

THYMELAEACEAE

瑞香科 rui xiang ke

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Shrubs or small trees, rarely herbs, evergreen or deciduous. Bark tough and fibrous. Leaves opposite or alternate, rarely some ternate, estipulate; blade simple, entire, pinnately veined, articulate at base. Plants mostly bisexual, sometimes dioecious. Inflorescences terminal or subterminal, less often axillary, sometimes on brachyblasts, sessile or pedunculate, basically racemose, sometimes capitate, spicate, umbelliform, or fascicled. Flowers usually actinomorphic, bisexual or unisexual (plants then mostly dioecious), bracteate (sometimes bracts forming an involucre) or ebracteate, sessile or pedicellate. Calyx tubular, campanulate, or infundibuliform, usually corollalike, 4- or 5(or 6)-merous, mostly caducous, sometimes circumscissile, or persistent; lobes imbricate. Petals absent or represented by 4–12 scales, inserted at or near throat of calyx tube (*Aquilaria*). Stamens 2 to many, usually as many as calyx lobes and opposite them or twice as many. Hypogynous disk usually present at base of ovary, scalelike, annular or cup-shaped, sometimes absent. Ovary superior, 1- or 2-loculed, sessile or shortly stipitate; ovules solitary in each locule, pendulous, anatropous; style filiform, caducous, sometimes very short or obscure, terminal or eccentric; stigma capitate, globose, subglobose, subclavate, or pyramidal, sometimes papillose. Fruit mostly indehiscent, dry or fleshy, sometimes a loculicidal capsule (*Aquilaria*). Seeds with or without endosperm, embryo straight.

About 48 genera and ca. 650 species: widely distributed in both hemispheres; nine genera and 115 species (89 endemic) in China.

The phloem contains very strong fibers, which make the bark of many species very suitable for the manufacture of high-quality paper such as that used for bank notes. The stems are extremely supple and difficult to break and are used as a substitute for string. Most species are poisonous and some are important medicinally.

“*Stellera formosana*” (H. L. Li, Woody Fl. Taiwan, 619. 1963) and “*Daphne formosana*” (Halda, Genus *Daphne*, 83. 2001) were not validly published because they were based on “*Chamaejasme formosana*” (Hayata, Icon. Pl. Formosan. 6 [Gen. Ind. Fl. Formos.]: 64. 1917), which was itself not validly published because it lacked a description or diagnosis. The illustrations suggest that this plant is a species of *Daphne*. It was described as having a circumscissile calyx, which, if true, would exclude it from *Daphne*, and 4-merous flowers not enclosed in any bracts, which would place it in *Diarthron*. The specimens listed by Hayata proved to be *Daphne arisanensis*, but the material described and illustrated by Li and Halda is clearly not that species nor any of the other species recorded from Taiwan. This apparently distinctive endemic must remain effectively nameless until authentic material can be located to serve as a type and a validating description can be published in the appropriate genus.

Huang Shuchung & Zhang Zerong. 1999. Thymelaeaceae. In: Ku Tsuechih, ed., Fl. Reipubl. Popularis Sin. 52(1): 287–400.

- 1a. Calyx with petaloid appendages adnate to or inserted in throat; ovary 2-loculed; fruit a loculicidal capsule; trees 1. *Aquilaria*
- 1b. Calyx without petaloid appendages; ovary 1-loculed; fruit an indehiscent berry, drupe, or nut; shrubs, subshrubs, or herbs, sometimes a small tree.
 - 2a. Calyx tube articulate above ovary, circumscissile in fruit.
 - 3a. Flowers 5- or 6-merous; inflorescence with involucre, terminal, capitate, not elongating in fruit 9. *Stellera*
 - 3b. Flowers 4-merous; inflorescence without involucre, terminal, often elongating in fruit, or axillary 8. *Diarthron*
 - 2b. Calyx tube not articulate, persistent or caducous, not circumscissile.
 - 4a. Annual herbs, mainly branched well above base, roots not thickened; hypogynous disk very reduced or absent; inflorescence terminal, lax, elongated, spikelike; calyx tube 2–4 mm 7. *Thymelaea*
 - 4b. Perennials, if herbaceous or suffrutescent then with stems rarely branched above base and roots often thickened; hypogynous disk present; inflorescence a compact raceme, spike, or head, sometimes grouped into panicles, or axillary fascicles subtended by normal leaves; calyx tube (2–)5–20 mm.
 - 5a. Style long, stigma narrowly terete, ± clavate 6. *Edgeworthia*
 - 5b. Style very short or obscure, stigma capitate.
 - 6a. Inflorescence sessile, or if pedunculate, flower buds not enclosed within an involucre; calyx lobes spreading at anthesis.
 - 7a. Hypogynous disk of distinct scales, inflorescences racemose, paniculate, or spicate, less often capitate; leaves opposite or alternate 2. *Wikstroemia*
 - 7b. Hypogynous disk annular and oblique or cup-shaped, margins entire or lobed to parted or developed on one side, inflorescences capitate or fascicled, rarely spicate or racemose; leaves usually alternate, rarely opposite 3. *Daphne*
 - 6b. Inflorescences long pedunculate, flower buds enclosed in conspicuous calyxlike involucre; calyx lobes erect at anthesis.

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- 8a. Inflorescence an axillary 5–10-flowered head, calyx white within 4. *Eriosolena*
 8b. Inflorescence a panicle of many terminal and subterminal (3 or)4(–7)-flowered heads,
 calyx red within 5. *Rhamnoneuron*

1. *AQUILARIA* Lamarck, Encycl. 1: 49. 1783, nom. cons.

沉香属 *chen xiang shu*

Wang Yinzheng (王印政); Lorin I. Nevling, Michael G. Gilbert

Agallochum Lamarck; *Ophispermum* Loureiro.

Trees or treelets. Leaves alternate, leaf blade pinnately veined; veins slender, ascending toward margins and joining several intramarginal veins. Inflorescences axillary or terminal, umbelliform or paniculiform, usually without involucre; peduncle short or absent. Flowers bisexual, pedicellate, usually 5-merous. Calyx tube persistent, yellow or yellowish green, campanulate; lobes 5, reflexed or erect. Petaloid appendages twice as many as the lobes, inserted at throat of tube, scalelike, united in a ring at base, usually densely pubescent or puberulous. Stamens twice as many as calyx lobes, alternating with petaloid appendages; filaments short or absent; anthers oblong, dorsifixed, pubescent, connectives broad. Disk absent. Ovary subsessile, pubescent, 2-loculed or incompletely 2-loculed; style very short; stigma capitate. Fruit a 2-valved loculicidal capsule, compressed laterally, obovoid, base enclosed by persistent calyx; pericarp leathery or woody. Seeds 2 or 1 by abortion, ovoid or ellipsoid, on carunclelike strongly tapered funicle; testa crustaceous, endosperm absent; cotyledons thick, plano-convex.

About 15 species: Bhutan, Cambodia, China, NE India, Laos, Malaysia, Myanmar, Thailand, Vietnam; two species (both endemic) in China.

Members of this genus are important as the source of agarwood, a very highly prized aromatic gum produced in the wood in response to injury. It is used as incense, in perfumery, and in traditional medicine. Trees have been over-harvested throughout the range of the genus, and most species are of conservation concern. The genus as a whole is included in Category 2 of CITES.

- 1a. Pericarp thickened, slightly rugose when dried; seeds densely brown-yellow pubescent, funicle 0.8–1 cm, slightly shorter or longer than seed; leaves 2–4 cm wide 2. *A. yunnanensis*
 1b. Pericarp thin, smooth when dried; seeds white sericeous or glabrous, funicle ca. 1.5 cm, longer than seed; leaves 2.8–6 cm wide 1. *A. sinensis*

1. *Aquilaria sinensis* (Loureiro) Sprengel, Syst. Veg. 2: 356. 1825.

土沉香 *tu chen xiang*

Ophispermum sinense Loureiro, Fl. Cochinch. 1: 281. 1790; *Agallochum sinense* (Loureiro) Kuntze; *Aquilaria grandiflora* Benthham; *A. ophispermum* Poiret.

Trees 5–15 m tall. Bark dark gray, smooth; branchlets terete, rugose, puberulous, glabrescent. Petiole 5–7 mm, pubescent; leaf blade dark or purple-green, glossy adaxially, light green abaxially, orbicular or elliptic to oblong, sometimes obovate, 5–9 × 2.8–6 cm, leathery, both surfaces glabrous, but sometimes puberulous along margin, base broadly cuneate, apex acuminate or acute, apiculate; lateral veins 15–20 pairs, more conspicuous abaxially, veins and veinlets slender, subparallel, obscure. Inflorescence terminal, a loose panicle of umbels, many flowered. Flowers fragrant at night; pedicel 5–10 mm, densely yellow-gray pubescent. Calyx yellowish green; tube narrowly campanulate, 5–6 mm, exterior and interior densely pubescent; lobes 5, ovate, 3–5 mm, both surfaces pubescent, apex rounded and obtuse, or acute. Petaloid appendages 10, scalelike, inserted at throat of tube, obviously densely pilose at anthesis. Stamens 10; filaments ca. 1 mm; anthers linear-oblong, ca. 1.5 mm. Ovary ovoid, densely grayish white hairy; style obsolete or nearly so; stigma capitate. Capsule shortly stipitate, ovoid, 2–3 × ca. 2 cm, densely yellow pubescent, base tapering, apex apiculate; pericarp thin, smooth when dried. Seeds dark brown, ovoid, ca. 10 × 7.5 mm, white sericeous or glabrous; funicle

conspicuous, ca. 1.5 × 0.4 cm, longer than seed, tapered at base, broad and compressed below seed. Fl. spring–summer, fr. summer–autumn.

• Lowland forests, sunny places on slopes or along roadsides. Fujian, Guangdong, Guangxi, Hainan.

Aquilaria sinensis has been very heavily exploited and is listed as vulnerable by the IUCN. The bark is used to make paper; the heart wood is prized for its fragrance.

2. *Aquilaria yunnanensis* S. C. Huang, Acta Bot. Yunnan. 7: 277. 1985.

云南沉香 *yun nan chen xiang*

Trees small, 3–8 m tall. Branchlets dark brown, puberulous. Petiole 4–5 mm, pubescent; leaf blade elliptic-oblong or oblong-lanceolate, rarely obovate, 7–11 × 2–4 cm, leathery, glabrous, glabrescent, or puberulous only on midrib, base cuneate or narrowly cuneate, apex caudate-acuminate, acumen 1–1.5 cm; veins usually branched, dense, conspicuous and raised abaxially, obscure adaxially. Inflorescence terminal or axillary, consisting of 1 or 2 umbels. Flowers fragrant; pedicel ca. 6 mm, slender. Calyx light yellow; tube campanulate, 6–7 mm, exterior pubescent, interior 10-ribbed, ribs pubescent; lobes 5, ovate-oblong, ca. 3 mm, nearly as long as tube, inside densely pubescent. Petaloid appendages ca. 1.5 mm, puberulous, apex rounded. Stamens 10, 1.5–2 mm; anthers linear, shorter than or equaling filaments. Ovary subglobose, ca. 3 mm, shiny, pubescent; style obscure; stigma capitate. Capsule obovoid, ca. 2.5 × 1.7 cm, base tapering and enclosed by erect, persistent calyx,

corky when dried, apex rounded and apiculate; pericarp thickened, slightly rugose when dried, yellow pubescent. Seeds 1 or 2, ovoid, densely brown-yellow pubescent, apex obtuse; funicle 0.8–1 cm, slightly shorter or longer than seed.

• Valley forests; ca. 1200 m. Yunnan.

This species has been confused with *Aquilaria sinensis* and is probably exploited in the same way. It is too poorly known for its conservation status to be assessed.

2. WIKSTROEMIA Endlicher, Prodr. Fl. Norfolk. 47. 1833 [*“Wickstroemia”*], nom. cons., not Schrader (1821), nor Sprengel (1821).

薨花属 rao hua shu

Wang Yinzheng (王印政); Michael G. Gilbert

Capura Linnaeus; *Diplomorpha* Meisner.

Shrubs or subshrubs, occasionally small trees or rarely a herbaceous perennial (*W. linooides*), evergreen or deciduous. Leaves opposite or alternate. Inflorescence usually terminal and subterminal, rarely axillary, fasciated or solitary, spicate, racemose, umbelliform or capitate, sometimes in compound terminal panicles, often without involucre; peduncle long or short. Flowers bisexual or unisexual (Hawaii), 4- or 5-merous, subsessile or distinctly pedicellate; pedicel articulate. Calyx tube yellow or green, less often purplish, red or white, cylindrical or tubular, sometimes slightly funnel-shaped, often caducous after anthesis, sometimes persistent; lobes 4 or 5, spreading. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series; filaments very short; anthers oblong, upper sometimes slightly exerted; connectives indistinct. Disk with 2 or 4, very rarely 1 or 5, scales, rarely joined at base by very narrow annulus, membranous. Ovary sessile, rarely shortly stipitate, usually ellipsoid, glabrous or hairy at apex, 1-loculed; style terminal, short, distinct or obscure; stigma large, capitate, globose, or discoid. Fruit a succulent berry or rather dry. Endosperm scanty or absent; cotyledons fleshy.

About 70 species: E Asia, Malaysia, Australia, and Pacific islands with a significant minor center of diversity in Hawaii where many species are dioecious; 49 species (43 endemic) in China.

The separation of *Wikstroemia* from the following genus, *Daphne*, is problematic. Features such as leaf arrangement, inflorescence type, and flower color are all clearly paralleled within the two genera and are of no diagnostic value, although they are mentioned in most keys to these genera. In most cases, the nature of the hypogynal disk is diagnostic, but even here there are species where the interpretation of the structure of the disk is difficult. For example, the distinction between the lateral ± square disk seen in several species of *Daphne* and species of *Wikstroemia* with a single large disk scale, or species of *Wikstroemia* in which the disk scales are connected by a narrow annulus, or species of *Daphne* with very deeply divided disks makes the division seem rather arbitrary, such that there must be a good case for combining these two genera, as was done by Halda (Genus *Daphne*. 2001). A review of generic delimitations in the family based on molecular data would be very desirable.

Wikstroemia ganpi (Siebold & Zuccarini) Maximowicz was indicated by Halda (loc. cit.: 158, as *Daphne ganpi* (Siebold & Zuccarini) Halda) to occur in Taiwan, but this species has not been recorded by botanists from Taiwan, and the basis of the record was not indicated.

Wikstroemia bodinieri H. Léveillé is a synonym of *Alyxia schlechteri* H. Léveillé in the Apocynaceae (see Fl. China 16: 162. 1995). *Wikstroemia hemsleyana* H. Léveillé is a synonym of *Alstonia mairei* H. Léveillé also in the Apocynaceae (loc. cit.: 156).

1a. Calyx exterior glabrous (rarely with a few scattered hairs), often caducous after anthesis.

2a. Flowers 5-merous.

3a. Leaves always alternate, sometimes very close spaced and apparently whorled, blade 1–1.5 mm wide 43. *W. linearifolia*

3b. Leaves at least partly opposite, blade at least 3 mm wide.

4a. Inflorescences clustered into a head; lateral veins 3–7 per side of midrib.

5a. Older branches pale reddish or brownish gray; leaf blade with lateral veins 3 or 4 per side of midrib; disk apex entire or slightly retuse 41. *W. fargesii*

5b. Older branches dark purple-brown; leaf blade with lateral veins 5–7 per side of midrib; disk apex irregularly deeply or shallowly lobed 42. *W. fuminensis*

4b. Inflorescence a raceme or panicle, or spike; lateral veins 6–12 per side of midrib or obscure.

6a. Inflorescence a solitary raceme.

7a. Peduncle 2–4 cm; racemes terminal and axillary 44. *W. scytophylla*

7b. Peduncle 0.7–1.1 cm; racemes terminal, 3–7-flowered.

8a. Leaf blade 1–2 cm wide, leathery or thinly so; calyx yellow 45. *W. huidongensis*

8b. Leaf blade 0.3–0.8 cm wide, membranous; calyx white 46. *W. anhuiensis*

6b. Inflorescence a panicle, lax or dense.

9a. Panicle dense, spicate; leaves closely spaced, blade leathery, lateral veins white and prominent; calyx yellow 47. *W. lamatsoensis*

9b. Panicle lax; leaves not closely spaced; leaf blade papery, lateral veins not white and prominent; calyx white or yellowish green.

- 10a. Leaf blade 1–2.2(–3.5) cm wide; calyx tube 6–8 mm 48. *W. trichotoma*
 10b. Leaf blade 0.3–0.6 cm wide; calyx tube 12–13 mm 49. *W. leptophylla*
- 2b. Flowers 4-merous.
- 11a. Leaves alternate, rarely subopposite.
- 12a. Inflorescence a much branched panicle 6. *W. longipaniculata*
 12b. Inflorescence a compact head or raceme.
- 13a. Calyx white or pink to purplish red; inflorescence bracteate 10. *W. glabra*
 13b. Calyx yellow, yellow-green or green; inflorescence ebracteate.
- 14a. Biennial or perennial herb or subshrub; leaf blade 1.2–2.5 × 0.3–0.8 cm 7. *W. linoides*
 14b. Shrub, sometimes dwarf; leaf blade 3–8 × 0.7–2.8(–4) cm 11. *W. nutans*
- 11b. Leaves mostly truly opposite.
- 15a. Young stems pubescent or puberulous.
- 16a. Calyx tube 4–7 mm 3. *W. chui*
 16b. Calyx tube 12–15 mm.
- 17a. Leaf blade elliptic, ovate, or ovate-lanceolate, 4–10 × 2–3.3 cm 4. *W. hainanensis*
 17b. Leaf blade oblong-obovate to lanceolate, 1.5–3 × 0.3–0.8 cm 12. *W. salicina*
- 15b. Young stems glabrous.
- 18a. Leaf blade 0.8–2.5 × 0.2–1.2 cm, ± leathery 8. *W. angustifolia*
 18b. Leaf blade 3–20 × 1.5–9 cm, membranous to papery.
- 19a. Leaf blade 13–20 × 4.5–9 cm; peduncle 2–6 cm; calyx lobes 5–6 mm 2. *W. liangii*
 19b. Leaf blade 3–6(–8.5) × 1.5–2.5(–4) cm; peduncle 0.7–2 cm, slender, pendulous; calyx lobes
 ca. 3 mm 11. *W. nutans*
- 1b. Calyx tube exterior hairy, often persistent and enclosing fruit.
- 20a. Flowers 5-merous.
- 21a. Inflorescences always axillary 38. *W. paxiana*
 21b. Inflorescences mostly terminal, often on lateral branches, sometimes also axillary.
- 22a. Stems yellow, leaves sometimes opposite; flowers shortly pedicellate 40. *W. pilosa*
 22b. Stems purple-red; leaves always alternate; flowers sessile 39. *W. dolichantha*
- 20b. Flowers 4-merous.
- 23a. Flowers in terminal and short, subapical, lateral fascicles forming a leafy thyrse; hypogynal disk
 scale very broad, almost annular, deeply 7–10-lobed 37. *W. subcyclolepidota*
- 23b. Flowers in terminal and subterminal spikes or racemes, sometimes grouped into panicles, or
 axillary; hypogynal disk annular or cupular or scales 1–4, linear or oblong, apically lobed or
 toothed.
- 24a. Herbaceous perennial 7. *W. linoides*
 24b. Shrub, sometimes dwarf.
- 25a. Leaves mostly alternate, rarely also subopposite, very rarely a few opposite.
- 26a. Inflorescence a panicle of terminal and subterminal spikes or heads; lateral leaf veins often
 obscure.
- 27a. Calyx 3.5–4 mm; leaf blade linear to narrowly oblong, 2–5 mm wide, adaxially glabrous 32. *W. cochlearifolia*
 27b. Calyx 8–9 mm; leaf blade elliptic or obovate-elliptic or narrowly elliptic, 3–8(–15) mm
 wide, adaxially hairy.
- 28a. Leaf blade adaxially tomentose; ovary densely appressed hirsute; disk scales 2, unequal,
 apex 2- or 3-toothed 31. *W. pampaninii*
 28b. Leaf blade adaxially sericeous; ovary glabrous except for pilose apex; disk scale 1, apex
 obtuse to truncate, finely dentate or irregularly crenulate 20. *W. haoi*
- 26b. Inflorescence a head elongating into a short raceme during anthesis, or a 1–4-flowered fascicle
 terminal on lateral branches; lateral leaf veins distinct.
- 29a. Inflorescence a 1–4-flowered fascicle.
- 30a. Both surfaces of leaf blade glabrous, membranous.
- 31a. Leaf blade broadly elliptic to obovate, 2–5 × 1–2.5 cm; calyx pale green 26. *W. techinensis*
 31b. Leaf blade oblong to elliptic, 0.8–1.8 × 0.4–1.1 cm; calyx yellow 27. *W. baimashanensis*
- 30b. Both surfaces of leaf blade pubescent.
- 32a. Leaf blade 1–2.5 mm wide 28. *W. sinoparviflora*
 32b. Leaf blade 4–12 mm wide.
- 33a. Leaf blade 3–3.8 × 0.9–1.2 cm 29. *W. alternifolia*
 33b. Leaf blade 0.7–1.2 × 0.4–0.7 cm 30. *W. lungtzeensis*
- 29b. Inflorescences elongating during anthesis, mostly more than 4-flowered; ovary completely
 pubescent; bud globose, densely white pubescent; flowers yellow.

- 34a. Ovary sessile; leaf blade appressed sericeous 33. *W. capitatoracemosa*
- 34b. Ovary stipitate; leaf blade pubescent at least on midrib, sometimes glabrescent.
 - 35a. Leaf blade glabrescent, reticulate veins abaxially obscure 34. *W. ligustrina*
 - 35b. Leaf blade persistently pubescent, at least on midrib, reticulate veins abaxially conspicuous.
 - 36a. Calyx ca. 15 mm, exterior with appressed and long sericeous pubescence; leaf blade 2–5 × 0.8–1.6 cm, lateral veins 5 or 6 pairs, abaxially conspicuous 35. *W. canescens*
 - 36b. Calyx ca. 12 mm, exterior with appressed and short pubescence; leaf blade 1.5–3 × 0.5–1 cm, lateral veins 3 or 4 pairs, slender, abaxially obscure 36. *W. lichiangensis*
- 25b. Leaves mostly opposite or subopposite, sometimes also alternate.
 - 37a. Leaf blade 1.5–2.5 mm wide, to 2.5 cm 23. *W. stenophylla*
 - 37b. Leaf blade (2–)3–35 mm wide, if less than 3 mm, then at least 2.5 cm.
 - 38a. Calyx pink, purple, lilac, or lavender.
 - 39a. Calyx 4–6 mm.
 - 40a. Ovary glabrous except for pilose apex; inflorescence ± paniculate, ca. 20-flowered 20. *W. haoi*
 - 40b. Ovary uniformly hairy; inflorescence not paniculate, 3–5(–8)-flowered 21. *W. vaccinium*
 - 39b. Calyx 7–12 mm.
 - 41a. Leaf blade drying dark brown; lateral veins 4 or 5 per side; calyx tube 9–12 mm 17. *W. monnula*
 - 41b. Leaf blade drying green, lateral veins 10 or 11 per side; calyx tube ca. 15 mm 1. *W. mononectaria*
 - 38b. Calyx yellow, greenish yellow, yellowish white, or green, sometimes flushed with purple or red.
 - 42a. Calyx 4–6 mm.
 - 43a. Calyx yellowish white or green, sometimes flushed with purple; tube slightly ovoid, 2–5 mm 15. *W. taiwanensis*
 - 43b. Calyx yellow; tube cylindric, 4–6 mm 9. *W. micrantha*
 - 42b. Calyx 7–15 mm.
 - 44a. Inflorescence a panicle of racemes.
 - 45a. Leaf blade abaxially glabrous; calyx greenish yellow or creamy-yellow, sometimes flushed with purple, tube often less than 10 mm.
 - 46a. Leaf blade lanceolate-obovate, obovate, or oblanceolate, 1.6–2.5 cm wide; hypogynal disk annular, extended on one side into 1(–3) obovate scale(s) 5. *W. delavayi*
 - 46b. Leaf blade lanceolate to oblong-lanceolate, 0.2–1 cm wide; hypogynal disk scales 2(or 3), linear or oblong, basally connate 22. *W. chamaedaphne*
 - 45b. Leaf blade abaxially hairy; calyx yellow, tube ca. 10 mm.
 - 47a. Leaf blade elliptic or ovate-orbicular to oblong, 0.8–2.8 cm wide; hypogynal disk scales 2, one linear and one oblong 24. *W. gracilis*
 - 47b. Leaf blade narrowly oblanceolate to broadly linear, 0.4–0.8 cm wide; hypogynal disk scale 1, obovate, margin crenate 25. *W. reginaldi-farreri*
 - 44b. Inflorescence capitate or shortly racemose, sometimes indistinctly paniculate.
 - 48a. Lateral veins slender, dense, at a very narrow angle to midrib.
 - 49a. Leaf blade oblong to lanceolate, 5–15 mm wide, abaxially reddish brown when dried 14. *W. indica*
 - 49b. Leaf blade elliptic or oblong, apex broad, 4–9 mm wide, both surfaces glabrous, abaxially pale green 18. *W. capitata*
 - 48b. Lateral veins remote, obscure, 5–7 pairs, at wide angle to midrib.
 - 50a. Leaf blade lanceolate, 0.8–1.2 cm wide; stems relatively slender 16. *W. lanceolata*
 - 50b. Leaf blade obovate to oblong, 1.3–2.5 cm wide; stems relatively stout.
 - 51a. Inflorescence often 15–26-flowered, peduncle to 0.5 cm, stout 13. *W. pachyrachis*
 - 51b. Inflorescence 4–6(–20)-flowered, peduncle 0.7–3 cm, slender 19. *W. retusa*

1. Wikstroemia mononectaria Hayata, Icon. Pl. Formosan. 5: 179. 1915.

独鳞堯花 du lin rao hua

Daphne mononectaria (Hayata) Halda.

Shrubs. Branches black-purple, long, slender, minutely rugulose, at first thinly strigose, soon glabrous. Leaves opposite, subopposite, or alternate, often on same shoot; petiole 2–3 mm; leaf blade green adaxially, paler abaxially, ovate to broadly lanceolate, 2.5–5 × 1–2 cm, membranous or papery, abaxially

soft white strigose, adaxially glabrous except sometimes for midrib, base cuneate, apex acute to obtuse and minutely apiculate; lateral veins 10 or 11 per side of midrib, slender, at narrow angle to midrib. Inflorescences terminal, racemose, ca. 4 cm, often 6–8-flowered, glabrous. Calyx reddish purple; tube terete, long and narrow, ca. 15 × 1 mm, exterior glabrous; lobes 4, ovate, ca. 2 × 1.5 mm, apex rounded. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl below throat. Disk scale 1, linear, ca. 2 mm. Ovary obconic, stipitate, glabrous. Drupe reddish, curved-ovoid, ca. 5 × 4 mm, acuminate.

- Taiwan.

2. Wikstroemia liangii Merrill & Chun, Sunyatsenia 5: 140. 1940.

大叶薨花 da ye rao hua

Daphne liangii (Merrill & Chun) Halda.

Shrubs to 2 m tall. Branches reddish brown, terete, slightly laterally compressed, glabrous. Leaves opposite; petiole ca. 2 mm, stout; leaf blade glossy olive-green adaxially, pale green abaxially, oblong-elliptic, (10–)13–20 × (4–)4.5–9 cm, thickly to thinly papery, both surfaces glabrous, base broadly cuneate or rounded, tapering toward petiole, apex acute; lateral veins 8–12 pairs, conspicuous abaxially, slender. Inflorescences terminal, capitate, later elongating, 3–12-flowered, glabrous; peduncle 2–6 cm. Pedicel short, ca. 1 mm. Calyx yellowish green, 12–15 mm, exterior glabrous; lobes 4, elliptic, 5–6 × 3–4 mm. Stamens 8; filaments short. Anthers oblong, ca. 1.8 mm. Disk scales 2, linear, ca. 1 mm. Ovary ellipsoid, glabrous; style short; stigma capitate. Drupe ovoid, 8–10 × 5–6 mm. Fl. Jun–Sep.

- Forests, stream banks. Hainan.

3. Wikstroemia chui Merrill, Lingnan Sci. J. 9: 41. 1930 [“*chuii*”].

窄叶薨花 zhai ye rao hua

Daphne chui (Merrill) Halda.

Shrubs to 1(–2) m tall. Young branches at first 4-angular, later terete, turning purplish, finely striped, densely yellow pubescent. Leaves opposite; petiole short, 1–1.8 mm; leaf blade glossy olive-green adaxially, yellowish brown when dried, green abaxially, lanceolate, 2.5–5 × 0.5–1.1 cm, thickly papery to thinly leathery, both surfaces glabrous, base cuneate, margin slightly revolute, apex acute or obtuse; lateral veins 9–15 pairs, more conspicuous abaxially, slender. Inflorescences terminal, capitate, elongating after flowering, often 4–7(–9)-flowered; peduncle 0.2–0.5 cm, slender, pubescent. Pedicel short. Calyx yellowish; tube 4–10 × 1–1.3 mm, exterior glabrous; lobes 4, ovate or elliptic, ca. 3 mm, apex obtuse. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments very short; anthers oblong, ca. 1.2 mm; upper ones almost exerted from calyx tube. Disk scales 1 or 2, linear. Ovary obovoid to cylindrical-ellipsoid, glabrous; style very short; stigma globose. Drupe red when ripe, ellipsoid, 6–8 mm, laterally compressed. Fl. Aug.

- Shaded moist places, by streams, valleys, forests, on rocks. Hainan.

4. Wikstroemia hainanensis Merrill, Lingnan Sci. J. 14: 40. 1935.

海南薨花 hai nan rao hua

Daphne hainanensis (Merrill) Halda.

Shrubs 1–3 m tall. Branches turning dark brown or purplish, terete, at first sparsely appressed puberulous. Leaves opposite; petiole 1–2 mm, glabrescent; leaf blade deep green adaxially, light green abaxially, ovate, elliptic, or oblong to broadly oblong-lanceolate, 2–10 × 1–3 cm, papery, both surfaces gla-

brous, base cuneate or subrounded, apex acute or minutely acuminate; lateral veins 8–12 pairs, conspicuous, slender. Inflorescences terminal, sometimes on lateral branches, subcapitate, rarely racemose, often 3–7-flowered; peduncle 0.3–0.4 cm, pubescent. Calyx yellow; tube 10–15 × ca. 1 mm, exterior glabrous; lobes 4, elliptic-ovate, 3–4 × 2–3 mm, apex obtuse. Stamens 8; filaments very short; anthers oblong, 1.5–2 mm. Disk very narrowly annular, with 1–4 scales; scales linear, ca. 1 mm. Ovary ellipsoid, 1–2 mm, glabrous; style very short; stigma capitate, subsessile. Drupe red, ellipsoid, 7–8 mm, enclosed by persistent calyx. Fl. May–Sep.

- Open forests, exposed shrubby slopes; low elevations. Hainan.

5. Wikstroemia delavayi Lecomte, Notul. Syst. (Paris) 3: 129. 1915.

澜沧薨花 lan cang rao hua

Daphne delavayi (Lecomte) Halda; *D. scytophylla* (Diels) Halda subsp. *mekongensis* (W. W. Smith) Halda; *Wikstroemia mekongensis* W. W. Smith.

Shrubs erect, 1–2 m tall, much branched. Young branches pale green, turning purplish or brownish, subterete, glabrous. Leaves opposite, larger toward stem apex; petiole ca. 2 mm; leaf blade pale green adaxially, paler abaxially, lanceolate-obovate, obovate, or oblanceolate, 3–5.5 × 1.6–2.5 cm, both surfaces glabrous, base broadly cuneate, rounded, or slightly cordate, apex rounded, shortly apiculate, or acuminate; lateral veins 4 or 5 pairs, dark, slender, very oblique. Inflorescences terminal, paniculate, 3–4(–12) cm, to 9 cm wide, axes elongating considerably in fruit; peduncle stout, soon glabrous. Pedicel short, ca. 1 mm, articulate. Calyx carmine-purple to yellowish green with purple at apex; tube tubular, 8–10 × ca. 1 mm, exterior scattered puberulous; lobes 4, oblong, (1–)2 mm, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat; filaments short; anthers oblong, ca. 1 mm. Disk annular, extended on one side into 1(–3) scale(s), scales obovate, apex 2-lobed. Ovary cylindrical-obovoid, 2.5–3 mm, stipitate, apex pubescent; style obscure; stigma capitate. Drupe dry or semidry, cylindrical, ca. 4 × 1.2 mm, enclosed by persistent calyx. Fl. and fr. autumn.

- Valley forests, shrubby or limestone areas; 2000–2700 m. Sichuan, Yunnan.

The calyx color can be strongly influenced by the environment: the type gathering of *Wikstroemia mekongensis* was described in the field as having deep purple-crimson flowers, whereas plants propagated in Europe from the same gathering had greenish yellow flowers, tipped with purple in bud.

6. Wikstroemia longipaniculata S. C. Huang, Acta Bot. Yunnan. 7: 283. 1985.

长锥序薨花 chang zhui xu rao hua

Daphne micrantha (Hemsley) Halda subsp. *longipaniculata* (S. C. Huang) Halda.

Shrubs to 2 m tall. Branches black, stout, glabrous. Leaves alternate; petiole 4–9 mm; leaf blade elliptic, 3–8 × 1–2.8 cm, stiffly papery, both surfaces glabrous, base cuneate, apex short-

ly acuminate, rarely obtuse or retuse; veins reticulate, dense and conspicuous, raised on both surfaces, anastomosing along margins. Inflorescences terminal, paniculate, much branched, 5–7 cm, many flowered; bracts lanceolate, white pubescent, with small, white tomentose bud in axil. Calyx greenish, ca. 3.5 mm; exterior glabrous; lobes 4, 2 large and 2 small, apex obtuse and rounded. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat; anthers ovoid. Disk scales 2, linear, one longer than other one. Ovary oblong, white hirsute, more densely so at apex; style short, hidden by hairs; stigma globose. Fruit not seen. Fl. autumn.

• Rocks and hill tops in mixed forests; ca. 500 m. SW Guangxi (Longzhou).

7. *Wikstroemia linoides* Hemsley, J. Linn. Soc., Bot. 26: 398. 1894.

亚麻堯花 ya ma rao hua

Daphne linoides (Hemsley) Halda.

Herbs biennial or perennial, 0.6–1 m tall. Branches very slender, glabrous. Leaves opposite or alternate; petiole ca. 1 mm; leaf blade bright- or olive-green adaxially, paler or glaucous abaxially, narrowly oblong to oblanceolate-oblong, 1.2–3 × 0.3–0.8 cm, membranous, both surfaces glabrous, base cuneate, apex obtuse or slightly acute; lateral veins 5 or 6 pairs, conspicuous, slender, obliquely spreading from midrib. Inflorescences terminal, subcapitate-spicate, (1–)6–12-flowered; peduncle 2–5 cm, slender. Pedicel absent. Calyx yellow; tube narrow, 7–12 × 0.9–1.2 mm, exterior puberulous; lobes 4, oblong, 2–4 mm, apex rounded. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl in throat, upper anthers slightly exerted from calyx tube. Disk scale 1, linear, ca. 1.5 mm. Ovary stipitate, hirsute; style short; stigma capitate. Drupe yellow, obovoid, ca. 4 mm, apiculate.

• Dry open forests, shrubby slopes; 700–1600 m. Hubei, Shanxi, Sichuan.

8. *Wikstroemia angustifolia* Hemsley, J. Linn. Soc., Bot. 26: 396. 1891.

岩杉树 yan shan shu

Daphne hemsleyi Halda.

Shrubs, erect and broomlike, 0.3–1 m tall. Branches slender, angular, pubescent, soon glabrous. Leaves opposite or subopposite, very closely spaced; petiole short, distinct from leaf base; leaf blade dark green adaxially, paler abaxially, linear-oblanceolate or oblong-spatulate, 0.8–2.6 × (0.1–)0.2–0.4 cm, leathery or papery, both surfaces glabrous, base slightly obtuse, margin revolute, apex obtuse-rounded, often finely apiculate; lateral veins obscure. Inflorescences terminal, capitate-racemose, 3(–5)-flowered; peduncle ± absent, sparsely puberulous. Pedicel to 3 mm, sparsely puberulous. Calyx whitish yellow, sometimes flushed pink or red, rather fleshy; tube cylindrical, 9–12 mm, 8-ribbed, exterior glabrous; lobes 4, oblong-ovate, 3–4 mm, net-veined. Stamens 8, lower whorl inserted at middle of calyx tube; anthers ca. 0.6 mm; upper ones slightly exerted from calyx tube. Disk scales 1(or 2), linear, apex 3-lobed. Ovary obovoid, ca. 3.5 mm, stipitate, apex pilose; style short;

stigma capitate. Drupe red, oblong-ovoid, ca. 8 mm. Fl. late summer–early autumn.

• Forest margins, open bushlands, among rocks; 100–200 m. W Hubei, S Shanxi, E Sichuan.

9. *Wikstroemia micrantha* Hemsley, J. Linn. Soc., Bot. 26: 399. 1894.

小黄构 xiao huang gou

Daphne brevipaniculata (Rehder) Halda; *D. micrantha* (Hemsley) Halda; *D. micrantha* subsp. *paniculata* (H. L. Li) Halda; *Wikstroemia brevipaniculata* Rehder; *W. ericifolia* Domke; *W. micrantha* var. *paniculata* (H. L. Li) S. C. Huang; *W. paniculata* H. L. Li.

Shrubs, little branched, 0.5–1(–3) m tall. Branches green, gradually becoming brown, terete, slender, glabrous. Leaves opposite to subopposite, rarely alternate; petiole 1–2 mm, glabrous; leaf blade dull green adaxially, paler abaxially, oblong, elliptic-oblong, or narrowly oblong, rarely oblanceolate-oblong or spatulate, 0.5–4 × 0.3–1.7 cm, stiffly papery, both surfaces glabrous, base often rounded, margin revolute, apex obtuse or apiculate; lateral veins 6–11 pairs, abaxially conspicuous, spreading to margins and anastomosing there. Inflorescences terminal, racemose, solitary or grouped into a small panicle, 0.5–4 cm, 4–15-flowered, glabrous or hairy. Calyx yellow, rarely white; tube narrow, 4–6 mm, exterior sparsely puberulous; lobes 4, broadly ovate, ca. 1 mm. Stamens 8, upper whorl in throat; anthers oblong-elliptic, ca. 0.5 mm; upper ones slightly exerted from calyx tube. Disk scales 1(–3), free, linear to suboblong, ca. 0.3 mm, apex irregularly lobed. Ovary obovoid, shortly stipitate, pubescent or glabrous; style short; stigma capitate. Drupe black-purple, ovoid. Fl. and fr. autumn and winter.

• Valleys, shrubby slopes, by roads or rivers; 200–1000 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shanxi, Sichuan, Yunnan.

10. *Wikstroemia glabra* W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser., 6: 69. 1931.

光叶堯花 guang ye rao hua

Daphne glabra (W. C. Cheng) Halda; *D. glabra* f. *purpurea* (W. C. Cheng) Halda; *Wikstroemia glabra* f. *purpurea* (W. C. Cheng) S. C. Huang; *W. glabra* var. *purpurea* W. C. Cheng.

Shrubs to 1.5 m tall. Bark ± cracked or creviced; branches green, turning black-purple in second year, angular, glabrous; leaf buds subglobose, small, tomentose. Leaves alternate; petiole ca. 2 mm, glabrous; leaf blade dull green adaxially, paler abaxially, ovate, elliptic, or oblong-elliptic, (1.5–)2–3.5 × 0.8–2 cm, membranous, abaxially pubescent, gradually glabrescent, adaxially glabrous, base cuneate to rounded or truncate, margin ± revolute, apex obtuse, acute, or shortly acuminate, sometimes retuse; lateral veins 5–10 pairs, sometimes purple, conspicuous abaxially. Inflorescences terminal, capitate, (1 or)2–5(–8)-flowered, peduncle 0.5–1.2 cm, glabrous. Calyx white or purple; tube 8–11 mm, exterior glabrous; lobes 4, ovate to orbicular, 4–5 × 4–5 mm, spreading to 1 cm in diam. overall, apex slightly acute. Stamens 8, lower whorl inserted at middle of calyx tube;

anthers yellow, oblong-ovoid, 1–1.2 mm, included within calyx tube. Disk scales 1–3, linear, ca. 1/3 as long as ovary or slightly longer, apex 2-lobed or slightly retuse, rarely obtuse. Ovary ca. 3 mm, sessile, upper part pubescent; style short; stigma capitate. Drupe reddish, ovoid, ca. 8 mm. Fl. summer.

• Forests, sunny shrubby slopes; 900–1800 m. Anhui, Sichuan, Zhejiang.

Plants with purple flowers have been placed in *Wikstroemia glabra* var. *purpurea* but, in view of the overlapping distribution and lack of any other differentiating character, this is not followed here.

11. *Wikstroemia nutans* Champion ex Bentham, Hooker's J. Bot. Kew Gard. Misc. 5: 195. 1853.

细轴堇花 xi zhou rao hua

Shrubs 1–2 m or more tall. Bark dark brown; branches reddish or grayish brown, terete, glabrous. Leaves opposite or alternate; petiole 1–2 mm, glabrous; leaf blade green to brownish green adaxially, greenish white abaxially, ovate or ovate-elliptic to ovate-lanceolate, 3–6(–8.5) × 1.2–2.5(–4) cm, membranous to papery, both surfaces glabrous, base cuneate, subrounded, apex acuminate; lateral veins 6–13 pairs, slender. Inflorescences terminal, shortly racemose, often pendulous, 3–8-flowered; peduncle 0.7–3 cm, slender, glabrous. Pedicel 0.5–2 mm. Calyx yellowish green or pinkish; tube (10–)13–16 mm, base slightly inflated, exterior glabrous; lobes 4, elliptic, ca. 3 mm. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments ca. 0.5 mm; anthers linear, 1.5–2 mm. Disk scales 2, each divided by a septum, so appearing like 4 scales, ca. 1 mm. Ovary obovoid, ca. 1.5 mm, stipitate, apex pubescent; style very short; stigma capitate. Drupe dark red, ellipsoid, 6–7 × ca. 4.5 mm. Fl. spring–early summer, fr. summer–autumn.

Forests, shrubby slopes, valleys, roadsides; 300–1500(–1700) m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan [Vietnam].

1a. Leaves opposite; peduncle 1.5–3 cm 11a. var. *nutans*
1b. Leaves alternate; peduncle ca. 0.7 cm 11b. var. *brevior*

11a. *Wikstroemia nutans* var. *nutans*

细轴堇花(原变种) xi zhou rao hua (yuan bian zhong)

Daphne nutans (Champion ex Bentham) Halda.

Leaves opposite. Peduncle pendulous, 1.5–3 cm. Calyx yellowish green.

Forests; 300–800(–1700) m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Taiwan [Vietnam].

11b. *Wikstroemia nutans* var. *brevior* Handel-Mazzetti, Akad. Wiss. Wien Sitzungsber., Math.-Naturwiss. Kl., Abt. 1, 58: 92. 1921.

短细轴堇花 duan xi zhou rao hua

Daphne nutans var. *brevior* (Handel-Mazzetti) Halda.

Leaves alternate, caducous. Inflorescences condensed, nearly capitate; peduncle ca. 0.7 cm, erect during anthesis, often pendulous in fruit.

• Forests, shrubby slopes, valleys, roadsides; 400–1500 m. Hunan, Jiangxi.

12. *Wikstroemia salicina* (H. Léveillé) H. Léveillé & Blin in Sargent, Pl. Wilson. 2: 535. 1916.

柳状堇花 liu zhuang rao hua

Daphne salicina H. Léveillé, Bull. Acad. Int. Géogr. Bot. 25: 42. 1915.

Shrubs to 1.5 m tall. Branches purplish, turning brownish purple, pubescent. Leaves opposite; petiole ± absent; leaf blade oblong-obovate to lanceolate, 1.5–3 × 0.3–0.8 cm, both surfaces densely pubescent, base attenuate, margin revolute, apex acute. Inflorescences terminal and axillary, racemose, 5–15-flowered; usually pedunculate, sometimes pendulous. Calyx tube cylindrical, 12–15 mm, exterior pubescent; lobes 4, obovate, 4–5 mm, margin undulate, apex acute. Stamens 8, lower whorl inserted slightly above middle, upper whorl in throat; anthers ca. 0.8 mm; upper ones partly exerted from calyx tube. Disk scale 1, oblong, ca. 3 mm, apex crenulate. Ovary ovoid, ca. 4 mm, glandular pubescent; style short; stigma globose, ca. 1 mm wide. Fruit not seen.

• Open bush lands on rocky slopes. Yunnan.

13. *Wikstroemia pachyrachis* S. L. Tsai, Sunyatsenia (Nat. Sci. Ed.) 5(2): 101. 1956.

粗轴堇花 cu zhou rao hua

Daphne pachyrachis (S. L. Tsai) Halda.

Shrubs 1–4 m tall. Branches dark brown, stout, sparsely pubescent, glabrescent, nodes swollen, internodes short. Leaves opposite, densely crowded; petiole 2(–8) mm; leaf blade dark green when dried, glossy adaxially, light green abaxially, obovate-elliptic or oblong-elliptic, 2.5–7 × 1–1.8(–2.5) cm, stiffly papery, abaxially covered with fine scales, base broadly cuneate or obtuse, margin slightly revolute, apex acute or obtuse; lateral veins (5–)8–15 pairs, conspicuous abaxially, dark and obscure adaxially. Inflorescences terminal and axillary, capitate, erect, often 15–26-flowered; peduncle to 0.5 cm, stout, sparsely pubescent. Pedicel almost absent. Calyx yellowish green, salverform-cylindric, 8–10 mm, exterior sparsely puberulous; lobes 4, ovate, ca. 2 mm, apex obtuse. Stamens 8, inserted above middle of calyx tube. Disk scales 1–3, linear, ca. 1/3 as long as ovary, membranous, apex lobed or truncate. Ovary obovoid-ellipsoid, sessile, apex pubescent or glabrous; style short; stigma capitate. Drupe red, pyriform-ovoid, 6–8 × ca. 4 mm. Fl. Sep–Oct, fr. winter.

• Open forests, rocky shrubby slopes; relatively high elevations. Guangdong, Guangxi, Hainan (Gan'en).

14. *Wikstroemia indica* (Linnaeus) C. A. Meyer, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 1: 357. 1843.

了哥王 liao ge wang

Daphne indica Linnaeus, Sp. Pl. 1: 357. 1753; *Capura purpurata* Linnaeus; *D. aquilaria* Blanco; *D. cannabina* Lour-eiro (1790), not Wallich (1820); *D. rotundifolia* Linnaeus f.;

Erioselema viridiflora Zollinger & Moritz; *Wikstroemia forsteri* Decaisne; *W. indica* var. *viridiflora* J. D. Hooker; *W. ovalifolia* Decaisne; *W. ovata* Fernández-Villar (1880), not C. A. Meyer (1843); *W. valbrayi* H. Léveillé; *W. viridiflora* Meisner.

Shrubs 0.5–2 m or more tall. Branches reddish brown, glabrous. Leaves opposite; petiole ca. 1 mm; leaf blade reddish brown on both surfaces when dried, obovate, elliptic-oblong, or lanceolate, 2–5 × 0.5–1.5 cm, papery to thinly leathery, both surfaces glabrous, base broadly or narrowly cuneate, apex obtuse or acute; lateral veins dense, slender, at narrow angle to midrib. Inflorescences terminal, capitate, several flowered; peduncle 0.5–1 cm, glabrous. Pedicel 1–2 mm. Calyx yellowish green, 7–12 mm, exterior glabrescent; lobes 4, broadly ovate to oblong, ca. 3 mm, apex acute or obtuse. Stamens 8. Disk scales often 2 or 4. Ovary obovoid or ellipsoid, glabrous or apex sparsely pubescent; style very short; stigma capitate. Drupe red to dark purple, ellipsoid, 7–8 mm. Fl. and fr. summer–autumn.

Forests, rocky shrubby slopes; below 1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Sichuan, Taiwan, Yunnan, Zhejiang [India, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Australia, Pacific islands east to Fiji; Mauritius, Sri Lanka (introduced)].

See Halda (Genus *Daphne*, 145–146. 2001) for a more extensive synonymy of this widespread and variable, apomictic species.

15. *Wikstroemia taiwanensis* C. E. Chang, Bull. Taiwan Prov. Pingtung Inst. Agric. 19: 18. 1977.

台湾茛菪花 tai wan rao hua

Daphne taiwanensis (C. E. Chang) Halda.

Shrubs to 2 m tall. Young branches pale yellowish green, turning reddish brown, terete, appressed pubescent, glabrescent. Leaves opposite or alternate; petiole ca. 2 mm; leaf blade bright green adaxially, paler abaxially, elliptic or narrowly obovate to cochleate, 3–4 × 1.2–1.8 cm, stiffly papery, both surfaces glabrous, base obtuse, apex acute to acuminate; lateral veins 8 or 9 pairs, slightly raised abaxially, obscure adaxially. Inflorescences terminal, shortly spicate or umbellate, (1–)7–10-flowered; peduncle ca. 1 cm, glabrous. Pedicel 1–5 mm, articulate at base. Calyx yellowish white or green, sometimes flushed with purple; tube slightly ovoid, 2–5 mm, exterior hairy; lobes 4, ovate or oblong, 1–2 mm. Stamens 8; anthers oblong-elliptic, ca. 0.4 mm, obtuse, included within calyx tube. Disk scales 2, linear, each deeply 2-lobed. Ovary obovoid, glabrous or with apex pubescent; style short, ca. 1 mm; stigma globose. Drupe red, ovoid, 5–7 × ca. 4 mm.

• Forested slopes, thickets; low to middle elevations. Taiwan.

16. *Wikstroemia lanceolata* Merrill, Publ. Bur. Sci. Gov. Lab. 29: 31. 1905.

披针叶茛菪花 pi zhen ye rao hua

Daphne lanceolata (Merrill) Halda; *Wikstroemia angustissima* Merrill.

Shrubs to 4 m tall. Young branches appressed puberulous, glabrescent. Leaves opposite; petiole 1–2.5 mm, glabrous; leaf blade lanceolate, 4–6(–8.5) × 0.8–1.2(–2.5) cm, membranous to papery, both surfaces glabrous, base cuneate or broadly cune-

ate, apex acuminate; lateral veins 8–10(–16) pairs, slightly prominent abaxially. Inflorescences umbellate or shortly racemose, (1–)3–6(–20)-flowered; peduncle 0.2–0.3(–1.5) cm. Pedicel 1–1.5 mm. Calyx green or yellow-green; tube 5–14 mm, exterior puberulous, glabrescent; lobes 4, ca. 1 mm, puberulous, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat. Disk scales 2, linear. Ovary ovoid, apex sparsely pubescent; style short; stigma subglobose. Drupe ovoid, ca. 8 × 5 mm, usually glabrous, sometimes with apex sparsely hairy.

Forested slopes, thickets. Taiwan [Philippines].

Wikstroemia lanceolata is being investigated as a potential fiber crop in the Philippines.

17. *Wikstroemia monnula* Hance, J. Bot. 16: 13. 1878.

北江茛菪花 bei jiang rao hua

Shrubs 0.5–0.8 m tall. Branches yellowish green, turning dark purple, angular, pubescent. Leaves opposite to alternate; petiole short, 1–1.5 mm; leaf blade dark brown adaxially when dried, light brown abaxially, ovate-elliptic to elliptic or elliptic-lanceolate, 1–3.5 × 0.5–1.5 cm, papery or stiffly so, abaxially puberulous at least on veins, adaxially glabrous, base broadly cuneate or subrounded, apex acute; lateral veins 4 or 5 pairs, slender. Inflorescences terminal, often on short lateral branches, densely shortly racemose, (8–)12-flowered, pedunculate. Pedicel short. Calyx purplish red; tube 9–12 mm, slender, exterior white pubescent; lobes 4, ovate, 1–2 mm, apex slightly obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat; upper anthers almost exerted from calyx tube. Disk scales 1–3, unequal, linear-oblong to broadly ovate, apex 3-lobed or -dentate. Ovary narrowly obovoid, ca. 4 mm, stipitate, apex puberulous; style very short; stigma depressed-globose. Drupe dry, ovoid-globose, enclosed by persistent calyx. Fl. and fr. Apr–Aug.

• Shrubby slopes, roadsides; 600–1100 m. S Anhui, Guangdong, Guangxi, Guizhou, Hunan, Zhejiang.

- 1a. Leaf blade abaxially puberulous only on veins; disk scales 1 or 2, linear-oblong or oblong 17a. var. *monnula*
- 1b. Leaf blade abaxially uniformly puberulous; disk scales 3, broadly ovate 17b. var. *xiuningensis*

17a. *Wikstroemia monnula* var. *monnula*

北江茛菪花(原变种) bei jiang rao hua (yuan bian zhong)

Daphne monnula (Hance) Halda; *D. stenantha* (Hemsley) Halda; *Wikstroemia stenantha* Hemsley.

Leaf blade abaxially with puberulous veins. Disk scales 1 or 2, linear-oblong or oblong.

• Shrubby slopes, roadsides; 600–1100 m. Guangdong, Guangxi, Guizhou, Hunan, Zhejiang.

This taxon was misidentified as *Wikstroemia nutans* by Cai (Bull. Zhongshan Univ. 5(2): 104. 1956).

17b. *Wikstroemia monnula* var. *xiuningensis* D. C. Zhang & J. Z. Shao in Y. J. Jin, Fl. Anhui 3: 646. Feb 1990.

休宁茛菪花 xiu ning rao hua

Daphne monnula var. *xiuningensis* (D. C. Zhang & J. Z. Shao) Halda.

Leaf blade abaxially uniformly puberulous. Disk scales 3, broadly ovate.

- 600–700 m. S Anhui (Xiuning).

The varietal epithet was misspelled “*xiningensis*” on p. 646 of the protologue. It was correctly spelled “*xiuningensis*,” corresponding with the transliteration of the type locality, Xiuning, on p. 453 (key), p. 457 (Chinese description), and p. 693 (index). The same name was published two months later by the same authors with the same type (Acta Phytotax. Sin. 28: 162. Apr 1990) and spelled “*xiuningensis*” throughout.

18. Wikstroemia capitata Rehder in Sargent, Pl. Wilson. 2: 530. 1916.

头序堇花 tou xu rao hua

Daphne capitata (Rehder) Halda.

Shrubs 0.5–1 m tall. Branches green, usually turning purple-brown in first year, terete, slender, glabrous. Leaves opposite or subopposite; petiole 0.5–1.5 mm; leaf blade dull yellowish green adaxially, paler abaxially, elliptic or obovate-elliptic, rarely obovate-oblong, 1–2 × 0.4–1 cm, membranous, both surfaces glabrous or sparsely strigose and glabrescent, base gradually narrowed, apex obtuse or slightly obtuse; lateral veins 5–7 pairs, oblique, slightly curved upward, raised abaxially. Inflorescences terminal, capitate, 3–7-flowered; peduncle 1–2 cm, very slender. Pedicel absent. Calyx yellow, 7–8 × ca. 1 mm, exterior sericeous-strigose; lobes 4, ovate or ovate-oblong, ca. 1.5 × 1 mm. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments short; anthers ovoid-oblong, 0.8–1 mm. Disk scale 1, linear, ca. 1 mm, apex 2- or 3-dentate. Ovary ca. 3 mm, strigose-pubescent; style very short, ca. 0.5 mm; stigma purple, capitate. Drupe yellow or orange, ovoid-globose, ca. 5 mm, slightly strigose, tapering at both ends, enclosed by persistent calyx. Fl. summer–autumn.

- Forests, exposed shrubby slopes; 300–1000 m. Guizhou, Hubei, Shanxi, Sichuan.

19. Wikstroemia retusa A. Gray, J. Bot. 3: 303. 1865.

倒卵叶堇花 dao luan ye rao hua

Daphne grayana Halda; *Wikstroemia obovata* Hemsley.

Shrubs, sometimes deciduous, 1–3 m tall. Branches red-brown, stout, densely appressed pubescent. Leaves opposite; petiole short, 1–2 mm, ± pubescent; leaf blade dark green adaxially, paler abaxially, obovate or oblong-obovate, 1.5–5 × 1–3.5 cm, thickly papery, both surfaces glabrous, base rounded to cuneate, apex rounded to rounded-obtuse, sometimes slightly retuse; lateral veins 8–10 pairs, slightly raised abaxially, obscure adaxially. Inflorescences terminal, spicate, 4–6(–20)-flowered; peduncle 0.7–3 cm, densely pubescent. Pedicel 1–3 mm. Calyx greenish yellow; tube 8–10 mm, exterior sparsely pubescent; lobes 4, ovate, ca. 3 mm. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl just below throat; filaments short. Disk scales 2 or 3, opposite, oblong, apex 2-lobed. Ovary pubescent at apex; style short; stigma globose. Drupe red, globose, ca. 6 mm. Fl. Jul–Sep.

Forest thickets, deforested slopes, grasslands. Taiwan [Japan, Philippines].

20. Wikstroemia haoi Domke, Notizbl. Bot. Gart. Berlin-Dahlem 13: 387. 1936 [“*haoii*”].

武都堇花 wu du rao hua

Daphne haoi (Domke) Halda.

Shrubs to 1 m tall, much branched. Branches black-purple, terete, ± densely white tomentose, glabrescent, irregularly rugose-lenticellate; leaf buds small, white sericeous. Leaves opposite or alternate, subopposite on flowering branches; petiole ca. 2 mm, puberulous; leaf blade dark green adaxially, whitish green abaxially, elliptic or ovate-elliptic, 0.8–1.5(–2.5) × 0.3–0.8(–1.5) cm, abaxially sparsely sericeous, adaxially less hairy, base tapering to petiole, margin ± revolute, apex acute or slightly obtuse; midrib conspicuously raised, lateral veins inconspicuous, concave or obscure. Inflorescences terminal and subterminal, ± spicate, sometimes grouped into a panicle, 3–20-flowered; peduncle 0.3–2.5 cm. Pedicel ca. 1 mm. Calyx purplish or brownish yellow; tube ± narrowly obconic, ca. 9 × 1 mm, exterior white or yellow sericeous, glabrescent; lobes 4, outer lobes ca. 2 × as long as inner, obovate or suborbicular-elliptic, ca. 2 × 1.5 mm, apex rounded. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments very slender; anthers oblong, ca. 1 × 0.5 mm; upper ones slightly exerted from calyx tube. Disk scale 1, linear, ca. 1.5 × 0.1 mm, finely dentate or irregularly crenulate, apex obtuse to truncate. Ovary cylindrical-clavate, ca. 3 mm, glabrous except for pilose tip; style very short, slender; stigma globose, papillose. Drupe brownish red, ovoid, ca. 6 mm. Fl. summer.

- Open woodlands, forest margins, rocky slopes, roadsides; 2500(–3000) m. S Gansu, N Sichuan.

21. Wikstroemia vaccinium (H. Léveillé) Rehder, J. Arnold Arbor. 15(2): 103. 1934.

平伐堇花 ping fa rao hua

Lonicera vaccinium H. Léveillé, Fl. Kouy-Tchéou 64. 1914; *Daphne monnula* (Hance) Halda var. *vaccinium* (H. Léveillé) Halda; *D. vaccinium* (H. Léveillé) Halda.

Shrubs, suckering from base, deciduous, 0.3–0.4 m tall. Bark blackish purple; branches sericeous-strigose, glabrous by second year. Leaves opposite; petiole ca. 1 mm, sericeous-strigose; leaf blade dark green, elliptic to ovate-elliptic, 0.5–1 cm, leathery, abaxially strigose, adaxially glabrous, base broadly cuneate, apex obtuse; lateral veins ca. 3 per side of midrib. Inflorescences terminal, capitate, becoming shortly spicate, 3–5(–8)-flowered; peduncle ca. 0.5 cm in fruit. Pedicel absent. Calyx pink; tube ca. 4 mm, exterior sericeous-strigose; lobes 4, ovate, 1–1.5 mm, glabrous, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; anthers linear, included within calyx tube. Disk scale 1, linear, ca. 0.7 mm, dentate. Ovary ovoid, ca. 2 mm, hairy; style short; stigma capitate. Drupe reddish, ellipsoid, ca. 4 mm, enclosed by persistent calyx.

- Bushy slopes, among rocks; 2400–3000 m. Guizhou.

22. Wikstroemia chamaedaphne (Bunge) Meisner in A. Candolle, Prodr. 14: 547. 1857.

河朔堯花 he shuo rao hua

Passerina chamaedaphne Bunge, Enum. Pl. China Bor. 58. 1833 ["1831"]; *Daphne chamaedaphne* (Bunge) Halda; *Diplomorpha chamaedaphne* (Bunge) C. A. Meyer.

Shrubs to 1(–1.5) m tall, much branched. Branches green, becoming brown, nearly 4-angled, slender, ± tomentose, soon glabrous. Leaves opposite; petiole very short to almost absent; leaf blade pale green adaxially, glaucous abaxially, lanceolate to oblong-lanceolate, 2–6 × 0.2–1 cm, thinly leathery, rugulose when dried, both surfaces glabrous, base cuneate, apex acute; lateral veins 7 or 8 pairs. Inflorescences terminal and axillary, spicate, often paniculate, axes lengthening in fruit, densely gray pubescent. Pedicel persistent, very short, articulate. Calyx greenish yellow or creamy-yellow, 8–10 mm; tube 5–8 mm, exterior gray sericeous-pubescent; lobes 4, in two pairs: one large, other one small, ovate to oblong, 1–2 mm, apex rounded. Stamens 8, inserted above middle of calyx tube; filaments short to absent; anthers oblong, ca. 1 mm. Disk scales 2(or 3), linear or oblong, ca. 0.8 mm, connate at base, apex obtuse. Ovary clavate, stipitate, apex minutely pubescent; style short; stigma globose, flattened. Drupe dry, brownish, ovoid, ca. 6 mm, enclosed by persistent calyx. Fl. Jun–Aug, fr. Sep.

• Open mixed forests, bushy slopes, among boulders, roadsides; 500–1900(–2400) m. Gansu, Hebei, Henan, Hubei, Jiangsu, Shaanxi, Shanxi, Sichuan.

23. Wikstroemia stenophylla E. Pritzl ex Diels, Bot. Jahrb. Syst. 29: 480. 1900.

轮叶堯花 lun ye rao hua

Daphne stenophylla (E. Pritzl ex Diels) Halda; ?*D. stenophylla* var. *ziyangensis* (C. Y. Yu) Halda; *Wikstroemia rosmarinifolia* H. Winkler (1922), not (Rehder) Domke (1932); ?*W. stenophylla* var. *ziyangensis* C. Y. Yu.

Shrubs evergreen, 0.2–0.8(–1.3) m tall. Bark brown, much branched in upper part; branches green, turning brownish, 4-angled when young, pubescent. Leaves opposite, decussate or ternate, densely crowded on upper branches; petiole very short; leaf blade deep green adaxially, glaucous abaxially, linear, 0.5–2.5 × 0.15–0.25 cm, leathery, both surfaces at first pubescent, soon glabrous, base tapering to petiole, margin revolute, apex aristate; midrib conspicuously raised, lateral veins obscure. Inflorescences terminal, rarely axillary, a panicle of spikes, rarely reduced to a single spike; spikes 4–10-flowered; peduncle to 1 cm, gray sericeous. Pedicel almost absent. Calyx yellow; tube 5–8(–10) mm, exterior yellow sericeous; lobes 4, oblong, 1–1.5(–2) mm. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; upper ones exerted from calyx tube. Disk scale 1(–4), lanceolate, apex 2-lobed. Ovary cylindrical, sparsely puberulous or pubescent only at apex; style very short; stigma globose. Drupe red, conic, ca. 5 mm, enclosed by persistent membranous calyx. Fl. summer–autumn.

• Sunny shrubby slopes, valleys, roadsides; 1600–2500 m. W Sichuan.

24. Wikstroemia gracilis Hemsley, J. Linn. Soc., Bot. 26: 397. 1894.

纤细堯花 xian xi rao hua

Daphne rehderi Halda, nom. illeg. superfl.

Shrubs to 1 m tall. Branches very slender, turning brownish striate, long strigose; leaf buds ovoid, white pubescent or tomentose. Leaves opposite or subopposite, sometimes in whorls of 3; petiole ca. 1 mm; leaf blade green adaxially, grayish green abaxially, elliptic or ovate-orbicular to oblong, 1.5–5 × 0.8–2.8 cm, membranous, both surfaces sparsely strigose, glabrescent, base broadly cuneate to ± rounded, apex obtuse; lateral veins 5 or 6 pairs, slender. Inflorescences terminal, racemose, sometimes in small panicles; peduncle short. Calyx yellow; tube broadly cylindrical, ca. 10 mm, exterior appressed hairy; lobes 4, elliptic, ca. 2 mm, reticulate veins obvious. Stamens 8, inserted in calyx tube. Disk scales 2, one linear and one oblong. Ovary stipitate, apex pubescent; style short; stigma capitate. Fruit not seen. Fl. autumn.

• Forests, shaded places on slopes; ca. 1100 m. Hubei, Sichuan.

When Halda published the nomen novum *Daphne rehderi* for this species (blocking name: *D. gracilis* E. Pritzl), he included *D. rehderi* subsp. *techinensis* (S. C. Huang) Halda, based on *Wikstroemia techinensis* S. C. Huang. Because the epithet of *W. techinensis* was available at species rank in *Daphne* and should have been so used (with *W. gracilis* as a subspecies), the name *D. rehderi* was nomenclaturally superfluous when published and is therefore illegitimate.

25. Wikstroemia reginaldi-farreri (Halda) Yin Z. Wang & M. G. Gilbert, comb. nov.

甘肃堯花 gan su rao hua

Basionym: *Daphne reginaldi-farreri* Halda, Acta Mus. Richnov., Sect. Nat. 8: 115. 2001.

Shrubs evergreen, to 1 m tall. Bark gray, soft; stems many; branches slender, glabrous. Leaves opposite; petiole 2–5 mm; leaf blade dark glossy green abaxially, narrowly oblanceolate to broadly linear, (1.5–)2.5–4 × 0.4–0.8 cm, thickly papery, both surfaces hirsute, base attenuate, apex abruptly acuminate, mucronulate; lateral veins obscure. Inflorescences terminal and subterminal, erect, racemose, ± paniculate, 6–10-flowered; peduncle to ca. 2 cm. Calyx yellow; tube ca. 10 mm, exterior puberulous at base; lobes 4, unequal, ovate, ca. 2 × 1 mm, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 0.4 mm; anthers linear, ca. 1 mm. Disk scale 1, obovate, ca. 0.5 mm, margin crenate. Fruit not seen.

• S Gansu (Zhugqu).

26. Wikstroemia techinensis S. C. Huang, Acta Bot. Yunnan. 7: 284. 1985.

德钦堯花 de qin rao hua

Daphne rehderi Halda subsp. *techinensis* (S. C. Huang) Halda.

Shrubs to 1.5 m tall. Branches striped, brown, slender, scattered puberulous, glabrescent; leaf buds subglobose, white pu-

bescent. Leaves alternate; petiole short, ca. 1 mm; leaf blade green adaxially, slightly grayish white abaxially, broadly elliptic to obovate, 2–5 × 1–2.5 cm, membranous, base cuneate, apex rounded, obtuse, or retuse; midrib conspicuous on both surfaces; lateral veins tenuous, slightly prominent abaxially. Inflorescences terminal on young branches, clustered, 2–4-flowered; peduncle ca. 0.5 cm. Calyx pale green, ca. 12 mm, 8-veined, exterior puberulous; lobes 4, oblong, margin slightly erose. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat. Disk scales 2, linear, or one of them broader, ca. 1/2 as long as ovary. Ovary clavate, stipitate, appressed pubescent, more densely so at apex; style short, hidden by hairs; stigma globose. Fruit not seen. Fl. summer.

- Forests; ca. 3400 m. Yunnan.

27. *Wikstroemia baimashanensis* S. C. Huang, Acta Bot. Yunnan. 7: 286. 1985.

白马山堇花 bai ma shan rao hua

Daphne baimashanensis (S. C. Huang) Halda.

Shrubs 0.8–1 m tall. Young branches brown, turning black-brown in second year, sparsely pubescent, soon glabrous. Leaves alternate, larger toward stem apex; petiole ca. 1 mm; leaf blade elliptic to oblong, 0.8–2 × 0.5–1.2 cm, membranous, both surfaces glabrous, base broadly cuneate or subrounded, apex rounded or obtuse to slightly retuse; lateral veins 2 or 3 pairs, slender. Inflorescences terminal, fasciculate, 2–4-flowered. Pedicel ca. 1 mm. Calyx yellow; tube ca. 1.2 cm, slender, 8-ribbed inside, exterior sparsely pubescent; lobes 4, oblong, ca. 2 mm, margin erose, apex rounded; reticulate veins obvious. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; anthers narrowly ovoid-sagittate, ca. 1 mm; upper ones slightly exerted from calyx tube. Disk scale 1, narrowly oblong, ca. 0.4 mm, apex 3-lobed. Ovary ca. 1.8 mm, stipitate, pubescent; style short; stigma globose. Fruit not seen.

- Forests; ca. 2800 m. Yunnan.

28. *Wikstroemia sinoparviflora* Yin Z. Wang & M. G. Gilbert, **nom. nov.**

小花堇花 xiao hua rao hua

Replaced synonym: *Wikstroemia parviflora* S. C. Huang, Acta Bot. Yunnan. 7: 289. 1985, not *Wikstroemia parviflora* (Choisy) S. F. Blake, Contr. Gray Herb., n.s., 53: 40. 1918 [*Haemocharis parviflora* Choisy, Mém. Soc. Phys. Genève 14: 144. 1855, Theaceae]; *Daphne parviflora* Halda.

Shrubs 0.2–0.5 m tall, much branched. Branches gray, pubescent, glabrescent. Leaves alternate, densely crowded at branch apices; leaf blade lanceolate or linear-lanceolate, 0.4–1 × 0.1–0.2 cm, both surfaces pubescent, margin revolute. Inflorescences terminal, fasciculate, 1–4-flowered; peduncle absent. Calyx yellowish green, 3–5 mm; tube trumpet-shaped, exterior pubescent; lobes 4, apex rounded. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; upper anthers slightly exerted from calyx tube. Disk scale 1, slender. Ovary obovoid, pubescent above middle; style short; stigma capitate. Drupe ovoid, ca. 3 × 1.5 mm, enclosed by persistent calyx.

- Dry shrubby slopes, roadsides; 1000(–2000) m. Gansu.

29. *Wikstroemia alternifolia* Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 9. 1893.

互生叶堇花 hu sheng ye rao hua

Daphne alternifolia (Batalin) Halda; *D. alternifolia* var. *multiflora* (Lecomte) Halda; *Wikstroemia alternifolia* var. *multiflora* Lecomte.

Shrubs. Branches pale white, terete, pubescent when young. Leaves mostly alternate, rarely some opposite; petiole short, ca. 1.5 mm, puberulous; leaf blade lanceolate to oblanceolate, (1.5–) 3–3.8 × 0.9–1.2(–1.8) cm, thinly papery, both surfaces sparsely pubescent, midrib slightly prominent abaxially, lateral veins obscure. Inflorescences terminal, 1–4(–15)-flowered; peduncle shorter than leaves. Pedicel absent. Calyx yellow, 10–11(–20) mm; tube slender, ca. 2 mm in diam., exterior appressed puberulous; lobes 4, 1/5–1/4 as long as tube, apex rounded and truncate (or acute), slightly premorse. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl in throat; upper ones slightly exerted from calyx tube. Disk scales 1(or 2), linear, 1/4–1/2 as long as ovary, apex 5-lobed. Ovary narrowly globose, densely pilose; stigma yellow, capitate. Fruit not seen.

- Open bushy slopes, rocks; below 2500 m. Gansu, N Sichuan.

30. *Wikstroemia lungtzeensis* S. C. Huang, Acta Bot. Yunnan. 7: 285. 1985.

隆子堇花 long zi rao hua

Daphne baimashanensis (S. C. Huang) Halda subsp. *lungtzeensis* (S. C. Huang) Halda.

Shrubs 1–1.5 m tall. Primary branches brown, turning grayish white, densely gray pubescent, glabrescent; leaf buds globose, white tomentose. Leaves alternate; petiole short; leaf blade suborbicular or oblong, 0.7–1.2 × 0.4–0.7 cm, both surfaces appressed pubescent, base broadly cuneate or subrounded, apex obtuse or apiculate; lateral veins 3–5 pairs, slender. Inflorescences terminal, 2–4 flowered. Calyx yellow, ca. 11 mm, exterior densely pilose; lobes 4, suborbicular, ca. 1.5 mm, apex erose; reticulate veins conspicuous inside. Stamens 8, lower whorl inserted slightly above middle of calyx tube, upper whorl at throat. Disk scales 1–3, apex 2-lobed or free. Ovary stipitate, densely pilose; style short; stigma capitate. Fruit not seen. Fl. Jun.

- Dry slopes; 3600–3800 m. Xizang.

31. *Wikstroemia pampaninii* Rehder in Sargent, Pl. Wilson. 2: 537. 1916.

鄂北堇花 e bei rao hua

Daphne pampaninii (Rehder) Halda.

Shrubs 0.5–0.7(–1.5) m tall. Branches erect, turning purplish brown in second year, terete, slender, smooth, densely white strigose; leaf buds subglobose, white pubescent. Leaves alternate; petiole ca. 1 mm, densely pubescent; leaf blade elliptic or obovate-elliptic or narrowly elliptic, 1–2 × 0.4–0.8 cm, membranous, both surfaces long strigose to tomentose, margin

slightly revolute, apex acute; midrib conspicuously raised abaxially, lateral veins remote and obscure. Inflorescences terminal and subterminal, spicate, often paniculate, many flowered. Pedicel absent. Calyx yellow; tube 3–4(–5) mm, exterior densely appressed puberulous; lobes 4, ovate, ca. 1.5 mm, outside puberulous. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat, subsessile; anthers oblong, ca. 0.8 mm; upper ones almost exerted from calyx tube. Disk scales 2, unequal, linear or lanceolate, ca. 1 mm, apex 2- or 3-toothed. Ovary ca. 3 mm, densely appressed hirsute; style short; stigma surrounded by hairs. Drupe reddish, ellipsoid, ca. 6 mm, pubescent. Fl. Jul–Aug, fr. Sep.

• Open mixed forests, shrubby slopes; 400–1100(–2800) m. Gansu, Henan, Hubei, Shaanxi, Shanxi.

32. Wikstroemia cochlearifolia S. C. Huang, Acta Bot. Yunnan. 7: 290. 1985.

匙叶堇花 chi ye rao hua

Daphne pampaninii (Rehder) Halda subsp. *cochlearifolia* (S. C. Huang) Halda.

Shrubs to 0.5 m tall. Young branches turning black in second year, densely gray pubescent, glabrescent. Leaves alternate, rarely subopposite; petiole short to almost absent; leaf blade elliptic to oblanceolate-spatulate, 1–2 × 0.2–0.5 cm, abaxially densely appressed puberulous, adaxially glabrous, base gradually narrowed, apex acuminate; lateral veins obscure. Inflorescences terminal, on short lateral shoots, or in axils of subterminal leaves, capitate, 1- to several flowered. Calyx pale yellow, ca. 8 mm, exterior pubescent; lobes 4, in two pairs: one larger than other, apex rounded. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat. Disk scales 4, linear, small. Ovary obconic, ca. 2 mm, pubescent; style short, hidden by hairs; stigma globose. Drupe ellipsoid, enclosed by persistent calyx. Fl. autumn.

• *Thuja* forests; ca. 1200 m. N Sichuan.

33. Wikstroemia capitatoracemosa S. C. Huang, Acta Bot. Yunnan. 7: 287. 1985 [“*capitato-racemosa*”].

短总序堇花 duan zong xu rao hua

Daphne canescens Wikström subsp. *capitatoracemosa* (S. C. Huang) Halda.

Shrubs 0.5–2 m tall, much branched. Primary branches grayish brown or dark brown in second year, densely grayish white pubescent, glabrescent; leaf buds subglobose, white pubescent. Leaves alternate; petiole 1–2 mm; leaf blade lanceolate or ovate-lanceolate to oblong-lanceolate, 1.5–3.5 × 0.5–1.5 cm, stiffly papery, both surfaces appressed grayish white sericeous-pubescent, glabrescent, base broadly cuneate or rounded, apex acute; lateral veins 4–7 pairs, conspicuous, raised abaxially, reticulate veins conspicuous and dense. Inflorescences terminal or subterminal, densely racemose, 5–10-flowered; peduncle 0.6–1.2 cm. Pedicel articulate at apex. Calyx yellow, 8–9 mm, exterior grayish white pubescent; lobes 4, oblong, 1–1.5 mm, apex obtuse. Stamens 8, lower whorl inserted slightly above middle of calyx tube, upper whorl at throat. Disk scale 1, linear-lanceolate, square, or oblong, apex irregularly dentate. Ovary ellip-

soid, 1.5–2 mm, sessile, sericeous-pubescent; style short, hidden by hairs; stigma globose. Drupe dry. Fl. autumn.

• Dry hot valleys, shrubby slopes; 2200–4000 m. N and SW Sichuan, E Xizang, NW Yunnan.

34. Wikstroemia ligustrina Rehder in Sargent, Pl. Wilson. 2: 531. 1916.

白腊叶堇花 bai la ye rao hua

Daphne ligustrina (Rehder) Halda.

Shrubs erect, 0.5–1.5 m tall, broomlike. Young branches turning brownish, terete, slender, grayish white sericeous-strigose, glabrescent; leaf buds subglobose, white pubescent. Leaves alternate, rarely subopposite; petiole short, 1–1.5 mm, pubescent; leaf blade dull green adaxially, paler abaxially, elliptic or narrowly oblong to oblanceolate-oblong, 1–4 × 0.3–1.5 cm, papery, both surfaces grayish white pubescent, glabrescent, base broadly cuneate or subrounded, apex obtuse or slightly acute; midrib slightly raised abaxially, lateral veins 4–6 pairs, conspicuous abaxially as are reticulate veins, obscure adaxially. Inflorescences terminal, capitate or shortly spicate, 1- to few or many flowered; peduncle 0.1–0.5 cm, appressed sericeous. Pedicel very short or absent. Calyx yellow; tube 6–11 mm, exterior appressed sericeous; lobes 4, ovate, ca. 2.5 mm, apex obtuse, slightly erose. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl at throat; filaments very short; anthers oblong, 1–1.3 mm, included within calyx tube. Disk scale 1, ± square, apex irregularly dentate. Ovary narrowly ellipsoid, ca. 3.5 mm, densely appressed pubescent; style very short; stigma capitate. Drupe orange-red, ovoid, ca. 7 mm. Fl. autumn. $2n = 20^*$.

• Forest margins, shrubby slopes; 1900–2700(–3500) m. Hebei, Shaanxi, Shanxi, Sichuan, Yunnan.

35. Wikstroemia canescens Wallich ex Meisner, Denkschr. Regensburg. Bot. Ges. 3: 288. 1841.

堇花 rao hua

Diplomorpha canescens (Wallich ex Meisner) C. A. Meyer; *Wikstroemia inamoena* Meisner.

Shrubs 1.6–2 m tall, often much branched toward apex. Primary branches purple-black, turning grayish brown, pubescent; leaf buds subglobose, white pubescent. Leaves alternate; petiole short, 1.5–2.5 mm; leaf blade green adaxially, slightly whitish abaxially, lanceolate, 2.5–5.5 × 0.8–2.5 cm, abaxially villous, adaxially appressed sericeous, base broadly cuneate or rounded, apex acute; lateral veins 4–7 pairs, conspicuous, reticulate veins obvious abaxially. Inflorescences terminal and axillary, many, capitate, elongating into racemes after anthesis, 4–10-flowered; peduncle 1–2 cm, sometimes with 2 tiny leaflike bracts. Pedicel persistent, ca. 2 mm, articulate. Calyx yellow, ca. 15 mm, 8-ribbed inside, exterior gray villous, similar to abaxial leaf surface; lobes 4, oblong, ca. 2 × 1 mm, apex obtuse. Stamens 8, inserted above middle of calyx tube; filaments very short; anthers ca. 1.5 mm. Disk scales 1–4, unequal in size, margin incised. Ovary clavate, ca. 5 × 1 mm, stipitate, pubescent; style short, completely hidden by hairs; stigma capitate, papillose. Drupe dry. Fl. autumn. $2n = 12, 18, 20, 26$.

Shrubby slopes, among rocks; 1000–2800(–3500) m. Xizang [Afghanistan, Bangladesh, India, Japan, Nepal, Pakistan].

36. *Wikstroemia lichiangensis* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 136. 1913.

丽江堯花 li jiang rao hua

Daphne lichiangensis (W. W. Smith) Halda.

Shrubs 1.5–3 m tall, much branched. Young branches yellowish green, turning grayish black, terete, rugose-stripped, densely grayish white tomentose, glabrescent. Leaves alternate; leaf blade dull green adaxially, paler abaxially, oblanceolate or oblong, 1.5–3 × 0.5–1 cm, papery, both surfaces scattered grayish white pubescent, base broadly cuneate, margin slightly recurved, apex rounded or obtuse; lateral veins 4 or 5 pairs, conspicuous abaxially as are reticulate veins, obscure adaxially. Inflorescences terminal, capitate, 5–15-flowered; peduncle 0.5–1 cm, grayish white pubescent. Calyx yellowish green, exterior sometimes purplish; tube ca. 10 × 1 mm, exterior densely grayish white pubescent; lobes 4, suborbicular, ca. 2 mm, outside pubescent, inside glabrous. Stamens 8, lower whorl inserted slightly above middle of calyx tube, upper whorl in throat; anthers oblong-ovoid, ca. 1 mm; upper ones exerted from calyx tube. Disk scale 1, linear-lanceolate, ca. 0.7 mm, apex sometimes 3-lobed. Ovary obovoid, ca. 2 mm, stipitate, densely pilose; style short; stigma capitate, flattened. Drupe narrowly ellipsoid, shortly stipitate, enclosed by persistent calyx. Fl. summer–autumn.

• Forests; 2600–3500 m. SW Sichuan, NW Yunnan.

37. *Wikstroemia subcyclolepida* L. P. Liu & Y. S. Lian, Acta Phytotax. Sin. 34: 440. 1996.

亚环鳞堯花 ya huan lin rao hua

Daphne pampaninii (Rehder) Halda subsp. *subcyclolepida* (L. P. Liu & Y. S. Lian) Halda.

Shrubs to 1 m tall. Branches turning brownish purple in second year, terete, slender, densely white strigose; leaf buds subglobose, white pubescent. Leaves subopposite, rarely alternate or opposite; petiole ca. 1 mm, densely pubescent; leaf blade elliptic or ovate-elliptic, 1.5–3 × 1.2–2 cm, thinly papery, membranous when dried, both surfaces appressed pubescent, base broadly cuneate to ± rounded, apex acute; lateral veins 3 or 4 per side, slender. Inflorescences terminal and subterminal, fasciculate, forming a thyrse, fascicles 1–6-flowered. Pedicel ca. 0.3 mm. Calyx yellowish green; tube 5–7 mm, exterior densely appressed pilose; lobes 4, oblong-ovate, ca. 1.5 mm, outside pilose. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments to 0.2 mm; anthers oblong. Disk scale very broadly ovate in outline, ± amplexicaul, irregularly deeply 7–10-lobed. Ovary narrowly ovoid, ca. 2.5 mm, densely appressed hirsute; style very short. Immature drupe pubescent. Fl. Aug.

• Woods on hillocks; ca. 1600 m. E Gansu (Zhengning).

Wikstroemia subcyclolepida is known to us only from the protologue. The almost amplexicaul disk scale and relatively slender, thyrse-like inflorescence seem extremely distinctive, and Halda's inclusion of this species within *W. pampaninii* is therefore not accepted.

38. *Wikstroemia paxiana* H. Winkler, Repert. Spec. Nov. Regni Veg. Beih. 12: 442. 1922.

懋功堯花 mao gong rao hua

Daphne paxiana (H. Winkler) Halda.

Shrubs 0.3–0.5 m tall, branching dichotomous. Branches slender, strigose, glabrescent. Leaves mostly alternate, sometimes also a few opposite; petiole ca. 1 mm; leaf blade lanceolate, 2.5–3.5 × 0.4–0.6 cm, leathery to thickly papery, sparsely appressed puberulous when young, base narrowly cuneate, margin narrowly revolute, apex obtuse, mucronulate. Inflorescences axillary, 1- or 2-flowered. Calyx yellow; tube narrow, ca. 11 × 1–1.5 mm, 10-ribbed, exterior appressed puberulous; lobes 5, oblong, 3–4 mm, margin erose. Stamens 10, upper whorl in throat; anthers oblong, ca. 1 mm; upper ones slightly exerted from calyx tube. Disk scale 1, obovate, ca. 1 mm, entire. Ovary clavate, ca. 4 mm, apex strigose-puberulous; style obvious; stigma globose. Drupe reddish, ovoid, ca. 6 mm, apex pubescent.

• Sichuan.

39. *Wikstroemia dolichantha* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 286. 1912.

一把香 yi ba xiang

Daphne dolichantha (Diels) Halda; *D. dolichantha* var. *effusa* (Rehder) Halda; *Diplomorpha dolichantha* (Diels) Hamaya; *D. dolichantha* var. *effusa* (Rehder) Hamaya; *D. dolichantha* var. *pubescens* (Domke) Hamaya; *Stellera circinata* Lecomte; *S. circinata* var. *divaricata* Lecomte; *Wikstroemia circinata* (Lecomte) Domke; *W. circinata* var. *divaricata* (Lecomte) Domke; *W. dolichantha* var. *effusa* (Rehder) C. Y. Chang; *W. dolichantha* var. *pubescens* Domke; *W. effusa* Rehder.

Shrubs 0.5–1 m tall, much branched. Branches erect, turning purple-red, terete, slender, grayish sericeous when young. Leaves alternate; petiole 1–1.5 mm, shortly pubescent; leaf blade dark vivid green adaxially, slightly paler abaxially, oblong to lanceolate, 1.5–3 × 0.4–1 cm, papery, sparsely puberulous, base broadly cuneate, apex shortly acuminate; lateral veins very oblique, 3–5 pairs, conspicuous on both surfaces. Inflorescences terminal and subterminal, spicate, densely many flowered, pedunculate, sericeous-puberulous. Pedicel absent. Calyx yellow; tube narrowly cylindrical, 9–11 mm, exterior sericeous, rarely glabrous; lobes 5, oblong, asymmetric, 1–2 mm, sericeous-puberulous, apex obtuse. Stamens 10, lower whorl inserted above middle of calyx tube; filaments ca. 0.2 mm; anthers ca. 1 mm; upper ones slightly exerted from calyx tube. Disk scale 1, linear-lanceolate, margin incised. Ovary cylindrical, 3–4 mm, upper part pubescent; style short; stigma globose. Drupe fusiform, enclosed by persistent calyx. Fl. between summer and autumn, fr. end of autumn.

• Roadsides, shrubby slopes; 1300–2300 m. Sichuan, Yunnan.

40. *Wikstroemia pilosa* Cheng, Contr. Biol. Lab. Sci. Soc. China 8: 140. 1932.

多毛堯花 duo mao rao hua

Daphne kulingensis (Domke) Halda; *Wikstroemia kulingensis* Domke; *W. pilosa* var. *kulingensis* S. C. Huang; *W. sericea* Domke (1932), not Christopherson (1931).

Shrubs to 1 m tall. Primary branches turning yellow or brownish in second year, terete, slender, irregularly rugulose, pilose or sericeous, glabrescent. Leaves opposite or subopposite, rarely alternate; leaf blade dark green adaxially, paler abaxially, ovate, elliptic-ovate, or elliptic, 1.5–4 × 0.7–2 cm, membranous, abaxially sericeous, adaxially pilose, base broadly cuneate, rounded, or truncate, margin revolute, apex acute or shortly acuminate; lateral veins 3–5 pairs, raised. Inflorescences terminal and axillary, capitate becoming spicate, ca. as long as or longer than leaves, puberulous; peduncle 0.5–1 cm. Pedicel short. Calyx yellow; tube cylindrical, 8–10 mm, 10-ribbed, exterior densely pilose; lobes 5, ovate, 1–1.2 × ca. 0.4 mm, apex rounded. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl near throat, subsessile; anthers oblong, ca. 1 mm; upper ones almost exerted from calyx tube. Disk scale 1, linear, 1–2 mm. Ovary clavate, ca. 2.5 mm, pilose; style ca. 0.4 mm; stigma capitate. Drupe reddish, fusiform, ca. 8 mm, enclosed in persistent calyx. Fl. autumn, fr. winter.

• Open bushy slopes, rocks, roadsides. Anhui, Guangdong, Hunan, Jiangxi, Zhejiang.

Plants with a more sericeous indumentum have been separated as *Wikstroemia pilosa* var. *kulingensis*.

41. *Wikstroemia fargesii* (Lecomte) Domke, Notizbl. Bot. Gart. Berlin-Dahlem 11: 361. 1932.

城口堇花 cheng kou rao hua

Stellera fargesii Lecomte, Notul. Syst. (Paris)3: 211. 1916; *Daphne fargesii* (Domke) Halda.

Shrubs. Branches slightly reddish or brownish gray, terete, glabrous. Leaves opposite to subopposite; petiole 0.5–1 mm; leaf blade dull green adaxially, slightly paler abaxially, elliptic, suborbicular, or oblong-lanceolate, 1–2.2 × 0.8–2 cm, papery, both surfaces glabrous, base broadly cuneate, apex rounded or obtuse; lateral veins 3 or 4 pairs, ± conspicuous. Inflorescences terminal on dichotomously much branched lateral branches, capitate, 7–10-flowered; peduncle 0.2–1 cm. Pedicel very short, obscure, articulate at base. Calyx yellow; tube trumpet-shaped, slightly swollen at base, 10–12 mm, exterior glabrous; lobes 5, ovate-oblong, 1.5–2 mm. Stamens 10; filaments ca. 0.3 mm; anthers subsagittate, ca. 1 mm, included within calyx tube. Disk scale 1, linear, apex entire or slightly retuse. Ovary obovoid-ellipsoid, apex strigose; style short; stigma red, globose. Drupe orange-red, ovoid-pyriform, ca. 8 mm, base rounded, apex acuminate.

• Dry bushy hills, calcareous rocks; 1200–1600(–2000) m. Chongqing (Chengkou).

42. *Wikstroemia fuminensis* Y. D. Qi & Yin Z. Wang, Novon 14: 324. 2004.

富民堇花 fu min rao hua

Shrubs 0.8–1.2 m tall. Branches pale green, turning dark purple-brown, glabrous. Leaves opposite or subopposite; petiole 1–2 mm; leaf blade ovate or broadly so, 1.7–3 × 0.7–1.4 cm,

papery, both surfaces glabrous, midrib impressed adaxially, elevated abaxially, base rounded or slightly attenuate, margin slightly revolute in dry state, apex acute, rarely obtuse; lateral veins 5–7 pairs, conspicuous abaxially. Inflorescences terminal, capitate, 6–10-flowered; peduncle absent. Pedicel ca. 1 mm. Calyx yellow; tube cylindrical, 11–13 mm, exterior glabrous; lobes 5, ovate to ovate-elliptic, 2–2.5 mm, apex obtuse. Stamens 10, lower whorl inserted slightly above middle of calyx tube, upper whorl in throat; anthers linear. Disk scale 1, ca. 2 mm, membranous, apex irregularly deeply or shallowly lobed. Ovary ellipsoid, glabrous; style ca. 0.2 mm; stigma globose, papillose. Fruit not seen.

• Shrubby slopes; ca. 2700 m. C Yunnan (Fumin).

This species needs careful comparison with the poorly known *Wikstroemia fargesii*. The original authors also compared it with *W. huidongensis*.

43. *Wikstroemia linearifolia* H. F. Zhou ex C. Y. Chang, Guihaia 6: 270. 1986.

线叶堇花 xian ye rao hua

Daphne zhouana Halda.

Shrubs 0.6–0.8 m tall, densely branched. Branches turning gray or grayish brown or pale yellow, angular, grayish pubescent, glabrous by second year. Leaves alternate, dense; petiole ca. 1 mm; leaf blade dark green adaxially, paler abaxially, linear, 0.6–1.5 × 0.1–0.15 cm, both surfaces glabrous, base tapering into petiole, margin revolute, apex acute or slightly obtuse; midrib raised abaxially, concave adaxially; lateral veins obscure. Inflorescences terminal, fascicled, 3(–5)-flowered; peduncle absent. Pedicel ca. 3 mm, grayish pubescent. Calyx yellow; tube narrowly tubular, ca. 10 mm, exterior glabrous; lobes 5, broadly ovate or oblong-lanceolate, 3–4 × 2–3 mm, conspicuously veined, apex slightly obtuse. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments 1–1.2 mm; anthers linear-oblong; upper ones exerted from calyx tube. Disk scale 1, broadly oblong, apex erose. Ovary clavate, upper part hairy; style short; stigma swollen, globose. Drupe semidry, brownish yellow, ca. 5 mm.

• Rocky slopes; 2800–3300 m. Sichuan (Xinlong).

44. *Wikstroemia scytophylla* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 286. 1912.

革叶堇花 ge ye rao hua

Daphne scytophylla (Diels) Halda.

Shrubs evergreen, 0.5–3 m tall, densely branched. Branches pale yellowish green, turning purplish or grayish brown, nearly 4-angled, glabrous. Upper leaves usually opposite; petiole short, ca. 1 mm, glabrous; leaf blade whitish green abaxially, oblanceolate to oblong, 2–4 × 0.3–1.2 cm, leathery, both surfaces glabrous, base cuneate to broadly cuneate, apex apiculate; lateral veins at narrow angle to midrib, obscure abaxially, conspicuous adaxially. Inflorescences terminal or axillary, racemose, solitary, usually pendulous at anthesis; peduncle 2–4 cm, rachis elongated during anthesis, slightly thickened and succulent, stouter and stronger than peduncle, glabrous; rachis

conspicuously scarred after fruit shed. Pedicel ca. 1 mm, articulate, glabrous. Calyx yellow; tube narrowly cylindrical-trumpet-shaped, ca. 10×1 mm, exterior glabrous; lobes 5, ovate, ca. 1 mm, margin undulate, apex obtuse. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments short; anthers oblong, 1–1.2 mm, included within calyx tube. Disk scale 1, oblong-ovate, ca. 0.5 mm. Ovary fusiform, ca. 4 mm, sparsely sericeous-pubescent; style short; stigma capitate. Drupe brownish purple, ovoid, ca. 5 mm, base narrowed, enclosed by persistent calyx. Fl. between summer and autumn, fr. winter.

• Dry shrubby slopes, on limestone; 1900–3000 m. Sichuan, Xizang, Yunnan.

45. *Wikstroemia huidongensis* C. Y. Chang, Bull. Bot. Res., Harbin 6(4): 145. 1986.

会东堯花 hui dong rao hua

Daphne huidongensis (C. Y. Chang) Halda.

Shrubs evergreen, 1–2 m tall. Branches yellowish green, turning purple-brown when older, terete, slender, glabrous, leaf scars closely spaced, prominent, suborbicular; leaf buds small, white pubescent when young. Leaves opposite; petiole ca. 1 mm, glabrous or glabrescent; leaf blade deep green adaxially, paler abaxially, broadly elliptic or suborbicular, $2-3 \times 1-2$ cm, thinly leathery, both surfaces glabrous, base rounded or broadly cuneate, margin revolute, apex rounded, rarely rounded-obtuse, often apiculate; lateral veins 6–12 pairs, conspicuous adaxially. Inflorescences terminal, spicate, 3–7-flowered; peduncle 0.7–1 cm, glabrous. Pedicel 0.5–1 mm. Calyx yellow; tube narrowly tubular, 8–10 \times ca. 1 mm, base slightly inflated, exterior glabrous; lobes 5, oblong, ca. 2 mm, margin slightly erose, apex rounded or truncate. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments very short; anthers yellow, narrowly oblong, ca. 1.8 mm; upper ones slightly exerted from calyx tube. Disk scale 1, linear, ca. 1.8 mm, apex deeply 2-lobed. Ovary subterete, ca. 2 mm, sessile or obscurely stipitate, glabrous, or rarely apex sparsely pubescent; style short to almost absent; stigma globose. Drupe purplish brown, ovoid, ca. 8 mm.

• Bushy slopes, rocks; 2000(–3000) m. Sichuan (Huidong), ?Yunnan.

46. *Wikstroemia anhuiensis* D. C. Zhang & X. P. Zhang in Y. J. Jin, Fl. Anhui 3: 646. Feb 1990.

安徽堯花 an hui rao hua

Daphne anhuiensis (D. C. Zhang & X. P. Zhang) Halda.

Shrubs to 0.6 m tall. Branches deep purple, slender, sparsely pubescent, soon glabrous; leaf buds ovoid, ca. 2 mm in diam., densely grayish white pubescent. Leaves opposite; petiole ca. 1 mm, glabrous; leaf blade green adaxially, light green abaxially, elliptic to narrowly elliptic, $0.6-1.6 \times 0.3-0.8$ cm, membranous, both surfaces glabrous, base cuneate or broadly cuneate, apex acute or rounded-obtuse; lateral veins 4 or 5 pairs. Inflorescences terminal, racemose, sometimes paniculate, 2–14-flowered; peduncle 0.7–1.1 cm, glabrous. Pedicel 1–1.2 mm, glabrous. Calyx white; tube tubular, with slightly swollen

base, 8–10 mm, exterior glabrous; lobes 5, broadly ovate, ca. 2 mm, margin entire, apex rounded, obtuse, or slightly acute. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl at throat; filaments very short; anthers narrowly oblong, ca. 1 mm. Disk scale 1, linear, ca. 1.5 mm. Ovary pyriform, 2–3 mm, pubescent, stipitate, stipe ca. 1 mm; style very short; stigma subglobose, ca. 0.3 mm in diam. Drupe brownish yellow, ovoid, ca. 8 mm.

• Open hills, rocks; 500–900 m. S Anhui (Shexian).

The same name was published two months later by the same authors with the same type (Acta Phytotax. Sin. 28: 159. Apr 1990).

47. *Wikstroemia lamatsoensis* Hamaya, Acta Horti Gothob. 26: 96. 1963.

金丝桃堯花 jin si tao rao hua

Wikstroemia androsaemifolia Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 135. 1924, not Decaisne (1844); *Daphne lamatsoensis* (Hamaya) Halda.

Shrubs 0.4–0.8 m tall, densely branched. Branches brownish, stout and strong, 4-angled when young, glabrous; leaf buds white hirsute. Leaves opposite-decussate, closely spaced; petiole absent; leaf blade oblong to elliptic, $2-4.5 \times 1-2$ cm, leathery, both surfaces glabrous and glossy, base rounded or slightly cordate, apex obtuse to acuminate; veins white and raised on both surfaces; lateral veins 5–8 pairs, oblique, much branched. Inflorescences terminal, spicate, rarely branched, erect and strong, 5–8 cm, many flowered; peduncle 1–3 cm; rachis 2–5 cm. Pedicel 0.5–1 mm. Calyx yellow; tube narrow, ca. 13×1.5 mm, exterior glabrous or puberulous; lobes 5, oblong, 1.5–2 mm, apex rounded. Stamens 10, lower whorl inserted slightly above middle of calyx tube, upper whorl in throat; filaments ca. 0.7 mm; anthers oblong-elliptic, ca. 1.5 mm; upper ones exerted from calyx tube. Disk scale 1, linear, 1–2 mm, membranous, apex truncate or slightly retuse. Ovary obconic, ca. 4 mm, hirsute; style very short; stigma globose. Drupe red, globose, ca. 6 mm in diam. Fl. autumn.

• Valleys or sunny shrubby slopes in limestone areas; 2600–3200 m. NW Yunnan.

48. *Wikstroemia trichotoma* (Thunberg) Makino, Bot. Mag. (Tokyo) 11: 71. 1897.

白花堯花 bai hua rao hua

Shrubs evergreen, 0.5–2.5 m tall. Bark brown, rugose; main stem stout, strong, much branched; branches erect, glossy, slightly yellow, turning purple-red or reddish, extended, slender, glabrous. Leaves opposite; petiole ca. 0.2 cm; leaf blade brown adaxially when dried, light brown to whitish abaxially, ovate to ovate-lanceolate, $(0.8-1.2-3.5(-8) \times (0.5-1-2.2(-4))$ cm, thinly papery, both surfaces glabrous, base broadly cuneate, rounded, or truncate, apex acute; lateral veins 6–8(–11) pairs, slender, more conspicuous abaxially. Inflorescences terminal, erect, a panicle of spikes, rachis 0.2–1.5(–3.5) cm, few to 10(–26)-flowered, sparsely puberulous; peduncle 1–2.5 cm, often branched, glabrous. Pedicel 0.5–1 mm or obscure. Calyx yellow or white; tube 6.5–20 mm, exterior glabrous; lobes 5, broadly elliptic, 1.7–2 mm, margin undulate, apex obtuse. Stamens 10,

lower whorl inserted above ca. 1/3 way up calyx tube, upper whorl at throat; anthers linear, ca. 1 mm. Disk scale 1, linear or linear-oblong, ca. 1/2 as long as ovary, membranous, lobed or truncate. Ovary obovoid, 2–3 mm, stipitate, glabrous or apex sparsely puberulous; style short, ca. 0.5 mm; stigma globose, large. Drupe dry, ovoid, ca. 5 mm, usually glabrous, enclosed in persistent calyx. Fl. summer.

Open forests, among shrubs on limestone hills, shaded places, roadsides; ca. 600 m. Anhui, Guangdong, NC Guangxi, Hunan, Jiangxi, Zhejiang [Japan, S Korea].

This species has been misidentified by some authors as *Wikstroemia nutans*. There seem to be discrepancies between evergreen Chinese plants with white flowers and a single linear hypogynal scale and deciduous Japanese plants with larger leaves (to 8 × 3.5 cm), yellow flowers, and up to 3 dissected scales. We therefore recommend more detailed investigations.

- 1a. Calyx tube 6.5–7.5 mm; inflorescence rachis 0.2–1.5 cm, up to 10-flowered; ovary apex sparsely puberulous 48a. var. *trichotoma*
- 1b. Calyx tube to 20 mm; inflorescence rachis 0.8–3.5 cm, 8–26-flowered; ovary glabrous 48b. var. *flavianthera*

48a. Wikstroemia trichotoma var. trichotoma

白花堯花(原变种) bai hua rao hua (yuan bian zhong)

Queria trichotoma Thunberg, Trans. Linn. Soc. London 2: 329. 1794; *Daphne alba* (Handel-Mazzetti) Halda; *D. trichotoma* (Thunberg) Halda; *Diplomorpha dolichantha* (Diels) Hamaya var. *pilosa* (Hamaya) Hamaya; *D. ellipsocarpa* (Maximowicz) Nakai; *D. japonica* (Siebold & Zuccarini) Endlicher; *D. trichotoma* (Thunberg) Nakai; *D. trichotoma* f. *pilosa* Hamaya; *Passerina japonica* Siebold & Zuccarini; *Stellera japonica* (Siebold & Zuccarini) Meisner; *Wikstroemia alba* Handel-Mazzetti; *W. ellipsocarpa* Maximowicz; *W. japonica* (Siebold & Zuccarini) Miquel.

Leaf blade with 6–8 pairs of lateral veins. Inflorescence rachis 0.2–1.5 cm, up to 10-flowered. Calyx tube 6.5–7.5 mm. Disk scale linear, lobed. Ovary ca. 3 mm, apex sparsely puberulous.

Open forests, shaded places, roadsides; ca. 600 m. Anhui, Guangdong, Hunan, Jiangxi, Zhejiang [Japan, S Korea].

48b. Wikstroemia trichotoma var. flavianthera S. Y. Liou, Acta Phytotax. Sin. 42: 265. 2004.

黄药白花堯花 huang yao bai hua rao hua

Leaf blade with 6–11 pairs of lateral veins. Inflorescence rachis 0.8–3.5 cm, 8–26-flowered. Calyx tube to 20 mm. Disk scale linear-oblong, apex truncate or slightly emarginate. Ovary ca. 2 mm, glabrous.

- Among shrubs on limestone hills. NC Guangxi (Luocheng).

The protologue of this variety emphasized the presence of yellow anthers but there is rather little information on anther color within the genus, including *Wikstroemia trichotoma*, and available images of Korean material also show flowers with yellow anthers. However, the apparently much larger calyx and isolated distribution do suggest that this taxon is worth maintaining.

49. Wikstroemia leptophylla W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 229. 1920.

细叶堯花 xi ye rao hua

Shrubs 0.5–1.5 m tall, densely branched. Branches green, becoming grayish or brownish with age, 4-angled, slender, glabrous. Leaves opposite or alternate; petiole almost absent; leaf blade green or black-purple adaxially, slightly paler abaxially, linear or linear-lanceolate, 2–6 × 0.3–0.6 cm, stiffly papery, abaxially smooth, adaxially rugose when dried, both surfaces glabrous, base gradually narrowed, margin revolute in dry conditions, apex ± acute; midrib raised abaxially, lateral veins obscure or conspicuous, 5 or 6 pairs. Inflorescences terminal and subterminal, racemose, 3–7 cm, often 10–20-flowered; peduncle 2–3 cm. Pedicel ca. 1 mm, articulate. Calyx yellowish green, exterior sometimes very dark; tube narrowly cylindrical, 10–13 × ca. 2 mm, exterior glabrous; lobes 5, ovate-oblong, ca. 1.5 mm, apex obtuse-rounded. Stamens 10, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments much shorter than anthers; anthers ca. 1 mm; upper ones exerted from calyx tube. Disk scale 1, linear, apex acute. Ovary oblong, 3–4.5 mm, base slightly narrowed, apex pubescent; style ca. 0.5 mm; stigma globose, papillose. Drupe reddish, ovoid, ca. 8 mm. Fl. and fr. winter.

- Forests, shaded places, shrubby slopes, on limestone; 1700–2900(–3400) m. Sichuan, Yunnan.

- 1a. Leaves opposite, lateral veins obscure; inflorescence less branched; calyx yellowish green 49a. var. *leptophylla*
- 1b. Leaves usually alternate, lateral veins conspicuous; inflorescences much branched; calyx exterior deep brown-purple to almost black 49b. var. *atroviolacea*

49a. Wikstroemia leptophylla var. leptophylla

细叶堯花(原变种) xi ye rao hua (yuan bian zhong)

Daphne leptophylla (W. W. Smith) Halda.

Leaves opposite; leaf blade adaxially green when dried, lateral veins obscure. Inflorescences less branched. Calyx yellowish green; tube 10–13 mm.

- Forests, shaded places, shrubby slopes; 1700–2900(–3400) m. Sichuan, Yunnan.

49b. Wikstroemia leptophylla var. atrovioleacea Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 135. 1924.

黑紫堯花 hei zi rao hua

Daphne leptophylla (W. W. Smith) Halda var. *atroviolacea* (Handel-Mazzetti) Halda.

Leaves usually alternate; leaf blade firm, adaxially black-purple when dried, lateral veins conspicuous. Inflorescences much branched. Calyx exterior deep brown-purple to almost black, interior yellowish green; tube ca. 10 mm.

- Shrubby slopes, on limestone; below 2400 m. Yunnan.

3. DAPHNE Linnaeus, Sp. Pl. 1: 356. 1753.

瑞香属 rui xiang shu

Wang Yinzheng (王印政); Michael G. Gilbert, Brian Mathew, Christopher D. Brickell

Farrerria I. B. Balfour & W. W. Smith ex Farrer; *Pentathymelaea* Lecomte.

Shrubs or subshrubs, evergreen or deciduous. Branches glabrous or pubescent. Leaves mostly alternate, sometimes opposite; petiole short. Inflorescence usually terminal, sometimes axillary, capitate or shortly racemose, sometimes paniculate, racemose, or spicate, with or without involucre; peduncle short or absent. Flowers bisexual or unisexual (plants sometimes dioecious), 4- or 5-merous. Calyx tube white, pink, or yellow, rarely mauve, campanulate, cylindric, or slightly funnel-shaped, exterior glabrous or pubescent; lobes 4 or 5, erect or spreading, alternately longer and shorter. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series; filaments short or absent; anthers oblong, included; connectives indistinct. Disk absent or annular, cup-shaped, sometimes elongated on one side. Ovary usually sessile or slightly stipitate, ovoid, 1-loculed; style terminal, short; stigma capitate. Fruit a succulent berry or dry and leathery, sometimes enclosed by persistent calyx, sometimes naked, usually red or yellow. Seed testa crustaceous, endosperm scanty or absent; cotyledons fleshy.

About 95 species: Asia, Europe; 52 species (41 endemic) in China.

Species of *Daphne* have long been valued by gardeners for their extremely fragrant flowers.

See the comments made in the account of the previous genus, *Wikstroemia*, on the problems of distinguishing *Daphne* and *Wikstroemia*. Halda (Genus *Daphne*. 2001) also included *Eriosolena* and *Rhamnoneuron* within *Daphne*.

Daphne argyi H. Léveillé is a synonym of *Myrica rubra* Siebold & Zuccarini in the Myricaceae (see Fl. China 4: 276. 1999). *Daphne bodinieri* H. Léveillé (1914, not 1915) is a synonym of *Alyxia schlechteri* H. Léveillé in the Apocynaceae (see Fl. China 16: 162. 1995).

1a. Flowers 5-merous.

2a. Inflorescences always axillary; calyx white; hypogynal disk annular 1. *D. axillaris*

2b. Inflorescences mostly terminal, often on lateral branches, sometimes also axillary; calyx mostly yellow or golden-yellow; hypogynal disk lateral to ovary.

3a. Upper whorl of stamens inserted at or below middle of calyx tube.

4a. Primary branches strigose; leaf blade 1–1.8 × 0.2–0.4 cm; calyx tube exterior glabrous 2. *D. rosmarinifolia*

4b. Primary branches finely pubescent; leaf blade 2.5–8 × 0.6–2.2 cm; calyx tube exterior sericeous.

5a. Calyx tube 10–14 mm, slender, obliquely ascending; inflorescences shortly spicate, ebracteate 3. *D. gemmata*

5b. Calyx tube 8–9 mm, broad, erect; inflorescences capitate or fascicled, bracteate, bracts leaflike, caducous 4. *D. gracilis*

3b. Upper whorl of stamens inserted at or close to mouth of calyx tube.

6a. Calyx tube exterior glabrous.

7a. Leaf blade linear to linear-oblong, lateral veins obscure 7. *D. angustiloba*

7b. Leaf blade ovate to obovate or oblong-lanceolate to broadly elliptic, lateral veins visible.

8a. Inflorescence few- to several flowered, peduncle 1–3 cm; young stems glabrous 5. *D. esquirolii*

8b. Inflorescence 2- or 3-flowered, peduncle shorter than 0.3 cm; young stems densely appressed hirsute 11. *D. penicillata*

6b. Calyx tube exterior hairy.

9a. Calyx tube 9–12 mm.

10a. Branches short, rather stout; plant deciduous 8. *D. modesta*

10b. Branches long, slender; plant evergreen 12. *D. tenuiflora*

9b. Calyx tube 4–7 mm.

11a. Leaf blade 5–9.5 × 1.5–3 cm; pedicel 0.5–1 mm 6. *D. pedunculata*

11b. Leaf blade 0.8–3 × 0.15–1.6 cm; pedicel absent.

12a. Leaf blade linear or linear-oblong, 8–10 × 1.5–2.5 mm; calyx tube 4–5 mm, lobes ca. 2 mm 9. *D. holosericea*

12b. Leaf blade obovate or broadly elliptic, 10–30 × 5–16 mm; calyx tube 6–7 mm, lobes 4–5 mm 10. *D. myrtilloides*

1b. Calyx lobes 4.

13a. Calyx exterior glabrous (rarely with few scattered hairs), often caducous after anthesis.

14a. Leaves at least partly truly opposite; calyx deep yellow to orange; ovary glabrous 13. *D. aurantiaca*

14b. Leaves alternate, rarely subopposite; calyx usually white or pink to purplish red, rarely yellow or greenish yellow.

15a. Calyx lobes 0.2–2.5 mm; tube 3–6 mm, often urceolate (Taiwan).

16a. Leaf blade apically obtuse or obtuse-apiculate.

17a. Leaf blade 15–20 mm wide; petiole 3–9 mm; calyx tube campanulate 16. *D. arisanensis*

- 17b. Leaf blade 3–4 mm wide; petiole ± absent; calyx tube urceolate 17. *D. morrisonensis*
- 16b. Leaf blade apically emarginate or retuse.
- 18a. Plants ca. 0.2 m tall; stems brown; calyx tube urceolate; leaf blade 7–10(–14) mm wide 18. *D. nana*
- 18b. Plants to 2 m tall; stems yellowish green; calyx tube cylindrical; leaf blade 10–15 mm wide 19. *D. chingshuishaniana*
- 15b. Calyx lobes 2.5–12 mm; tube (5–)6–16 mm, cylindrical (mainland China).
- 19a. Calyx yellow, yellow-green, or green; inflorescence ebracteate.
- 20a. Petiole very short to absent; inflorescences terminal on long, slender branches; calyx yellow 20. *D. giraldii*
- 20b. Petiole 3–10 mm; inflorescences terminal on very short lateral branchlets, superficially apparently axillary; calyx yellowish green 21. *D. pseudomezereum*
- 19b. Calyx white or pink to purplish red; inflorescence bracteate.
- 21a. Calyx tube 5–8 mm, shorter than or equal to lobes.
- 22a. Bracts 1.5–3 cm; leaf blade 6–10 × 2.5–3.2 cm 22. *D. grueningiana*
- 22b. Bracts 0.5–0.8 cm; leaf blade 1.4–4(–7) × 0.6–1.4 cm 23. *D. retusa*
- 21b. Calyx tube (6–)9–13 mm, usually longer than lobes (ca. as long in *D. odora*).
- 23a. Branchlets glabrous; calyx lobes 6–12 mm, ca. as long as tube, base auriculate 24. *D. odora*
- 23b. Branchlets pubescent at least when young; calyx lobes 5–8(–10) mm, clearly shorter than tube, base not auriculate.
- 24a. Branchlets turning purplish red to purplish brown; calyx white, lobes acute or acuminate 25. *D. acutiloba*
- 24b. Branchlets turning yellowish brown or brownish gray to gray; calyx white or pale pink, exterior flushed purplish, lobes obtuse, rarely acuminate.
- 25a. Hypogynal disk shallowly cup-shaped, margin entire; ovary apically gray pubescent, stigma squamate 26. *D. limprichtii*
- 25b. Hypogynal disk annular, margin fringed; ovary glabrous, stigma not squamate 27. *D. tangutica*
- 13b. Calyx tube exterior hairy.
- 26a. Calyx bluish purple, lilac, or lavender, lobes 4–7(–10) mm, almost as long as tube; inflorescences mostly produced before leaves, sessile on very short lateral branches, less often pedunculate, terminal on long shoots and/or axillary 14. *D. genkwa*
- 26b. Calyx white, green, yellow, pink, or if purplish, then with lobes shorter than tube; inflorescences produced after leaves, terminal on normal stems or truly axillary.
- 27a. Leaves mostly opposite or subopposite, sometimes also alternate 15. *D. jinzhaiensis*
- 27b. Leaves mostly alternate, rarely also subopposite, very rarely a few opposite.
- 28a. Inflorescences axillary.
- 29a. Calyx white; leaf blade 1.5–4.5 × 0.6–1.8 cm; fruit apically rounded or subacute 28. *D. championii*
- 29b. Calyx purple-red; leaf blade 5–11 × 2–3 cm; fruit apically acuminate-apiculate 29. *D. rhynchocarpa*
- 28b. Inflorescences terminal, sometimes also axillary, sometimes on short lateral branches.
- 30a. Calyx lobes 12–13 mm; calyx white with yellow center; creeping shrublet to 30 cm 39. *D. macrantha*
- 30b. Calyx lobes 2.5–9(–11) mm; calyx not white or if white without yellow center; shrub 50–200 cm or taller.
- 31a. Leaf blade abaxially persistently hairy, sometimes only at apex.
- 32a. Calyx yellow, tube 8–15 mm; hypogynal disk square, lateral 31. *D. erosiloba*
- 32b. Calyx green, reddish, or purplish red, tube 3–8 mm; hypogynal disk cupular or annular, symmetric.
- 33a. Leaf blade linear or linear-oblong, 1.5–2.5 mm wide; calyx green, tube 3–6 mm 32. *D. wangiana*
- 33b. Leaf blade elliptic, oblong, oblong-lanceolate, or obovate-elliptic, 3–25 mm wide; calyx reddish or purplish red with paler purple-pink or white lobes.
- 34a. Calyx lobes 2.5–3 mm, much shorter than tube; leaf blade membranous, rarely thinly papery 23. *D. retusa*
- 34b. Calyx lobes 6–9 mm, ca. as long as or longer than tube; leaf blade leathery 30. *D. leishanensis*
- 31b. Leaf blade abaxially glabrous except sometimes when extremely immature.
- 35a. Inflorescences without involucre bracts.
- 36a. Calyx purplish red, tube ca. 4 mm 33. *D. purpurascens*
- 36b. Calyx white or cream, 8–12 mm.
- 37a. Leaf blade 5–13 × 1.6–3.5(–5) cm, apex long acuminate; calyx tube ca. 15 mm 38. *D. sureil*
- 37b. Leaf blade 1.5–6(–9) × 0.6–1.5(–2) cm, apex obtuse or acute, rarely apiculate or retuse; calyx tube 8–12(–14) mm.
- 38a. Peduncle very short to absent; plant deciduous; calyx tube 10–12 mm; lobes 6–8 × 4–5 mm, obtuse, apiculate 34. *D. altaica*
- 38b. Peduncle 3–10 mm; plant evergreen; calyx tube 8–10(–14) mm; lobes 2–2.5(–3.5) mm wide, acuminate.

- 39a. Leaf blade papery; peduncle 8–10 mm; drupe 8–12 mm 35. *D. longilobata*
 39b. Leaf blade leathery; peduncle ca. 3 mm; drupe ca. 5 mm 36. *D. depauperata*
- 35b. Inflorescences with involucre bracts.
- 40a. Hypogynal disk lobed or lacinate.
- 41a. Petiole 4–12 mm; inflorescences terminal and axillary.
- 42a. Calyx lobes 5–7 mm; leaf blade lateral veins 8–12 pairs; disk 2-lobed, each lobe 2-fid at apex 40. *D. yunnanensis*
- 42b. Calyx lobes 3–4 mm; leaf blade lateral veins 12–16 pairs; disk cup-shaped, irregularly lacinate 41. *D. laciniata*
- 41b. Petiole 0.5–2 mm; inflorescences strictly terminal.
- 43a. Leaf blade 2–5 × 0.8–1.5 cm, lateral veins 5 or 6 pairs; calyx tube 10–11 mm 42. *D. tripartita*
 43b. Leaf blade 5–15 × 2–4 cm, lateral veins 6–10 pairs; calyx tube 6–8 mm 43. *D. jinyunensis*
- 40b. Hypogynal disk entire, sometimes very narrow, or margin undulate or undulate-serrate.
- 44a. Calyx at least partly purplish red or pink.
- 45a. Involucre bracts 14–18 mm; calyx lobes 5–7 mm 48. *D. bholua*
 45b. Involucre bracts 4–7 mm; calyx lobes 3–5 mm.
- 46a. Pedicel 3–4 mm; calyx lobes 2-colored, adaxially white, abaxially 2 purple or dark maroon 52. *D. taylorii*
- 46b. Pedicel 1–2.5 mm; calyx lobes uniformly colored.
- 47a. Branches hispid; pedicel ca. 2.5 mm; calyx overall ca. 14 mm; fruit ca. 6 mm 49. *D. xichouensis*
 47b. Branches sparsely tomentose; pedicel 1–1.4 mm; calyx overall 10–11 mm; fruit ca. 4 mm 50. *D. emeiensis*
- 44b. Calyx white or creamy-white.
- 48a. Calyx tube urceolate, 3–5 mm; leaf blade 0.8–1.6 cm wide, apex obtuse or rounded, usually slightly retuse 37. *D. breviflora*
- 48b. Calyx tube cylindrical, (5–)8–15(–18) mm; leaf blade (0.7–)1.4–3.5 cm, apex often acute.
- 49a. Young branches tomentose.
- 50a. Peduncle ca. 2 mm; flowers not fragrant; anthers 1–2 mm 44. *D. papyracea*
 50b. Peduncle 3–6 mm; flowers fragrant; anthers ca. 3 mm 46. *D. longituba*
- 49b. Young branches sparsely hairy to glabrous.
- 51a. Branches initially angular, grayish yellow, later turning purplish brown or bright purple, sometimes sparsely hairy 45. *D. feddei*
- 51b. Branches not angular, dark gray, dark purplish red or purplish brown, or brown, usually glabrous.
- 52a. Margins of leaf blade and bracts ciliate with a tuft of hairs at apex 51. *D. pachyphylla*
 52b. Margins of leaf blade and bracts not ciliate and without apical tufts.
- 53a. Bracts sparsely hairy; inflorescence 3–10(–12)-flowered 44. *D. papyracea*
 53b. Bracts glabrous; inflorescence usually 9–12-flowered 47. *D. kiusiana*

1. *Daphne axillaris* (Merrill & Chun) Chun & C. F. Wei, Acta Phytotax. Sin. 8: 264. 1963.

腋花瑞香 ye hua rui xiang

Wikstroemia axillaris Merrill & Chun, Sunyatsenia 5: 139. 1940.

Shrubs 2–5 m tall. Branches pale yellowish green, turning grayish brown, sparsely brown appressed pubescent. Leaves alternate; petiole 4–7 mm, appressed pubescent; leaf blade shiny green adaxially, paler abaxially, oblong to elliptic, 5–12 × (1.5–)2–4.5 cm, papery or subleathery, both surfaces glabrous or midrib sometimes sparsely pubescent abaxially, base broadly cuneate, apex caudate-acuminate; veins 8–10 pairs. Inflorescences axillary, 2–4(–8)-flowered; peduncle 1–2 mm; bracts absent. Pedicel absent. Calyx white; tube cylindrical, 6–10 mm, exterior pubescent; lobes 5, ovate, 2.5–3 mm, apex obtuse. Stamens 10, lower whorl inserted at middle of calyx tube, upper whorl just below lobes; filaments short; anthers oblong, ca. 1.5 mm; upper ones partly exerted from calyx tube. Disk annular,

pubescent, entire. Ovary ovoid, ca. 2.5 mm, densely pilose; style short; stigma capitate or shallowly discoid. Drupe black or purple, narrowly ovoid, 8–10 mm, puberulous. Fl. May–Jun, fr. Aug–Oct.

- Dense forests; 600–900 m. Hainan.

2. *Daphne rosmarinifolia* Rehder in Sargent, Pl. Wilson. 2: 549. Mar 1916.

华瑞香 hua rui xiang

Daphne clivicola Handel-Mazzetti; *Stellera chinensis* Lecomte; *S. diffusa* Lecomte (Jun 1916); *Wikstroemia clivicola* (Handel-Mazzetti) Domke; *W. diffusa* (Lecomte) Domke; *W. lecomteana* Domke; *W. rosmarinifolia* (Rehder) Domke (1932), not H. Winkler (1922).

Shrubs, often procumbent, evergreen, 0.3–1 m tall, densely branched. Branches yellowish green, turning brownish, angular, densely gray- or yellowish strigose. Leaves alternate; petiole ca. 1 mm, glabrous; leaf blade linear-oblong to obovate-

lanceolate, 1–2 × 0.2–0.5 cm, papery, both surfaces glabrous or pilose when young, base cuneate, margin revolute, ciliate, apex rounded or truncate, usually aristate; veins obscure. Inflorescences terminal, fasciculate, 2–8-flowered; peduncle absent; bracts caducous, linear-oblong or spatulate-oblong, 4–6 mm. Pedicel absent. Calyx yellow; tube cylindrical, ± curved, 8–10(–12) mm, exterior glabrous; lobes 5, ovate or ovate-oblong, 3–5 mm, apex obtuse or rounded. Stamens 10, both whorls inserted below middle of calyx tube; filaments short; anthers oblong, 1.3–1.7 mm. Disk annular, irregularly lateral to ovary. Ovary ovoid, 2–2.5 mm, glabrous; style short, ca. 0.5 mm; stigma subcapitate. Drupe brownish yellow, ovoid, 5–6 mm. Fl. Apr–May, fr. Jul.

Shrubby slopes; 2500–3800 m. SW Gansu, SE Qinghai, NW and W Sichuan, Yunnan [Myanmar].

3. *Daphne gemmata* E. Pritzl, Bot. Jahrb. Syst. 29: 481. 1900.

川西瑞香 chuan xi rui xiang

Daphne ambigua Matsuda; *Wikstroemia gemmata* (E. Pritzl) Domke.

Shrubs normally deciduous, 0.3–1 m tall, much branched. Branches erect, broomlike, pale yellowish green, turning yellowish brown to gray-brown, pubescent. Leaves alternate, clustered apically; petiole 1–2 mm, pubescent; leaf blade obovate-lanceolate, 2.5–8 × 0.6–2.2(–3) cm, membranous, both surfaces sparsely pubescent, with apical tuft of hairs, base cuneate, apex obtuse-rounded; veins 7–12 pairs. Inflorescences terminal, condensed-spicate, 5–10-flowered; peduncle ca. 2 mm, pubescent; bracts caducous, ovate-rhomboid, ca. 5 mm, pubescent. Pedicel almost absent. Calyx yellow; tube curved-cylindrical, 10–15 mm, slender, exterior sericeous; lobes 5, oblong-ovate, 4–5 × 2–3 mm, obtuse-subtruncate, pubescent apically. Stamens 10, both whorls inserted below middle of calyx tube; filaments short; anthers oblong, ca. 1 mm. Disk subcylindrical to ± square, lateral to ovary, sometimes 2-lobed. Ovary ovoid, 1–2.5 mm, shortly stipitate, sparsely pubescent; style very short; stigma capitate. Drupe red, ellipsoid, 4–5 mm, often enclosed in persistent calyx. Fl. Apr–Sep, fr. Aug–Dec.

• Cliffs, dry sunny banks; 400–1500(–1800) m. NW and W Sichuan, N Yunnan.

4. *Daphne gracilis* E. Pritzl, Bot. Jahrb. Syst. 29: 480. 1900.

小娃娃皮 xiao wa wa pi

Wikstroemia domkeana H. L. Li; *W. gracilis* (E. Pritzl) Domke (1932), not Hemsley (1894).

Shrubs evergreen, 0.3–1(–1.5) m tall. Branches dense, ascending, yellowish brown or purplish, slender, densely grayish yellow tomentose; buds ovoid. Leaves alternate; petiole 1–3 mm; leaf blade bright green adaxially, paler abaxially, obovate, obovate-lanceolate, or oblong-lanceolate, 2–8 × 0.6–1.6 cm, thinly leathery or papery, both surfaces ciliate when young, glabrescent, base cuneate, margin slightly revolute, apex obtuse, rarely acute; veins 6–10 pairs, usually raised abaxially and obscure adaxially. Inflorescences terminal, subcapitate or fascicled, 3–8-flowered; peduncle very short, densely yellowish

green hirsute; bracts caducous, leaflike, broadly ovate, abaxially densely yellowish green sericeous, adaxially glabrescent, base cuneate, apex obtuse. Calyx yellow, suffused purplish, erect; tube narrowly cylindrical, 8–9(–12) × 1.5–2 mm, exterior sericeous; lobes 5, ovate or ovate-oblong, (3–)4–5 × 2–3 mm, rounded, margin usually erose. Stamens 10, both whorls inserted below middle of calyx tube; filaments very short; anthers oblong, ca. 1 mm. Disk with 2 lobes, lateral to ovary. Ovary ovoid, 2–2.5 mm, glabrous; style short; stigma globose. Drupe greenish yellow, conic-ovoid, ca. 5 mm, enclosed in persistent calyx. Fl. Apr–May, fr. Jun–Aug.

• Shrubby slopes; 1000–1300 m. Chongqing.

5. *Daphne esquirolii* H. Léveillé, Bull. Acad. Int. Géogr. Bot. 25: 42. 1915.

穗花瑞香 sui hua rui xiang

Daphne leuconeura Rehder; *D. leuconeura* var. *mairei* (Lecomte) Rehder & H. Léveillé; *Stellera mairei* Lecomte; *Wikstroemia leuconeura* (Rehder) Domke; *W. mairei* (Lecomte) Domke.

Shrubs deciduous, 0.5–1.5 m tall, branching dichotomous. Branches sparsely pilose, quickly glabrescent; buds axillary, conspicuous. Leaves alternate; petiole 1–3 mm; leaf blade obovate or obovate-oblong, 2.5–8 × 1.4–3.5 cm, membranous, both surfaces glabrous, base cuneate, margin revolute, apex rounded or rarely subacute; veins 6–12 pairs, anastomosing at margins. Inflorescences terminal and axillary, spicate, to ca. 6 cm, several- to many flowered; peduncle 1–4 cm, stout, glabrous. Pedicel very short, glabrous. Calyx bright to orange yellow; tube narrowly cylindrical, 8–15 mm, exterior glabrous; lobes 5, broadly ovate or broadly oblong-ovate, 3–5 × 3–3.5 mm, apex obtuse. Stamens 10; lower whorl inserted at middle of calyx tube, filaments 0.5–0.75 mm; upper whorl slightly below throat, filaments 0.2–0.5 mm and anthers slightly exerted; anthers oblong, ca. 2 mm. Disk ± square, lateral to ovary, apex truncate to deeply 2-lobed. Ovary subcylindrical, 3–5 mm, sparsely tomentose; style very short; stigma capitate, depressed at apex, margin slightly lobed. Fruit not seen. Fl. May.

• Valleys, slopes; 700–2000(–3400) m. SW Sichuan, NE Yunnan.

6. *Daphne pedunculata* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 89. 1985.

长梗瑞香 chang geng rui xiang

Daphne esquirolii H. Léveillé subsp. *pedunculata* (H. F. Zhou ex C. Y. Chang) Halda.

Shrubs evergreen, to 0.7 m tall. Branches tomentose. Leaves alternate; petiole 2–3 mm; leaf blade lanceolate or oblanceolate, 5–9.5 × 1.5–3 cm, papery, abaxially sericeous when young, base narrowly cuneate, margin sometimes slightly revolute, apex acute, rarely obtuse, usually apiculate; veins 11–14 pairs, obliquely ascending, anastomosing at margins. Inflorescences terminal, many flowered; peduncle yellowish green, ca. 10 mm, sericeous; bracts absent. Pedicel 0.5–1 mm. Calyx yellow; tube narrowly cylindrical, 5–7 mm, exterior sparsely sericeous; lobes 5, oblong, 2.5–3 × 1.5–2 mm, apex obtuse-rounded.

Stamens 10, lower whorl inserted just above middle of calyx tube, upper whorl in throat; filaments ca. 1 mm; anthers linear-oblong, ca. 1.2 mm; upper ones slightly exerted from calyx tube. Disk \pm square, lateral to ovary, ca. 0.6 mm, 2-lobed. Ovary ca. 3.5 mm (including stipe ca. 2 mm), stipitate, densely pilose; style short; stigma globose, papillose. Fruit not seen. Fl. Nov–Dec.

- Dry valleys, sandy shrubby slopes; ca. 400 m. SE Yunnan.

7. *Daphne angustiloba* Rehder in Sargent, Pl. Wilson. 2: 547. 1916.

狭瓣瑞香 xia ban rui xiang

Wikstroemia angustiloba (Rehder) Domke.

Shrubs evergreen, to 0.5 m tall. Branches erect, pale yellowish green, turning brownish or purplish, slender, sparsely pubescent. Leaves alternate; petiole 1–2 mm, glabrous; leaf blade dull green adaxially, paler abaxially, linear-oblong, 1–2.5 \times 0.15–0.4 cm, subpapery, both surfaces glabrous, base narrowly cuneate, margin slightly revolute, apex acute or acuminate, apiculate; veins obscure. Inflorescences terminal, fasciculate, 2–7-flowered. Pedicel ca. 1 mm, glabrescent. Calyx yellow; tube 10–11 mm, very slender, exterior glabrous; lobes 5, narrowly elliptic-oblong or oblong-lanceolate, 4–5(–7) \times 1–2 mm. Stamens 10, lower whorl inserted at or slightly above middle of calyx tube, upper whorl in throat; filaments ca. 1 mm; anthers oblong, ca. 1.2 mm. Disk \pm square, lateral to ovary. Ovary ca. 3 mm, apex tomentose; style very short; stigma slightly lobed. Drupe brownish yellow, ovoid, ca. 5 mm. Fl. Jun–Jul.

High mountain forests; 3000–5000 m. SW and W Sichuan [Myanmar].

8. *Daphne modesta* Rehder in Sargent, Pl. Wilson. 2: 541. 1916.

瘦叶瑞香 shou ye rui xiang

Wikstroemia modesta (Rehder) Domke.

Shrubs deciduous, 0.3–0.5(–1.2) m tall. Branches pale yellowish gray, turning grayish, short, rather stout, pubescent when young. Leaves alternate; petiole ca. 1 mm, glabrous or sparsely pubescent; leaf blade bright green adaxially, paler abaxially, linear-oblong or narrowly elliptic, 1.5–3.5 \times 0.3–0.7 cm, thickly papery, both surfaces glabrous or sometimes midrib sparsely pubescent abaxially, base cuneate, margin revolute, apex obtuse, sometimes minutely apiculate; veins obscure. Inflorescences terminal, rarely also axillary, fasciculate, several flowered; bracts absent. Pedicel ca. 1 mm, pubescent. Calyx golden-yellow; tube (8–)9–11 mm, slender, exterior sparsely pubescent; lobes 5, ovate or ovate-oblong, 3–4 \times 2–2.5 mm, sparsely strigose, apex obtuse. Stamens 10, lower whorl inserted just above middle of calyx tube, upper whorl just below throat; filaments short; anthers oblong, ca. 2 mm. Disk \pm square, lateral to ovary, apex undulate. Ovary obovoid-ellipsoid, ca. 2.5 mm, apex pubescent; style very short; stigma capitate. Drupe greenish yellow, ovoid, ca. 6 mm. Fl. Apr–Jun.

- Open bushy hills, rocky slopes; 2100–2900 m. W Sichuan, Yunnan.

9. *Daphne holosericea* (Diels) Hamaya, Acta Horti Gothob. 26: 85. 1963.

丝毛瑞香 si mao rui xiang

Shrubs evergreen, 0.3–1 m tall. Branches slender, grayish green sericeous. Leaves alternate or opposite to whorled, usually clustered at apices of branches; petiole very short to absent; leaf blade linear or linear-oblong, 0.8–1 \times 0.15–0.25 cm, leathery or subleathery, abaxially densely gray sericeous when young, adaxially sericeous or glabrous, base cuneate, margin strongly revolute, apex apiculate; veins obscure. Inflorescences terminal, many flowered; bracts absent. Pedicel absent. Calyx exterior white, interior yellow; tube cylindrical, 4–5 \times ca. 2 mm, exterior gray sericeous; lobes 5, ovate or triangular-ovate, ca. 2 mm, apex acuminate or obtuse. Stamens 10, lower whorl inserted just above middle of calyx tube, upper whorl just below throat; filaments short; anthers triangular-oblong, ca. 0.7 mm. Disk obliquely shallowly discoid, lateral to ovary, and irregularly lobed or 1–3-lobed. Ovary narrowly ovoid-conic or ovoid, ca. 2.5 mm, apex sericeous or papillose; style short, ca. 0.5 mm; stigma globose. Drupe dry, conic, enclosed in persistent calyx. Fl. Jul–Aug, fr. Sep–Oct.

- Among shrubs and herbs on slopes in dry valleys; 3000–3600 m. Sichuan, SE Xizang, W Yunnan.

- 1a. Leaf blade adaxially densely grayish sericeous when young; ovary narrowly ovoid-conic, apex sericeous 9a. var. *holosericea*
- 1b. Leaf blade adaxially glabrous; ovary ovoid, apex papillose 9b. var. *thibetensis*

9a. *Daphne holosericea* var. *holosericea*

丝毛瑞香(原变种) si mao rui xiang (yuan bian zhong)

Wikstroemia holosericea Diels, Notes Roy. Bot. Gard. Edinburgh 5: 286. 1912.

Leaf blade with both surfaces densely grayish sericeous when young. Disk obliquely shallowly discoid, lateral to ovary, irregularly lobed. Ovary narrowly ovoid-conic, apex sericeous.

- Among shrubs and herbs on slopes in dry valleys; 3000–3600 m. W Sichuan, SE Xizang, W Yunnan.

9b. *Daphne holosericea* var. *thibetensis* (Lecomte) Hamaya, Acta Horti Gothob. 26: 87. 1963.

五出瑞香 wu chu rui xiang

Pentathymelaea thibetensis Lecomte, Notul. Syst. (Paris) 3: 214. 1916; *Wikstroemia eriophylla* H. Winkler; *W. thibetensis* (Lecomte) Domke.

Leaf blade leathery, abaxially sericeous, adaxially glabrous. Disk 1–3-lobed, apex of lobes \pm further lobed. Ovary ovoid, apex papillose.

- Among shrubs and herbs on slopes in dry valleys; 3000–3400 m. SW Sichuan, SE Xizang, NW Yunnan.

10. *Daphne myrtilloides* Nitsche, Beitr. *Daphne*, 29. 1907.

乌饭瑞香 wu fan rui xiang

Farreria pretiosa I. B. Balfour & W. W. Smith ex Farrer; *Wikstroemia myrtilloides* (Nitsche) Domke; *W. pretiosa* (I. B. Balfour & W. W. Smith ex Farrer) Domke.

Shrubs deciduous, 0.1–0.3 m tall. Primary root fusiform, stout. Branches all basal, yellowish green, turning brownish or grayish, slender, densely appressed pubescent. Leaves alternate, clustered apically on branches, appearing whorled; petiole 1–2 mm, glabrous; leaf blade obovate or broadly elliptic, 1–3 × 0.4–1.6 cm, thinly papery or membranous, abaxially sparsely pilose on midrib, adaxially glabrous, base cuneate, margin slightly revolute, apex obtuse; veins 3–5 pairs. Inflorescences terminal, fasciculate, 2–5-flowered; bracts absent. Pedicel absent. Calyx yellow; tube cylindrical, 6–7[–?15] mm, slender, exterior sparsely sericeous; lobes 5, oblong, 4–5 mm, glabrous, apex obtuse or rounded. Stamens 10, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments short; anthers linear-oblong, 1–1.5 mm. Disk obovate-angular, lateral to ovary. Ovary ca. 2 mm, apex pubescent; style ca. 0.5 mm; stigma globose. Drupe brownish yellow, ovoid, ca. 5 mm. Fl. May.

- Open subalpine forests, stony fields. Gansu, Shaanxi, Shanxi.

11. *Daphne penicillata* Rehder in Sargent, Pl. Wilson. 2: 542. 1916.

岷江瑞香 *min jiang rui xiang*

Daphne flaviflora H. Winkler; *Wikstroemia flaviflora* (H. Winkler) Domke.

Shrubs 0.2–0.5 m tall, densely branched. Branches turning yellowish or grayish brown, angular, densely appressed hirsute when young; leaf buds ovoid, 3–5 cm, densely gray pubescent. Leaves alternate; petiole ca. 1 mm, glabrous or sparsely sericeous; leaf blade broadly elliptic, oblong-elliptic, or obovate, 0.7–2.5(–3) × 0.5–1.2(–1.5) cm, membranous, both surfaces glabrous except for tuft of hairs at apex and sometimes midrib sparsely appressed pubescent abaxially, base cuneate or subrounded, margin sometimes slightly revolute, apex obtuse, retuse, or emarginate, markedly apiculate; veins 5–7 pairs. Inflorescences terminal, fasciculate, 2- or 3-flowered; peduncle shorter than 0.3 cm; bracts ovate, densely pubescent; Pedicel absent or very short. Calyx golden-yellow; tube cylindrical, 7–10 mm, slender, exterior glabrous; lobes 5, narrowly oblong, 4–5 mm. Stamens 10, lower whorl inserted at middle of calyx tube, upper whorl slightly below throat; filaments very short; anthers oblong, ca. 1.5 mm. Disk ± square, lateral to ovary, ca. 0.5 mm. Ovary ca. 2.5 mm, apex pubescent; style 0.5–1.5 mm; stigma capitate, sparsely puberulous. Drupe brownish yellow, ovoid, ca. 5 mm. Fl. May–Jun.

- Forests, arid slopes among rocks; 1200–1700(–2500) m. Sichuan.

12. *Daphne tenuiflora* Bureau & Franchet, J. Bot. (Morot) 5: 151. 1891.

细花瑞香 *xi hua rui xiang*

Shrubs evergreen, 0.3–0.7 m tall. Branches long, slender, pubescent. Leaves alternate; petiole 1–1.5 mm; leaf blade lanceolate or oblong-elliptic, 2–5 × 0.4–1.2 cm, papery or mem-

branous, both surfaces glabrous or sometimes young leaves sparsely sericeous abaxially, base narrowly cuneate, margin slightly revolute, apex obtuse or rounded, usually apiculate; veins 5–8 pairs. Inflorescences terminal, condensed-racemose, several flowered; bracts absent. Flowers fragrant; pedicel ca. 1.5 mm, sparsely pubescent. Calyx pale yellow; tube cylindrical, 10–12 mm, slender, exterior glabrous or sparsely appressed pubescent; lobes (4 or)5, ovate, ovate-lanceolate, or oblong, 3–5 mm, margin usually incised, apex obtuse. Stamens 10, lower whorl inserted just above middle of calyx tube, upper whorl just below throat; filaments short; anthers oblong, ca. 1.6 mm. Disk ± square, lateral to ovary, divided to half depth. Ovary narrowly ovoid, stipitate, apex tomentose; style ca. 0.7 mm; stigma capitate. Fruit not seen. Fl. May–Jun.

- Forests, shrubby slopes; 2700–3500 m. SW Sichuan, NW Yunnan.

- 1a. Calyx tube exterior glabrous 12a. var. *tenuiflora*
 1b. Calyx tube exterior sparsely appressed
 pubescent 12b. var. *legendrei*

12a. *Daphne tenuiflora* var. *tenuiflora*

细花瑞香(原变种) *xi hua rui xiang* (yuan bian zhong)

Stellera tenuiflora (Bureau & Franchet) Lecomte; *Wikstroemia tenuiflora* (Bureau & Franchet) Domke.

Calyx tube exterior glabrous.

- Forests, shrubby slopes; 2700–3500 m. SW Sichuan, NW Yunnan.

12b. *Daphne tenuiflora* var. *legendrei* (Lecomte) Hamaya, Acta Horti Gothob. 26: 83. 1963.

毛细花瑞香 *mao xi hua rui xiang*

Stellera tenuiflora var. *legendrei* Lecomte, Notul. Syst. (Paris) 3: 209. 1916; *Wikstroemia tenuiflora* var. *legendrei* (Lecomte) Domke.

Calyx tube exterior sparsely appressed pubescent.

- Forests, shrubby slopes; ca. 3300 m. SW Sichuan.

13. *Daphne aurantiaca* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 285. 1912.

橙黄瑞香 *cheng huang rui xiang*

Daphne aurantiaca var. *callicola* (W. W. Smith) Halda; *D. callicola* W. W. Smith; *Wikstroemia aurantiaca* (Diels) Domke; *W. aurantiaca* var. *pulvinata* Domke; *W. callicola* (W. W. Smith) Domke.

Shrubs evergreen, 0.6–1.2 m tall. Main branches often prostrate; branches reddish to dark brown, glabrous. Leaves opposite or subopposite; petiole 1–2 mm; leaf blade obovate, ovate, or elliptic, sometimes also linear to linear oblong, 0.8–2.3 × 0.2–1.2 cm, subleathery, both surfaces glabrous, base cuneate or subrounded, margin revolute, apex obtuse or acute; lateral veins obscure. Inflorescences terminal, often on reduced lateral shoots, 2–5-flowered, glabrous; bracts leaflike, ovate or ovate-lanceolate, 2–5 × 1–1.5 mm, glabrous or sometimes pubescent, apex acuminate. Flowers fragrant; pedicel short, ca. 1

mm. Calyx deep yellow to orange; tube funnellform-cylindric, 8–11 mm, exterior glabrous; lobes 4, broadly ovate or ovate-elliptic, 2.5–4(–5) × 2–3 mm, apex obtuse or rounded. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl slightly below throat; filaments ca. 1 mm; anthers oblong. Disk ± square, lateral to ovary, ca. 1.2 mm, usually 2-fid, sometimes reduced to distinct scales. Ovary ovoid-ellipsoid, 2–3 mm, glabrous; style ca. 0.7 mm; stigma capitate. Drupe brownish yellow, ellipsoid, 3–5 × 2–3 mm. Fl. May–Jun, fr. Aug.

• Forests, shrubby slopes, often on ledges and faces of limestone cliffs; 2600–3500 m. SW Sichuan, NW Yunnan.

14. *Daphne genkwa* Siebold & Zuccarini, Fl. Jap. 1: 137. 1835.

芫花 yuan hua

Daphne fortunei Lindley; *D. genkwa* var. *fortunei* (Lindley) Franchet; *D. genkwa* f. *taitoensis* Hamaya; *Wikstroemia genkwa* (Siebold & Zuccarini) Domke.

Shrubs deciduous, 0.3–1 m tall. Branches many, yellowish green or purplish brown, densely yellowish sericeous. Leaves opposite, subopposite, or alternate; petiole almost absent to 2 mm, gray pubescent; leaf blade ovate, ovate-lanceolate, or elliptic-oblong, 3–4(–6) × (0.5–)1–2 cm, papery, abaxially sericeous, base broadly cuneate or rounded, apex acute or shortly acuminate; lateral veins 5–7 pairs. Inflorescences mostly lateral, produced before leaves, less often terminal on long shoots or axillary, 3–7(–15)-flowered; peduncle usually very short, better developed on later inflorescences. Flowers not fragrant; pedicel short, grayish yellow pubescent. Calyx bluish purple, lilac, or lavender; tube cylindric, 6–11 mm, slender, exterior sericeous; lobes 4, ovate or oblong, 5–6(–10) × ca. 4 mm, abaxially puberulous, apex rounded. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl below throat; filaments short; anthers ovoid-ellipsoid, ca. 1 mm, upper ones partly exerted from calyx tube; disk annular. Ovary obovoid, ca. 2 mm, densely yellow pubescent; style short or absent; stigma capitate. Drupe white to reddish, black when dry, ellipsoid, ca. 4 mm, enclosed in persistent calyx. Fl. Mar–May, fr. Jun–Jul.

Forests, shrubby slopes; 300–1000 m. Anhui, Fujian, Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Korea].

Daphne genkwa is a popular garden plant that can usually be easily identified by the precocious inflorescences of distinctively colored flowers (the “lilac daphne”), produced on very reduced lateral shoots such that they superficially appear to be axillary. However, it seems that there is sometimes a second flush of flowers produced later in the season, after the leaves, when the inflorescences are often pedunculate and sometimes axillary as well as clearly terminal, sometimes on long shoots. The leaf arrangement is very variable. The species is valued horticulturally, while the dried flower buds are used medicinally.

15. *Daphne jinzhaiensis* D. C. Zhang & J. Z. Shao, Bull. Bot. Res., Harbin 9(3): 37. 1989.

金寨瑞香 jin zhai rui xiang

Daphne genkwa Siebold & Zuccarini subsp. *jinzhaiensis* (D. C. Zhang & J. Z. Shao) Halda.

Shrubs deciduous, to 1 m tall. Branches slender, at first densely yellow tomentose, later grayish brown, glabrescent. Leaves opposite, subopposite, or alternate; petiole 2–2.5 mm, yellow pilose; leaf blade narrowly elliptic or lanceolate, 3–4.5 × 0.8–1.3 cm, thickly papery, adaxially glabrous, base cuneate, margin slightly revolute, apex acute; lateral veins 4 or 5 pairs. Inflorescences terminal, 3–5-flowered; peduncle 0.6–0.8 cm, densely yellowish tomentose. Pedicel short. Calyx dull purple; tube cylindric, 10–12(–15) mm, exterior densely yellowish tomentose; lobes 4, narrowly elliptic, 5–7 mm, apex rounded. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments ca. 0.6 mm; anthers yellow, oblong, ca. 1.3 mm. Disk cupular, margin entire. Ovary ellipsoid, ca. 2 mm, densely yellow pubescent; style ca. 0.2 mm; stigma capitate. Drupe not seen. Fl. Jul.

• Anhui.

16. *Daphne arisanensis* Hayata, Icon. Pl. Formosan. 2: 126. 1912.

台湾瑞香 tai wan rui xiang

Shrubs evergreen, 2–3 m tall. Branches laxly spreading, grayish, slender, tomentose when young. Leaves alternate or subopposite; petiole 3–10 mm; leaf blade lanceolate or elliptic, 4.5–7 × 0.5–1.3(–2) cm, (membranous or) papery, both surfaces glabrous, base cuneate, margin slightly revolute, apex acuminate to obtuse. Inflorescences terminal, rarely also axillary, 2–7-flowered; bracts caducous, lanceolate, ca. 5 mm, margin long ciliate. Pedicel ca. 2 mm, articulate, sparsely puberulous below articulation. Calyx yellow, rarely creamy-white; tube campanulate, 4–6 mm, exterior glabrous; lobes 4, ovate-triangular, 1.5–2.5 × 1–2 mm, apex obtuse. Stamens 8, lower whorl inserted just above middle of calyx tube, upper whorl slightly below throat; filaments ca. 0.3 mm; anthers linear, ca. 1 mm. Disk annular, margin crenulate. Ovary oblong-ovoid, ca. 2 mm, glabrous; style short to almost absent; stigma capitate. Drupe (yellow or) red, ovoid, ca. 7 × 4 mm, apiculate.

• Forests. Taiwan.

17. *Daphne morrisonensis* C. E. Chang, Fl. Taiwan, ed. 2, 3: 773. 1993 [“*morrisonensis*”].

玉山瑞香 yu shan rui xiang

Shrubs evergreen, 2–3 m tall. Branches glabrous. Leaves alternate; petiole ± absent, glabrous; leaf blade linear or linear-oblongate, 4–7 × 0.3–0.4 cm, thick, both surfaces glabrous, base attenuate, margin slightly revolute, apex acuminate-caudate. Inflorescences terminal and axillary, to 7-flowered; peduncle absent; bracts caducous, linear-lanceolate. Pedicel short, glabrous. Calyx whitish; tube urceolate, 3–4 mm, exterior glabrous; lobes 4, ovate, outer lobes ca. 1.5 mm. Stamens 8; filaments absent. Anthers linear. Disk annular, very narrow. Ovary ovoid, sessile, glabrous; style short; stigma tiny, 2-lobed. Fruit not seen.

• Rocky slopes in open montane forests. Taiwan (Jiayi).

18. *Daphne nana* Tagawa, Acta Phytotax. Geobot. 5: 265. 1936.

小芫花 xiao yuan hua

Shrublets, ca. 0.2 m tall, branching dichotomous, trichotomous, or whorled. Branches brown, ± glossy, slender, glabrous. Leaves alternate; petiole very short; leaf blade oblong or oblong-lanceolate, rarely obovate-oblong, 1.5–2.5 × 0.7–1(–1.4) cm, thickly papery, both surfaces glabrous, base cuneate, apex rounded-emarginate. Inflorescences terminal, capitate, 5–8-flowered; bracts soon caducous, ovate-oblong, ca. 1 mm, margin ciliate toward apex. Pedicel ca. 2 mm, glabrous. Calyx white; tube cylindrical-urceolate, ca. 3 × 1.5 mm, exterior glabrous; lobes 4, broadly ovate, ca. 2 × 1.5 mm, 2 lobes with apex obtuse, alternating with 2 others with apex mucronate. Stamens 8, lower whorl inserted below middle of calyx tube, upper whorl near middle; filament shorter than anther; anthers narrowly oblong, ca. 0.5 mm, base emarginate, apex mucronate. Disk annular, very narrow. Ovary cylindrical-ovoid, ca. 2 × 0.7 mm, glabrous; style absent; stigma flattened-globose, slightly lobed. Drupe ovoid-apiculate, ca. 4 × 2 mm. Fl. and fr. Sep.

- E Taiwan (Hualian).

19. *Daphne chingshuishaniana* S. S. Ying, Coloured Illustr. Fl. Taiwan 3: 531. 1988.

高山瑞香 gao shan rui xiang

Shrubs evergreen, ca. 2 m tall. Branches erect, yellowish green, glabrous. Leaves alternate; petiole 2–3 mm, glabrous; leaf blade yellowish green, ovate or ovate-oblong to oblong, 1.5–2.5 × 1–1.5 cm, leathery, both surfaces glabrous, base rounded or cuneate, margin slightly revolute, apex emarginate. Inflorescences terminal on branchlets, fasciculate, 6–9-flowered; peduncle absent. Pedicel 1–1.5 mm, pubescent. Calyx tube 3–4 × 1–1.5 mm, exterior glabrous; lobes 4, triangular, 0.2–0.4 mm, apex acute. Stamens 8, inserted near middle of calyx tube; filaments ca. 0.1 mm; anthers basifixed, oblong, 0.4–0.6 mm. Disk annular, margin irregularly toothed. Ovary globose or oblong, 0.7–0.9 × 0.3–0.5 mm, glabrous; style absent or short, to 0.1 mm; stigma globose or capitate. Fruit not seen. Fl. Jun.

- Slopes with shrubs near mountain summits; ca. 2200 m. E Taiwan (Hualian).

20. *Daphne giraldii* Nitsche, Beitr. *Daphne*, 7. 1907 [“*giraldi*”].

黄瑞香 huang rui xiang

Shrubs deciduous, 0.45–0.8 m tall. Branches glabrous. Leaves alternate; petiole very short to absent; leaf blade oblanceolate, 3–6(–8) × 0.7–1.2(–1.5) cm, membranous or papery, both surfaces glabrous, base narrowly cuneate, apex obtuse, often apiculate; veins 8–10 pairs. Inflorescences terminal, capitate, 3–8-flowered; peduncle very short to absent; bracts absent. Flowers slightly fragrant; pedicel shorter than 1 mm. Calyx golden-yellow; tube cylindrical, 6–8(–10) × 2–3 mm, exterior glabrous; lobes 4, ovate-triangular, 3–4(–5) mm, glabrous, apex acute or acuminate. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments ca. 0.5 mm; anthers oblong, ca. 1.2 mm. Disk shallow, entire. Ovary ellipsoid, glabrous; style absent; stigma capitate. Drupe red, ovoid or subglobose, 5–6(–8) mm. Fl. Jun, fr. Jul–Aug.

- Forest margins, open slopes with bushes; 1600–3100 m. Gansu, Heilongjiang, Liaoning, Qinghai, Shanxi, Sichuan, Xinjiang.

This species is widely cultivated and sometimes used as a rootstock for grafting.

21. *Daphne pseudomezereum* A. Gray, Mem. Amer. Acad. Arts, n.s., 6: 404. 1859 [“*pseudo-mezereum*”].

东北瑞香 dong bei rui xiang

Daphne japonica Siebold & Zuccarini (1846), not Thunberg (1792).

Shrubs deciduous, 0.15–0.4 m tall. Older stems with leaf scars large and closely spaced; branches short, stout, smooth, irregularly striped, glabrous. Leaves alternate; petiole 3–10 mm; leaf blade lanceolate or oblong-lanceolate, (3–)4–10 × 0.8–2 cm, membranous, both surfaces glabrous, base cuneate, apex obtuse; veins 8–12 pairs, anastomosing near margins. Inflorescences terminal, mainly on very reduced lateral shoots, fasciculate, 2–10-flowered; peduncle absent; bracts absent. Pedicel very short. Calyx yellowish green; tube 6–8 mm, exterior glabrous; lobes 4, 2.5–5.5 mm. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat. Disk annular. Drupe red, ovoid, 5–8 mm. Fl. Feb–Apr, fr. Jul–Aug.

Forests; 800–1600 m. Jilin, Liaoning [Japan, Korea].

The identity of Chinese material so named needs confirmation. Japanese material is described as a shrub to 1.5 m tall with glaucous leaves and ellipsoidal fruit ca. 8 mm. Halda (Genus *Daphne*, 11. 2001) further stated that this species is dioecious.

22. *Daphne grueningiana* H. Winkler, Repert. Spec. Nov. Regni Veg. Beih. 12: 443. 1922.

倒卵叶瑞香 dao luan ye rui xiang

Shrubs evergreen, 0.3–1 m tall. Branches dichotomous or whorled, grayish white or grayish brown, turning brownish gray, thinly pubescent when young. Leaves alternate, usually clustered at tips of branches; petiole absent; leaf blade obovate-lanceolate or obovate-elliptic, 6–10 × 2–3.5 cm, thinly leathery, base narrowly cuneate, margin slightly revolute, apex obtuse to rounded, slightly retuse; veins 6–11 pairs, anastomosing near margins. Inflorescences terminal, (6–)8–12(–15)-flowered; peduncle present, hirsute; bracts 5–8, ovate-elliptic, 1–1.2 × 0.25–0.4 cm, glabrous or ciliate at least at apex, apex obtuse, slightly retuse. Pedicel short to almost absent. Calyx white; tube cylindrical, 9–14 mm, exterior glabrous; lobes 4, ovate or oblong, 8–11 × 3–4 mm, almost as long as tube, glabrous, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl slightly below throat; filaments very short; anthers ca. 1 mm. Disk annular, margin rounded-serrate. Ovary broadly ellipsoid, glabrous; style almost absent; stigma minute, ± flat. Drupe red, ovoid, ca. 5 × 4 mm. Fl. Mar–Apr, fr. Jun–Jul.

- Valleys, forests; 300–400 m. Anhui, Zhejiang.

23. *Daphne retusa* Hemsley, J. Linn. Soc., Bot. 29: 318. 1892.

凹叶瑞香 ao ye rui xiang

Shrubs evergreen, 0.4–1.5 m tall, densely branched. Branches strigose. Leaves alternate, usually clustered at apices of branches; petiole absent to almost absent; leaf blade oblong, oblong-lanceolate, or obovate-elliptic, 1.4–4(–7) × 0.6–1.4 cm,

leathery, both surfaces glabrous. base cuneate, margin revolute, apex obtuse or retuse and apiculate. Inflorescences terminal, usually several flowered; peduncle ca. 2 mm, densely strigose; bracts caducous, oblong to ovate-oblong or obovate-oblong, 5–8 × 3–4 mm, glabrous, apex rounded. Flowers fragrant; pedicel absent or almost absent, glabrous. Calyx purplish red abaxially with paler purple-pink or white lobes; tube cylindrical, 6–8 mm, exterior pubescent; lobes 4, broadly ovate or ovate-elliptic, 6–9 mm, apex rounded to obtuse, rarely acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl just below throat; filaments ca. 0.5 mm; anthers oblong, ca. 1.5 mm. Disk annular, glabrous, undulate. Ovary cylindrical or obovoid, ca. 2 mm, glabrous; style very short; stigma capitate, densely tomentose. Drupe red, subglobose or ovoid, 6–8 mm. Fl. Apr–May, fr. Jun–Jul.

Shrubby or herbaceous slopes; 3000–3900 m. Gansu, Hubei, Qinghai, Shanxi, Sichuan, Xizang, Yunnan [Bhutan, N India (Assam, Punjab), Kashmir, Nepal].

24. *Daphne odora* Thunberg in Murray, Syst. Veg., ed. 14, 372. 1784.

瑞香 rui xiang

Daphne chinensis Sprengel; *D. hybrida* Lindley; *D. japonica* Thunberg (1792), not Siebold & Zuccarini (1846); *D. kiusiana* Miquel var. *odora* (Thunberg) Makino; *D. mazellii* Carrière; *D. odora* f. *alba* (Hemsley) H. Hara; *D. odora* var. *alba* Hemsley; *D. odora* var. *leucantha* Makino; *D. odora* f. *marginata* Makino; *D. odora* var. *marginata* Miquel; *D. odora* var. *mazellii* (Carrière) Hemsley; *D. odora* f. *rosacea* (Makino) H. Hara; *D. odora* var. *rosacea* Makino; *D. odora* var. *variegata* Bean; *D. sinensis* Lamarck; *D. speciosissima* Carrière; *D. triflora* Loureiro.

Shrubs evergreen, to 1.5 m tall. Branches purplish red to purplish brown, stout, glabrous. Leaves alternate; petiole 4–5 mm, glabrous or sparsely puberulous; leaf blade obovate or obovate-elliptic, 6–13 × 2.5–5 cm, leathery, both surfaces glabrous, base cuneate, apex subacute, often apiculate; veins 7–13 pairs. Inflorescences terminal, capitate, up to 12(–20)-flowered; bracts lanceolate or ovate-lanceolate, 5–12 × 2–4 mm, glabrous. Flowers fragrant. Calyx purplish red abaxially with pinkish red to white lobes; tube 6–10 mm, exterior glabrous; lobes 4, ovate or ovate-lanceolate, 6–12 mm, base auriculate, apex obtuse. Stamens 8, lower whorl inserted just above middle of calyx tube, upper whorl in throat; filaments ca. 0.7 mm; anthers oblong, ca. 2 mm; upper ones 1/2 exerted from calyx tube. Disk annular, very narrow. Ovary oblong, glabrous; style short; stigma capitate. Drupe scarlet-red, globose, ca. 8 mm. Fl. Mar–May, fr. Jul–Aug.

Widely cultivated in China [native origin obscure, probably China or Japan but now widely cultivated].

25. *Daphne acutiloba* Rehder in Sargent, Pl. Wilson. 2: 539. 1916.

尖瓣瑞香 jian ban rui xiang

Shrubs evergreen, 0.5–2 m tall. Branches few, yellowish green, turning purplish reddish brown, appressed tomentose, becoming glabrous. Leaves alternate; petiole almost absent to

8 mm, glabrous; leaf blade yellowish green, oblanceolate, elliptic-oblanceolate, or lanceolate, 4–10 × 1.2–3.6 cm, leathery, both surfaces glabrous, base cuneate, apex acuminate or obtuse, rarely retuse; veins 7–12 pairs. Inflorescences terminal, usually 5–7(–10)-flowered; bracts caducous, ovate-elliptic or oblong-lanceolate, 6–8 × 1–3 mm, pubescent, apex obtuse, acute, or rarely caudate; leaflike bracts several, usually persistent, oblong-lanceolate, 3–3.5 × 0.5–1 cm, glabrous. Flowers fragrant; pedicel 0.5–2 mm, sericeous. Calyx white, sometimes suffused with purple; tube cylindrical, 9–12(–14) mm, exterior glabrous; lobes 4, ovate or ovate-oblong, 5–7 × 4–5 mm, apex acuminate or acute. Stamens 8, lower whorl inserted well above middle of calyx tube, upper whorl in throat; filaments ca. 0.5 mm; anthers oblong, ca. 1.5 mm; upper ones partly exerted from calyx tube. Disk annular-cup-shaped, entire or variously lobed. Ovary ellipsoid, 3–4 mm, glabrous; style very short; stigma capitate. Drupe red, ellipsoid, ca. 8 mm. Fl. Apr–May, fr. Jul–Sep.

• Forests; 1400–3000 m. Hubei, Sichuan, Yunnan.

26. *Daphne limprichtii* H. Winkler, Repert. Spec. Nov. Regni Veg. Beih. 12: 444. 1922.

铁牛皮 tie niu pi

Shrubs evergreen, 0.2–0.8 m tall, much branched, sometimes cushionlike. Branches pale yellowish green, turning brownish gray or grayish, stout, pubescent. Leaves alternate; petiole very short to absent; leaf blade bright green adaxially, paler abaxially, lanceolate or oblong-oblanceolate to oblong-elliptic, 1.5–3.2 × 0.5–0.8 cm, thinly leathery, both surfaces glabrous, base narrowly cuneate, margin strongly revolute, apex rounded, sometimes retuse; veins 8–12 pairs. Inflorescences terminal, 5–7-flowered; peduncle very short, sparsely tomentose; bracts ovate, 4.5–6(–9) × 3–4(–5) mm, apex obtuse, ciliate. Flowers fragrant; pedicel ca. 1 mm. Calyx white or pale pink; tube cylindrical, 10–11(–14) mm, exterior glabrous; lobes 4, ovate-oblong, 5–8 × 3–5 mm, apex obtuse, often retuse. Stamens 8, lower whorl inserted above middle of calyx tube; upper whorl in throat. Disk shallowly cup-shaped, entire. Ovary ovoid-ellipsoid, glabrous or apex gray pubescent; style short, ca. 0.4 mm; stigma capitate. Drupe red, ovoid, ca. 7 mm. Fl. May.

• Among boulders and bushes on sunny slopes; 3000–4400 m. SW Gansu, W Sichuan.

27. *Daphne tangutica* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 531. 1881.

唐古特瑞香 tang gu te rui xiang

Shrubs evergreen, 0.5–2.5 m tall. Branches yellowish green, turning grayish yellow or purplish red to grayish brown, sparsely pubescent, glabrescent. Leaves alternate; petiole ca. 1 mm, glabrous; leaf blade lustrous dark green, lanceolate to oblanceolate, 2–10 × 0.5–2.2(–3) cm, leathery, abaxially glabrous or sparsely puberulous, adaxially glabrous, base cuneate or decurrent, margin sometimes revolute, apex obtuse, rarely retuse or acute to acuminate. Inflorescences terminal, capitate, 3–12-flowered; peduncle 1–3 mm, pubescent; bracts caducous, ovate or ovate-lanceolate, 5–9 × 3–4 mm, glabrous, ciliate on margin, apex obtuse. Pedicel to ca. 1 mm, densely pubescent. Calyx pink to white flushed purplish red abaxially; tube cylindrical, 9–

13(–15) mm, exterior glabrous; lobes 4, ovate or ovate-elliptic, 5–8(–10) × (3–)4–5(–6) mm, apex obtuse. Stamens 8, lower whorl inserted slightly above middle of calyx tube, upper whorl in throat; filaments short; anthers oblong, 1–1.2 mm; upper ones slightly exserted from calyx tube. Disk annular, ca. 0.5 mm wide, irregularly lobed. Ovary oblong-obovoid, 2–3(–4) mm, glabrous; style short; stigma discoid-capitate, 4-lobed. Drupe red, subglobose or ovoid, 6–8(–10) mm. Fl. Apr–Jun, fr. May–Jul.

• Forests; 1000–3800 m. Chongqing, Gansu, Guizhou, W Hubei, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan.

- 1a. Leaf blade margin sometimes revolute, apex obtuse; young branches grayish yellow 27a. var. *tangutica*
- 1b. Leaf blade margin not revolute, apex acute or acuminate; young branches purplish red or grayish brown 27b. var. *wilsonii*

27a. *Daphne tangutica* var. *tangutica*

唐古特瑞香(原变种) tang gu te rui xiang (yuan bian zhong)

Daphne bodinieri H. Léveillé (1915), not H. Léveillé (1914); *D. laciniata* Lecomte var. *duclouxii* Lecomte; *D. szechuanica* H. Winkler; *D. vaillantii* Danguy.

Young branches grayish yellow. Leaf blade lanceolate to oblong-lanceolate or oblanceolate, 2–8 × 0.5–1.7 cm, margin sometimes revolute, apex obtuse.

• Forests; 1000–3800 m. Gansu, Guizhou, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan.

27b. *Daphne tangutica* var. *wilsonii* (Rehder) H. F. Zhou, Fl. Sichuan. 9: 272. 1989.

野梦花 ye meng hua

Daphne wilsonii Rehder in Sargent, Pl. Wilson. 2: 540. 1916.

Young branches purplish red or grayish brown. Leaf blade obovate-lanceolate or oblong-lanceolate, 3.5–10 × 1–2.2 cm, margin not revolute, apex acute or acuminate.

• Forests. Chongqing, W Hubei, S Shanxi, Sichuan.

28. *Daphne championii* Benth, Fl. Hongk. 296. 1861 [“*championii*”].

长柱瑞香 chang zhu rui xiang

Shrubs evergreen, 0.3–1(–2) m tall, erect. Older branches with leaf scars; branches yellowish green or grayish green, turning blackish brown, slender. Leaves alternate; petiole 1–2 mm, densely white sericeous; leaf blade elliptic or ovate-elliptic, 1.5–4.5 × 0.6–1.8 cm, papery or membranous, abaxially white sericeous, adaxially more sparsely so, base broadly cuneate, apex obtuse or subacute, apiculate; veins 5 or 6 pairs. Inflorescences axillary, 3–7-flowered; peduncle very short to almost absent, bracts usually absent, sometimes small and leaflike. Pedicel absent. Calyx white; tube cylindrical, 5–9 mm, exterior appressed yellow- or white sericeous; lobes 4, broadly ovate, 1–3 × ca. 0.5 mm, abaxially densely white sericeous, apex obtuse.

Stamens 8, inserted above middle of calyx tube; filaments short; anthers oblong, ca. 0.6 mm. Disk acuminate, lateral to ovary. Ovary ellipsoid, sessile or with a short stipe, apex sericeous; style slender, ca. 4 mm; stigma capitate. Drupe semidry, ovoid, ca. 6 mm, densely pubescent. Fl. Feb–Apr.

• Forests at low elevations; 200–700 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi.

This species was first misidentified (Bentham, Hooker’s J. Bot. Kew Gard. Misc. 5: 196. 1853) as *Daphne fortunei* (i.e., *D. genkwa* in this treatment).

29. *Daphne rhynchocarpa* C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 87. 1985.

喙果瑞香 hui guo rui xiang

Daphne axillaris (Merrill & Chun) Chun & Wei subsp. *rhynchocarpa* (C. Y. Chang) Halda.

Shrubs evergreen, to 3 m tall. Branches gray-brown or dull brown, sparsely pubescent. Leaves alternate; petiole 1–3 mm; leaf blade deep green adaxially, paler abaxially, elliptic or oblanceolate, 5–11 × 2–3 cm, papery or thinly leathery, both surfaces glabrous, base cuneate, margin slightly undulate and revolute, apex obtuse; lateral veins 12–14 pairs, anastomosing near margins. Inflorescences mostly axillary, occasionally also terminal, 1–3-flowered; peduncle 1–2 mm, sericeous; bracts ovate-oblong, ca. 4 × 1.8 mm, margin ciliate, apex obtuse. Pedicel 1–2 mm, sericeous. Calyx purple-red; tube cylindrical, 8–10 mm, exterior sericeous; lobes 4, ovate or ovate-oblong, ca. 4 mm. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments short; anthers oblong, ca. 1.7 mm; upper ones ca. 1/2 exserted from calyx tube. Disk cup-shaped, margin entire. Ovary glabrous; style very short; stigma capitate. Drupe ovoid, ca. 7 × 5 mm, apex acuminate or beaked. Fl. Nov–Dec, fr. Mar–Apr.

• Forests; ca. 2500 m. SW Yunnan.

30. *Daphne leishanensis* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 90. 1985.

雷山瑞香 lei shan rui xiang

Daphne genkwa Siebold & Zuccarini subsp. *leishanensis* (H. F. Zhou ex C. Y. Chang) Halda.

Shrubs deciduous, to 0.5 m tall. Branches turning dark purple, long, slender. Leaves alternate; petiole 1.2–2.3 mm, grayish sericeous; leaf blade elliptic, rarely elliptic-lanceolate, 3.5–6.5 × 1.2–2.5 cm, membranous, rarely thinly papery, abaxially sparsely grayish sericeous when young, adaxially glabrous, base nearly rounded or broadly cuneate, apex acute or shortly acuminate; veins 6–8 pairs. Inflorescences terminal, umbellate, 3–5-flowered; peduncle ca. 2 mm, densely sericeous; bracts absent. Pedicel 1–2 mm, densely sericeous. Calyx reddish; tube cylindrical, 6–7 mm, exterior sparsely sericeous; lobes 4, broadly ovate, 2.5–3 × ca. 2 mm, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 0.5 mm; anthers oblong, ca. 1 mm, upper ones ca. 3/4 exserted from calyx tube. Disk irregularly serrate-lobed. Ovary ovoid or broadly ellipsoid, ca. 1.2 mm, apex densely pubescent; style short; stigma capitate, papillose. Fruit not seen. Fl. May–Jun.

- Rocky slopes with bushes; 900–1200 m. Guizhou.

31. *Daphne erosiloba* C. Y. Chang, *Guihaia* 6: 265. 1985.

啮蚀瓣瑞香 *nie shi ban rui xiang*

Shrubs deciduous, 0.5–1 m tall. Branches slender, densely sericeous. Leaves alternate; petiole 1–2 mm, densely sericeous; leaf blade oblong or oblong-lanceolate, 1–2.8 × 0.5–1.6 cm, membranous or thinly papery, both surfaces sericeous when young, glabrescent, base broadly cuneate or rounded, margin rarely slightly revolute, apex obtuse; lateral veins 4–7 pairs. Inflorescences terminal, usually 3–5-flowered; peduncle 0.5–1 mm, densely sericeous; bracts absent. Pedicel absent. Calyx yellow; tube slender, broader in upper part near throat, 8–10 mm, exterior densely sericeous; lobes 4, oblong, rarely subovate, 2–3 × 1.2–2 mm, sparsely sericeous, margin irregularly incised, apex obtuse or truncate. Stamens 8, lower whorl inserted just above middle of calyx tube, upper whorl in throat; filaments very short; anthers oblong, ca. 1.1 mm. Disk ± square, lateral to ovary. Ovary clavate or obovoid, ca. 2 mm, stipitate, densely sericeous; style short; stigma capitate, papillose. Fruit not seen. Fl. Jun.

- Sunny herbaceous slopes; 3200–3800 m. W Sichuan.

32. *Daphne wangiana* (Hamaya) Halda, *Acta Mus. Richnov.*, Sect. Nat. 7: 10. 2000 [*“wangeana”*].

少丝瑞香 *shao si rui xiang*

Daphne holosericea (Diels) Hamaya var. *wangiana* Hamaya, *Acta Horti Gothob.* 26: 90. 1963 [*“wangeana”*].

Shrubs to 0.3 m tall. Branches with very dense leaf scars. Leaves alternate; leaf blade linear or linear-oblong, 1.5–2.5 mm wide, glabrous except for midrib abaxially. Inflorescences terminal. Calyx green; tube 3–6 × ca. 1.5 mm, exterior sparsely pubescent; lobes 4, unequal, triangular-ovate, 1.4–3 × 1.5–2 mm, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube; anthers linear-oblong, included within calyx tube. Disk obliquely cupular, irregularly 2- or 3-lobed, margin minutely serrate. Ovary pubescent at apex; style short; stigma globose, tiny. Drupe semidry, yellowish green, obovoid, ca. 5 mm.

- SE Xizang.

The 4-merous flowers of *Daphne holosericea* var. *wangiana*, when coupled with other differences in calyx indumentum and anther shape, support Halda's elevation of this taxon to species rank.

33. *Daphne purpurascens* S. C. Huang, *Acta Bot. Yunnan.* 7: 280. 1985.

紫花瑞香 *zi hua rui xiang*

Daphne longilobata (Lecomte) Turrill subsp. *purpurascens* (S. C. Huang) Halda.

Shrubs evergreen, 1.5–2 m tall, erect. Branches densely pubescent. Leaves alternate; petiole ca. 2 mm, glabrous; leaf blade oblong-elliptic or oblong-lanceolate, 4–6.5 × 1–1.7 cm, papery, both surfaces glabrous, base broadly cuneate or subrounded, apex acuminate; veins 5–7 pairs. Inflorescences terminal, 5–9-

flowered; peduncle ca. 7 mm, densely strigose; bracts absent. Pedicel short, densely strigose. Calyx purplish red; tube cylindrical, ca. 4 mm, 8-ribbed, exterior sericeous; lobes 4, ovate-oblong, 4–5 × 2–2.5 mm, obtuse and slightly retuse. Stamens 8, lower whorl inserted below middle of calyx tube, upper whorl just below throat; filaments very short, ca. 0.25 mm; anthers oblong, ca. 1.3 mm; upper ones ca. 1/2 exerted from calyx tube. Disk annular. Ovary ovoid, ca. 1.5 mm, glabrous, sessile; style short; stigma depressed-globose, papillose. Fruit not seen. Fl. Aug–Oct.

- Shrubby slopes; 2600–3100 m. Xizang.

34. *Daphne altaica* Pallas, *Fl. Ross.* 1: 53. 1784.

阿尔泰瑞香 *a er tai rui xiang*

Daphne altaica subsp. *fasciculiflora* (T. Z. Hsu) Halda; *D. fasciculiflora* T. Z. Hsu.

Shrubs deciduous, 0.4–0.8 m tall, erect. Bark brown, turning dark gray; branches elongated, pubescent at first, becoming glabrous. Leaves alternate; petiole absent to almost absent; leaf blade oblong-elliptic or elliptic-lanceolate, 2.5–6 × 0.7–1.5 cm, membranous, abaxially glaucescent, both surfaces glabrous, base cuneate, margin sometimes slightly revolute, apex obtuse or acute, shortly apiculate; veins 5–7 pairs. Inflorescences terminal, 3–7-flowered; bracts absent. Pedicel absent or almost absent. Calyx white; tube cylindrical, 10–12 mm, slender, exterior sparsely pubescent; lobes 4, narrowly ovate or broadly elliptic, 6–8 × 4–5 mm, apex obtuse, apiculate. Stamens 8, lower whorl inserted at ca. middle of calyx tube; upper whorl in throat, upper ones ca. 1/2 exerted from calyx tube. Disk small. Ovary ovoid, glabrous; style very short; stigma capitate. Drupe purplish black, ovoid, 5–7 mm. Fl. May–Jun, fr. Jul–Sep.

Valleys, mountains, shrubby slopes; ca. 1000 m. Xinjiang [NW Mongolia, Russia (Siberia)].

35. *Daphne longilobata* (Lecomte) Turrill, *Bot. Mag.* 172: t. 344. 1959.

长瓣瑞香 *chang ban rui xiang*

Daphne altaica Pallas var. *longilobata* Lecomte, *Notul. Syst. (Paris)* 3: 217. 1916.

Shrubs evergreen, to 1.5 m tall, erect. Branches pale green, sometimes turning purplish brown, slender, pubescent. Leaves alternate; petiole 0.5–2(–3) mm, glabrous; leaf blade lanceolate or oblanceolate, 1.5–4.5(–9) × 0.6–1.1(–2) cm, papery, both surfaces glabrous except sometimes for apical tuft of hairs when young, base narrowly cuneate, margin sometimes slightly revolute, apex obtuse or obtuse-rounded, rarely apiculate or retuse; veins 6–9 pairs. Inflorescences terminal, 3–5(or 6)-flowered; peduncle 0.8–1 cm, pubescent; bracts absent. Pedicel 1(–3) mm, pubescent. Calyx pale green, with white or very pale cream lobes; tube cylindrical, 8–10(–14) mm, exterior pubescent; lobes 4, unequal, lanceolate, 5–7 × 2–2.5(–3.5) mm, abaxially glabrescent, apex long acuminate. Stamens 8, lower whorl inserted below middle of calyx tube, upper whorl between throat and middle of tube; filaments ca. 0.5 mm; anthers oblong, ca. 1.5 mm, pollen orange. Disk annular, margin shallowly undu-

late. Ovary ovoid, ca. 2 mm, glabrous; style short; stigma capitate. Drupe scarlet-red, ovoid-globose, 8–12 mm. Fl. Jun–Jul, fr. Aug–Dec.

• Forests, shrubby slopes, among rocks; 1600–3500 m. SW Sichuan, E Xizang, NW Yunnan.

Daphne longilobata is widely grown and is sometimes used as a stock for grafting.

36. *Daphne depauperata* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 92. 1985.

少花瑞香 shao hua rui xiang

Shrubs evergreen, to 1.5 m tall. Branches brownish striate, densely yellowish hirsute. Leaves alternate, usually clustered at apices of branches; petiole 1.5–2 mm, glabrous; leaf blade dark glossy green, narrowly elliptic to lanceolate, rarely oblanceolate, 2–5.5 × 0.7–1.5 cm, leathery, both surfaces glabrous, base cuneate, margin slightly revolute, apex obtuse; veins 5–8 pairs. Inflorescences terminal, capitate, 2–4-flowered; peduncle ca. 3 mm, densely brownish tomentose; bracts absent. Pedicel ca. 1.5 mm, densely tomentose. Calyx white; tube cylindrical, 8–10 mm, exterior sparsely hirsute; lobes 4, ovate-lanceolate, ca. 6 mm, apex acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments very short; anthers oblong-conic, ca. 2.1 mm, upper ones exerted from calyx tube. Disk shallow. Ovary oblong-conic, ca. 2.5 mm, sessile or shortly stipitate, glabrous; style ca. 0.5 mm; stigma capitate. Drupe red, ovoid, ca. 5 mm. Fl. Aug, fr. Feb–Mar.

• Forests; 2000–3200 m. W Yunnan.

37. *Daphne brevituba* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 101. 1985.

短管瑞香 duan guan rui xiang

Shrubs evergreen, to 1 m tall. Branches yellowish green, turning brownish or grayish, densely tomentose, glabrescent. Leaves alternate, usually clustered at apices of branches; petiole 1–2 mm, glabrous; leaf blade vivid green adaxially, paler abaxially, oblanceolate or obovate-lanceolate, 2.5–6 × 0.8–1.6 cm, thinly leathery or papery, both surfaces glabrous, base narrowly cuneate, apex obtuse or rounded, usually slightly retuse; veins 7–11 pairs. Inflorescences terminal, usually 3–5-flowered; bracts narrowly lanceolate or obovate-lanceolate, 8–12 × ca. 2.5 mm, pilose, apex rounded. Flowers fragrant; pedicel ca. 1 mm, densely brown tomentose. Calyx white; tube urceolate, 3–5 × ca. 2.5 mm, exterior sparsely tomentose or glabrescent; lobes 4, ovate or ovate-elliptic, 2.5–3.5 mm, apex obtuse or acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments short; anthers broadly ovoid-ellipsoid, ca. 1 mm. Disk annular, poorly developed, very narrow, margin fimbriate. Ovary oblong-conic, glabrous; style very short; stigma capitate. Drupe red, ovoid, ca. 7 × 5 mm. Fl. Mar–Apr, fr. Apr–May.

• Open forests, bushy slopes, among rocks; ca. 2000 m. C and NW Yunnan (Heqing, Yimen).

38. *Daphne sureil* W. W. Smith & Cave, Rec. Bot. Surv. India 6: 51. 1914.

头序瑞香 tou xu rui xiang

Daphne shillong Banerji.

Shrubs evergreen, to 2.5 m. Bark grayish brown; branches ascending, very finely white tomentose, quickly glabrescent. Leaves alternate; petiole to 10 mm; leaf blade glossy dark green adaxially, paler abaxially, lanceolate to oblong-lanceolate, 5–13 × 1.6–3.5(–5) cm, leathery, both surfaces glabrous or abaxially puberulous, soon glabrous, base cuneate, apex long acuminate; lateral veins 9–12 per side of midrib, very oblique. Inflorescences terminal, sometimes on short lateral branches, capitate, 12–20-flowered; peduncle very short. Pedicel to 3 mm, finely tomentose. Calyx white, with green base; tube ca. 15 × 3 mm, exterior pubescent; lobes 4, triangular-lanceolate, ca. 10 × 4 mm, margin slightly involute, apex acute to acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; anthers ca. 2 mm. Disk cup-shaped, ca. 1 mm, margin serrate. Ovary cylindrical-ovoid, ca. 4 × 2 mm, glabrous; style very short but distinct; stigma discoid, ca. 1.5 mm wide. Drupe orange-red, ovoid, ca. 15 × 10 mm. Fl. Oct–Nov.

Dense montane forests; 1800–2100(–2800) m. Xizang [Bangladesh, Bhutan, NE India, E Nepal].

This Chinese record is based on *Kingdon Ward 10930* (BM), the first record for the Flora area.

39. *Daphne macrantha* Ludlow, Bull. Brit. Mus. (Nat. Hist.), Bot. 11: 77. 1956.

大花瑞香 da hua rui xiang

Shrubs evergreen, to 0.3 m tall, creeping. Branches angular, with semilunate leaf scars, purplish red or brown, glabrous. Leaves alternate, usually clustered at apices of branches; petiole 1–2 mm; leaf blade narrowly obovate, 3–5.5 × 1.5–2.5 cm, leathery, both surfaces glabrous, base cuneate and decurrent to petiole, margin revolute, apex obtuse, sometimes retuse. Inflorescences terminal, capitate, 5–10-flowered; peduncle almost absent; bracts caducous, oblong or oblong-ovate, 10–15 × 5–7 mm. Flowers fragrant; pedicel 1–2 mm, pilose. Calyx white, with yellowish throat; tube cylindrical, 12–17 mm, exterior pubescent; lobes 4, ovate or broadly ovate, 12–13 × 7–10 mm, apex obtuse, sometimes retuse. Stamens 8, inserted above middle of calyx tube; filaments ca. 0.5 mm; anthers oblong, ca. 2 mm. Disk cup-shaped, 0.6–1 mm, entire. Ovary ca. 4.5 mm, shortly stipitate, glabrous; style short; stigma capitate. Drupe red, ovoid, ca. 8 mm. Fl. Jun.

• Among rocks on north-facing open hillsides; 4200–4300 m. NE Xizang.

40. *Daphne yunnanensis* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 96. 1985.

云南瑞香 yun nan rui xiang

Daphne papyracea Wallich ex Steudel subsp. *yunnanensis* (H. F. Zhou ex C. Y. Chang) H. F. Zhou ex Halda.

Shrubs evergreen. Branches sparsely pubescent when young. Leaves alternate; petiole 4–12 mm, glabrous; leaf blade obovate-lanceolate, 8–20 × 2–4.2 cm, papery to submembranous, sometimes thinly leathery, both surfaces glabrous, base narrowly cuneate, apex caudate-acuminate, rarely obtuse-acu-

minate; veins 8–12 pairs, anastomosing near margins. Inflorescences terminal or axillary, capitate; peduncle 1–2 mm; bracts caducous, lanceolate or oblong-lanceolate, 8–10 × 2–3 mm, sericeous, apex acuminate. Pedicel 1–2 mm, densely sericeous. Calyx white; tube cylindric or slightly infundibuliform, 10–14 mm, exterior sparsely pubescent; lobes 4, ovate or oblong-lanceolate, 5–7 mm, glabrous, unequal, the 2 larger lobes acute with a tuft of hairs, the 2 smaller obtuse, glabrous. Stamens 8, lower whorl inserted just above middle of calyx tube, upper whorl slightly below throat; filaments short; anthers oblong, ca. 2 mm. Disk 2-lobed, lobes 2-fid. Ovary ellipsoid, ca. 2.2 mm, glabrous; style short, ca. 0.3 mm; stigma capitate. Drupe red.

- Montane forests, among boulders. SW Yunnan.

41. *Daphne laciniata* Lecomte, Notul. Syst. (Paris) 3: 215. 1916.

翼柄瑞香 *yi bing rui xiang*

Shrubs deciduous, 0.8–1.5 m tall. Branches glabrous or sometimes at first sparsely pubescent. Leaves alternate; petiole 8–15 mm, glabrous; leaf blade lanceolate or oblong-elliptic to elliptic, 12–17 × 2.5–5 cm, papery or leathery, both surfaces glabrous, base cuneate, margin sometimes slightly revolute, apex subacuminate; veins 12–16 pairs, anastomosing at margins. Inflorescences terminal and axillary, fasciculate; bracts leaflike, ovate-lanceolate or lanceolate, (6–)10–12 × 3–4 mm. Pedicel very short, pubescent or glabrescent. Calyx white or pinkish; tube cylindric, 9–11 mm, exterior sparsely appressed tomentose; lobes 4, triangular-ovate, 3–4 mm, apex acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 1 mm; anthers oblong, ca. 1.5 mm. Disk cup-shaped, laciniate. Ovary globose, ca. 3.5 mm, glabrous, sessile; style short; stigma globose or ovoid-globose. Fruit not seen.

- Forests; 1000–1500 m. Yunnan.

42. *Daphne tripartita* H. F. Zhou ex C. Y. Chang, Guihaia 6: 268. 1986.

九龙瑞香 *jiu long rui xiang*

Shrubs evergreen, small. Branches brownish or purplish brown, stout, shortly pubescent, glabrescent. Leaves alternate; petiole 1–2 mm, broadly winged; leaf blade lustrous dark green adaxially, paler abaxially, elliptic or oblong-lanceolate, 2–5 × 0.8–1.5 cm, papery or thinly leathery, both surfaces glabrous, base narrowly cuneate, margin sometimes revolute, apex obtuse, apiculate or retuse; veins 5 or 6 pairs. Inflorescences terminal, capitate, 2–8-flowered; bracts caducous, lanceolate, ca. 8 mm, mostly glabrous, margin and apex tomentose. Pedicel 1–2 mm, densely brown tomentose. Calyx white (or pink); tube narrowly cylindric, 10–11 mm, exterior brownish pubescent; lobes 4, broadly ovate or ovate-lanceolate, 2–3 mm, apex acute. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments short; anthers linear-oblong, ca. 1 mm. Disk annular, 3-lobed; lobes ± square, irregularly 1- or 2-fid. Ovary ellipsoid, ca. 3 mm, glabrous; style ca. 1.5 mm; stigma capitate, tiny. Drupe red, ovoid, ca. 8 mm. Fl. Jun, fr. Jul–Aug.

- Forests, among boulders; 2700–3000 m. SW Sichuan, NW Yunnan.

43. *Daphne jinyunensis* C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 94. 1985.

缙云瑞香 *jin yun rui xiang*

Shrubs evergreen, to 1.5 m tall. Branches sparsely pubescent. Leaves alternate, usually clustered at apices of branches; petiole 0.5–1 mm; leaf blade elliptic, elliptic-lanceolate, or obovate, 5–15 × 2–4 cm, thinly leathery or papery, both surfaces glabrous, base cuneate, margin slightly revolute, apex obtuse, acute, or caudate-acuminate, sometimes retuse; veins 6–10 pairs. Inflorescences terminal, several flowered; bracts caducous, lanceolate or oblong, ca. 6 × 1.8 mm, sparsely pubescent. Pedicel 1–1.5 mm, densely pubescent. Calyx purplish white; tube 6–8 mm, exterior densely pubescent; lobes 4, ovate or ovate-lanceolate, 3–4 × 1.5–2.5 mm, apex obtuse or acute. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments very short; anthers linear-oblong, ca. 1.4 mm. Disk annular, margin irregularly 4- or 5-lobed. Ovary ellipsoid, glabrous; style 0.7–1.2 mm, hairy or glabrous; stigma capitate. Drupe red, broadly ovoid. Fl. Aug–Sep, fr. Mar–Apr.

- Open forests on rocky slopes. Chongqing.

- 1a. Leaf blade thinly leathery, apex not retuse, style ca. 1.2 mm, glabrous 43a. var. *jinyunensis*
- 1b. Leaf blade papery, apex retuse, sometimes midrib forked at apex, style 0.7–1 mm, densely yellowish brown sericeous 43b. var. *ptilostyla*

43a. *Daphne jinyunensis* var. *jinyunensis*

缙云瑞香(原变种) *jin yun rui xiang* (*yuan bian zhong*)

Daphne papyracea Wallich ex Steudel subsp. *jinyunensis* (C. Y. Chang) Halda.

Leaf blade thinly leathery, apex not retuse. Style ca. 1.2 mm, glabrous.

- Chongqing.

43b. *Daphne jinyunensis* var. *ptilostyla* C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 95. 1985.

毛柱瑞香 *mao zhu rui xiang*

Daphne papyracea var. *ptilostyla* (C. Y. Chang) Halda.

Leaf blade papery, apex retuse; midrib sometimes forked into 2 at apex. Style 0.7–1 mm, densely yellowish brown sericeous.

- Open forests on rocky slopes. Chongqing.

44. *Daphne papyracea* Wallich ex Steudel, Nomencl. Bot., ed. 2, 1: 483. 1840.

白瑞香 *bai rui xiang*

Shrubs evergreen, to 1.5 m tall. Branches grayish brown or -black or purplish red or -brown, glabrous or tomentose. Leaves alternate; petiole 1–15 mm, glabrescent; leaf blade ovate, lan-

ceolate, elliptic, or oblanceolate, 6–16 × 1.5–4 cm, thinly leathery, membranous, or papery, both surfaces glabrous, base cuneate, apex acuminate or obtuse; veins 6–15 pairs. Inflorescences terminal, fasciculate, 3–10(–12)-flowered; peduncle ca. 2 mm, sericeous; bracts caducous, ovate, 7–15 × 3–4 mm, sparsely sericeous, apex acuminate. Flowers not fragrant; pedicel ca. 2 mm, densely sericeous. Calyx white or greenish white, sometimes flushed pink; tube narrowly funnel-shaped, (5–)10–15(–18) mm, exterior sericeous; lobes 4, ovate, 4–11 × 2–5 mm, apex acute or obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments short; anthers oblong, 1–2 mm; upper ones partly exerted from calyx tube. Disk cup-shaped, margin slightly undulate to obscurely serrate. Ovary cylindrical, 2–4 mm, glabrous; style very short; stigma capitate, papillose. Drupe red, ovoid-pyriform, 8–10 mm. Fl. Nov–Jan, fr. Apr–May.

Forests, shrubby and herbaceous slopes; 700–3100 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan [India, Nepal].

The separation of the varieties of *Daphne papyracea* from the following three species, *D. feddei*, *D. longituba*, and *D. kusei*, is difficult, and the status of all these taxa needs more detailed investigation.

- 1a. Branches grayish brown or grayish black, tomentose; leaf blade papery, membranous, or thinly leathery.
- 2a. Leaf blade membranous or papery, narrowly elliptic to oblong-lanceolate or oblanceolate, petiole 4–15 mm; calyx tube 10–12 mm, throat ca. 2.5 mm wide 44a. var. *papyracea*
- 2b. Leaf blade thinly leathery, lanceolate, petiole 1–3 mm; calyx tube 7–9 mm, throat ca. 2 mm wide 44b. var. *duclouxii*
- 1b. Branches purplish red or purplish brown, usually glabrous; leaf blade leathery or thickly papery.
- 3a. Leaf blade elliptic or lanceolate, leathery; calyx tube 5–6 mm, lobes ca. 4 mm 44c. var. *crassiuscula*
- 3b. Leaf blade ovate or broadly elliptic, thickly papery; calyx tube 14–15 mm, lobes 5–6 mm 44d. var. *grandiflora*

44a. *Daphne papyracea* var. *papyracea*

白瑞香(原变种) bai rui xiang (yuan bian zhong)

Daphne cannabina Wallich, *Asiat. Res.* 13: 385. 1820, not Loureiro (1790); *D. cavaleriei* H. Léveillé; *D. mairei* H. Léveillé.

Branches grayish brown or grayish black, tomentose. Petiole 4–15 mm; leaf blade elliptic to oblong-lanceolate or oblanceolate, membranous or papery. Calyx tube 10–12(–18) × 2.5–5 mm at throat.

Forests, shrubby slopes; 700–2000 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan [India, Nepal].

“*Daphne papyrifera* Buchanan-Hamilton,” an unpublished name

listed by D. Don (*Prodr. Fl. Nepal.* 68. 1825) in the synonymy of *D. odora*, belongs here (see Meisner in A. Candolle, *Prodr.* 14: 537. 1857).

44b. *Daphne papyracea* var. *duclouxii* Lecomte, *Notul. Syst. (Paris)* 3: 216. 1916.

短柄白瑞香 duan bing bai rui xiang

Branches grayish brown or grayish black, tomentose. Petiole 1–3 mm; leaf blade lanceolate, subleathery. Calyx tube 7–9 × ca. 2 mm at throat; lobes ovate-oblong, 4–6 mm.

- Forests; ca. 1200 m. NE Yunnan.

44c. *Daphne papyracea* var. *crassiuscula* Rehder in Sargent, *Pl. Wilson.* 2: 546. 1916.

山辣子皮 shan la zi pi

Branches purplish red or purplish brown, short, stout, usually glabrous. Leaf blade elliptic or lanceolate, leathery. Calyx tube 5–6 mm; lobes ovate, ca. 4 × 3–4 mm.

- Shrubby and herbaceous slopes; 1000–3100 m. Guizhou, Sichuan, Yunnan.

44d. *Daphne papyracea* var. *grandiflora* (Meisner ex Diels) C. Y. Chang, *Fl. Reipubl. Popularis Sin.* 52(1): 376. 1999.

大花白瑞香 da hua bai rui xiang

Daphne papyracea f. *grandiflora* Meisner ex Diels, *Notes Roy. Bot. Gard. Edinburgh* 7: 290. 1912.

Branches purplish red or purplish brown, usually glabrous. Leaf blade ovate or broadly elliptic, thickly papery. Calyx tube 14–15 mm; lobes ovate, 5–6 mm.

- Forests; ca. 2500 m. W Yunnan.

45. *Daphne feddei* H. Léveillé, *Repert. Spec. Nov. Regni Veg.* 9: 326. 1911.

滇瑞香 dian rui xiang

Shrubs evergreen, 0.6–2 m tall. Branches few, angular when young, pale yellowish green, turning purplish brown or bright purple, sparsely tomentose or glabrous. Leaves alternate; petiole 1–3 mm; leaf blade dark lustrous green adaxially, yellowish abaxially, oblanceolate or oblong-lanceolate to obovate-lanceolate or obovate, (3–)4.5–12 × (0.7–)1.4–3.5 cm, papery, both surfaces glabrous, base cuneate, margin revolute, apex acute or acuminate, rarely obtuse; veins 11–16 pairs, anastomosing near margins. Inflorescences terminal, usually 8–12-flowered; peduncle ca. 3 mm; bracts caducous, lanceolate or oblong, sericeous. Flowers fragrant; pedicel ca. 1 mm, sericeous. Calyx white; tube cylindrical, 8–12(–18) × 1.5–2.5 mm, exterior densely pubescent; lobes 4, ovate or ovate-lanceolate, 4.5–5.5(–8) × ca. 2.5 mm, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 0.5 mm; anthers oblong, ca. 1.3 mm; upper ones ca. 1/2 exerted from calyx tube. Disk cup-shaped, very narrow, margin fringed. Ovary ovoid or conic, glabrous; style short, ca. 0.5 mm; stigma capitate, papillose. Drupe orange-red, globose or ovoid, 4.5–8 mm. Fl. Feb–Apr, fr. May–Jun.

- Forests, shrubby slopes; 1800–2600 m. Guizhou, Sichuan, Yunnan.

- 1a. Young branches sparsely dark gray tomentose 45a. var. *feddei*
 1b. Young branches glabrous 45b. var. *taliensis*

45a. *Daphne feddei* var. *feddei*

滇瑞香(原变种) *dian rui xiang* (yuan bian zhong)

Daphne martini H. Léveillé.

Young branches sparsely dark gray tomentose. Leaf blade oblanceolate or oblong-lanceolate to obovate-lanceolate, 5–12 × 1.4–3.5 cm, apex acute or acuminate.

• Forests, shrubby slopes; 1800–2600 m. Guizhou, Sichuan, Yunnan.

45b. *Daphne feddei* var. *taliensis* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 99. 1985.

大理瑞香 *da li rui xiang*

Young branches glabrous. Leaf blade narrowly obovate, 4.5–9 × 1.8–3.2 cm, apex usually acute.

• Forests. Yunnan.

46. *Daphne longituba* C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 97. 1985.

长管瑞香 *chang guan rui xiang*

Daphne papyracea Wallich ex Steudel var. *longituba* (C. Y. Chang) Halda.

Shrubs evergreen, to 1 m tall. Branches purplish red or brown, tomentose. Leaves alternate; petiole 3–10 mm; leaf blade broadly elliptic, ovate, or obovate, 3.5–9.5 × 2–4.5 cm, papery or thinly leathery, both surfaces glabrous, base broadly cuneate, margin sometimes slightly revolute, apex obtuse or acute, sometimes retuse; veins 8–10 pairs. Inflorescences terminal, usually 3–8-flowered; peduncle 3–6 mm; bracts caducous, narrowly ovate-elliptic or narrowly elliptic, pubescent at apex, ciliate. Flowers fragrant; pedicel 2–3 mm, densely sericeous. Calyx white; tube cylindric or narrowly funnel-shaped, 10–14 mm, exterior sericeous; lobes 4, ovate, 3–4(–7) × ca. 2.5 mm, abaxially very sparsely sericeous, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl slightly below throat; filaments very short; anthers oblong, ca. 3 mm. Disk cup-shaped, margin erose. Ovary ovoid or oblong-cylindric, 1.5–3 mm, glabrous; style ca. 1 mm; stigma capitate. Fruit not seen. Fl. Oct–Nov(–Jan).

• Forests, valleys; 1000–1200 m. NE Guangxi.

47. *Daphne kiusiana* Miquel var. *atrocaulis* (Rehder) F. Maekawa, J. Jap. Bot. 21: 45. 1945.

毛瑞香 *mao rui xiang*

Daphne odora Thunberg var. *atrocaulis* Rehder in Sargent, Pl. Wilson. 2: 545. 1916; *D. odora* var. *taiwaniana* Masamune; *D. taiwaniana* (Masamune) Masamune.

Shrubs evergreen, 0.5–1.2(–2) m tall. Branches dark purplish red or brown, glabrous. Leaves alternate; petiole 6–8 mm;

leaf blade adaxially dark green, elliptic or lanceolate, (5–)6–12 × (1.5–)1.8–3 cm, leathery, both surfaces glabrous, base decurrent into petiole, margin slightly revolute, apex acuminate; veins 6 or 7 pairs. Inflorescences terminal, subcapitate, usually 9–12-flowered; peduncle almost absent; bracts caducous, oblong-lanceolate, outer ca. 15 × 4 mm, glabrous, apex caudate or acuminate, ciliate. Pedicel 1–2 mm, densely tomentose. Calyx white (or creamy); tube cylindric, 10–14 mm, exterior densely sericeous; lobes 4, ovate-triangular or ovate-oblong, ca. 5 mm, glabrous, apex obtuse. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 2 mm; anthers oblong, ca. 2.1 mm. Disk cup-shaped, margin entire or slightly undulate. Ovary obconic, ca. 2.2 mm, glabrous; style short; stigma capitate. Drupe broadly ellipsoid or ovoid-ellipsoid, ca. 10 mm. Fl. Nov–Feb, fr. Apr–May.

• Forests, moist places; 300–400 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

This species has been misidentified as *Daphne odora* (e.g., by Hemsley, J. Linn. Soc., Bot. 26: 395. 1891). *Daphne kiusiana* var. *kiusiana* is found in Japan and S Korea. It has oblanceolate leaf blades and smaller flowers with calyx tubes 7–8 mm.

48. *Daphne bholua* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 68. 1825.

藏东瑞香 *zang dong rui xiang*

Shrubs evergreen or deciduous, creeping or erect, 1–2.6 (–4) m tall. Branches brownish, becoming dark brown suffused with purple, sparsely hirsute, soon glabrescent. Leaves alternate, clustered at stem apex; petiole 1–5 mm; leaf blade dull dark green, narrowly elliptic or oblong-lanceolate, (3.5–)5–17 × (1–)1.7–3.2 cm, thinly leathery, both surfaces glabrous, base broadly cuneate, margin sometimes slightly revolute and/or undulate, apex acute, rarely acuminate or obtuse; veins 6–16 pairs. Inflorescences terminal or axillary, (5–)7–12(–15)-flowered; peduncle almost absent; bracts paired, caducous, broadly lanceolate or oblong-ovate, 14–18 × ca. 4 mm, sericeous, apex caudate. Flowers fragrant; pedicel absent or to 4 mm, articulate, densely sericeous. Calyx purplish red or red at least abaxially; tube cylindric, 7–10(–12) mm, exterior densely sericeous; lobes 4, ovate, 5–7 × 3–5 mm, abaxially pubescent, apex slightly retuse to subacute. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl reaching mouth; filaments ca. 0.5 mm; anthers ca. 2 mm. Disk cupular, ca. 1 mm wide, margin entire. Ovary cylindric-pyriform, ca. 4 mm, glabrous, shortly stipitate; style ca. 0.5 mm; stigma capitate. Drupe black, ovoid, 7–8 × ca. 5 mm. ?Fl. Jan–Mar, fr. Apr–May.

Forests; 1700–3500 m. Sichuan, Xizang, NW Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal].

- 1a. Shrubs erect, 1.5–2.6(–4) m tall, leaf scar semicircular, lateral veins 11–16 pairs 48a. var. *bholua*
 1b. Shrubs creeping, 1–2 m tall, leaf scar subrhombic, lateral veins 6–11 pairs 48b. var. *glacialis*

48a. *Daphne bholua* var. *bholua*

藏东瑞香(原变种) *zang dong rui xiang* (yuan bian zhong)

Daphne cannabina Wallich var. *bholua* (Buchanan-Hamilton ex D. Don) Keissler, Bot. Jahrb. Syst. 25: 93. 1898.

Shrubs erect, 1.5–2.6 m tall. Leaf scars semicircular. Leaf blade with 11–16 pairs of lateral veins.

Forests. Sichuan, Xizang, NW Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal].

48b. *Daphne bholua* var. *glacialis* (W. W. Smith & Cave) B. L. Burtt, Bull. Misc. Inform. Kew 1936: 438. 1936.

落叶瑞香 *luo ye rui xiang*

Daphne cannabina var. *glacialis* W. W. Smith & Cave, Rec. Bot. Surv. India 6: 52. 1913.

Shrubs creeping, 1–2 m tall. Leaf scars subrhombic. Leaf blade with 6–11 pairs of lateral veins.

Forests. S Xizang (Dinggyê, Yadong), NW Yunnan [India, Nepal].

49. *Daphne xichouensis* H. F. Zhou ex C. Y. Chang, Bull. Bot. Res., Harbin 5(3): 99. 1985.

西畴瑞香 *xi chou rui xiang*

Daphne papyracea Wallich ex Steudel var. *xichouensis* (H. F. Zhou ex C. Y. Chang) Halda.

Shrubs evergreen, to 1 m tall. Branches sparsely tomentose. Leaves alternate; petiole 2–4 mm, glabrous; leaf blade oblong to lanceolate, 4.5–11 × 1.5–2.8 cm, thinly leathery or papery, both surfaces glabrous, base broadly cuneate, margin slightly revolute, apex obtuse, rarely acuminate; veins 7 or 8 pairs. Inflorescences terminal or axillary, usually 4–8-flowered; bracts caducous, ovate-lanceolate or lanceolate, 5–7 mm, apex acuminate, ciliate. Pedicel 1–1.4 mm, densely sericeous. Calyx reddish white; tube cylindrical, broader in throat, ca. 7 mm, exterior sparsely tomentose; lobes 4, broadly ovate, 3–4 mm, glabrous, apex obtuse. Stamens 8, lower whorl inserted slightly above middle of calyx tube, upper whorl in throat; filaments short; anthers oblong, ca. 1.6 mm. Disk shallow, margin slightly undulate. Ovary ovoid, glabrous; style short; stigma papillose. Drupe globose, ca. 6 mm. Fl. Jan–Feb, fr. Apr.

- Moist shrubby slopes; 1500–1800 m. SE Yunnan.

50. *Daphne emeiensis* C. Y. Chang, Guihaia 6: 267. 1985.

峨眉瑞香 *e mei rui xiang*

Daphne bholua Buchanan-Hamilton ex D. Don subsp. *emeiensis* (C. Y. Chang) Halda.

Shrubs evergreen, 0.5–1 m tall. Branches hispid. Leaves alternate, usually clustered at apices of branches; petiole 3–7 mm; leaf blade narrowly elliptic or subobovate, 4–8 × 1.1–2.5 cm, leathery or thinly so, both surfaces glabrous, base cuneate, apex obtuse, sometimes retuse; veins 6–9 pairs. Inflorescences terminal and axillary; peduncle very short to absent; bracts oblong, ca. 6 × 2–3 mm, ciliate. Pedicel ca. 2.5 mm, densely hispid-pilose. Calyx red; tube cylindrical, ca. 9 mm, exterior densely hispid; lobes 4, ovate-elliptic, ca. 5 mm, glabrous or sparsely hispid abaxially, apex obtuse. Stamens 8, lower whorl inserted ca. 5 mm below throat, upper whorl ca. 1.5 mm below throat; filaments ca. 0.8 mm; anthers linear-oblong, ca.

2.1 mm. Disk annular, margin undulate-serrate. Ovary ellipsoid, ca. 2.5 mm, glabrous; style ca. 0.35 mm; stigma capitate. Drupe globose, ca. 4 mm. Fl. Nov–Feb, fr. Apr–May.

- Forests, forest margins; 800–1100 m. Sichuan (Emei Shan, Pingshan).

51. *Daphne pachyphylla* D. Fang, Acta Phytotax. Sin. 39: 547. 2001.

厚叶瑞香 *hou ye rui xiang*

Shrubs evergreen, ca. 0.7 m tall. Branches dark gray, robust, at first sparsely appressed brownish pubescent; leaf scars reniform. Leaves alternate; petiole 2–5 mm, glabrous; leaf blade brownish green abaxially, narrowly oblong-elliptic, 5–11.2 × (1–)1.5–3.8 cm, thickly leathery, adaxially rugose, glabrous except for ciliate margins and apical tuft of hairs, base cuneate-decurrent, margin revolute, apex acute or subobtusate; lateral veins 5–9 per side of midrib. Inflorescences terminal on reduced lateral branches, 5–15-flowered; peduncle to 12 mm, densely rusty pubescent, or absent; bracts narrowly oblanceolate to elliptic, 10–16 × 2.5–3.5 mm, apex acute or rarely obtuse, with apical tuft of hairs. Pedicel absent. Calyx white; tube cylindrical, ca. 8 × 3 mm, exterior appressed brownish pubescent; lobes 4, narrowly ovate, ca. 4 × 1–2 mm, sparsely pubescent, apex slightly acuminate. Stamens 8, lower whorl inserted at middle of calyx tube, upper whorl in throat; filaments ca. 0.5 mm; anthers oblong, ca. 1.5 mm, upper ones ca. 1/2 exerted from calyx tube. Disk cupshaped, ca. 0.5 mm, margin entire. Ovary shortly stipitate, ellipsoid, ca. 1.5 × 0.7 mm, glabrous; style ca. 0.3 mm; stigma capitate. Fruit not seen.

- Forests on limestone hills; 1200–1300 m. W Guangxi (Napo).

Daphne pachyphylla is a member of the group of species closely allied to *D. bholua* and *D. papyracea*, including species nos. 44–50 in this treatment. It is known to us only from the protologue, which suggests that it can most easily be distinguished by the brownish undersides of the thickly leathery leaf blades and by the distinctive, ciliate margins and tufted apices of the leaf blades and bracts.

52. *Daphne taylorii* Halda, Acta Mus. Richnov., Sect. Nat. 7: 10. 2000.

西藏瑞香 *xi zang rui xiang*

Shrubs 0.3–0.5(–1) m tall, branching dichotomous. Branches reddish brown, densely pubescent. Leaves alternate; petiole short; leaf blade glossy dark green adaxially, dull pale green abaxially, oblanceolate, 2.5–5.5 × 0.9–2.2 cm, leathery, abaxially at first sparsely hairy but both surfaces glabrous well before leaf is fully expanded, base cuneate, margin narrowly revolute, apex obtuse or retuse; lateral veins 6–8 per side of midrib. Inflorescences terminal, fasciculate, 2–5(–8)-flowered; peduncle absent; bracts very soon caducous, ovate-elliptic, ciliate. Pedicel 3–4 mm. Calyx exterior purple or dark maroon except for 2 white lobes, interior white; tube cylindrical, 7–12 mm, exterior sericeous; lobes 4, ovate, 3–5 × 3–3.5 mm, apex acute. Stamens 8, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments almost absent; anthers 1.5–1.75 × 0.3–0.2 mm. Disk annular, very narrow, entire. Ovary pyriform, glabrous; style ca. 0.5 mm; stigma capitate, tiny. Drupe red, ovoid, 8–10 mm.

- Deep shade at base of cliffs; ca. 3500 m. Xizang.

4. ERIOSOLENA Blume, Bijdr. 651. 1826.

毛花瑞香属 mao hua rui xiang shu

Wang Yinzheng (王印政); Michael G. Gilbert

Scopolia Linnaeus f. (1782), not Adanson (1763), nor Jacquin (1764), nom. cons., nor J. R. Forster & G. Forster (1775).

Trees or shrubs. Leaves alternate; leaf blade oblong-lanceolate, densely pinnately veined, apex acute. Inflorescence axillary, long pedunculate, capitate, with involucre; bracts 2–4, caducous. Flowers bisexual, sessile, 4-merous. Calyx tube white, funnel-shaped, exterior densely pilose; lobes ± unequal; imbricate. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series; filaments very short; anthers linear, introrse, basifixed; upper ones half exerted from throat. Disk cup-shaped, membranous, unequal, lobed or serrate, sometimes developed on one side. Ovary ellipsoid, 1-loculed; style short; stigma capitate, included. Fruit a berrylike drupe. Seed testa crustaceous.

Two species: Cambodia, China, India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam; one species in China.

Halda (Genus *Daphne*, 84. 2001) included *Eriosolena* within his very broad concept of *Daphne*. This view is not accepted here.

1. Eriosolena composita (Linnaeus f.) Tieghem, Bull. Soc. Bot. France 40: 68. 1893.

毛花瑞香 mao hua rui xiang

Scopolia composita Linnaeus f., Suppl. Pl. 409. 1782; *Daphne composita* (Linnaeus f.) Gilg; *D. involucrata* Wallich; *D. pendula* Smith; *Eriosolena composita* var. *szemauensis* Y. Y. Qian; *E. involucrata* (Wallich) Tieghem; *E. montana* Blume; *E. pendula* (Smith) Blume ex Lecomte.

Shrubs or trees, to 10 m tall. Branchlets erect, brown to grayish brown, striped when dried, slender, glabrous. Leaves alternate; petiole 2–5 mm, glabrous; leaf blade green, sometimes brownish adaxially, grayish green abaxially, elliptic to elliptic-lanceolate, (3.5–)5–14(–20) × (1.5–)1.8–3.5(–5) cm, both surfaces glabrous, base cuneate, apex acuminate; lateral veins 9–15

pairs, dense, slender, curved ascending, more conspicuous abaxially, reticulate veins dense. Inflorescences axillary, rarely paired, capitate, (4–)8–12-flowered; peduncle 1.4–4 cm, slender; involucre bracts 2–4, caducous during anthesis, adaxially pubescent. Flowers fragrant. Calyx pale yellow or white; tube ca. 12 mm, exterior densely sericeous; lobes 4, unequal, ovate, 2–4 × 1–1.5 mm. Stamens 8; filaments very short; anthers yellow, oblong, 1–1.5 mm. Disk scalelike, cup-shaped, ca. 2 mm wide, membranous, unequal laterally. Ovary ellipsoid, apex white hirsute; style short, densely white hirsute; stigma capitate, papillose. Drupe blackish violet or red, ovoid, 10–15 × ca. 5 mm. Fl. spring.

Forests, shrubby slopes; 1300–1800 m. SE to SW Yunnan [Cambodia, India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam].

5. RHAMNONEURON Gilg in Engler & Prantl, Nat. Pflanzenfam. 3(6a): 245. 1894.

鼠皮树属 shu pi shu shu

Wang Yinzheng (王印政); Michael G. Gilbert

Shrubs. Leaves alternate, leaf blade ± leathery, densely and prominently pinnately veined. Inflorescence terminal or axillary, paniculate, consisting of many few flowered involucre heads; bracts white. Flowers bisexual, sessile, 4-merous. Calyx tube white or red, cylindrical, usually saccate, exterior sericeous. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series; filaments very short or absent. Disk cup-shaped, membranous, margin ± undulate. Ovary completely pilose, 1-loculed; style short; stigma capitate. Fruit pilose abaxially, enclosed by persistent calyx. Seed fusiform to linear; testa crustaceous, cotyledons succulent.

Two species: China, Vietnam; one species in China.

Halda (Genus *Daphne*, 100. 2001) included *Rhamnoneuron* within his very broad concept of *Daphne*. This view is not accepted here.

1. Rhamnoneuron balansae (Drake) Gilg in Engler & Prantl, Nat. Pflanzenfam. 3(6a): 245. 1894.

鼠皮树 shu pi shu

Wikstroemia balansae Drake, J. Bot. (Morot): 227. 1889; *Daphne balansae* (Drake) Halda; *Rhamnoneuron rubriflorum* C. Y. Wu ex S. C. Huang.

Shrubs or small trees, to 2–4(–10) m tall. Branchlets erect, brown, slender, appressed hispid, glabrescent. Petiole 1–3 mm, sparsely pubescent; leaf blade ovate or oblong to lanceolate, (8–)10–19 × 2.5–5.5 cm, abaxially appressed pubescent, adaxi-

ally glabrous, base cuneate or broadly cuneate, rarely rounded, apex acuminate; lateral veins 19–24 pairs, slightly curved ascending, conspicuous. Inflorescences terminal and axillary, capitate, in panicles, 4-flowered; peduncle 1.5–2 cm, sericeous; involucre bracts 2. Calyx red, ca. 12 mm, exterior sericeous; lobes 4, erect, ovate, ca. 2.5 mm. Stamens 8, inserted in calyx tube; filaments ca. 1/2 as long as anthers; anthers oblong, ca. 1.5 mm. Disk cup-shaped, margin undulate. Ovary white hirsute; style short; stigma subglobose. Drupe fusiform, ca. 8 mm, abaxially white hirsute, covered by persistent calyx. Fl. Mar.

Forests; 900–1200 m. SE Yunnan (Pingbian) [Vietnam].

6. **EDGEWORTHIA** Meisner, Pl. Vasc. Gen. 1: 330, 2: 242. 1841.

结香属 jie xiang shu

Wang Yinzheng (王印政); Michael G. Gilbert

Shrubs, deciduous, much branched. Leaves alternate, usually clustered apically; petiole short; leaf blade narrowly elliptic to oblanceolate, thickly membranous. Inflorescence terminal or axillary, densely capitate; peduncle long or short; involucre present; bracts caducous, small. Flowers bisexual, 4-merous; pedicel present, articulate. Calyx tube cylindrical, incurved, interior yellow or white, exterior densely white pilose; lobes 4, spreading. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series; filaments very short. Disk cup-shaped, lobed. Ovary sessile, pilose, 1-loculed; style long, sometimes puberulous; stigma rounded or clavate, papillose. Fruit dry or slightly succulent, base enclosed by persistent calyx.

Five species: Asia; four species (three endemic) in China.

- 1a. Leaves deciduous, absent at flowering 3. *E. chrysantha*
- 1b. Leaves evergreen or biennial, present at flowering.
 - 2a. Inflorescences 10–17-flowered 1. *E. eriosolenoides*
 - 2b. Inflorescences 30–50-flowered.
 - 3a. Calyx interior yellow; ovary uniformly hairy; stigma rounded 2. *E. gardneri*
 - 3b. Calyx interior white; ovary base glabrous, apex hairy; stigma clavate 4. *E. albiflora*

1. *Edgeworthia eriosolenoides* K. M. Feng & S. C. Huang, Acta Bot. Yunnan. 7: 281. 1985.

Forests, moist places; 1000–2500(–3500) m. E Xizang, NW Yunnan [Bhutan, India, N Myanmar, Nepal].

西畴结香 xi chou jie xiang

Shrubs, branching trichotomous. Branchlets brown, pubescent. Petiole 0.6–1 mm, appressed sericeous; leaf blade green adaxially, grayish green abaxially, elliptic to elliptic-lanceolate, 5.5–15 × 1.7–4.7 cm, thinly papery, both surfaces sparsely appressed sericeous, more densely so abaxially, base gradually narrowed, apex acuminate; lateral veins 10–13 pairs, conspicuous, reticulate veins visible. Inflorescences axillary, capitate, 10–17-flowered; peduncle 1.5–2 cm, densely sericeous. Calyx ca. 20 × 1.5 mm, exterior densely white shiny sericeous; lobes 4, ovate-lanceolate, ca. 4 × 1.5 mm. Anthers lanceolate, ca. 1.5 mm. Disk shallowly cup-shaped. Ovary ellipsoid, ca. 3 mm, apex white sericeous; style filiform, ca. 3 mm; stigma clavate, ca. 2 mm. Fl. spring.

• SE Yunnan (Xichou).

2. *Edgeworthia gardneri* Meisner, Denkschr. Regensburg. Bot. Ges. 3: 280. 1841.

3. *Edgeworthia chrysantha* Lindley, J. Hort. Soc. London 1: 148. 1846.

结香 jie xiang

Edgeworthia papyrifera Siebold & Zuccarini; *E. tomentosa* (Thunberg) Nakai, comb. rej.; *Magnolia tomentosa* Thunberg, nom. utique rej.

滇结香 dian jie xiang

Daphne gardneri Wallich, Asiat. Res. 13: 388. 1820.

Trees small, to 3–4 m tall. Stem brownish red; branchlets glabrous or sparsely sericeous at apex. Petiole 4–8 mm, puberulous; leaf blade narrowly elliptic to elliptic-lanceolate, 6–10 × 2.5–3.4 cm, both surfaces appressed pubescent, base cuneate, apex acute; lateral veins 8 or 9 pairs, conspicuous. Inflorescences terminal and axillary, capitate, 3.5–4 cm in diam., 30–50-flowered; peduncle pendulous, 2–2.5(–5) cm, white sericeous at anthesis, glabrescent; bracts caducous, leaflike, narrowly lanceolate. Calyx ca. 15 mm, exterior densely white sericeous; lobes 4, yellow adaxially, ovate, ca. 3.5 × 2.5 mm, abaxially densely sericeous, apex acute or rounded. Disk scale lacerate. Ovary ellipsoid, ca. 5 mm, uniformly densely grayish white sericeous; style pubescent, ca. 2 mm; stigma globose, ca. 3 mm. Drupe ovoid, densely sericeous. Fl. late winter and early spring, fr. summer.

Shrubs to 0.7–1.5 m tall, deciduous, branching usually trichotomous. Branchlets brown, strong, stout, usually pubescent when young. Leaves falling before anthesis; leaf blade oblong, lanceolate, or oblanceolate, 8–20 × 2.5–5.5 cm, both surfaces whitish gray sericeous, more densely so abaxially, base gradually narrowed, cuneate, apex apiculate; lateral veins 10–13 pairs, slender, curved, pubescent. Inflorescences terminal and axillary, capitate, 30–50-flowered; peduncle 1–2 cm, grayish white hirsute; bracts ca. 10, pilose. Flowers fragrant. Calyx yellow inside, 13–20 × 4–5 mm; tube exterior densely white sericeous; lobes 4, ovate-lanceolate, ca. 3.5 × 3 mm. Anthers subovoid, ca. 2 mm. Disk shallowly cup-shaped, margin irregular. Ovary ovoid, ca. 4 × 2 mm, apex sericeous; style glabrous, ca. 2 mm; stigma globose, ca. 3 mm. Drupe ellipsoid, ca. 8 × 3.5 mm, apex pubescent. Fl. late winter and early spring, fr. spring–summer. *2n* = 36*.

• Forests, shrubby slopes, also cultivated. Fujian, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangxi, Yunnan, Zhejiang [cultivated and naturalized in Japan].

The name *Edgeworthia chrysantha* was published a few weeks earlier in 1846 than *E. papyrifera* and therefore has priority. The oldest name, *Magnolia tomentosa*, was never generally taken up and was formally rejected to protect *E. papyrifera*. This means that Nakai's *E. tomentosa* is also rejected. "*Daphne papyrifera*" is not a validly published name: D. Don (Prodr. Fl. Nepal.: 68. 1825) merely cited "*D. papyrifera* Buchanan-Hamilton" as a synonym of *D. odora*; later, Siebold (Verh. Batav. Genootsch. Kunsten 12: 22. 1830) commented on the value of "*D. papyrifera*" for paper-making, referring to *E. chrysantha* as currently understood, but this is not acceptable as a validating description or diagnosis (see Art. 32.3 of the *Vienna Code*).

4. Edgeworthia albiflora Nakai, J. Arnold Arbor. 5: 82. 1924.

白结香 bai jie xiang

Shrubs to 1–5 m tall, branching usually trichotomous. Branchlets brownish yellow, slender; leaf scars visible, ca. 2 mm wide. Leaves lasting 2 years; petiole 2–10 mm, pubescent; leaf blade green adaxially, grayish green abaxially, oblanceolate, 3.5–15 × 1–6 cm, abaxially glabrous or puberulous along midrib, adaxially glabrous, base gradually narrowed, margin slightly revolute, apex acute; lateral veins 8–10 pairs, conspic-

uous. Inflorescences subterminal on branches, capitate, 30–50-flowered; peduncle 0.5–2.3 cm, densely sericeous. Calyx white inside, ca. 14 mm, exterior densely white sericeous; lobes 4, broadly ovate, 2.5–3 × ca. 1 mm, apex acute. Anthers oblong, ca. 1.5 mm, base rounded. Disk lacerate. Ovary ellipsoid, ca. 3.5 mm, apex fascicled white sericeous; style puberulous, ca. 3 mm; stigma clavate, ca. 2 mm. Drupe ovoid, ca. 4 mm, apex sericeous.

- Forests, valleys; 1000–1200 m. SW Sichuan (Huili, Miyi).

7. THYMELAEA Miller, Gard. Dict. Abr., ed. 4, [1381]. 1754, nom. cons.

欧瑞香属 ou rui xiang shu

Wang Yinzheng (王印政); Lorin I. Nevling, Michael G. Gilbert

Ligia Fasano.

Herbs annual, subshrubs, or shrubs; upper parts much branched. Branchlets usually tuberculate. Leaves alternate, crowded when young; petiole short or absent; leaf blade herbaceous or leathery. Inflorescence terminal or axillary, 1-flowered or fasciculate, with or without involucre. Flowers bisexual or unisexual, 4-merous. Calyx tube persistent, rarely deciduous, yellow to yellow-green, cylindrical, funnel-shaped, or urceolate, contracted at apex of ovary; lobes 4. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series, included or upper slightly exerted from throat. Disk tiny or absent. Ovary 1-loculed; style terminal or excentric, short; stigma capitate or appressed globose, papillose. Fruit indehiscent, pericarp membranous.

Between 20 and 30 species: N Africa, C and SW Asia, C, E, and S Europe; naturalized in S Australia and North America; one species in China.

1. Thymelaea passerina (Linnaeus) Cosson & Germain, Syn. Fl. Env. Paris, ed. 2, 360. 1859.

欧瑞香 ou rui xiang

Stellera passerina Linnaeus, Sp. Pl. 1: 559. 1753; *Ligia passerina* (Linnaeus) Fasano; *Passerina annua* Wikström; *S. annua* Salisbury; *Thymelaea arvensis* Lamarck.

Herbs annual, erect, (10–)40–70 cm tall. Primary root rarely branched, yellow-brown. Stem usually single, erect, branched from above base, green, terete, slender, base slightly woody, glabrous or rarely puberulous. Leaves alternate; petiole very short to nearly absent; leaf blade green on both surfaces, linear-lanceolate or narrowly lanceolate, 0.5–2 × 0.1–0.25 cm, herbaceous, abaxially puberulous, margin not revolute, apex acuminate; midrib inconspicuous, lateral veins obscure. Inflorescence an axillary cluster of 1–5 flowers; bracts 2, leaflike,

green, lanceolate, 2–3 mm, margin proximally sparsely white ciliate, apex acuminate, pubescent. Pedicel short, pubescent. Calyx yellowish green; tube 2–3 mm, exterior whitish pubescent, long white ciliate at base; lobes 4, ovate, 0.5–1 mm, apex obtuse. Stamens 8, both whorls inserted above middle of calyx tube; filaments very short; anthers oblong, ca. 0.4 mm, included within calyx tube. Disk absent or reduced. Ovary ovoid, with short, thick hairs at apex; style terminal; stigma capitate, slightly papillate. Drupe green, ovoid, 2–3 mm, indehiscent; enclosed in persistent calyx; epicarp membranous. Fl. May–Aug, fr. Jul–Oct. $2n = 18$.

Near farm fields, livestock farms, saline hillsides, dry river beds; 400–1000 m. C and W Xinjiang [Afghanistan, Kashmir, W Pakistan, Russia (W Siberia), Turkmenistan, Uzbekistan; N Africa, SW Asia, C, E, and S Europe; naturalized in S Australia and North America].

Thymelaea passerina is considered a noxious weed in the NW United States.

8. DIARTHRON Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 204. 1832.

草瑞香属 cao rui xiang shu

Wang Yinzheng (王印政); Michael G. Gilbert

Stelleropsis Pobedimova.

Annual or perennial herbs, or small deciduous shrubs. Leaves alternate; leaf blade elliptic, linear, or lanceolate, herbaceous. Inflorescence usually terminal, sometimes apparently axillary, laxly racemose to capitate, without involucre. Flowers bisexual, small, 4(or 5)-merous. Calyx reddish, white, or green; tube persistent, slender, urceolate, funnel-shaped, or cylindrical, contracted and articulate at apex of ovary; lobes 4, erect and slightly spreading. Petaloid appendages absent. Stamens as many as or twice as many as calyx lobes, in one or two series, opposite to calyx lobes when in one series; filaments absent; anthers oblong, included. Disk annular, oblique, sometimes tiny or absent. Ovary ± stipitate, glabrous, 1-loculed; style excentric or subterminal, short; stigma subclavate, thick. Fruit dry, enclosed by persistent calyx base; pericarp thin, glossy black.

Sixteen species: C and SW Asia, SE Europe (European Russia); four species in China.

The authors have accepted the view of Kit Tan (Notes Roy. Bot. Gard. Edinburgh 40: 219–220. 1982) that the difference in habit used to separate the annual herbs of *Diarthron* sensu stricto from the perennial herbs traditionally placed in *Stelleropsis* and the small shrubs in the C Asian genus *Dendrostellera* (C. A. Meyer) Tieghem are outweighed by the similar 4-merous flowers and ebracteate inflorescences combined with the continuous range of variation in habit.

- 1a. Calyx tube 2–4 mm; annual herbs, mainly branched well above base, roots not thickened; hypogynous disk very reduced or absent; inflorescence terminal, lax, elongated, spikelike.
 - 2a. Calyx green or light green, lower part of tube not ribbed, lobes obovate-elliptic; stamens 4 or 5 in 1 series 1. *D. linifolium*
 - 2b. Calyx white, lower part of tube ribbed, lobes linear; stamens 8 in 2 series 2. *D. vesiculosum*
- 1b. Calyx tube 8–12 mm; small shrub or perennial herb, if herbaceous or suffrutescent then with stems rarely branched above base and roots often thickened; hypogynous disk present, annular; inflorescence a compact raceme, spike, or head, sometimes grouped into panicles, sometimes apparently axillary.
 - 3a. Inflorescence elongated; leaf blade 5–10 mm wide; calyx tube 8–10 mm 3. *D. altaicum*
 - 3b. Inflorescence capitate; leaf blade 3–5 mm wide; calyx tube 10–12 mm 4. *D. tianschanicum*

1. *Diarthron linifolium* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 204. 1832.

草瑞香 cao rui xiang

Thesium chanetii H. Léveillé; *T. glabrum* Schindler.

Herbs annual, erect, 10–40 cm tall. Stem usually single, branched from above base, erect, lower part pale purple, otherwise pale green, terete, slender, glabrous. Leaves alternate, rarely opposite; petiole absent or to 0.6 mm; leaf blade paler abaxially, linear to narrowly lanceolate, 0.7–1.5 × 0.1–0.3 cm, herbaceous, both surfaces glabrous, base cuneate, margin slightly revolute, sometimes sparsely white ciliate, apex obtuse-rounded; midrib conspicuous abaxially, slender, obscure adaxially; lateral veins obscure. Inflorescences terminal, racemose. Pedicel ca. 1 mm, swollen at apex. Calyx green; tube cylindrical, 2.2–3 mm, slender, exterior glabrous or sparsely sericeous; lobes 4, erect or slightly spreading, ovate-elliptic, ca. 0.8 mm, apex acuminate. Stamens 4(or 5), inserted above middle of calyx tube; filament short, ca. 0.5 mm; anthers broadly ovate, very small, included within calyx tube. Disk obscure. Ovary ellipsoid, ca. 0.8 mm, glabrous, stipitate; style filiform, 0.8–1 mm; stigma clavate, slightly swollen. Drupe black, ovoid or conic, ca. 2 × 1.1 mm, enclosed in persistent calyx; pericarp membranous, glabrous. Fl. May–Jul, fr. Jun–Aug. $2n = 18$.

Sandy places; 500–1400 m. Gansu, Hebei, Jiangsu (Tongshan), Jilin, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia].

2. *Diarthron vesiculosum* (Fischer & C. A. Meyer) C. A. Meyer, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 1: 359. 1843.

囊管草瑞香 nang guan cao rui xiang

Passerina vesiculosa Fischer & C. A. Meyer, Bull. Soc. Imp. Naturalistes Moscou 12: 170. 1839; *Diarthron carinatum* Jaubert.

Herbs annual, erect, ca. 50 cm tall. Stem usually single, densely branched from above base, erect, lower part purplish red, otherwise pale green, terete, slender, glabrous or sparsely puberulous when young. Leaves alternate; petiole very short or absent; leaf blade linear to linear-lanceolate, 0.7–1.2 × 0.2–0.3 cm, herbaceous, both surfaces glabrous, base broadly cuneate, margin not revolute, apex obtuse-rounded; midrib obscure on both surfaces or slightly visible abaxially; lateral veins obscure.

Inflorescences terminal, racemose or spicate, ca. 3.5 cm, usually slightly white pubescent or glabrous. Pedicel very short, 0.5–1 mm, articulate at apex. Calyx white; tube cylindrical, 3–3.5 mm, slender, lower part conspicuously ribbed; lobes 4, slightly spreading, oblong-linear, ca. 0.4 mm, apex obtuse. Stamens 8, both whorls inserted above middle of calyx tube; anthers sub-ellipsoid, ca. 0.2 mm; included within calyx tube. Ovary ellipsoid, stipitate; style filiform, long. Drupe light red, ovoid or conic, ca. 2 mm, glabrous, enclosed in persistent calyx. Fl. and fr. Jun–Aug. $2n = 18$.

Sandy places; 600–900 m. Xinjiang (Gongliu, Tacheng, Xinyuan) [Afghanistan, NW India, Kazakhstan, Pakistan, Russia (including European part); SW Asia].

3. *Diarthron altaicum* (M.-A. Thiébaud ex Persoon) Kit Tan, Notes Roy. Bot. Gard. Edinburgh 40: 219. 1982.

阿尔泰假狼毒 a er tai jia lang du

Stellera altaica M.-A. Thiébaud ex Persoon, Syn. Pl. 1: 436. 1805; *Passerina racemosa* Wikström; *Stelleropsis altaica* (M.-A. Thiébaud ex Persoon) Pobedimova; *Wikstroemia altaica* (M.-A. Thiébaud ex Persoon) Domke.

Herbs perennial, 20–50 cm tall. Rhizome woody, brown. Stems many, clustered, erect, unbranched, base slightly woody, with many leaf scars. Leaves alternate, closely spaced; petiole 1–1.5 mm; leaf blade elliptic, 2–2.5 × 0.5–1 cm, herbaceous, both surfaces glabrous, base cuneate, rarely obtuse-rounded, margin slightly revolute, apex obtuse or acute; midrib conspicuous; lateral veins 3–5 pairs, proximal pair usually longer, sometimes visible on both surfaces. Inflorescences terminal, spicate, at first short but later elongated, 3–7 cm. Flower fragrant. Calyx reddish; tube cylindrical, 8–10 mm, slender, exterior glabrous; lobes 4, broadly lanceolate, 5–6 × 2.5–3 mm, apex acuminate. Stamens 8, the 2 whorls inserted 1–1.5 mm apart, upper whorl in throat; filaments short; anthers oblong, (0.8–)1.5 mm, base and apex retuse; upper ones slightly exerted from calyx tube. Disk oblique, entire, enclosing stipe of ovary. Ovary ellipsoid, stipitate, pubescent distally; style ca. 1 mm; stigma globose. Drupe dark green, obconic, glabrous, enclosed in persistent calyx. Fl. May–Jun, fr. Jul–Aug.

Sunny and dry slopes, sandy places. Xinjiang [Russia (Siberia); C Asia].

4. *Diarthron tianschanicum* (Pobedimova) Kit Tan, Notes Roy. Bot. Gard. Edinburgh 40: 220. 1982.

天山假狼毒 tian shan jia lang du

Stelleropsis tianschanica Pobedimova, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. nauk S.S.S.R. 12: 153. 1950.

Herbs perennial, 15–30 cm tall. Rhizome woody, yellowish brown or light brown. Stems 10–20, erect, unbranched, herbaceous or slightly woody near base, glabrous; leaf scars green, small. Leaves alternate; petiole ca. 1 mm; leaf blade oblong-elliptic to narrowly elliptic, 1.4–2 × 0.3–0.5 cm, herbaceous, both surfaces glabrous, base broadly cuneate, margin slightly revolute or not, sparsely white ciliate, apex acute or slightly acuminate; midrib conspicuous, flattened on both surfaces or raised abaxially; lateral veins 3–5 pairs, second proximal pair

usually longer, ± visible on both surfaces. Inflorescences terminal, capitate or shortly racemose, to 1 cm, 15–20-flowered. Pedicel short, 1–2 mm, articulate at apex, glabrous. Calyx reddish; tube funnel-shaped-cylindric, 9–12 mm, articulate, contracted above ovary after anthesis, exterior glabrous; lobes 4, narrowly ovate or ovate-lanceolate, 5–7 × 1.5–2.2 mm, apex obtuse. Stamens 8, upper whorl on and slightly below throat; filaments short; anthers oblong, ca. 1 mm, base and apex retuse. Disk annular, oblique, enclosing base of ovary, margin usually toothed. Ovary ellipsoid, ca. 1.3 mm, brown pilose above middle or at apex, stipitate; style filiform, short; stigma globose. Drupe green, ellipsoid, enclosed in persistent calyx. Fl. Jun, fr. Aug.

Sunny and dry slopes, sandy places; 1700–2000 m. Xinjiang (Zhaosu) [C Asia].

9. STELLERA Linnaeus, Sp. Pl. 1: 559. 1753.

狼毒属 lang du shu

Wang Yinzheng (王印政); Michael G. Gilbert

Chamaejasme Kuntze.

Perennial herbs or shrubs, caespitose. Stems usually unbranched. Leaves alternate, rarely opposite; leaf blade lanceolate, entire. Inflorescence terminal, capitate or spicate, with involucre; peduncle absent. Flowers bisexual, 4(–6)-merous. Calyx tube persistent, white, yellow, or light red, cylindric or funnel-shaped, contracted at apex of ovary; lobes 4(–6), spreading, subequal. Petaloid appendages absent. Stamens twice as many as calyx lobes, in two series, included. Disk at one side, acerose- or linear-scale, membranous, entire or 2-lobed. Ovary almost sessile, 1-loculed; style short; stigma capitate, ellipsoid, hirsute-papillose. Fruit dry, enclosed by persistent calyx; pericarp membranous.

Between ten and twelve species: C and E Asia; one species in China.

1. *Stellera chamaejasme* Linnaeus, Sp. Pl. 1: 559. 1753.

狼毒 lang du

Chamaejasme stelleriana Kuntze; *Stellera bodinieri* H. Léveillé; *S. chamaejasme* f. *angustifolia* Diels; *S. chamaejasme* f. *chrysantha* Linnaeus; *Wikstroemia chamaejasme* (Linnaeus) Domke.

Herbs perennial, 20–50 cm tall. Rhizome woody, terete, stout, branched or not. Stems many, clustered, erect, unbranched, base woody, sometimes brown scaly, upper part herbaceous, green or sometimes purple, glabrous. Leaves alternate, rarely opposite or ± whorled; petiole short, ca. 1.1 mm, articulate at base; leaf blade pale or grayish green abaxially, lanceolate or oblong-lanceolate, rarely oblong, 1.2–2.8 × 0.3–1 cm, thinly papery, both surfaces glabrous, base rounded to cuneate, margin slightly revolute or not, apex acuminate or acute, rarely obtuse; lateral veins 4–6 pairs, visible on both surfaces. Inflorescences terminal, capitate, globose, many flowered, with involucre of

green leaflike bracts. Flowers fragrant; pedicel absent. Calyx white, yellow, or reddish purple; tube cylindric, 9–11 mm, slender, conspicuously ribbed, slightly swollen at base, exterior glabrous; lobes 5, ovate-oblong, 2–4 × ca. 2 mm, apex rounded or rarely truncate, usually with red, reticulate veins. Stamens 10, lower whorl inserted above middle of calyx tube, upper whorl in throat; filaments very short; anthers yellow, linear-ellipsoid, ca. 1.5 mm; upper ones slightly exerted from calyx tube. Disk developed on one side, linear, ca. 1.8 × 0.2 mm, apex slightly 2-lobed. Ovary ellipsoid, ca. 2 × 1.2 mm, sessile, yellow silky-pubescent distally; style short; stigma capitate, apex sparsely yellow pubescent. Drupe conic, ca. 5 × 2 mm, grayish white pubescent at apex or upper part, enclosed in persistent calyx. Fl. Apr–May, fr. Jul–Sep. $2n = 18^*$.

Sunny and dry slopes, sandy places; 2600–4200 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, Mongolia, Nepal, Russia].