Fl. China 19: 231–242. 2011.

56. MUSSAENDA Linnaeus, Sp. Pl. 1: 177. 1753.

玉叶金花属 yu ye jin hua shu

Chen Tao (陈涛); Charlotte M. Taylor

Belilla Adanson.

Trees, shrubs, or clambering or twining lianas, rarely dioecious, unarmed. Raphides absent. Leaves opposite or occasionally in whorls of 3, with or usually without domatia; stipules persistent or caducous, interpetiolar, entire or 2-lobed. Inflorescences terminal and sometimes also in axils of uppermost leaves, cymose, paniculate, or thyrsiform, several to many flowered, sessile to pedunculate, bracteate. Flowers sessile to pedicellate, bisexual and usually distylous or rarely unisexual. Calyx limb 5-lobed nearly to base, frequently some or all flowers of an inflorescence with 1(–5) white to colored, petaloid, persistent or deciduous, membranous, stipitate calycophyll(s) with 3–7 longitudinal veins. Corolla yellow, red, orange, white, or rarely blue (*Mussaenda multinervis*), salverform with tube usually slender then abruptly inflated around anthers, or rarely constricted at throat (*M. hirsuta*), inside variously pubescent but usually densely yellow clavate villous in throat; lobes 5, valvate-reduplicate in bud, often long acuminate. Stamens 5, inserted in middle to upper part of corolla tube, included; filaments short or reduced; anthers basifixed. Ovary 2-celled, ovules numerous in each cell, inserted on oblong, fleshy, peltate, axile placentas; stigmas 2-lobed, lobes linear, included or exserted. Fruit purple to black, baccate or perhaps rarely capsular (*M. decipiens*), fleshy, globose to ellipsoid, often conspicuously lenticellate, with calyx limb persistent or caducous often leaving a conspicuous scar; seeds numerous, small, angled to flattened; testa foveolate-striate; endosperm abundant, fleshy.

About 200 species: widespread in tropical Africa, Asia, Madagascar, and Pacific islands; 29 species (18 endemic, one introduced) in China.

The characteristic large, petaloid calycophylls of *Mussaenda* are frequently but mistakenly considered to be bracts. *Mussaenda* is frequently confused with *Schizomussaenda*; *Schizomussaenda* can be recognized by its large shrub habit with relatively large leaves and calycophylls, its capsular fruit, and its flower buds with the corollas clavate and rather flat-topped with the acuminate ends of the corolla lobes then bent upward to form an erect appressed group of filaments on the top of the bud.

Several species of *Mussaenda* are frequently cultivated as ornamentals in tropical regions. *Mussaenda philippica* A. Richard is apparently the most commonly cultivated species and has numerous cultivar forms; Puff et al. (Rubiaceae of Thailand, 215. 2005) presented photos of several of the cultivated forms. This species is pilosulous to villous throughout, with white to pink flowers and calycophylls and with calyx lobes variously 1 to all modified into calycophylls. Also frequently cultivated are *M. frondosa* of our flora and *M. erythrophylla* Schumacher & Thonning of Africa; the latter has pilose to villous pubescence on all organs, including the corollas, and deep red inflorescence axes and flowers, including the calycophylls and the outside of the corolla but excepting the corolla limb, which is creamy white.

In addition to the species treated here, Hooker and Arnott (Bot. Beechey Voy. 265. 1838) reported *Mussaenda glabra* Vahl from “Loo Choo” in China. *Mussaenda glabra* was described from the Himalaya and has medium-sized leaves, a climbing habit, petioles 3–15 mm, a corymbiform branched inflorescence, calyx lobes 1–4 mm and deciduous in fruit, corolla tubes 13–18 mm, and corolla lobes 3–3.5 mm; this species is otherwise known from 300–1300 m in India and Bhutan and has not been confidently recorded from China. The name *“M. glabra”* has been frequently applied in herb. to Chinese specimens of both *M. erosa* and *M. frondosa*. Also *Henry 8279* from Hainan was treated by C. E. C. Fisher (Bull. Misc. Inform. Kew 1928: 274. 1928) as *M. parryorum* C. E. C. Fischer, a species otherwise known only from Assam, NE India. This identification seems unlikely, especially given that *M. parryorum* has not otherwise been reported or treated from China or Indochina, so the Henry specimen will need re-examination. *Mussaenda parryorum* is included for reference in the key below, based on its protologue, but the species is not otherwise treated here.

H. H. Hsue and H. Wu (in FRPS 71(1): 283–306. 1999), Hutchinson (in Sargent, Pl. Wilson. 3: 395–400. 1916), and some other authors have distinguished *Mussaenda* species in large part based on leaf shape, ovary length, calyx lobe length, and corolla size, but the consistency and distinctiveness of these characters within species of *Mussaenda* have been questioned by some other authors. In particular, corolla size is apparently sometimes widely variable among living plants in a population (see comments by Wood, Fl. Bhutan 2(2): 781. 1999), and the flower buds of *Mussaenda* apparently often open prematurely when collected and thus are shorter than flowers at anthesis (pers. obs.). The calyx lobes and the ovary often elongate after fertilization of the ovary, and the calyx lobes then fall off; thus, fruiting plants are very difficult to identify. Also Hutchinson misidentified several widely distributed sets of Chinese *Mussaenda* specimens, generating confusion in this group (e.g., he identified *Henry 12157* as *M. pubescens* in spite of its pedicellate flowers with corolla tubes ca. 32 mm, vs. sessile and 11–20 mm in *M. pubescens*); and he described only the “typical” leaf size and shape of several species although he saw material with more variability. The weakness in some cases of Hutchinson’s characters and species concepts is shown by his simultaneous description in his *Mussaenda* treatment of two new species that were separated primarily on vegetative features and actually are both based on different specimens of a single distinctive species, *Schizomussaenda dehiscens*.

As noted below, *Mussaenda multinervis* and *M. decipiens* were both described as having capsular fruit and most likely belong in other genera, but which other genus or genera is not yet clear so they are maintained here. The measurements below of inflorescence size do not include the corollas and calycophylls.

1a. Individual flowers with all 5 calyx lobes enlarged into petaloid calycophylls.
  2a. Petiole 0.3–0.8 cm, leaf blade 2–9 × 1–4 cm; calyx lobes linear ..... 25. *M. pubescens*
  2b. Petiole 1.5–3.5 cm, leaf blade 6–20 × 3.5–13 cm; calyx lobes lanceolate to ovate, 2–2.5 mm wide ..... 27. *M. shikokiana*
1b. Individual flowers with only 1 or 2 calyx lobes enlarged into a petaloid calycophyll, or without calycophylls.
  3a. Calyx lobes (i.e., not calycophylls) subleaflike, 1.5–5 mm wide, lanceolate, oblanceolate, oblong-lanceolate, ligulate, or broadly triangular.

4a. Corolla tube 20–25 mm, sericeous with appressed indument, sericeous with apices of trichomes spreading, or villous.
5a. Stems sericeous with appressed indument; stipules 5–8 × 4–5 mm; calyx lobes 4–11 mm ..... 19. *M. macrophylla*
5b. Stems villous or hirsute with widely spreading trichomes; stipules 7–10 × 6–12 mm; calyx lobes 7–18 mm ..... 29. *M. treutleri*
4b. Corolla tube 9–14 mm, sericeous.
6a. Stipules triangular-ovate to broadly ovate, acute to cuspidate; corolla tube 10–11 mm; berries ellipsoid ..... 9. *M. emeiensis*
6b. Stipules triangular to ovate-lanceolate, acute; corolla tube 9–14 mm; berries ellipsoid to subglobose ..... 27. *M. shikokiana*
3b. Calyx lobes less than 1.5 mm wide, linear to narrowly triangular, not at all leaflike.
7a. Stipules 13–20 mm, lobed for less than half their length; corolla yellow or pale blue.
8a. Corolla pale blue; leaves 8.5–12 cm wide; calyx lobes ca. 2 mm; fruit baccate ..... 22. *M. multinervis*
8b. Corolla yellow; leaves 2.5–7.5 cm wide; calyx lobes 1–4 mm; fruit capsular.
9a. Calyx lobes 3–4 mm; leaves 6–7.5 cm wide ..... 5. *M. decipiens*
9b. Calyx lobes 1–2 mm; leaves 2.5–6 cm wide ..... *Schizomussaenda dehiscens*
7b. Stipules 2–8 mm, deeply 2-parted; corolla white, yellow, or orange.
10a. Leaves sessile, subsessile, or shortly petiolate with petioles to 3 mm, obtuse, rounded, truncate, or cordulate and then sometimes decurrent at base, if petioles more than 2 mm then leaves truncate or cordulate.
11a. Leaf blade obtuse to rounded then abruptly acuminate at apex; corolla tube outside densely villous with pubescence drying reddened; stems densely villous ..... 26. *M. sessilifolia*
11b. Leaf blade tapered to acuminate apex; corolla tube outside with sparse to dense villosulous, pilosulous, tomentulose, strigose, or strigillose pubescence drying clear, whitened, or reddened; stems strigillose, villous, villosulous, or tomentulose.
12a. Corolla tube 20–26 mm; inflorescences shortly branched, flowers with pedicels ca. 1 mm ..... 14. *M. hossei*
12b. Corolla tube 11–20 mm; inflorescences subcapitate to congested, flowers mostly or all sessile to subsessile.
13a. Calyx lobes ca. 2 mm ..... 2. *M. breviloba*
13b. Calyx lobes 3–6 mm ..... 25. *M. pubescens*
10b. Leaves distinctly petiolate with petioles 2–15 mm, truncate, obtuse, acute, or attenuate at base, if petioles 3 mm or shorter then leaves acute.
14a. Leaves glabrous throughout or sparsely strigose on principal veins, drying thickly papery and usually brown, with tertiary venation sparsely visible abaxially, widely spaced and subparallel, not areolate; stipules caducous exposing a persistent, reddish brown fringe of trichomes ..... 10. *M. erosa*
14b. Leaves glabrous or pubescent at least sparsely on veins abaxially, drying thinly to thickly papery or membranous and green to brown, with tertiary venation regularly visible abaxially, subparallel or areolate; stipules persistent or deciduous, without persistent fringe of trichomes or this present and clear or whitened.
15a. Corolla tube constricted at throat ..... 13. *M. hirsutula*
15b. Corolla tube uniformly cylindrical or inflated just below or at throat.
16a. Calyx lobes 25–30 mm, as long as or longer than corolla tube ..... 15. *M. kwangsiensis*
16b. Calyx lobes 1–15 mm, shorter than corolla tube.
17a. Corolla tube 5–8 mm; fruit stipitate or pedicellate, pedicels to 12 mm ..... 23. *M. parviflora*
17b. Corolla tube 5–40 mm; fruit sessile or subsessile to pedicellate, pedicels to 8 mm.
18a. Flowers sessile in 1–5 capitate groups; bracts and calyx lobes linear, 8–15 mm, and so densely hirsute as to obscure inflorescence morphology ..... 6. *M. densiflora*
18b. Flowers sessile to pedicellate in cymes with axes at least shortly developed; bracts and calyx lobes narrowly triangular to lanceolate, 1–15 mm, glabrous to variously pubescent, inflorescence morphology obscured or evident.
19a. Longest calyx lobes 6–15 mm on flowers at anthesis, longer than hypanthium portion.
20a. Corolla lobes 6–8 mm.
21a. Cultivated plants; leaves strigose, strigillose, or glabrescent abaxially ..... 11. *M. frondosa*
21b. Native plants; leaves hirsute, subappressed villous, pilose, or strigose abaxially.
22a. Calyx densely villous, with pubescence spreading ..... 3. *M. caudatiloba*
22b. Calyx hirsute ..... 6. *M. densiflora*
20b. Corolla lobes 2.5–6 mm, at least some shorter than 6 mm.
23a. Corolla tubes 26–30 mm.
24a. Inflorescences densely congested; flowers sessile or subsessile ..... 13. *M. hirsutula*
24b. Inflorescences congested to laxly cymose; flowers with pedicels 1–5 mm ..... 17. *M. laxiflora*
23b. Corolla tubes 11–25 mm.

25a. Fruit ellipsoid to ellipsoid-oblong, 18–20 × 11–12 mm, densely lenticellate, somewhat woody; stems and leaves abaxially densely villosulous to tomentulose; Hainan ..... 12. *M. hainanensis*
25b. Fruit subglobose to ellipsoid, 5–10 × 4–10 mm, smooth, fleshy or stiffly papery; stems and leaves abaxially glabrescent to variously pubescent; widespread.
26a. Corolla with tube ca. 14 mm, lobes ca. 2.5 mm; Yunnan, elevation not noted ... 24. *M. pingbianensis*
26b. Corolla with tube 11–23 mm, lobes 2.5–5 mm; widespread, below 100–1600 m.
27a. Leaves 2–11.5 × 1–4.5 cm; flowers sessile to pedicellate, white to yellow; below 100–900 m, throughout China ..... 25. *M. pubescens*
27b. Leaves 6–20 × 3–10 cm; flowers sessile, mixed sessile and pedicellate, or all pedicellate with pedicels to 3 mm, yellow-orange; S China, 300–1400 m.
28a. Corolla lobes rounded ..... 28. *M. simpliciloba*
28b. Corolla lobes acute or acuminate.
29a. Climbers; leaves 8–13 × 3–6 cm ..... 6. *M. densiflora*
29b. Erect shrubs; leaves 6–20 × 3–10 cm ..... 8. *M. elliptica*
19b. Longest calyx lobes 1–5.9 mm, shorter than to longer than hypanthium portion.
30a. Corolla tube ca. 40 mm ..... 16. *M. kwangtungensis*
30b. Corolla tube 5–37 mm.
31a. Stems densely tomentose.
32a. Erect shrubs; calyx lobes 3–4 mm; corolla lobes acuminate ..... 21. *M. mollissima*
32b. Climbers; calyx lobes 5–7 mm; corolla lobes rounded ..... 28. *M. simpliciloba*
31b. Stems appressed pubescent to glabrescent.
33a. Most or all calyx lobes 1–2 mm.
34a. Leaves with 4–6 pairs of lateral veins; Hainan.
35a. Corolla tube 25–31 mm; calycophylls elliptic to ovate ..... 1. *M. antiloga*
35b. Corolla tube 13–15 mm; calycophylls oblong-elliptic or oblanceolate ..... 18. *M. lotungensis*
34b. Leaves with 6–8 pairs of lateral veins; mainland.
36a. Corolla tube ca. 12.8 mm ..... 2. *M. breviloba*
36b. Corolla tube 18–21 mm.
37a. Leaves 5.5–7.5 × 3–4.7 cm; petioles 0.5–0.6 cm ..... 4. *M. chingii*
37b. Leaves 10–17 × 2.5–6 cm; petioles 0.5–1.6 cm ..... *Schizomussaenda dehiscens*
33b. Most or all calyx lobes 2.3–5.9 mm.
38a. Corolla with tube ca. 32 mm and lobes ca. 4 mm; Hainan ..... 20. *M. membranifolia*
38b. Corolla with tube 11–25 mm and lobes 2–6 mm; widespread, including Hainan.
39a. Corolla lobes ca. 2 mm.
40a. Corolla tube ca. 22 mm; Assam (not known from China, included here for reference) ..... *M. parryorum* (see comment above)
40b. Corolla tube 13–15 mm; Hainan ..... 18. *M. lotungensis*
39b. Corolla lobes 3.5–6 mm; widespread.
41a. Inflorescences subcapitate, mostly unbranched; flowers 3–20, sessile to subsessile (though fruit may be stipitate).
42a. Corolla tube 22–25 mm; stems generally without axillary short shoots ..... 6. *M. densiflora*
42b. Corolla tube 11–20 mm; stems often with axillary short shoots with small leaves ..... 25. *M. pubescens*
41b. Inflorescences branched, at least to one order, i.e., tripartite; flowers 5 to numerous, sessile to long pedicellate.
43a. Stems strigose; near sea level to 1400 m ..... 7. *M. divaricata*
43b. Plants tomentose to glabrescent; 1200–1400 m ..... 28. *M. simpliciloba*

1. Mussaenda antiloga Y. H. Chun & W. C. Ko, Fl. Hainan. 3: 582. 1974.

壮丽玉叶金花 zhuang li yu ye jin hua

Climbing shrubs; branches terete, sparsely strigillose to glabrescent. Leaves opposite; petiole 3–10 mm, densely strigillose to glabrescent; blade drying membranous, elliptic-oblong, elliptic, or oblanceolate, 7–11(–18) × 2–5.5 cm, adaxially sparsely strigillose to glabrescent, abaxially moderately to sparsely strigillose with pubescence denser on veins, base acute to obtuse, apex acuminate; secondary veins 4–6 pairs, tertiary venation visible and reticulate; stipules deciduous, triangular to ovate, 3–6 mm, densely strigillose, deeply 2-lobed, lobes narrowly triangular to linear. Inflorescence laxly cymose, usually regularly dichotomous, ca. 5 × 4–5 cm, strigillose to glabrescent, pedunculate; peduncles 3.5–4 cm; bracts subulate, 1–3 mm; pedicels 1–5 mm. Flowers pedicellate (or on higher order inflorescence axes). Calyx with hypanthium portion ellipsoid to

turbinate, 2–3 mm, glabrous; lobes narrowly triangular to linear, 1–2 mm, strigillose, 1 lobe on 1 flower of most inflorescences enlarged into calycophyll, blade elliptic or ovate, 3–5 × 2–3 cm, sparsely puberulent to strigillose especially on veins, base obtuse, stipe 15–24 mm, apex acute to obtuse. Corolla yellow, outside sparsely to moderately strigillose; tube 22–31 mm, inside with clavate hairs at inflated throat; lobes broadly ovate, 3–4 mm, inside densely yellow papillose. Berry subglobose or ellipsoid, 8–10 × 5–7 mm, glabrous, with calyx limb caducous. Fl. May–Dec.

● Wet sites in dense forests; ca. 900 m. S Hainan.

H. H. Hsue and H. Wu (in FRPS 71(1): 296. 1999) gave the corolla tube length of this species as 22–25 mm, but the corolla tube of the type specimen is ca. 31 mm; this report is added here.

2. Mussaenda breviloba S. Moore, J. Bot. 43: 137. 1905.

短裂玉叶金花 duan lie yu ye jin hua

Shrubs to 1.5 m tall; branches terete, ferruginous tomentose. Leaves opposite; petiole 1–5 mm, tomentulose; blade drying stiffly papery, long elliptic to broadly elliptic, 5.5–10 × 3.5–5 cm, adaxially sparsely strigillose with pubescence denser along veins, abaxially pale tomentose along veins with indument grayish white and brownish, base obtuse, apex acuminate or acute; secondary veins 7 or 8 pairs; stipules triangular-ovate, 4–5 mm, deeply 2-lobed, lobes triangular-subulate. Inflorescence cymose to corymbiform, densely flowered to rather lax, ca. 4.5 × 7–8 cm, brown tomentose, pedunculate; bracts subulate, 3–5 mm, acute; pedicels 1–2 mm. Flowers sessile or pedicellate. Calyx tomentose; hypanthium portion ellipsoid to turbinate, 1.5–2.5 mm; lobes lanceolate or triangular-linear, ca. 2 mm, sometimes 1 lobe on 1 flower per inflorescence expanded into calycophyll, blade elliptic, 3–4 × 1–2 cm, both surfaces pubescent with pubescence denser along veins, base acute, stipe ca. 6 mm, apex acute or obtuse. Corolla pale yellow, externally densely tomentulose to strigose; tube ca. 12.8 mm, with clavate hairs in throat; lobes triangular, ca. 2.2 mm, acuminate. Berry unknown. Fl. Apr.

Roadsides in mountain forests; ca. 1300 m. Yunnan [Thailand].

This species was described from Thailand, and characters from there are added to the description here. H. H. Hsue and H. Wu (in FRPS 71(1): 291. 1999) described the corolla tubes as 20–23 mm, which would make this species very similar to *Mussaenda laxiflora*, but the protologue described them as ca. 12.8 mm.

3. Mussaenda caudatiloba D. Fang, Acta Phytotax. Sin. 40: 156. 2002.

尾裂玉叶金花 wei lie yu ye jin hua

Shrubs, erect to climbing, size not reported; branches terete, retrorsely to spreading villous. Leaves opposite; petiole 5–10 mm, villous; blade drying thinly papery, dark green adaxially, pale abaxially, ovate to lanceolate, 4–11 × 2–5 cm, both surfaces subappressed villous with pubescence denser on principal veins, base rounded to rarely cordate, apex acuminate to subcaudate; secondary veins 6–9 pairs; stipules persistent, deeply 2-lobed, villous, lobes linear-subulate, 7–10 mm. Inflorescences congested-cymose, several flowered, densely villous, pedunculate; peduncle 0.5–1 cm; bracts linear, ca. 8 mm. Flowers sessile. Calyx densely spreading villous; hypanthium portion turbinate, ca. 2.5 mm; lobes linear, 10–13 mm, acute, 1 lobe on 1 or 2 flowers per inflorescence expanded into white calycophyll, blade ovate, 5–6.7 × 3–5.3 cm, appressed villous, base rounded, stipe 18–25 mm, apex acute. Corolla outside spreading grayish villous; tube ca. 25 mm, inside densely clavate puberulent in upper part; lobes triangular-lanceolate, ca. 8 mm, caudate. Berry unknown. Fl. May.

● Thickets. Guangxi.

The pubescence descriptions here are from the protologue.

4. Mussaenda chingii C. Y. Wu ex H. H. Hsue & H. Wu, Acta Phytotax. Sin. 24: 236. 1986.

仁昌玉叶金花 ren chang yu ye jin hua

Shrubs, ca. 1.5 m tall; branches terete, appressed pubescent. Leaves opposite; petiole 5–6 mm, sparsely appressed pubescent; blade drying papery, adaxially shiny green, abaxially glaucous, broadly ovate-elliptic or broadly ovate, 5.5–7.5 × 3–4.7 cm, both surfaces sparsely appressed pubescent with pubescence denser along veins, base rounded or obtuse, apex cuspidate, acute, or acuminate; secondary veins 6 or 7 pairs; stipules deciduous, lanceolate or ovate, ca. 6 mm, densely pubescent, deeply 2-lobed, lobes narrowly triangular. Inflorescences congested-cymose to somewhat lax, ca. 4 × 4.5 cm, densely pubescent, pedunculate or subsessile and tripartite; peduncle 1–1.5 cm; bracts linear, ca. 3.5 mm. Flowers shortly pedicellate. Calyx sparsely to densely pubescent; hypanthium portion cylindrical to ellipsoid, ca. 2.5 mm; lobes lanceolate-triangular, 1.5–2 mm, acuminate, 1 lobe on 1–3 flowers per inflorescence expanded into calycophyll, blade elliptic to obovate, ca. 2.4 cm × 9 mm, pubescent along veins on both surfaces, base cuneate, stipe ca. 10 mm, apex acute. Corolla yellow to orange, outside sparsely to densely appressed pubescent; tube ca. 21 mm, inside densely yellow clavate puberulent in upper part; lobes orbicular-ovate, ca. 2.5 mm, inside yellow papillose, acute to apiculate. Berry unknown. Fl. May.

● Thickets. Guangxi.

5. Mussaenda decipiens H. Li, Acta Phytotax. Sin. 18: 117. 1980.

墨脱玉叶金花 mo tuo yu ye jin hua

Shrubs, 1–2 m tall; branches villous, terete, drying dark green. Leaves opposite; petiole 1–5 cm, densely villous; blade drying papery, elliptic, 13–15 × 6–7.5 cm, adaxially subglabrous, abaxially hirsute with pubescence denser along veins, base narrowly cuneate and decurrent on petiole, apex acuminate; secondary veins 7–9 pairs, tertiary venation indistinct; stipules apparently persistent, linear-lanceolate to lanceolate, 15–20 mm, densely villous, shortly 2-lobed. Inflorescence laxly to rather congested-cymose, generally dichotomous, ca. 10 cm wide, branched 3 or 4 times, villous becoming glabrescent, pedunculate. Flowers subsessile, biology not noted. Calyx with hypanthium portion turbinate, ca. 5 mm, hirtellous; lobes linear, 3–4 mm, sparsely villous, with 1 lobe on ca. 5 flowers per inflorescence expanded into white calycophyll, blade elliptic, ca. 7.5

× 4 cm, base obtuse to cuneate, apex shortly acuminate. Corolla yellow, tubular-salverform, outside densely pale yellow strigose; tube ca. 18 mm; lobes ovate-lanceolate, ca. 6 × 3 mm, abaxially carinate, adaxially densely orange-yellow papillose, long caudate. Capsule or berry globose, ca. 6 mm in diam., smooth, glabrous, with calyx limb persistent. Fl. Aug.

● Broad-leaved forests or thickets on mountain slopes; 300–1700 m. Xizang (Mêdog), Yunnan (Gongshan).

The protologue described the fruit of this species as capsular, which would be anomalous in *Mussaenda*, although H. H. Hsue and H. Wu (in FRPS 71(1): 293. 1999) described it as a berry.

6. Mussaenda densiflora H. L. Li, J. Arnold Arbor. 24: 455. 1943.

密花玉叶金花 mi hua yu ye jin hua

Climbers, ca. 2 m tall; branches terete, densely yellowish brown villous or hirsute. Leaves opposite; petiole 5–7 mm, densely hirsute; blade drying membranous or thinly papery, broadly oblong-lanceolate or narrowly oblong-elliptic to usually ovate, 8–13 × 3–6 cm, adaxially moderately to sparsely strigose, hirsute, or hirsutulous, abaxially moderately to densely hirsute, pilose, or strigose with pubescence denser on principal veins, base obtuse to rounded and sometimes abruptly attenuate, apex acute or acuminate; secondary veins 8–10 pairs, tertiary venation visible and reticulate; stipules persistent, 8–10 mm, densely villous to hirsute, deeply 2-lobed, lobes lanceolate, narrowly triangular, or linear. Inflorescences capitate or subcapitate with 2–5 subglobose heads, 2–6 × 2–6 cm, densely villous, subsessile to pedunculate; peduncle to 3.5 cm; bracts lanceolate, narrowly triangular, narrowly elliptic, or linear, 10–15 mm. Flowers sessile, biology not noted. Calyx densely hirsute; hypanthium portion urceolate to ellipsoid, 2–3 mm; lobes linear-lanceolate to usually linear, 8–15 × 0.2–2 mm, sometimes 1 lobe of 1 or 2 flowers per inflorescence expanded into white calycophyll, blade ovate, 5–6 × 3–4 cm, moderately to densely strigose to pilose on both surfaces, base obtuse to cordulate, stipe 8–15 mm, apex acute to acuminate. Corolla yellow, outside moderately to densely hirsute; tube 22–25 mm, sometimes contracted around anthers; lobes narrowly lanceolate or orbicular-lanceolate, 6–8 mm, inside densely yellow papillose, long acuminate. Berry ovoid, 8–9 × 6–7 mm, glabrous, with calyx limb deciduous. Fl. May.

Sparse thickets; 300–800 m. Guangxi [Vietnam (*Tsang 29049*, P!)].

This species is said in the protologue to be similar to *Mussaenda subsessilis* Pierre, and it may be that with more specimens the distinctions between them (smaller calycophylls and longer narrower corolla lobes in *M. densiflora*) may turn out to be endpoints of continuous variation. H. H. Hsue and H. Wu (in FRPS 71(1): 300. 1999) described the stipules as caducous, but this has not been seen on specimens studied. The protologue described the corolla tube as 3–3.5 cm, but this does not match specimens seen, including the type; this may have been the length of the entire corolla that was labeled incorrectly in the final article.

7. Mussaenda divaricata Hutchinson in Sargent, Pl. Wilson. 3: 394. 1916.

展枝玉叶金花 zhan zhi yu ye jin hua

Climbing or suberect shrubs; branchlets terete, sparsely or moderately strigose to densely mixed strigose, -strigillose, and -hirtellous, sometimes becoming glabrescent, sometimes with congested groups of leaves borne on reduced axillary buds. Leaves opposite; petiole 0.5–1 cm, densely strigose; blade drying thinly papery, adaxially pale to bright green or brown, abaxially pale gray to bright green, elliptic, lanceolate, elliptic-oblong, or ovate-elliptic, 3.5–12 × 1.5–7 cm, adaxially sparsely strigillose on lamina and densely strigillose on principal veins, abaxially strigillose to glabrous on lamina and densely strigillose along veins, base obtuse to acute, apex acute to abruptly acuminate; secondary veins 5–11 pairs, tertiary venation reticulate to subparallel; stipules usually deciduous, ovate to triangular, 3–7 mm, moderately to densely strigose, deeply 2-lobed, lobes narrowly triangular to subulate. Inflorescence congested to somewhat laxly cymose, 1–2 × 3–4 cm, densely strigose, tripartite and sessile or pedunculate; peduncle 0.3–3.5 cm; bracts narrowly triangular to linear, 1–7 cm, strigose to glabrescent; pedicels to 1.5 mm. Flowers subsessile to pedicellate, biology not noted. Calyx with hypanthium portion ellipsoid to turbinate, 1.5–2 mm, sparsely strigose; lobes subulate, 2.2–5 mm, densely strigillose to strigose, with 1 lobe on 1–3 flowers per inflorescence expanded into white calycophyll, blade broadly elliptic or ovate, 3.5–6 × 3–5 cm, sparsely strigillose on lamina and densely strigillose along veins on both surfaces, base cuneate to truncate, stipe 10–25 mm, apex obtuse to shortly acuminate. Corolla yellow, salverform, densely strigillose outside; tube 18–25 mm, densely yellow clavate pubescent inside upper part; lobes ovate, 3.5–4 mm, adaxially densely yellow papillose, acute to shortly acuminate. Berry ellipsoid, 1–1.2 × 0.4–0.6 cm, sparsely strigillose, on pedicels or stipes to 6 mm. Fl. May–Sep, fr. Oct.

Thickets at riversides, in fields, or in valleys; near sea level to 1400 m. Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [Vietnam].

The illustration of this species presented by H. H. Hsue and H. Wu (in FRPS 71(1): 304, t. 80, f. 1–3. 1999) is difficult to separate from the plants included here in *Mussaenda frondosa*.

1a. Branches and abaxial surface of leaf blades sparsely pubescent ..... 7a. var. *divaricata*
1b. Branches and abaxial surface of leaf blades densely pubescent ..... 7b. var. *mollis*

7a. Mussaenda divaricata var. **divaricata**

展枝玉叶金花(原变种) zhan zhi yu ye jin hua (yuan bian zhong)

Branches sparsely pubescent. Leaf blade sparsely pubescent abaxially. Fl. Jun–Sep.

● Thickets at riversides or in fields; near sea level to 1200 m. Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan.

7b. Mussaenda divaricata var. **mollis** Hutchinson in Sargent, Pl. Wilson. 3: 398. 1916.

柔毛玉叶金花 rou mao yu ye jin hua

Branches densely pubescent. Leaf blade densely pubescent abaxially. Fl. May, fr. Oct.

Thickets in valleys; ca. 1400 m. Yunnan [Vietnam].

8. Mussaenda elliptica Hutchinson in Sargent, Pl. Wilson. 3: 395. 1916.

椭圆玉叶金花 tuo yuan yu ye jin hua

Shrubs, 1–2 m tall; branchlets terete, sparsely strigillose. Leaves opposite; petiole 0.7–1 cm, strigillose to strigose; blade drying thinly papery, elliptic, 6–20 × 3–10 cm, both surfaces glabrous to strigillose at least on veins, base rounded to cuneate, apex acuminate; secondary veins 6 or 7 pairs, tertiary venation apparently reticulate; stipules deciduous, ovate-triangular, ca. 8 mm, sparsely puberulent, deeply 2-lobed, lobes narrowly triangular, acuminate. Inflorescence congested-cymose, ca. 1.5 × 1.5 cm, strigillose or strigose, subsessile to pedunculate; bracts linear-subulate, to 8 mm. Flowers pedicellate, biology not noted. Calyx strigillose; hypanthium portion turbinate, ca. 2 mm; lobes subulate, 6–7 mm, with 2 lobes on 2–5 flowers per inflorescence expanded into white calycophyll, blade broadly ovate, 5–7.5 × 3.5–5 cm, strigillose along veins, base obtuse to truncate, stipe 7–15 mm, apex acute to shortly acuminate. Corolla yellow, salverform, outside strigose; tube ca. 20 mm, densely yellow clavate pubescent inside upper part; lobes triangular-ovate, ca. 3 mm, mucronate with appendage ca. 1 mm. Berry unknown. Fl. May–Jun.

● Forests in valleys, forest margins; 600–1000 m. Guangxi, Sichuan, Yunnan.

It is implied in the protologue that the stipules are entire, but on an isotype specimen (*E. H. Wilson 4604,* US – bar code 00137848, Web!) they are deeply bilobed; also the protologue described the inflorescences as pedunculate, but they are subsessile on this isotype. In FRPS (71(1): 302. 1999), the leaves were described as sparsely pubescent and the calyx lobes as 4.5–5.5 mm, but in the protologue they were described as glabrous and 6–7 mm, respectively.

9. Mussaenda emeiensis Z. Y. Zhu & S. J. Zhu, Bull. Bot. Res., Harbin 28: 257. 2008.

峨眉玉叶金花 e mei yu ye jin hua

Weak shrubs, to 5 m tall; branches compressed, shortly pubescent. Leaves opposite; petiole 2–3.5 cm, shortly pubescent; blade drying thickly papery, green adaxially, pale abaxially, 7–18(–20) × 4.5–12(–15) cm, both surfaces pilose on veins to glabrescent, base obtuse to acute, apex acute to acuminate; secondary veins 7–9 pairs; stipules triangular-ovate to broadly ovate, 6–7 mm, shortly pubescent, acute to cuspidate or 2-lobed. Inflorescence cymose or fasciculate, ca. 1 × 1.5 cm, many flowered, densely pubescent, sessile; bracts ovate-lanceolate, 4–10 mm, acuminate; pedicels ca. 2 mm. Flowers pedicellate, biology not noted. Calyx obovoid, ca. 4 mm, pilosulous; lobes oblong-lanceolate to lanceolate, 8–10 × 2–2.5 mm, pilosulous, acute, with 1 lobe in ca. 2 flowers per inflorescence expanded into calycophyll, blade ovate to elliptic, 2.5–5.5 cm, pubescent to glabrous, base obtuse, stipe 8–10 mm, apex obtuse to acute. Corolla yellow or orange, tubular, outside densely pubescent; tube 10–11 mm, inside densely clavate pilose; lobes broadly ovate, 3–4 mm, inside verrucose, acute to acuminate. Berry ellipsoid, ca. 10 × 8 mm, pilosulous to glabrescent, calyx limb deciduous.

● Mixed forests on slopes; 700–900 m. Sichuan (Emei Shan).

10. Mussaenda erosa Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 4: 193. 1852.

楠藤 nan teng

Climbing shrubs, to 5 m tall; branches glabrous, terete, sparsely lenticellate. Leaves opposite; petiole 0.3–1.5 cm, glabrous; blade drying thickly papery, brown, ovate, oblanceolate, lanceolate, or oblong-elliptic, 5.5–14 × 2.4–6 cm, both surfaces glabrous or sparsely strigose on principal veins, base acute, cuneate, or occasionally obtuse, apex acute to acuminate; secondary veins 4–6 pairs, without domatia, tertiary venation only sparsely visible abaxially; stipules caducous exposing a fringe of persistent reddish brown trichomes, narrowly triangular, 3–8 mm, glabrous, deeply 2-parted, lobes acute to acuminate. Inflorescence compound-cymose to compound-corymbiform, 2–8 × 2–12 cm, congested when young becoming lax with age, glabrous, pedunculate or sessile and 3- or 5-partite; peduncles 1–2.5 cm; bracts triangular to linear-lanceolate, 1.5–7 mm, sparsely strigillose to glabrous; pedicels 1–5 mm. Flowers pedicellate, biology not noted. Calyx with hypanthium portion ellipsoid, 2.5–3.5 mm, glabrous; lobes linear-lanceolate to narrowly triangular, 2–4.5 mm, often unequal on an individual flower, strigillose or hispidulous, with 1 lobe on 1–6 flowers per inflorescence expanded into white calycophyll, blade broadly elliptic to ovate, 3.5–6.5 × 3–5 cm, glabrous except sparsely strigillose on principal veins, base cuneate, rounded, or truncate, stipe 9–20 mm, apex rounded to acute. Corolla yellow to orange-yellow, outside densely strigillose to strigose; tube 22–24 mm; lobes ovate, 4–5 mm, adaxially yellow papillose, rounded then abruptly shortly acuminate. Berry ellipsoid to subglobose, 10–13 × 8–10 mm, glabrous, smooth or sparsely lenticellate, calyx limb deciduous. Fl. Apr–Jul, fr. Sep–Dec.

Sparse evergreen forests, streamsides, along roads; 300–800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Japan (Ryukyu Islands), Vietnam].

11. Mussaenda frondosa Linnaeus, Sp. Pl. 1: 177. 1753.

洋玉叶金花 yang yu ye jin hua

Climbing shrubs; branches terete to compressed, moderately to densely pale red sericeous to hirsute becoming glabrescent, red-brown or brown, rather densely lenticellate. Leaves opposite; petiole 4–10 mm, densely sericeous; blade drying thinly papery or leathery, adaxially dark green to brownish green, abaxially pale green to yellowed, broadly elliptic, elliptic-oblong, ovate, or oblanceolate, 8–15 × 3–8 cm, both surfaces sparsely strigillose on lamina and strigose to sericeous on principal veins, base acute, obtuse, or rounded, apex acute to caudate-acuminate; secondary veins 7–10 pairs, tertiary venation visible and reticulate; stipules persistent, triangular, 5–10 mm, densely strigose to pilose, deeply 2-lobed, lobes lanceolate to narrowly triangular, acute to acuminate. Inflorescences congested-cymose becoming lax with lateral axes elongating markedly, 4–8 × 8–20 cm with lateral axes to 8 cm, sparsely to moderately pubescent with 2 types of pubescence, mixed strigillose to appressed puberulent and hirsute to villous, pedunculate or sessile and 3-partite; peduncles 1–3 cm; bracts triangular

or elliptic, 4–10 mm, usually 2- to multifid, acute to acuminate; pedicels 1–6 mm. Flowers pedicellate, biology not noted. Calyx with hypanthium portion ellipsoid, 3–4 mm, strigose to sericeous; lobes narrowly triangular to narrowly ligulate, 7–12 mm, hirsute, acute to acuminate, with 1 lobe of 1–4 flowers per inflorescence sometimes expanded into calycophyll, blade elliptic-oblong to ovate, 6–8 × 2.5–5 cm, both surfaces glabrescent on lamina and strigillose on principal veins, base acute to cuneate, stipe 10–30 mm, apex acute or acuminate. Corolla salverform, outside hirsute; tube 22–25 mm; lobes ovate, 6–7 mm, acuminate. Berry ovoid or ellipsoid, ca. 10 × 7 mm, strigose to glabrescent, calyx limb deciduous. Fl. Apr–May.

Cultivated in Guangdong and Hainan [native to Cambodia, India, Indonesia, Sri Lanka, and Vietnam].

12. Mussaenda hainanensis Merrill, Lingnan Sci. J. 14: 58. 1935.

海南玉叶金花 hai nan yu ye jin hua

Climbing shrubs; branches terete, densely ferruginous- or gray villosulous to tomentulose. Leaves opposite; petiole 2–5 mm, densely velutinous to hirtellous; blade drying papery, adaxially dark green, abaxially pale, oblong-elliptic, obovate, or lanceolate, 3–12 × 1.5–4 cm, adaxially sparsely to densely villosulous to strigillose or hispid, abaxially densely villosulous or tomentulose, both surfaces with pubescence denser along principal veins, base cuneate to acute, apex acute to shortly acuminate; secondary veins 7 or 8 pairs, tertiary venation visible and reticulate; stipules persistent, triangular to ovate, 3–7 mm, densely pilosulous to villosulous, entire or usually deeply 2-lobed, lobes lanceolate to linear, acuminate. Inflorescence subcapitate to congested-cymose, 3–5 × 3–5 cm, densely pilosulous to villosulous, pedunculate or sessile and 3-partite; peduncle 1–3 cm; bracts linear-lanceolate, 3–6 mm. Flowers sessile or subsessile, biology not noted. Calyx densely strigose to sericeous or pilose; hypanthium portion ellipsoid to turbinate, 1.5–2 mm; lobes linear-lanceolate to narrowly elliptic, 6–8 mm, acute to acuminate, with 1 lobe on 1 or 2 flowers per inflorescence expanded into calycophyll, blade broadly elliptic to ovate, 1.5–4 × 1–3.5 cm, moderately to sparsely strigillose or sericeous, base obtuse, truncate, or cordulate, stipe 10–16 mm, apex acute. Corolla yellow, salverform, densely strigose outside; tube 20–25 mm; lobes triangular-ovate, 3–5 mm, adaxially densely yellow papillose, acuminate. Berry ellipsoid to ellipsoid-oblong, 18–20 × 11–12 mm, pilosulous to hirtellous, densely lenticellate, somewhat woody, with calyx limb deciduous, with pedicels sometimes elongating, to 4 mm. Fl. Mar–Jun, fr. Jul–Aug.

● Forests at middle elevations; 300–800 m. Hainan.

The protologue and H. H. Hsue and H. Wu (in FRPS 71(1): 297. 1999) described the “calyx tube” as 3–4 mm, but this has not been seen on specimens studied.

13. Mussaenda hirsutula Miquel, J. Bot. Néerl. 1: 109. 1861.

粗毛玉叶金花 cu mao yu ye jin hua

Mussaenda inflata H. S. Hsue & H. Wu.

Climbing shrubs; branches terete, densely ferruginous- or gray villosulous, hirtellous, or tomentulose. Leaves opposite; petiole (2–)3–15 mm, moderately to densely villosulous, tomentulose, or velutinous; blade drying papery to subleathery, abaxially pale, oblong-elliptic, lanceolate, or ovate, (4–)7–13 × (2–)2.5–4 cm, adaxially sparsely to moderately hirtellous or hispid with pubescence usually denser along principal veins, abaxially moderately to densely villosulous, hirtellous, or strigose-hirsute, base acute, cuneate, or rounded, apex acute or acuminate; secondary veins 5–8 pairs, tertiary venation visible and reticulate; stipules persistent (or in *M. inflata* form deciduous), triangular, (4–)5–10 mm, densely strigose, villosulous, or pilose, deeply 2-lobed, lobes lanceolate, narrowly triangular, or linear. Inflorescence subcapitate to congested-cymose, (1–)1.5–4 × 1.5–4 cm, densely villosulous to hirsute, pedunculate; peduncle 0.3–1.5 cm; bracts linear-lanceolate, 4–6 mm. Flowers subsessile or sessile, biology not noted. Calyx sparsely to densely villosulous or villous; hypanthium portion ellipsoid to subglobose, 1.5–2 mm; lobes linear to narrowly triangular, (4–)7–10(–13) mm, sometimes 1 lobe on 1–3 flowers per inflorescence expanded into calycophyll, blade broadly elliptic to ovate, (2.5–)4–6 × (2–)3–5 cm, sparsely strigillose to villosulous with pubescence usually denser on veins, base cuneate to rounded, stipe 10–14 mm, apex rounded or acute. Corolla yellow to orange-yellow, salverform, outside densely strigose to sericeous; tube cylindrical and 26–28 mm (or constricted in throat and 18–19 mm in *M. inflata* form); lobes elliptic to lanceolate, 4–6 mm, adaxially densely yellow papillose, acute to acuminate. Berry ellipsoid or subglobose, 14–20 × 9–12 mm, lenticellate, with calyx limb persistent, with pedicels sometimes elongating, to 4 mm. Fl. Apr–Jun (Nov in *M. inflata* form), fr. Jul–Jan of following year.

● Thickets in fields, at streamsides, or in valleys, often on tree crowns; 300–800 m. Guangdong, Guizhou, Hainan, Hunan, Yunnan.

The name *Mussaenda inflata* was based on a single specimen distinguished primarily by a notably swollen corolla. Deng and Zhang (Acta Phytotax. Sin. 44: 608–609. 2006) studied this and concluded that *M. inflata* is a synonym of *M. hirsutula* and was described based on a specimen with malformed corollas. In the description above, in general, the measurements in parentheses apply only to the plants previously included in *M. inflata*.

14. Mussaenda hossei Craib, Beih. Bot. Centralbl. 28(2): 444, 457. 1911.

红毛玉叶金花 hong mao yu ye jin hua

Mussaenda rehderiana Hutchinson.

Shrubs, to 2 m tall; branches densely whitened, reddish, or brownish villosulous, tomentulose, or villous, terete, sometimes becoming glabrescent. Leaves opposite; petiole 0.5–3 mm, villosulous to villous; blade drying thickly papery, oblanceolate, oblong-oblanceolate, elliptic, lanceolate, or ovate, 3–14 × 1.5–4 cm, adaxially sparsely to densely pilosulous to villosulous, abaxially densely hirtellous, villosulous, or villous, base obtuse, subcordate, or rounded, apex acuminate or acute; secondary veins 8–10 pairs, tertiary venation not readily visible; stipules usually persistent, lanceolate to triangular, 5–7 × 2–3 mm, densely strigose, villosulous, or villous, entire or usually 2-lobed for up to 1/2, segments acute to acuminate. Inflorescence congested-cymose, densely tomentose to villous, pedunculate or

sessile and 3(or 5)-partite; peduncle 1–5 cm; bracts lanceolate, narrowly triangular, or linear, 1–10 mm; pedicels to 1 mm. Flowers subsessile to shortly pedicellate, biology not noted. Calyx densely villosulous to hirtellous; hypanthium portion subellipsoid to oblanceoloid, 2–2.5 mm; lobes lanceolate to narrowly triangular, 2–2.2 mm, acute, with 2 lobes on 4–6 flowers of each inflorescence expanded into white calycophyll, blade elliptic to suborbicular, 2–5.5 × 2–4 cm, base cuneate to cordulate, stipe 12–15 mm, apex obtuse or rounded and shortly acuminate. Corolla orange-yellow, salverform, outside densely pilosulous, villosulous, or tomentulose; tube 20–26 mm; lobes suborbicular, 2.5–3 mm, obtuse then abruptly acuminate or acute. Berry oblong-ellipsoid, ca. 18 × 8 mm, calyx lobes persistent. Fl. Nov–Mar.

Forests; 600–1600 m. S Yunnan [Laos, Myanmar, Thailand, Vietnam].

In the protologue, Craib noted variation in density of the pubescence among the few specimens he studied; continuous variation in density and length of the trichomes is evident among the specimens collected since then.

15. Mussaenda kwangsiensis H. L. Li, J. Arnold Arbor. 24: 455. 1943.

广西玉叶金花 guang xi yu ye jin hua

Climbing shrubs; branches terete, densely strigillose, sometimes with congested groups of leaves borne on reduced axillary buds. Leaves opposite; petiole 5–8 mm, appressed pubescent; blade drying thinly papery, oblong-lanceolate or lanceolate, 8–11 × 2.5–4 cm, adaxially sparsely strigillose with pubescence denser along veins, abaxially densely villous, sparsely villosulous, or hirtellous, base attenuate or cuneate, apex acuminate or shortly acuminate; secondary veins 6–8 pairs, with tertiary venation not readily visible; stipules caducous, deeply 2-parted, lobes linear, ca. 6 mm. Inflorescence congested-cymose, ca. 4 cm, moderately to densely strigillose; bracts linear, 5–15 mm. Flowers densely grouped, sessile, biology not noted. Calyx with hypanthium portion ellipsoid, ca. 5 mm, densely pubescent; lobes linear, 25–30 × 1–2 mm, sparsely pilose, with 1 lobe on 1(or ?more) flower in each inflorescence enlarged into white calycophyll, blade ovate, ca. 6 cm, sparsely pubescent on both surfaces, base rounded, stipe ca. 8.5 mm, apex acuminate. Corolla yellow, slenderly salverform, outside gray pubescent; tube 20–25 mm; lobes ovate, ca. 3 × 1.5 mm, adaxially densely yellow papillose, acuminate, acute, or mucronate. Berry not seen. Fl. Sep–Jan.

● Sparse forests at streamsides in valleys. Guangxi.

16. Mussaenda kwangtungensis H. L. Li, J. Arnold Arbor. 25: 427. 1944.

广东玉叶金花 guang dong yu ye jin hua

Climbing shrubs, 1–2.5 m tall; branches terete, brown, densely strigillose becoming glabrescent. Leaves opposite; petiole 3–5 mm, strigillose; blade drying thinly papery, lanceolate-elliptic to elliptic-oblong, 3–9 × 1–3 cm, adaxially sparsely strigillose to glabrescent, abaxially sparsely to densely strigose or strigillose with pubescence denser along principal veins, base acute to obtuse, apex acute to acuminate with tips to 1 cm; secondary veins 3–6 pairs, apparently without domatia, tertiary venation not visible; stipules caducous, 1.5–3 mm, densely strigillose, deeply 2-lobed, lobes linear, 1.5–2 mm. Inflorescence compact-cymose to subcapitate, ca. 1 × 1–1.5 cm, few to several flowered, densely strigillose, pedunculate; peduncles 2–10 mm; bracts linear, ca. 1 mm. Flowers subsessile, biology not noted. Calyx strigillose to glabrescent; hypanthium portion ellipsoid, 2–3 mm; lobes linear, 2.5–3.5 mm, with 1 lobe on 2–4 flowers per inflorescence sometimes expanded into calycophyll, blade oblong-ovate, elliptic, or elliptic-ovate, 3.5–5 × 1.5–2.5 cm, strigillose, base cuneate, stipe 12–15 mm, apex acute to obtuse. Corolla yellow, salverform, outside strigose to strigillose; tube (31–)39–42 mm; lobes ovate, 4.5–5 mm, adaxially densely yellow papillose, acuminate. Berry not seen. Fl. May–Sep.

● Thickets on mountains. S Guangdong.

17. Mussaenda laxiflora Hutchinson in Sargent, Pl. Wilson. 3: 399. 1916.

疏花玉叶金花 shu hua yu ye jin hua

Shrubs, to 3 m tall; branches terete, densely strigillose, strigose, or appressed tomentose. Leaves opposite; petiole 4–10 mm, densely strigillose or appressed tomentulose; blade drying papery, elliptic, obovate, or obovate-oblanceolate, 6.5–14 × 2.5–5 cm, adaxially sparsely strigillose especially along veins, abaxially densely strigillose to strigose along veins and glabrescent on lamina, base cuneate, apex caudate to acuminate; secondary veins 6–9 pairs, apparently without domatia, tertiary venation visible and subparallel; stipules deciduous, 4–8 mm, densely strigillose, deeply 2-lobed, lobes narrowly triangular, acute. Inflorescences congested to laxly cymose, 2–5 × 3–7 cm, densely strigose to strigillose, pedunculate or sessile and tripartite; peduncle 20–25 mm; bracts linear, 1–10, usually caducous; pedicels 1–5 mm. Flowers pedicellate in umbelliform groups of 2 or 3, biology not noted. Calyx moderately to densely strigose; hypanthium portion narrowly ellipsoid to turbinate, ca. 3 mm; lobes linear to narrowly triangular, 5–7 mm, with 1 lobe in 1–3 flowers per inflorescence sometimes expanded into calycophyll, blade lanceolate or ovate, 3.5–7 × 1.5–2.5 cm, sparsely strigillose with pubescence usually denser on veins, base cuneate to obtuse, stipe 10–12 mm, apex acute to subacuminate. Corolla yellow or orange-yellow, salverform, outside densely sericeous; tube 26–30 mm, inside densely yellow clavate pubescent in upper part; lobes triangular-lanceolate, 3–4 mm, adaxially densely yellow papillose, acuminate to long acuminate. Berry ellipsoid, ca. 1 cm, sparsely pubescent. Fl. Jun–Jul, fr. Aug–Dec.

● Forests, thickets; ca. 1600 m. Yunnan.

18. Mussaenda lotungensis Y. H. Chun & W. C. Ko, Fl. Hainan. 3: 581. 1974.

乐东玉叶金花 le dong yu ye jin hua

Climbing shrubs; branches terete, sparsely strigillose to glabrescent. Leaves opposite; petiole 4–12 mm, moderately to densely strigillose; blade drying papery, lanceolate or oblong-lanceolate, 5–10 × 1.5–3 cm, adaxially glabrous or sparsely strigillose along principal veins, abaxially sparsely strigillose to glabrous with pubescence denser along veins, base cuneate or obtuse, apex acuminate; secondary veins 4 or 5 pairs, tertiary

venation subparallel; stipules deciduous, triangular, 3–6 mm, moderately strigillose, deeply 2-lobed, lobes narrowly triangular to subulate. Inflorescences terminal on main stems and sometimes short lateral stems, congested to somewhat laxly cymose, 1–3 × 1.5–3 cm, moderately to densely strigillose and strigose, pedunculate; peduncles 1.5–2 cm; bracts triangular, 3–3.5 mm; pedicels 1–3 mm. Flowers pedicellate, biology not noted. Calyx with hypanthium portion ellipsoid to subturbinate, 2–2.5 mm, sparsely strigillose; lobes narrowly triangular, 1.5–2.5 mm, densely strigillose, with 1 lobe on 1–3 flowers per inflorescence expanded into calycophyll, blade narrowly oblong-elliptic to oblanceolate, 3–4 × 0.8–1.2 cm, both surfaces sparsely to moderately strigillose, base acute, stipe 5–16 mm, apex obtuse or acute. Corolla yellow, salverform, outside moderately to densely strigillose; tube 13–15 mm, with yellow clavate pubescence in throat; lobes triangular to ovate, ca. 2 mm, adaxially densely yellow papillose, acuminate. Berry unknown. Fl. Apr–Jun.

● Wet soil in dense forests. Hainan (Ledong).

19. Mussaenda macrophylla Wallich in Roxburgh, Fl. Ind. 2: 228. 1824.

大叶玉叶金花 da ye yu ye jin hua

Mussaenda hispida D. Don; *M. kotoensis* Hayata.

Erect or climbing shrubs; branches terete to quadrangular, sparsely to moderately sericeous. Leaves opposite; petiole 4–35 mm, sparsely hirsute to glabrescent; blade drying membranous to papery, green to brownish, paler below when specimen well preserved, elliptic-oblong, elliptic, or ovate, 12–21 × 8–11 cm, both surfaces sparsely strigillose to pilose on lamina and moderately hirsute along principal veins, base cuneate to obtuse, apex acute to acuminate; secondary veins 6–8 pairs, without domatia, tertiary venation reticulate; stipules deciduous, ovate to triangular, 5–8 mm, sparsely brown hirsute to glabrescent, deeply 2-lobed, lobes acute to acuminate. Inflorescences laxly cymose, 6–15 cm, hirsute, sessile with arching lateral axes; bracts lanceolate or 2- or 3-parted, 5–10 mm, obtuse to acuminate. Flowers subsessile, biology not noted. Calyx with hypanthium portion campanulate to obconic, 3–4 mm, densely brown strigose to sericeous; lobes lanceolate, ligulate, or oblanceolate, 4–11 × 1.5–3 mm, often unequal on an individual flower, densely to moderately strigillose to strigose, acute, with 1 lobe on 1 to several flowers in each inflorescence expanded into white calycophyll, blade broadly ovate or rhombic, 5–12 cm, both surfaces sparsely hirsute to glabrescent on lamina and moderately to densely pilosulous to puberulent on principal veins, base obtuse to truncate, stipe 18–37 mm, apex obtuse to shortly acuminate. Corolla orange-yellow to golden yellow, salverform, outside densely sericeous; tube 20–25 mm; lobes ovate, 7–10 mm, acute to acuminate. Berry ellipsoid, 10–15 mm, strigose, lenticellate, calyx limb deciduous. Fl. Jun–Jul, fr. Aug–Nov.

Thickets or forests on mountains; sea level to 1300 m. Guangdong, Guangxi, Taiwan [Indonesia, Malaysia, Philippines].

This species is circumscribed somewhat differently here than by H. H. Hsue and H. Wu (in FRPS 71(1): 287–289. 1999); see comments under *Mussaenda treutleri*.

20. Mussaenda membranifolia Merrill, Philipp. J. Sci. 23: 267. 1923.

膜叶玉叶金花 mo ye yu ye jin hua

Climbing shrubs; branches terete, glabrous. Leaves opposite; petiole 3–30 mm, hispid to strigillose; blade drying membranous, oblanceolate, elliptic, or elliptic-oblong, 9–15 × 2.5–4.5 cm, both surfaces sparsely strigose with pubescence denser along veins abaxially, base obtuse to acute, apex long acuminate; secondary veins 6–9 pairs, tertiary venation visible, reticulate; stipules generally deciduous, triangular, 3–5 mm, strigose, deeply 2-lobed, lobes linear. Inflorescences laxly dichotomous, 10–12 × 10–13 cm, strigillose to glabrescent, pedunculate or apparently sessile and tripartite; peduncles 4.5–6 cm; bracts linear, ca. 3 mm; pedicels 0.5–1 mm. Flowers pedicellate (or borne on higher order inflorescence axes), biology not noted. Calyx glabrous; hypanthium portion subellipsoid, 2–2.5 mm; lobes linear, 3–4 mm, with 1 lobe on 1 flower per inflorescence expanded into calycophyll, blade ovate to elliptic, 3–7.5 × 2–5 cm, strigose along veins on both surfaces, base cuneate to obtuse, stipe ca. 22 mm, apex acute to subacuminate. Corolla white, slenderly salverform, outside sparsely strigose; tube ca. 32 mm, densely yellow clavate pubescent in throat; lobes lanceolate or ovate-lanceolate, ca. 4 mm, adaxially yellow papillose, acute to acuminate. Berry subglobose or ellipsoid, 10–13 × 5–7 mm, glabrous, calyx lobes caducous. Fl. Apr–Jun, fr. Aug–Oct.

● Humid sites in forests. Hainan.

21. Mussaenda mollissima C. Y. Wu ex H. H. Hsue & H. Wu, Acta Phytotax. Sin. 24: 235. 1986.

多毛玉叶金花 duo mao yu ye jin hua

Shrubs, 1–7 m tall; branches terete, densely pale yellow- to brown tomentose, -hirtellous, or -hirsute. Leaves opposite; petiole 9–12 mm, sparsely to moderately strigose, hirtellous, or hirsute; blade drying subleathery, elliptic, broadly elliptic, or broadly ovate, 8–11 × 4–7.2 cm, both surfaces densely pale yellow tomentose to -hirtellous, base cuneate or obtuse, apex acute to shortly acuminate; secondary veins 9 or 10 pairs, apparently without domatia, tertiary venation reticulate to subparallel; stipules deciduous, ovate, ca. 6 mm, densely tomentose, deeply 2-lobed, lobes linear, ca. 3.5 mm. Inflorescence congested-cymose to subcapitate, ca. 4 × 4 cm, densely tomentose to hirtellous; peduncles 3–4 cm; bracts lanceolate, ca. 6 mm. Flowers subsessile, biology not noted. Calyx densely tomentose to hirtellous; hypanthium cylindrical to ellipsoid, 2.5–3.5 mm; lobes narrowly lanceolate to narrowly triangular, 3–4 mm, with 1 lobe in 1–4 flowers per inflorescence sometimes expanded into calycophyll, blade elliptic to obovate, ca. 5.5 × 2.8 cm, densely tomentose, base acute, stipe ca. 14 mm, apex obtuse to acute. Corolla orange, salverform, outside densely yellowish brown villous; tube ca. 22.5 mm, inside densely yellow clavate pubescent in upper part; lobes ovate, ca. 4 mm, adaxially densely yellow papillose, acuminate. Berry ellipsoid, ca. 12 × 9 mm, sparsely tomentose to hirtellous. Fl. May, fr. Jun.

● Forest margins, roadsides. S Yunnan.

22. Mussaenda multinervis C. Y. Wu ex H. H. Hsue & H. Wu, Acta Phytotax. Sin. 24: 237. 1986.

多脉玉叶金花 duo mai yu ye jin hua

Shrubs, 2–3 m tall; branches terete to angled, densely white pubescent to glabrescent. Leaves opposite; petiole ca. 3 cm, sparsely pubescent; blade drying membranous, adaxially drying pale green, abaxially gray, broadly elliptic or broadly ovate, 16–22 × 8.5–12 cm, adaxially sparsely appressed pubescent with pubescence denser on principal veins, abaxially glabrescent except densely appressed pubescent on principal veins, base acute, apex acute; secondary veins 11 or 12 pairs; stipules ovate-lanceolate, ca. 13 mm, acuminate and shortly 2-lobed. Inflorescence congested-cymose, ca. 4 × 8 cm, densely pale gray pilose, pedunculate or sessile and tripartite; bracts lanceolate, ca. 9 mm; pedicels ca. 1 mm. Flowers pedicellate, biology not noted. Calyx sparsely pubescent; hypanthium portion urceolate to ellipsoid, ca. 2.5 mm; lobes lanceolate, ca. 2 mm, with 1 lobe in ca. 3 flowers per inflorescence expanded into calycophyll, blade ovate, ca. 4 × 2.1 cm, densely pubescent along veins on both surfaces, base broadly cuneate, stipe ca. 19 mm, apex acute. Corolla pale blue, salverform, outside densely pubescent; tube ca. 23 mm, inside densely yellow clavate puberulent at upper part; lobes orbicular-ovate, ca. 2.5 mm, adaxially sparsely yellow papillose, mucronate. Berry globose, ca. 5 × 5 mm. Fl. May.

● Thickets, jungles; ca. 1500 m. S Yunnan.

The blue flowers, the lack of barbate pubescence in the throat of the tubular corolla (according to the protologue figure), and the apparently exserted stigmas (all these features are illustrated or described in the protologue) are quite anomalous features in *Mussaenda*.

23. Mussaenda parviflora Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 110. 1867.

小玉叶金花 xiao yu ye jin hua

Mussaenda albiflora Hayata; *M. parviflora* var. *formosana* Matsumura; *M. taihokuensis* Masamune.

Climbing shrubs or lianas; branches terete, sparsely to densely strigillose or glabrescent. Leaves opposite; petiole 1–2.3 cm, sparsely to densely strigillose; blade drying thickly papery, ovate, elliptic, or lanceolate, 7–15 × 2.3–6 cm, adaxially glabrous or strigillose on principal veins, abaxially sparsely to densely strigillose to appressed villous especially along veins, base acute to obtuse or subrounded, apex acuminate to caudate; secondary veins 5–7 pairs, tertiary venation rather finely reticulate; stipules usually deciduous, triangular, 5–7 mm, moderately to densely strigillose, deeply 2-lobed, lobes narrowly triangular to linear. Inflorescences laxly cymose, 4–8 × 3–8 cm, terminal and often in uppermost leaf axils, axes often somewhat scorpioid, sparsely to densely strigillose, pedunculate; peduncle 2–5 cm; bracts broadly triangular to linear, 1–7 mm, often caducous; pedicels 2–5 mm. Flowers pedicellate (or borne on higher order inflorescence axes), floral biology not noted. Calyx sparsely to densely strigillose; hypanthium portion ellipsoid to turbinate, 1.5–5 mm; lobes linear to narrowly triangular, 3–6 mm, with 1 lobe on 1–3 flowers of some inflorescences expanded into white calycophyll, blade broadly ovate or elliptic, 3–4.5 cm, sparsely strigillose to glabrescent, base obtuse to rounded, stipe 4–10 mm, apex obtuse to shortly acuminate. Corolla yellow, salverform to tubular-funnelform, outside puberulent to glabrous; tube 5–8 mm, densely yellow clavate pubescent in throat; lobes ovate, 2–3 mm, abaxially densely yellow papillose, acute to cuspidate. Berry ellipsoid to subglobose, 10–15 mm, glabrescent, calyx limb caducous, with pedicels sometimes elongating, to 12 mm. Fl. Mar–May, fr. Aug–Dec and Jan of following year.

Forests, thickets; 100–1700 m. Guangdong, Taiwan [Japan].

24. Mussaenda pingbianensis C. Y. Wu ex H. H. Hsue & H. Wu, Acta Phytotax. Sin. 24: 233. 1986.

屏边玉叶金花 ping bian yu ye jin hua

Shrubs, ca. 3 m tall; branchlets glabrous. Leaves opposite; petiole ca. 6 mm, sparsely appressed pubescent; blade drying papery, adaxially shiny green, abaxially pale, elliptic or ovate, 7–8.5 × 2.5–3.2 cm, adaxially glabrous, abaxially pubescent along veins, base cuneate, apex acuminate; secondary veins ca. 7 pairs; stipules caducous to persistent, ovate, ca. 3.5 mm, pubescent, deeply 2-lobed, lobes narrowly triangular. Inflorescences congested-cymose, ca. 6 × 10 cm, many flowered, densely pubescent, sessile and tripartite or pedunculate; peduncles 1–2 cm; bracts lanceolate, 8–12 mm, densely pubescent. Flowers subsessile, biology not noted. Calyx sparsely pubescent; hypanthium portion turbinate, ca. 3 mm; lobes linear to narrowly triangular, ca. 8.5 mm, with 1 lobe in ca. 4 flowers per inflorescence expanded into white calycophyll, blade ovate to obovate, 5.5–6 cm, base obtuse to acute, stipe 10–14 mm, apex obtuse to shortly acuminate. Corolla orange to orange-red, salverform, outside sparsely to densely pubescent; tube ca. 14 mm, inside densely yellow clavate pubescent in upper part; lobes ovate, ca. 2.5 mm, adaxially densely yellow papillose, acuminate to mucronate. Berry unknown. Fl. May.

● Valleys. SE Yunnan.

The protologue described the stipules as caducous, but the protologue figure showed them as persistent. The specific epithet was written as *"pingpienensis"* by H. H. Hsue and H. Wu (in FRPS 71(1): 299. 1999), but it was originally published with the spelling above.

25. Mussaenda pubescens W. T. Aiton, Hort. Kew., ed. 2, 1: 372. 1810.

玉叶金花 yu ye jin hua

Mussaenda bodinieri H. Léveillé & Vaniot; *M. pubescens* var. *alba* X. F. Deng & D. X. Zhang; *M. pubescens* f. *clematidiflora* Chun ex H. H. Hsue & H. Wu.

Climbing shrubs, often extensively twining; branches terete, densely strigillose and sometimes also villosulous, sometimes with congested groups of leaves borne on reduced axillary buds. Leaves opposite or perhaps rarely whorled; petiole 3–8 mm, moderately to densely strigillose; blade drying membranous or thinly papery, ovate-oblong, ovate-lanceolate, elliptic, lanceolate, or oblanceolate, 2–9 × 1–4 cm, adaxially sparsely strigillose to glabrescent on lamina and moderately to densely strigillose on veins, abaxially sparsely to densely strigillose with pubescence denser on veins, base acute to obtuse, apex

acute to slightly acuminate; secondary veins 4–7 pairs, tertiary venation reticulate; stipules usually deciduous, triangular, 3–7 mm, moderately to densely strigillose, deeply 2-lobed, lobes narrowly triangular to subulate. Inflorescences terminal, subcapitate to congested-cymose, unbranched or sometimes tripartite, 1–3 × 1–3 cm, densely strigillose to villosulous, sessile to pedunculate; peduncles 0.1–1.4 cm; bracts linear, 3–5 mm; pedicels to 1 mm. Flowers sessile or infrequently pedicellate, biology not noted. Calyx moderately to densely strigillose to strigose; hypanthium portion ellipsoid to turbinate, 1.5–3 mm; lobes linear to narrowly triangular, 3–6 mm, with 1(or 5) lobes on 1–3 flowers per inflorescence of some plants expanded into white calycophyll, blade elliptic, broadly elliptic, ovate, or lanceolate, (0.4–)2.5–5 × (0.2–)2–3.5 cm, sparsely to moderately puberulent or strigillose on both surfaces, base acute to rounded, stipe 3–28 mm, apex obtuse to acute. Corolla white or yellow, salverform, outside moderately to densely strigillose or strigose; tube 11–20 mm, densely clavate pubescent in throat; lobes oblong-lanceolate to lanceolate, 2.5–4 mm, adaxially densely golden yellow papillose, acuminate. Berry subglobose, 8–10 × 6–7.5 mm, sparsely strigillose to glabrescent, smooth or finely lenticellate, calyx limb caducous, sometimes stipitate with stipe to 5 mm. Fl. Apr–Jul, fr. Jun–Dec.

Thickets in ravines, on hill slopes, or at village margins or roadsides; below 100–900 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, Zhejiang [Vietnam].

This species is widespread, common, and morphologically variable. H. H. Hsue and H. Wu (in FRPS 71(1): 296. 1999) described the leaf arrangement as opposite or whorled, but only opposite leaves have been seen on the numerous specimens studied.

One plant from Guangdong (Gaoyao) has all five of the calyx lobes petaloid and enlarged on each flower, though these structures are smaller than calycophylls that are borne singly on a flower. These plants have been separated as *Mussaenda pubescens* f. *clematidiflora*; this case was studied by Deng and Zhang (Acta Phytotax. Sin. 44: 611. 2006), who concluded that this plant is better regarded as developmentally abnormal and formally synonymized this name here. Plants with white corollas have been separated as *M. pubescens* var. *alba*; at least a third of the specimens of *M. pubescens* studied belong to this group, and considering that this color variation is common in other Rubiaceae species the variety is not recognized taxonomically here.

26. Mussaenda sessilifolia Hutchinson in Sargent, Pl. Wilson. 3: 397. 1916.

无柄玉叶金花 wu bing yu ye jin hua

Climbing shrubs; branches subterete, pale red- or red villous. Leaves opposite; petiole 1–3 mm, villous; blade drying thickly papery, oblong-elliptic, 6–10 × 3–4.5 cm, densely red villous on both surfaces with pubescence denser on principal veins abaxially, base rounded to subtruncate, apex subacute then abruptly narrowed and acuminate; secondary veins 9 or 10 pairs; stipules generally deciduous, ca. 8 mm, densely villous, deeply 2-lobed, lobes linear-subulate. Inflorescence congested-cymose with developed principal axes, 1.5–7.5 × 1.5–4.5 cm, densely villous, pedunculate; peduncles 0.75–2.2 cm; bracts subulate, ca. 8 mm. Flowers subsessile, biology not noted. Calyx densely villous; hypanthium portion ca. 3 mm; lobes subulate, 2–3.5 mm, with 1 lobe of 1–5 flowers of each inflorescence expanded into calycophyll, blade broadly ovate, 5–8.5 × 3–6.5 cm, slightly pubescent, base rounded, stipe ca. 15 mm, apex obtuse. Corolla yellow, salverform, outside densely villous; tube ca. 17 mm; lobes ovate, shortly acuminate. Berry not seen. Fl. spring.

● Forests; ca. 1300 m. S Yunnan.

The protologue described the calyx lobes as ca. 2 mm, while H. H. Hsue and H. Wu (in FRPS 71(1): 289. 1999) described them as ca. 3.5 mm.

27. Mussaenda shikokiana Makino, Bot. Mag. (Tokyo) 18: 44. 1904.

大叶白纸扇 da ye bai zhi shan

Mussaenda anomala H. L. Li; *M. esquirolii* H. Léveillé; *M. taiwaniana* Kanehira; *M. wilsonii* Hutchinson.

Erect or climbing shrubs, 1–3 m tall; branches terete, densely strigillose and sometimes also strigose, villosulous, or tomentulose to occasionally glabrescent. Leaves opposite; petiole 1.5–3.5 cm, moderately to densely strigillose; blade drying thinly papery, adaxially green to pale green, abaxially pale gray to whitened, broadly ovate, ovate, or broadly elliptic, 6–20 × 3.5–13 cm, both surfaces sparsely strigillose to glabrescent with pubescence denser along veins, base cuneate or usually obtuse to rounded, apex abruptly acuminate or acute; secondary veins 7–10 pairs, tertiary venation regularly areolate; stipules caducous, triangular to ovate-lanceolate, 6–10 mm, sparsely to densely strigillose, often deeply 2-lobed, segments acute. Inflorescences subcapitate becoming laxly cymose, 2–5 × 2–7 cm, densely strigillose and/or tomentulose, many flowered, sessile and tripartite or pedunculate; peduncle 1.5–3 cm; bracts deciduous, ovate, lanceolate, or bilobed, 4–10 mm, sparsely to moderately strigose to strigillose; pedicels 1–4 mm. Flowers pedicellate, biology not noted. Calyx with hypanthium portion turbinate to ellipsoid, 2.5–5 mm, densely strigose; lobes subleaflike, white, lanceolate to ligulate, 5–10 × 2–2.5 mm, moderately to densely strigillose to strigose, acute to long acuminate, with 1 lobe of 1 or few flowers on each inflorescence (or rarely all lobes of all flowers, *M. anomala*) usually expanded into calycophyll, blade obovate, ovate, or elliptic, (2–)3–4.5 cm, glabrescent on lamina and densely villosulous to strigillose on veins, base cuneate, stipe 5–15(–25) mm, apex acute to shortly acuminate. Corolla yellow, salverform-funnelform, outside densely sericeous; tube 9–14 mm; lobes ovate, 2–3 mm, abruptly acuminate. Infructescences to 6 × 12 cm. Berry subglobose to ellipsoid, ca. 10 × 10 mm, moderately to densely strigose, sparsely lenticellate, calyx limb deciduous. Fl. May–Jul, fr. Jul–Oct.

Roadsides or sparse forests on hills; 100–1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Zhejiang [Japan].

The names *Mussaenda shikokiana* and *M. taiwaniana* were not cited by H. H. Hsue and H. Wu (in FRPS 71(1): 283–306. 1999). No differences are apparent between *M. shikokiana* and *M. esquirolii*, as noted by Japanese taxonomists (in herb.), and the latter are accordingly synonymized here.

Mussaenda anomala was described based on one specimen that appears to represent only an aberrant form of *M. shikokiana* with all its

calyx lobes expanded and petaloid. This name was formally synonymized by Deng and Zhang (Acta Phytotax. Sin. 44: 609–611. 2006, under *M. esquirolii*), who reported visiting the type locality where they were unable to find a similar plant.

28. Mussaenda simpliciloba Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 147. 1925.

单裂玉叶金花 dan lie yu ye jin hua

Climbing shrubs; branches subterete, grayish brown tomentose becoming glabrescent. Leaves opposite; petiole to 4 cm, glabrous; blade drying papery, adaxially dark green, abaxially pale green, broadly ovate or elliptic-ovate, 6–15 × 3–7.5 cm, both surfaces densely pubescent and villous along veins, base acute or rounded, apex acuminate; secondary veins 8 or 9 pairs; stipules triangular, ca. 6 mm, abaxially hispidulous, adaxially densely hirsute, 2-lobed. Inflorescences laxly cymose; bracts lanceolate; pedicels 2–3 mm. Flowers sessile or lateral flowers pedicellate (or on expanded axes), biology not noted. Calyx with hypanthium campanulate, ca. 4 mm, sparsely pubescent; lobes linear-lanceolate, 5–7 mm, densely pubescent, with ?1 lobe on 1(or ?more) flower per inflorescence expanded into calycophyll, blade ovate, ca. 6 × 5–6 cm, densely pubescent along veins, base obtuse, stipe ca. 2 mm, apex acute. Corolla orange-yellow, salverform, outside pubescent; tube ca. 23 mm, densely yellow clavate pubescent inside upper part; lobes rounded, ca. 5 mm, adaxially yellow papillose. Berry globose, 8–9 × 8–9 mm, calyx limb deciduous. Fl. Jun–Jul, fr. Aug.

● Thickets in valleys or at riversides; 1200–1400 m. Guizhou, Sichuan, Yunnan.

The rounded corolla lobes described for this species are very unusual in *Mussaenda*.

29. Mussaenda treutleri Stapf, Bot. Mag. 135: t. 8254. 1909.

贡山玉叶金花 gong shan yu ye jin hua

Erect or climbing shrubs; branches terete, moderately to densely villous or hirsute. Leaves opposite; petiole 4–10 mm, hirsute or villous; blade drying membranous to papery, green to brownish, paler below when specimen well preserved, elliptic to ovate, 2.5–21 × 4–11 cm, both surfaces moderately strigillose to pilose on lamina and moderately to densely strigillose to hirsute along principal veins, base cuneate to obtuse, truncate, or rounded, apex acute to acuminate; secondary veins 6–8 pairs, without domatia, tertiary venation reticulate; stipules generally persistent, ovate, 7–12 × 6–12 mm, moderately to densely hirsute or pilose, entire to deeply 2-lobed, segments acute to acuminate. Inflorescences subcapitate to congested-cymose or sometimes with axes later elongating, 2–6 × 2–8 cm, hirsute, sessile to subsessile; bracts lanceolate, 0.5–1 cm, obtuse to acuminate or 2- or 3-parted. Flowers subsessile, biology not noted. Calyx with hypanthium portion campanulate to obconic, 3–4 mm, densely brown strigose to -sericeous; lobes lanceolate, ligulate, or oblanceolate, 7–18 × 3–4 mm, often markedly unequal on an individual flower, densely brown strigillose to -strigose, acute, with 1 lobe on 1 to several flowers on each inflorescence sometimes expanded into white calycophyll, blade ovate or rhombic, 5–7 × 3.5–4 cm, both surfaces sparsely hirsute to glabrescent on lamina and moderately to densely pilosulous to puberulent on principal veins, base obtuse to truncate, stipe 25–37 mm, apex obtuse to shortly acuminate. Corolla orange-yellow, salverform, outside densely spreading villous; tube ca. 22 mm; lobes ovate, 5–7 mm (to 10 mm in other regions), acute to acuminate. Berry ellipsoid, 10–12 × 10–12 mm, strigose, lenticellate, calyx limb deciduous. Fl. Jul–Sep.

Thickets or dense forests on mountains; [600–]1000–1500[–2000] m. Yunnan [Bhutan, NE India, Nepal].

The description of the fruit here is based on specimens from outside our flora region.

This species is similar to *Mussaenda macrophylla*, and in the protologue *M. treutleri* was explicitly separated from plants commonly called *M. macrophylla*, both in the wild and in cultivation; in fact, the protologue noted that *M. treutleri* was already widely distributed in cultivation at that time incorrectly under the other name. *Mussaenda treutleri* subsequently has apparently still been confused with or combined with *M. macrophylla*, including by recent authors (e.g., Springate et al., Fl. Bhutan 2(2): 783. 1999). *Mussaenda treutleri* is here circumscribed somewhat differently than by H. H. Hsue and H. Wu (in FRPS 71(1): 301. 1999): the plants from montane Yunnan and adjacent regions with broad, generally persistent stipules were separated by Stapf from *M. macrophylla* and included in *M. treutleri*, and this distinction is followed here.

The illustration presented for *Mussaenda treutleri* by Fu et al. (Higher Pl. China 10: 575. 2004) is incorrect; this figure shows a species of Asteraceae.

Fl. China 19: 231–242. 2011.