in Praglowski, World Pollen Spore Fl. 3(Magnoliaceae): 5. 1974.

大叶木莲 da ye mu lian

Manglietia dandyi Gagnepain, Notul. Syst. (Paris) 8: 63. 1939; *M. megaphylla* (Hu & W. C. Cheng) V. S. Kumar; *Manglietia megaphylla* Hu & W. C. Cheng; ?*M. sinoconifera* F. N. Wei.

Trees, 30–50 m tall, 80–100 cm d.b.h. Branches, leaf blade abaxial surfaces, petioles, stipules, peduncles, and spatheaceous bracts densely long ferruginous tomentose. Stipular scar 1/3–2/3 as long as petiole. Leaves usually 5 or 6 clustered on branch apex; petiole 2–3 cm; leaf blade obovate, 25–50 × 10–20 cm, leathery, basal ca. 2/3 narrowed, adaxially glabrous, secondary veins 20–22 on each side of midvein, reticulate veins sparse and prominent on both surfaces when dry, base cuneate, apex acute. Brachyblasts thick and strong, 3.5–4 × ca. 1.5 cm; spatheaceous bract 1, ca. 3 mm basal to tepals. Tepals 9 or 10, in 3 whorls, fleshy; tepals of outer whorl obovate-oblong, 4.5–5 × 2.5–2.8 cm, adaxially ca. 7-striated; tepals of inner 2 whorls smaller. Stamens villous, 1.2–1.5 cm; filaments flat, ca. 2 mm; connective exerted with a ca. 1 mm triangular appendage; anthers 8–10 mm, thecae distinct and ca. 1 mm wide. Gynoecium ovoid, 2–2.5 cm; carpels 60–75, ca. 1.5 cm, glabrous, with 1 furrow reaching to style apex. Fruiting brachyblasts thick and strong, 1–3 × 1–1.3 cm. Fruit ovoid to long ellipsoid, 6.5–11 cm; mature carpels 2.5–3 cm, extrorsely slightly curved, dehiscent along dorsal and ventral sutures, apex acute. Fl. Jun, fr. Sep–Dec. $2n = 38$.

Evergreen broad-leaved forests; 400–1500 m. W Guangxi, SE Yunnan [Laos, Vietnam].

“*Manglietia admirabilis* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, Magnolias China, 120. 2004) probably belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

The status of *Manglietia sinoconifera* is uncertain because the authors have been unable to see the holotype, although it may be conspecific with *M. dandyi*.

Manglietia dandyi is grown as an ornamental and used for timber.

2. *Manglietia aromatica* Dandy, J. Bot. 69: 231. 1931.

香木莲 xiang mu lian

Manglietia aromatica (Dandy) V. S. Kumar; *Paramanglietia aromatica* (Dandy) Hu & W. C. Cheng.

Trees, to 35 m tall, to 1.2 m d.b.h., glabrous except vegetative buds white appressed pubescent, aromatic. Bark gray and smooth. Young twigs pale green; terminal buds ellipsoid, ca. 3 × 1.2 cm. Stipular scar 1/4–1/3 as long as petiole. Petiole 1.5–2.5 cm; leaf blade narrowly obovate to narrowly elliptic, 15–19 × 6–7 cm, thinly leathery, lower ca. 1/3 gradually tapered, secondary veins 12–16 on each side of midvein, reticulate veins sparse and conspicuously prominent on both surfaces when dry, base slightly decurrent, apex shortly acuminate to acuminate. Peduncle strong, 10–15 × 6–8 mm in fruit; bract scar 1, 5–7 mm basal to tepals. Tepals 11 or 12, in 4 whorls of 3, white; outer 3 tepals obovate-oblong, 7–11 × 3.5–5 cm, nearly leath-

ery; tepals of inner whorls obovate-spoon-shaped, 9–11.5 × 4–5.5 cm, fleshy, base clawed. Stamens ca. 100, 1.5–1.8 cm. Carpels glabrous. Fruit red when fresh, subglobose to ovoid, 7–8 cm in diam.; mature carpels dehiscent along ventral and then dorsal sutures. Fl. May–Jun, fr. Sep–Oct. $2n = 38$.

Evergreen broad-leaved forests; 900–1600 m. SW Guangxi, Guizhou, SE Yunnan [Vietnam].

3. *Manglietia lucida* B. L. Chen & S. C. Yang, Acta Sci. Nat. Univ. Sunyatseni 1988(3): 94. 1988.

亮叶木莲 liang ye mu lian

Manglietia lucida (B. L. Chen & S. C. Yang) V. S. Kumar.

Trees, to 18 m tall, to 65 cm d.b.h. Young twigs grayish, 8–10 mm in diam., smooth, often longitudinally wrinkled when dry, glabrous or with minute trichomes. Stipules pubescent, scar 1.6–4.5 cm. Petiole 3.6–6 cm, often thickened toward base, glabrous; leaf blade obovate, 27–44 × 11–16 cm, leathery, midvein abaxially rather elevated lengthwise, adaxially sulcate, secondary veins 13–19 on each side of midvein, apically curved, and meeting in an intramarginal vein, reticulate veins coarse and adaxially rather dull, base cuneate and decurrent with 2 ridges into petiole, apex acuminate, acumen 1–2.5 cm. Brachyblasts ca. 1.4 × 0.6 cm, pubescent; spatheaceous bract 1, ± at base of peduncle, broadly obovate, ca. 8.3 × 6.9 cm, thickly leathery, abaxially pubescent. Peduncle 5–6 mm, with same indumentum as brachyblast. Tepals 9(–11), purple; outer 3 tepals narrowly obovate, 12–14 × 5.8–6 cm, fleshy; inner 6–8 tepals in 2 whorls, shorter and narrower than outer ones. Stamens many. Gynoecium ovoid, ca. 2.7 × 1.8 cm; carpels 70–80, nearly entirely connate when young, glabrous. Fruiting brachyblasts ca. 4.5 × 1 cm; pedicel ca. 2.5 × 1 cm. Fruit ovoid-globose, ca. 9.5 × 8–10 cm; torus ca. 3 × 2 cm, with scars of perianth and stamens; mature carpels 2–3.5 × 0.8–1 cm, woody, abaxial part 1–1.5 cm, dehiscent along dorsal suture at first and later also along ventral suture. Seeds ca. 3 per carpel. Fl. Mar–May, fr. Sep–Oct.

• Secondary evergreen broad-leaved forests; 500–700 m. SE Yunnan.

4. *Manglietia grandis* Hu & W. C. Cheng, Acta Phytotax. Sin. 1: 158. 1951.

大果木莲 da guo mu lian

Manglietia grandis (Hu & W. C. Cheng) V. S. Kumar.

Trees, to 12 m tall. Twigs pale gray, thick and strong, glabrous. Stipules glabrous, scar ca. 1/4 as long as petiole. Petiole 2.6–4 cm; leaf blade elliptic to obovate, 20–35.5 × 10–13 cm, leathery, glabrous, abaxially papillate, adaxially lucid, secondary veins 17–26 on each side of midvein and conspicuous when dry, base broadly cuneate, apex acute to cuspidate. Tepals 12, red; outer tepals thinner, obovate-oblong, 9–11 cm, 9–11-striated; innermost 3 tepals obovate-spoon-shaped, 8–12 × 3–6 cm, fleshy. Stamens 1.4–1.6 cm; connective with a ca. 1 mm mucro; anthers ca. 1.3 cm. Gynoecium ovoid, ca. 4 cm; carpels with midvein abaxially concave to apex of style. Fruiting brachyblasts thick and strong, ca. 1.3 cm in diam. Fruit ellipsoid-ovoid, 10–12 cm; mature carpels 3–4 cm, dehiscent along ven-

tral sutures, apex acute and minutely incurved. Fl. May, fr. Sep–Oct. $2n = 38^*$.

• Evergreen broad-leaved forests; 800–1500 m. SW Guangxi, SE Yunnan.

This species is used for timber.

5. *Manglietia garrettii* Craib, Bull. Misc. Inform. Kew 1922: 166. 1922.

泰国木莲 tai guo mu lian

Magnolia garrettii (Craib) V. S. Kumar.

Trees, to 20 m tall, to 1.2 m d.b.h. Young twigs, stipules, petioles, and peduncles densely brown pubescent with short to long and straight to slightly undulate trichomes. Twigs brown, 5–8 mm in diam. Stipules adnate to petiole, scar 1.8–2.5 cm. Petiole 3–5 cm, thickened toward base; leaf blade elliptic to obovate, 18–34.5 × 8–12 cm, leathery, abaxially densely coated with minute (hardly visible even with hand lens) brownish trichomes, secondary veins 12–21 on each side of midvein and abaxially prominently elevated, reticulate veins coarse and prominent on both surfaces, base cuneate to rounded, apex shortly acuminate. Brachyblasts 1.5–4 × 0.6–0.9 cm. Flower buds elongate, 6–6.5 × 2.2–2.5 cm. Tepals 9, purple to violet red, thick and succulent; outer 3 tepals 6–6.5 × ca. 3 cm; inner tepals slightly smaller. Stamens 1.1–1.5 cm; connective appendage triangular, ca. 3 mm. Gynoecium ovoid to narrowly ovoid, ca. 3 × 2 cm, glabrous; carpels 66–68; styles glabrous, 2–3 mm. Fruit broadly ovoid-oblong, 4–9 × 3.5–6 cm; scar on torus of perianth and stamens 10–12 × ca. 9 mm; dorsal face of mature carpels 2.5–3.2 cm for basal ones and 1–2 cm for apical ones, apex shortly beaked. Seeds ellipsoid to obovoid, 9–14 × 5–8 mm, irregularly shaped.

Evergreen broad-leaved forests; 1300–1900 m. S Yunnan [N Thailand, Vietnam].

6. *Manglietia hookeri* Cubitt & W. W. Smith, Rec. Bot. Surv. India 4: 273. 1913.

中緬木蓮 zhong mian mu lian

Magnolia hookeri (Cubitt & W. W. Smith) D. C. S. Raju & M. P. Nayar.

Trees, to 25 m tall, young parts grayish white to pale brown appressed pilose. Stipular scar obtusely triangular, 2–3 cm. Petiole 3–5 cm; leaf blade elliptic-obovate to narrowly obovate, 20–30 × 6–10 cm, both surfaces glabrous, secondary veins 16–20 on each side of midvein, reticulate veins prominent on both surfaces when dry, base cuneate, apex acute to shortly acuminate. Flowers ca. 10 cm in diam. at anthesis; bract scar 5–10 mm basal to tepals. Tepals 9–12, white; outer 3 tepals basally green and apically milky white, obovate-oblong, 6–8 × 2.5–3 cm; middle and inner tepals thickly obovate to spatulate, 6–8 × 1.5–2.5 cm, fleshy, base clawed. Fruit ovoid-ellipsoid to nearly terete, 7–10 × ca. 6 cm, smooth, not tuberculate; mature carpels more than 100, rhombic on exposed side, dehiscing along dorsal suture, apex shortly beaked. Seeds 1–4 per carpel. Fl. Apr–May, fr. Sep. $2n = 38$.

Evergreen broad-leaved forests; 1400–3000 m. Guizhou (Wangmo), C and S Yunnan (Jingdong, Xishuangbanna) [Myanmar, Thailand].

This species is grown as an ornamental and used for timber.

7. *Manglietia zhengyiana* N. H. Xia, sp. nov.

锈毛木莲 xiu mao mu lian

Type: China. Yunnan: Maguan Xian, Laojun Shan (老君山), Sitaipo (四台坡), alt. 1300–1600 m, 20 Dec 1947, K. M. Feng 13960 (holotype, KUN; isotypes, A, PE).

Arbor usque ad 25 m alta, trunco usque ad 30 cm diametro, ramunculis gemmisque indumento denso ferrugineo indutis, gemmis ellipsoideis 1.3–2 cm longis et 0.5–0.9 cm latis. Foliis petiolo 1.2–1.8 cm longo pilis ferrugineis induto cicatrice 7–10 mm longa; lamina obovata usque elliptica 15–21.5 cm longa et 5.5–9 cm lata acumine 0.6–1.1 cm longo, nervis utroque costae latere 8 ad 11. Brachyblastus florifer 1.5–2 cm longus. Flos tepalis albis; androecio pilis longis ferrugineis induto; carpellis glabris ca. 30, pilis ferrugineis dense indutis. Brachyblastus fructifer 1.5–3 cm longus et 4–5 mm latus pilis ferrugineis dense indutus. Fructus cylindraceus 5–8.3 cm longus et 2–2.8 cm latus.

Trees, to 25 m tall, to 30 cm d.b.h. Branchlets with dense rust-colored trichomes; vegetative buds ellipsoid, 1.3–2 × 0.5–0.9 cm, with dense rust-colored trichomes. Stipular scar 7–10 mm. Petiole 1.2–1.8 cm, with rust-colored trichomes; leaf blade obovate to elliptic, 15–21.5 × 5.5–9 cm, papery to thinly leathery, abaxially glaucous and with rust-colored trichomes, adaxially glabrous, secondary veins 8–11 on each side of midvein, base broadly cuneate, apex acuminate to acute, acumen 0.6–1.1 cm. Brachyblasts 1.5–2 cm. Tepals 9, white; outer tepals 3, oblong, ca. 3 × 2 cm, thinly leathery, outside with rust-colored trichomes at base; middle and inner tepals slightly fleshy, shorter and narrower. Stamens many, ca. 1.2 cm; filaments 1.5–2 mm; connectives exerted, with a ca. 1 mm triangular appendage; anthers ca. 1 cm, thecae distinct. Stamen scars with long rust-colored trichomes. Carpels ca. 30, with dense rust-colored trichomes. Fruiting brachyblasts 1.5–3 cm × 4–5 mm, with dense rust-colored trichomes. Fruit cylindrical, 5–8.3 × 2–2.8 cm; mature carpels 1–1.5 × 0.6–1 cm, dehiscing along dorsal sutures. Seeds cordate. Fl. May–Jun, fr. Sep–Oct.

• Forests; 1300–1600 m. SE Yunnan (Maguan, Xichou).

K. M. Feng reported the type as being from “Mar-li-po: Sze-tai-po (loa-chün-shan),” but modern maps show that Sitaipo is in Dulong Zhen (都龙镇) in Maguan Xian, on the SW flank of Laojun Shan very close to the border with Malipo Xian (see: Atlas of roads and kilometers of Yunnan and neighboring regions (云南及周边地区公路里程地图册) 34. 2008). Feng also misspelled the first character of the mountain name as “loa” rather than “lao.” *Manglietia zhengyiana* has been mistakenly included in *M. rufibarbata* (FRPS 31: 89. 1996; Fl. Yunnan. 16: 5. 2006) or in *M. dandyi* (B. L. Chen & H. P. Nootboom, Ann. Missouri Bot. Gard. 80: 1037. 1993). Also, see the comment under *M. rufibarbata* regarding the paratypes of *M. pubipetala*.

8. *Manglietia ventii* N. V. Tiep, Feddes Repert. 91: 560. 1980.

毛果木莲 mao guo mu lian

Magnolia hebecarpa (C. Y. Wu & Y. W. Law) V. S. Kumar; *M. ventii* (N. V. Tiep) V. S. Kumar; *Manglietia hebecarpa* C. Y. Wu & Y. W. Law.

Trees, to 30 m tall. Young twigs blackish gray, 2–3.5 mm in diam., densely appressed tomentulose with short straight glistening yellowish trichomes, old ones ± gray pubescent to glabrescent. Stipular scar 1–2 cm. Leaves usually crowded at apex of twigs; petiole slender, 2.6–3 cm, tomentulose, with same trichomes as on young twigs, glabrescent; leaf blade elliptic, broadly elliptic, obovate-elliptic, or obovate, 9–18 × 2.2–6.5 cm, papery to thinly leathery, abaxially appressed tomentose with short straight glistening yellowish to silver trichomes, adaxially glabrous, midvein abaxially elevated and densely pubescent to glabrescent and adaxially impressed, secondary veins 12–16 on each side of midvein, fine, abaxially visible, and adaxially inconspicuous, reticulate veins lax and faint on both surfaces, base cuneate to obtuse, apex shortly acuminate to acuminate, acumen 0.3–1.7 cm and sometimes asymmetric. Flower not seen. Fruiting brachyblasts 10–15 × 4–6 mm, yellowish appressed tomentose, with a bract scar. Pedicel absent. Fruit ovoid to long globose, 3.5–7 × 2.5–4.5 cm; torus with 6–9 × ca. 7 mm scar of perianth and stamens; scar of fallen tepals ca. 10 mm; mature carpels ca. 64, long ovoid, 2–2.2 cm, erect or recurved, dehiscing along dorsal suture, beak rather long, 5–7 mm; basalmost carpels ± yellowish pubescent especially toward base, basally decurrent along torus. Seeds 1–3 per carpel, subcordate to ovoid, 7–7.5 × 5–6 mm, ± impressed. Fl. Apr–May, fr. Aug–Sep.

Forests; 800–1200 m. SE Yunnan (Pingbian) [Vietnam].

9. *Manglietia insignis* (Wallich) Blume, Fl. Javae 19–20 (Magnoliaceae): 23. 1829.

红花木莲 hong hua mu lian

Magnolia insignis Wallich, Tent. Fl. Nepal. 3. 1824; *M. insignis* var. *angustifolia* (J. D. Hooker & Thomson) H. J. Chowdhery & P. Daniel; *M. insignis* var. *latifolia* (J. D. Hooker & Thomson) H. J. Chowdhery & P. Daniel; *M. shangpaensis* Hu; *Manglietia insignis* var. *angustifolia* J. D. Hooker & Thomson; *M. insignis* var. *latifolia* J. D. Hooker & Thomson; *M. maguanica* Hung T. Chang & B. L. Chen; *M. rufisyncarpa* Y. W. Law et al.; *M. yunnanensis* Hu.

Trees, to 30 m tall, to 20 cm d.b.h. Twigs glabrous or nodes ferruginous to yellowish brown pubescent when young. Stipular scar 0.5–1.2 cm. Petiole 1.8–3.5 cm; leaf blade narrowly ovate or elliptic, 10–26 × 4–10 cm, leathery, adaxially glabrous, midvein abaxially reddish brown pubescent or scattered appressed hispidulous, basal ca. 2/3 tapered to base, apex acuminate to caudate-acuminate. Brachyblasts thick and strong, 8–10 mm in diam.; bract scar 1, ca. 1 cm basal to tepals. Flowers fragrant. Tepals 9–12; outer 3 tepals abaxially brown and adaxially reddish to purplish red, obovate-oblong, ca. 7 cm, curved outward; middle and inner tepals milky whitish pink, obovate-spatulate, 5–7 cm, erect, basal ca. 1/4 tapered and clawed. Stamens 1–1.8 cm; filaments nearly as long as exerted part of connective; connective exerted and forming a triangular mucro; thecae slightly distinct. Gynoecium terete, 5–6 cm; carpels glabrous, abaxially shallowly furrowed. Fruit purplish red when fresh, ovoid-ellipsoid, 7–12 cm; mature carpels tuberculate, completely dehiscing along dorsal sutures. Fl. May–Jun, fr. Aug–Sep. $2n = 38$.

Evergreen broad-leaved forests; 900–1200 m. Guangxi, Guizhou, SW Hunan, SW Sichuan, SE Xizang, Yunnan [NE India, N Myanmar, Nepal, Thailand].

“*Manglietia carimina* Y. W. Law & R. Z. Zhou,” “*M. laojunia* Y. W. Law & R. Z. Zhou,” “*M. malipoensis* S. C. Yang & Y. W. Law,” “*M. miechangensis* Y. W. Law & D. X. Li,” “*M. nucifera* D. X. Li & R. Z. Zhou,” “*M. parvicula* Y. W. Law & R. Z. Zhou,” “*M. tengchongensis* S. C. Yang & Y. W. Law,” and “*M. zhengkangensis* R. Z. Zhou & D. X. Li” (in Y. H. Liu, Magnolias China, 126, 158, 166, 173, 176, 184, 196, 204. 2004) belong here but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

This species is grown as an ornamental and used for timber.

10. *Manglietia hongheensis* Y. M. Shui & W. H. Chen, Bull. Bot. Res., Harbin 23: 129. 2003.

红河木莲 hong he mu lian

Magnolia hongheensis (Y. M. Shui & W. H. Chen) V. S. Kumar.

Trees, 10–15 m tall. Old twigs robust, 1.1–1.5 cm in diam., sparsely lenticellate; young twigs densely rust-colored appressed hispid. Stipular scar 7–8 mm. Petiole ca. 3.3 cm, densely rust-colored appressed hispid; leaf blade oblong, ca. 21 × 11 cm, leathery, abaxially densely rust-colored appressed hispid (visible under hand lens), adaxially glabrous, midvein abaxially prominent and adaxially impressed, secondary veins 12–14 on each side of midvein, reticulate veins adaxially conspicuous, base rounded, margin slightly involute, apex obtuse to emarginate. Flowers not seen. Fruiting brachyblasts 2.3–2.4 × ca. 0.7 cm, smooth, sparsely lenticellate. Fruit ovoid-ellipsoid to cylindrical, 10–11 × ca. 4.4 cm; mature carpels ca. 100, ellipsoid, 1.9–2 cm, glabrous, tuberculate, dehiscing along dorsal and ventral sutures, apex shortly beaked. Seeds 2–5 per carpel, irregularly polygonal, smooth; testa red. Fr. Oct.

• Evergreen broad-leaved forests; 1900–2600 m. SE Yunnan (Lüchun, Yuanyang).

11. *Manglietia caveana* J. D. Hooker & Thomson, Fl. Ind. 1: 76. 1855.

西藏木莲 xi zang mu lian

Magnolia caveana (J. D. Hooker & Thomson) D. C. S. Raju & M. P. Nayar; *M. tibetica* V. S. Kumar; *Manglietia microtricha* Y. W. Law; *M. tenuifolia* Hung T. Chang & B. L. Chen.

Trees, 30–40 m tall, 40–60 cm d.b.h. Twigs thick and strong, 6–10 mm in diam.; vegetative buds orangish red appressed pubescent. Stipular scar 1/3–1/2 as long as petiole. Leaves usually 6–9 clustered on apex of twigs; petiole 2–2.5 cm; leaf blade obovate, 13–17 × 5–7 cm, leathery, abaxially grayish white, adaxially glabrous, midvein adaxially impressed, secondary veins 15–17 on each side of midvein, reticulate veins fine, dense, and prominent on both surfaces when dry, base cuneate, apex shortly acute. Flowers not seen; bract scar 1, just basal to tepals. Fruiting peduncle 1.5–2 cm, glabrous. Fruit ovoid, ca. 6 × 4 cm, usually curved because of carpels partly undeveloped; mature carpels abaxially narrowly elliptic, tuber-

culate, brownish appressed pilose and pale brown appressed finely pilose, apex with a ca. 3 mm beak. Seeds pale brown. Fr. Sep–Oct.

Evergreen broad-leaved forests; ca. 2000 m. SE Xizang (Médog), SE Yunnan (Maguan) [NE India, Myanmar].

12. *Manglietia patungensis* Hu, Acta Phytotax. Sin. 1: 335. 1951.

巴东木莲 ba dong mu lian

Trees, to 25 m tall, to 1.4 m d.b.h. Bark pale grayish brown and reddish. Twigs grayish brown. Stipular scar 1/7–1/5 as long as petiole. Petiole 2.5–3 cm; leaf blade obovate-elliptic, 14–18(–20) × 3.5–7 cm, thinly leathery, both surfaces glabrous, abaxially pale green, adaxially green and glossy, midvein abaxially prominent, secondary veins 13–15 on each side of midvein, base cuneate, apex caudate-acuminate. Flowers 8.5–11 cm in diam., fragrant. Peduncle ca. 1.5 cm; bract scar 1, 5–10 mm basal to tepals. Tepals 9, white; outer 3 tepals narrowly oblong, 4.5–6 × 1.5–2.5 cm, nearly leathery, apex obtuse; middle and inner tepals obovate, 4.5–5.5 × 2–3.5 cm, fleshy. Stamens 6–8 mm; anthers purplish red, 5–6 mm; connective exerted and forming a ca. 1 mm mucro; thecae adnate at base, sometimes apex slightly free. Gynoecium conic, ca. 2 cm; carpels not abaxially furrowed; ovules 4–8 per carpel. Fruit pale purplish red, terete-ellipsoid, 5–9 × 2.5–3 cm; mature carpels dotted on exposed side. Fl. May–Jun, fr. Jul–Oct.

• Forests; 600–1000 m. Chongqing, W Hubei, NW Hunan, E Sichuan.

This species is used medicinally.

13. *Manglietia szechuanica* Hu, Bull. Fan Mem. Inst. Biol., Bot. 10: 117. 1940.

四川木莲 si chuan mu lian

Manglietia figlarii V. S. Kumar (2006), not *M. szechuanica* (Dandy) Figlar (2000).

Trees, to 20 m tall, to 60 cm d.b.h. Older twigs grayish yellow; young twigs green, densely villous, hairs gradually deciduous, only residual at nodes. Stipular scar 4–6(–9) cm. Petiole 1.5–2.5 cm, white villous; leaf blade narrowly obovate to obovate, 11–20 × 3–6 cm, lower ca. 1/3 tapered, abaxially pale green and pale brown pubescent, adaxially deep green and glabrous, midvein white villous, secondary veins 13–16 on each side, reticulate veins sparse and prominent on both surfaces when dry, base cuneate, apex acuminate to shortly caudate. Flower buds ovoid; bract scar 1, 3–6 mm basal to tepals. Tepals 9, purplish red; outer 3 tepals pale green and usually flushed purplish, obovate, 5.5–6.5 × ca. 3 cm, sparsely villous; middle and inner tepals purplish red, 4–5.5 × 2.5–3 cm but inner ones smaller. Stamens 1.2–2 cm; filaments deep red, ca. 1 mm; connective exerted and forming a ca. 1 mm triangular mucro; anthers ca. 1 cm, introrse. Gynoecium ovoid-ellipsoid, 2–2.5 cm; carpels pale green, narrowly ellipsoid, 0.8–1 cm, densely shortly brown tomentose; styles pale red, ca. 3 mm. Fruit ovoid, 8–10 cm. Fl. Apr–May, fr. Aug–Sep.

• Evergreen broad-leaved forests; 1300–2000 m. C and S Sichuan, N Yunnan.

14. *Manglietia chevalieri* Dandy, J. Bot. 68: 204. 1930.

陸南木莲 mu nan mu lian

Manglietia chevalieri (Dandy) V. S. Kumar.

Trees, to 10 m tall. Bark grayish brown. Perules, young twigs, leaf blade abaxial surfaces, petioles, and stipular scars with pale reddish brown appressed trichomes. Young twigs green. Stipular scar semi-orbicular to semi-elliptic, 1/10–1/5 as long as petiole. Petiole 1.5–3 cm; leaf blade obovate to narrowly obovate, 10–18(–20) × 3.5–5(–6.5) cm, leathery, adaxially glabrous, secondary veins 10–18 on each side of midvein, base cuneate, apex cuspidate to shortly caudate. Tepals 9, in 3 whorls; outer (2 or)3 tepals oblong-elliptic, ca. 7.5 × 3 cm, thin, abaxially greenish; tepals of inner 2 whorls white and slightly yellowish, obovate, fleshy, base gradually tapered and forming a long claw; inner tepals smaller and narrower. Stamens 6–9 mm; connective exerted and forming a ca. 1.5 mm mucro. Gynoecium terete, ca. 1.7 × 1 cm; carpels narrowly obovoid, ca. 6 mm, exposed part of apical ones shallowly furrowed; ovules 8–10 per carpel, stalked. Fruit ovoid to ellipsoid, 5–9 × ca. 4 cm. Fl. Feb–Apr, fr. Sep–Oct.

Forests. S Yunnan [N Laos, Vietnam].

This species is grown as an ornamental.

15. *Manglietia duclouxii* Finet & Gagnepain, Bull. Soc. Bot. France 52(Mém. 4): 33. 1906.

川滇木莲 chuan dian mu lian

Manglietia duclouxii (Finet & Gagnepain) Hu in Hu & Chun, Icon. Pl. Sin. 2: 18. 1929.

Trees, to 6 m tall. Twigs glabrous. Stipular scar ca. 1/3 as long as petiole. Petiole 1–2.3 cm, adaxially deeply furrowed; leaf blade narrowly obovate to obovate-narrowly elliptic, 8–13 × 2.5–4 cm, thinly leathery, glabrous, adaxially deep green, midvein impressed and abaxially grayish green, reticulate veins inconspicuous, base cuneate, apex acuminate. Peduncle glabrous; spatheaceous bract 1, next to tepals. Tepals 9, fleshy; outer 3 tepals red, abaxially tuberculate; tepals of inner 2 whorls purplish red, obovate, 2.8–4.5 × 1.5–2.5 cm, transversely veined, clawed, base thickened. Stamens 1–1.2 cm; filaments short and broad, 1–1.5 mm; connective exerted and forming a 2–3 mm triangular mucro; anthers 6–7 mm, thecae slightly distinct and dehiscent introrsely. Gynoecium narrowly ellipsoid, 7–8 mm, villous; ovules 5 per carpel; styles 2–3 mm. Fruit ovoid-ellipsoid, 5–6 cm. Fl. May–Jun, fr. Sep–Oct.

Evergreen broad-leaved forests; 1300–2000 m. Guangxi, SE Sichuan, NE Yunnan [N Vietnam].

This species is used medicinally.

16. *Manglietia crassipes* Y. W. Law, Bull. Bot. Res., Harbin 2(4): 133. 1982.

粗梗木莲 cu geng mu lian

Manglietia crassipes (Y. W. Law) V. S. Kumar.

Trees or shrubs, to 4 m tall. Twigs, vegetative buds, and abaxial surfaces of leaf blade glaucous. Twigs thick and strong,

0.6–10 mm in diam. Stipular scar ca. 1/6 as long as petiole. Petiole thick and strong, 3–3.5 cm × 2–2.5 mm; leaf blade narrowly obovate to obovate-elliptic, 13–26 × 5–8 cm, leathery, abaxially glaucous, adaxially green, midvein adaxially slightly prominent to flat, secondary and reticulate veins prominent on both surfaces when dry, secondary veins 8–14 on each side of midvein, reticulate veins sparse, base broadly cuneate, apex shortly acute. Peduncle thick and strong, 3.5–4 cm; spatheaceous bract 1, thin. Tepals 9, in 3 whorls, white; outer 3 tepals obovate-oblong, 3.5–4 × 2–2.5 cm, thin, 5-striated; tepals of inner 2 whorls thick, fleshy. Stamens numerous, 1–1.5 cm; connective exerted, triangular, 2–3 mm; anthers 8–9 mm. Gynoecium ovoid, ca. 1.5 × 1.8 cm. Fruiting peduncle thick and strong, 4.5–5.5 × ca. 1 cm. Fruit ovoid, 5–6 × 4–5 cm; mature carpels ellipsoid, 1.5–2 cm, dehiscent into 2 valves along both ventral and dorsal sutures, apex shortly beaked. Fl. May, fr. Sep. $2n = 38^*$.

- Forests; ca. 1300 m. Guangxi (Jinxu).

17. *Manglietia pachyphylla* Hung T. Chang, Acta Sci. Nat. Univ. Sunyatseni 1: 55. 1961.

厚叶木莲 hou ye mu lian

Trees, to 16 m tall, to 30 cm d.b.h. Bark grayish black. Twigs thick and strong, glaucous and glabrous; vegetative buds pale yellow to dark brown villous. Stipular scar 2–3 mm. Petiole thick and strong, 3–5 cm; leaf blade obovate-elliptic to obovate-oblong, 12–32 × 6–10 cm, thickly leathery, rigid, both surfaces glabrous, abaxially pale green, adaxially deep green and glossy, secondary veins 12–14 on each side of midvein and inconspicuous on both surfaces, reticulate veins inconspicuous, base cuneate, apex acute. Peduncle thick and strong, ca. 1 cm in diam., glabrous; bract scar 1, ca. 5 mm basal to tepals. Flowers fragrant. Tepals 9(or 10), white; outer 3 tepals obovate, 7–8 × 3–3.5 cm; middle 3 tepals obovate, 5.5–6 cm, fleshy; inner 3(or 4) tepals obovate, ca. 5 × 2.5 cm, fleshy, base narrowed and forming a claw; innermost tepal narrower and longer, ca. 5.5 × 2 cm. Stamens ca. 1.2 cm; filaments ca. 1 mm, basally connate; connective exerted and forming a mucro; anthers ca. 1 cm. Gynoecium ovoid, ca. 2.2 × 1.8 cm; carpels ca. 5 mm; ovules 10–12 per carpel; styles 1–2 mm. Fruit ellipsoid, ca. 7 × 4.5 cm; mature carpels 38–46, 2–2.5 cm, abaxially furrowed, apex shortly beaked. Seeds 3 or 4, orbicular, 5–6 mm. Fl. May, fr. Sep–Oct.

- Montane forests; 800–1500 m. SC Guangdong.

This species is grown as an ornamental and used for timber.

18. *Manglietia fordiana* Oliver, Hooker's Icon. Pl. 20: t. 1953. 1891.

木莲 mu lian

Trees, to 25 m tall, to 45 cm d.b.h. Bark pale grayish brown. Young twigs and vegetative buds reddish brown pubescent, later glabrescent. Stipular scar semi-elliptic, 3–5 mm. Petiole 1–3(–4.5) cm, base slightly swollen; leaf blade narrowly obovate, narrowly elliptic-obovate, or rarely narrowly elliptic, 8–17(–20) × 2.5–5.5(–9.5) cm, leathery or thinly leathery, abaxially sparsely reddish brown pubescent, secondary veins 8–17

on each side of midvein, reticulate veins conspicuous or inconspicuous on both surfaces when dry, base cuneate and decurrent along petiole, margin slightly involute and wavy or not wavy, apex acute to acuminate. Peduncle 5–11(–40) × 4–10 mm, with 1 annular bract scar, with or without reddish brown pubescence. Tepals 9, 3 per whorl, white; outer 3 tepals slightly thinner, oblong-elliptic, broadly ovate or obovate, 5–7 × 3–4 cm, nearly leathery; tepals of inner 2 whorls obovate, 4–6 × 2–3 cm, usually fleshy. Stamens red, ca. 1 cm; connective forming an obtuse mucro; anthers ca. 8 mm. Gynoecium 1.5–2.5 cm, smooth; carpels 18–32, basal ones 5–10 × 3–5 mm, middle ones ca. 5 mm wide on exposed side; ovules 5–10 per carpel; styles inconspicuous or to 1 mm. Fruit brown, ovoid to ellipsoid-ovoid, 2–6 cm; mature carpels with dot-protuberance on exposed side, apex with or without a ca. 1 mm beak. Seeds slightly flat, 7–8 × 5–6 mm; testa red. Fl. Apr–May, fr. Sep–Oct.

Hills, forests, beside rivers; 300–1200 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Yunnan, Zhejiang [Vietnam].

This species is used medicinally and for timber.

- 1a. Leaf blade leathery, reticulate veins inconspicuous on both surfaces when dry, margin not wavy; peduncle with reddish brown trichomes; outer tepals oblong-elliptic; carpel with ca. 1 mm beak 18a. var. *fordiana*
- 1b. Leaf blade thinly leathery, reticulate veins conspicuous on both surfaces when dry, margin wavy; peduncle glabrous; outer tepals broadly ovate to obovate; carpel without a beak 18b. var. *hainanensis*

18a. *Manglietia fordiana* var. *fordiana*

木莲(原变种) mu lian (yuan bian zhong)

Manglietia fordiana (Oliver) Hu; *M. yuyuanensis* (Y. W. Law) V. S. Kumar; *Manglietia yuyuanensis* Y. W. Law; *Paramanglietia microcarpa* Hung T. Chang.

Leaf blade leathery, reticulate veins inconspicuous on both surfaces when dry, margin not wavy. Peduncle with reddish brown trichomes. Outer tepals oblong-elliptic. Carpel with a ca. 1 mm beak. Fl. May, fr. Oct. $2n = 38$.

Hills; ca. 1200 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan, Zhejiang [Vietnam].

This taxon is used medicinally and for timber.

18b. *Manglietia fordiana* var. *hainanensis* (Dandy) N. H. Xia, **comb. et stat. nov.**

海南木莲 hai nan mu lian

Basionym: *Manglietia hainanensis* Dandy, J. Bot. 68: 204. 1930; *M. albistaminea* Y. W. Law et al.

Leaf blade thinly leathery, reticulate veins conspicuous on both surfaces when dry, margin wavy. Peduncle glabrous. Outer tepals broadly ovate to obovate. Carpel without a beak. Fl. Apr–May, fr. Sep–Oct.

- Forests, beside rivers; 300–1200 m. Hainan.

“*Manglietia albistaminata* Y. W. Law & R. Z. Zhou” and “*M. renzhangii* Y. W. Law” (in Y. H. Liu, *Magnolias China*, 122, 187, 2004) belong here but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1). “*Manglietia albistaminata*” was subsequently validly published as *M. albistaminea*.

This taxon is used for timber.

19. *Manglietia forrestii* W. W. Smith ex Dandy, *Notes Roy. Bot. Gard. Edinburgh* 16: 126. 1928.

滇桂木莲 dian gui mu lian

Magnolia fordiana (Oliver) Hu var. *forrestii* (W. W. Smith ex Dandy) V. S. Kumar; *Manglietia fordiana* Oliver var. *forrestii* (W. W. Smith ex Dandy) B. L. Chen & Nooteboom.

Trees, to 25 m tall, ca. 30 cm d.b.h. Young twigs, buds, petioles, abaxial base of outer tepals, and peduncles reddish brown appressed glossy villous. Stipular scars 3–10 mm. Petiole 1–3 cm; leaf blade obovate to oblong-obovate, 11–20 × 5–9.5 cm, leathery, abaxially sparsely covered with reddish brown erect trichomes, adaxially glabrous, secondary veins 12–16 on each side of midvein, base cuneate to broadly cuneate, apex abruptly acute to acuminate. Flowers fragrant. Tepals 9 (or 10), white; outer 3 tepals oblong-obovate, 4.5–7 cm; tepals of inner 2 whorls obovate, ca. 4.5 cm, thickly fleshy, glabrous; inner 3 tepals smaller. Stamens 1.1–1.5 cm; connective exerted, obtuse; anthers ca. 1 cm, ± distinct or only connate at base. Gynophore 1–2.5 cm. Gynoecium ovoid, ca. 2.5 cm; carpels glabrous. Fruit ovoid, 4–6 cm; mature carpels densely tuberculate, dehiscent along dorsal and ventral sutures, apex shortly beaked. Seeds black, abaxially with several furrows, ventral furrow impressed, base sharp. Fl. Jun, fr. Sep–Oct.

- Forests; 1100–2900 m. SW Guangxi, S and W Yunnan.

One of the co-authors (Nooteboom) considers that this taxon would be better treated as a variety of *Manglietia (Magnolia) fordiana*.

This species is used for timber.

20. *Manglietia calcarea* X. H. Song, *J. Nanjing Inst. Forest.* 1984(4): 46. 1984.

石山木莲 shi shan mu lian

Magnolia fordiana (Oliver) Hu var. *calcarea* (X. H. Song) V. S. Kumar; *Manglietia fordiana* Oliver var. *calcarea* (X. H. Song) B. L. Chen & Nooteboom.

Trees, to 14 m tall, ca. 35 cm d.b.h., glabrous except for stipules. Young twigs 5–7 mm in diam. Stipules densely covered with straight appressed brown trichomes, adnate to base of petiole, scars 4–5 mm. Petiole 2.8–3.8 cm, dilated toward base; leaf blade obovate-elliptic to narrowly obovate, 14.5–20 × 3.5–7 cm, leathery and rigid, adaxially dark green, midrib abaxially prominent and adaxially impressed, secondary veins 14–17 on each side of midvein, abaxially visible to slightly prominent, and adaxially inconspicuous, base attenuate-cuneate, apex rounded with a 6–10(–14) mm acumen. Peduncle 5–8(–20) × 5–6 mm. Tepals 9, white; outer 3 tepals obovate-elliptic, ca. 6.2 × 2.5 cm, apex rounded; inner tepals spatulate, 4.5–5.5(–6) cm. Stamens many, ca. 1.2 cm; filament ca. 2 mm;

connective exerted into a triangular ca. 1.8 mm tip. Perianth and stamens scar band 8–14 × 5–6 mm. Gynoecium broadly ellipsoid, 1.6–2 × ca. 1 cm; carpels 12–16(–30); ovules ca. 7 per carpel. Fruiting gynophore 9–11 × ca. 6 mm. Fruit ovoid to ovoid-globose, ca. 6 × 5 cm; mature carpels woody, dorsal face elliptic, dehiscent along dorsal suture; perianth and stamens scar band 1.2–1.3 × 0.7–0.8 cm. Seeds 2–5 per carpel, oblong, 8–10 × 5–6 mm.

- Forest margins, limestone areas; 600–800 m. Guizhou.

One of the co-authors (Nooteboom) considers that this taxon would be better treated as a variety of *Manglietia (Magnolia) fordiana*.

This species is grown as an ornamental and used for timber.

21. *Manglietia obovalifolia* C. Y. Wu & Y. W. Law, *Acta Phytotax. Sin.* 34: 89. 1996.

倒卵叶木莲 dao luan ye mu lian

Magnolia obovalifolia (C. Y. Wu & Y. W. Law) V. S. Kumar.

Trees, to 30 m tall, to 50 cm d.b.h. Twigs 3–4 mm in diam., glabrous. Stipular scar 2–3 mm. Petiole 1.5–2 cm, glabrous, adaxially furrowed; leaf blade obovate, 6–11 × 3–6 cm, thinly leathery, both surfaces glabrous, midvein adaxially impressed, secondary veins 9–11 on each side of midvein, reticulate veins prominent on both surfaces when dry, base broadly cuneate and slightly decurrent, margin slightly reflexed, apex cuspidate with a 5–10 mm mucro. Flower buds ovoid, 3–4 cm. Peduncle 1–1.5 cm, glabrous, with a bract scar; spatheaceous bract 1, just next to tepals, tuberculate, glabrous, dehiscing along one side. Tepals 9, fleshy; outer 3 tepals ovate, 3–3.5 × ca. 1.5 cm; tepals of inner 2 whorls smaller. Gynoecium narrowly ovoid-ellipsoid, ca. 2.5 × 0.8 cm; carpels conspicuously with 2 or 3 series, tuberculate, furrowed along dorsal suture, furrow not reaching to style apex; ovules ca. 6 per carpel; styles 5–6 mm. Fruit not seen. Fl. Apr–May.

- Forests; 1400–1500 m. S Guizhou, SE Yunnan.

22. *Manglietia oblonga* Y. W. Law et al., *Ann. Bot. Fenn.* 43: 64. 2006.

椭圆叶木莲 tuo yuan ye mu lian

Trees, to 20 m tall, to 40 cm d.b.h. Bark blackish brown. Vegetative buds, petioles, leaf blade abaxial surfaces, flower buds, and peduncles golden yellow appressed pubescent. Twigs pale green when young, brown when old. Stipular scar ca. 6 mm. Petiole 2–2.5 cm; leaf blade obovate-elliptic, 13–20 × 3.5–4.5 cm, leathery, secondary veins 12–15 on each side of midvein, base cuneate, apex acuminate. Tepals 9, outer 3 pale green and thinner, inner 6 white and fleshy, transversely wavy striate; tepals of middle whorl 3, ovate, 4.5–5.5 × 2.5–3.5 cm; innermost 3 tepals long ovate, 4–5 × 2–3 cm. Stamens numerous, red, 6–7 mm; connective exerted and forming a triangular mucro; anthers 5–6 mm. Gynoecium ovoid; carpels 14 or 15, long ovoid, ca. 7 mm, brownish pubescent; styles white. Fruit not seen. Fl. Apr–May.

- Evergreen broad-leaved forests; 800–1200 m. Guangxi (Lingui, Xing’an).

23. *Manglietia kwangtungensis* (Merrill) Dandy, Bull. Misc. Inform. Kew 1927: 264. 1927.

毛桃木莲 mao tao mu lian

Manglietia kwangtungensis Merrill, J. Arnold Arbor. 8: 5. 1927; *M. fordiana* (Oliver) Hu var. *kwangtungensis* (Merrill) V. S. Kumar; *M. moto* (Dandy) V. S. Kumar; *Manglietia fordiana* Oliver var. *kwangtungensis* (Merrill) B. L. Chen & Nootboom; *M. moto* Dandy.

Trees, to 20 m tall, to 60 cm d.b.h. Bark deep gray, with several lenticels transversely arranged or linked into pieces. Young twigs, vegetative buds, petioles, young leaf blades, and fruiting peduncles densely rust-colored tomentose. Stipules narrowly ovate, ca. 6 × 1.2 cm, ferruginous tomentose, scar narrowly triangular, ca. 1/3 as long as petiole. Petiole 2–4 cm, apical part narrowly furrowed; leaf blade obovate-elliptic, narrowly obovate-elliptic, or narrowly obovate, 12–25 × 4–8 cm, leathery, abaxially ferruginous tomentose especially along midvein, adaxially glabrous, secondary veins 10–15 on each side of midvein, base cuneate to broadly cuneate, apex acute to acuminate. Flowers fragrant. Peduncle 6–12 cm. Tepals 9, milky white; outer 3 tepals nearly oblong, 6.5–7.5 cm, leathery; middle 3 tepals obovate, 6.5–7 × 3.5–4 cm, thickly fleshy; inner 3 tepals obovate-spoon-shaped, 6–6.5 × 2–2.5 cm, thickly fleshy. Stamens red, 1.1–1.3 cm; connective exerted 1.5–2 mm, apex mucronate; anthers ca. 1 cm. Gynoecium ovoid, ca. 2 × 1.5 cm; basal carpels narrowly ellipsoid, 10–12 × ca. 3 mm (including style), dorsally 4–6-ridged, glabrous; apical carpels abaxially shallowly furrowed, apex sharply long acuminate; ovules 6–8 per carpel. Fruit ovoid, 5–7 × 3.5–6 cm; mature carpels abaxially tuberculate, apex with a 2–3 mm beak. Fl. May–Jun, fr. Aug–Dec.

• Evergreen broad-leaved forests, on acidic yellow soil; 400–1200 m. S Fujian, Guangdong, W Guangxi, S Hunan.

This species is used for timber.

24. *Manglietia rufibarbata* Dandy, Notes Roy. Bot. Gard. Edinburgh 16: 128. 1928.

毛瓣木莲 mao ban mu lian

Manglietia rufibarbata (Dandy) V. S. Kumar; *Manglietia pubipetala* Q. W. Zeng.

Trees to 20 m tall, to 30 cm d.b.h. Bark grayish brown. Young twigs, vegetative buds, stipules, petioles, young leaf blades, and fruiting peduncles densely rust-colored tomentose. Stipules adnate to petiole; scar as long as 1/3–1/2 of petiole. Petiole 2–2.5 cm; leaf blade obovate-oblong, 18–24 × 7–8 cm, thinly leathery, basal ca. 1/2 gradually narrower, abaxially with dense rust-colored trichomes, adaxially glabrous, base broadly cuneate, apex caudate-acuminate. Flower buds ovoid, ca. 3.5 × 2 cm. Peduncle ca. 2.5 cm. Tepals 12; outer 3 tepals pale green, oblong, ca. 3.8 × 2 cm, rust-colored tomentose; middle 3 tepals white, ca. 3.2 × 2.3 cm, fleshy, base rust-colored tomentose; inner 6 tepals spatulate, ca. 3 × 1.6 cm, fleshy. Stamens many, red, abaxially sparsely hirsute; filaments 1–1.5 mm; connective exerted, with a ca. 1 mm triangular appendage; anthers ca. 1 cm, thecae distinct and ca. 1 mm wide. Gynoecium obovoid, ca.

2 × 1.5 cm, densely rust-colored hirsute; carpels many; ovules 5–8 per carpel. Mature fruit unknown. Fl. May.

Evergreen broad-leaved forests; ca. 1500 m. Yunnan (Maguan) [Vietnam].

Although the holotype of *Manglietia pubipetala* is conspecific with *M. rufibarbata*, the paratypes (*T. X. Gao & D. Q. Zhu 05, Q. W. Zeng 67*) are conspecific with *M. zhengyiana*.

25. *Manglietia longipedunculata* Q. W. Zeng & Y. W. Law, Ann. Bot. Fenn. 41: 151. 2004.

长梗木莲 chang geng mu lian

Manglietia longipedunculata (Q. W. Zeng & Y. W. Law) V. S. Kumar.

Trees, to 15 cm tall, to 50 cm d.b.h. Bark blackish brown. Vegetative buds, young twigs, petioles, peduncles, and leaf blade abaxial surfaces reddish brown erect villous. Twigs green when young, brown when old. Stipular scar 7–8 mm. Petiole 2.5–3.5 cm, furrowed; leaf blade obovate-elliptic to elliptic, 13–19(–22) × 5–7 cm, thickly leathery, abaxially pale green, adaxially dark green, midvein abaxially prominent, secondary veins 13 or 14 on each side of midvein, base cuneate, apex shortly acuminate to acuminate. Peduncle 5.5–6 cm, slender. Flowers fragrant. Tepals 9 or 11 (or 12); outer 3 tepals elliptic, 10–10.5 × ca. 4 cm, abaxially pale green, adaxially white, 5-veined; middle 3 tepals white, obovate-elliptic, 8–9 × ca. 3.5 cm, thickly fleshy; inner 3 tepals white, obovate-spatulate, 7–8 × 2.5–3 cm, thickly fleshy. Stamens numerous, red, ca. 2.5 cm; filaments purplish red, ca. 3 mm; connective red, exerted and forming a semiorbicular mucro; anthers yellow, ca. 2 cm. Gynoecium pale yellowish green, ovoid, ca. 3.5 × 3 cm; carpels 50–60; ovules 3 or 4 per carpel; styles lanceolate, slightly curved; stigmas pale red, glabrous. Fruiting peduncle 5.5–6 cm. Fruit ovoid; mature carpels thickly woody, tuberculate, dehiscing along dorsal suture. Seeds compressed ovoid. Fl. May–Jun, fr. Aug–Sep.

• Evergreen broad-leaved forests; 700–800 m. Guangdong (Longmen).

26. *Manglietia confifera* Dandy, J. Bot. 68: 205. 1930.

桂南木莲 gui nan mu lian

Manglietia confifera (Dandy) V. S. Kumar; *M. confifera* var. *chingii* (Dandy) V. S. Kumar; *Manglietia chingii* Dandy; *M. confifera* subsp. *chingii* (Dandy) J. Li; *M. tenuipes* Dandy.

Trees, to 20 m tall. Bark gray and smooth. Vegetative buds and young twigs reddish brown pubescent. Stipular scar 3–5 mm. Petiole 2–3 cm, narrowly furrowed, at first appressed villous; leaf blade narrowly obovate to narrowly obovate-elliptic, 12–15 × 2–5 cm, leathery, abaxially at first grayish green and hispidulous or glaucous, adaxially glabrous, secondary veins 12–14 on each side of midvein, base narrowly cuneate to cuneate, apex shortly acuminate to rotund. Peduncle 4–7 cm, slender, pendulous, with 1 bract scar basal to tepals. Flower buds ovoid. Tepals 9 or 11, 3 per whorl; outer 3 tepals usually green, elliptic, 4–5 × 2.5–2.8 cm, thinner, apex rotund; middle 3 tepals obovate-elliptic, 5–5.5 × 2.5–3 cm, fleshy; inner 3 or 4 tepals pure white, obovate-spoon-shaped, 4–4.5 × 1.5–2 cm,

fleshy. Stamens 1.5–2 cm; connective exerted and forming a triangular mucro; anthers 8–9 mm. Gynoecium 1.5–2 cm; basal carpels 0.8–1 cm, abaxially 3- or 4-furrowed; styles ca. 2 mm. Fruit ovoid, 4–5 cm; mature carpels tuberculate, apex shortly beaked; endotesta dotted. Fl. May–Jun, fr. Sep–Oct.

Hills, wet places in valleys; 700–1300 m. N Guangdong, Guangxi, SE Guizhou, S Hunan, SE Yunnan [N Vietnam].

This species is grown as an ornamental. It is used medicinally and for timber.

27. *Manglietia ovoidea* Hung T. Chang & B. L. Chen, Acta Sci. Nat. Univ. Sunyatseni 1988(1): 108. 1988.

卵果木莲 luan guo mu lian

Manglietia ovoidea (Hung T. Chang & B. L. Chen) V. S. Kumar.

Trees, to 10 m tall, to 30 cm d.b.h. Twigs robust, at first with rust-colored trichomes but glabrescent. Stipular scar ca. 1/2 as long as petiole. Petiole at first with rust-colored trichomes; leaf blade narrowly elliptic to elliptic-oblong, 13–14 × 4–5 cm, leathery, abaxially pale green, adaxially dark green, midvein adaxially impressed, secondary and reticulate veins inconspicuous, base cuneate, apex shortly acute. Peduncle with trichomes, 1.5–2 cm. Tepals 11, pale yellowish green, fleshy; outer 3 tepals obovate, ca. 3.5 × 2.4 cm; innermost 2 tepals purplish, spatulate-obovate. Stamens numerous. Gynoecium broadly ovoid to subglobose, 3.2–3.6 cm. Fruiting peduncle with trichomes, 2.7–3.2 cm; mature carpels ellipsoid, abaxially papillate. Fl. Apr, fr. Oct–Nov.

• Evergreen broad-leaved forests; 1700–2000 m. Guangxi, SE Yunnan.

28. *Manglietia glaucifolia* Y. W. Law & Y. F. Wu, Guihaia 6: 263. 1986.

苍背木莲 cang bei mu lian

Trees, to 8 m tall. Twigs yellowish brown, glabrous; vegetative buds glabrous. Stipular scar 1/3–1/2 as long as petiole. Petiole 1.5–2 cm; leaf blade narrowly obovate to narrowly elliptic, 9–18 × 2–3.5 cm, both surfaces glabrous, abaxially glaucous, adaxially deep green, midvein adaxially impressed, secondary and reticulate veins inconspicuous, secondary veins 10–15 on each side of midvein, base cuneate, apex acuminate.

Peduncle ca. 4 cm. Tepals 9, white; tepals of outer whorls 3, oblong-obovate, 4–5 cm; tepals of inner whorls 6, obovate to obovate-spoon-shaped, fleshy. Stamens numerous, 1–1.5 cm; connective thick, exerted, apically tapered triangular; anthers 8–10 mm. Gynoecium ellipsoid, 1.6–2 cm; carpels numerous; ovules 10 per carpel. Fruiting peduncle 4–6 cm. Fruit ovoid, 4.5–5 cm, pendulous; mature carpels ellipsoid, 1.5–2 cm, abaxially papillate, apex shortly beaked. Seeds heart-shaped, ca. 7 × 5 mm. Fl. May–Jun, fr. Aug.

• Forests; 1500–1600 m. Guizhou.

29. *Manglietia decidua* Q. Y. Zheng, J. Nanjing Forest. Univ. 19(1): 46. 1995.

落叶木莲 luo ye mu lian

Manglietia decidua (Q. Y. Zheng) V. S. Kumar; *Sino-manglietia glauca* Z. X. Yu & Q. Y. Zheng.

Trees, deciduous, to 15 m tall, to 45 cm d.b.h. Bark grayish white. Twigs purple, smooth, scattered with white sub-orbicular lenticels; vegetative buds subglabrous. Stipular scar 1/4–1/2 as long as petiole. Leaves often clustered on apex of branches; petiole 2.5–4.5(–6) cm; leaf blade narrowly obovate, narrowly elliptic, or elliptic, ca. 20 × 3.5–7 cm, papery, abaxially with gray and white trichomes but later glabrescent, adaxially dark green and smooth, midvein adaxially slightly impressed, secondary veins 9–12 on each side of midvein, base cuneate, margin slightly revolute, apex obtuse to shortly acute. Flower buds narrowly ovoid, subtended by a spathaceous bract. Peduncle ca. 1 cm, at first with trichomes but later glabrescent. Tepals 15 or 16, in 5 or 6 whorls, pale yellow, lanceolate to narrowly obovate, becoming shorter and narrower inward, glabrous; outer 3 tepals 7–7.4 × 1.8–2 cm; innermost 3 or 4 tepals 5.5–6 × 0.3–0.8 cm. Stamens 54–60, 6–7 mm; filaments ca. 1 mm; connective exerted and forming a ca. 1 mm triangular mucro; anthers 4–5 mm. Gynoecium sessile, long ovoid, ca. 1 cm; carpels 15–22; ovules 6–8 per carpel. Fruiting peduncle ca. 1.6 cm. Fruit reddish brown when fresh but pale brown when dry, ovoid to subglobose, 4.7–7 × 4–4.5 cm; mature carpels long ovoid to long ellipsoid, 1.5–3 × 1–1.7 × 0.3–0.7 cm, woody, dehiscent along ventral sutures first then along dorsal suture. Seeds nearly cordate to subglobose, 7–11 × 7–11 × 5–8 mm; testa red. Fl. May, fr. Sep–Oct.

• Bamboo forests; 400–700 m. Jiangxi (Yichun).

2. MAGNOLIA Linnaeus, Sp. Pl. 1: 535. 1753.

木兰属 mu lan shu

Trees or shrubs, evergreen. Bark usually gray and smooth or sometimes coarsely deeply furrowed. Twigs with annular stipular scar. Stipules membranous, free or adnate to petiole and leaving a stipular scar on petiole. Leaves spirally arranged, folded in bud, erect when young; leaf blade thickly papery or leathery, margin entire. Flowers terminal on terminal brachyblasts, solitary, bisexual, large, usually fragrant. Tepals 9–12, in 3 or 4 whorls, subequal. Stamens caducous; filaments flat; connective elongated, forming a short or long tip; anthers dehiscent introrsely. Gynoecium linked to androecium, without a gynophore. Carpels few to many, distinct; styles curved outward; ovules 2 per carpel or rarely in basal carpels 3 or 4; stigmas papillate, located in adaxial side of carpel. Fruit usually ovoid; mature carpels distinct, leathery or woody, dehiscent along dorsal sutures, apex long or shortly beaked. Seeds 1 or 2 per carpel; testa orangish red or bright red, fleshy, oily; endotesta rigid, hilum connected to placentation by filiform funiculus.

About 20 species: Central America, E and S North America, including Mexico and Antilles; one species (introduced) in China.

1. *Magnolia grandiflora* Linnaeus, Syst. Nat., ed. 10, 2: 1802. 1759.

荷花木兰 he hua mu lan

Trees, to 30 m tall but usually shorter when cultivated. Bark pale brown to gray, thinly scaly fissured. Twigs, vegetative buds, petioles, and leaf blade abaxial surfaces densely brown to grayish brown shortly tomentose but abaxial surface of young leaf blades glabrous. Twigs thick and strong. Petiole 1.5–4 cm, deeply furrowed, without a stipular scar; leaf blade elliptic, oblong-elliptic, or obovate-oblong, 10–20 × 4–7(–10) cm, thickly leathery, adaxially deep green and glossy, secondary veins 8–10 on each side of midvein, base cuneate, apex obtuse

to shortly mucronate. Flowers 15–20 cm in diam., fragrant. Tepals 9–12, white, obovate, 6–10 × 5–7 cm, thickly fleshy. Stamens ca. 2 cm; filaments purple, flat; connective exerted and forming a mucro; anthers introrse. Gynoecium ellipsoid, densely long tomentose; carpels ovoid, 1–1.5 cm; styles reclinate. Fruit terete to ovoid, 7–10 × 4–5 cm, densely brown to pale grayish yellow tomentose; mature carpels abaxially rounded, dehiscing along dorsal sutures, apex long beaked. Seeds ovoid, ca. 1.4 × 0.6 cm; testa red. Fl. May–Jun, fr. Sep–Oct. $2n = 114$.

Cultivated in provinces south of Chang Jiang [native to SE North America].

This species is widely cultivated as an ornamental and for timber.

3. *LIRIANTHE* Spach, Hist. Nat. Vég. Phan. 7: 485. 1839.

长喙木兰属 chang hui mu lan shu

Trees or shrubs, evergreen. Bark usually gray, smooth or sometimes rough and furrowed. Stipules membranous, adnate to petiole and leaving a stipular scar on petiole. Leaves spirally arranged, folded in bud, erect when young; leaf blade thickly papery or leathery, margin entire. Flowers terminal on terminal brachyblasts, solitary, bisexual, large, usually fragrant. Spathaceous bracts 1 to several. Tepals 9–12, 3 per whorl, usually white, subequal. Stamens caducous; filaments flat; connective exerted and forming a mucro; anthers dehiscing introrsely. Gynoecium without a gynophore; carpels few or many, distinct; ovules 2(–4) per carpel. Fruit usually ellipsoid, both ends acute; mature carpels distinct, leathery or subwoody, all persistent on torus, dehiscing along dorsal sutures, apex beaked.

About 12 species: SE Asia; eight species (five endemic) in China.

“*Magnolia menlunica* Q. W. Zeng & Y. W. Law” (in Y. H. Liu, Magnolias China, 76. 2004) is of uncertain identity. It belongs to *Lirianthe* and is probably the same as an already published species but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

- 1a. Stipular scar 1/3–1/2 as long as petiole 1. *L. fistulosa*
 1b. Stipular scar reaching apex of petiole.
 2a. Leaf blade large-sized, 20–70 × 7–22 cm 2. *L. henryi*
 2b. Leaf blade medium-sized or small-sized, length not exceeding 30 cm, width usually not exceeding 10 cm.
 3a. Plants glabrous throughout.
 4a. Leaf blade slightly wavy adaxially, margin slightly revolute, secondary veins 8–10 on each side of midvein, reticulate veins sparse 7. *L. coco*
 4b. Leaf blade flat, margin not revolute, secondary veins 14–16 on each side of midvein, reticulate veins dense 8. *L. fujianensis*
 3b. Plants ± with trichomes.
 5a. Flowers smaller; outer tepals shorter than 4 cm 6. *L. championii*
 5b. Flowers larger; outer tepals longer than 5 cm.
 6a. Petiole 5–7 cm; leaf blade rounded or slightly cordate at base 3. *L. delavayi*
 6b. Petiole 1.5–3 cm; leaf blade cuneate or broadly cuneate at base.
 7a. Leaf blade pale green, abaxially with white curved trichomes 4. *L. odoratissima*
 7b. Leaf blade glaucous, abaxially with dense white silky trichomes 5. *L. albosericea*

1. *Lirianthe fistulosa* (Finet & Gagnepain) N. H. Xia & C. Y. Wu, **comb. nov.**

显脉木兰 xian mai mu lan

Basionym: *Talauma fistulosa* Finet & Gagnepain, Bull. Soc. Bot. France 52(Mém. 4): 31. 1906; *Magnolia championii* Benth. subsp. *fistulosa* (Finet & Gagnepain) J. Li; *M. fistulosa* (Finet & Gagnepain) Dandy; *M. phanerophlebia* B. L. Chen; *M. talaumoides* Dandy.

Shrubs or small trees, to 3 m tall, to 6 cm d.b.h., glabrous.

Young twigs gray to yellowish gray when dry, 5–7 mm in diam., terete, smooth. Stipular scar 0.7–1.9(–2.5) cm. Petiole (1–)3–6(–7) cm, obviously thickened toward its base; leaf blade obovate to elliptic, 31–34.5(–36) × 9.5–14(–17) cm, leathery, abaxially greenish, adaxially dark green and shiny, midvein conspicuously elevated abaxially, secondary veins (11–)13–17(–19) on each side of midvein, adaxially much impressed, anastomosing with an intramarginal vein, and more prominent on both surfaces than coarsely netted reticulate veins, base cuneate and decurrent with 2 ridges into petiole, apex acuminate, acumen 1–2 cm. Peduncle ca. 2.5 × 0.4 cm, recurved; spatha-

ceous bracts 3, 1 toward base of peduncle, 1 at middle or slightly apically on peduncle, and 1 at base of perianth. Tepals 8 or 9, subequal; outer 3 tepals greenish, thinly leathery; inner 5 or 6 tepals white, fleshy. Stamens numerous. Gynoecium narrowly ovoid; carpels ca. 11. Fruit not seen. Fl. May.

- Evergreen broad-leaved forests; 500–700 m. S Yunnan.

2. *Lirianthe henryi* (Dunn) N. H. Xia & C. Y. Wu, **comb. nov.**

大叶木兰 da ye mu lan

Basionym: *Magnolia henryi* Dunn, J. Linn. Soc., Bot. 35: 484. 1903; *Manglietia wangii* Hu & Chun; *Talauma kerrii* Craib.

Trees, to 20 m tall. Young twigs with appressed trichomes but later glabrescent. Stipular scar nearly reaching apex of petiole. Petiole 4–11 cm, with appressed trichomes when young; leaf blade obovate-oblong, 20–70 × 7–22 cm, leathery, abaxially sparsely appressed pubescent, adaxially glabrous, midvein adaxially prominent, secondary veins 14–20 on each side of midvein, reticulate veins sparse and prominent on both surfaces when dry, base broadly cuneate, apex obtuse to acute. Peduncle pendulous, ca. 8 cm, with 2 bract scars, glabrous. Flower buds ovoid; spatheaceous bracts glabrous. Tepals 9; tepals of outer whorl 3, green, ovate-elliptic, 6–6.5 × 3–3.5 cm, apex obtuse; tepals of middle and inner whorls milky white, obovate-spoon-shaped, 5.5–6 cm, thickly fleshy; tepals of inner whorl narrower and smaller. Stamens 1.2–1.5 cm; anthers 1–1.2 cm; connective exerted and forming a mucro. Gynoecium narrowly ellipsoid, 3.5–4 cm, glabrous; carpels 85–95, narrowly long ellipsoid, 1.5–2 cm × 2–3 mm, abaxially 4- or 5-ridged; styles 4–9 mm. Fruit ovoid-ellipsoid, 10–15 × 3–5 cm. Fl. May, fr. Aug–Sep.

Evergreen broad-leaved forests; 500–1500 m. S Yunnan [Myanmar, Thailand].

3. *Lirianthe delavayi* (Franchet) N. H. Xia & C. Y. Wu, **comb. nov.**

山玉兰 shan yu lan

Basionym: *Magnolia delavayi* Franchet, Pl. Delavay. 1: 33. 1889; *M. carpunii* M. S. Romanov & A. V. Bobrov.

Trees, to 12 m tall, to 80 cm d.b.h. Bark gray to grayish black, coarse and fissured. Old twigs thick and strong, dotted with lenticels; young twigs olive green, pale yellowish brown pubescent. Stipular scar nearly reaching apex of petiole. Petiole 5–7(–10) cm, densely villous; leaf blade ovate to ovate-oblong, 10–20(–32) × 5–10(–20) cm, leathery, abaxially densely interwoven tomentose and white powdery but later only with residual trichomes on veins, adaxially covered with curved long trichomes at first but later glabrescent, midvein flat to impressed and with residual trichomes, secondary veins 11–16 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base broadly rounded to sometimes slightly cordate, margin wavy, apex obtuse to rarely emarginate. Peduncle erect, 3–4 cm. Flowers fragrant, cupular, 15–20 cm in diam. Tepals 9 or 10; tepals of outer whorl pale green, oblong, 6–8(–10) × 2–3(–4) cm, margin revolute; tepals of inner 2 whorls milky white or red, obovate-spoon-shaped, 8–11 × 2.5–3.5 cm; tepals of inner whorl narrower. Stamens ca. 210, 1.8–2.5 cm; connective exerted and forming a sharp triangular tip;

anthers divergent. Gynoecium ovoid, 3–4 cm, finely yellow villous, apex acute; carpels ca. 100. Fruit ovoid-ellipsoid, 9–15(–20) cm; mature carpels narrowly ellipsoid, finely yellow villous, completely dehiscent along dorsal suture, apical beak reflexed. Fl. Apr–Jun, fr. Aug–Oct. $2n = 38^*$.

- Forests, limestone areas, wet slopes; 1500–2800 m. Guizhou, S Sichuan, Yunnan.

This species is grown as an ornamental.

4. *Lirianthe odoratissima* (Y. W. Law & R. Z. Zhou) N. H. Xia & C. Y. Wu, **comb. nov.**

馨香木兰 xin xiang mu lan

Basionym: *Magnolia odoratissima* Y. W. Law & R. Z. Zhou, Bull. Bot. Res., Harbin 6(2): 139. 1986.

Trees, 5–6 m tall. Twigs pale grayish brown; young twigs densely white villous. Stipules nearly reaching apex of petiole. Leaf blade ovate-elliptic, elliptic, or oblong-elliptic, 8–14(–30) × 4–7(–10) cm, leathery, abaxially pale green and with white curved trichomes, adaxially dark green, secondary veins 9–13 on each side of midvein, adaxially impressed, and prominent on both surfaces when dry, base cuneate to broadly cuneate, apex acuminate to shortly acute. Flower buds ovoid, 3–3.5 × 2–2.2 cm. Flowers erect, very fragrant. Tepals 9, white, curved, fleshy; tepals of outer whorl obovate to oblong, 5–6 × 2.5–3 cm, thinner, 9-veined; tepals of middle whorl obovate, 5–6 × 2–3 cm; tepals of inner whorl obovate-spoon-shaped, 4–4.5 × 2–2.5 cm. Stamens ca. 175, ca. 3 cm; filaments ca. 5 mm; connective exerted and forming a triangular mucro; anthers ca. 2 cm, dehiscent introrsely. Fruit not seen. Fl. May, fr. Sep.

- Evergreen broad-leaved forests; ca. 1100 m. SE Yunnan (Guangnan).

5. *Lirianthe albosericea* (Chun & C. H. Tsoong) N. H. Xia & C. Y. Wu, **comb. nov.**

绢毛木兰 juan mao mu lan

Basionym: *Magnolia albosericea* Chun & C. H. Tsoong, Acta Phytotax. Sin. 9: 117. 1964.

Trees, to 8 m tall. Bark grayish white, young part densely white sericeous. Stipular scar reaching apex of petiole. Petiole thick and strong; leaf blade elliptic, narrowly elliptic, or narrowly obovate-elliptic, 18–30(–40) × 6–9(–15) cm, abaxially glaucous and white villous, adaxially dark green, midvein sparsely long sericeous on both surfaces, secondary veins 15–20 on each side of midvein, base cuneate to narrowly cuneate, apex acuminate. Peduncle 1.5–2 cm, densely sericeous, with 3 bract scars. Flower buds ovoid, 4–5 cm. Tepals 9, white; tepals of outer whorl oblong, 4–4.6 cm, thinner, abaxially densely papillate, white sericeous near base; tepals of middle whorl 4–5 cm, abaxially white sericeous near base; tepals of inner 2 whorls obovate, thickly fleshy, base clawed; tepals of innermost whorl 3–4 cm. Stamens 0.9–1.2 cm; connective exerted and forming a mucro; anthers 6–8 mm, dehiscent introrsely. Carpels narrowly ellipsoid, 0.8–1.3 cm, abaxially with brown trichomes and inconspicuously papillate, shallow furrow reaching to apex in middle. Fruit dark brown, ellipsoid to obovoid, 4.5–8 cm; mature carpels narrowly ellipsoid, 2–2.5 cm, leathery, abaxially pale brown pubescent and papillate, apex with an outcurved 5–

7 mm sharp beak. Seeds red, irregularly triangular, 7–10 × 7–10 mm, laterally flat, adaxially shallowly and narrowly furrowed, base cuneate, apex finely pitted. Fl. Apr–May, fr. Aug–Sep. $2n = 38^*$.

• Evergreen broad-leaved forests, slopes, ravines; 500–800 m. Hainan (Baoting, Diaoluo Shan).

This species is grown as an ornamental.

6. *Lirianthe championii* (Bentham) N. H. Xia & C. Y. Wu, comb. nov.

香港木兰 xiang gang mu lan

Basionym: *Magnolia championii* Bentham, Fl. Hongk. 8. 1861 [“*championii*”]; *M. liliifera* Baillon var. *championii* (Bentham) Pampanini; *M. mulunica* Y. W. Law & Q. W. Zeng; *M. paenetauma* Dandy; *M. pumila* Andrews var. *championii* (Bentham) Finet & Gagnepain; *M. shangsiensis* Y. W. Law et al.; *M. tenuicarpella* Hung T. Chang.

Shrubs or small trees. Young twigs, petiole adaxial surfaces, leaf blade abaxial surface of bases and midveins, and peduncles with pale brown appressed long trichomes but very soon glabrescent. Young twigs green. Stipular scar nearly reaching apex of petiole. Petiole 0.5–1.5 cm; leaf blade elliptic, narrowly oblong-elliptic, or narrowly obovate-elliptic, 7–14(–20) × 2–4.5(–6.5) cm, leathery, abaxially pale green, adaxially deep green and glossy, secondary veins 8–12 on each side of midvein, divergent near edge, and curving and circling apically, base cuneate to narrowly cuneate and slightly decurrent on petiole, apex acuminate, cuspidate, or rarely acute. Peduncle 1–1.5 cm, with pale yellow long trichomes; spatheaceous bracts 3 or 4, apical-most bract scar ca. 1 cm basal to tepals. Flowers erect, very fragrant. Tepals 9; outer 3 tepals pale green, oblong-elliptic, 3.5–4 × ca. 2 cm; tepals of inner 2 whorls white, obovate, 2–2.5 × ca. 1.5 cm, fleshy, apex sometimes emarginate. Stamens 7–9 mm; connective exerted and forming a triangular mucro; anthers 6–7 mm, dehiscing introrsely. Gynoecium narrowly obovoid, 1–1.4 cm, white villous; carpels 8–9 mm, furrows abaxially reaching to base of style; ovules 2 per carpel, parallel. Fruit 3–4.5 cm; mature carpels ca. 1 cm, with ca. 2 mm apical beaks. Seeds narrowly ellipsoid or irregularly ovoid, 8–12 × 4–6 mm. Fl. Apr–Jun, fr. Sep–Oct.

Evergreen broad-leaved forests, sandy soil, hills, along riversides; near sea level to 1000 m. Guangdong, Guangxi, S Guizhou, Hainan [N Vietnam].

“*Magnolia bawangensis* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*, 34. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

One of us (Xia) considers that *Magnolia mulunica* is a distinct species of *Lirianthe*.

7. *Lirianthe coco* (Loureiro) N. H. Xia & C. Y. Wu, comb. nov.

夜香木兰 ye xiang mu lan

Basionym: *Liriodendron coco* Loureiro, Fl. Cochinch. 1: 347. 1790; *Magnolia coco* (Loureiro) Candolle; *M. pumila* Andrews; *Talauma coco* (Loureiro) Merrill; *T. pumila* (Andrews) Blume.

Trees or shrubs, 2–4 m tall, glabrous. Bark gray. Twigs green, smooth, slightly ridged, glossy. Stipular scar reaching apex of petiole. Petiole 5–10 mm; leaf blade elliptic, narrowly elliptic, or obovate-elliptic, 7–14(–28) × 2–4.5(–9) cm, leathery, adaxially deep green, glossy, and slightly wavy wrinkled, secondary veins 8–10 on each side of midvein, reticulate veins sparse, base cuneate, margin slightly revolute, apex long acuminate. Peduncle pendulous, with 3 or 4 bract scars. Flowers globose, 3–4 cm in diam. Tepals 9, obovate, fleshy, adaxially concave; 3 tepals of outer whorl greenish, ca. 2 cm, 5-veined; tepals of inner 2 whorls pure white, 3–4 × ca. 4 cm. Stamens 4–6 mm; filaments white, ca. 2 mm; connective exerted and forming a mucro; anthers ca. 3 mm. Gynoecium green, ovoid, 1.5–2 cm; carpels ca. 10, narrowly ovoid, 5–6 mm, abaxially with 1 furrow downward to base of style; styles short, deciduous after anthesis and leaving carpel with a truncate apex. Fruit ca. 3 cm; mature carpels nearly woody. Seeds ovoid, ca. 1 cm, apex laterally pitted adaxially, ventral furrow inconspicuous, base cuneate; endotesta brown. Fl. summer (all year in Guangzhou, Guangdong), fr. autumn. $2n = 38$.

Forests; 600–900 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan, Zhejiang [Vietnam].

This species is grown as an ornamental and used medicinally.

8. *Lirianthe fujianensis* N. H. Xia & C. Y. Wu, nom. nov.

福建木兰 fu jian mu lan

Replaced synonym: *Magnolia fujianensis* R. Z. Zhou, J. Trop. Subtrop. Bot. 12: 473. 2004, not *Magnolia fujianensis* (Q. F. Zheng) Figlar, Proc. Int. Symp. Fam. Magnoliac. 1998, 22. 2000.

Trees, 8–10 m tall, 1.5–2 cm d.b.h., glabrous throughout. Twigs green when young, brown when old. Stipular scar reaching apex of petiole, margin prominent. Petiole 1–1.5 cm; leaf blade long ovate-elliptic to long elliptic, 12–20 × 5.5–6.5 cm, leathery, abaxially green, adaxially dark green and shiny, secondary veins 14–16 on each side of midvein, reticulate veins prominent on both surfaces, base broadly cuneate, apex long acuminate. Brachyblasts ca. 3.5 cm, green, curved downward at anthesis, glabrous. Flowers fragrant. Tepals 9, in 3 whorls; outer 3 tepals pale green, oblong-elliptic, 4–4.2 × 2–2.3 mm; middle 3 tepals white, obovate-spatulate, 4–4.5 × 2.3–2.5 mm, fleshy; inner 3 tepals white, obovate-spatulate, 3–3.5 × 1.6–2 mm, fleshy. Androecium white; stamens ca. 128, 6–7 mm; connective exerted, apex obtuse; anthers 5–6 mm. Gynoecium white; carpels 16–18, abaxially tuberculate; styles purple. Fruit not seen. Fl. Apr–May and Aug–Sep.

• Forests; 300–500 m. Fujian (Nanping).

4. HOUPOËA N. H. Xia & C. Y. Wu, nom. nov.

厚朴属 hou po shu

Replaced synonym: *Magnolia* sect. *Rytidospermum* Spach, Hist. Nat. Vég. Phan. 7: 474. 1839, not *Rhytidpermum* Link, Hand-

buch 1: 579. 1829, nor *Rhytidosperrum* Schultz Bipontinus in Webb & Berthelot, Hist. Nat. Iles Canaries 3(2, 2): 277. 1844, nor *Rytidosperma* Steudel, Syn. Pl. Glum. 1: 425. 1854.

Trees or shrubs, deciduous. Bark usually gray, smooth. Twigs with annular stipular scar. Stipules membranous, adnate to petiole, leaving stipular scar on petiole. Leaves spirally arranged, often fascicled and pseudowhorled, folded in bud, erect when young; leaf blade membranous or thickly papery, margin entire or rarely shallowly 2-lobed at apex. Flowers terminal, solitary, bisexual, large, fragrant. Spathaceous bract 1. Tepals 9–12, in 3 or 4 whorls, usually white, subequal. Stamens caducous; filaments flat; connective exerted and forming a short mucro; anthers dehiscing introrsely. Gynoecium without a gynophore; carpels numerous, distinct; ovules usually 2(–4) per carpel; styles curved outward, adaxially papillate. Fruit usually cylindrical when mature; mature carpels distinct, leathery or subwoody, dehiscing along dorsal sutures, persistent on torus, apex long beaked.

Nine species: E North America and temperate regions of SE Asia; three species (one endemic, one introduced) in China.

- 1a. Inner and outer tepals patent at anthesis; basal mature carpels decurrent along fruit axis and tapered at base 1. *H. obovata*
 1b. Inner tepals erect and outer ones reflexed at anthesis; basal mature carpels not decurrent along fruit axis but rotund at base.
 2a. Vegetative buds glabrous, leaf abaxial surface gray villous; leaf blade cuneate at base; mature carpels with a 3–4 mm beak 2. *H. officinalis*
 2b. Vegetative buds and abaxial surface of young leaves covered with reddish brown and curved indumentum; leaf blade broadly cuneate, obtuse, or cordate at base; mature carpels with a 5–8 mm beak 3. *H. rostrata*

1. Houpoëa obovata (Thunberg) N. H. Xia & C. Y. Wu, **comb. nov.**

日本厚朴 ri ben hou po

Basionym: *Magnolia obovata* Thunberg, Trans. Linn. Soc. London 2: 336. 1794; *Liriodendron liliiflorum* Steudel; *M. glauca* Thunberg (1784), not (Linnaeus) Linnaeus (1759); *M. honogi* P. Parmentier; *M. hoonokii* Siebold; *M. hypoleuca* Siebold & Zuccarini; *M. hypoleuca* var. *concolor* Siebold & Zuccarini; *Yulania japonica* Spach var. *obovata* (Thunberg) P. Parmentier.

Trees, to 30 m tall. Twigs green at first then becoming purple, glabrous; vegetative buds glabrous. Stipular scar ca. 1/2 as long or longer than petiole. Leaves clustered on twigs; petiole 2.5–4.5(–7) cm, at first white villous; leaf blade obovate, 20–38(–45) × 12–18(–20) cm, abaxially glaucous, adaxially green and white curved villous, secondary veins 20–24 on each side of midvein, base cuneate to broadly cuneate, apex shortly acute. Flowers cupular, 14–20 cm in diam., erect, very fragrant. Tepals 9–12, milky white; outer 3 tepals yellowish green but outside flushed red, shorter; inner 6 or 9 tepals obovate to elliptic-obovate, 8.5–12 × 1.5–4.5 cm. Stamens 1.5–2 cm; filaments purplish red; connective exerted and forming a mucro. Gynoecium ca. 3 cm. Fruit red when mature, terete, 12–20 × ca. 6 cm, pendulous; mature carpels long beaked, basal ones decurrent along receptacles and becoming cuneate at base; testa bright red; endotesta black. Fl. Jun–Jul, fr. Sep–Oct.

Cultivated in NE China as well as in Guangdong [native to Japan].

This species is grown as an ornamental. It is used medicinally and for timber.

2. Houpoëa officinalis (Rehder & E. H. Wilson) N. H. Xia & C. Y. Wu, **comb. nov.**

厚朴 hou po

Basionym: *Magnolia officinalis* Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 391. 1913; *M. cathayana* D. L. Fu & T. B. Chao; *M. officinalis* subsp. *biloba* (Rehder & E. H. Wilson) Y. W. Law; *M. officinalis* var. *biloba* Rehder & E. H. Wilson;

M. officinalis var. *glabra* D. L. Fu et al.; *M. officinalis* var. *pubescens* C. Y. Deng.

Trees, to 20 m tall. Bark brown, thick, not fissured. Twigs pale yellow to grayish yellow, thick and strong, sericeous at first; terminal buds ovoid-conical, large, glabrous. Stipular scar ca. 2/3 as long as petiole. Petiole thick and strong, 2.5–4 cm. Leaves 7–9 clustered on twig apex; leaf blade oblong-obovate, 22–45 × 10–24 cm, nearly leathery, abaxially grayish green, glaucous, and gray villous, adaxially green and glabrous, base cuneate, margin entire or slightly wavy, apex shortly acute, obtuse, emarginate, or sometimes 2-lobed. Peduncle short and thick, villous; bract scar ca. 1 cm basal to tepals. Flowers 10–15 cm in diam., fragrant. Tepals 9–12(–17), white, thickly fleshy; outer 3 tepals pale green, oblong-obovate, 8–10 × 4–5 cm, usually reflexed at anthesis; tepals of inner 2 whorls obovate-spoon-shaped, 8–8.5 × 3–4.5 cm, base clawed; inner tepals 7–8.5 cm, erect at anthesis. Stamens numerous, 2–3 cm; filaments red, 4–12 mm; anthers 1.2–1.5 cm, dehiscing introrsely. Gynoecium ellipsoid-ovoid, 2.5–3 cm. Fruit ellipsoid-ovoid, 9–15 cm; mature carpels with a 3–4 mm beak. Seeds triangular-obovoid, ca. 1 cm. Fl. May–Jun, fr. Aug–Oct. $2n = 38^*$.

• Forests; 300–1500 m. Anhui, Fujian, SE Gansu, N Guangdong, Guangxi, NE Guizhou, SE Henan, W Hubei, NW Hunan, Jiangxi, S Shaanxi, E and S Sichuan, Zhejiang.

This species is grown as an ornamental. It is used medicinally and for timber.

3. Houpoëa rostrata (W. W. Smith) N. H. Xia & C. Y. Wu, **comb. nov.**

长喙厚朴 chang hui hou po

Basionym: *Magnolia rostrata* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 213. 1920.

Trees, to 25 m tall. Bark pale gray. Vegetative buds and young twigs reddish brown curved villous. Twigs green at first then turning brown, strong and thick; axillary vegetative buds grayish green, terete, glabrous. Stipular scar significantly prominent, nearly 1/3–2/3 as long as petiole. Leaves 7–9 clus-

tered on twig apex; petiole strong and thick, 4–7 cm, at first with trichomes; leaf blade obovate to broadly obovate, 34–50 × 21–23 cm, thickly papery, abaxially glaucous and reddish brown curved villous, adaxially green and glossy, secondary veins 28–30 on each side of midvein, base broadly cuneate to cordate, apex broadly rotund, shortly acute, or sometimes 2-cleft. Flowers appearing after leaves, 8–9 cm in diam., fragrant. Tepals 9–12; tepals of outer whorl outside green flushed slightly pink and inside pink, oblong-elliptic, 8–13 × ca. 5.6 cm, reflexed; tepals of inner 2 whorls purely white, obovate-spoon-

shaped, 12–14 cm, erect, base clawed. Stamens purplish red; filaments ca. 5 mm; connective exerted and forming a triangular mucro; anthers ca. 1 cm. Gynoecium cylindric. Fruit terete, 11–20 × ca. 4 cm, erect, base broadly rounded, apex gradually narrowing; mature carpels with a 5–8 mm curved beak. Seeds ca. 7 × 5 mm, flat. Fl. May–Jul, fr. Sep–Oct.

Broad-leaved forests; 2100–3000 m. SE Xizang (Médog), W Yunnan [NE Myanmar].

This species is grown as an ornamental and is used medicinally.

5. TALAUMA Jussieu, Gen. Pl. 281. 1789.

盖裂木属 gai lie mu shu

Trees or shrubs, evergreen. Stipules adnate to petiole. Young leaves folded in bud; petiole with stipular scar. Flowers terminal, solitary, bisexual. Tepals 9–15, in 3 or 4 whorls, subequal. Staminal connective exerted and forming a mucro; anthers dehiscing introrsely. Gynoecium sessile; carpels numerous or few, at least connate at base. Mature carpels woody or bony, peripherally dehiscing, base persistent on torus, apical part single or irregularly massive deciduous. Seeds 1 or 2 per carpel, pendulous.

About 60 species: SE Asia and tropical America; one species in China.

1. *Talauma hodgsonii* J. D. Hooker & Thomson, Fl. Ind. 1: 74. 1855.

盖裂木 gai lie mu

Magnolia candollii (Blume) H. Keng var. *obovata* (Korthals) Nootboom; *M. hodgsonii* (J. D. Hooker & Thomson) H. Keng; *M. liliifera* (Linnaeus) Baillon var. *obovata* (Korthals) Govaerts.

Trees, to 15 m tall. Twigs slightly glaucous, glabrous. Stipular scar nearly reaching apex of petiole. Petiole 5–6 cm; leaf

blade obovate-oblong, 20–50 × 10–13 cm, leathery, secondary veins 10–20 on each side of midvein, base cuneate, apex obtuse to acuminate. Peduncle thick and strong, 1.5–2 × ca. 1.5 cm, with 1 or 2 bract scars; spathaceous bracts purple. Tepals 9, thickly fleshy; outer 3 tepals grassy green outside, ovate, ca. 9 cm; tepals of middle and inner whorls milky white; inner tepals smallest. Fruit ovoid, 13–15 cm; mature carpels 40–80, narrowly ellipsoid to ovoid, 2.5–4 cm, apex long tipped. Fl. Apr–May, fr. Aug. $2n = 38$.

Forests; 800–1500 m. S Xizang, SE Yunnan [Bhutan, NE India, N Myanmar, Nepal, Thailand].

6. OYAMA (Nakai) N. H. Xia & C. Y. Wu, stat. nov.

天女花属 tian nü hua shu

Basionym: *Magnolia* sect. *Oyama* Nakai, Fl. Sylv. Kor. 20: 117. 1933; *M.* sect. *Gophantera* Dandy.

Trees or shrubs, deciduous. Bark usually gray, smooth or sometimes coarse and deeply furrowed. Twigs with annular stipular scar. Leaves at first distichous, later spirally arranged, folded in bud, erect when young; leaf blade membranous or papery, abaxially grayish green or glaucous and pubescent, margin entire. Flowers terminal, solitary, bisexual, often overtopped by a growing axillary vegetative bud and thus seemingly axillary. Peduncle slender, nodding but pendulous or erect at anthesis. Tepals 9–12, 3 per whorl, usually white, subequal. Stamens red, caducous; filaments flat; connective not exerted, apex obtuse or emarginate; anthers dehiscing introrsely. Gynoecium without a gynophore; carpels few to many, distinct; ovules usually 2 per carpel; styles curved outward, adaxially papillate. Fruit ellipsoid when mature, pendulous; mature carpels distinct, leathery or subwoody, dehiscing along dorsal sutures, persistent on torus, apex shortly beaked.

Four species: E and SE Asia; four species (two endemic) in China.

- 1a. Twigs purplish red or purplish brown; leaves widest toward base from middle; stipular scar nearly as long as petiole.
 - 2a. Leaf blade oblong-ovate to elliptic-ovate, 6.5–12 cm, abaxially gray appressed villous; flowers pendulous during anthesis 1. *O. wilsonii*
 - 2b. Leaf blade elliptic-ovate to ovate, 10–24 cm, abaxially reddish brown and with long curved trichomes; flowers slightly pendulous or erect during anthesis 2. *O. globosa*
- 1b. Twigs pale grayish yellow or grayish brown; leaves widest toward apex from middle; stipular scar 1/2–2/3 as long as petiole.
 - 3a. Leaf blade obovate, secondary veins 9–13 on each side of midvein, abaxially pale yellow villous; stipular scar nearly 2/3 as long as petiole; flowers pendulous during anthesis 3. *O. sinensis*
 - 3b. Leaf blade obovate to broadly obovate, secondary veins 6–8 on each side of midvein, abaxial surface with brown and white multicellular trichomes and scattered with golden yellow dots; stipular scar nearly 1/2 as long as petiole; flowers slightly pendulous during anthesis 4. *O. sieboldii*

1. *Oyama wilsonii* (Finet & Gagnepain) N. H. Xia & C. Y. Wu, **comb. nov.**

西康天女花 *xi kang tian nü hua*

Basionym: *Magnolia parviflora* Blume var. *wilsonii* Finet & Gagnepain, Bull. Soc. Bot. France 52(Mém. 4): 39. 1906 ["*wilsonii*"]; *M. globosa* J. D. Hooker & Thomson subsp. *wilsonii* (Finet & Gagnepain) J. Li; *M. liliifera* Baillon var. *taliensis* (W. W. Smith) Pampanini; *M. nicholsoniana* Rehder & E. H. Wilson; *M. taliensis* W. W. Smith; *M. wilsonii* (Finet & Gagnepain) Rehder; *M. wilsonii* f. *nicholsoniana* (Rehder & E. H. Wilson) Rehder; *M. wilsonii* f. *taliensis* (W. W. Smith) Rehder.

Shrubs or small trees, rarely to 8 m tall. Bark grayish brown, conspicuously lenticellate. Old twigs gray; annual twigs purplish red, at first brown villous. Stipular scar 4/5–5/6 as long as petiole. Petiole (0.5–)1–3(–5) cm, densely brown villous; leaf blade elliptic-ovate to oblong-ovate, 6.5–12(–20) × 3–5(–8) cm, papery, abaxially silvery gray appressed villous, adaxially grayish yellow pubescent along midvein and secondary veins, trichomes on midvein and secondary veins usually brown, base rounded to sometimes slightly cordate, apex acute to acuminate. Peduncle pendulous, 1.5–5 cm, brown villous. Flowers appearing at same time as leaves, cupular at first, plate-shaped at anthesis, 10–12 cm in diam., fragrant. Tepals 9(–12), white; outer 3 tepals broadly spoon-shaped to obovate, 4–6.5(–7.5) × 3–4.5(–5.5) cm, subequal to inner ones, base clawed, apex rounded. Stamens purplish red, 0.8–1.2 cm; filaments red, 1.5–2 mm; connective rounded or emarginate at apex; thecae distinct, 8–9 mm. Gynoecium green, ovoid-cylindric, 1.5–2 cm; carpels ca. 1 cm. Fruit red and then becoming purple when mature, terete, 6–10 × 2–3 cm, pendulous; mature carpels beaked. Seeds obovoid, ca. 6 mm. Fl. May–Jun, fr. Sep–Oct. $2n = 38^*$.

• Forests; 1900–3000 m. Guizhou, C and W Sichuan, N Yunnan.

This species is grown as an ornamental and is used medicinally.

2. *Oyama globosa* (J. D. Hooker & Thomson) N. H. Xia & C. Y. Wu, **comb. nov.**

毛叶天女花 *mao ye tian nü hua*

Basionym: *Magnolia globosa* J. D. Hooker & Thomson, Fl. Ind. 1: 77. 1855; *M. tsarongensis* W. W. Smith; *Yulania japonica* Spach var. *globosa* (J. D. Hooker & Thomson) P. Parmentier.

Trees, to 10 m tall. Bark black, smooth. Young twigs, young leaf blade adaxial midvein and secondary veins, leaf blade abaxial surfaces, petioles, and peduncles reddish brown and curved villous. Twigs reddish brown to dark purplish red. Stipular scar nearly reaching petiole apex. Petiole 3–3.5 cm; leaf blade elliptic-ovate, broadly ovate, or elliptic, 10–24 × 5–14 cm, membranous, adaxially deep green, secondary veins 8–12 on each side of midvein, base rounded to subcordate, apex acute to obtuse. Peduncle 5–6.5(–7.5) cm, curved to erect, with a bract scar at ca. 6 mm basal to tepals. Flowers appearing at same time as leaves, cupular, 6–7.6 cm in diam., fragrant. Tepals 9(or 10), creamy yellowish white, obovate to elliptic, 4–7.5 × 2–3 cm, subequal, apex rounded. Stamens dark red, 1.2–

1.7 cm; thecae connate to each other, apex slightly emarginate. Gynoecium green, ca. 3.5 cm. Fruiting peduncle thick and strong, densely villous. Fruit red when mature and later becoming reddish brown, terete, 6–8 cm, apex rounded; mature carpels with curved beaks. Seeds black, cordate, 7–8 × 7–9 mm. Fl. May–Jul, fr. Aug–Sep.

Forests; 1900–3300 m. W Sichuan, S and SE Xizang, Yunnan [Bhutan, India (E Sikkim), N Myanmar].

3. *Oyama sinensis* (Rehder & E. H. Wilson) N. H. Xia & C. Y. Wu, **comb. nov.**

圆叶天女花 *yuan ye tian nü hua*

Basionym: *Magnolia globosa* J. D. Hooker & Thomson var. *sinensis* Rehder & E. H. Wilson, Sargentia 1: 393. 1913; *M. sieboldii* K. Koch subsp. *sinensis* (Rehder & E. H. Wilson) Spongberg; *M. sinensis* (Rehder & E. H. Wilson) Stapf.

Shrubs, to 6 m tall. Bark pale brown. Twigs slender; annual twigs pale grayish yellow, 3–4 mm in diam., grayish yellow appressed villous; biennial twigs grayish white or pale yellow. Stipular scar nearly 2/3 as long as petiole. Petiole 1.5–4(–8) cm, pale yellow appressed villous; leaf blade obovate, broadly obovate, obovate-elliptic, or rarely suborbicular, 8–13(–26) × 6–10(–19) cm, papery, abaxially pale grayish yellow villous, adaxially subglabrous, midvein and secondary veins pale yellow appressed villous, secondary veins 9–13 on each side of midvein, base rounded and truncate, broadly cuneate, or sometimes slightly cordate, apex broadly rounded to shortly acute. Peduncle 3–5 cm, curved downward, pale yellow appressed villous at first. Flowers appearing at same time as leaves, cupular, 8–12(–15) cm in diam., fragrant. Tepals 9(or 10), white; outer 3 tepals ovate to elliptic, shorter and smaller; inner tepals broadly obovate, 6–7.5 cm, larger. Stamens 0.9–1.3 cm; filaments purplish red; anthers 7–10 mm, thecae distinct, apex rounded to rarely slightly apiculate. Gynoecium green, narrowly obovoid-ellipsoid, ca. 1.5 mm. Fruit red, terete, 3–5.5(–7.5) × 2–2.5 cm; mature carpels narrowly ellipsoid, only dehiscing along dorsal sutures, beaks curved outward. Seeds nearly cordate, 5–6 × 6–7 mm; testa bright red; endotesta black. Fl. May–Jun, fr. Sep–Oct.

• Forests; ca. 2600 m. C, N, and S Sichuan.

This species is used medicinally.

4. *Oyama sieboldii* (K. Koch) N. H. Xia & C. Y. Wu, **comb. nov.**

天女花 *tian nü hua*

Basionym: *Magnolia sieboldii* K. Koch, Hort. Dendrol. 4. 1853, based on *M. parviflora* Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 187. 1845, not Blume, Bijdr. 9. 1825; *M. oyama* Millais, nom. illeg. superfl.; *M. verecunda* Koidzumi, nom. illeg. superfl.

Trees, to 10 m tall. Annual twigs pale grayish brown, slender, ca. 3 mm in diam., silvery gray appressed villous at first. Stipular scar nearly 1/2 as long as petiole. Petiole 1–4(–6.5) cm, brown and white appressed villous; leaf blade obovate to broadly obovate, (6–)9–15(–25) × 4–9(–12) cm, membranous, abaxially glaucous and usually covered with brown and white multicellular trichomes, scattered golden yellow dots, and

white long sericeous hairs along midvein and secondary veins, adaxially curved pilose along midvein and secondary veins, secondary veins 6–8 on each side of midvein, base broadly cuneate, truncate, or subcordate, apex abruptly narrowly acute to shortly acuminate. Peduncle 3–7 cm, densely brown and grayish white appressed villous. Flowers appearing at same time as leaves, cupular at first but plate-shaped at anthesis, 7–10 cm in diam., erect or slightly nodding, fragrant. Tepals 9, white, subequal; outer 3 tepals oblong-obovate to obovate, 4–6 × 2.5–3.5 cm, base with white trichomes, apex broadly rounded to rounded; inner 6 tepals smaller, base gradually narrowing to shortly clawed. Stamens purplish red, 0.9–1.1 cm; connective

not exerted; filaments 3–4 mm; anthers ca. 6 mm, thecae adnate, apex slightly emarginate. Gynoecium green, ellipsoid, ca. 1.5 cm. Fruit red when mature, obovoid to ellipsoid, 2–7 cm; mature carpels narrowly ellipsoid, ca. 1 cm, dehiscent into 2 valves along dorsal sutures, apex with a ca. 2 mm beak. Seeds cordate, 6–7 × 6–7 mm, apex finely tipped; testa red; endotesta brown. Fl. Mar–Apr, fr. Sep–Oct.

Forests; 1600–2000 m. Anhui, N Fujian, Guangxi, Guizhou, Hebei, Hubei, Hunan, Jiangxi, Jilin, Liaoning, Zhejiang [Japan, Korea].

This species is grown as an ornamental. It is used medicinally and for timber.

7. WOONYOUNGIA Y. W. Law, Bull. Bot. Res., Harbin 17: 354. 1997.

焕镛木属 huan yong mu shu

Trees, dioecious. Stipules adnate to petiole. Young leaves folded in bud; petiole with stipular scar. Flowers terminal, solitary, sometimes overtopped by a growing axillary vegetative bud and thus seemingly axillary. Spathaceous bract 1, just basal to tepals. Tepals 6 or 7, 3 per whorl, subequal. Male flower: stamen connective exerted and forming a mucro; anthers dehiscing introrsely. Female flower: gynoecium sessile; carpels 6–15, connate; ovules 2 per carpel. Mature carpels woody, dehiscing along dorsal sutures. Seeds 1 or 2 per carpel, pendulous on an elongated filiform and elastic pseudofuniculus.

Three species: Cambodia, S China, N Thailand, Vietnam; one species (endemic) in China.

1. Woonyoungia septentrionalis (Dandy) Y. W. Law, Bull. Bot. Res., Harbin 17: 355. 1997.

焕镛木 huan yong mu

Kmeria septentrionalis Dandy, J. Bot. 69: 233. 1931; *Magnolia kwangsiensis* Figlar & Nootboom.

Trees, to 18 m tall, to 40 cm d.b.h. Bark gray. Twigs green, at first appressed pubescent. Stipular scar nearly reaching apex of petiole. Petiole 2–3.5 cm, at first grayish pubescent, later glabrescent; leaf blade elliptic-oblong to obovate-oblong, 8–15 × 3.5–6 cm, leathery, both surfaces glabrous or when young abaxially sparsely pilose at base, adaxially green and glossy, secondary veins 12–17 on each side of midvein, reticulate veins prominent on both surfaces, base broadly cuneate, apex obtuse and slightly emarginate. Male flower: tepals white and pale greenish; outer 3 tepals obovate, 2–3 × ca. 2 cm; tepals of inner 2 whorls elliptic, slightly narrower and smaller; androecium

white with pale yellow, obovoid; stamens 1.8–2.5 cm; filaments ca. 2 mm; connective exerted and forming a 2–3 mm tongue-like tip; anthers 1–1.5 cm, dehiscing laterally. Female flower: outer 3 tepals obovate, 2.5–3 × 2–2.5 cm; tepals of inner whorls 8–10, linear-narrowly ovate, 2–2.5 cm × 2–3 mm; gynoecium green, obovoid, ca. 10 × 8–9 mm; carpels 6–9; ovules 2 per carpel, shortly funiculate; styles short; stigmas cristate. Fruit red when mature, subglobose; pericarp 3.5–4 cm, woody, dehiscing completely along dorsal sutures. Seeds 1 or 2 per carpel, those with testa red but those without testa black, bean-shaped to cordate, 10–12 × 7–9 mm, narrowly long furrowed, with several irregular massive protuberances, stalked at middle, apex truncate to slightly concave. Fl. May–Jun, fr. Oct–Nov. $2n = 38^*$.

• Limestone hills, forests; 300–600 m. N Guangxi, SE Guizhou, SE Yunnan.

This species is grown as an ornamental and used for timber.

8. PACHYLARNAX Dandy, Bull. Misc. Inform. Kew 1927: 259, 260. 1927.

厚壁木属 hou bi mu shu

Manglietiastrum Y. W. Law.

Trees, evergreen. Stipules free from petiole. Leaves spirally arranged, not folded and firmly adnate to young buds when young; petiole without a scar; leaf blade margin entire. Flowers terminal, solitary, bisexual. Tepals 9, in 3 whorls; outer whorl largest. Stamens numerous; filaments short; connective exerted and forming a long mucro; anthers linear, dehiscent introrsely. Gynoecium with basal carpels elongated at base and forming a thick strong stalk; carpels [2–8 or] numerous, linked to each other, connate after fertilization; ovules 3–5 per carpel. Fruit obovoid or ellipsoid; mature carpels thickly woody, completely dehiscing along ventral sutures and at apex. Seeds 1–3 per carpel, hanging on a filiform false ovule stalk.

Three species: SW China, NE India, Indonesia, Malaysia (peninsular), Vietnam; one species (endemic) in China.

1. Pachylarnax sinica (Y. W. Law) N. H. Xia & C. Y. Wu, **comb. nov.**

华盖木 hua gai mu

Basionym: *Manglietiastrum sinicum* Y. W. Law, Acta Phytotax. Sin. 17(4): 73. 1979; *Magnolia sinica* (Y. W. Law) Nootboom; *Manglietia sinica* (Y. W. Law) B. L. Chen & Nootboom.

Trees, to 40 m tall, to 1.2 m d.b.h., glabrous. Bark grayish white, finely fissured. Old twigs dark brown; young twigs deep green, 5–9 mm in diam. Petiole 1.5–2 cm, without a stipular scar, base slightly enlarged; leaf blade narrowly obovate to narrowly obovate-elliptic, 15–26(–30) × 5–8(–9.5) cm, leathery, abaxially pale green, adaxially deep green and glossy, midvein prominent on both surfaces, secondary veins 13–16 on each side of midvein, reticulate veins sparse and prominent on both surfaces when dry, base gradually narrowly cuneate and decurrent on petiole, margin slightly revolute, apex rounded and with a ca. 5 mm acute tip, tip obtuse and slightly curved. Flowers terminal, solitary; flower buds green, obovoid to ovoid. Spathaceous bracts just next to tepals. Tepals 9, in 3 whorls; outer

tepals oblong-spatulate, apex obtuse; middle and inner tepals obovate-spatulate, smaller. Stamens ca. 65; connective exerted, forming a long tip; anthers dehiscent introrsely. Gynoecium long ovoid; carpels 13–16; ovules 3–5 per carpel. Fruiting gynophore ca. 1 cm. Fruit green when mature, dark brown when dry, obovoid to ellipsoid-ovoid, 5–8.5 × 3.5–6.5 cm; mature carpels narrowly long ellipsoid to obovoid-ellipsoid, 2.5–4 × 1.5–2.5 cm, thickly woody, dehiscing completely along ventral sutures, abaxially with coarse lenticels, apex 2-lobed. Seeds 1–3 per carpel, transversely ellipsoid, bilaterally flat, 1–1.3 cm wide, ca. 7 mm tall. Fl. Apr, fr. Sep–Nov. $2n = 38^*$.

• Evergreen broad-leaved forests; 1300–1600 m. SE Yunnan (Maguan, Xichou).

9. PARAKMERIA Hu & W. C. Cheng, Acta Phytotax. Sin. 1: 1. 1951.

拟单性木兰属 ni dan xing mu lan shu

Micheliopsis H. Keng.

Trees, evergreen, glabrous, hermaphrodite or andro-dioecious. Twigs densely noded and bamboo nodelike; terminal vegetative buds dehiscing into 2 valves. Stipules not adnate to petiole. Leaves when young not folded and surrounded by young vegetative buds in bud; petiole without a stipular scar; leaf blade margin entire, bony, semitransparent, decurrent on petiole. Flowers terminal, solitary. Spathaceous bract 1, just basal to tepals. Tepals 9–12; outer 3 tepals nearly leathery and striated; tepals of inner 2 or 3 whorls subequal but gradually smaller inward, fleshy. Male flower: stamens 10–75, inserted on cylindrical torus; filaments short; connective exerted and forming a mucro; anthers filiform, thecae divergent, dehiscing introrsely; torus deciduous from peduncle after anthesis. Bisexual flower: stamens as in male flowers but fewer; gynophore conspicuous; carpels 10–20, connate when developed; ovules 2 per carpel. Fruit ellipsoid or obovoid, shape varied because of carpels partly undeveloped; fruiting stalks short, not elongated; mature carpels woody, dehiscing along dorsal sutures and apex. Seeds 1 or 2 per carpel, pendulous on a filiform elastic false ovule stalk; testa red or yellow; endotesta bony, with an apical hole.

Five species: China, N Myanmar; five species (three endemic) in China.

1a. Plants with bisexual flowers; tepals apiculate at apex.

2a. Leaf blade leathery, rigid, deep green and glossy, elliptic, oblong-elliptic, or obovate-elliptic, secondary veins 7–13 on each side; tepals purplish red at base abaxially, obovate-spoon-shaped, 4–5 cm; fruit 5–7.5 cm 1. *P. nitida*

2b. Leaf blade thinly leathery, adaxially green and glossy, narrowly ovate to narrowly elliptic, secondary veins 14–16 on each side; outer tepals pale yellow, obovate-oblong, 2.5–4 cm; fruit 2–2.5 cm 2. *P. kachirachirai*

1b. Plants andro-dioecious; tepals rounded or acuminate at apex.

3a. Leaf blade thinly leathery, usually widest toward base from middle, ovate-oblong or ovate-elliptic, base broadly cuneate or suborbicular; outer tepals red abaxially; torus of male flowers rounded at apex 3. *P. yunnanensis*

3b. Leaf blade leathery, usually widest at middle, base cuneate or narrowly cuneate; outer tepals pale yellow; torus of male flowers shortly mucronate or long acuminate at apex.

4a. Leaf blade elliptic, narrowly elliptic, or obovate-elliptic, apex shortly acute or shortly acuminate, adaxially deep green, abaxially grayish green, glandular; torus of male flower shortly mucronate 4. *P. omeiensis*

4b. Leaf blade obovate-elliptic or narrowly obovate-elliptic, apex acuminate, tips obtuse, adaxially green, abaxially pale green, not glandular; torus of male flower long acuminate at apex 5. *P. lotungensis*

1. Parakmeria nitida (W. W. Smith) Y. W. Law, Acta Phytotax. Sin. 34: 91. 1996.

光叶拟单性木兰 guang ye ni dan xing mu lan

Magnolia nitida W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 212. 1920; *M. nitida* var. *robusta* B. L. Chen & Nooteboom.

Trees, to 30 m tall, to 1 m d.b.h., with bisexual flowers. Petiole 1–4 cm; leaf blade elliptic, oblong-elliptic, or rarely obovate-elliptic, 5.5–9.5 × 2–4 cm, leathery, adaxially deep green and glossy but reddish brown when young, secondary veins 7–13 on each side of midvein, base cuneate or broadly cuneate, apex acute to acuminate. Flowers fragrant. Tepals ca.

12; outer 3 tepals outside purplish red at middle, obovate-spoon-shaped, 4–5 × 2.3–2.5 cm; tepals of inner 3 whorls pale yellowish white, gradually smaller. Stamens 1–1.7 cm; connective exerted ca. 3 mm; anthers ca. 1 cm. Gynoecium green; styles red. Fruit green, ellipsoid-ovoid, 5–7.5 cm; testa bright yellow. Fl. Mar–May, fr. Sep–Oct.

Evergreen broad-leaved forests; 1800–2500 m. SE Xizang, NW Yunnan [N Myanmar].

2. Parakmeria kachirachirai (Kanehira & Yamamoto) Y. W. Law, Acta Phytotax. Sin. 34: 91. 1996.

恒春拟单性木兰 heng chun ni dan xing mu lan

Michelia kachirachirai Kanehira & Yamamoto, Icon. Pl. Formosan., Suppl. 2: 14 1926; *Magnolia kachirachirai* (Kanehira & Yamamoto) Dandy; *Micheliopsis kachirachirai* (Kanehira & Yamamoto) H. Keng.

Trees, to 20 m tall, to 1.2 m d.b.h., with bisexual flowers. Dry bark dark brown, smooth, massively scaly fissured when old. Petiole 0.5–2 cm; leaf blade narrowly ovate to narrowly elliptic, 6.5–12 × 2–3 cm, thinly leathery, secondary veins 14–16 on each side of midvein, base cuneate, apex acute to shortly acuminate. Peduncle 1–1.5 cm; spatheaceous bract 1, brown, ca. 2.5 cm, glabrous. Tepals 9–12, in 3 or 4 whorls, pale yellow, obovate-oblong, 2.5–4 × 1–1.5 cm; tepals of innermost whorl usually smaller. Stamens 50–60, 1.4–1.8 cm; connective exerted and forming a mucro; anthers 1.2–1.5 cm. Gynophore 0.5–0.8 cm; gynoecium ovoid, 1.2–1.4 cm; carpels 9–18. Fruit long cylindrical, 2–2.5 × 1.2–1.5 cm. Seeds without testa flat, orbicular or reniform. Fl. Apr–May, fr. Oct–Nov.

- Evergreen broad-leaved forests; 500–1300 m. Taiwan.

This species is grown as an ornamental and used for timber.

3. Parakmeria yunnanensis Hu, Acta Phytotax. Sin. 1: 2. 1951.

云南拟单性木兰 yun nan ni dan xing mu lan

Magnolia yunnanensis (Hu) Nootboom.

Trees, to 30 m tall, to 50 cm d.b.h., andro-dioecious. Bark grayish white, smooth and not fissured. Petiole 1–2.5 cm; leaf blade ovate-oblong to ovate-elliptic, 6.5–15(–20) × 2–5 cm, thinly leathery, abaxially pale green and adaxially green but both surfaces purplish red when young, secondary veins 7–15 on each side of midvein, reticulate veins conspicuous on both surfaces, base broadly cuneate to nearly rounded, apex shortly acuminate to acuminate. Flowers fragrant. Male flower: tepals 12, in 4 whorls; outer tepals red, obovate, ca. 4 × 2 cm; tepals of inner 3 whorls white, narrowly obovate-spoon-shaped, 3–3.5 cm, fleshy, base tapering into claw; stamens ca. 30, ca. 2.5 cm; filaments ca. 1 cm, red; connective exerted and forming a ca. 1 mm mucro; anthers ca. 1.5 cm; torus rounded at apex. Bisexual flower: tepals as those of male flowers; stamens fewer than those of male; gynoecium green, ovoid. Fruit long ovoid, ca. 6 cm; mature carpels rhombic, dehiscing along dorsal sutures when matured. Seeds compressed, 6–7 × ca. 10 cm; testa red. Fl. May, fr. Sep–Oct. $2n = 114$.

Evergreen broad-leaved forests; 1200–1500 m. SE Xizang, Yunnan [N Myanmar].

4. Parakmeria omeiensis W. C. Cheng, Acta Phytotax. Sin. 1: 1. 1951.

峨眉拟单性木兰 e mei ni dan xing mu lan

Magnolia omeiensis (W. C. Cheng) Dandy.

Trees, to 25 m tall, to 40 cm d.b.h., andro-dioecious. Bark dark grayish. Petiole 1.5–2 cm; leaf blade elliptic, narrowly elliptic, or obovate-elliptic, 8–12 × 2.5–4.5 cm, leathery, glandular, abaxially pale grayish green, adaxially deep green and glossy, secondary veins 8–10 on each side of midvein, base cuneate to narrowly cuneate, apex shortly acuminate with an obtuse acumen. Male flower: tepals 12; outer 3 tepals pale yellow, oblong, 3–3.8 × 1–1.4 cm, thinner, apex rounded or obtuse; tepals of inner 3 whorls milky white, obovate-spoon-shaped, narrower and smaller, fleshy; stamens ca. 30, 2–2.2 cm; filaments dark red, 2–4 mm; connective dark red, exerted and forming a mucro; anthers 1–1.2 cm; torus apex mucronate. Bisexual flower: tepals same as those of male flowers; stamens 16–18; gynoecium ellipsoid, ca. 1 cm; carpels 8–12. Fruit obovoid, 3–4 cm. Seeds obovate, 6–8 mm in diam.; testa reddish brown. Fl. May, fr. Sep. $2n = 76^*$.

- Evergreen broad-leaved forests; 1200–1300 m. Sichuan (Emei Shan).

5. Parakmeria lotungensis (Chun & C. H. Tsoong) Y. W. Law, Acta Phytotax. Sin. 34: 91. 1996.

乐东拟单性木兰 le dong ni dan xing mu lan

Magnolia lotungensis Chun & C. H. Tsoong, Acta Phytotax. Sin. 8: 225. 1963; *M. nitida* W. W. Smith var. *lotungensis* (Chun & C. H. Tsoong) B. L. Chen & Nootboom; *Parakmeria lotungensis* var. *xiangxiensis* C. L. Pang & L. H. Yan.

Trees, to 30 m tall, to 30 cm d.b.h., andro-dioecious. Bark grayish white. Annual twigs green. Petiole 1–2 cm; leaf blade narrowly obovate-elliptic, obovate-elliptic, or narrowly elliptic, 6–11 × 2–3.5(–5) cm, leathery, abaxially pale green, adaxially green and glossy, secondary veins 9–13 on each side of midvein and conspicuously prominent on both surfaces when dry, base cuneate to narrowly cuneate, apex acuminate with an obtuse tip. Male flower: tepals 9–14; outer 3 or 4 tepals pale yellow, obovate-oblong, 2.5–3.5 × 1.2–2.5 cm; tepals of inner 2 or 3 whorls white; filaments purplish red; connective purplish red, exerted and forming a mucro; torus long sharply acuminate at apex and sometimes with a gynophore. Bisexual flower: tepals 10–35, same shape as those of male flowers but smaller; stamens 10–35; gynoecium green, ovoid; carpels 10–20 (sometimes 1–5 due to abortion, and flowers tending to be male). Fruit ellipsoid-ovoid or rarely obovoid, 3–6 cm. Seeds ellipsoid to ellipsoid-ovoid, 7–12 × 6–7 mm; testa red. Fl. Apr–May, fr. Aug–Sep. $2n = 114^*$.

- Forests; 700–1400 m. Fujian, Guangdong, Guangxi, SE Guizhou, Hainan, Hunan, Jiangxi, Zhejiang.

10. ALCIMANDRA Dandy, Bull. Misc. Inform. Kew 1927: 259, 260. 1927.

长蕊木兰属 chang rui mu lan shu

Trees, evergreen. Stipules free from petiole. Petiole without a stipular scar. Young leaves folded in bud. Flowers terminal, solitary, bisexual. Tepals 9, in 3 whorls. Stamens 35–40; exerted part of connective tongue-shaped; anther elongated, dehiscing introrsely. Gynoecium with a gynophore not longer than androecium; carpels ca. 30, distinct; ovules 2–5 per carpel. Mature carpels leathery, dehiscing along dorsal sutures. Seeds 1–4 per carpel.

One species: Bhutan, SW China, NE India, N Myanmar, N Vietnam.

1. *Alcimandra cathcartii* (J. D. Hooker & Thomson) Dandy, Bull. Misc. Inform. Kew 1927: 260. 1927.

长蕊木兰 *chang rui mu lan*

Michelia cathcartii J. D. Hooker & Thomson, Fl. Ind. 1: 79. 1855; *Magnolia cathcartii* (J. D. Hooker & Thomson) Nooteboom.

Trees, to 50 m tall, to 50 cm d.b.h. Young twigs pubescent; terminal vegetative buds long conic, white villous. Petiole 1.5–2 cm, without a stipular scar; leaf blade ovate to elliptic-ovate, 8–18 cm, leathery, base rounded to broadly cuneate, adaxially glossy, secondary veins 12–15 on each side of midvein, slender,

and ends inconspicuously netted with dense reticulate veins. Spathaceous bract green, just basal to tepals. Peduncle ca. 1.5 cm. Tepals 9, white, with pellucid glands, ca. 9-veined; outer 3 tepals oblong, 5.5–6 × 2–2.2 cm; tepals of inner 2 whorls obovate-elliptic, slightly shorter and smaller than outer ones. Stamens ca. 4 cm; connective exerted and forming a mucro; anthers ca. 2.8 cm. Gynophore ca. 1 cm; gynoecium cylindrical, ca. 2 × 0.3 cm; carpels ca. 30. Fruit 3.5–4 cm; mature carpels compressed globose, white lenticellate. Fl. May, fr. Aug–Sep. $2n = 38$.

Evergreen broad-leaved forests; 1800–2700 m. SE Xizang, S and W Yunnan [Bhutan, India (Assam, Sikkim), Myanmar, Vietnam].

11. YULANIA Spach, Hist. Nat. Vég. Phan. 7: 462. 1839.

玉兰属 *yu lan shu*

Magnolia subg. *Pleurochasma* Dandy; *M.* subg. *Yulania* (Spach) Reichenbach.

Trees or shrubs, deciduous. Stipules membranous, adnate to petiole and leaving a scar on petiole. Leaves spirally arranged, folded in bud, erect when young; leaf blade membranous or thickly papery, margin entire or rarely 2-lobed at apex. Flowers terminal on brachyblasts, solitary, bisexual, appearing before or at same time as leaves, large and showy, usually fragrant. Tepals 9–15(–45), 3 per whorl, white, pink, purplish red, or rarely yellow, subequal, sometimes outer ones (perules) smaller, greenish or yellowish brown, and sepal-like. Stamens caducous; filaments flat; connective exerted and forming a long or short mucro; anthers dehiscing introrse-latorse or latrorsely. Gynoecium without a gynophore; carpels distinct; ovules 2(–4) per carpel; styles curved outward. Fruit usually terete when mature, often curved because of carpels partly abortive; mature carpels often distinct or rarely connate, leathery or subwoody, dehiscing along dorsal sutures, persistent on torus.

About 25 species: temperate and subtropical regions of SE Asia and North America; 18 species including one to six hybrid species (16 endemic, one introduced) in China.

Yulania kobus (Candolle) Spach (*Magnolia kobus* Candolle, nom. cons.; *M. praecocissima* Koidzumi), native to Japan and S Korea, is cultivated as a garden plant in Shandong and Zhejiang.

“*Magnolia glabrata* Y. W. Law & R. Z. Zhou” and “*M. glabrata* var. *multipetala* Y. W. Law & Q. W. Zeng” (in Y. H. Liu, *Magnolias China*, 62, 64. 2004) either represent hybrids between *Yulania* (*Magnolia*) species found in plantations grown for medicinal *xinyi* or could be a synonyms of already published taxa; however, they were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

- 1a. Tepals unequal, outer ones sepal-like and much smaller than inner ones.
 - 2a. Flowers appearing at same time as or later than leaves; leaf blade conspicuously decurrent at base; stipular scar nearly 1/2 as long as petiole 12. *Y. liliiflora*
 - 2b. Flowers appearing before leaves; leaf blade not decurrent at base; stipular scar less than 1/2 as long as petiole.
 - 3a. Mature carpels connate or densely aggregated, not curved, abaxially white lenticellate 11. *Y. cylindrica*
 - 3b. Mature carpels distinct from each other, usually curved, tuberculate abaxially.
 - 4a. Gynoecium with trichomes.
 - 5a. Young twigs yellowish green, densely pubescent; leaf blade varied in shape, obovate, ovate, obtriangular, or orbicular, apex obtuse with an acute acumen or emarginate or lobed 13. *Y. jigongshanensis*
 - 5b. Young twigs purplish brown, glabrous; leaf blade obovate, apex obtusely rounded, with a shortly acute mucro 16. *Y. pilocarpa*
 - 4b. Gynoecium glabrous.
 - 6a. Twigs glabrous 9. *Y. biondii*
 - 6b. Twigs with trichomes 10. *Y. stellata*
 - 1b. Tepals subequal, outer ones not much smaller and sepal-like.
 - 7a. Tepals clawed at base; leaf blade elliptic or ovate.
 - 8a. Tepals 12–16, obovate-spatulate or oblong-ovate 1. *Y. campbellii*
 - 8b. Tepals 33–48, narrowly elliptic 18. *Y. viridula*
 - 7b. Tepals base usually not clawed; leaf blade obovate or elliptic-obovate.
 - 9a. Leaf blade usually emarginate or obtuse at apex.
 - 10a. Leaf blade obovate-spatulate or narrowly obovate, apex emarginate, abaxially dense silvery wavy villous; tepals 10–14 2. *Y. sargentiana*
 - 10b. Leaf blade narrowly oblong-spatulate or obovate-oblong, apex obtuse, abaxially glabrous or with trichomes along veins; tepals 9–12 3. *Y. dawsoniana*

- 9b. Leaf blade acute or shortly acuminate at apex.
- 11a. Twigs with trichomes.
- 12a. Leaf blade irregularly triangular; gynoeceum densely villous 14. *Y. mirifolia*
- 12b. Leaf blade obovate; gynoeceum glabrous.
- 13a. Tepals pure white, sometimes reddish at base abaxially, outer ones equal to inner ones in length 8. *Y. denudata*
- 13b. Tepals pale to dark red, outer ones ca. 2/3 as long as inner ones 17. *Y. ×soulangeana*
- 11b. Twigs glabrous.
- 14a. Tepals 12–24.
- 15a. Leaf blade 10–18 cm, lower ca. 2/3 cuneate; each flower bud with 1 flower, tepals rosy (to red) outside, whitish within 4. *Y. sprengeri*
- 15b. Leaf blade 5–10 cm, base broadly cuneate; each flower bud with 2 or 3 flowers; tepals white 15. *Y. multiflora*
- 14b. Tepals 9–12.
- 16a. Leaf blade obovate to narrowly obovate-elliptic, apex acuminate to abruptly cuspidate, acumen 0.5–2 cm; tepals red or pale red 5. *Y. amoena*
- 16b. Leaf blade obovate-oblong, apex rounded, with an acuminate mucro; tepals pale purplish red.
- 17a. Tepals 9, upper part white, lower part pale purplish red 6. *Y. zenii*
- 17b. Tepals 11(or 12), pale purplish red 7. *Y. elliptigemata*

1. *Yulania campbellii* (J. D. Hooker & Thomson) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

滇藏玉兰 dian zang yu lan

Magnolia campbellii J. D. Hooker & Thomson, Fl. Ind. 1: 77. 1855; *M. campbellii* subsp. *mollicomata* (W. W. Smith) G. H. Johnstone; *M. campbellii* var. *mollicomata* (W. W. Smith) F. S. Ward; *M. mollicomata* W. W. Smith.

Trees, to 30 m tall. Bark grayish brown. Twigs yellowish green when young and reddish brown when old, glabrous. Stipular scar short and small. Petiole 1–5 cm, pilose; leaf blade elliptic, oblong-ovate, or broadly obovate, 10–23(–33) × 4.5–10(–14) cm, papery, abaxially grayish green and white appressed pilose, adaxially deep green and glabrous, midvein and secondary veins appressed long sericeous, secondary veins 12–16 on each side of midvein, base rounded to broadly cuneate and usually unequal, apex acute to shortly acuminate. Peduncle thick and strong, ca. 2 cm, glabrous or slightly pilose. Flower buds ovoid, ca. 2.5 cm, pale yellow sericeous. Flowers appearing before leaves, 15–25(–35) cm in diam., slightly fragrant. Tepals 12–16, dark red, pink, or sometimes white, obovate-spoon-shaped to oblong-ovate, 6–14 × 4–6 cm, base gradually narrowed and forming a claw; outer 3 patent, reflexed, or pendulous; tepals of innermost whorl broadly ovate to suborbicular, 8–10 × 4–6 cm, erect, surrounding stamens and gynoeceum. Stamens 1–3 cm; filaments purplish red. Gynoeceum green, 2–3 cm; stigmas red. Fruiting peduncle thick and strong, 1–1.5 cm in diam., glabrous. Fruit purplish red turning brown, terete, 11–20 × 2.5–3 cm, at first erect then pendulous; mature carpels firmly connate, thin, dehiscent into 2 valves along dorsal sutures. Seeds cordate, 1–1.2 × 0.8–1 cm, laterally flat. Fl. Mar–May, fr. Jun–Jul. $2n = 114$.

Forests; 2500–3500 m. S Xizang, NW Yunnan [Bhutan, NE India (Assam, Sikkim), N Myanmar, Nepal].

This species is grown as an ornamental.

2. *Yulania sargentiana* (Rehder & E. H. Wilson) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

凹叶玉兰 ao ye yu lan

Magnolia sargentiana Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 398. 1913; *M. conspicua* Salisbury var. *emarginata* Finet & Gagnepain; *M. denudata* Desrousseau var. *emarginata* (Finet & Gagnepain) Pampanini; *M. emarginata* (Finet & Gagnepain) W. C. Cheng; *M. sargentiana* var. *robusta* Rehder & E. H. Wilson.

Trees 8–20(–25) m tall, to 1 m d.b.h. Annual twigs yellowish green later becoming gray. Stipular scar 1/6–1/4 as long as petiole. Petiole 2–4.5 cm; leaf blade obovate to rarely oblong-ovate, 10–19 × 6–10 cm, nearly leathery, abaxially pale green and densely silvery gray wavy villous but when young those on trunk only with trichomes abaxially along midvein, adaxially dark green, glabrous, and glossy, secondary veins 8–12 on each side of midvein, base narrowly cuneate to broadly cuneate, apex rounded and emarginate or mucronate. Flower buds ovoid, ca. 3.5 cm, pale yellow villous. Flowers appearing before leaves, 15–33(–36) cm, erect or pendulous, slightly fragrant. Tepals 10–14(–17), in 3 whorls, pale red to pale purplish red, obovate-spoon-shaped or narrowly obovate, 8–10 × 3–4.3 cm, fleshy, apex rounded to emarginate. Stamens 1–1.9 cm; filaments purple; connective exerted and forming a 0.5–1 mm mucro; anthers 7–9 mm, dehiscent laterally, base broad. Gynoeceum green, terete, 1.8–2 cm, glabrous; stigmas purple. Fruiting peduncle thick and strong, 7–10 mm in diam., with residual trichomes on nodes. Fruit terete, 8–15(–17) × 2–3 cm, usually wrinkled; mature carpels blackish purple, hemispherical or subglobose, 1.2–1.4 × ca. 0.9 cm, densely tuberculate, apex shortly beaked. Seeds nearly reniform, irregularly orbicular, or obovate, 10–12 × 6–8 mm, bilaterally flat; testa reddish brown. Fl. Apr–May, fr. Sep. $2n = 114^*$.

• Wet broad-leaved forests; 1400–3000 m. C and S Sichuan, N and NE Yunnan.

3. *Yulania dawsoniana* (Rehder & E. H. Wilson) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

光叶玉兰 guang ye yu lan

Magnolia dawsoniana Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 397. 1913.

Trees, to 20 m tall, to 1 m d.b.h. Twigs yellowish green becoming yellowish brown, glabrous or with fine trichomes, sparsely lenticellate. Petiole slender, 1–3 cm, base with short stipular scar; leaf blade obovate to elliptic-obovate, 7.5–14(–18) × 4–8 cm, basal ca. 2/3 gradually narrowing, abaxially pale green, vein axils and both sides of midvein usually residual with white villous hairs, adaxially green and glossy with only fine trichomes along midvein but glabrescent, secondary veins 8–10 on each side of midvein and usually reddish, reticulate veins conspicuously prominent on both surfaces when dry, base cuneate and usually oblique, apex obtuse, shortly acute, or rarely emarginate. Peduncle 1–1.5 cm, nodes villous. Flowers appearing before leaves, 16–25 cm in diam., erect to nodding, fragrant. Tepals 9–12, white but outside reddish, narrowly oblong-spoon-shaped to obovate-oblong, subequal, apex obtuse to emarginate. Stamens purplish red, 1.2–2 cm; filaments 3–4.5 mm. Gynoecium narrowly cylindrical, 1.5–2 cm. Fruit dark red when fresh turning dark reddish brown, cylindrical, 7–14 × 2.5–3.5 cm, slightly curved because part of carpels sterile; mature carpels obovoid, with sparse yellow lenticels, 2-valved, apex rounded and without a beak. Seeds compressed orbicular or irregularly triangular, ca. 1 cm in diam. Fl. Apr–May, fr. Sep–Oct.

• Forests; 1400–2500 m. NW Hunan (Sangzhi), C Sichuan.

This species is grown as an ornamental.

4. *Yulania sprengeri* (Pampanini) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

武当玉兰 wu dang yu lan

Magnolia sprengeri Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 295. 1915; *M. denudata* Desrousseaux var. *elongata* Rehder & E. H. Wilson; *M. denudata* var. *purpurascens* Rehder & E. H. Wilson; *M. diva* Stapf ex Millais; *M. elongata* (Rehder & E. H. Wilson) Millais; *M. sprengeri* var. *diva* Stapf; *M. sprengeri* var. *elongata* (Rehder & E. H. Wilson) Stapf; *M. wufengensis* L. Y. Ma & L. R. Wang; *M. wufengensis* var. *multitepala* L. Y. Ma & L. R. Wang; *Yulania denudata* (Desrousseaux) D. L. Fu var. *elongata* (Rehder & E. H. Wilson) D. L. Fu & T. B. Chao.

Trees, to 21 m tall. Bark pale grayish brown or blackish brown, falling in small flakes when old. Twigs pale yellowish brown becoming gray, glabrous. Petiole 1–3 cm with small stipular scar; leaf blade obovate, 10–18 × 4.5–10 cm, abaxially finely appressed pilose at first, adaxially sparsely appressed pilose along midvein and secondary veins, base cuneate, apex acute to abruptly shortly acuminate. Flower buds erect, pale grayish yellow sericeous. Flowers appearing before leaves, cupular, fragrant. Tepals 12(–14), outside rosy red and dark purple striated, obovate-spoon-shaped to spoon-shaped, 5–13 × 2.5–3.5 cm, subequal. Stamens 1–1.5 cm; filaments purplish red, broad and flat; connective exerted and forming a mucro; anthers ca. 5 mm, slightly distinct. Gynoecium pale green, cylindrical, 2–3 cm; styles rosy red. Fruit cylindrical, 6–18 cm; mature carpels brown, flat and orbicular. Fl. Mar–Apr, fr. Aug–Sep.

• Forests, thickets; 1300–2400 m. Chongqing, S Gansu, Guizhou, SW Henan, Hubei, NW Hunan, NW Jiangxi (Xiushui), Shaanxi, C Sichuan, Yunnan.

This species is grown as an ornamental and used medicinally.

5. *Yulania amoena* (W. C. Cheng) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

天目玉兰 tian mu yu lan

Magnolia amoena W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 9: 280. 1934.

Trees, to 12 m tall. Bark gray or grayish white. Twigs green when young becoming purple when old, 3–4 mm in diam., glabrous; buds with grayish white appressed trichomes. Stipular scar 1/5–1/2 as long as petiole. Petiole 0.8–1.3 cm, at first with white long trichomes; leaf blade obovate to narrowly obovate-elliptic, 10–15 × 3.5–5 cm, papery, abaxially with white curved long trichomes along veins and in axils, adaxially glabrous, secondary veins 10–13 on each side of midvein, base broadly cuneate to rounded, apex acuminate to abruptly cuspidate, acumen 0.5–2 cm. Spathaceous bract just below tepals. Flowers appearing before leaves, red to pale red, ca. 6 cm in diam., fragrant. Tepals 9, oblanceolate to spoon-shaped, 5–5.6 cm. Stamens 9–10 mm; filaments purplish red, 3.5–4 mm; connective exerted and forming a 0.5–0.7 mm mucro; anthers 4.5–5 mm, dehiscing laterally. Gynoecium cylindrical, ca. 2 cm × 2 mm; stigmas ca. 1 mm. Fruiting peduncle ca. 1 cm, with residual villous trichomes. Fruit cylindrical, 4–10 cm, usually curved because of carpels partly undeveloped; mature carpels compressed globose, ca. 10 × 6–7 mm, tuberculate, dehiscing into 2 valves along dorsal sutures, apex obtuse. Seeds (without testa) cordate, 8–9 × 5–6 mm. Fl. Apr–May, fr. Sep–Oct.

• Montane sparse forests; 700–1000 m. Anhui, Fujian, Hebei, S Jiangsu, Jiangxi, Zhejiang.

6. *Yulania zenii* (W. C. Cheng) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

宝华玉兰 bao hua yu lan

Magnolia zenii W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 8: 291. 1933; *M. elliptilimba* Y. W. Law & Z. Y. Gao.

Trees, to 11 m tall, to 30 cm d.b.h. Bark grayish white, smooth. Old twigs purple, sparsely lenticellate; young twigs green, glabrous; buds narrowly ovoid, apex slightly curved, long sericeous. Stipular scar 1/5–1/2 as long as petiole. Petiole 0.6–1.8 cm, at first villous; leaf blade obovate-oblong to oblong, 7–16 × 3–7 cm, membranous, abaxially pale green, adaxially green and glabrous, midvein and secondary veins with long curved trichomes, secondary veins 8–10 on each side of midvein, base broadly cuneate to obtuse, apex broadly rounded and with an acuminate tip. Peduncle 2–4 mm, with dense long trichomes. Flower buds ovoid. Flowers appearing before leaves, ca. 12 cm in diam., fragrant. Tepals 9, nearly spoon-shaped, 6.8–7.8 × 2.7–3.8 cm, apex rounded to slightly acuminate; inner tepals white but outside pale purplish red from base to middle and apically white, narrower and smaller. Stamens ca. 1.1 cm; filaments purple, ca. 4 mm; connective exerted and forming a mucro; anthers ca. 7 mm, thecae divergent, dehiscing introrsely.

Gynoecium cylindric, ca. 2 cm; carpels ca. 4 mm; styles ca. 1 mm. Fruit cylindric, 5–7 cm; mature carpels suborbicular, tuberculate, apex obtuse. Fl. Mar–Apr, fr. Aug–Sep.

- Hills; ca. 200 m. Jiangsu (Baohua Shan, Jurong).

This species is grown as an ornamental.

7. *Yulania elliptigemmata* (C. L. Guo & L. L. Huang) N. H. Xia, **comb. nov.**

椭圆玉兰 tuo lei yu lan

Basionym: *Magnolia elliptigemmata* C. L. Guo & L. L. Huang, *J. Wuhan Bot. Res.* 10: 325. 1992.

Trees, to 10 m tall, 40–50 cm d.b.h. Bark gray, with grayish white massive lenticels. Twigs, petioles, and adaxial surface of leaf blades glabrous. Stipular scar 1/4–1/3 as long as petiole. Petiole 1.5–2 cm; leaf blade obovate to broadly obovate, 5–9 × 4.5–6.5 cm, abaxially green, white appressed pubescent when young, adaxially dark green, secondary veins 7 or 8 on each side of midvein, base cuneate to broadly cuneate, apex broadly rounded, slightly emarginate, or shortly acute. Peduncle ca. 6 mm. Flowers appearing before leaves, fragrant. Tepals 11 (or 12), pale purplish red but basally darker and apically lighter, obovate-spoon-shaped, 5.5–6.7 × 2.2–3.2 cm, subequal. Stamens ca. 50, 1–1.5 cm; filaments ca. 4 mm; connective exerted and forming a ca. 1 mm mucro; anthers dehiscing laterally. Gynoecium cylindric, 1.8–2 cm, glabrous; styles 2–3 mm. Fruit 4–7 cm, usually withered because of carpels partly undeveloped; mature carpels compressed globose, 0.7–1.5 cm in diam., dehiscing into 2 valves, tuberculate. Seeds bean-shaped or cordate; testa red; endotesta pale brown. Fl. Mar, fr. Sep–Oct.

- Forests; ca. 700 m. Hubei (Yuan'an).

This is possibly a form of *Yulania sprengeri* with smaller leaves.

8. *Yulania denudata* (Desrousseaux) D. L. Fu, *J. Wuhan Bot. Res.* 19: 198. 2001.

玉兰 yu lan

Magnolia denudata Desrousseaux in Lamarck, *Encycl.* 3: 675. 1792; *Gwillimia yulan* (Desfontaines) de Vos; *Lassonia heptapeta* Buc'hoz, nom. utique rej.; *M. alexandrina* Steudel; *M. citriodora* Steudel; *M. conspicua* Salisbury; *M. conspicua* var. *purpurascens* Maximowicz; *M. cyathiformis* Rinz ex K. Koch; *M. denudata* var. *angustitepala* T. B. Chao & Zhi X. Chen; *M. denudata* var. *pyramidalis* T. B. Chao & Zhi X. Chen; *M. denudata* var. *pyriformis* T. D. Yang & T. C. Cui; *M. heptapeta* (Buc'hoz) Dandy, comb. rej.; *M. obovata* Thunberg var. *denudata* (Desrousseaux) Candolle; *M. yulan* Desfontaines; *Michelia yulan* (Desfontaines) Kostelecky; *Yulania conspicua* (Salisbury) Spach; *Y. denudata* var. *flava* D. L. Fu et al.; *Y. denudata* subsp. *pubescens* (D. L. Fu et al.) D. L. Fu et al.; *Y. denudata* var. *pubescens* D. L. Fu et al.; *Y. denudata* var. *purpurascens* (Maximowicz) D. L. Fu; *Y. denudata* var. *pyramidalis* (T. B. Chao & Zhi X. Chen) D. L. Fu; *Y. pyriformis* (T. D. Yang & T. C. Cui) D. L. Fu.

Trees, to 25 m tall, to 1 m d.b.h. Bark deep gray, coarse and fissured. Winter buds and peduncles densely pale grayish yellow long sericeous. Branches patent and forming a broad

crown; twigs grayish brown, slightly thick and strong. Stipular scar 1/4–1/3 as long as petiole. Petiole 1–2.5 cm, villous, adaxially narrowly furrowed; leaf blade obovate, broadly obovate, or obovate-elliptic but basal leaves elliptic, 10–15(–18) × 6–10(–12) cm, papery, gradually narrowing from middle toward base, abaxially pale green and villous along veins, adaxially deep green, villous when young, and later only pilose on midvein and secondary veins, secondary veins 8–10 on each side of midvein, reticulate veins conspicuous, apex broadly rounded, truncate, or slightly emarginate. Peduncle significantly enlarged, densely pale yellow long sericeous. Flower buds ovoid. Flowers appearing before leaves, 10–16 cm in diam., erect, fragrant. Tepals 9, white, oblong-obovate, 6–8(–10) × 2.5–4.5(–6.5) cm, subequal, base usually pinkish. Stamens 7–12 mm; connective ca. 5 mm wide, exerted and forming a mucro; anthers 6–7 mm, dehiscing laterally. Gynoecium pale green, cylindric, 2–2.5 cm, glabrous; ovaries narrowly ovoid, 3–4 mm; styles conical, ca. 4 mm. Fruit cylindric but in cultivation often curved because of carpels partly undeveloped, 12–15 × 3.5–5 cm; mature carpels brown, thickly woody, white lenticellate. Seeds cordate, ca. 9 × 10 mm, laterally compressed; testa red; endotesta black. Fl. Feb–Mar, fr. Aug–Sep. $2n = 76^*$, 114^* .

- Forests; 500–1000 m. Anhui, Chongqing, N Guangdong, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Yunnan, Zhejiang.

This species is grown as an ornamental and for timber. It is widely cultivated in temperate parts of the world.

9. *Yulania biondii* (Pampanini) D. L. Fu, *J. Wuhan Bot. Res.* 19: 198. 2001.

望春玉兰 wang chun yu lan

Magnolia biondii Pampanini, *Nuovo Giorn. Bot. Ital.*, n.s., 17: 275. 1910; *M. aulacosperma* Rehder & E. H. Wilson; *M. biondii* var. *axilliflora* T. B. Chao et al.; *M. biondii* var. *flava* T. B. Chao et al.; *M. biondii* var. *latitepala* T. B. Chao & J. T. Gao [“*latitepala*”]; *M. biondii* var. *multilabastra* T. B. Chao et al.; *M. biondii* var. *ovata* T. B. Chao & T. X. Zhang; *M. biondii* var. *planities* T. B. Chao & Y. Z. Qiao; *M. conspicua* Salisbury var. *fargesii* Finet & Gagnepain; *M. denudata* Desrousseaux var. *fargesii* (Finet & Gagnepain) Pampanini; *M. fargesii* (Finet & Gagnepain) W. C. Cheng; *M. funiushanensis* T. B. Chao et al.; *M. funiushanensis* var. *purpurea* T. B. Chao & J. T. Gao; *Yulania biondii* var. *angustitepala* D. L. Fu et al.

Trees, to 12 m tall, to 1 m d.b.h. Bark pale gray, smooth. Twigs grayish green, 3–4 mm in diam., glabrous; terminal buds ovoid to broadly ovoid, 1.7–3 cm, densely pale yellow opened villous. Stipular scar 1/5–1/3 as long as petiole. Petiole 1–2 cm; leaf blade narrowly elliptic, narrowly ovate, narrowly obovate, or ovate, 10–18 × 3.5–6.5 cm, abaxially light green and appressed lanate but later glabrescent, adaxially dark green, secondary veins 10–15 on each side of midvein, base broadly cuneate to obtuse and decurrent on petiole, margin dry membranous, apex acute to shortly acuminate. Peduncle ca. 1 cm, with 3 bract scars, apically swollen. Flowers appearing before leaves, 6–8 cm in diam., fragrant. Tepals 9; outer 3 tepals sepaled, purplish red, nearly narrowly obovate-linear, ca. 1 cm; tepals of middle and inner whorls white but usually outside purplish red at base, spoon-shaped, 4–5 × 1.3–2.5 cm; tepals of inner whorls smaller and narrower. Stamens 8–10 mm; fila-

ments purple, 3–4 mm; anthers 4–5 mm. Gynoecium 1.5–2 cm. Fruiting peduncle ca. 1 × 0.7 cm, with residual long sericeous trichomes. Fruit cylindrical, 8–14 cm, usually withered because of carpels partly undeveloped; mature carpels light brown, sub-orbicular, compressed laterally, tuberculate. Seeds cordate, with a V-shaped furrow prominent in middle, abaxially deeply furrowed, apically concave, apex inconspicuously acute; testa bright red; endotesta dark black. Fl. Mar, fr. Sep. $2n = 76^*$.

• Forests; 600–2100 m. Chongqing, SE Gansu, Henan, Hubei, N Hunan, Shaanxi, Sichuan.

This species is grown as an ornamental and used medicinally.

“*Magnolia biondii* var. *parvialabastra* T. B. Chao,” “*M. biondii* var. *purpurea* T. B. Chao et al.,” and “*M. honanensis* B. Y. Ding & T. B. Chao” (in J. Henan Agric. College 1983(4): 7, 8, 10. 1983) belong here but were not validly published because in each case two gatherings were indicated as types (*Vienna Code*, Art. 37.2).

10. *Yulania stellata* (Maximowicz) N. H. Xia, **comb. nov.**

星花玉兰 xing hua yu lan

Basionym: *Magnolia stellata* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 17: 418. 1872; *M. sinostellata* P. L. Chiu & Z. H. Chen; *Yulania sinostellata* (P. L. Chiu & Z. H. Chen) D. L. Fu.

Shrubs, 0.3–2.4 m tall. Twigs slender, lenticellate; old twigs grayish brown; annual and biennial twigs green. Stipular scar ca. 1/2 as long as petiole. Petiole 3–12 mm, glabrous; leaf blade elliptic, narrowly elliptic, or obovate-elliptic, 7–12 × 2.5–4 cm, abaxially glabrous or white pubescent in vein axils, adaxially glabrous, midvein abaxially slightly impressed, secondary veins 6–8 on each side of midvein, base cuneate, apex acuminate to caudate. Peduncle 3–5 mm, densely yellow sericeous. Flower buds 1.5–2 cm. Flowers appearing before leaves, 5–7 cm in diam. Tepals 12–15(–18), in 4 or 5(6) whorls, pale red at first but later gradually becoming white with red on outside on apical part or only at middle, oblanceolate to obovate-spoon-shaped, 3.3–4.5 × 1.3–1.8 cm, fleshy, apex rounded to nearly acute. Stamens 86–99, 7–9(–10) mm; filaments 1–2(–3) mm; anthers 6–7 mm. Gynoecium cylindrical, 6–8 × 2–4 mm; carpels many, narrowly ovoid, ca. 2 mm, distinct, glabrous; stigmas ca. 1.5 mm. Fruit not seen. Fl. Feb.

Sparse forests; ca. 1000 m. Naturalized in Zhejiang (Jingning) [native to Japan].

This species is commonly cultivated in Jiangsu, Shandong, and Zhejiang.

In FRPS (30(1): 139. 1996) the name *Magnolia tomentosa* Thunberg, nom. utique rej., was misapplied to this species.

One of us (Xia) considers that *Yulania sinostellata* is a distinct species.

11. *Yulania cylindrica* (E. H. Wilson) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

黄山玉兰 huang shan yu lan

Magnolia cylindrica E. H. Wilson, J. Arnold Arbor. 8: 109. 1927.

Trees, to 10 m tall. Bark grayish white, smooth. Young twigs, petioles, and leaf blade abaxial surfaces with pale yellow appressed trichomes. Old twigs purplish brown, bark with

pungent odor when crushed. Stipular scar 1/6–1/3 as long as petiole. Petiole 0.5–2 cm, narrowly furrowed; leaf blade obovate, narrowly obovate, or obovate-oblong, 6–14 × 2–5(–6.5) cm, membranous, abaxially grayish green, adaxially green and glabrous, base nearly rounded to broadly cuneate, apex obtuse, acute, or caudate. Peduncle 1–1.5 cm, thick and strong, densely pale yellow long sericeous. Flowers appearing before leaves, erect. Flower buds ovoid, with pale grayish yellow to silvery gray long trichomes. Tepals 9; outer 3 tepals sepal-like, 1.2–2 × ca. 0.4 cm, membranous; tepals of middle and inner whorls white but base usually red, petal-like, obovate, 6.5–10 × 2.5–4.5 cm, base clawed; inner 3 tepals erect. Stamens ca. 1 cm; filaments pale red; connective exerted and forming a tip or mucro. Gynoecium green, cylindrical-ovoid, ca. 1.2 cm. Fruit purplish red at first then turning dark purplish black, cylindrical, 5–7.5 × 1.8–2.5 cm, pendulous; mature carpels connate and not curved. Seeds (without testa) brown, cordate, 7–10 × 9–11 mm, laterally compressed, adaxially broadly furrowed, base cuneate, apex V-shaped. Fl. Apr–Jun, fr. Aug–Sep. $2n = 76^*$.

• Forests; 700–1600 m. Anhui, Fujian, S Henan, Hubei, Jiangxi, Zhejiang.

“*Magnolia concinna* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*, 44. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

12. *Yulania liliiflora* (Desrousseaux) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

紫玉兰 zi yu lan

Magnolia liliiflora Desrousseaux in Lamarck, *Encycl.* 3: 675. 1792; *Lassonia quinquepeta* Buc’hoz, nom. utique rej.; *M. plena* C. L. Peng & L. H. Yan; *M. polytepala* Y. W. Law et al.; *M. quinquepeta* (Buc’hoz) Dandy, *comb. rej.*; *Yulania japonica* Spach.

Shrubs, to 3 m tall, usually caespitose. Bark grayish brown. Twigs greenish purple to pale purplish brown. Stipular scar ca. 1/2 as long as petiole. Petiole 0.8–2 cm; leaf blade elliptic-obovate to obovate, 8–18 × 3–10 cm, abaxially grayish green and pubescent along veins, adaxially deep green and sparsely pubescent when young, secondary veins 8–10 on each side of midvein, base gradually narrowing along petiole to stipular scar, apex acute to acuminate. Peduncle thick and strong, with trichomes. Flower buds ovoid, pale yellow sericeous. Flowers appearing at same time with leaves, vase-shaped, erect, slightly fragrant. Tepals 9–12; outer 3 tepals purplish green, sepal-like, lanceolate, 2–3.5 cm, caducous; tepals of inner 2 whorls purple to purplish red outside and whitish inside, petal-like, elliptic-obovate, 8–10 × 3–4.5 cm, fleshy. Stamens purplish red, 8–10 mm; connective exerted and forming a mucro; anthers ca. 7 mm, dehiscing laterally. Gynoecium pale purple, ca. 1.5 cm, glabrous. Fruit dark purplish brown, cylindrical, 7–10 cm; mature carpels subglobose, apex shortly beaked. Fl. Mar–Apr, fr. Aug–Sep. $2n = 76^*$.

• Forest margins, slopes; 300–1600 m. Chongqing, Fujian, Hubei, S Shaanxi, Sichuan, NW Yunnan.

This species is grown as an ornamental and used medicinally.

Hybrids or putative hybrids

13. *Yulania jigongshanensis* (T. B. Chao et al.) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

鸡公山玉兰 *ji gong shan yu lan*

Magnolia jigongshanensis T. B. Chao et al., J. Henan Univ., Nat. Sci. 26: 62. 2000.

Trees. Twigs purplish brown, lustrous, glabrous, rarely pubescent; young twigs pale yellowish green, terete, densely pubescent. Petiole 1–3 cm, furrowed adaxially; leaf blade broadly elliptic, broadly ovate, orbicular, suborbicular, obovate, or obtriangular, 16.5–19.5 × 5–17.5 cm, thinly leathery to leathery, abaxially pale yellowish green and densely curved pubescent, adaxially dark green, lustrous, and densely pubescent along veins, secondary veins 5–9 on each side of midvein and prominent on both surfaces, base subrounded to broadly cuneate, apex obtuse and with a long mucro to 2-lobed. Brachyblasts densely pubescent. Flower buds ovoid, small, densely grayish white to pale yellowish brown villous. Flowers appearing before leaves. Tepals 9; outer 3 tepals pale yellowish green, sepal-like, triangular or lanceolate, 1–5(–15) mm, membranous; inner 6 tepals pale yellowish white but outside pale purplish in middle at base, petal-like, spatulate-elliptic, 5–9 × 3–5 cm, apex obtuse to sometimes emarginate. Stamens 65–71; filaments purple; anthers 0.8–1.3 cm, dehiscing laterally. Carpels many, densely pubescent. Fruit terete, 15–20 × 3–5 cm. Fl. Apr, fr. Aug.

• Henan (Jigong Shan).

One of the largest plantations of *Yulania* for growing medicinal *xinyi* is found at Jigong Shan Forest Station in Xinying, Henan. This plant may be one of the many hybrids that originate in plantations with different *Yulania* species, probably with *Yulania biondii* as one of the parents.

14. *Yulania mirifolia* D. L. Fu et al., Bull. Bot. Res., Harbin 24: 261. 2004.

奇叶玉兰 *qi ye yu lan*

Trees, to 8 m tall. Juvenile twigs purplish brown, shiny, later densely pale yellow pubescent, glabrescent or with persistent trichomes. Stipules long lanceolate, 1.5–2 cm, abaxially densely silvery pubescent, apex obtuse; stipular scar conspicuous, less than 1/5 as long as petiole. Petiole 1.5–2.5(–5) cm, pubescent; leaf blade irregularly obtriangular, 9.2–16.5 × 7–11.5 cm, abaxially pale green and densely pubescent, adaxially glabrous but pubescent along midvein, secondary veins 6–9 on each side of midvein, reticulate veins conspicuous on both surfaces, base cuneate, apex with 2 irregular orbicular to triangular lobes. Brachyblasts densely pale yellowish white villous. Flower buds ovoid, 1.5–2.5 × 1–1.2 cm, apex obtuse; bracts 1(or 2), thickly leathery, abaxially densely pale brown villous. Flowers appearing before leaves. Tepals 12, white, spatulate-long elliptic, 5.5–6.5 × 2.5–3.2 cm, pale purplish outside in middle at base, base narrowly cuneate, apex obtuse. Stamens 6–8 mm; filaments abaxially pale purple, ca. 2 mm; connective apex acute and with a ca. 1.5 mm mucro; anthers 4–6 mm, dehiscing laterally. Gynoecium pale green to green, terete, 1.2–2 cm; carpels many, densely white pubescent; styles pale green, 5–6 mm. Fruit not seen. Fl. late Mar.

• Forests; ca. 600 m. Henan (Xinyang).

This plant may be a hybrid between species of *Yulania* cultivated in the area for the production of medicinal *xinyi*.

15. *Yulania multiflora* (M. C. Wang & C. L. Min) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

多花玉兰 *duo hua yu lan*

Magnolia multiflora M. C. Wang & C. L. Min, Acta Bot. Boreal.-Occid. Sin. 12: 85. 1992.

Trees, to 14 m tall, to 31 cm d.b.h. Bark gray. Annual twigs purplish green, smooth, glabrous. Stipular scar 1/6–1/5 as long as petiole. Petiole 1–2 cm; leaf blade obovate, 5–10 × 3.5–7 cm, abaxially grayish green, adaxially green and glabrous, secondary veins 6–8 on each side of midvein, base broadly cuneate, apex rounded and shortly acute. Flower buds densely grayish yellow sericeous, inserted on twig apex, enclosing 2 or 3 flowers per bud and forming a thyrses, flowers cupular. Flowers appearing before leaves, fragrant. Tepals 12–14(or 15), white but outside pale red at base, narrowly obovate to obovate-lanceolate, 4.6–6.8 × 1.1–2.3 cm. Stamens 1.1–1.6 cm; filaments purplish red, ca. 4 mm; connective exerted and forming a mucro; anthers 7–8 mm, dehiscing laterally. Gynoecium green, cylindrical, 1.8–3 cm. Fruit cylindrical, 4–9 cm, usually curved because of carpels partly undeveloped; mature carpels grayish brown, globose and compressed, 0.7–1.5 cm in diam., abaxially tuberculate, dehiscing into 2 valves along dorsal sutures. Fl. May, fr. Aug–Sep.

• Forests; 1600–1700 m. Shaanxi (Ningshan).

This plant may be a hybrid between *Yulania biondii* and *Y. sprengeri*. Both species are grown for the production of medicinal *xinyi* and easily hybridize.

16. *Yulania pilocarpa* (Z. Z. Zhao & Z. W. Xie) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

罗田玉兰 *luo tian yu lan*

Magnolia pilocarpa Z. Z. Zhao & Z. W. Xie, Acta Pharmacol. Sin. 22: 777. 1987; *Yulania pilocarpa* var. *ellipticifolia* D. L. Fu et al.

Trees, 12–15 m tall. Bark grayish brown. Young twigs purplish brown, glabrous. Stipular scar nearly 1/2 as long as petiole. Leaf blade obovate to broadly obovate, 10–17 × 8.5–11 cm, papery, abaxially pale green, adaxially deep green, secondary veins 9–11 on each side of midvein, base cuneate to broadly cuneate, apex broadly rounded and slightly emarginate. Flower buds ovoid, ca. 3 cm, yellow villous. Flowers appearing before leaves. Tepals 9; outer 3 tepals yellowish green, sepal-like, sharply triangular, 1.7–3 cm, membranous; tepals of inner 2 whorls white, nearly spoon-shaped, 7–10 × 3–5 cm, fleshy. Stamens numerous, ca. 1.1 cm; connective exerted and forming a ca. 1 mm mucro; anthers 8–9 mm, dehiscing laterally. Gynoecium ellipsoid-cylindrical, ca. 2 cm; carpels pubescent; stigmas ca. 1 mm. Fruit cylindrical, 10–20 × ca. 3.5 cm, with residual trichomes. Seeds bean-shaped to obovoid; testa red; endotesta black. Fl. Mar–Apr, fr. Sep.

• Forests; ca. 500 m. Hubei (Luotian).

This species is used medicinally.

This plant may be one of the many spontaneous hybrids that originate in plantations with different *Yulania* species grown for medicinal *xinyi* with *Y. biondii* as one of the parents. *Yulania wugangensis* (T. B. Chao et al.) D. L. Fu (J. Wuhan Bot. Res. 19: 198. 2001; *Magnolia wugangensis* T. B. Chao et al., Acta Bot. Yunnan. 21: 171. 1999) may be another hybrid from the same sort of medicinal plantation in Henan and also involving *Y. biondii* as one of its parents.

17. *Yulania* ×*soulangeana* (Soulange-Bodin) D. L. Fu, J. Wuhan Bot. Res. 19: 198. 2001.

二乔玉兰 *er qiao yu lan*

Magnolia ×*soulangeana* Soulange-Bodin, Mém. Soc. Linn. Paris 1826: 269. 1826 [*“soulangiana”*]; *M. yulan* Desfontaines var. *soulangeana* (Soulange-Bodin) Lindley.

Trees, 6–10 m tall. Twigs glabrous. Stipular scar ca. 1/3 as long as petiole. Petiole 1–1.5 cm, pubescent; leaf blade obovate, 6–15 × 4–7.5 cm, basal ca. 2/3 gradually narrowing, papery, abaxially ± pubescent, adaxially with residual trichomes along midvein at base, secondary veins 7–9 on each side of midvein, base cuneate, apex shortly acute. Flower buds ovoid. Flowers appearing before leaves. Tepals 6–9, pale red to dark red; outer 3 tepals usually ca. 2/3 as long as inner ones. Stamens 1–1.2 cm; connective exerted and forming a mucro; anthers ca. 6 mm, dehiscent laterally. Gynoecium cylindric, ca. 1.5 cm, glabrous. Fruit ca. 8 × 3 cm; mature carpels black, ovoid to obovoid, 1–1.5 cm, with white lenticels. Seeds dark brown, broadly obovoid to obovoid, compressed laterally. Fl. Feb–Mar, fr. Sep–Oct. $2n = 76^*$.

• Cultivated throughout most of China and occurring occasionally where the two parents grow together.

This very ornamental hybrid between *Yulania denudata* and *Y. liliiflora* varies in the shape, size, and color of its tepals. Although originally named based on a hybrid made in Europe, the same hybridization occurs in China. There are about 20 cultivars in cultivation.

18. *Yulania viridula* D. L. Fu et al., Bull. Bot. Res., Harbin 24: 263. 2004.

青皮玉兰 *qing pi yu lan*

Trees. Juvenile twigs pale yellowish green, robust, ca. 1 cm in diam., shiny, sparsely to densely pubescent, later glabrescent, conspicuously lenticellate. Stipular scar ring conspicuously prominent, ca. 1/3 as long as petiole, densely pubescent. Petiole 3.5–4.5 cm, sparsely pubescent; leaf blade circular, elliptic, or broadly elliptic, 15–19.5 × 11.5–15.5 cm, papery, abaxially grayish green and villous along midvein and secondary veins, adaxially dark green and sparsely pubescent along midvein, secondary veins 6–9 on each side of midvein and spreading, base rotund to cordate, apex obtuse and rarely with a short mucro. Brachyblasts densely annular grayish white villous at apex, usually glabrous or pubescent from base to middle; bracts 3 or 4, abaxially densely pale yellow, brown, or grayish white villous; spatheaceous bracts 1, blackish brown, membranous, abaxially densely pale gray villous. Flower buds pale yellowish green, ellipsoid to ovoid, 1.5–2.5 × 1.7–2.5 cm. Flowers appearing before leaves. Tepals 33–48, outside basal 1/2 red, inside pure white, narrowly elliptic, 5.7–7.2 × 1–1.5 cm, base narrowly cuneate, apex obtuse. Stamens ca. 80, 1.3–1.5 cm; filaments ca. 3 mm, abaxially purplish red; connective with ca. 1 mm long mucro at apex; anthers dehiscent laterally. Gynoecium cylindric, ca. 3 cm; carpels many, green, glabrous; styles red, curved inward. Fruit not seen. Fl. Mar.

• Forests; ca. 700 m. Shaanxi (Hanzhong).

The authors have not seen any specimens of this species, but judging from the description and illustration in the protologue it may be a hybrid between species of *Yulania* cultivated for the production of medicinal *xinyi*.

12. MICHELIA Linnaeus, Sp. Pl. 1: 536. 1753.

含笑属 *han xiao shu*

Champaca Adanson; *Elmerrillia* Dandy; *Liriopsis* Spach (1839), not Reichenbach (1828–1829); *Paramichelia* Hu; *Sampacca* Kuntze; *Tsoongiodendron* Chun.

Trees or shrubs, evergreen. Stipules hooded, 2-valved, membranous, adnate to or free from petiole, annular scar persistent on petiole or twig. Leaves spirally arranged; leaf blade leathery, margin entire. Young leaves erect or folded in buds. Flowers pseudo-axillary on a brachyblast, solitary or rarely 1 flower bud surrounding 2 or 3 flower buds on different nodes and forming a 2- or 3-flowered thyrse, bisexual, usually fragrant; bud surrounded by 2–4 deciduous spatheaceous bracts. Peduncle with annular bract-scar but if bracts adnate to petiole then petiole with bract-scar. Tepals 6–21, 3 or 6 per whorl, subequal or rarely much smaller than outer whorl. Stamens numerous; filaments short or long; connective elongated, exerted and forming a long or short tip, rarely not exerted; anthers dehiscent laterally or nearly laterally. Gynoecium with or without a gynophore; carpels few or numerous, usually partly undeveloped, without abaxial longitudinal furrow, adaxial base inserted on rachis, apical part often distinct or rarely coherent; ovules 2 to several per carpel. Fruit usually terete when mature, often curved because of partly abortive carpels; mature carpels leathery or woody, completely persistent on fruiting axis, sessile or shortly stalked, dehiscent into 2 valves along dorsal sutures or along both dorsal and ventral sutures, sometimes fruit fleshy and tardily and irregularly dehiscent, or a woody syncarp, upper parts of carpels falling away while also dehiscent along dorsal suture, basal parts remaining attached to torus with their suspended seeds. Seeds 2 to several per carpel, red or brown.

About 70 species: tropical and subtropical Asia; 39 or 37 species including one or two hybrid species (20 or 18 endemic, one introduced) in China.

“Michelia fadouensis D. X. Li & Y. W. Law,” *“M. fugongensis* D. X. Li & Y. W. Law,” *“M. gigantea* D. X. Li & R. Z. Zhou,” *“M. gushanensis* D. X. Li & Y. W. Law,” *“M. pingbianica* R. Z. Zhou & Q. W. Zeng,” and *“M. virensipetala* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, Magnolias China, 248, 259, 266, 272, 304, 322. 2004) are of uncertain identity and are probably the same as already published *Michelia* species but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

- 1a. Tepals unequal, outmost whorl membranous but others fleshy; stipules free from petiole 37. *M. gioi*
- 1b. Tepals subequal, ± fleshy; stipules free from or connate to petiole.
- 2a. Tepals 6, in 2 whorls; stipules free from petiole.
- 3a. Leaf blades glabrous on both surfaces.
- 4a. Gynoecium glabrous.
- 5a. Fruit 8–15 cm 30. *M. martini*
- 5b. Fruit 3.5–10 cm 31. *M. chapensis*
- 4b. Gynoecium with trichomes.
- 6a. Brachyblasts with trichomes; tepals obovate-elliptic 31. *M. chapensis*
- 6b. Brachyblasts glabrous; tepals narrowly oblong to broadly lanceolate 32. *M. xanthantha*
- 3b. Leaf blades at least abaxially with some trichomes.
- 7a. Leaf blade 1.5–2.5 cm wide, secondary veins inconspicuous; tepals narrower and smaller, oblanceolate 33. *M. angustiblonda*
- 7b. Leaf blade 2.8–10 cm wide, secondary veins conspicuous; tepals broader and larger, obovate-elliptic, obovate, oblong, or narrowly elliptic (but unknown for *M. levilleana*).
- 8a. Leaf blades thinly leathery, both surfaces pubescent when young 36. *M. levilleana*
- 8b. Leaf blades thickly leathery or leathery, abaxially brown tomentose and adaxially glabrous.
- 9a. Petiole 1.5–4 cm; mature carpels 2–6 cm 34. *M. balansae*
- 9b. Petiole ca. 1 cm; mature carpels 1–2 cm 35. *M. guangxiensis*
- 2b. Tepals 9 or more, in 3 or more whorls; stipules free from or connate to petiole.
- 10a. Stipules adnate to petiole, leaving stipular scar on petiole.
- 11a. Petiole shorter, usually not exceeding 5 mm; outer tepals smaller.
- 12a. Gynoecium glabrous 27. *M. figo*
- 12b. Gynoecium with trichomes.
- 13a. Tepals pale yellow, outer ones outside with brownish trichomes 29. *M. skinneriana*
- 13b. Tepals white, purplish red, or dark purple, outer ones outside glabrous.
- 14a. Tepals white; gynoecium exceeding androecium; fruit usually with 5–9 mature carpels 26. *M. yunnanensis*
- 14b. Tepals dark purple; gynoecium not exceeding androecium; fruit with more than 10 mature carpels 28. *M. crassipes*
- 11b. Petiole longer, often exceeding 5 mm; outer tepals larger.
- 15a. Stipular scar shorter than 1/3 of petiole.
- 16a. Tepals yellow.
- 17a. Leaf blade thinly leathery, obovate, 20–27 × 7–11 cm, abaxially glaucous; tepals 8 10. *M. opipara*
- 17b. Leaf blade leathery, obovate to narrowly obovate, 9–15 × 3–7 cm, abaxially grayish white; tepals 9–12 11. *M. wilsonii*
- 16b. Tepals white.
- 18a. Twigs and petioles grayish white appressed pubescent 7. *M. doltsopa*
- 18b. Twigs and petioles with brownish trichomes.
- 19a. Young twigs densely yellowish brown tomentose; petiole adaxially furrowed 8. *M. fulva*
- 19b. Young twigs brown pubescent; petiole not adaxially furrowed 9. *M. sphaerantha*
- 15b. Stipular scar longer than 1/3 of petiole.
- 20a. Tepals obovate to spatulate.
- 21a. Tepals white 6. *M. floribunda*
- 21b. Tepals yellow or ivory-yellow, red-dotted.
- 22a. Stipular scar reaching middle of petiole; tepals yellow or ivory-yellow, red-dotted; fruit subellipsoid, ca. 13 × 9 cm; mature carpels connate 4. *M. odora*
- 22b. Stipular scar reaching apex of petiole; tepals yellow; fruit terete; mature carpels distinct 5. *M. kisopa*
- 20b. Tepals narrowly oblanceolate or narrowly lanceolate.
- 23a. Young twigs densely gray tomentose; old twigs, fruiting brachyblasts, gynophores, and carpels pilose 1. *M. velutina*
- 23b. Young parts pubescent, later pubescent or glabrous.
- 24a. Tepals white 38. *M. ×alba*
- 24b. Tepals yellow or white but if white at least cream-colored in bud.
- 25a. Leaf blade adaxially glabrous, midvein flat; fruit terete, 7–15 cm, mature carpels distinct 2. *M. champaca*
- 25b. Leaf blade adaxially brownish appressed villous at first, midvein impressed; fruit ellipsoid to ellipsoid-cylindric, 6–10 cm, mature carpels connate 3. *M. baillonii*
- 10b. Stipules free from petiole, no stipular scar on petiole.
- 26a. Tepals obovate, broadly obovate, or obovate-oblong.

- 27a. Leaf blade glabrous on both surfaces.
 28a. Buds narrowly ellipsoid; twigs glabrous 22. *M. shiluensis*
 28b. Buds cylindrical; twigs puberulous 23. *M. coriacea*
- 27b. Leaf blade with trichomes.
 29a. Tepals white 24. *M. guangdongensis*
 29b. Tepals pale yellow.
 30a. Leaf blade oblong-elliptic, elliptic-ovate, or ovate, 17–23 × 6–11 cm, reddish brown or silvery gray tomentose abaxially 25. *M. foveolata*
 30b. Leaf blade obovate-oblong or narrowly elliptic, 9–18 × 4.5–5.5 cm, densely brown pubescent or golden yellow villous 39. *M. elegans*
- 26b. Tepals spatulate-obovate, narrowly obovate, or spatulate.
 31a. Leaf blade glabrous on both surfaces.
 32a. Leaf blade abaxially glaucous 12. *M. maudiae*
 32b. Leaf blade not abaxially glaucous.
 33a. Leaf blade oblong-elliptic to elliptic, 14–17 × 6–8 cm 13. *M. lacei*
 33b. Leaf blade elliptic to narrowly elliptic, 7–10 × 1.7–2.3 cm 14. *M. iteophylla*
- 31b. Leaf blade with some trichomes.
 34a. Androecium exceeding gynoecium 15. *M. fujianensis*
 34b. Androecium not exceeding gynoecium.
 35a. Tepals yellow.
 36a. Leaf blade narrowly obovate, abaxially scattered with reddish brown erect trichomes 11. *M. wilsonii*
 36b. Leaf blade narrowly ovate to narrowly elliptic, abaxially with brown silky trichomes 16. *M. flaviflora*
- 35b. Tepals white or red.
 37a. Bark fissured 17. *M. masticata*
 37b. Bark smooth.
 38a. Buds, young twigs, and young leaves with dense reddish brown silky trichomes or tomentose.
 39a. Leaf blade abaxially grayish white or mixed with reddish brown appressed trichomes; tepals 9 18. *M. cavaleriei*
 39b. Leaf blade abaxially glabrescent; tepals 9–12 20. *M. macclurei*
- 38b. Buds, young twigs, and young leaves with brownish appressed trichomes or puberulous.
 40a. Gynoecium with fine golden trichomes 19. *M. compressa*
 40b. Gynoecium brown tomentose or silvery appressed puberulous.
 41a. Leaf blade leathery, obovate, elliptic-obovate, rhomboid-obovate, rhomboid, or oblong-elliptic, 7–18 × 5–7 cm 20. *M. macclurei*
 41b. Leaf blade thinly leathery, rhomboid-elliptic, 6–13 × 3–5 cm 21. *M. mediocris*

1. *Michelia velutina* Candolle, Prodr. 1: 79. 1824.

绒毛含笑 rong mao han xiao

Magnolia lamuginosa (Wallich) Figlar & Nooteboom; *M. velutina* (Candolle) Figlar (2000), not P. Parmentier (1896); *Michelia lanceolata* E. H. Wilson; *M. lamuginosa* Wallich; *Sampacca lamuginosa* (Wallich) Kuntze.

Trees, to 15–20 m tall, to 90 cm d.b.h. Bark dark brown. Young part densely gray long tomentose. Twigs, leaf blade adaxial midvein, brachyblasts, gynoecium stalks in fruiting, and mature carpels residually sparsely long tomentose. Twigs with spongy pith, diaphragmed sclerenchyma. Stipular scar ca. 1/2 as long as petiole. Petiole 1–2 cm, densely gray long tomentose; leaf blade narrowly elliptic to elliptic, 11.5–18.5 × 4–6 cm, thinly leathery, secondary veins 18–20 on each side of midvein, dense and slender, divergent, and reticulated 4–6 mm from margin, base broadly cuneate to obtuse, apex acute to slightly obtuse and with a short acumen. Flowers axillary near twig apex, 8–10 cm in diam. Tepals 10–12, pale yellow, narrowly oblanceolate, 4–6.5 × 1–1.8 cm; tepals of outer whorl sericeous; tepals of inner whorl smaller. Staminal connective exerted and forming a mucro. Gynoecium and carpels densely long tomentose. Fruiting brachyblasts 1–1.5 cm. Fruiting gynophore ca. 5

mm, with lenticels and sparse long trichomes. Fruit 10–13 cm; mature carpels sparse or crowded at apical part of gynoecium, obovate, basally shrinking into gynophore, apex obtuse and mucronate. Seeds orangish yellow. Fl. May–Jun, fr. Aug–Sep. 2n = 38.

Forests, slopes; 1500–2400 m. S Xizang, Yunnan [Bhutan, NE India, Nepal].

2. *Michelia champaca* Linnaeus, Sp. Pl. 1: 536. 1753.

黄兰 huang lan

Trees, to 50 m or taller, to 1.9 m d.b.h. Buds, young twigs, young petioles, and young leaf blades pale yellow appressed pubescent. Twigs ascending and forming a narrow umbelliform crown. Stipular scar 0.3–1 × as long as petiole. Petiole 2–4 cm; leaf blade elliptic or ovate, 10–20(–30) × 4.5–10 cm, abaxially slightly puberulous, base broadly cuneate, cuneate, or rounded, apex long acuminate to subcaudate. Flowers fragrant. Tepals 15–20, yellow, oblanceolate, 2–4 × 0.4–0.5 cm. Staminal connective exerted and forming a long tip. Gynophore ca. 3 mm; gynoecium with trichomes. Fruit 7–15 cm; mature carpels obovoid-ellipsoid, 1–1.5 cm, tuberculate. Seeds 2–4 per carpel, rugose. Fl. Jun–Jul, fr. Sep–Oct.

Evergreen broad-leaved forests; 200–1600 m. S Xizang, S and SW Yunnan; cultivated in Fujian, Guangdong, Guangxi, Hainan, Taiwan [India, Indonesia, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

- 1a. Leaf blade ovate, base cuneate to narrowly cuneate, apical acumen often quite long; stipular scar almost $0.5 \times$ as long as petiole 2a. var. *champaca*
 1b. Leaf blade \pm elliptic, base cuneate to rounded, apical acumen often rather short; stipular scar $0.3\text{--}0.7 \times$ as long as petiole 2b. var. *pubinervia*

2a. *Michelia champaca* var. *champaca*

黄兰(原变种) huang lan (yuan bian zhong)

Magnolia champaca (Linnaeus) Baillon ex Pierre; *M. membranacea* P. Parmentier; *Michelia blumei* Steudel; *M. euonymoides* N. L. Burman; *M. pilifera* Bakhuizen f.; *M. rheedii* Wight; *M. suaveolens* Persoon; *M. tsiampacca* Blume; *M. tsiampacca* var. *blumei* Moritz; *M. velutina* Blume (1829), not Candolle (1824); *Sampacca suaveolens* (Persoon) Kuntze.

Trees, to 30 m tall, to 50 cm d.b.h. Stipular scar almost $0.5 \times$ as long as petiole. Leaf blade ovate, base cuneate to narrowly cuneate, apical acumen often quite long. $2n = 38$.

Cultivated. Fujian, Guangdong, Guangxi, Hainan, Taiwan [probably originally from India].

This species is grown as an ornamental and used medicinally.

2b. *Michelia champaca* Linnaeus var. *pubinervia* (Blume) Miquel, Ann. Mus. Bot. Lugduno-Batavi 4. 72. 1868.

毛叶脉黄兰 mao ye mai huang lan

Michelia pubinervia Blume, Fl. Javae 19–20 (Magnoliaceae): 14. 1829; *Magnolia champaca* var. *pubinervia* (Blume) Figlar & Nootboom.

Trees, to 50 m tall or taller, to 1.9 m d.b.h. Stipular scar $0.3\text{--}0.7 \times$ as long as petiole. Leaf blade \pm elliptic, base cuneate to rounded, apical acumen often rather short.

Evergreen broad-leaved forests; 200–1500 m. S Xizang, S and SW Yunnan [India, Indonesia, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

3. *Michelia baillonii* (Pierre) Finet & Gagnepain, Bull. Soc. Bot. France 52 (Mém. 4): 46. 1906.

合果木 he guo mu

Magnolia baillonii Pierre, Fl. Forest. Cochinch. 1: t. 2. 1880; *Aromadendron baillonii* (Pierre) Craib; *A. spongiocarpum* (King) Craib; *M. baillonii* var. *bailingia* Sima & H. Jiang; *M. phellocarpa* (King) H. J. Chowdhery & P. Daniel; *Michelia phellocarpa* (King) Finet & Gagnepain; *Paramichelia baillonii* (Pierre) Hu; *Talauma phellocarpa* King; *T. spongiocarpa* King.

Trees, to 35 m tall, to 1 m d.b.h. Young twigs, petioles, and leaf blade abaxial surfaces pale brown appressed villous. Stipular scar $1/3\text{--}1/2$ as long as petiole. Petiole 1.5–3 cm; leaf blade elliptic, ovate-elliptic, or narrowly ovate, $6\text{--}22(-25) \times 4\text{--}7$ cm, adaxially at first brown appressed villous, midvein impressed

and remaining with long trichomes, secondary veins 9–15 on each side of midvein, reticulate veins dense, slender, and prominent on both surfaces when dry, base cuneate to broadly cuneate, apex acuminate. Brachyblasts 1–1.5 cm. Flowers fragrant. Tepals 18–21, 6 in a whorl, white but cream-colored in bud; tepals of outer 2 whorls oblanceolate, $2.5\text{--}2.7 \times$ ca. 0.5 cm, gradually smaller and narrower inward; inner tepals lanceolate, ca. 2 cm \times 2 mm. Stamens 6–7 mm; filaments 1–1.2 mm; connective exerted and forming a short sharp tip; anthers ca. 5 mm. Gynophore ca. 3 mm, densely pale yellow pubescent; gynoecium narrowly ovoid, ca. 5 mm; carpels completely connate, densely pale yellow pubescent; styles red, ca. 1 mm. Fruit obovoid to ellipsoid-cylindric, $6\text{--}10 \times$ ca. 4 cm, fleshy; mature carpels completely connate, flat, hooked, with dotted prominent lenticels; midribs of carpels persistent on fruiting axis after carpels dehisce. Fl. Mar–May, fr. Aug–Oct. $2n = 38$.

Forests; 500–1500 m. S Yunnan [Cambodia, India (Assam), Myanmar, Thailand, Vietnam].

This species is used for timber.

4. *Michelia odora* (Chun) Nootboom & B. L. Chen, Ann. Missouri Bot. Gard. 80: 1086. 1993.

观光木 guan guang mu

Tsoongiodendron odorum Chun, Acta Phytotax. Sin. 8: 283. 1963; *Magnolia odora* (Chun) Figlar & Nootboom.

Trees, to 25 m tall. Bark pale grayish brown, deeply wrinkled. Twigs, buds, petioles, leaf blade abaxial surfaces and adaxial midvein, and brachyblasts yellowish brown strigose. Stipular scar nearly reaching middle of petiole. Petiole 1.2–2.5 cm, flattened at base; leaf blade obovate-elliptic, $8\text{--}17 \times 3.5\text{--}7$ cm, middle and apical part wider, adaxially green and glossy, midvein, secondary veins, and reticulate veins adaxially impressed, secondary veins 10–12 on each side, base cuneate, apex acute to obtuse. Brachyblasts ca. 6 mm, with 1 bract scar; spatheaceous bract dehiscing along one side, pubescent. Flowers fragrant. Tepals ivory-yellow and red-dotted, narrowly obovate-elliptic; outer tepals largest, $1.7\text{--}2 \times 0.7\text{--}0.8$ cm; innermost tepals $1.5\text{--}1.6 \times$ ca. 0.5 cm. Stamens 35–45, 7.5–8.5 mm; filaments white or reddish, 2–3 mm. Gynophore stout, ca. 2 mm, sulcate, densely strigose; carpels 9–13, narrowly ovoid, densely appressed pubescent, ventral sutures conspicuous; styles red, subulate, ca. 2 mm. Fruiting brachyblasts $1\text{--}2 \times 1\text{--}2$ cm. Fruit dark brown when dry, markedly yellow-dotted, long ellipsoid, sometimes globose because of upper carpels aborted, ca. 13×9 cm, hanging on old twigs; pericarp olive green, glaucous, lenticellate; valves thick, 1–2 cm. Seeds 4–6 per carpel, ellipsoid to triangular-obovoid, ca. 1.5×0.8 cm. Fl. Mar, fr. Oct–Dec. $2n = 38$.

Evergreen broad-leaved forests; 300–1100 m. Fujian, Guangdong, Guangxi, Hainan, S Hunan, S Jiangxi, SE Yunnan [N Vietnam].

This species is grown as an ornamental and used for timber.

5. *Michelia kisopa* Buchanan-Hamilton ex Candolle, Syst. Nat. 1: 448. 1817.

西藏含笑 xi zang han xiao

Magnolia kisopa (Buchanan-Hamilton ex Candolle) Fig-

lar; *Michelia doltsopa* Buchanan-Hamilton ex Candolle subsp. *kisopa* (Buchanan-Hamilton ex Candolle) J. Li; *Sampacca kiso-pa* (Buchanan-Hamilton ex Candolle) Kuntze.

Trees, 20–40 m tall, to 45 cm d.b.h., with appressed trichomes. Twigs pale brown pubescent when young and blackish brown when old, glabrous, with scattered lenticels; buds narrowly ovoid, 8–10 mm, densely brown pubescent. Stipular scar reaching petiole apex. Petiole 1.5–3 cm; leaf blade elliptic, oblong, or narrowly ovate, 9–15 × 3–5 cm, leathery, abaxially brown pubescent when young but glabrous when old, adaxially glabrous, secondary veins 7–11 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base cuneate to rounded, apex acute to shortly acuminate. Brachyblasts ca. 4 mm, pubescent. Tepals 9, yellow; 6 tepals of outer whorl obovate, 2–2.2 × 0.9–1 cm; 3 tepals of inner whorl nearly spoon-shaped, 1.8–1.9 × 0.6–0.8 cm. Stamens 1–1.4 cm; filaments 4–6 mm; connective exerted and forming a 3–4 mm tip; anthers 6–8 mm. Gynophore ca. 5 mm, pubescent; gynoecium cylindrical, 8–10 mm, pubescent; carpels ca. 2 mm; ovaries ovoid, ca. 1.5 mm, densely pubescent; styles ca. 0.5 mm. Fruit 5–10 cm; mature carpels blackish brown, subglobose, ca. 1.3 cm in diam., scattered with white lenticels. Seeds red, broadly cordate, ca. 10 × 3–5 mm. Fl. Apr–May, fr. Sep–Oct. $2n = 38$.

Forests, slopes; 1600–2400 m. S Xizang (Médog, Nyalam) [Bhutan, NE India, Nepal].

6. *Michelia floribunda* Finet & Gagnepain, Bull. Soc. Bot. France 52(Mém. 4): 46. 1906.

多花含笑 duo hua han xiao

Magnolia floribunda (Finet & Gagnepain) Figlar; *M. microtricha* (Handel-Mazzetti) Figlar; *Michelia kerrii* Craib; *M. microtricha* Handel-Mazzetti.

Trees, to 20 m tall. Bark gray, smooth. Young twigs 2–3 mm in diam., with white appressed trichomes. Stipular scar 1/2 or more as long as petiole. Petiole 1–1.5(–2.5) cm, with white appressed trichomes; leaf blade narrowly ovate-elliptic, narrowly ovate, or narrowly obovate-elliptic, 7–12(–14) × 2–4 cm, leathery, abaxially glaucous or not and with white long appressed trichomes, adaxially deep green and glossy, midvein impressed and usually with residual white trichomes, secondary veins 8–12 on each side of midvein and slender, reticulate veins dense, slender, and slightly prominent on both surfaces, base broadly cuneate to rounded, apex acuminate to caudate-acuminate. Brachyblasts 3–7 × ca. 3 mm, with dense silvery appressed fine trichomes, with 1 or 2 bract scars. Flowers narrowly ellipsoid, slightly curved, golden yellow appressed villous. Tepals 11–13, white, spoon-shaped to oblanceolate, 2.5–3.5 × 0.4–0.7 cm, apex usually with a small tip. Stamens 10–14; connective exerted and forming a long tip. Gynophore ca. 5 mm; gynoecium ca. 1 cm; carpels ca. 4 mm; ovaries ovoid, ca. 2 mm, densely silvery puberulous; styles as long as ovaries. Fruit 2–6 cm, wrinkled; mature carpels compressed globose to long spherical, 0.6–1.5 cm, white lenticellate, apex slightly tipped. Fl. Feb–Apr, fr. Aug–Sep. $2n = 38$.

Forests; 1300–2700 m. Chongqing, SW Hubei, Hunan, C Sichuan, SE Xizang, Yunnan [Laos, Myanmar, Thailand, Vietnam].

7. *Michelia doltsopa* Buchanan-Hamilton ex Candolle, Syst. Nat. 1: 448. 1817.

南亚含笑 nan ya han xiao

Magnolia doltsopa (Buchanan-Hamilton ex Candolle) Figlar; *M. excelsa* Wallich; *Michelia calcuttensis* P. Parmentier; *M. excelsa* (Wallich) Blume ex Wight; *M. manipurensis* G. Watt ex Brandis; *M. wardii* Dandy; *Sampacca excelsa* (Wallich) Kuntze.

Trees, to 30 m tall. Young twigs, buds, petioles, and leaf blade abaxial surfaces grayish white appressed pubescent. Stipular scar ca. 1/5 as long as petiole. Petiole 1–2 cm; leaf blade elliptic, oblong-elliptic, or narrowly elliptic, 10–22 × 5–7 cm, secondary veins 10–14 on each side of midvein, reticulate veins dense, slender, abaxially grayish, adaxially prominent when dry, and densely firmly finely pubescent, base broadly cuneate or obtuse, margin slightly involute, apex acute to long acute. Brachyblasts densely appressed villous. Tepals white, narrowly obovate-spoon-shaped, 5–7 × ca. 2.5 cm, base clawed, apex rounded. Stamens 1.2–1.7 cm; connective exerted and forming a 1.5–2 mm sharp tip; anthers 0.8–1.2 cm. Gynophore 6–8 mm, densely grayish firmly puberulous; gynoecium narrowly ovoid, 1.5–2 cm; carpels 9–12 mm, densely grayish firmly pubescent; ovaries 4–5 mm; styles 5–7 mm. Fruit 4–7 cm; mature carpels nearly obovoid, ca. 1.5 cm, with residual appressed fine pubescence, apex acutely beaked. Fl. Apr–May, fr. Sep–Oct.

Evergreen broad-leaved forests; 1500–2400 m. S and SE Xizang, NW Yunnan [Bhutan, NE India, N Myanmar, Nepal].

8. *Michelia fulva* Hung T. Chang & B. L. Chen, Acta Sci. Nat. Univ. Sunyatseni 3: 87. 1987.

棕毛含笑 zong mao han xiao

Magnolia fulva (Hung T. Chang & B. L. Chen) Figlar; *M. fulva* var. *calcicola* (C. Y. Wu ex Y. H. Law & Y. F. Wu) Sima & Hong Yu; *M. glaucophylla* Sima & Hong Yu; *M. ingrata* (B. L. Chen & S. C. Yang) Figlar; *Michelia calcicola* C. Y. Wu ex Y. H. Law & Y. F. Wu; *M. ingrata* B. L. Chen & S. C. Yang.

Trees, 3–15 m tall, to 40 cm d.b.h. Bark grayish brown. Old twigs dark brown, 5–7 mm in diam., glabrous, lenticellate; young twigs yellowish brown tomentose; buds cylindrical to narrowly ovoid, 2.5–3.5 cm, yellowish brown to golden yellow tomentose. Stipular scar ca. 1/4 as long as petiole. Petiole robust, 1.5–4.5 cm, adaxially furrowed, yellowish brown tomentose; leaf blade elliptic to ovate-elliptic, 13–24 × 4.5–12 cm, thickly leathery, abaxially glaucous, adaxially glabrous or appressed villous at first, and with trichomes but glabrescent, midvein abaxially evidently prominent and adaxially appressed, secondary veins 7–13 on each side of midvein, reticulate veins dense and prominent on both surfaces, base obtuse, apex acuminate to acute. Brachyblasts and bracts densely yellowish brown tomentose; brachyblasts robust, 1–2 cm; spatheaceous bracts 3. Flowers 4–5 cm in diam. Tepals 9–12(–14), white or yellow, obovate to elliptic, subequal, fleshy; inner tepals smaller, 4.4–5.3 × 1–3 cm. Stamens numerous; filaments 4–8 mm; connective exerted and forming a mucro; anthers 1.5–2.9 cm. Gynophore 0.6–2.4 cm, pubescent; gynoecium terete, 2.4–4.8 cm; carpels ca. 1.52, narrowly ovoid, densely golden yellow

pubescent; styles 1–2.5 mm. Mature carpels ovoid, sessile, ca. 1.5 × 1 cm, apex shortly beaked. Fl. Mar, fr. Nov.

- Limestone forests; 600–1700 m. S Guangxi, SE Yunnan.

“*Michelia rufivillosa* D. X. Li & S. C. Yang” and “*M. xanthostemina* D. X. Li & Y. W. Law” (in Y. H. Liu, *Magnolias China*, 312, 326. 2004) belong here but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

9. *Michelia sphaerantha* C. Y. Wu ex Z. S. Yue, *Acta Bot. Yunnan.* 9: 413. 1987.

球花含笑 qiu hua han xiao

Magnolia elliptilimba (B. L. Chen & Nootboom) Figlar; *M. sphaerantha* (C. Y. Wu ex Z. S. Yue) Sima; *Michelia elliptilimba* B. L. Chen & Nootboom.

Trees, 5–16 m tall. Bark grayish green, smooth. Young twigs, stipule abaxial surfaces, petioles, leaf blade on both surfaces, brachyblasts, bracts, gynophores, and carpels brown pubescent. Stipular scar 3–4 mm. Petiole 2–2.5 cm, pubescent; leaf blade elliptic to obovate-elliptic, 16–22 × 7.5–10 cm, thinly leathery, abaxially glaucous, adaxially green, midvein abaxially evidently prominent and adaxially impressed, secondary veins 9–14 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base rounded, apex acute to acuminate. Brachyblasts 3–3.5 cm, with 3 or 4 bract scars. Tepals 11 or 12, white, subequal; outer 3 tepals obovate, 5.5–7.5 × 2.5–3 cm, base attenuate; inner tepals obovate to spatulate, narrower and smaller. Stamens numerous, 2–2.4 cm; connective exerted and forming a ca. 0.5 mm triangular mucro; anthers ca. 1.5 mm. Gynophore ca. 1 cm; gynoecium terete, ca. 3 cm; carpels numerous, ovoid, 4–5 mm; styles glabrous. Fruit 19–24 cm; mature carpels dark brown, ovoid, whitish lenticellate, dehiscing into 2 valves, valve ca. 2 mm thick. Fl. Mar, fr. Jul.

- Evergreen broad-leaved forests; 1800–2000 m. C Yunnan (Jingdong).

10. *Michelia opipara* Hung T. Chang & B. L. Chen, *Acta Sci. Nat. Univ. Sunyatseni* 3: 90. 1987.

马关含笑 ma guan han xiao

Magnolia opipara (Hung T. Chang & B. L. Chen) Sima.

Trees, deciduous or semideciduous, to 16 m tall, to 50 cm d.b.h. Old twigs grayish yellow, rough; juvenile twigs brown, terete, glabrous or with trichomes when young, with elliptic grayish yellow prominent lenticels; buds long ovoid, with white silky trichomes. Stipular scar 1/4–1/3 as long as petiole. Petiole 2.5–3 cm; leaf blade obovate to broadly obovate, 20–27 × 7–11 cm, thinly leathery, abaxially glaucous and at first grayish white pubescent but glabrescent, adaxially green and glabrous or at first grayish white pubescent, midvein adaxially slightly impressed and abaxially conspicuously prominent, pubescent, but glabrescent, secondary veins 13–18 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base cuneate to rounded, apex abruptly acute. Brachyblasts 4–6 mm, robust, gray pubescent; bracts 3, spatheaceous, outermost bract appressed yellow pubescent, innermost ones spreadingly

pubescent. Flower buds ellipsoid, ca. 4.2 × 1.6 cm. Tepals 8, yellow; outer 3 tepals obovate, ca. 3.8 × 1.5 cm; innermost 2 tepals oblanceolate, ca. 3.4 × 1 cm, thinly fleshy. Androecium narrowly ellipsoid, ca. 2.3 cm; stamens ca. 93, 1.3–2 cm; filaments 2–4 mm; connective exerted and forming a mucro; anthers 0.9–1.4 cm. Gynophore ca. 8 mm; carpels ca. 140, ovoid, grayish white to pale yellow tomentose; styles 1.5–2 mm, glabrous. Fruiting brachyblasts ca. 1.5 cm, pale yellow pubescent. Fruit 11.5–14.3 cm; mature carpels ovoid, 1.5–2 × 0.9–1.1 cm, with lenticels, apex shortly beaked. Seeds 1 or 2 per carpel. Fl. Apr, fr. Sep–Oct.

- Evergreen broad-leaved forests; 1600–1900 m. SE Yunnan (Maguan).

This could well be a variety of *Michelia doltsopa*.

11. *Michelia wilsonii* Finet & Gagnepain, *Bull. Soc. Bot. France* 52(Mém 4): 45. 1906.

峨眉含笑 e mei han xiao

Trees, to 25 m tall. Old twigs densely noded and lenticellate; young twigs green, pale brown or reddish brown sparsely appressed pubescent; terminal buds cylindrical. Stipular scar 2–4 mm or absent. Petiole 1.5–4 cm; leaf blade obovate to narrowly obovate, 9–15 × 3–7 cm, leathery, abaxially glaucous and sparsely white glossy appressed pubescent or with scattered reddish brown erect trichomes, adaxially glabrous and glossy, secondary veins 8–13 on each side of midvein and slender, reticulate veins slender, dense, and prominent on both surfaces when dry, base cuneate to broadly cuneate, apex acute, shortly acuminate, or caudate. Brachyblasts with 2–4 bract scars. Flowers 5–6 cm in diam., fragrant. Tepals 9–12, yellow, obovate, narrowly obovate, or oblanceolate, 2–5 × 1–2.5 cm, slightly fleshy; tepals of inner whorl smaller. Stamens 1–2 cm; filaments green, ca. 2 mm; connective exerted and forming a ca. 1 mm mucro; anthers 0.8–1.2 cm, dehiscing introrsely. Gynoecium cylindrical, 3.5–4 cm; carpels 3–6 mm; ovaries ovoid to ovoid-ellipsoid, with dense silvery or yellow appressed fine trichomes; ovules ca. 14 per carpel; styles nearly as long to as long as ovaries. Fruit 6–15 cm; fruiting torus wrinkled; mature carpels purplish brown, ellipsoid to obovoid, 1–2.5 cm, with grayish yellow lenticels, 2-valved, apex with a curved short beak. Fl. Mar–May, fr. Aug–Sep.

- Forests; 600–2000 m. Chongqing, Guizhou, SW and W Hubei, Hunan, Jiangxi, C, S, and W Sichuan, NE and SE Yunnan.

- 1a. Petiole with a 2–4 mm stipular scar 11a. subsp. *wilsonii*
- 1b. Petiole without a stipular scar 11b. subsp. *szechuanica*

11a. *Michelia wilsonii* subsp. *wilsonii*

峨眉含笑(原亚种) e mei han xiao (yuan ya zhong)

Magnolia ernestii Figlar; *Michelia sinensis* Hemsley & E. H. Wilson.

Trees, to 20 m tall. Petiole with a 2–4 mm stipular scar. Fl. Mar–May, fr. Aug–Sep. $2n = 38^*$.

- Forests; 600–2000 m. Guizhou, SW Hubei, Jiangxi, C and W Sichuan, SE Yunnan.

11b. *Michelia wilsonii* subsp. ***szechuanica*** (Dandy) J. Li, Acta Bot. Yunnan. 19: 137. 1997.

川含笑 chuan han xiao

Michelia szechuanica Dandy, Notes Roy. Bot. Gard. Edinburgh 16: 131. 1928; *Magnolia ernestii* subsp. *szechuanica* (Dandy) Sima & Figlar; *M. szechuanica* (Dandy) Figlar.

Trees, to 25 m tall. Petiole without a stipular scar.

• Forests; 800–1600 m. Chongqing, N Guizhou, W Hubei, Hunan, S Sichuan, NE Yunnan.

12. *Michelia maudiae* Dunn, J. Linn. Soc., Bot. 38: 353. 1908.

深山含笑 shen shan han xiao

Magnolia maudiae (Dunn) Figlar; *Michelia chingii* W. C. Cheng.

Trees, to 20 m tall, glabrous. Bark pale gray or grayish brown, thin. Young twigs, buds, leaf blade abaxial surfaces, and bracts white powdery. Petiole 1–3 cm, without a stipular scar; leaf blade oblong-elliptic to rarely ovate-elliptic, 7–18 × 3.5–8.5 cm, leathery, abaxially grayish green and glaucous, adaxially deep green and glossy, secondary veins 7–12 on each side of midvein, straight or slightly curved, and divaricate and netted, reticulate veins dense, base cuneate, broadly cuneate, or obtuse, apex abruptly shortly acuminate to shortly acuminate and with an obtuse tip. Brachyblasts green, with 3 annular bract scars; spatheaceous bracts pale brown, ca. 3 cm, thinly leathery. Flowers fragrant. Tepals 9, white but base slightly pale red; outer tepals obovate, 5–7 × 3.5–4 cm, base ca. 1 cm clawed, apex shortly acute; tepals of inner 2 whorls gradually narrowing, nearly spoon-shaped, apex acute. Stamens 1.5–2.2 cm; filaments pale purple, flat, ca. 4 mm; connective exerted and forming a 1–2 mm tip. Gynophore 5–8 mm; gynoecium 1.5–1.8 cm; carpels green, narrowly ovoid, 5–6 mm including style. Fruit 7–15 cm; mature carpels ellipsoid, obovoid, or ovoid, apex obtuse or abruptly mucronate. Seeds red, obliquely ovoid, ca. 10 × 5 mm, slightly compressed. Fl. Feb–Mar, fr. Sep–Oct. $2n = 38^*$.

• Evergreen broad-leaved forests; 600–1500 m. S Anhui, Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Hunan, S Zhejiang.

This species is grown as an ornamental. It is used medicinally and for timber.

13. *Michelia lacei* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 216. 1920.

壮丽含笑 zhuang li han xiao

Magnolia lacei (W. W. Smith) Figlar; *Michelia magnifica* Hu; *M. pachycarpa* Y. W. Law & R. Z. Zhou; *M. tignifera* Dandy; *M. uniflora* Dandy.

Trees, to 15 m tall, to 18 cm d.b.h. Twigs 0.7–1 cm in diam., sparsely pale brown villous when young, later glabrescent, with elliptic coarse lenticels. Petiole 2.5–3 cm, without a stipular scar; leaf blade oblong-elliptic to elliptic, 14–17 × 6–8 cm, leathery, both surfaces glabrous, adaxially green and glossy, midvein impressed and abaxially dark green, secondary veins 15–20 on each side of midvein, reticulate veins prominent on

both surfaces when dry, base broadly cuneate and slightly decurrent on petiole, margin slightly reflexed, apex acuminate to acute. Brachyblasts 3–4 cm, stout, with brown long trichomes on nodes, with 3 or 4 bract scars; spatheaceous bracts several, thin, with white appressed trichomes. Tepals 9, in 3 whorls; outer 3 tepals obovate-spoon-shaped, ca. 6 × 2.5 cm, base clawed; innermost tepals 3–5.5 × ca. 1 cm. Stamens ca. 2.3 cm; filaments ca. 3 mm; connective exerted and forming a 1–2 mm mucro; anthers ca. 2 cm, dehiscent laterally. Gynophore ca. 2.5 cm, puberulous; gynoecium ca. 1.7 cm; carpels ca. 12, narrowly ovoid, ca. 4 mm, glabrous; ovules 10 per carpel; styles 3–4 mm. Fruit not seen. Fl. Feb. $2n = 38$.

Forests; ca. 1500 m. SE Yunnan (Luxi, Maguan) [Myanmar, N Thailand, Vietnam].

14. *Michelia iteophylla* C. Y. Wu ex Y. W. Law & Y. F. Wu, Acta Bot. Yunnan. 10: 337. 1988.

鼠刺含笑 shu ci han xiao

Trees, to 8 m tall. Twigs brown to yellowish brown, glabrous, scattered with lenticels; buds cylindrical, ca. 1.4 cm, brownish tomentulose. Stipules free from petiole. Petiole 0.8–1.2 cm, without a stipular scar; leaf blade elliptic to narrowly elliptic, 7–10 × 1.7–2.3 cm, leathery, both surfaces glabrous, midvein adaxially slightly impressed, secondary veins 11–15 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base cuneate, apex acuminate. Brachyblasts 6–7 mm, glabrous or strigose when young. Flowers fragrant. Tepals 9, white, narrowly obovate, ca. 2.8 × 0.8–1 cm, subequal. Stamens many, ca. 7 mm; filaments ca. 1 mm; connective exerted and forming a ca. 1 mm mucro; anthers ca. 5 mm. Gynophore ca. 6 mm, very finely strigose; gynoecium ovoid, ca. 6 mm, very finely strigose; carpels many, ca. 2 mm; ovaries ovoid, ca. 1.8 mm, very finely strigose; styles ca. 0.2 mm. Fruit dark brown, 5–7 cm, ovoid, whitish lenticellate, completely dehiscent into 2 valves when matured. Fl. Dec–Jan, fr. Oct.

• Forests; 1600–1700 m. SE Yunnan (Jinping).

15. *Michelia fujianensis* Q. F. Zheng, Bull. Bot. Res., Harbin 1(3): 92. 1981.

福建含笑 fu jian han xiao

Magnolia fujianensis (Q. F. Zheng) Figlar; *Michelia caloptila* Y. W. Law & Y. F. Wu; *M. septipetala* Z. L. Nong.

Trees, to 16 m tall, to 1 m d.b.h. Bark grayish white, smooth. Young twigs, buds, petioles, leaf blade abaxial surfaces, leaf blade adaxial surfaces when young, and brachyblasts densely appressed grayish white to brown villous. Twigs black, ca. 3 mm in diam., remaining with pubescence. Petiole 0.6–1.5 cm, without a stipular scar; leaf blade narrowly elliptic to narrowly obovate-elliptic, 8–15 × 3–5 cm, midvein adaxially impressed, secondary veins 9–15 on each side of midvein, reticulate veins slender, dense, and prominent on both surfaces when dry, base rounded to broadly cuneate, apex acuminate to acute. Brachyblasts stout, ca. 7 mm; bract scar 1, ca. 2 mm below tepals; spatheaceous bract 1, just next to tepals. Flower buds ovoid, ca. 1.5 cm. Tepals ca. 12, in 4 whorls; outer tepals

3, narrowly obovate, 1–1.2 cm; tepals of next inward whorl obovate, 1.3–1.5 cm; tepals of innermost 2 whorls narrowly ovate, narrower and smaller, ca. 1 cm. Androecium exceeding gynoecium; stamens 4–5.5 mm; filaments broad and flat, 1–1.5 mm; connective exerted and forming a 1–1.5 mm obtuse tip; anthers 3.5–4 mm, thecae divaricate 0.5–0.8 mm away from each other, dehiscing introrsely and laterally. Gynophore ca. 1 mm, pubescent; gynoecium cylindrical, ca. 5 mm; ovaries globose, densely tomentulose. Fruit usually curved because of carpels partly undeveloped, 2–3 cm; mature carpels black, obovoid, 1.5–2 cm, conspicuously white lenticellate, apex rounded. Seeds broad and flat, transversely ellipsoid, ca. 1.5 × 1 cm, adaxially broadly furrowed, base mucronate, apex impressed; endotesta black. Fl. Apr–May, fr. Aug–Sep.

• Evergreen broad-leaved forests; 300–700 m. Fujian (Yong'an), Jiangxi.

16. *Michelia flaviflora* Y. W. Law & Y. F. Wu, *Acta Bot. Yunnan.* 10: 340. 1988.

素黄含笑 *su huang han xiao*

Magnolia flaviflora (Y. W. Law & Y. F. Wu) Figlar.

Trees, ca. 15 m tall. Old twigs scattered with lenticels; young twigs brown tomentulose; buds pale yellow tomentose. Stipules free from petiole. Petiole 0.5–1.2 cm, tomentulose, without a stipular scar, base slightly flattened; leaf blade narrowly ovate to narrowly elliptic, 15–24 × 3.6–5.5 cm, papery, abaxially glaucous and brown sericeous, adaxially green and glabrous, midvein adaxially slightly prominent to flat, secondary veins 16–24 on each side of midvein, base cuneate, apex acuminate. Brachyblasts ca. 1 cm, yellow tomentose. Flowers fragrant. Tepals 15, pale yellow, oblanceolate. Stamens ca. 90, 1.1–1.5 cm; connective exerted and forming a 1–2 mm sharp tip; anthers 7–10 mm. Gynophore ca. 1 cm, tomentose; gynoecium narrowly ovoid, ca. 1.2 cm; carpels many, ovoid, ca. 4 mm, distinct, densely villous; styles ca. 2 mm. Fruit not seen. Fl. Feb.

Evergreen broad-leaved forests; 1400–1500 m. SE Yunnan (Dawei Shan, Pingbian) [Vietnam].

17. *Michelia masticata* Dandy, *J. Bot.* 67: 222. 1929.

屏边含笑 *ping bian han xiao*

Magnolia masticata (Dandy) Figlar.

Trees, 18–25 m tall, to 80 cm d.b.h. Bark grayish brown, irregularly fissured, conspicuously lenticellate. Twigs yellowish green when young and dark green when old, pubescent or glabrous when young, shiny, white lenticellate. Petiole 2–3(–4) cm, without a stipular scar; leaf blade broadly elliptic, elliptic-oblong, ovate, or obovate, 12–22(–28) × 5–8(–10) cm, leathery, abaxially pubescent, adaxially glabrous and slightly shiny green, midvein and secondary veins abaxially prominent and adaxially impressed, secondary veins 8–13 on each side of midvein, reticulate veins dense and prominent on both surfaces when dry, base cuneate to rounded, apex shortly acuminate. Brachyblasts ca. 1 cm, with yellow silky trichomes; bracts 3. Tepals 9–12, white to yellowish white, subequal; outer 3 tepals obovate,

narrowly obovate, or spatulate, 5–9(–11) × 1–2.5 cm; inner tepals narrower. Stamens numerous, ca. 2 cm; anthers ca. 1.5 mm. Gynophore ca. 1 cm, pubescent; gynoecium terete, 3–6(–8) cm, pubescent; carpels numerous, ca. 6 mm; styles ca. 2.2 mm. Fruit 10–40(–53) cm; mature carpels dark brown, ovoid, densely white lenticellate, dehiscing completely into 2 valves, valves ca. 2 mm thick. Fl. Apr–May, fr. Oct.

Forests; 1100–1300 m. SE Yunnan (Pingbian) [Laos, Vietnam].

This species is used for timber.

18. *Michelia cavalieriei* Finet & Gagnepain, *Bull. Soc. Bot. France* 53: 573. 1906.

平伐含笑 *ping fa han xiao*

Trees, 10–20 m tall, to 50 cm d.b.h., many branched. Bark grayish white. Young twigs, buds, petioles, leaf blade abaxial surfaces when young, brachyblasts, and fruiting brachyblasts silvery to reddish brown appressed pubescent. Twigs black. Petiole 1.5–3 cm, becoming black with age, without a stipular scar; leaf blade narrowly oblong to narrowly obovate-oblong, 10–20(–24) × 3.5–7 cm, thinly leathery, abaxially glaucous and silvery to reddish brown pubescent, adaxially with remaining trichomes, midvein impressed, secondary veins slender, 11–15 on each side of midvein, reticulate veins dense and prominent on both surfaces, base cuneate to broadly cuneate, apex acuminate to shortly acute. Brachyblasts 1.5–2.5 cm, with 1 or 2 bract scars; spatheaceous bracts densely reddish brown appressed villous. Flower buds narrowly ovoid, ca. 3 cm. Tepals 9 or ca. 12, white, papery, with pellucid glands; outer 3 tepals obovate-elliptic, 2.5–7 cm, gradually narrower and smaller inward. Stamens 1.2–1.4 cm, grayish yellow pubescent; connective exerted and forming a ca. 1 mm tip; anthers ca. 8 mm, dehiscing introrsely. Gynophore ca. 4 mm; gynoecium narrowly ovoid, ca. 1 cm; carpels ca. 4 mm; ovaries ovoid, densely puberulous; styles grayish yellow pubescent, nearly as long as ovaries. Fruit 5–15 cm; mature carpels obovoid to ellipsoid, 1.5–2 cm, white lenticellate, 2-valved, apex rounded to rarely mucronate. Fl. Mar–Apr, fr. Sep–Oct. $2n = 38^*$.

• Forests; 800–2400 m. Fujian, E and N Guangdong, Guangxi, Guizhou, W Hubei, SW Hunan, SE Sichuan, Yunnan.

- 1a. Twigs ca. 4 mm in diam.; tepals ca. 12, outer ones 2.5–4 cm 18a. var. *cavalieriei*
 1b. Twigs ca. 2 mm in diam.; tepals 9, outer ones 5–7 cm 18b. var. *platypetala*

18a. *Michelia cavalieriei* var. *cavalieriei*

平伐含笑(原变种) *ping fa han xiao* (yuan bian zhong)

Magnolia cavalieriei (Finet & Gagnepain) Figlar; *M. maudiae* (Dunn) Figlar var. *hunanensis* (C. L. Peng & L. H. Yan) Sima; *Michelia fallax* Dandy; *M. hunanensis* C. L. Peng & L. H. Yan; *M. xinningia* Y. W. Law & R. Z. Zhou.

Trees, to 10 m tall. Twigs ca. 4 mm in diam. Tepals ca. 12, outer ones 2.5–4 cm. $2n = 38^*$.

• Forests; 800–2400 m. Fujian, N Guangdong, Guangxi, Guizhou, W Hubei, SW Hunan, SE Sichuan, Yunnan.

18b. *Michelia cavalieri* var. *platypetala* (Handel-Mazzetti) N. H. Xia, **comb. nov.**

阔瓣含笑 *kuo ban han xiao*

Basionym: *Michelia platypetala* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 58: 89. 1921; *Magnolia maudiae* var. *platypetala* (Handel-Mazzetti) Sima.

Trees, to 20 m tall. Twigs ca. 2 mm in diam. Tepals 9, outer ones 5–7 cm.

• Forests; 1200–1500 m. E Guangdong, NE Guangxi, E Guizhou, W Hubei, SW Hunan.

“*Michelia yunshanensis* Y. W. Law & R. Z. Zhou” and “*M. xiangnanensis* Q. W. Zeng & Y. W. Law” (in Y. H. Liu, *Magnolias China*, 334. 2004) belong here but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

19. *Michelia compressa* (Maximowicz) Sargent, Gard. & Forest 5: 75. 1893.

台湾含笑 *tai wan han xiao*

Magnolia compressa Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 17: 417. 1872; *Michelia compressa* var. *formosana* Kanehira; *M. compressa* var. *lanyuensis* S. Y. Lu; *M. formosana* (Kanehira) Masamune & Suzuki.

Trees, to 17 m tall, to 1 m d.b.h. Bark grayish brown, smooth. Axillary buds, young twigs, petioles, and leaf blade midvein with brown appressed short trichomes. Petiole 0.8–1.2 cm, without a stipular scar; leaf blade obovate-elliptic to narrowly elliptic, 5–7 × 2–3 cm, thinly leathery, secondary veins 8–12 on each side of midvein, reticulate veins sparse, slightly prominent on both surfaces when dry, base cuneate, apex acute, acumen obtuse to sharp. Brachyblasts 6–7 mm, appressed pubescent, with 1 or 2 bract scars. Flower buds golden yellow appressed sericeous. Tepals 12, pale yellowish white to pale reddish near base, narrowly obovate, 12–15 × 3–5 mm. Stamens ca. 45, 5–6 mm; connective exerted and forming a 1–1.8 mm long tip; anthers 3.5–4 mm, dehiscing laterally. Gynophore ca. 3 mm; gynoecium ca. 4 mm, with golden yellow fine trichomes. Fruit 3–5 cm; mature carpels ellipsoid to ovoid, 1.5–2 × 1.1–1.4 cm, dehiscing dorsally, apex mucronate. Seeds 2–4 per carpel, pink. Fl. Jan, fr. Oct–Nov. $2n = 38$.

Evergreen broad-leaved forests; 200–2600 m. Taiwan [S Japan, Philippines].

This species is used for timber.

20. *Michelia macclurei* Dandy, J. Bot. 66: 360. 1928.

醉香含笑 *zui xiang han xiao*

Magnolia macclurei (Dandy) Figlar; *Michelia macclurei* var. *sublanaea* Dandy; *M. multitepala* R. Z. Zhou & S. G. Jian.

Trees, to 30 m tall, to 1 m d.b.h. Bark grayish white, smooth and not fissured. Young twigs, buds, petioles, stipules, and brachyblasts densely firmly and glossy reddish brown shortly tomentose to spreading villous. Petiole 1.5–4 cm, adaxially narrowly furrowed, without a stipular scar; leaf blade obo-

vate, elliptic-obovate, rhomboid, or oblong-elliptic, 7–18 × 5–7 cm, leathery, abaxially with grayish trichomes mixed with brown appressed short tomentum, adaxially at first pubescent but later glabrescent, secondary veins 10–15 on each side of midvein, slender, and adaxially inconspicuous, reticulate veins slender, forming a honeycomb pattern, base cuneate to broadly cuneate, apex shortly acute to acuminate. Brachyblasts 1–1.8 cm, 3–4 mm in diam., with 2–3 bract scars. Flower buds sometimes enclosing 2 or 3 small flower buds on different nodes and forming a 2- or 3-flowered thyrses. Tepals usually 9–12, white, rarely red, spoon-shaped to oblanceolate, 3–5 cm; inner tepals narrower and smaller. Stamens 1–2 cm; filaments red, ca. 1 mm; connective exerted and forming a ca. 1 mm mucro; anthers 0.8–1.4 cm. Gynophore 1–2.5 cm, densely brown tomentose; gynoecium 1.4–2 cm; carpels ovoid to narrowly ovoid, 1–3 × ca. 1.5 cm, sparsely white lenticellate, dehiscing into 2 valves along both ventral and dorsal sutures, base broad, apex rounded. Seeds 1–3 per carpel, compressed ovoid, 0.8–1 × 0.6–0.8 mm. Fl. Feb–Apr, fr. Sep–Nov.

Evergreen broad-leaved forests; 200–1500 m. Guangdong, N Guangxi, Hainan, SE Yunnan (Xichou) [N Vietnam].

“*Michelia ovatifolia* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*, 300. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

This species is grown as an ornamental and used for timber.

21. *Michelia mediocris* Dandy, J. Bot. 66: 47. 1928.

白花含笑 *bai hua han xiao*

Magnolia mediocris (Dandy) Figlar; *Michelia mediocris* var. *angustifolia* G. A. Fu; *M. rubriflora* Y. W. Law & R. Z. Zhou; *M. subulifera* Dandy.

Trees, to 25 m tall, to 90 cm d.b.h. Bark grayish brown. Young twigs and young leaf blades grayish white appressed pubescent. Buds reddish brown, pendulous, apex acute. Petiole 1.5–3 cm, without a stipular scar; leaf blade rhomboid-elliptic, 6–13 × 3–5 cm, thinly leathery, abaxially grayish white appressed puberulous, adaxially glabrous, secondary veins 10–15 on each side of midvein, slender, and inconspicuous, reticulate veins dense, base cuneate to broadly cuneate, apex shortly acuminate. Spathaceous bracts 3. Flower buds ellipsoid, 10–15 × 5–9 mm, densely brownish yellow to grayish white appressed puberulous. Tepals 9, white, spoon-shaped, 1.8–2.2 × 0.5–0.8 cm. Stamens 1–1.5 cm; connective exerted and forming a 3–4 mm long tip; anthers 0.8–1.4 cm. Gynophore 3–5 mm, densely silvery appressed puberulous; gynoecium cylindrical, ca. 1 cm; carpels 7–14; ovules 4 or 5 per carpel. Fruit blackish brown when matured, 2–3.5 cm; mature carpels obovoid, ellipsoid, or globose, 1–2 cm, slightly compressed, white lenticellate, apex with an obtuse beak. Seeds 5–8 × ca. 5 mm; testa bright red. Fl. Oct–Feb, fr. Jun–Nov.

Evergreen broad-leaved forests; 400–1000 m. Guangdong, Guangxi, Hainan, S Hunan [Cambodia, Vietnam].

“*Michelia biacuminata* Y. W. Law & R. Z. Zhou” and “*M. elliptifolia* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*,

224, 246, 2004) belong here but were not validly published because no Latin descriptions or diagnoses were provided and no types were indicated (*Vienna Code*, Art. 36.1 and 37.1).

22. *Michelia shiluensis* Chun & Y. F. Wu, *Acta Phytotax. Sin.* 8: 286. 1963.

石碌含笑 shi lu han xiao

Magnolia shiluensis (Chun & Y. F. Wu) Figlar.

Trees, to 18 m tall, to 30 cm d.b.h. Bark gray. Twigs, leaf blades, and petioles glabrous. Terminal buds narrowly ellipsoid, orangish yellow to gray, glossy pubescent. Petiole 1–3 cm, broadly furrowed, without a stipular scar; leaf blade obovate-oblong, 8–14(–20) × 4–7(–8) cm, leathery and rigid, abaxially glaucous, adaxially deep green, secondary veins 8–12 on each side of midvein, reticulate veins prominent on both surfaces when dry, base cuneate to broadly cuneate, apex obtuse and mucronate. Tepals 9, in 3 whorls, white, obovate, 3–4.5 × 1.5–2.5 cm. Stamens 2–2.5 cm; filaments red. Gynoecium 1.4–2.1 cm, puberulous; carpels ovoid, 2.5–4 mm. Fruiting brachyblasts 2–3 cm. Fruit 4–5 cm; mature carpels sometimes only a few developed, obovoid to obovoid-ellipsoid, 0.8–1.2 cm, apex shortly beaked. Seeds broadly ellipsoid, ca. 8 mm. Fl. Mar–May, fr. Jun–Aug. $2n = 38^*$.

• Evergreen broad-leaved forests, ravines, beside trails; 200–1500 m. Hainan.

This species is grown as an ornamental.

23. *Michelia coriacea* Hung T. Chang & B. L. Chen, *Acta Sci. Nat. Univ. Sunyatseni* 3: 89. 1988.

西畴含笑 xi chou han xiao

Magnolia coriacea (Hung T. Chang & B. L. Chen) Figlar; *Michelia nitida* B. L. Chen; *M. polyneura* C. Y. Wu ex Y. W. Law & Y. F. Wu.

Trees, 10–20 m tall. Twigs thick and strong, 5–7 mm in diam., sparsely puberulous, with grayish yellow lenticels; buds cylindrical, densely gray pubescent. Stipules free from petiole. Petiole 1–1.5 cm, without a stipular scar, adaxially furrowed; leaf blade oblong to elliptic-oblong, 11–15 × 4–6 cm, thinly leathery, both surfaces glabrous, midvein abaxially prominent and adaxially slightly impressed, secondary veins 17–20 on each side of midvein, reticulate veins dense and prominent on both surfaces, base cuneate to obtuse, apex acuminate. Brachyblasts ca. 2.5 mm, densely yellow tomentose. Tepals 9, in 3 whorls, white, oblong to obovate-oblong, 2.3–3 × 0.8–1 cm, subequal. Stamens ca. 80, 0.8–1 cm; connective exerted and forming a 1.5–2 mm sharp tip; anthers 4–5 mm. Gynophore 2–7 mm but 1.2–1.5 cm in fruit; gynoecium cylindrical, 1–1.2 cm, glabrous; carpels many. Fruit 3–4 cm; mature carpels yellowish green, with dense lenticels. Fl. Feb–Apr, fr. Sep–Oct.

• Evergreen broad-leaved forests; 1200–1700 m. SE Yunnan.

24. *Michelia guangdongensis* Y. H. Yan et al., *Ann. Bot. Fenn.* 41: 491. 2004.

广东含笑 guang dong han xiao

Shrubs or small trees, 1–4 m tall, to 10 cm d.b.h. Bark grayish brown. Young twigs and buds densely reddish brown

appressed pubescent. Petiole 0.5–1.5 cm, densely reddish brown villous, without a stipular scar; leaf blade obovate-elliptic to obovate, 4.5–9 × 2.5–4.5 cm, leathery, abaxially reddish brown appressed villous, adaxially dark green and glabrous, secondary veins 4–9 on each side of midvein, reticulate veins dense, base rounded to broadly cuneate, margin slightly revolute, apex rounded to shortly acute. Brachyblasts 1.5–2.8 × 0.3–0.5 cm; spatheaceous bract 1. Flower buds long ovoid, densely reddish brown appressed villous. Flowers fragrant. Tepals 9–12, white, base slightly greenish; outer 3–5 tepals ovate-elliptic, 5.6–6.2 × 2.5–3 cm; middle 3 or 4 tepals elliptic to obovate-elliptic, 5.6–7 × 2.7–3 cm; inner 3 tepals elliptic, 5.4–7 × 1.9–2.5 cm. Stamens 50–70, pale green, 1.1–1.5 cm; filaments purplish red, ca. 3 mm; connective exerted and forming a ca. 1 mm triangular mucro; anthers 6–8 mm. Gynophore green, 6–8 mm, puberulous; gynoecium green, terete, 0.9–1.4 cm, reddish brown pubescent; carpels 13–20; ovules 4–6 per carpel; styles purplish red, 1–3 mm, curved outward. Fruit not seen. Fl. Mar.

• Thickets, forests; 1200–1400 m. Guangdong (Yingde).

This species is grown as an ornamental.

25. *Michelia foveolata* Merrill ex Dandy, *J. Bot.* 66: 360. 1928.

金叶含笑 jin ye han xiao

Magnolia foveolata (Merrill ex Dandy) Figlar; *Michelia aenea* Dandy; *M. foveolata* var. *cinerascens* Y. W. Law & Y. F. Wu; *M. foveolata* var. *xiangnanensis* C. L. Peng & L. H. Yan; *M. fulgens* Dandy; *M. longistyla* Y. W. Law & Y. F. Wu; *M. oblongifolia* Hung T. Chang & B. L. Chen.

Trees, to 30 m tall, to 80 cm d.b.h. Bark pale gray to dark gray. Young twigs, buds, petioles, leaf blade abaxial surfaces, and brachyblasts densely reddish brown, brown, or white tomentulose. Petiole 1.5–3 cm, without a stipular scar; leaf blade oblong-elliptic, elliptic-ovate, or narrowly ovate, 17–23 × 6–11 cm, thickly leathery, abaxially coppery to gray tomentulose, adaxially deep green and glossy, secondary veins 16–26, ends slender, divaricate, and netted near margin, reticulate veins dense, base broadly cuneate, obtuse, or subcaudate and usually asymmetrical, apex acuminate to shortly acuminate. Brachyblasts ca. 5 mm in diam., with 3 or 4 bract scars. Tepals 9–12, pale yellowish green, base purplish; outer 3 tepals broadly obovate, 6–7 cm; tepals of middle and inner whorls obovate, narrower and smaller. Stamens ca. 50, 2.5–3 cm; filaments dark purple, 7–10 mm; anthers 1.5–2 cm. Gynophore 1.7–2 cm, silvery tomentulose; gynoecium 2–3 cm; carpels ca. 5 mm; ovaries narrowly ovoid, ca. 3 mm, adnate to torus at base; ovules ca. 8 per carpel. Fruit 7–20 cm; mature carpels long ellipsoid, 1–2.4 cm. Fl. Mar–May, fr. Sep–Oct. $2n = 38$.

Evergreen broad-leaved forests, wet places; 500–1800 m. Fujian, Guangdong, S Guangxi, SE Guizhou, Hainan, W Hubei, Hunan, Jiangxi, SE Yunnan [N Vietnam].

26. *Michelia yunnanensis* Franchet ex Finet & Gagnepain, *Bull. Soc. Bot. France* 52(Mém 4): 43. 1906.

云南含笑 yun nan han xiao

Magnolia amabilis Sima & Y. H. Wang; *M. dianica* Sima

& Figlar; *M. laevifolia* (Y. W. Law & Y. F. Wu) Nootboom; *Michelia dandyi* Hu; *M. laevifolia* Y. W. Law & Y. F. Wu; *M. yunnanensis* var. *angustifolia* Finet & Gagnepain; *M. yunnanensis* subsp. *glabrifolia* Y. K. Li & J. F. Zuo.

Shrubs, to 4 m tall. Twigs and leaves dense. Young twigs, buds, young leaf blade adaxial surfaces, petioles, and brachyblasts with dark red appressed trichomes. Stipular scar ca. 2/3 as long as petiole or reaching petiole apex. Petiole 4–5 mm; leaf blade obovate, narrowly obovate, or narrowly obovate-elliptic, 4–10 × 1.5–3.5 cm, leathery, abaxially with appressed trichomes, adaxially deep green and glossy, secondary veins 7–9 on each side of midvein, reticulate veins prominent on both surfaces when dry, base cuneate, apex obtuse to shortly acute. Brachyblasts thick and strong, 3–7 mm, with 1 bract scar. Flowers very fragrant. Tepals 6–12(–17), white, obovate to obovate-elliptic, 3–3.5 × 1–1.5 cm; inner tepals smaller. Stamens 5–10 mm; filaments white, ca. 3 mm; connective exerted and forming a 1–3 mm mucro; anthers 5–7 mm. Gynophore and gynoecium with reddish brown appressed fine trichomes; gynoecium ovoid to long ellipsoid, 1–1.3 cm; carpels 8–20, compressed globose, 3–4 mm; ovules 5 or 6 per carpel; styles ca. 1 mm, longitudinally furrowed. Fruit usually with 5–9 mature carpels; mature carpels compressed globose, 5–8 mm wide, with trichomes, apex mucronate. Seeds 1 or 2 per carpel. Fl. Mar–Apr, fr. Aug–Sep. $2n = 38^*$.

• Thickets; 1100–2300 m. Guizhou, Sichuan, SE Xizang, C and S Yunnan.

This species is grown as an ornamental and used for making perfume.

27. *Michelia figo* (Loureiro) Sprengel, Syst. Veg. 2: 643. 1825.

含笑花 han xiao hua

Liriodendron figo Loureiro, Fl. Cochinch. 1: 347. 1790; *Liriopsis fuscata* (Andrews) Spach; *Magnolia annonifolia* Salisbury; *M. figo* (Loureiro) Candolle; *M. fuscata* Andrews; *M. fuscata* var. *annonifolia* (Salisbury) Candolle; *M. fuscata* var. *hebeclada* Candolle; *M. fuscata* var. *parviflora* (Blume) Steudel; *M. parviflora* Blume; *M. parvifolia* Candolle; *Michelia fuscata* (Andrews) Blume; *M. parviflora* Delessert (1821), not Rumphius ex Candolle (1817); *Sampacca parviflora* Kuntze.

Shrubs, 2–3 m tall. Bark grayish brown. Twigs and leaves dense. Young twigs, buds, petioles, and brachyblasts densely yellowish brown tomentose. Stipular scar reaching petiole apex. Petiole 2–4 mm; leaf blade narrowly elliptic to obovate-elliptic, 4–10 × 1.8–4.5 cm, abaxially midvein with brown appressed trichomes but other parts glabrescent, adaxially glossy and glabrous, base cuneate to broadly cuneate, apex obtusely acute. Flowers 1.2–2 × 0.6–1.1 cm, erect, sweetly fragrant. Tepals 6, pale yellow but margin sometimes red to purple, long elliptic, 1.2–2 × 0.6–1.1 cm, fleshy and thick. Stamens 7–8 mm; connective exerted and forming a sharp tip. Gynophore ca. 6 mm, pale yellow tomentose; gynoecium ca. 7 mm, exceeding androecium, glabrous. Fruit 2–3.5 cm; mature carpels ovoid to globose, apex with a mucronate beak. Fl. Mar–May, fr. Jul–Aug. $2n = 38^*$.

• Cultivated throughout most of S China and probably originated in cultivation.

This species is grown as an ornamental and used medicinally. It is cultivated in most other tropical, subtropical, and warm temperate regions of the world.

Loureiro published *Liriodendron figo* based on a plant cultivated in Macao. Although the type was probably destroyed, the plant today identified as *Michelia figo* is identical with Loureiro's description.

28. *Michelia crassipes* Y. W. Law, Bull. Bot. Res., Harbin 5(3): 121. 1985.

紫花含笑 zi hua han xiao

Magnolia figo (Loureiro) Candolle var. *crassipes* (Y. W. Law) Figlar & Nootboom; *Michelia brevipes* Y. K. Li & Wang; *M. figo* (Loureiro) Sprengel var. *crassipes* (Y. W. Law) B. L. Chen & Nootboom.

Trees or shrubs, 2–5 m tall. Young twigs, buds, petioles, and peduncles densely reddish brown to yellow long tomentose. Bark grayish brown. Stipular scars as long as petiole. Petiole 2–4 mm; leaf blade narrowly oblong, obovate, narrowly obovate, or rarely narrowly elliptic, 7–13 × 2.5–4 cm, leathery, abaxially green and villous along veins, adaxially dark green, glabrous, and glossy, base cuneate to broadly cuneate, apex long caudate-cuspidate to acute. Flowers very fragrant. Tepals 6, purplish red to dark purple, long elliptic, 1.8–2 × 0.6–0.8 cm. Stamens ca. 1 cm; connective exerted into a short tip; anthers ca. 6 mm. Gynophore ca. 2 mm; gynoecium ca. 8 mm, not exceeding androecium, densely pilose; carpels ovoid, 3.5–4 mm, densely pilose; style 2 mm. Fruit 2.5–5 cm; brachyblast 1–2 × 0.3–0.5 cm; mature carpels more than 10, compressed ovoid to compressed globose, papillate and with trichomes. Fl. Apr–May, fr. Aug–Sep.

• Evergreen broad-leaved forests, ravines; 300–1000 m. N Guangdong, NE Guangxi, S Hunan.

One of the co-authors (Nootboom) considers that *Michelia crassipes* and *M. skinneriana* probably represent the wild forms of *M. (Magnolia) figo* and would be better treated as varieties of that species.

This species is grown as an ornamental.

29. *Michelia skinneriana* Dunn, J. Linn. Soc., Bot. 38: 354. 1908.

野含笑 ye han xiao

Michelia amoena Q. F. Zheng & M. M. Lin; *M. linyaoensis* D. C. Zhang & S. B. Zhou.

Trees, to 15 m tall. Young twigs, buds, petioles, leaf blade midrib abaxially, and peduncles densely brown villous. Bark grayish white, smooth. Stipular scars as long as petiole. Petiole 2–4 mm; leaf blade narrowly obovate-elliptic, oblanceolate, or narrowly elliptic, 5–11(–14) × 1.5–3.5(–4) cm, leathery, abaxially sparsely brown villous, adaxially dark green and glossy, secondary veins 10–13 on each side of midvein, reticulate veins sparse and prominent on both surfaces when dry, base cuneate, apex long caudate-acuminate. Flowers fragrant. Peduncle slender. Tepals 6, pale yellow, obovate, 1.6–2 cm; outer tepals with

brown trichomes at base. Stamens 6–10 mm; connective exerted into a ca. 0.5 mm mucro; anthers 4–5 mm, latrorse. Gynophore 4–7 mm, with dense brown trichomes; gynoecium ca. 6 mm; carpels with dense brown trichomes. Fruit 4–7 cm, usually curved or shortened due to carpels partly undeveloped; peduncle slender; mature carpels black, globose to ellipsoid, 1–1.5 cm, beak mucronate. Fl. May–Jun, fr. Aug–Sep. $2n = 38^*$.

• Forests, ravines, slopes; below 1200 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

One of the co-authors (Nooteboom) considers that *Michelia skinneriana* and *M. crassipes* probably represent the wild forms of *M. (Magnolia) figo* and would be better treated as varieties of that species.

“*Michelia microphylla* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*, 296. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

This species is grown as an ornamental.

30. *Michelia martini* (H. Léveillé) Finet & Gagnepain ex H. Léveillé, Fl. Kouy-Tchéou, 270. 1914–1915.

黄心含笑 huang xin han xiao

Magnolia martini H. Léveillé, Bull. Soc. Agric. Sarthe 39: 321. 1904; *Michelia bodinieri* Finet & Gagnepain; *M. longistamina* Y. W. Law.

Trees, to 20 m tall. Bark gray, smooth. Old twigs brown, scattered with lenticels; young twigs olive green, glabrous; buds ovoid to ellipsoid-ovoid, with dense grayish yellow to reddish brown erect long trichomes. Petiole 1.5–2 cm, without a stipular scar; leaf blade narrowly obovate-elliptic, 12–18 × 3–5 cm, leathery, both surfaces glabrous, adaxially deep green and glossy, midvein abaxially prominent, secondary veins 11–17 on each side of midvein and nearly parallel, base cuneate to broadly cuneate, apex acute to shortly caudate. Brachyblasts thick and strong, ca. 7 mm, densely yellowish brown tomentose. Flowers fragrant. Tepals 6–8, pale yellow; outer tepals obovate-oblong, 4–4.5 × 2–2.4 cm; inner tepals oblanceolate, ca. 4 × 1.1–1.3 cm. Stamens 1.3–1.8 cm; filaments purple; connective exerted and forming a ca. 0.5 mm tip; anthers 1–1.2 cm, dehiscing laterally. Gynoecium pale green, ca. 3 cm; carpels ellipsoid-ovoid, ca. 1 cm; ovules 8–12 per carpel; styles nearly as long as carpels. Fruit 8–15 cm, wrinkled; mature carpels obovoid to ellipsoid-ovoid, 1–2 cm, dehiscing along both ventral and dorsal sutures at same time, white lenticellate, apex shortly beaked. Fl. Feb–Mar, fr. Aug–Oct. $2n = 38$.

Forests; 1000–2000 m. Guangdong, Guangxi, Guizhou, S Henan, W Hubei, Hunan, C and S Sichuan, E Yunnan [Vietnam].

“*Michelia funingensis* D. X. Li & Y. W. Law” (in Y. H. Liu, *Magnolias China*, 265. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

This species is grown as an ornamental. It is used for making perfume and for timber.

31. *Michelia chapensis* Dandy, J. Bot. 67: 222. 1929.

乐昌含笑 le chang han xiao

Magnolia chapensis (Dandy) Sima; *M. jiangxiensis* (Hung T. Chang & B. L. Chen) Figlar; *M. microcarpa* (B. L. Chen & S. C. Yang) Sima; *Michelia brachyandra* B. L. Chen & S. C. Yang; *M. chartacea* B. L. Chen & S. C. Yang; *M. constricta* Dandy; *M. glaberrima* Hung T. Chang; *M. jiangxiensis* Hung T. Chang & B. L. Chen; *M. microcarpa* B. L. Chen & S. C. Yang; *M. tsoi* Dandy.

Trees, 15–30 m tall, to 1 m d.b.h. Bark gray to dark brown. Twigs glabrous or nodes grayish puberulous when young. Petiole 1–2.5 cm, adaxially furrowed, glabrous or puberulous when young but later glabrescent, without a stipular scar; leaf blade obovate, narrowly obovate, or oblong-obovate, 6.5–15(–16) × 3–6.5(–7) cm, thinly leathery, adaxially deep green and glossy, secondary veins 9–12(–15) on each side of midvein, reticulate veins sparse, base cuneate, broadly cuneate, or obtuse, apex acute to shortly acuminate, acumen obtuse. Brachyblasts 4–10 mm, appressed gray puberulous, with 2–5 bract scars. Flowers fragrant. Tepals 6, in 2 whorls, pale yellow; outer tepals obovate-elliptic, ca. 3 × 1.5 cm; inner tepals narrower. Stamens 1.7–2 cm; connective exerted and forming a ca. 1 mm mucro; anthers 1.1–1.5 cm. Gynophore ca. 7–10 mm, densely silvery appressed puberulous; gynoecium narrowly cylindrical, ca. 1.5 cm; carpels ovoid, ca. 2 mm; ovules 6 per carpel; styles ca. 1.5 mm. Fruiting brachyblasts ca. 2 mm. Fruit 3.5–10 cm; mature carpels ellipsoid to ovoid, 1–1.5 × ca. 1 cm, base broad, apex with short and curved tip. Seeds red, ovoid to ellipsoid-ovoid, ca. 10 × 6 mm. Fl. Mar–Apr, fr. Aug–Nov.

Evergreen broad-leaved forests; 500–1700 m. N and W Guangdong, NE and SE Guangxi, Guizhou, S and W Hunan, S Jiangxi, SE Yunnan [N Vietnam].

This species is grown as an ornamental and used for timber.

32. *Michelia xanthantha* C. Y. Wu ex Y. W. Law & Y. F. Wu, Acta Bot. Yunnan. 10: 338. 1988.

黄花含笑 huang hua han xiao

Magnolia xanthantha (C. Y. Wu ex Y. W. Law & Y. F. Wu) Figlar.

Trees, to 30 m tall, to 1 m d.b.h. Twigs blackish brown to grayish yellow, ca. 4.5 mm in diam., scattered with lenticels; buds cylindrical, ca. 1.5 cm, glabrous. Stipules free from petiole. Petiole 2–2.5 cm, without a stipular scar; leaf blade elliptic to obovate-elliptic, 15–17 × 6.2–7.5 cm, thinly leathery, both surfaces glabrous, midvein abaxially slightly prominent and adaxially prominent, secondary veins 11 or 12 on each side of midvein, reticulate veins prominent on both surfaces, base cuneate to obtuse, apex shortly cuspidate. Brachyblasts ca. 1.5 cm, glabrous. Flowers fragrant. Tepals 6, in 2 whorls, yellow, narrowly oblong to broadly oblanceolate, 4–5.5 × 1–1.5 cm. Stamens 2.3–2.5 cm; connective exerted and forming a 1–2 mm sharp tip; anthers 1.8–2 cm. Gynophore 2–3 mm; gynoecium cylindrical, 1.8–2 cm, densely gray pubescent; carpels many, ovoid, 3–4 mm, densely gray pubescent; styles brown, ca. 1 mm. Fruit ca. 21 cm, pendulous; mature carpels dark brown, scattered with lenticels. Fl. Mar, fr. Sep–Oct.

• Forests; 1300–1400 m. S Yunnan (Xishuangbanna).

33. *Michelia angustiolongia* Y. W. Law & Y. F. Wu, Bull. Bot. Res., Harbin 6(2): 97. 1986.

狭叶含笑 xia ye han xiao

Magnolia angustiolongia (Y. W. Law & Y. F. Wu) Figlar.

Trees, to 4 m, glossy, with appressed indument. Twigs black; buds densely brown villous. Stipules free from petiole. Petiole 1–1.5 cm, without a stipular scar; leaf blade narrowly oblong, 6.5–10 × 1.5–2.5 cm, leathery, abaxially grayish green and villous, adaxially deep green, midvein abaxially prominent, secondary veins inconspicuous, reticulate veins dense and conspicuous when dry, base cuneate to broadly cuneate, apex obtuse. Brachyblasts pilose. Tepals 6, in 2 whorls, white, oblanceolate; outer 3 tepals 1.8–2 × 0.4–0.5 cm; inner 3 tepals 1.4–1.6 cm. Stamens 1.1–1.5 cm; connective exerted and forming a mucro; anthers 6–10 mm. Gynophore ca. 3 mm; gynoecium embedded in androecium, narrowly ellipsoid, ca. 1 cm; carpels brown puberulous. Fruit not seen. Fl. Apr.

• Forests; ca. 1000 m. Guizhou (Libo).

34. *Michelia balansae* (Aug. Candolle) Dandy, Bull. Misc. Inform. Kew 1927: 263. 1927.

苦梓含笑 ku zi han xiao

Magnolia balansae Aug. Candolle, Bull. Herb. Boissier, sér. 2, 4: 294. 1904; *Michelia balansae* var. *appressipubescens* Y. W. Law; *M. balansae* var. *brevipes* B. L. Chen; *M. baviensis* Finet & Gagnepain; *M. tonkinensis* A. Chevalier.

Trees, 7–10 m tall, to 60 cm d.b.h. Bark gray to grayish brown, smooth. Young twigs, buds, petioles, leaf blade abaxial surfaces, flower buds, and brachyblasts densely brown tomentose or with appressed fine trichomes. Petiole 1.5–4 cm, without a stipular scar, base flattened; leaf blade oblong-elliptic to obovate-elliptic, 10–20(–28) × 5–10(–12) cm, abaxially veins evidently prominent and brown tomentose, adaxially subglabrous, secondary veins 12–15 on each side of midvein with ends arching upward and becoming reticulate, base broadly cuneate, apex abruptly acute. Flowers fragrant. Tepals 6, white and pale greenish, obovate-elliptic, 3.5–3.7 × 1.3–1.5 cm; innermost tepals oblanceolate, smaller. Stamens 1–1.5 cm; connective exerted and forming a mucro; anthers 8–10 mm. Gynophore 4–6 mm, yellowish brown tomentose; gynoecium ovoid. Fruiting gynophore 4.5–7 cm. Fruit 7–12 cm; mature carpels ellipsoid-ovoid, obovoid, or cylindric, 2–6 × 1.2–1.5 cm, apex with a reflexed 3–5 mm beak. Seeds nearly ellipsoid, 1–1.5 cm, one end or both ends truncate; testa bright red; endotesta brown. Fl. Mar–Jul, fr. Aug–Oct. $2n = 38$.

Evergreen broad-leaved forests, along rivers; 300–1000 m. S Fujian, S and SW Guangdong, S Guangxi, Guizhou, Hainan, S Yunnan [Vietnam].

Magnolia balansae and *Michelia baviensis* were published based on the same gathering (*Balansa 3886*, but Finet and Gagnepain wrongly cited the number as “3386”) from Mt. Bavi, Vietnam.

“*Michelia bailina* Y. W. Law & R. Z. Zhou” (in Y. H. Liu, *Magnolias China*, 218. 2004) belongs here but was not validly published because no Latin description or diagnosis was provided and no type was indicated (*Vienna Code*, Art. 36.1 and 37.1).

This species is used for timber.

35. *Michelia guangxiensis* Y. W. Law & R. Z. Zhou, J. Trop. Subtrop. Bot. 7: 191. 1999.

广西含笑 guang xi han xiao

Magnolia guangxiensis (Y. W. Law & R. Z. Zhou) Sima.

Trees, 5–10 m tall, 10–20 cm d.b.h. Bark brown. Young twigs, buds, petioles, and brachyblasts densely brown tomentose. Twigs of current year green; older twigs grayish brown, glabrous. Petiole ca. 1 cm, without a stipular scar or stipular scar 1–3 mm; leaf blade oblong to ovate-oblong, 6–15 × 3–5 cm, leathery, abaxially grayish green and with sparse brown trichomes, adaxially shiny dark green and glabrous, midvein abaxially prominent, secondary veins 9–11 on each side, reticulate veins dense and prominent on both surfaces when dry, base cuneate to broadly cuneate, apex acute to shortly acuminate. Flowers fragrant. Tepals 6, in 2 whorls, white, subequal, fleshy; outer 3 tepals obovate, 3–4 × 1.3–1.5 cm; inner 3 tepals narrowly obovate, 3–4 × 1–1.3 cm. Stamens many, 1.2–1.5 cm; connective exerted and forming a ca. 0.5 mm mucro; anthers ca. 1 cm. Gynophore 4–5 mm, densely brown firmly appressed pubescent; gynoecium ellipsoid-ovoid, ca. 1 cm; ovaries ovoid, ca. 3 mm; ovules (2–)4(or 5) per carpel; styles ca. 1 mm. Fruit 5–10 cm; mature carpels 10–15, ovoid, obovoid, or ellipsoid-ovoid, 1–2 cm, completely dehiscent into 2 valves, apex shortly beaked. Fl. Apr–May, fr. Sep–Oct.

• Forests; 2100–2200 m. Guangxi (Longsheng).

36. *Michelia leveilleana* Dandy, Bull. Misc. Inform. Kew 1927: 263. 1927.

长柄含笑 chang bing han xiao

Magnolia leveilleana (Dandy) Figlar; *Michelia cavaleriei* H. Léveillé (1911), not Finet & Gagnepain (1906); *M. chongjiangensis* Y. K. Li & X. M. Wang; *M. longipetiolata* C. Y. Wu ex Y. W. Law & Y. F. Wu.

Trees, to 15 m tall, to 30 cm d.b.h. Young twigs appressed pubescent; buds ovoid, ca. 1 cm, densely red villous. Stipules free from petiole. Petiole 2.5–3 cm, appressed pubescent, without a stipular scar; leaf blade broadly to narrowly obovate, 7.5–10.5 × 2.8–3.8 cm, thinly leathery, both surfaces pubescent when young, midvein flat to adaxially slightly prominent, secondary veins 6–10 on each side of midvein and adaxially prominent, reticulate veins inconspicuous, base cuneate to broadly cuneate, apex acute. Flowers not seen. Stamen scar band in fruit ca. 8 mm. Fruiting brachyblasts ca. 3 mm. Fruiting gynophore 1–1.5 cm. Fruit 7–9 cm; undeveloped carpels ca. 20; mature carpels 7–12, blackish brown, ovoid, ca. 1.2 × 0.9 cm, lenticellate and villous, completely 2-valved. Fr. Sep–Oct.

• Forests; 1000–1500 m. Guizhou, Hubei, Hunan, Yunnan.

37. *Michelia gioi* (A. Chevalier) Sima & Hong Yu, Seed Pl. Honghe Reg. S. E. Yunnan China, 55. 2003 [“*gioii*”].

香子含笑 xiang zi han xiao

Talauma gioi A. Chevalier, Bull. Écon. Indochine, n.s., 21: 790. 1918; *Magnolia hypolampra* (Dandy) Figlar; *Michelia hedyosperma* Y. W. Law; *M. hypolampra* Dandy.

Trees, to 21 m tall, to 60 cm d.b.h. Buds, young petioles, brachyblasts, flower buds, and carpels appressed short sericeous but other parts glabrous. Twigs black turning pale brown when old, sparsely scattered with lenticels. Leaf blade obovate to elliptic-obovate, 6–13 × 5–5.5 cm, thinly leathery, with *Illicium* odor when crushed, both surfaces freshly green, glossy, and glabrous, secondary veins 8–10 on each side of midvein and prominent on both surfaces, reticulate veins slender, dense, and prominent on both surfaces, base broadly cuneate, apex with an obtuse tip. Flower buds long ellipsoid, ca. 2 cm. Brachyblasts ca. 1 cm. Flowers fragrant. Tepals 9, in 3 whorls; outer tepals membranous, linear, ca. 15 × 2 mm; tepals of inner 2 whorls

narrowly elliptic, 1.5–2 × ca. 0.6 cm. Stamens ca. 25, 8–9 mm; connective exerted and forming a 1–1.5 mm sharp tip. Gynophore 4–5 mm and 2–3 cm in fruit; gynoecium ovoid; carpels ca. 10, narrowly ellipsoid, 6–7 mm, 5-ridged abaxially; ovules 6–8 per carpel; styles ca. 2 mm, reflexed. Fruiting brachyblasts thick, 1.5–2 cm. Mature carpels grayish black, ellipsoid, 2–4.5 × 1–2.5 cm, densely lenticellate, base shrunken into 2–8 mm stalks, apex mucronate, valves thick, reflexed when matured, exposing white endocarp. Seeds 1–4. Fl. Mar–Apr, fr. Sep–Oct.

Forests, slopes, ravines; 300–800 m. SW Guangxi, Hainan, S Yunnan [Vietnam].

Hybrids or putative hybrids

38. *Michelia* × *alba* Candolle, Syst. Nat. 1: 449. 1817.

白兰 bai lan

Magnolia × *alba* (Candolle) Figlar; *Michelia* × *longifolia* Blume; *M. longifolia* var. *racemosa* Blume; *Sampacca* × *longifolia* (Blume) Kuntze.

Trees, to 17 m tall, to 30 cm d.b.h. Bark gray. Branches and leaves fragrant after being crushed. Twigs patent, forming a broadly umbelliform crown; young twigs and buds densely pale yellowish white puberulous, trichomes gradually deciduous with age. Stipular scar nearly reaching middle of petiole. Petiole 1.5–2 cm, sparsely puberulous; leaf blade long elliptic to narrowly ovate, 10–27 × 4–9.5 cm, thinly leathery, abaxially sparsely puberulous, adaxially glabrous, reticulate veins very conspicuous on both surfaces when dry, base cuneate, apex long acuminate to caudate-acuminate. Flowers very fragrant. Tepals 10, white, lanceolate, 3–4 cm × 3–5 mm. Staminal connective exerted and forming a long tip. Gynophore ca. 4 mm; gynoecium puberulous; carpels numerous, usually partly undeveloped, forming a sparsely follicular fruit as torus elongates when mature. Fl. Apr–Sep. Usually not fruiting. $2n = 38$.

Cultivated. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [native to Indonesia (Java)].

This hybrid is grown as an ornamental and used medicinally. The plant is usually not fruiting and is propagated by grafting.

39. *Michelia* *elegans* Y. W. Law & Y. F. Wu, Bull. Bot. Res., Harbin 8(3): 71. 1988.

雅致含笑 ya zhi han xiao

Trees, to 5 m tall, with appressed indument. Old twigs dark brown, glabrous, scattered with lenticels; young twigs grayish brown, densely pubescent; buds ovoid, 1.5–2 × 0.7–1.2 cm, brown tomentose. Stipules free from petiole. Petiole 0.5–1 cm, pubescent, without a stipular scar, base slightly flattened; leaf blade obovate-oblong to rarely oblong, 9–18 × 4.5–5.5 cm, leathery, abaxially densely brown pubescent, adaxially glabrous, midvein abaxially prominent, secondary veins 11–13 on each side of midvein, reticulate veins dense and prominent when dry, base broadly cuneate to suborbicular, apex cuspidate. Brachyblasts ca. 1 cm, brown tomentose. Tepals 9, white, obovate to obovate-oblong, ca. 3 × 1.5–2 cm. Stamens many, ca. 1.5 cm; connective exerted and forming a ca. 1.5 mm mucro; anthers ca. 1 cm. Gynophore ca. 8 mm, densely pubescent; gynoecium cylindrical, 1.2–1.8 cm, densely pubescent; carpels ovoid, ca. 2.5 mm, densely pubescent. Fruiting gynophore 1.3–1.5 cm. Fruit cylindrical, 6–7 cm; mature carpels broadly obovoid to subglobose, 1.1–1.2 × ca. 1 cm, slightly white lenticellate. Seeds 1 per carpel. Fl. Apr, fr. Oct.

• Open fields. Zhejiang (Qingyuan).

This plant may be a hybrid with *Michelia cavaleriei* as one of the parents. It is cultivated at the South China Botanical Garden, from where the holotype was collected.

13. LIRIODENDRON Linnaeus, Sp. Pl. 1: 535. 1753.

鹅掌楸属 e zhang qiu shu

Trees, deciduous. Bark grayish white, longitudinally fissured, falling off in small masses. Winter buds ovoid, surrounded by 2 connate stipules. Stipules free from petiole. Leaves spirally arranged, folded and pendulous in buds; petiole long; leaf blade with 1 or 2 lateral lobes near base, apex truncate to emarginate. Flowers terminal, solitary, bisexual, not fragrant, appearing at same time as leaves. Tepals 9, in 3 whorls, subequal. Anthers dehiscing extrorsely. Gynoecium sessile; carpels many, spirally arranged, distinct, basal ones sterile; ovules 2 per carpel, pendulous. Fruit fusiform; mature carpels woody, falling off from torus when matured; testa fused with endocarp, apex elongated winglike; torus persistent. Seeds 1 or 2 per carpel; testa thin and dry.

Two species: E Asia and E North America; one species in China.

The North American species *Liriodendron tulipifera* Linnaeus is cultivated as a garden plant in E China.

1. *Liriodendron chinense* (Hemsley) Sargent, *Trees & Shrubs* 1: 103. 1903.

鹅掌楸 e zhang qiu

Liriodendron tulipifera Linnaeus var. *chinense* Hemsley, J. Linn. Soc., Bot. 23: 25. 1886; *L. tulipifera* var. *sinense* Diels.

Trees, to 40 m tall, to 1 m d.b.h. Twigs gray to grayish brown. Petiole 4–8(–16) cm; leaf blade 4–12(–18) × 3–9.5(–23) cm, membranous to papery, abaxially glaucous, base truncate to slightly cordate and with 1 lateral lobe near base of each side, apex 2-lobed. Flowers cupular. Tepals 9; outer 3 tepals green, sepal-like, curved and outwardly pendulous; tepals of inner 2

whorls green with yellow striations, erect, petal-like, obovate, 3–4 cm. Filaments 5–6 mm; anthers 1–1.6 cm. Gynoecium exceeding tepals at anthesis; carpels yellowish green. Fruit 7–9 cm; nutlets ca. 6 mm, winged, apex obtuse to mucronate, 1- or 2-seeded. Fl. May, fr. Sep–Oct. $2n = 38$.

Forests; 900–1000 m. Anhui, Chongqing, Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, SE Sichuan, Yunnan, Zhejiang [N Vietnam].

This species is used for timber and grown as an ornamental. It is a rare and endangered species composed of small populations or scattered individuals.