

LINNAEACEAE

北极花科 bei ji hua ke

Yang Qiner (杨亲二)¹; Sven Landrein²

Shrubs, erect or creeping. Leaves opposite, sometimes whorled, simple, estipulate, with an interpetiolar line. Inflorescence terminal or axillary; flowers in 3-flowered cymes, paired or single; bracts leaflike or reduced and located at base of ovary and forming an “epicalyx.” Flowers bisexual, ± zygomorphic. Perianth 4- or 5-merous. Corolla imbricate in bud; nectary consisting of ± compact glandular hairs, inside corolla tube (nectaria trichomalia). Stamens 4, alternating with corolla lobes; filaments adnate from 1/3–1/2 with corolla tube. Ovary inferior, 3- or 4-loculed, placentation axile; 1 or 2 locules with a single fertile ovule and 2 locules with numerous sterile ovules; style long, stigmas capitate. Fruit an achene crowned with persistent sepals (deciduous in *Linnaea*). Seeds 1 or 2; embryo small, straight; endosperm copious.

Seven genera and 19 species (including one cultivated hybrid): Afghanistan, China, India, Japan, Korea, Kyrgyzstan, Nepal, Pakistan, Russia, Uzbekistan, and in Europe and North America; six genera (two endemic) and 15 species (eight endemic, one cultivated hybrid) in China.

Hu Jia-qi. 1988. Caprifoliaceae (Linnaeae, excluding *Heptacodium* and *Symphoricarpos*). In: Hsu Ping-sheng, ed., Fl. Reipubl. Popularis Sin. 72: 112–131.

- 1a. Petioles of opposite leaf pairs dilated and connate at base, enclosing axillary buds; corolla hypocrateriform, with a cylindrical tube and 4 or 5 spreading lobes; flowers in 3-flowered cymes or paired; stigmas green and mucilaginous ... 1. *Zabelia*
- 1b. Petioles of opposite leaf pairs not dilated, axillary buds exposed; corolla funnelform or bilabiate with 5 spreading lobes; flowers paired or single; stigmas white and not mucilaginous.
- 2a. Two bracts accrescent and becoming winglike in fruit; ovary 4-locular with 2 fertile locules 5. *Dipelta*
- 2b. Bracts not winglike in fruit; ovary 3- or 4-locular with 1 or 2 fertile locules.
 - 3a. Evergreen, creeping subshrubs; two bracts shieldlike and covered with sticky glandular hairs; inflorescence reduced to 2 single flowers at apices of branchlets (those can look like paired flowers but have more bracts and internodes separating them) 6. *Linnaea*
 - 3b. Erect shrubs; bracts and inflorescence not as above.
 - 4a. Bracts and bracteoles covered with bristles, accrescent and becoming spongy, woody and fused to ovaries in fruit 4. *Kolkwitzia*
 - 4b. Bracts and bracteoles without bristles, small and non-accrescent in fruit.
 - 5a. Flowers terminal and paired (flowers opening simultaneously), sometimes 1–3(–8) due to supernumerary flowers axillary to bracteoles (more often so on repeat-bloom long shoots), spring flowering 3. *Diabelia*
 - 5b. Flowers axillary, paniculate, single or paired (flowers opening consecutively), summer or autumn flowering 2. *Abelia*

1. ZABELIA (Rehder) Makino, Makinoa 9: 175. 1948.

六道木属 liu dao mu shu

Abelia sect. *Zabelia* Rehder in Sargent, Pl. Wilson. 1: 124. 1911.

Shrubs, deciduous. Old branches often with 6 deep longitudinal grooves. Young branches often with retrorse stiff hairs. Leaves opposite, margin entire or dentate (or sometimes lobed on vigorous shoots), shortly petiolate, estipulate. Petioles of opposite leaf pairs dilated and connate at base, enclosing winter buds. Inflorescence a terminal congested thyrs of sessile cymes; cymes 1–3-flowered. Calyx of 4 or 5 sepals, persistent, spreading, narrowly oblong to elliptic. Corolla white, pale rose, or sometimes reddish, hypocrateriform and ± zygomorphic, 4- or 5-lobed; corolla tube usually without distinct swelling at base, glandular inside. Stamens included, didynamous, inserted at base or middle of corolla tube; anthers yellow, introrse. Ovary usually 3-locular, 2 locules with 2 series of sterile ovules and 1 locule with a single fertile ovule; style filiform; stigmas green, capitate, mucilaginous. Fruit a leathery achene, oblong, crowned with persistent calyx lobes; seed subterete, testa membranous; endosperm fleshy.

Six species: Afghanistan, China, NW India, Japan, Korea, Kyrgyzstan, Nepal, Russia (Far East); three species (one endemic) in China.

This group was first published by Rehder (in Sargent, Pl. Wilson. 1: 118. 1911) as *Abelia* sect. *Zabelia*. It was described in honor of Zabel who was the first to delimit the genus *Abelia* into sections (Mitt. Deutsch. Dendrol. Ges. 2: 33. 1893). The phylogeny of this group was further studied by Makino and supported by the studies of Ikuse and Kurosawa (Notes on Sect. *Zabelia* Rehder of the genus *Abelia*, J. Jap. Bot. 29(4): 11. 1954), and later by Fukuoka (Phylogeny of the Tribe Linnaeae, Acta Phytotax. Geobot. 23: 82. 1968). The genus *Zabelia* was segregated from *Abelia* based on pollen, wood anatomy, inflorescence structure, and karyology (Makino, Makinoa 9: 175. 1948; cf. Hisauchi & Hara, J. Jap. Bot. 29: 143. 1954).

¹ Herbarium, South China Botanical Garden, Chinese Academy of Sciences, 723 Xingke Lu, Tianhe Qu, Guangzhou, Guangdong 510650, People's Republic of China.

² Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AE, United Kingdom.

- 1a. Calyx and corolla lobes 5; inflorescence a congested terminal thyrsse of sessile cymes (cymes 1–3-flowered); bracts and bracteoles leaflike; sepals long ciliate in fruit 1. *Z. triflora*
- 1b. Calyx and corolla lobes 4; inflorescence terminal of paired flowers (occasionally more due to supernumerary flowers axillary to bracteoles); bracts and bracteoles reduced; sepals not long ciliate in fruit (occasionally sparsely ciliate) 2–3. *Z. biflora* species complex

1. *Zabelia triflora* (R. Brown ex Wallich) Makino, Makinoa 9: 175. 1948.

醉鱼草状六道木 zui yu cao zhuang liu dao mu

Abelia triflora R. Brown ex Wallich, Pl. Asiat. Rar. 1: 14. 1829; *A. angustifolia* Bureau ex Franchet; *A. buddleiooides* W. W. Smith; *A. buddleiooides* var. *divergens* W. W. Smith; *A. buddleiooides* var. *intercedens* Handel-Mazzetti; *A. buddleiooides* var. *steanantha* Handel-Mazzetti; *Zabelia buddleiooides* (W. W. Smith) Hisauchi & H. Hara; *Z. buddleiooides* var. *divergens* (W. W. Smith) Golubkova; *Z. buddleiooides* var. *steanantha* (Handel-Mazzetti) Hisauchi & H. Hara; *Z. steanantha* (Handel-Mazzetti) Golubkova.

Shrubs, deciduous, 1–2 m tall. Young branches with retrorse stiff hairs, becoming glabrous. Petiole very short, to 2 mm, hispid. Leaf blade ovate to lanceolate, 15–70 × 5–20 mm, both surfaces glabrous but long hispid on margin and veins abaxially, base cuneate, margin entire to occasionally serrate or lobed, apex acute. Inflorescence a congested terminal thyrsse of cymes (cymes 1–3-flowered); pedicels short or nearly absent. Bracts leaflike, lanceolate to obovate; bracteoles linear to subulate, ca. 4 mm, hispid. Calyx of 5 linear sepals, 4–10 × ca. 1 mm, ciliate with stiff hairs. Corolla white, sometimes tinged red, hypocrateriform, 10–20 mm, nearly twice as long as sepals; lobes 5, spreading, suborbicular; tube densely villous inside, with sparsely adpressed hairs outside. Stamens 4, didynamous, included; filaments short, hispid; anthers oblong. Ovary narrowly ovoid, hirsute; styles filiform, exceeding stamens; stigmas capitate. Achene terete, striate, crowned with 5 slightly enlarged and long ciliate persistent sepals. Fl. May, fr. Jun–Aug.

Forests, scrub, grasslands; 1800–3500 m. SW Sichuan, SE Xizang, NW Yunnan [Afghanistan, NW India, Nepal, Pakistan].

The Chinese specimens were previously named as *Abelia buddleiooides* by W. W. Smith (Notes Roy. Bot. Gard. Edinburgh 9: 75. 1915–1916). The type specimen *Forrest 12636* from Yunnan is similar to the type of *A. triflora* var. *parvifolia* (Clarke) Hisauchi & H. Hara from Pakistan. Nevertheless, the group shows much variation in the size and shape of the leaves and sepals.

2–3. *Zabelia biflora* species complex

Shrubs deciduous, 2–3 m tall. Petiole 4–7 mm, sparsely hispid. Leaf blade narrowly ovate or obovate to lanceolate, 30–80 × 5–30 mm, abaxially glabrous but with stiff hairs on veins, adaxially sparsely pubescent when young, base cuneate to obtuse, margin entire or with 1–6 pairs of teeth, apex acute to long acuminate. Inflorescence terminal, of paired flowers (occasionally more due to supernumerary flowers axillary to bracteoles); flowers sessile but long pedunculate, peduncles often appearing ± fused; peduncles 0–12 mm; flowers with 3 bracts at base of each ovary; bracts 1–6 mm. Sepals 4, ovate-lanceolate or obovate. Corolla white sometimes tinged red abaxially, 4-lobed; lobes orbicular, 1/3 or 1/5 as long as tube; tube pubescent inside. Stamens 4, didynamous, included. Ovary to 8

mm, with sparse, stiff hairs; styles long, equaling corolla, slender; stigmas capitate, not exserted from corolla tube. Achene 1–1.5 cm, crowned with 4 persistent and slightly enlarged sepals. Fl. Apr–Jun, fr. Aug–Sep.

Scrub, forests, grasslands; 800–3700 m. Anhui, Fujian, SE Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangxi, Liaoning, Nei Mongol, S Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Japan, Korea, Russia (Far East)].

The *Zabelia biflora* species complex was revised by Nakai (J. Jap. Bot. 13(8): 1–12. 1937) who distinguished 11 species. We currently recognize two species in China.

Most of the differences between taxa were based on the length of the peduncles, bracts, and bracteoles, which are highly variable. Classification of *Zabelia biflora* is complex and needs to be investigated.

- 1a. Distributed in NE China (Anhui, Hebei, Henan, Liaoning, Nei Mongol, Shanxi) 2. *Z. biflora*
 1b. Distributed in SW China (Anhui, Fujian, SE Gansu, Guizhou, Henan, Hubei, Jiangxi, S Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang) 3. *Z. dielsii*

2. *Zabelia biflora* (Turczaninow) Makino, Makinoa 9: 175. 1948.

六道木 liu dao mu

Abelia biflora Turczaninow, Byull. Moskovsk. Obschch. Isp. Prir., Otd. Biol. 10: 152. 1837; *A. adenotricha* Hance; *A. biflora* var. *coreana* (Nakai) C. F. Fang; *A. biflora* f. *minor* (Nakai) C. F. Fang; *A. biflora* var. *minor* Nakai; *A. coreana* Nakai.

For description see under species complex. Fl. Apr–Jun, fr. Aug–Sep.

Scrub, forests; 1000–2000 m. Anhui, Hebei, Henan, Liaoning, Nei Mongol, Shanxi [Korea, Russia (Far East)].

3. *Zabelia dielsii* (Graebner) Makino, Makinoa 9: 175. 1948.

南方六道木 nan fang liu dao mu

Linnaea dielsii Graebner, Bot. Jahrb. Syst. 29: 140. 1900; *Abelia anhweiensis* Nakai; *A. brachystemon* (Diels) Rehder; *A. davidii* Hance; *A. dielsii* (Graebner) Rehder; *A. hersii* Nakai; *A. onkocarpa* (Graebner) Rehder; *A. umbellata* (Graebner & Buchwald) Rehder; *A. zanderi* (Graebner) Rehder; *L. brachystemon* Diels; *L. onkocarpa* Graebner; *L. umbellata* Graebner & Buchwald; *L. zanderi* Graebner; *Zabelia brachystemon* (Diels) Golubkova.

For description see under species complex. Fl. Apr–Jun, fr. Aug–Sep.

- Scrub, forests, grasslands; 800–3700 m. Anhui, Fujian, SE Gansu, Guizhou, Henan, Hubei, Jiangxi, S Ningxia, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang.

2. ABELIA R. Brown in Abel, Narr. J. China, App. B, 376. 1818.

糯米条属 nuo mi tiao shu

Shrubs, deciduous or semi-evergreen. Winter buds exposed, ovoid-orbicular, small, with several pairs of scales. Leaves opposite, rarely 3- or 4-whorled, shortly petiolate with an interpetiolar line, estipulate. Leaf margin entire to dentate or crenate-serrate. Flowers axillary, paniculate, single or paired (flowers opening consecutively); paired flowers with 6 bracts (*Abelia chinensis*), single flowers with 4 bracts (*A. uniflora* and *A. forrestii*) at base of ovaries; bracts small and not accrescent. Sepals 2-5, spreading, narrowly oblong, elliptic, persistent. Corolla 5-lobed, funnelform or bilabiate, white, yellow, pink, or red. Corolla tube gibbous ventrally at base containing a nectary of dense glandular hairs (nectaria trichomalia). Stamens didynamous, adnate to corolla tube, included or exserted; anthers introrse. Ovary narrowly oblong, 3-locular, 2 locules with 2 series of sterile ovules, 1 locule with a single fertile ovule; style filiform; stigmas capitate, white and papillose. Fruit an oblong, leathery achene, crowned with persistent sepals. Seed subterete, testa membranous; endosperm fleshy.

Five species (including one cultivated hybrid): China, Japan; five species (three endemic, one cultivated hybrid) in China.

- 1a. Flowers paired, opening consecutively; paired ovaries with 6 bracts at base; sepals 5; corolla funnelform, 10-12 mm; stamens and style conspicuously exserted from corolla tube 1. *A. chinensis*
- 1b. Flowers solitary; ovary with 4 bracts at base; sepals 2-5; corolla bilabiate (funnelform to slightly bilabiate in *A. ×grandiflora*), 20-50 mm; stamens and style not conspicuously exserted from corolla tube.
 - 2a. Corolla ca. 20 mm; plants cultivated 5. *A. ×grandiflora*
 - 2b. Corolla 25-50 mm; plants wild.
 - 3a. Sepals usually 2; corolla lower lip with reticulate orange markings 3-4. *A. uniflora* species complex
 - 3b. Sepals usually 5; corolla lower lip without any markings 2. *A. forrestii*

1. Abelia chinensis R. Brown in Abel, Narr. J. China, App. B, 376. 1818.

糯米条 nuo mi tiao

Abelia aschersoniana (Graebner) Rehder; *A. cavaleriei* H. Léveillé; *A. chinensis* var. *ionandra* (Hayata) Masamune; *A. hanceana* M. Martens ex Hance; *A. ionandra* Hayata; *A. lipoensis* M. T. An & G. Q. Gou; *A. rupestris* Lindley; *Linnaea aschersoniana* Graebner; *L. chinensis* (R. Brown) A. Braun & Vatke; *L. rupestris* (Lindley) A. Braun & Vatke.

Shrubs, deciduous to semi-evergreen, to 2 m tall, highly branched. Young branches slender and pubescent. Leaves opposite, sometimes in whorls of 3; leaf blade ovate, 2-5 × 1-3.5 cm, abaxially sparsely pubescent, densely white villous at base of midvein and lateral veins, base rounded or cordate, margin remotely crenate-serrate, apex acute to long acuminate. Inflorescence a large terminal panicle of paired flowers (flowers opening consecutively). Flowers fragrant, with 6 oblong or lanceolate bracts at base of paired ovaries. Calyx of 5 sepals, elliptic, 5-6 mm, turning red at fruiting stage. Corolla 5-lobed, white to pink, funnelform, 10-12 mm, ca. 2 × as long as sepals, outside pubescent and gibbous at base of tube. Stamens and style long exserted; filaments slender, equal in length, inserted at base of corolla tube. Ovary cylindric, slightly compressed, pubescent, longitudinally striate; stigmas capitate. Achene crowned with persistent and slightly enlarged sepals. Fl. Aug-Sep, fr. Oct-Nov. 2n = 32.

Mountains; 200-1500 m. Fujian, Guangdong, Guangxi, Guizhou, ?Henan, Hubei, Hunan, ?Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan].

This species is commonly cultivated in China.

2. Abelia forrestii (Diels) W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 76. 1916.

细瘦糯米条 xi shou nuo mi tiao

Linnaea forrestii Diels, Notes Roy. Bot. Gard. Edinburgh 5: 178. 1912; *Abelia gracilenta* W. W. Smith; *A. gracilenta* var. *microphylla* W. W. Smith; *A. microphylla* (W. W. Smith) Golubkova.

Shrubs, deciduous, to 2 m tall. Branches densely pubescent. Leaf blade narrowly elliptic to lanceolate, 3-7 × 1-2 cm, base obtuse, margin entire, apex acute. Flowers single and axillary, sometimes slightly paniculate; peduncles 3-4 mm; ovary with 4 linear bracts at base. Calyx reddish in fruit; sepals 5, oblanceolate, 6-8 × 1-2 mm, 3-veined, sparsely pubescent. Corolla white to rose, bilabiate, outside pubescent or glandular hairy, inside sparsely villous; tube to 45 mm, expanded in upper part, gibbous at base; lobes 5, orbicular, 4-5 mm; lip without any markings. Stamens 4; filaments ca. as long as corolla; anthers elliptic, to 2 mm. Style sparsely pubescent; stigmas capitate, slightly exserted. Achene to 7 mm, crowned with 5 persistent and enlarged sepals. Fl. May-Sep, fr. Oct.

• Sunny places on mountain slopes, scrub; 1900-3300 m. SW Sichuan, NW Yunnan.

This is a rare species.

3-4. Abelia uniflora species complex

Shrubs deciduous, to 4 m tall. Branches pubescent, occasionally glabrous. Leaves highly variable in shape and size, ovate, orbicular, or lanceolate, 1-8 × 0.5-3.5 cm, abaxially densely white pubescent at base of midvein and lateral veins, adaxially sparsely pubescent, base cuneate, margin subentire or remotely serrate, apex obtuse to acuminate. Flowers single and axillary, sometimes slightly paniculate. Calyx of 2 oblong to elliptic sepals, 10-15 mm, ca. 1/3 as long as corolla tube. Corolla white to purplish pink, bilabiate, 25-50 mm, gibbous at base of tube, 5-lobed, outside pubescent, inside villous on lip; upper lip 2-lobed; lower lip 3-lobed, bearded and with reticu-

late orange markings. Stamens 4, didynamous; filaments partially adnate to corolla tube. Ovary pubescent, with 4 ovate to lanceolate bracts at base; style ca. as long as corolla tube; stigmas capitate. Achene 6–15 mm, pubescent, crowned with 2 persistent and slightly enlarged sepals. Fl. Apr–Jun, fr. Aug–Oct.

- Thickets, forests; 200–2000 m. Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

This species shows variation in leaf and sepal shape, ovary length, and corolla size. In the past, many species have been recognized as separate. A specimen collected in Guizhou (*Simmons et al.* 288) has been identified to show introgression from *Abelia chinensis*. This phenomenon, as well as possible polyploidy, renders the infraspecific classification of *A. uniflora* very unreliable.

- Leaves shortly acuminate; sepals with rounded apex 3. *A. uniflora*
- Leaves long acuminate with asymmetrical apex; sepals with acute apex 4. *A. macrotera*

3. *Abelia uniflora* R. Brown in Wallich, Pl. Asiat. Rar. 1. 15. 1830.

蕩梗花 tong geng hua

Abelia engleriana (Graebner) Rehder; *A. longituba* Rehder; *A. mairei* H. Léveillé; *A. myrtilloides* Rehder; *A. parvifolia* Hemsley; *A. schischkinii* Golubkova; *A. schumannii* (Graebner) Rehder; *A. tereticalyx* (Graebner & Buchwald) Rehder; *A. verticillata* H. Léveillé; *Linnaea engleriana* Graebner; *L. koehneana* Graebner; *L. parvifolia* (Hemsley) Graebner; *L. schumannii* Graebner; *L. tereticalyx* Graebner & Buchwald; *Strobilanthes hypericifolia* H. Léveillé.

For description see under species complex. Distinguishing characters for this species are as follows: Leaves shortly acuminate. Sepals with rounded apex. Fl. Apr–Jun, fr. Aug–Oct.

- Thickets, forests; 200–2000 m. Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

The holotype of *Abelia uniflora* is held in Cambridge University Herbarium (CGE) and the name was validly published by R. Brown within the description of *Zabelia triflora*.

4. *Abelia macrotera* (Graebner & Buchwald) Rehder in Sargent, Pl. Wilson. 1: 126. 1911.

二翅糯米条 er chi nuo mi tiao

Linnaea macrotera Graebner & Buchwald, Bot. Jahrb. Syst. 29: 131. 1900; *Abelia deutziifolia* (H. Léveillé) H. Léveillé; *A. graebneriana* Rehder; *A. graebneriana* var. *deutziifolia* (H. Léveillé) Lauener; *Strobilanthes deutziifolia* H. Léveillé.

For description see under species complex. Distinguishing characters for this species are as follows: Leaves long acuminate with asymmetrical apex. Sepals with acute apex. Fl. Apr–Jun, fr. Aug–Oct.

- Thickets, forests; 200–2000 m. Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan.

5. *Abelia ×grandiflora* (Rovelli ex André) Rehder, Cycl. Amer. Hort. 1: 1. 1900.

大花糯米条 da hua nuo mi tiao

Abelia rupestris Lindley f. *grandiflora* Rovelli ex André, Rev. Hort. 58: 488. 1886.

Shrubs, semi-evergreen, 1–1.5 m tall. Branches pubescent. Leaves sometimes whorled on vigorous shoots (3- or 4-whorled). Leaves adaxially glossy green, sometimes coppery tinged, ovate, to 4.5 cm, glabrous or with tuft of hairs on veins abaxially, base cuneate, margin remotely serrate with unequal teeth, apex acute. Flowers single and axillary, paniculate; peduncle 2–4 mm; flower with 4 bracts at base of ovary. Calyx with sepals varying from 2–5, reddish, often partly united, lanceolate, apex acute. Corolla white, sometimes tinged with pink, funnelform to slightly bilabiate, gibbous at base, ca. 20 mm, slightly fragrant, hirsute bearded with long hairs on lower lip. Stamens nearly as long as corolla tube; filaments partially adnate to corolla, generally inserted but sometimes slightly protruding, glabrous. Ovary 2–8 mm, slender, minutely pilose; style slightly exserted, 17–18 mm, glabrous; stigmas capitate. Achene 8–10 mm, slender, sparsely pilose or glabrous, with persistent sepals at apex. Fl. Jun–Oct, fr. Sep–Nov.

Cultivated in China [cultivated in Africa, the Americas, and Europe].

Abelia ×grandiflora is a cultivated hybrid between *A. uniflora* and *A. chinensis*. It is commonly cultivated in the Americas, Africa, and Europe but less so in China.

3. DIABELIA Landrein, Phytotaxa 3: 35. 2010.

双六道木属 shuang liu dao mu shu

Linnaea [unranked] *Serratae* Graebner, Bot. Jahrb. Syst. 29: 127. 1900.

Shrubs, deciduous. Winter buds exposed, with several pairs of scales. Branches without grooves. Leaves opposite, shortly petiolate with an interpetiolar line, estipulate. Leaf margin entire to serrate, often undulate. Flowers terminal and paired at ends of short shoots (flowers opening simultaneously); flowers sometimes 1–3(–8) due to supernumerary flowers axillary to bracteoles (more often so on repeat-bloom long shoots); paired flowers with 6 bracts at base of ovaries, bracts small and not accrescent. Sepals 2–5, spreading, narrowly oblong, elliptic, persistent and ± accrescent in fruit. Corolla 5-lobed, bilabiate, white, yellow, pink, or red. Corolla tube gibbous ventrally at base and containing a nectary of dense glandular hairs sometimes clavate and free (nectaria trichomalia). Stamens didynamous, adnate to corolla tube, included or exserted; anthers introrse. Ovary narrowly oblong, 3-locular, 2 locules with 2 series of sterile ovules, 1 locule with a single fertile ovule; style filiform; stigmas capitate, white and papillose. Fruit an oblong, leathery achene, crowned with persistent sepals. Seed subterete, testa membranous; endosperm fleshy.

Three species: China, Japan; two species in China.

- 1a. Sepals usually 2; nectary not clavate and free at apex 1. *D. serrata*
 1b. Sepals usually 5; nectary clavate and free at apex 2. *D. spathulata*

1. Diabelia serrata (Siebold & Zuccarini) Landrein, Phytotaxa 3: 37. 2010.

黃花双六道木 huang hua shuang liu dao mu

Abelia serrata Siebold & Zuccarini, Fl. Jap. 1: 76. 1835.

Shrubs, deciduous, to 3 m tall. Branches pubescent. Leaf blade ovate, ca. 5×2.5 cm, both surfaces sparsely pubescent, more densely so on veins, base cuneate, margin entire or remotely serrate, ciliate, apex acute to acuminate. Flowers paired, terminal; ovaries with 6 bracts at base; peduncle 2–3 mm; bracts lanceolate, 2–3 mm. Calyx of usually 2 oblong sepals, ca. 10×6 mm, apex sometimes lobed. Corolla bilabiate, yellow or yellow-green, with orange markings on lower lip; tube ca. 18 mm, inside villous. Stamens 4, didynamous, partially adnate to corolla tube, slightly exserted. Ovary 8–10 mm, pubescent; style filiform, slightly exceeding stamens; stigmas capitate. Achene crowned with usually 2 slightly accrescent sepals. Fl. May, fr. Sep.

Forests; ca. 900 m. Zhejiang (Yongjia) [Japan].

4. KOLKWITZIA Graebner, Bot. Jahrb. Syst. 29: 593. 1901.

蝶实属 wei shi shu

Shrubs, deciduous. Winter buds with several pairs of pubescent scales. Leaves opposite, shortly petiolate with an interpetiolar line, estipulate. Flowers paniculate, single or paired (flowers opening consecutively) in same inflorescence; paired flowers with 6 bracts, single flowers with 4 bracts at base of ovaries; ovaries each crowned with a long narrow beak; bracts densely hairy, adnate to ovaries, accrescent and becoming spongy, woody, and covered with stiff bristles in fruit. Calyx of 5 narrow, sparsely pubescent sepals. Corolla bilabiate, 5-lobed; lobes spreading. Stamens 4, didynamous, partially adnate to corolla tube. Ovary 3- or 4-locular, 2 locules with 2 series of sterile ovules, 1 or 2 locules with a single fertile ovule. Achenes single or in pairs embedded in accrescent bristly bracts, each crowned with persistent sepals.

• One species: China.

1. Kolkwitzia amabilis Graebner, Bot. Jahrb. Syst. 29: 593. 1901.

蝶实 wei shi

Kolkwitzia amabilis var. *calicina* Pampanini; *K. amabilis* var. *tomentosa* Pampanini.

Shrubs, erect, to 3 m tall. Branchlets hirsute, becoming glabrous. Petiole 1–2 mm; leaf blade elliptic to ovate, $3–8 \times 1.5–2.5$ cm, both surfaces sparsely pubescent, densely spreading pubescent and ciliate on veins and margin, base rounded or broadly cuneate, margin entire, rarely shallowly dentate, apex acute to acuminate. Inflorescence paniculate; flowers single or paired (flowers opening consecutively) in same inflorescence;

peduncle 10–15 mm; bracts lanceolate, tightly adnate to base of ovary. Sepals 5, lanceolate, to 5 mm, pubescent. Corolla whitish, tinged pink, 15–25 mm, outside pubescent, base very narrow, abruptly enlarged above middle; lower lip 3-lobed, bearded, with orange reticulate markings; upper lip 2-lobed. Ovary bottle-shaped with a long neck; style pubescent; stigmas capitate, inserted. Achenes embedded in spongy, woody, and bristly bracts, apex elongated, crowned with persistent, non-accrecent sepals. Fl. May–Jun, fr. Aug–Sep. $2n = 32^*$.

• Mountain slopes, roadsides, scrub; 300–1300 m. Anhui, Gansu, ?Hebei, Henan, Hubei, Shaanxi, Shanxi.

This species is rare in the wild but widely cultivated.

5. DIPELTA Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 24: 50. 1877.

双盾木属 shuang dun mu shu

Shrubs, erect, deciduous. Winter buds with several pairs of scales. Leaves opposite, estipulate, shortly petiolate, slightly pubescent on veins and margin, margin entire or dentate at apex. Inflorescences of single flowers, paniculate; ovaries with 4 bracts at base; bracts unequal in size, larger 2 tightly adnate to ovary. Sepals 5, linear to lanceolate, ± fused at base. Corolla bilabiate, distinctly nar-

rowed and gibbous at base; upper lip 2-lobed; lower lip 3-lobed. Stamens 4, didynamous, partially adnate to corolla tube, included. Ovary 4-locular, 2 locules with 2 series of sterile ovules, 2 locules each with a single fertile ovule; style slightly shorter than corolla. Fruit an achene with 2 accrescent, membranous, winglike bracts at base, crowned with persistent calyx.

- Three species: China.

- 1a. Sepals fused into a tube for at least 2/3 of their length; style villous 3. *D. elegans*
- 1b. Sepals fused for less than 1/2 their length; style glabrous to sparsely hairy.
 - 2a. Narrow part of corolla tube exserted from sepals; accrescent bracts often peltate, obscuring sepals at anthesis, calyx divided to base 1. *D. floribunda*
 - 2b. Narrow part of corolla tube not exserted from sepals; accrescent bracts reniform, not obscuring sepals at anthesis, calyx divided 1/2–2/3 2. *D. yunnanensis*

1. Dipelta floribunda Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 24: 51. 1877.

双盾木 shuang dun mu

Dipelta floribunda var. *parviflora* Rehder.

Shrubs or small trees, to 6 m tall, deciduous. Branches glandular hairy, becoming glabrous. Petiole 6–14 mm; leaf blade ovate to lanceolate, 4–10 × 1.5–6 cm, midvein white pubescent, base cuneate or obtuse, margin entire, occasionally remotely 2- or 3-dentate at apex, apex acute or long acuminate. Peduncles to 10 mm; ovaries with 4 bracts tightly adnate to base; 2 outer bracts larger, peltate, obscuring sepals at anthesis, accrescent to 20 mm wide when mature, dry membranous, with conspicuous veins; 2 inner bracts smaller, unequal, one ovate, other smaller and narrowly elliptic. Calyx 5-lobed, glandular hairy; lobes linear, 5–7 mm. Corolla white to pink, bilabiate, narrowly cylindrical at base, flaring and campanulate in upper part, 25–40 mm; lower lip with reticulate orange-yellow markings. Ovary pubescent; style filiform, glabrous to sparsely hairy. Achene crowned with persistent calyx, enclosed within 2 accrescent, membranous, winglike, peltate bracts. Fl. Apr–Jul, fr. Aug–Sep.

• Mixed forests, scrub; 600–2200 m. Gansu, Guangxi, Hubei, Hunan, Shaanxi, Sichuan.

Dipelta wenxianensis Y. F. Wang & Lian (Acta Bot. Boreal.-Occid. Sin. 14(6): 91, f. 92. 1994; as seen in the illustration but type specimen not located) and a specimen collected in Gansu (Wenxian: Bikou, *D. E. Boufford* 37425) with peltate bracts, pilose style, calyx divided to base, and short corolla tube both show intermediate characters between *D. floribunda* and *D. yunnanensis*. It is not excluded that other intermediate specimens exist.

2. Dipelta yunnanensis Franchet, Rev. Hort. 63: 246. 1891.

云南双盾木 yun nan shuang dun mu

Dipelta ventricosa Hemsley; *D. yunnanensis* var. *brachycalyx* Handel-Mazzetti.

Shrubs, deciduous, to 4 m tall. Branches pubescent. Petiole to 5 mm; leaf blade elliptic to lanceolate, 5–10 × 2–4 cm, abaxially white villous on midvein, ciliate along margin, adaxially sparsely pubescent, base cuneate to rounded, margin entire or rarely remotely dentate, apex acuminate to long acuminate. Ovaries with 4 bracts; 2 outer bracts larger, reniform, accrescent in fruit and not obscuring calyx at anthesis; 2 inner bracts smaller, unequal, one ovate, other smaller and narrowly elliptic. Calyx 5-lobed, pubescent; lobes divided 1/2–2/3, spreading in fruit. Corolla white to dark pink, bilabiate, 20–40 mm, very short and narrowly tubular at base; lower lip pubescent with yellow-orange reticulate markings. Ovary pubescent; style inserted, glabrous. Achene ovoid with a short neck, pubescent. Achene crowned with persistent calyx, enclosed within 2 accrescent, membranous, winglike, and reniform bracts. Fl. May–Jul, fr. Jul–Nov.

• Mixed forests, scrub; 800–2400 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan.

3. Dipelta elegans Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 14: 174. 1895.

优美双盾木 you mei shuang dun mu

Shrubs, deciduous, to 2 m tall. Leaf blade elliptic, 5–10 × 2–5 cm, glandular hairy, pubescent on veins and margin, base acute to rounded, margin entire or remotely dentate in upper 1/2, apex long acute to long acuminate. Ovaries with 4 bracts; 2 outer bracts larger, peltate, accrescent in fruit and not obscuring calyx at anthesis. Calyx tubular-campanulate, 5-lobed, sparsely hairy; lobes obtuse, ca. 1/3 as long as tube. Corolla bilabiate, densely pubescent, narrowly cylindric at base, flaring and campanulate in upper part; lower lip villous. Ovary pubescent; style pilose to sparsely pubescent; stigmas capitate. Achene with 2 very large persistent peltate bracts to 40 mm wide. Fl. May–Jun, fr. Sep.

• Broad-leaved forests; ca. 2000 m. Gansu, ?Sichuan.

6. LINNÆA Linnaeus, Sp. Pl. 2: 631. 1753.

北极花属 bei ji hua shu

Linneusia Rafinesque; *Obolaria* Kuntze (1891), not Linnaeus (1753).

Subshrubs, creeping, evergreen. Branches ascending, slender. Leaves opposite, petiolate, estipulate. Inflorescences of 2 paired and nodding flowers at apices of short lateral branches; peduncles long, slender; ovary with 2 pairs of bracts at base; 2 outer bracts larger and shieldlike, covered with stipitate glandular hairs; 2 inner bracts minute; peduncles, ovaries, and sepals glandular hairy.

Sepals 5, deciduous. Corolla funnelform, 5-lobed, slightly bilabiate. Stamens 4, didynamous, inserted in corolla tube; anthers included. Ovary 3-locular, 2 locules with 2 series of sterile ovules, 1 locule with a single fertile ovule; style filiform; stigmas capitate. Fruit a 1-seeded achene.

One species: widely distributed in alpine and cold regions of the N Hemisphere.

1. *Linnaea borealis* Linnaeus, Sp. Pl. 2: 631. 1753.

北极花 bei ji hua

Linnaea borealis f. *arctica* Witrock.

Subshrubs, creeping, evergreen, 5–10 cm tall. Stem long, slender, sparsely shortly pubescent. Petiole 3–4 mm; leaf blade orbicular to obovate, abaxially glabrous, adaxially sparsely pubescent, margin with 1–3 pairs of rounded teeth. Flowers fra-

grant, nodding; main peduncles 60–70 mm; inflorescence bracts linear, shortly pubescent; inflorescence peduncles less than 10 mm. Sepals shortly pubescent, narrowly acute, deciduous in fruit. Corolla white to pink, to 10 mm; tube glabrous outside, pubescent inside. Stigmas capitate. Achenes nodding, yellow, orbicular. Fl. and fr. Jul–Aug. $2n = 32$.

Needle-leaved forests, on trunks, mossy rocks; 700–2300 m. Hebei, Heilongjiang, Jilin, ?Liaoning, Nei Mongol, Xinjiang [widely distributed in other parts of N temperate regions].