

## BERBERIDACEAE

小檗科 xiao bo ke

Ying Junsheng (应俊生 Ying Tsun-shen)<sup>1</sup>; David E. Boufford<sup>2</sup>, Anthony R. Brach<sup>3</sup>

Herbs, perennial, or shrubs, rarely small trees, evergreen or deciduous, sometimes rhizomatous or tuberous. Stems with or without spines. Leaves alternate, opposite, or basal, simple, or 1–3 × pinnately or 2–3 × ternately compound; stipules present or absent; venation pinnate or palmate. Inflorescences terminal or axillary, racemes, spikes, umbels, or panicles, or flowers fascicled or solitary. Flowers pedicellate or sessile, bisexual, radially symmetric; bracteoles or bracts present or absent. Perianth usually 2- or 3-merous, rarely absent. Sepals 6–9, often petaloid, distinct, in 2 or 3 whorls. Petals 6, distinct, flat, hooded, pouched, or spurred; nectary present or absent. Stamens 6, opposite petals; anthers 2-celled, dehiscent by valves or longitudinal slits. Ovary superior, apparently 1-carpellate; ovules numerous, rarely solitary; placentation marginal or appearing basal; style present or absent, sometimes persistent in fruit as a beak. Fruit a berry, capsule, follicle, or utricle. Seeds 1 to numerous, sometimes arillate; endosperm abundant.

Seventeen genera and ca. 650 species: mainly in the north temperate zone and on subtropical mountains; 11 genera and 303 species (272 endemic, one introduced) in China; 17 additional species (15 endemic) are insufficiently known.

Editors' note. The Berberidaceae were to be published in *Flora of China* Volume 7 (2008). However, a problem with the treatment of *Berberis* necessitated postponing publication of the family until the present volume. See the comments under *Berberis*, below.

The family Berberidaceae presents an interesting, distinctive biogeography. The two species of *Achlys* Candolle are disjunctly distributed between E Asia and North America, with one in Japan and Korea and one along the west coast of North America. *Caulophyllum* and *Diphylleia* each contain three species; the former has one species in E Asia and two in North America, the latter has two in E Asia and one in North America. *Sinopodophyllum* and *Plagiorhegma* (if maintained separate from *Podophyllum* Linnaeus and *Jeffersonia* Barton, respectively) are endemic to E Asia, but their closest relatives, *Podophyllum* and *Jeffersonia*, are widely disjunct in E North America. *Epimedium* has a wide, fragmented range from Japan westward to Algeria; the nearest relative, *Vancouveria* C. Morren & Decaisne, is endemic to the Pacific Northwest of North America. *Dysosma* and *Nandina* are endemic to China, and *Ranzania* T. Ito is endemic to Japan.

*Podophyllum cavaleriei* H. Léveillé (Bull. Acad. Int. Géogr. Bot. 14: 142. 1914) is the replaced synonym of *Pilea panzhihuaensis* C. J. Chen et al. (Novon 17: 24. 2007) in the Urticaceae.

Ying Tsunshen. 2001. Berberidaceae. In: Ying Tsunshen, ed., Fl. Reipubl. Popularis Sin. 29: 50–310.

### 1a. Shrubs.

- 2a. Leaves 2 or 3 × pinnately compound; margins of leaflets entire; anthers dehiscent by longitudinal slits; placentation parietal ..... 1. *Nandina*  
2b. Leaves simple or pinnately compound; margins of leaflets toothed; anthers dehiscent by 2 apically hinged valves; placentation basal.  
3a. Leaves simple; branches spiny ..... 2. *Berberis*  
3b. Leaves pinnately compound; branches without spines ..... 3. *Mahonia*

### 1b. Perennial herbs.

- 4a. Leaves simple; petals without nectary.  
5a. Flowers solitary.  
6a. Rhizomes stout; flowers appearing before leaves; fruit a berry, indehiscent ..... 4. *Sinopodophyllum*  
6b. Rhizomes slender; flowers appearing with the leaves; fruit a dehiscent capsule ..... 5. *Plagiorhegma*  
5b. Flowers 2 or more, in fascicles, umbels, or cymes.  
7a. Inflorescences fascicles or umbels; leaves 3–9-parted or -lobed; seeds numerous ..... 6. *Dysosma*  
7b. Inflorescences terminal cymes or umbelliform; leaves 2-parted; seeds 2–4 ..... 7. *Diphylleia*  
4b. Leaves compound (except in few species of *Epimedium*); petals with nectary.  
8a. Fruit resembling a berry, actually a naked seed at maturity; inflorescences compound cymes ..... 11. *Caulophyllum*  
8b. Fruit capsules or achenes; seeds contained within fruit; inflorescences racemes or panicles.  
9a. Plants from rhizomes; margins of leaflets toothed; petals 4, often spurred ..... 8. *Epimedium*  
9b. Plants from tubers; margin of leaflets entire; petals 6, nectary-like, spurs absent.  
10a. Tubers producing 1 or rarely 2 leaves per year; fruit a dehiscent capsule; seeds with arils ..... 9. *Gymnospermium*  
10b. Tubers producing 2–5 leaves per year; fruit an achene, globose, utricular; seeds without arils ..... 10. *Leontice*

<sup>1</sup> Institute of Botany, Chinese Academy of Sciences, 20 Nanxincun, Xiangshan, Beijing 100093, People's Republic of China.

<sup>2</sup> Harvard University Herbaria, 22 Divinity Avenue, Cambridge, Massachusetts 02138-2094, U.S.A.

<sup>3</sup> Missouri Botanical Garden, c/o Harvard University Herbaria, 22 Divinity Avenue, Cambridge, Massachusetts 02138-2094, U.S.A.

**1. NANDINA** Thunberg, Nov. Gen. Pl. 14. 1781.南天竹属 *nan tian zhu shu*Ying Junsheng (应俊生 *Ying Tsun-shen*); David E. Boufford, Anthony R. Brach

Shrubs, evergreen, without rhizomes. Leaves alternate, 2 or 3 × pinnately compound, stipulate; petioles and petiolules swollen at base; leaflets entire, venation pinnate. Inflorescences terminal or axillary panicles of dozens to hundreds of flowers. Flowers bisexual, 3-merous; bracteoles present. Sepals numerous, spirally arranged. Petals 6, larger than sepals, basally without nectaries. Anthers dehiscing by longitudinal slits; pollen grains prolate, 3-polyporate, exine distinctly reticulate. Ovary ellipsoid; placentation submarginal; style short; stigma entire or crisped. Fruit berries, globose. Seeds 1–3; aril absent.  $2n = 20$ .

One species: E Asia.

*Nandina* is occasionally treated as a separate family, Nandinaceae (Takhtajan, Divers. Classific. Fl. Pl. 1997), or subfamily, Nandinoideae (Loconte in Kubitzki et al., Fam. Gen. Vasc. Pl. 2: 147–151. 1993).

**1. *Nandina domestica*** Thunberg, Nov. Gen. Pl. 14. 1781.南天竹 *nan tian zhu**Nandina domestica* var. *linearifolia* C. Y. Wu ex S. Y. Bao.

Shrubs, evergreen, erect, to 3 m tall, glabrous, few branched. Branchlets reddish when young. Leaves 30–50 cm; leaflets nearly sessile; blades elliptic or elliptic-lanceolate, 2–10 × 0.5–2 cm, weakly leathery, glabrous, base cuneate, apex acuminate. Inflorescences erect, 20–35 cm. Flowers cream or white. Sepals ovate-triangular or ovate-oblong, 1–4 mm. Petals

oblong, ca. 4.2 × 2.5 mm, apex obtuse. Stamens ca. 3.5 mm; anther connective prolonged. Ovary locules 1; ovules 1–3. Carpodium 4–8 mm. Berry red or purplish, 6–8 mm in diam. Seeds grayish or brownish, oblate-spheroidal. Fl. Mar–Jun, fr. May–Nov.  $2n = 20^*$ .

Streamsides in montane forests, roadsides, thickets; below 1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [India, Japan; probably not native in SE North America, West Indies, and South America (Peru)].

**2. BERBERIS** Linnaeus, Sp. Pl. 1: 330. 1753.小檗属 *xiao bo shu*Ying Junsheng (应俊生 *Ying Tsun-shen*)

Shrubs, evergreen or deciduous. Branches glabrous or tomentose, spinose or not; spines simple or usually 3–5-fid. Leaves on short shoots, simple, alternate, usually petiolate. Inflorescences solitary or fascicled flowers, racemes, umbels, or panicles. Flowers 3-merous; bracteoles usually 3, caducous, scalelike. Sepals 6, rarely 3 or 9, yellow. Petals 6, yellow, bases nectariferous. Stamens opposite petals; anthers dehiscing by valves; pollen grains subspheroidal, exine reticulate. Ovary symmetrically club-shaped; ovules 1–12, rarely to 15, subbasal; styles very short. Fruit a berry, usually red, dark red, or black, globose, ellipsoid, oblong, ovoid, or obovoid. Seeds 1–10, tan to red-brown or black; aril absent.  $2n = 14$ .

About 500 species: north temperate regions, a few in the S Hemisphere; 215 species (197 endemic, one introduced) in China.

Many species of the genus are grown as ornamental shrubs and used for medicinal purposes.

Editors' note. This treatment of *Berberis* was written solely by the Chinese author, Ying Junsheng. The non-Chinese co-author of the genus was to be Julian Harber (Mytholmroyd, West Yorkshire, U.K.), and the Berberidaceae were to be included in *Flora of China* Volume 7 (2008), but two months before that volume was sent to the printer, Ying rejected Harber's revision, with the result that the Berberidaceae were postponed until the present volume. The treatment provided here is an edited version of the English manuscript provided by Ying and is essentially a translation of his earlier treatment in FRPS (29: 54–214. 2001). It has been edited only to follow the *Flora of China* format, to correct the usage of English, and to correct nomenclatural errors, including errors of bibliographic citation. The taxonomy and data provided in the descriptions and distributions have not been changed. The editors observe that 49 names based on Chinese material have apparently been overlooked or disregarded in this treatment. They are provided as an appendix at the end of the genus. Harber is currently preparing a thorough revision of Chinese *Berberis*, expanded from the joint treatment that was intended to appear in the *Flora of China*; it will include all taxa known to occur in China, will account for all names based on Chinese material, and will be published by Missouri Botanical Garden Press.

1a. Inflorescence an umbel, raceme, or panicle.

2a. Inflorescence an umbel.

3a. Branches densely pubescent ..... 119. *B. weiningensis*

3b. Branches glabrous.

4a. Inflorescences not pedunculate (flowers fascicled at base of peduncle).

5a. Stems, pedicels, and leaves abaxially pruinose, each leaf margin 2–7-aristate-dentate ..... 124. *B. multiserrata*

5b. Stems, pedicels, and leaves abaxially not pruinose, each leaf margin 1–4-spinose-serrate or entire.

6a. Shrubs evergreen; spines 3-fid; each leaf margin 1–4-spinose-serrate, rarely entire, veins raised on both surfaces; ovules 4 or 5 ..... 125. *B. pulangensis*

- 6b. Shrubs deciduous; spines simple; leaves entire, veins inconspicuous; ovules 1 or 2 ..... 126. *B. thunbergii*
- 4b. Inflorescences pedunculate (flowers not fascicled at base of peduncle).
- 7a. Sepals in 3 whorls; fruit contracted at middle part, apex usually bent ..... 120. *B. johannis*
- 7b. Sepals in 2 whorls; fruit not bent at apex.
- 8a. Leaves narrowly elliptic or obovate-elliptic; fruit contracted at lower part, style persistent; ovules 2 ..... 121. *B. leboensis*
- 8b. Leaves obovate, obovate-lanceolate, or oblong; fruit not contracted, style not persistent; ovules 4 or 5.
- 9a. Petals emarginate at apex; leaves obovate or obovate-lanceolate ..... 122. *B. umbratica*
- 9b. Petals entire at apex; leaves oblong or elliptic ..... 123. *B. gilungensis*
- 2b. Inflorescence a raceme or panicle.
- 10a. Inflorescence a panicle.
- 11a. Inflorescence a corymbose panicle.
- 12a. Leaf blade narrowly obovate or obovate-lanceolate, margin entire; sepals in 3 whorls; petals emarginate at apex; ovules 3 or 4 ..... 198. *B. jiulongensis*
- 12b. Leaf blade narrowly elliptic, margin 1–4-spinose-serrate on each side; sepals in 2 whorls; petals entire at apex; ovules 1 ..... 199. *B. contracta*
- 11b. Inflorescence a panicle.
- 13a. Inflorescence a congested panicle; pedicels 1–2(–3) mm; fruit subglobose ..... 200. *B. aggregata*
- 13b. Inflorescence a loose panicle; pedicels longer than 2 mm.
- 14a. Sepals in 3 whorls.
- 15a. Rachis and peduncle pubescent ..... 201. *B. luhuoensis*
- 15b. Rachis and peduncle glabrous.
- 16a. Leaves entire.
- 17a. Rachis conspicuously flexuose; fruit oblong-ovoid, pruinose, style not persistent ..... 202. *B. sherriffii*
- 17b. Rachis not flexuose; fruit ovoid, not pruinose, style persistent ..... 203. *B. prattii*
- 16b. Leaves spinose-serrate.
- 18a. Leaves abaxially pruinose; inflorescences 2–4 cm; petals entire or slightly emarginate at apex; style not persistent; ovules 3 or 4 ..... 204. *B. beaniana*
- 18b. Leaves abaxially not pruinose; inflorescences 5–12 cm; petals incised at apex; style persistent; ovules 2 ..... 205. *B. francisci-ferdinandi*
- 14b. Sepals in 2 whorls.
- 19a. Branches and rachises pubescent.
- 20a. Bracts shorter than pedicels; anther connective apiculate; ovules 2 ..... 206. *B. trichiata*
- 20b. Bracts longer than pedicels; anther connective truncate; ovules usually 3 or 4 ..... 207. *B. gyalalica*
- 19b. Branches and rachises glabrous.
- 21a. Shrubs deciduous.
- 22a. Leaves narrowly oblanceolate, thinly papery; petals entire or emarginate at apex ..... 215. *B. beijingensis*
- 22b. Leaves obovate, papery; petals emarginate at apex.
- 23a. Leaves up to 6.5 cm; pedicels 5–12 mm; fruit red, pruinose, style not persistent ..... 213. *B. xanthophlaea*
- 23b. Leaves up to 2.7 cm; pedicels 2–3 mm; fruit dark red to purple-red, not pruinose, style persistent ..... 214. *B. concolor*
- 21b. Shrubs evergreen or semi-evergreen.
- 24a. Shrubs evergreen; leaves oblanceolate; fruit black, pruinose ..... 208. *B. kerriana*
- 24b. Shrubs semi-evergreen; leaves spatulate-cuneate, obovate, or oblong-obovate.
- 25a. Leaf margin spinose-serrate; style 1–1.5 mm.
- 26a. Spines usually simple; inflorescences 5–15 cm; petals incised at apex; ovules 2 ..... 209. *B. polyantha*
- 26b. Spines 3-fid; inflorescences 3–5 cm; petals entire at apex; ovules 4 ..... 210. *B. sikkimensis*
- 25b. Leaves entire; style 0.5–0.75 mm.
- 27a. Leaves spatulate-cuneate, apex retuse; bracts shorter than pedicels ..... 211. *B. coryi*
- 27b. Leaves obovate, apex rounded; bracts subequal to pedicels in length ..... 212. *B. metapolyantha*
- 10b. Inflorescence a raceme.
- 28a. Inflorescence a spikelike raceme.
- 29a. Leaves glabrous.
- 30a. Leaf margin 2–15-spinose-serrate on each side; fruit black ..... 131. *B. purdomii*
- 30b. Leaf margin entire; fruit red.
- 31a. Petals entire at apex ..... 132. *B. vernae*
- 31b. Petals incised at apex ..... 133. *B. poiretii*
- 29b. Leaves pubescent.

- 32a. Sepals in 3 whorls.
- 33a. Adaxial surface of leaf rugose, both surfaces pubescent ..... 127. *B. brachypoda*
- 33b. Adaxial surface of leaf not rugose, only abaxially pubescent ..... 128. *B. salicaria*
- 32b. Sepals in 2 whorls.
- 34a. Leaves entire; petals entire at apex; pedicels glabrous ..... 129. *B. gilgiana*
- 34b. Leaf margin aristate-dentate; petals incised at apex; pedicels pubescent ..... 130. *B. stenostachya*
- 28b. Inflorescence a racemose subumbel or raceme.
- 35a. Inflorescence a racemose subumbel.
- 36a. Inflorescences not pedunculate.
- 37a. Sepals in 3 whorls ..... 134. *B. pallens*
- 37b. Sepals in 2 whorls.
- 38a. Leaf margin closely spinose-serrate; petals slightly emarginate at apex; berry ovoid ..... 135. *B. reticulata*
- 38b. Leaves entire or 1–4-spinose-serrate; petals entire or deeply emarginate at apex.
- 39a. Leaves oblong-obovate; spines simple; ovules solitary ..... 136. *B. pruinocarpa*
- 39b. Leaves lanceolate or broadly ovate; spines 3-fid; ovules 2–5.
- 40a. Leaves lanceolate; spines stout, 1–3 cm; petals entire at apex; ovules 2 or 3 ..... 137. *B. hemsleyana*
- 40b. Leaves broadly obovate; spines slender, ca. 1 cm; petals emarginate at apex; ovules 3–5 ..... 138. *B. platyphylla*
- 36b. Inflorescences pedunculate.
- 41a. Sepals in 3 whorls.
- 42a. Inflorescences with leaflike bracts; fruit globose, style persistent ..... 139. *B. sichuanica*
- 42b. Inflorescences without leaflike bracts; fruit oblong, style not persistent.
- 43a. Leaves obovate or broadly obovate; stamens truncate at apex ..... 140. *B. mekongensis*
- 43b. Leaves oblanceolate or narrowly elliptic; stamens apiculate at apex; fruit contracted below middle ..... 141. *B. pseudoamoena*
- 41b. Sepals in 1 or 2 whorls.
- 44a. Sepals in 1 whorl; leaves narrowly oblanceolate, less than 5 mm wide ..... 142. *B. lepidifolia*
- 44b. Sepals in 2 whorls.
- 45a. Stems, rachises, and pedicels conspicuously pruinose ..... 143. *B. calcipratorum*
- 45b. Stems, rachises, and pedicels not pruinose.
- 46a. Leaves leathery.
- 47a. Leaves abaxially not pruinose; fruit obovoid-oblong ..... 146. *B. derongensis*
- 47b. Leaves abaxially pruinose; fruit globose or oblong.
- 48a. Leaves elliptic or oblong-obovate, reticulate veins conspicuous; fruit subglobose; seeds 3 ..... 144. *B. weisiensis*
- 48b. Leaves narrowly obovate, reticulate veins inconspicuous; fruit oblong; seeds 1 ..... 145. *B. amoena*
- 46b. Leaves papery.
- 49a. Leaves entire.
- 50a. Petals incised at apex; stamens truncate at apex ..... 147. *B. papillifera*
- 50b. Petals entire at apex; stamens shortly apiculate at apex.
- 51a. Leaves acute at apex; petals obovate, clawed at base ..... 148. *B. virescens*
- 51b. Leaves obtuse at apex; petals elliptic, not clawed at base ..... 149. *B. integripetala*
- 49b. Leaves spinose-serrate or entire and 1–10-spinose-serrate.
- 52a. Branches and pedicels pubescent ..... 150. *B. tomentulosa*
- 52b. Branches and pedicels glabrous.
- 53a. Leaves oblanceolate, abaxially brown ..... 154. *B. atroviridiana*
- 53b. Leaves abaxially pale green, grayish, or pruinose.
- 54a. Leaves abaxially pruinose; ovules 3 or 4 ..... 151. *B. tischleri*
- 54b. Leaves abaxially not pruinose; ovules 1 or 2.
- 55a. Petals entire at apex; fruit globose ..... 152. *B. silva-taroucana*
- 55b. Petals emarginate at apex; fruit oblong-ellipsoid ..... 153. *B. tsarongensis*
- 35b. Inflorescence a raceme.
- 56a. Racemes not pedunculate.
- 57a. Evergreen or semi-evergreen shrubs.
- 58a. Semi-evergreen shrubs; leaves entire ..... 50. *B. wilsoniae*
- 58b. Evergreen shrubs; leaves spinose-serrate or aristate-dentate.
- 59a. Leaves 1–4-aristate-dentate; stem spines 1.5–6 cm ..... 182. *B. potaninii*
- 59b. Leaves 10–25-spinose-serrate on each side; stem spines 0.6–1.5 cm.
- 60a. Leaves 3–9 × 1–3 cm; fruit oblong-ellipsoid; style persistent, short ..... 183. *B. centiflora*

- 60b. Leaves 0.8–2(–3.5) × 0.5–1.2 cm; fruit subglobose; style not persistent ..... 184. *B. tenuipedicellata*
- 57b. Deciduous shrubs.
- 61a. Sepals in 3 whorls.
- 62a. Leaves rounded or retuse at apex; reticulate veins distinctly raised; anther connective truncate ..... 196. *B. batangensis*
- 62b. Leaves acute or rounded at apex; reticulate veins inconspicuous; anther connective apiculate ..... 197. *B. ignorata*
- 61b. Sepals in 1 or 2 whorls.
- 63a. Sepals in 1 whorl; leaves entire or 1–8-spinose-serrate ..... 185. *B. mouillacana*
- 63b. Sepals in 2 whorls.
- 64a. Leaves entire or rarely few spinose-serrate.
- 65a. Leaves entire.
- 66a. Fruit usually bent, style persistent; petals acute at apex ..... 186. *B. franchetiana*
- 66b. Fruit not bent, style not persistent.
- 67a. Petals incised at apex; leaf margin not revolute, 1.2–3.5 × 0.5–1.4 cm ..... 187. *B. lecomtei*
- 67b. Petals rounded, entire at apex; leaf margin revolute, 1–2 × 0.4–0.8 cm ..... 188. *B. microtricha*
- 65b. Leaves entire, occasionally 1–7-spinose-serrate.
- 68a. Fruit red; style persistent, short ..... 189. *B. dawoensis*
- 68b. Fruit black; style not persistent.
- 69a. Leaves obovate; petals entire at apex ..... 190. *B. heteropoda*
- 69b. Leaves lanceolate; petals slightly emarginate at apex ..... 191. *B. kaschgarica*
- 64b. Leaves spinose-serrate.
- 70a. Petals deeply incised at apex; leaves elliptic, glabrous ..... 192. *B. dielsiana*
- 70b. Petals entire at apex.
- 71a. Ovules 7–11; leaves oblong-orbicular, abaxially grayish white, usually pruinose ..... 42. *B. aemulans*
- 71b. Ovules 1 or 2.
- 72a. Leaf blade elliptic or obovate-elliptic, margin spinose-serrate; bracts ca. 1 mm ..... 193. *B. dictyoneura*
- 72b. Leaf blade obovate, margin remotely spinose-serrate; bracts 4–5 mm.
- 73a. Spines to 2.5 cm; leaves to 5 × 2 cm ..... 194. *B. nutanticarpa*
- 73b. Spines to 5 cm; leaves to 4 × 1.7 cm ..... 195. *B. bracteata*
- 56b. Racemes pedunculate.
- 74a. Leaves entire.
- 75a. Leaves pubescent.
- 76a. Rachises, peduncles, and pedicels pubescent ..... 155. *B. daochengensis*
- 76b. Rachises, peduncles, and pedicels glabrous ..... 156. *B. pubescens*
- 75b. Leaves glabrous.
- 77a. Leaves abaxially pruinose.
- 78a. Leaves oblanceolate; petals slightly emarginate at apex ..... 157. *B. kongboensis*
- 78b. Leaves obovate; petals entire at apex ..... 158. *B. agricola*
- 77b. Leaves not pruinose.
- 79a. Sepals in 3 whorls.
- 80a. Peduncles 1–4 cm; fruit not pruinose, style not persistent ..... 159. *B. forrestii*
- 80b. Peduncles 3–7 cm; fruit pruinose, style persistent ..... 160. *B. racemulosa*
- 79b. Sepals in 2 whorls.
- 81a. Leaves cuneate, obovate, or oblong-rhombic.
- 82a. Leaves cuneate or obovate, 0.8–1.4 × 0.6–0.9 cm ..... 161. *B. retusa*
- 82b. Leaves oblong-rhombic, 3.5–8 × 1.5–3.5(–7) cm ..... 162. *B. virgetorum*
- 81b. Leaves elliptic, oblong, obovate, oblong-obovate, or obovate-lanceolate.
- 83a. Style persistent.
- 84a. Leaves oblong-obovate; fruit obovoid, pruinose when mature ..... 163. *B. humidumbrosa*
- 84b. Leaves narrowly obovate; fruit oblong, not pruinose ..... 164. *B. sabulicola*
- 83b. Style not persistent.
- 85a. Fruit oblong or oblong-ellipsoid.
- 86a. Fruit oblong; inflorescences 5–18 cm; leaves subleathery, obovate or oblong-obovate ..... 165. *B. feddeana*
- 86b. Fruit oblong-ellipsoid; inflorescences 2.5–3.5 cm; leaves papery, narrowly obovate-lanceolate or narrowly elliptic ..... 166. *B. haoi*
- 85b. Fruit globose or subglobose.
- 87a. Fruit globose, apex lacunose ..... 167. *B. jamesiana*

- 87b. Fruit ovoid-ellipsoid or subglobose, apex flat ..... 168. *B. iliensis*
- 74b. Leaves spinose-serrate or sometimes entire.
- 88a. Leaves spinose-serrate, sometimes entire; petals entire at apex ..... 169. *B. farreri*
- 88b. Leaves spinose-serrate.
- 89a. Sepals in 3 or 4 whorls.
- 90a. Sepals in 3 whorls; leaves thinly papery, abaxially pale green ..... 170. *B. honanensis*
- 90b. Sepals in 4 whorls; leaves thickly papery, abaxially brown when dry ..... 171. *B. pingwuensis*
- 89b. Sepals in 2 whorls.
- 91a. Style persistent.
- 92a. Petals elliptic, apex emarginate; leaves abaxially not pruinose ..... 172. *B. tianshuiensis*
- 92b. Petals oblong-obovate, apex incised; leaves abaxially pruinose ..... 173. *B. henryana*
- 91b. Style not persistent.
- 93a. Leaves suborbicular to broadly elliptic.
- 94a. Petals emarginate at apex; stem spines simple or 3-fid ..... 174. *B. kansuensis*
- 94b. Petals entire at apex; stem spines absent or simple.
- 95a. Leaves abaxially whitish, slightly pruinose ..... 175. *B. anhweiensis*
- 95b. Leaves abaxially yellow-green, not pruinose ..... 176. *B. dasystachya*
- 93b. Leaves oblong, elliptic, ovate, or obovate.
- 96a. Leaves obovate.
- 97a. Leaves narrowly obovate, abaxially whitish; style persistent, short ..... 180. *B. pseudotibetica*
- 97b. Leaves oblong-obovate, abaxially pale yellow-green; style not persistent ..... 181. *B. dubia*
- 96b. Leaves oblong or elliptic.
- 98a. Leaves oblong to ovate, 5–10 × 2.5–5 cm, abaxially pale green; spines 3-fid ..... 177. *B. amurensis*
- 98b. Leaves elliptic, 1.5–5 × 0.6–1.8 cm; spines absent, simple, or 3-fid.
- 99a. Petals entire at apex; anther connective slightly prolonged, shortly apiculate;  
ovules 5 or 6 ..... 178. *B. shensiensis*
- 99b. Petals slightly emarginate at apex; anther connective not prolonged, truncate;  
ovules 2 ..... 179. *B. hersii*
- 1b. Flowers solitary or fascicled.
- 100a. Flowers solitary.
- 101a. Leaves abaxially pruinose.
- 102a. Sepals in 3 whorls.
- 103a. Petals entire at apex; ovules 3 or 4 ..... 1. *B. candidula*
- 103b. Petals 2-lobate at apex; ovules 6–12.
- 104a. Petals emarginate at apex; fruit ovoid, black, with strict style ..... 2. *B. chrysochaera*
- 104b. Petals incised at apex; fruit oblong-ovoid, red, with bent style at apex ..... 3. *B. temolaica*
- 102b. Sepals in 2 whorls.
- 105a. Leaves entire; anther connective shortly apiculate; fruit ovoid; ovules 3 or 4(–6) ..... 4. *B. dictyophylla*
- 105b. Leaf margin 1–6-spinose-serrate; anther connective truncate; fruit globose or subglobose;  
ovules 5–8.
- 106a. Plants 1–1.5 m tall; leaf margin 1–7-spinose-serrate; pedicels 3–7 mm; fruit pruinose,  
style persistent ..... 5. *B. approximata*
- 106b. Plants 10–20 cm tall; leaf margin 1- or 2-spinose-serrate; fruiting pedicels to 23 mm;  
fruit not pruinose, style not persistent ..... 6. *B. medogensis*
- 101b. Leaves abaxially not or slightly pruinose.
- 107a. Leaves entire.
- 108a. Sepals in 3 whorls ..... 7. *B. parisepala*
- 108b. Sepals in 2 whorls.
- 109a. Shoots pubescent; petals entire at apex; ovules 6 ..... 8. *B. angulosa*
- 109b. Shoots glabrous; petals 2-lobate at apex; ovules 3–5.
- 110a. Leaves oblong-oblongeolate, oblanceolate, or oblong-obovate.
- 111a. Leaves oblong-oblongeolate; style not persistent ..... 9. *B. qiaojiaensis*
- 111b. Leaves oblanceolate or oblong-obovate; style persistent ..... 10. *B. woomungensis*
- 110b. Leaves obovate, oblong, or elliptic.
- 112a. Leaf blade leathery, margin thickened; anther connective truncate ..... 11. *B. crassilimba*
- 112b. Leaf blade herbaceous, margin not thickened; anther connective apiculate.
- 113a. Fruit obovoid, style persistent; ovules 4 or 5 ..... 14. *B. tsarica*
- 113b. Style not persistent; ovules 3 or 4.
- 114a. Fruit globose; spines 5-fid, conspicuously longer than leaves; pedicels 3–5 mm ..... 12. *B. longispina*

- 114b. Fruit oblong-ovoid or ovoid; spines 3-fid, subequal to or shorter than leaves; pedicels 10–30 mm ..... 13. *B. muliensis*
- 107b. Leaf margin spinose-serrate or entire and sometimes 1–6-spinose-serrate.
- 115a. Leaves entire and sometimes 1–6-spinose-serrate.
- 116a. Pedicels 15–30 mm.
- 117a. Pedicels stout, tip bent; fruit large (1.3–1.5 × 1.2–1.3 cm); ovules 11 ..... 15. *B. daiiana*
- 117b. Pedicels slender, straight; fruit small (ca. 6.5 × 4–5 mm); ovules 4 or 5 ..... 16. *B. asmyana*
- 116b. Pedicels shorter than 10 mm.
- 118a. Shoots pubescent.
- 119a. Plants 20–30 cm tall; fruit elliptic-ovoid, style persistent; ovules 4 ..... 17. *B. multicaulis*
- 119b. Plants ca. 1 m tall; fruit subglobose, style not persistent; ovules 6 or 7 ..... 18. *B. kangdingensis*
- 118b. Shoots glabrous.
- 120a. Fruit oblong, tip bent; leaves elliptic or oblanceolate ..... 19. *B. campyloptropa*
- 120b. Fruit ovoid, oblong-ovoid, or ovoid-globose, tip not bent; leaves obovate or narrowly oblanceolate.
- 121a. Petals entire at apex; fruit ovoid; spines 3–5-fid ..... 20. *B. everestiana*
- 121b. Petals emarginate or incised at apex; spines 1–3-fid.
- 122a. Leaves slightly papery, elliptic; ovules solitary ..... 21. *B. mianningensis*
- 122b. Leaves subleathery or papery, narrowly obovate or oblanceolate; ovules 2.
- 123a. Leaf margin applanate; anther connective prolonged; pedicels 5–10 mm; style not persistent ..... 22. *B. minutiflora*
- 123b. Leaf margin revolute; anther connective not prolonged; pedicels 1–3 mm; style persistent or not ..... 23. *B. graminea*
- 115b. Leaf margin spinose-serrate.
- 124a. Sepals in 3 whorls.
- 125a. Pedicels 4–10 mm; stems densely verruculose; leaves abaxially grayish green ..... 24. *B. verruculosa*
- 125b. Pedicels 15–20 mm; stems sometimes scarcely verruculose; leaves abaxially slightly glaucous ... 25. *B. concinna*
- 124b. Sepals in 2 whorls.
- 126a. Style persistent.
- 127a. Leaves elliptic; fruit ellipsoid, black, not pruinose ..... 26. *B. alpicola*
- 127b. Leaves oblong-ovate; fruit ovoid or oblong-ovoid, red, pruinose ..... 4. *B. dictyophylla*
- 126b. Style not persistent.
- 128a. Spines of stems 3–9-fid.
- 129a. Spines 3–7-fid; petals obtusely emarginate at apex; leaf margin coarsely aristate-dentate ..... 27. *B. sibirica*
- 129b. Spines 3–9-fid; petals entire at apex; leaf margin spinose-serrate ..... 28. *B. erythroclada*
- 128b. Spines of stems 3-fid.
- 130a. Leaves oblanceolate, subleathery; fruit black; ovules 1 or 2 ..... 30. *B. paraspecta*
- 130b. Leaves obovate or elliptic; fruit red.
- 131a. Leaves narrowly obovate; fruit ovoid or oblong-ovoid, 1–1.4 cm; ovules 3 or 4 ..... 13. *B. muliensis*
- 131b. Leaves elliptic or obovate; fruit broadly ellipsoid, to 2 cm; ovules 6 or 7 ..... 29. *B. fengii*
- 100b. Flowers fascicled.
- 132a. Shrubs deciduous.
- 133a. Leaf margin entire or only 1- or 2-spinose-serrate.
- 134a. Shoots, pedicels, and leaf margins pubescent ..... 31. *B. hobsonii*
- 134b. Shoots, pedicels, and leaf margins glabrous.
- 135a. Sepals in 3 whorls ..... 32. *B. reticulineris*
- 135b. Sepals in 2 whorls.
- 136a. Pedicels 20–40 mm; flowers 2–4-fascicled ..... 33. *B. yunnanensis*
- 136b. Pedicels 2–12 mm.
- 137a. Pedicels 2–5 mm; fruit black or red ..... 34. *B. ulicina*
- 137b. Pedicels 8–12 mm; fruit red.
- 138a. Leaf blade elliptic or oblanceolate, margin rarely 1- or 2-spinose-serrate; fruit slightly pruinose; ovules 2 ..... 35. *B. nullinervis*
- 138b. Leaf blade obovate or suborbicular, margin entire; fruit not pruinose; ovules 3 ..... 36. *B. hypericifolia*
- 133b. Leaf margin spinose-serrate.
- 139a. Pedicels 2–4 mm; ovules solitary ..... 37. *B. tsienii*
- 139b. Pedicels 12–30 mm; ovules 2–11.
- 140a. Petals incised or emarginate at apex.
- 141a. Petals emarginate at apex; veins not conspicuous ..... 38. *B. morrisonensis*

- 141b. Petals incised at apex; veins conspicuous or raised.
- 142a. Leaves oblanceolate; sepals in 3 whorls; ovules 2 ..... 39. *B. yui*
- 142b. Leaves oblong or obovate-oblong; sepals in 2 whorls; ovules 6–10 ..... 40. *B. diaphana*
- 140b. Petals entire at apex.
- 143a. Sepals in 3 whorls ..... 41. *B. circumserrata*
- 143b. Sepals in 2 whorls.
- 144a. Leaf margin 15–40-spinose-serrate; petals obovate; anther connective truncate ..... 41. *B. circumserrata*
- 144b. Leaf margin 5–12-spinose-serrate; petals oblong; anther connective apiculate ..... 42. *B. aemulans*
- 132b. Shrubs evergreen.
- 145a. Leaf margin entire or 1- or 2-spinose-serrate.
- 146a. Stems without spines or with very weak spines.
- 147a. Stems without spines; leaves broadly oblong-ovate, abaxially not pruinose, stramineous when dry; branches dark gray ..... 43. *B. hypoxantha*
- 147b. Stems without spines or with very weak spines; leaves abaxially pruinose or glaucous.
- 148a. Leaves leathery, oblong-obovate or oblong-elliptic, apex obtuse, abaxially glaucous; shoots stramineous ..... 44. *B. holocraspedon*
- 148b. Leaves thickly leathery, elliptic, narrowly elliptic, or oblanceolate, apex acuminate, abaxially slightly pruinose; shoots dark purple ..... 45. *B. ziyunensis*
- 146b. Stems with spines, usually 3-fid.
- 149a. Ovules 3–5.
- 150a. Leaves obovate or obovate-spatulate, 0.6–2.5 cm; fruit globose ..... 50. *B. wilsoniae*
- 150b. Leaves elliptic, lanceolate, or oblanceolate, to 3–7 cm; fruit ellipsoid or oblong.
- 151a. Leaf blade elliptic or oblanceolate, to 3 cm, margin conspicuously revolute; style not persistent ..... 51. *B. taliensis*
- 151b. Leaf blade lanceolate or oblong-elliptic, to 7 cm, margin not revolute; style persistent, short ..... 52. *B. subholophylla*
- 149b. Ovules 1 or 2.
- 152a. Petals entire at apex; leaves 3.5–7 cm wide ..... 46. *B. pingshanensis*
- 152b. Petals emarginate at apex; leaves less than 2 cm wide.
- 153a. Flowers 2–4-fascicled; leaves obovate ..... 47. *B. obovatifolia*
- 153b. Flowers 6–15-fascicled; leaves oblong-elliptic, oblong-lanceolate, or oblanceolate.
- 154a. Leaves oblanceolate, 8–16 mm wide, abaxially not pruinose ..... 48. *B. wuyiensis*
- 154b. Leaves oblong-elliptic to oblong-lanceolate, 3–5(–8) mm wide, abaxially pruinose ..... 49. *B. replicata*
- 145b. Leaf margin spinose-serrate or spinose-dentate, rarely entire.
- 155a. Leaves elliptic, oblong, ovate, or obovate.
- 156a. Petals entire at apex.
- 157a. Sepals in 3 whorls.
- 158a. Leaf margin 1–3-aristate-dentate on each side; pedicels to 3.5 cm ..... 90. *B. dongchuanensis*
- 158b. Leaf margin spinose-serrate; pedicels to 2 cm.
- 159a. Leaf margin flat, 2–6-spinose-serrate on each side; pedicels 10–20 mm; ovules 3 or 4 .... 91. *B. parapruiosa*
- 159b. Leaf margin slightly revolute, 12–16-spinose-serrate on each side; pedicels 1–4 mm; ovules solitary ..... 92. *B. jinshajiangensis*
- 157b. Sepals in 2 whorls.
- 160a. Flowers 7–15-fascicled; sepals lanceolate; petals oblong; leaves elliptic, ovate, or obovate .... 93. *B. kawakamii*
- 160b. Flowers 3–8-fascicled; sepals ovate, obovate, or ovate-elliptic; petals obovate.
- 161a. Leaf margin 10–25-spinose-serrate on each side; berry not pruinose ..... 94. *B. bicolor*
- 161b. Leaf margin 3–10-spinose-serrate on each side; berry pruinose.
- 162a. Leaves ovate-elliptic, abaxially not pruinose; outer sepals ovate ..... 95. *B. chunanensis*
- 162b. Leaves elliptic, abaxially pruinose; outer sepals obovate ..... 96. *B. jinfoshanensis*
- 156b. Petals emarginate or incised at apex.
- 163a. Petals incised at apex.
- 164a. Ovules solitary.
- 165a. Leaf margin flat, 3–7-spinose-serrate; flowers 2–6-fascicled; petals obovate ..... 97. *B. hayatana*
- 165b. Leaf margin revolute, 6–15-spinose-serrate; flowers 5–20-fascicled; petals ovate ..... 98. *B. cavaleriei*
- 164b. Ovules 2 or 3.
- 166a. Leaf blade rhombic-elliptic to lanceolate, margin 20–40-spinulose-serrate on each side; petals obovate-spatulate ..... 99. *B. aristatoserrulata*
- 166b. Leaf blade elliptic or elliptic to obovate, margin 1–16-spinose-serrate on each side; petals ovate or obovate.

- 167a. Leaf blade elliptic, margin 12–16-spinose-serrate on each side, abaxially not pruinose; flowers 2–5-fascicled; style persistent, short ..... 100. *B. silvicola*
- 167b. Leaf blade elliptic to obovate, margin 1–6-aristate-dentate on each side, rarely entire, abaxially pruinose; flowers 8–25-fascicled; style not persistent ..... 101. *B. pruinosa*
- 163b. Petals emarginate at apex.
- 168a. Sepals in 3 whorls.
- 169a. Leaf blade elliptic or narrowly elliptic, margin revolute, abaxially pruinose; ovules 4 ..... 102. *B. laojunshanensis*
- 169b. Leaf blade oblong or oblong-elliptic, margin flat, abaxially not pruinose.
- 170a. Leaf margin 15–25-spinose-serrate on each side; berry not pruinose, style not persistent; ovules 1 or 2 ..... 103. *B. sargentiana*
- 170b. Leaf margin 5–18-spinose-serrate on each side; berry pruinose, style persistent; ovules 2 or 3.
- 171a. Flowers 3–7-fascicled; petals cuneate at base; berry dark purple ..... 104. *B. lempergiana*
- 171b. Flowers 7–20-fascicled; petals clawed at base; berry red ..... 105. *B. soulieana*
- 168b. Sepals in 2 whorls.
- 172a. Stem spines absent or very weak; leaves oblong or narrowly elliptic ..... 106. *B. impedita*
- 172b. Stem spines 3-fid.
- 173a. Flowers 30–50-fascicled; ovules 5 or 6 ..... 107. *B. hsuyunensis*
- 173b. Flowers less than 25-fascicled; ovules 1–5.
- 174a. Ovules solitary.
- 175a. Leaf margin 20–30-spinose-serrate on each side; flowers 6–20-fascicled; style not persistent ..... 108. *B. deinacantha*
- 175b. Leaf margin 6–16-spinose-serrate on each side; flowers 3–7-fascicled; style persistent, short.
- 176a. Leaves abaxially not pruinose; flowers 3–5-fascicled; berry not pruinose ..... 109. *B. valida*
- 176b. Leaves abaxially pruinose; flowers 5–7-fascicled; berry pruinose ..... 110. *B. nemorosa*
- 174b. Ovules 2–5.
- 177a. Style persistent.
- 178a. Leaf margin 1–6-spinose-serrate on each side.
- 179a. Leaf blade oblong-elliptic, margin 2–10-spinose-serrate on each side; berry ellipsoid or obovoid, not pruinose ..... 111. *B. chingii*
- 179b. Leaf blade elliptic, broadly elliptic, or obovate, margin 1–4-spinose-serrate on each side, rarely entire; berry ovoid, pruinose ..... 112. *B. vinifera*
- 178b. Leaf margin 7–40-spinose-serrate on each side.
- 180a. Leaf blade elliptic, margin 20–40-spinose-serrate on each side; ovules 1 or 2; berry pruinose ..... 113. *B. dunicola*
- 180b. Leaf blade oblong-elliptic to lanceolate, margin 7–15-spinose-serrate on each side; ovules 4 or 5; berry not pruinose ..... 114. *B. fallax*
- 177b. Style not persistent.
- 181a. Flowers 10–17-fascicled; pedicels to 35 mm; ovules 2; leaf margin spinose-serrate ..... 118. *B. malipoensis*
- 181b. Flowers 2–6-fascicled; pedicels less than 15 mm; ovules 3–5; leaf margin sinuate or flat.
- 182a. Leaf margin sinuate, conspicuously revolute, abaxially brown, not pruinose ... 115. *B. guizhouensis*
- 182b. Leaf margin flat, abaxially pruinose or slightly so.
- 183a. Leaf blade oblong-obovate, margin 3- or 4-spinose-serrate on each side; pedicels 12–15 mm; berry pruinose ..... 116. *B. lijiangensis*
- 183b. Leaf blade elliptic or ovate-oblong, margin 12–25-spinose-serrate on each side; pedicels 7–13 mm; berry not pruinose ..... 117. *B. xanthoclada*
- 155b. Leaves linear, lanceolate, elliptic-lanceolate, or oblanceolate.
- 184a. Leaves linear or linear-lanceolate.
- 185a. Leaf blade 4–15 cm × 2–10 mm, margin conspicuously revolute, 3–26-spinulose-serrate on each side; ovules 1 or 2 ..... 53. *B. insolita*
- 185b. Leaf margin not conspicuously revolute; ovules 2–4.
- 186a. Leaf blade 1.5–16 cm × 3–6 mm, margin 4–17-spinulose-serrate on each side, adaxially dark green; ovules 2 or 3 ..... 54. *B. sanguinea*
- 186b. Leaf blade 6–9 cm × 10–15 mm, margin 12–24-spinose-serrate on each side, adaxially shiny; ovules 4 ..... 55. *B. lubrica*

- 184b. Leaves lanceolate, elliptic-lanceolate, or oblanceolate.
- 187a. Sepals in 3 whorls.
- 188a. Petals emarginate or incised at apex.
- 189a. Pedicels 5–15 mm; ovules 4 or 5.
- 190a. Leaves 1.5–3 × 0.3–0.5 cm; petals elliptic or oblong; style persistent, short ..... 62. *B. multiovula*
- 190b. Leaves 5–11 × 1–2 cm; petals obovate; style not persistent ..... 63. *B. gagnepainii*
- 189b. Pedicels 10–35 mm; ovules 2(–4).
- 191a. Leaves oblong-lanceolate or narrowly elliptic, abaxially slightly pruinose; flowers 2–6-fascicled ..... 64. *B. triacanthophora*
- 191b. Leaves lanceolate, abaxially not pruinose; flowers 4–16-fascicled.
- 192a. Leaves 6–15 × 1.3–4 cm; petals emarginate at apex; anther connective truncate; ovules 2 ..... 65. *B. xingwenensis*
- 192b. Leaves 5–11 × 1–2 cm; petals incised at apex; anther connective rounded; ovules 2–4 ..... 66. *B. veitchii*
- 188b. Petals entire at apex.
- 193a. Berry subglobose; ovules 5–7; shoots dark red ..... 56. *B. insignis*
- 193b. Berry ellipsoid, oblong, or obovoid; ovules 1–5.
- 194a. Ovules 2–5; style not persistent.
- 195a. Petals obtusely emarginate at apex, clawed at base; ovules 4 or 5 ..... 60. *B. delavayi*
- 195b. Petals rounded, entire at apex, not clawed at base; ovules 2 ..... 61. *B. davidii*
- 194b. Ovules solitary; style persistent, conspicuous.
- 196a. Pedicels 8–12(–20) mm; petals elliptic; berry red ..... 57. *B. wangii*
- 196b. Pedicels 15–22 mm; petals obovate or ovate-elliptic; berry black.
- 197a. Leaf margin pectinate-spinose-serrate; petals ovate-elliptic; berry not pruinose ..... 58. *B. pectinocraspedon*
- 197b. Leaf margin spinose-serrate, petals obovate; berry pruinose ..... 59. *B. kunmingensis*
- 187b. Sepals in 2 whorls.
- 198a. Stems without spines.
- 199a. Leaf margin 15–20-spinose-serrate on each side; berry globose, red, not pruinose, style not persistent ..... 67. *B. pingbienensis*
- 199b. Leaf margin 2–4-aristate-dentate on each side; flowers 2–10-fascicled; berry pomiform or ellipsoid, purplish black, pruinose, style persistent ..... 68. *B. griffithiana*
- 198b. Stems with 3-fid spines.
- 200a. Ovules solitary.
- 201a. Funicles 3–6 × longer than ovules; berry ovoid, red ..... 69. *B. sublevis*
- 201b. Funicles equal to or shorter than ovules; berry ellipsoid, oblong, obovoid, or globose.
- 202a. Petals entire at apex.
- 203a. Branches purplish brown; flowers 6–12-fascicled; anther connective truncate; style not persistent ..... 70. *B. wuliangshanensis*
- 203b. Branches yellow or yellow-brown; flowers 10–20-fascicled; anther connective rounded; style persistent.
- 204a. Sepals ovate; petals clawed at base ..... 71. *B. vernalis*
- 204b. Sepals lanceolate; petals cuneate at base ..... 72. *B. levis*
- 202b. Petals emarginate or incised at apex.
- 205a. Petals incised at apex; berry ovoid-ellipsoid or ovoid-globose ..... 73. *B. bergmanniae*
- 205b. Petals emarginate at apex; berry oblong or ellipsoid.
- 206a. Leaf margin more than 25-spinose-serrate on each side.
- 207a. Leaf blade narrowly lanceolate, 9–16 cm, margin 25–35-spinose-serrate on each side; berry not pruinose ..... 74. *B. iteophylla*
- 207b. Leaf blade elliptic-lanceolate, 4–9 cm, margin 35–60-spinose-serrate on each side; berry pruinose or not ..... 75. *B. ferdinandi-coburgii*
- 206b. Leaf margin less than 20-spinose-serrate on each side.
- 208a. Leaf margin conspicuously revolute; pedicels 3–4 cm or 4–12 mm ..... 76. *B. grodtmanniana*
- 208b. Leaf margin flat; pedicels 8–20 mm.
- 209a. Anther connective not prolonged; berry pruinose, style persistent ..... 77. *B. julianae*
- 209b. Anther connective prolonged; berry sometimes pruinose, style not persistent ..... 78. *B. liophylla*
- 200b. Ovules 2–4.
- 210a. Petals entire.

- 211a. Leaf blade abaxially pruinose, margin 2–7-aristate-dentate on each side; pedicels 10–25 mm; berry obovoid, style persistent ..... 79. *B. taronensis*
- 211b. Leaf blade abaxially not pruinose, margin 8–14-spinose-serrate on each side; berry ellipsoid, style not persistent.
- 212a. Shoots purplish red; leaves lanceolate; fruit stalks 10–15 mm; berry slightly pruinose ..... 80. *B. photiniifolia*
- 212b. Shoots pale yellow; leaves elliptic or elliptic-lanceolate; fruit stalks 10–15 mm; berry sometimes pruinose ..... 81. *B. fujianensis*
- 210b. Petals emarginate or incised.
- 213a. Petals deeply incised; berry ovoid ..... 82. *B. atrocarpa*
- 213b. Petals emarginate; berry ellipsoid or obovoid.
- 214a. Berry obovoid.
- 215a. Leaf blade lanceolate, margin 10–20-spinose-serrate on each side; flowers 5–30-fascicled; style persistent ..... 83. *B. zanlanscianensis*
- 215b. Leaf blade elliptic-lanceolate, margin 15–30-spinose-serrate on each side; flowers 2–5-fascicled; style not persistent ..... 84. *B. fallaciosa*
- 214b. Berry ellipsoid.
- 216a. Leaf margin conspicuously revolute; flowers 6–25-fascicled ..... 85. *B. amabilis*
- 216b. Leaf margin flat; flowers 2–8-fascicled.
- 217a. Leaf margin 30–60-spinose-serrulate on each side; berry not pruinose; pedicels red ..... 86. *B. arguta*
- 217b. Leaf margin 4–25-spinose-serrate on each side; berry pruinose.
- 218a. Leaf blade abaxially pruinose, margin 4–7-spinose-serrate on each side; pedicels 6–10 mm; style persistent, short ..... 87. *B. jiangxiensis*
- 218b. Leaf blade abaxially not pruinose, margin 8–25-spinose-serrate on each side; pedicels 10–25 mm; style not persistent.
- 219a. Leaf blade leathery, lanceolate, 10–17 × 2–2.5 cm, margin 10–25-spinose-serrate on each side ..... 88. *B. weixinensis*
- 219b. Leaf blade subleathery, lanceolate or elliptic-lanceolate, 4–9 × 1.2–2.2 cm, margin 8–15-spinose-serrate on each side ..... 89. *B. subacuminata*

**1. *Berberis candidula*** (C. K. Schneider) C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 402. 1905.

单花小檗 dan hua xiao bo

*Berberis hookeri* Lemaire var. *candidula* C. K. Schneider, Ill. Handb. Laubholz. 1: 303. 1904.

Shrubs, evergreen, ca. 1 m tall. Stems gray-brown, verruculose; young shoots pale green; spines 3-fid, subterete, 1–1.5 cm. Petiole very short or leaf sessile; leaf blade adaxially very shiny, deep green, elliptic to ovate, 1–2 × 0.5–1 cm, thickly leathery, abaxially white pruinose, both surfaces inconspicuously reticulate veined, base cuneate, margin conspicuously revolute, 1–4-spinose-serrate on each side, apex acuminate. Flowers solitary. Pedicels 4–10 mm, glabrous. Sepals in 3 whorls; outer sepals yellowish red, oblong-ovate, ca. 4 × 2 mm, apex acute; median sepals oblong-ovate, ca. 7 × 5 mm; inner sepals obovate, ca. 10 × 8 mm. Petals obovate, ca. 8 × 6 mm, base cuneate, glands ovate, apex entire. Stamens ca. 5 mm; anther connective prolonged, truncate. Ovules 3 or 4. Berry ellipsoid, 8–9 × 4–5 mm, thinly pruinose, style not persistent. Fl. Apr–May, fr. Jun–Sep.

- Montane roadsides, thickets; 1200–3000 m. Hubei, Sichuan.

**2. *Berberis chrysosphaera*** Mulligan, Bull. Misc. Inform. Kew 1940: 77. 1940.

黄球小檗 huang qiu xiao bo

Shrubs, evergreen. Mature stems dark red, sparsely verruculose; internodes 1.5–3 cm; spines 3-fid, 1–2 cm, sulcate. Leaves subsessile; leaf blade adaxially shiny, dark green, elliptic or obovate-elliptic, 1.5–4 cm × 4–10 mm, leathery, abaxially pruinose, not veined, finely papillose, adaxially ± not veined, base attenuate, margin conspicuously revolute, 5–12-spinose-serrate on each side, apex acuminate. Flowers solitary. Pedicels 1.8–2.5 cm. Sepals in 3 whorls; outer sepals ovate, ca. 4 × 3 mm, apex acute; median sepals obovate-elliptic, ca. 7 × 6 mm; inner sepals ca. 10 × 8 mm. Petals obovate, ca. 8 × 6 mm, basal glands oblong, apex slightly emarginate. Stamens ca. 5 mm; anther connective slightly prolonged, truncate. Ovules 9–12. Berry black, ovoid, ca. 10 × 6 mm, slightly pruinose, style not persistent. Fl. May, fr. Oct–Nov.

- Granite cliffs in valleys, forest understories; 2700–3000 m. SE Xizang.

**3. *Berberis temolaica*** Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941 [“*telomaica*”].

林芝小檗 lin zhi xiao bo

*Berberis temolaica* var. *artisejala* Ahrendt.

Shrubs, deciduous, to 2 m tall. Stems dark purple, terete, glabrous, not verruculose; internodes 1.5–3 cm; spines 3-fid, pale purplish brown, 5–15 mm, slightly sulcate. Petiole 1–4 mm or leaf sessile; leaf blade adaxially dark blue-green, slightly pruinose, oblong-ovate, 2–4.2 × 0.8–1.5 cm, papery, abax-

ially white pruinose, adaxially slightly pruinose, abaxially inconspicuously reticulate veined, adaxially with branched veins, base cuneate, margin entire, sometimes 1–5-aristate-dentate on each side, apex rounded. Flowers solitary. Pedicels 8–13 mm, pruinose. Sepals in 3 whorls; outer sepals ovate, ca.  $5 \times 3.2$  mm, pruinose, apex acute; median sepals obovate, ca.  $7 \times 5$  mm; inner sepals obovate-orbicular, ca.  $8 \times 7.5$  mm. Petals broadly obovate, ca.  $7 \times 6$  mm, base with separate glands, apex emarginate. Stamens ca. 4 mm; anther connective slightly prolonged, truncate or obtuse. Ovules 7–9. Berry red when mature, oblong-ovoid,  $11\text{--}14 \times 6\text{--}7$  mm, pruinose, apex bent; style persistent, short. Fl. Jun–Jul, fr. Aug–Sep.

- *Abies* forests; ca. 4000 m. Xizang.

#### 4. *Berberis dictyophylla* Franchet, Pl. Delavay. 39. 1889.

刺红珠 ci hong zhu

Shrubs, deciduous, 1–2.5 m tall. Stems blackish gray or yellow-brown; young shoots purplish red, subterete, pruinose or not; spines 3-fid, sometimes simple, pale yellow or grayish, 1–3 cm. Leaves sessile; leaf blade adaxially dark green, narrowly obovate, oblong, or elliptic,  $1\text{--}2.5 \text{ cm} \times 6\text{--}8$  mm, thickly papery or subleathery, abaxially white pruinose or not pruinose, both surfaces with raised lateral and reticulate veins, base cuneate, margin entire, apex rounded or obtuse. Flowers solitary. Pedicels 3–10 mm, sometimes pruinose. Sepals in 2 whorls; outer sepals linear-oblong, ca.  $6.5 \times 2.5$  mm; inner sepals oblong-elliptic,  $8\text{--}9 \times 4$  mm. Petals narrowly obovate, ca.  $8 \times 3\text{--}6$  mm, base clawed, with widely separated glands, apex entire. Stamens 4.5–5 mm; anther connective slightly prolonged, shortly apiculate. Ovules 3–6. Berry red, ovoid, ovoid-globose, or oblong-ovoid,  $9\text{--}14 \times 6\text{--}8$  mm, pruinose; style persistent, sometimes bent. Fl. May–Jun, fr. Jul–Sep.

- Mountain slopes, thickets, forest understories, river beaches, streamsides, forest margins, roadsides; 2500–4800 m. Qinghai, Sichuan, Xizang, Yunnan.

- 1a. Branchlets usually pruinose; leaf blade narrowly obovate or oblong, abaxially pruinose; ovules 3 or 4; fruit ovoid or ovoid-globose ..... 4a. var. *dictyophylla*  
 1b. Branchlets not pruinose; leaf blade elliptic, abaxially not pruinose; ovules 5 or 6; fruit oblong-ovoid ..... 4b. var. *epruinosa*

#### 4a. *Berberis dictyophylla* var. *dictyophylla*

刺红珠(原变种) ci hong zhu (yuan bian zhong)

Branchlets subterete, usually pruinose. Leaf blade narrowly obovate or oblong, abaxially pruinose. Ovules 3 or 4. Fruit ovoid or ovoid-globose.

- Mountain slopes, thickets, forest understories, river beaches, forest margins; 2500–4000 m. Sichuan, Xizang, Yunnan.

#### 4b. *Berberis dictyophylla* var. *epruinosa* C. K. Schneider in Sargent, Pl. Wilson. 1: 353. 1913.

无粉刺红珠 wu fen ci hong zhu

*Berberis ambrozyana* C. K. Schneider.

Branchlets slightly sulcate, not pruinose. Leaf blade elliptic, abaxially not pruinose. Ovules 5 or 6. Fruit oblong-ovoid.

- Mountain thickets, forest margins, forest understories, roadsides, streamsides; 2500–4800 m. Qinghai, Sichuan, Xizang, Yunnan.

#### 5. *Berberis approximata* Sprague, Bull. Misc. Inform. Kew 1909: 256. 1909.

近似小檗 jin si xiao bo

*Berberis dictyophylla* Franchet var. *approximata* (Sprague) Rehder; *B. stiebritziana* C. K. Schneider.

Shrubs, deciduous, 1–1.5 m tall. Stems dark brown, angulate, glabrous, sparsely verruculose; shoots reddish brown; spines 3-fid, gray or pale yellow, 1–2.1 cm, adaxially subsulcate. Leaf blade adaxially pale green, narrowly obovate, obovate, or narrowly elliptic,  $1\text{--}2.2 \text{ cm} \times 4\text{--}7$  mm, papery, abaxially pruinose, conspicuously reticulate veined, base cuneate, margin entire or 1–7-spinose-serrate on each side, apex rounded or acute. Flowers solitary. Pedicels 3–7 mm, glabrous. Sepals in 2 whorls; outer sepals elliptic, ca.  $4.5 \times 3$  mm; inner sepals obovate,  $6\text{--}7 \times 3.5\text{--}4$  mm. Petals obovate or elliptic, ca.  $5 \times 3.2$  mm, base clawed, with closely spaced glands, apex slightly emarginate; lobes acute. Stamens ca. 3.5 mm; anther connective truncate. Ovules 4–6, shortly funiculate. Berry red, ovoid,  $8\text{--}10 \times 6\text{--}7$  mm, slightly pruinose, style persistent. Fl. May–Jun, fr. Sep–Oct.

- Mountain slopes, thickets, forests, forest margins; 2900–4300 m. Qinghai, Sichuan, Xizang, Yunnan.

This species is a dominant species of thickets in the Xiangcheng region of Sichuan.

#### 6. *Berberis medogensis* T. S. Ying, Acta Phytotax. Sin. 37: 350. 1999.

矮生小檗 ai sheng xiao bo

Shrubs, low, 10–20 cm tall. Stems pale yellow, shiny, glabrous, sulcate; young branchlets dark purple, conspicuously sulcate; spines 3-fid, concolorous, 3–13 mm. Leaves sessile; leaf blade adaxially dark green, obovate,  $7\text{--}13 \times 3\text{--}5$  mm, papery, abaxially thickly pruinose, abaxially with conspicuously raised midvein and lateral veins, reticulate veins inconspicuous, adaxially with slightly raised midvein, base cuneate, margin thickened but not revolute, 1- or 2-spinose-serrate on each side, apex aristate-cuspidate. Flowers unknown. Fruit solitary; fruit stalks dark purple, to 2.3 cm, glabrous; berry red, subglobose, ca.  $1.1 \times 1$  cm, not pruinose, style not persistent; seeds 6 or 7. Fl. unknown, fr. Nov.

- Alpine thickets; 3300–3400 m. Xizang (Mêdog).

#### 7. *Berberis parisepala* Ahrendt, Gard. Chron., ser. 3, 109: 100. 1941.

等萼小檗 deng e xiao bo

*Berberis everestiana* Ahrendt var. *nambuensis* Ahrendt.

Shrubs, deciduous, to 1.5 m tall. Branches dark gray-brown, pubescent, markedly sulcate, not verruculose; shoots brownish; spines weak, 3-fid, rarely simple or 5-fid, 4–16 mm.

Petiole 2–5 mm; leaf blade shiny, abaxially pale green, adaxially yellow-green, obovate or narrowly obovate, 1.5–2.8 × 0.6–1.2 cm, papery, abaxially with slightly raised midvein, both surfaces with inconspicuous lateral and reticulate veins, base cuneate, margin entire or rarely 1–3-spinose-serrate on each side, apex rounded. Flowers solitary. Pedicels 5–12 mm, pubescent; bracteoles yellow, ovate, ca. 1.3 mm, apex acute. Sepals in 3 whorls, equal in size, 8–9 × 6.5–7.5 mm. Petals ca. 7.5 × 4 mm, basal glands separate, apex emarginate. Stamens ca. 5 mm; anther connective not prolonged, truncate. Ovules 4. Berry red, ellipsoid, 10–11 × 7–8 mm, not pruinose, style persistent. Fl. May–Jun, fr. Sep–Oct.

Thickets, alpine meadows; 3600–3900 m. Xizang [Bhutan, Myanmar, Nepal].

**8. *Berberis angulosa*** Wallich ex J. D. Hooker & Thomson, Fl. Ind. 1: 227. 1855.

有棱小檗 *you leng xiao bo*

Shrubs, deciduous, to 2 m tall. Branches dark brown, pubescent, sulcate; shoots yellow-brown, puberulous; spines simple or 3(or 5)-fid, 7–12 mm, slender, rarely puberulous. Leaf blade abaxially shiny, pale yellow-green, adaxially shiny, yellow-green, obovate, 1.5–2.5 × 0.7–1.4 cm, papery, both surfaces glabrous, inconspicuously veined, base cuneate, margin entire, apex obtuse or acute. Flowers solitary. Pedicels pendulous, 3–5 mm, pubescent; bracteoles ovate, ca. 3.5 × 2 mm, apex acuminate. Sepals in 2 whorls; outer sepals elliptic, ca. 5.5 × 3.5 mm; inner sepals obovate, ca. 9.2 × 6.1 mm. Petals obovate, ca. 6 × 4.8 mm, base clawed, glands separate and oblong, apex entire, rounded. Stamens ca. 4 mm; anther connective slightly prolonged, rounded. Ovules 6, subsessile. Berry shiny, red, subglobose, 10–12 × 9–12 mm, not pruinose, style persistent or not. Fl. May–Jun, fr. Jul–Aug.

Sparse forests, thickets, grasslands; 3500–4500 m. Qinghai, Xizang [NE India, Nepal].

**9. *Berberis qiaojiensis*** S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 1. 1985.

巧家小檗 *qiao jia xiao bo*

Shrubs, deciduous, small, 30–50 cm tall. Branches dark brown, terete, black verruculose; shoots purplish red, angulate; spines 3-fid, concolorous, slender, adaxially slightly sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially shiny, deep green, oblong-oblongate, 1–1.3 cm × 4–5 mm, papery, abaxially with markedly raised midvein and lateral veins, reticulate veins inconspicuous, not pruinose, purplish red, base cuneate, margin thickened, entire, apex rounded. Flowers unknown. Berry solitary, ellipsoid or oblong-ellipsoid, 1–1.2 cm × 5–7 mm, slightly pruinose, style not persistent; seeds 4. Fl. unknown, fr. Oct.

• Grasslands at mountain summits; ca. 3300 m. Yunnan.

**10. *Berberis woomungensis*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 4. 1985.

乌蒙小檗 *wu meng xiao bo*

Shrubs, deciduous, to 1 m tall. Branches brown, black

verruculose; shoots curved, brownish red, sulcate; spines 3-fid, 1–1.7 cm, adaxially slightly sulcate, yellow-brown. Leaves sessile; leaf blade abaxially pale green, adaxially green, oblong-obovate or oblanceolate, 1–2 cm × 5–7 mm, papery, abaxially not pruinose, midvein raised, reticulate veins not conspicuous on both surfaces, base attenuate, margin entire, apex rounded or acute. Flowers solitary. Pedicels 5–10 mm, glabrous. Sepals in 2 whorls; outer sepals oblong, ca. 7 × 3–4 mm; inner sepals oblong-elliptic, ca. 6 × 4 mm. Petals oblong-obovate, ca. 4 × 2 mm, base clawed and with approximate oblanceolate glands, apex emarginate with acute lobes. Stamens ca. 4 mm; anther connective not prolonged, truncate. Ovules 3, shortly funiculate. Berry red, oblong, ca. 10 × 5–6 mm, slightly pruinose, style not persistent. Fl. May, fr. Nov.

• Thickets; 3700–4400 m. Yunnan.

**11. *Berberis crassilimba*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 2. 1985.

厚檐小檗 *hou yan xiao bo*

Shrubs, evergreen, to 1 m tall. Branches gray-brown, terete, not verruculose; shoots purplish red, sulcate; spines 3-fid, dark yellow-brown, ca. 1.5 cm, adaxially slightly sulcate. Leaves subsessile; leaf blade adaxially green, oblong to obovate, ca. 1.2 × 0.5 cm, leathery, adaxially not pruinose, midvein and lateral veins conspicuous, base cuneate, margin thickened, entire, apex rounded, mucronate. Flowers solitary. Pedicels 4–8 mm, glabrous. Sepals in 2 whorls; outer sepals oblong-elliptic, ca. 7 × 3.5 mm, apex obtuse; inner sepals broadly obovate, ca. 7 × 5 mm, apex rounded. Petals obovate, 5–6 × 2.5–3 mm, base clawed, with separate oblong glands, apex emarginate. Stamens 3–3.5 mm; anther connective truncate. Ovules 3, funiculate. Berry globose or ellipsoid, 5–7 × 5–6 mm, not pruinose, style not persistent. Fl. Mar–Jun, fr. Oct.

• Open slopes; ca. 3600 m. Sichuan, Yunnan.

**12. *Berberis longispina*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 148. 1985.

长刺小檗 *chang ci xiao bo*

Shrubs, deciduous, 70–80 cm tall. Branches purplish red, sulcate, not verruculose; spines 5-fid, pale brown, 1.3–2 cm, adaxially sulcate. Leaves subsessile; leaf blade abaxially pale yellow-green, adaxially dark green, oblong-obovate, 4–9 × 2–3 mm, papery, abaxially not pruinose, veins inconspicuous, adaxially glabrous, base attenuate, margin entire, apex acute. Flowers solitary. Pedicels 3–5 mm, glabrous; bractlets lanceolate, ca. 3 × 1 mm. Sepals in 2 whorls; outer sepals oblong, ca. 4 × 2 mm; inner sepals obovate, ca. 4.5 × 2.2 mm. Petals obovate, ca. 3.8 × 1.5 mm, base with separate glands, apex emarginate. Stamens ca. 2.1 mm; anther connective acute. Ovules 3. Berry red, globose, ca. 7 × 7 mm, not pruinose, style not persistent. Fl. May, fr. Jun–Aug.

• Beside springs on shaded slopes; 4000–4100 m. Xizang.

**13. *Berberis muliensis*** Ahrendt, Bull. Misc. Inform. Kew 1939: 268. 1939.

木里小檗 *mu li xiao bo*

Shrubs, deciduous, to 2 m tall. Branches gray-brown, sulcate, not pruinose; shoots shiny, red; internodes 2–5 cm; spines 3-fid, yellow-brown, 1.5–3 cm, slender, sometimes absent. Petiole 2–3 mm; leaf blade abaxially sometimes grayish green, adaxially dark green, narrowly obovate or oblong-obovate, 1.5–3 × 0.3–1.1 cm, papery, abaxially pruinose, midvein raised, adaxially with slightly impressed midvein, both surfaces with conspicuous lateral and reticulate veins, base cuneate, margin applanate-entire or spinose-serrate, apex rounded or acute. Flowers solitary. Pedicels 1–3 cm, not pruinose; bractlets yellow, broadly obovate, ca. 2.5 × 2.5 mm. Sepals in 2 whorls; outer sepals ovate, 7–8 × 4–5 mm, apex acute; inner sepals obovate, 9–10 × 6–7 mm. Petals obovate, ca. 6.5 × 5.5 mm, base with narrowly elliptic glands, apex shortly emarginate. Stamens ca. 5 mm; anther connective prolonged, apiculate. Ovules 3 or 4. Berry red, ovoid or oblong-ovoid, 10–14 × 6–9 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Aug–Sep.

• Thickets, forests, river beaches by forest margins, grassy slopes, rocky slopes; 2800–4300 m. Sichuan, Xizang, Yunnan.

1a. Leaves entire ..... 13a. var. *muliensis*  
1b. Leaves spinose-serrate ..... 13b. var. *atuntzeana*

### 13a. *Berberis muliensis* var. *muliensis*

木里小檗(原变种) mu li xiao bo (yuan bian zhong)

*Berberis capillaris* Cox ex Ahrendt; *B. ludlowii* Ahrendt; *B. ludlowii* var. *capillaris* (Cox ex Ahrendt) Ahrendt; *B. ludlowii* var. *deleica* (Ahrendt) Ahrendt; *B. macrosepala* J. D. Hooker & Thomson var. *deleica* Ahrendt; *B. tianbaoshanensis* S. Y. Bao.

Leaf margin entire.

• Thickets, *Abies* forests, river beaches by forest margins; 2800–4300 m. Sichuan, Xizang, Yunnan.

13b. *Berberis muliensis* var. *atuntzeana* Ahrendt, Bull. Misc. Inform. Kew 1939: 269. 1939.

阿墩小檗 a dun xiao bo

*Berberis ludlowii* var. *saxiclivicola* Ahrendt; *B. muliensis* var. *beimanica* Ahrendt.

Leaf margin 2–7-spinose-serrate on each side.

• Thickets, grassy slopes, rocky slopes, forests, forest margins; 3100–4200 m. Sichuan, Xizang, Yunnan.

14. *Berberis tsarica* Ahrendt, J. Bot. 79(Suppl.): 48. 1941.

隐脉小檗 yin mai xiao bo

Shrubs, deciduous, low, less than 1 m tall. Branches dark purplish red or dark black, sometimes pale yellow, sulcate; shoots pubescent; internodes 5–10 mm; spines 3–5-fid, weak, 3–11 mm. Leaves sessile; leaf blade abaxially grayish or grayish white, adaxially dark green, obovate, 5–12 × 2–5 mm, herbaceous, abaxially pruinose, base cuneate, margin entire, apex obtuse. Flowers solitary. Pedicels 4–7 mm, glabrous or sparsely puberulous; bractlets red, ovate, ca. 2.3 × 1 mm, apex acute.

Sepals in 2 whorls; outer sepals ovate, 3.5–5 × 2.5–3 mm, apex acute; inner sepals oblong-obovate, 5–6.5 × 3.5–4 mm. Petals oblong-obovate, 3.5–4 × 2–2.3 mm, base cuneate with oblong-elliptic glands, apex emarginate with 2 acute lobes. Stamens 2.5–3 mm; anther connective slightly prolonged, truncate or rounded. Ovules 3 or 4, shortly funiculate. Berry obovoid, 8–9 × ca. 6 mm; style persistent, short. Fl. Jun, fr. Oct.

• Alpine thickets, thicket-meadows; 3900–4400 m. Xizang.

15. *Berberis daiana* T. S. Ying, Acta Phytotax. Sin. 37: 345. 1999.

城口小檗 cheng kou xiao bo

Shrubs, semi-evergreen, 0.5–1 m tall. Branches gray-brown, sulcate, sparsely black verruculose; shoots pale yellow, glabrous; spines 3(or 5)-fid, concolorous, 5–12 mm, slender. Petiole usually red, 2–5 mm; leaf blade abaxially pale yellow-green, adaxially deep green, elliptic-obovate or obovate, 2–5 × 1.2–2.2 cm, papery, both surfaces glabrous, abaxially not pruinose, midvein conspicuously raised, adaxially with complanate midvein, both surfaces with markedly raised reticulate veins, base cuneate, margin entire or inconspicuously 3–8(–20)-spinose-serrate on each side, sometimes conspicuously 10–20-spinose-serrate on each side, apex rounded. Flowers solitary. Pedicels 1.5–2.5 cm, stout, glabrous, tip bent. Sepals in 2 whorls; outer sepals elliptic, 7.5–8 × 4.5–5 mm; inner sepals broadly obovate-elliptic, 7–7.2 × ca. 5 mm. Petals obovate, ca. 6 × 4 mm, base clawed and with separate elliptic glands, apex narrowly incised with acute lobes. Stamens ca. 3 mm; anther connective prolonged, rounded. Ovules 11. Fruit stalk curved at apex, stout, glabrous. Berry red, subglobose, 1.3–1.5 × 1.2–1.3 cm, slightly pruinose, style not persistent; seeds 6 or 7. Fl. Jun, fr. Aug–Sep.

• Thickets on mountain slopes, weedy places, rock crevices; 2200–2500 m. Sichuan.

16. *Berberis asmyana* C. K. Schneider in Sargent, Pl. Wilson. 1: 357. 1913.

直梗小檗 zhi geng xiao bo

Shrubs, evergreen, to 1.5 m tall. Branches brownish gray, sulcate, sparsely black verruculose; spines 3-fid, weak, pale yellow, terete, 3–9 mm. Leaves subsessile; leaf blade abaxially pale green, adaxially shiny, deep green, elliptic or obovate-elliptic, 1–3 × 0.6–1 cm, thinly leathery, abaxially not pruinose, midvein markedly raised, adaxially with impressed midvein, both surfaces with inconspicuous secondary and reticulate veins, base cuneate, margin occasionally entire, otherwise 1–4-spinose-serrate on each side, apex acute. Flowers solitary. Pedicels straight, 2–4 cm, slender, glabrous; bractlets ovate, ca. 1.8 mm. Sepals in 2 whorls; outer sepals ovate, ca. 3 × 2.5 mm; inner sepals obovate-orbicular, ca. 5 × 4.5 mm. Petals obovate, ca. 4.5 × 3.2 mm, base clawed and with approximate glands, apex slightly emarginate. Stamens ca. 3.2 mm; anther connective truncate. Ovules 4 or 5, sessile. Berry ellipsoid, (6.5–)7–8 × 4–5 mm, slightly pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

• Mountain thickets, grassy slopes; 3000–3200 m. Sichuan.

**17. *Berberis multicaulis*** T. S. Ying in C. Y. Wu, Fl. Xizang, 2: 147. 1985.

多枝小檗 duo zhi xiao bo

Shrubs, small, 20–30 cm tall, much branched. Branches dark gray, sulcate; shoots pale yellow, puberulous, sparsely verruculose; spines 3-fid, pale brown or pale yellow, 5–14 mm, slender, puberulous. Leaves subsessile; leaf blade abaxially shiny, pale yellow-green, adaxially green, obovate or elliptic, 7–16 × 4–6 mm, papery, abaxially with conspicuously raised midvein, adaxially with slightly raised midvein, lateral veins 2–4 pairs, both surfaces with inconspicuous reticulate veins, not pruinose, base cuneate, margin slightly thickened, puberulous, becoming glabrous, margin entire or 1–3-spinose-serrate on each side, apex obtuse, acute, or mucronate. Flowers solitary. Pedicels 2–3 mm, glabrous; bractlets oblong-lanceolate, ca. 4 × 1.8 mm. Sepals in 2 whorls; outer sepals oblong, ca. 5 × 3 mm, apex acute; inner sepals obovate-oblong, ca. 8 × 4 mm. Petals elliptic, ca. 6 × 3.2 mm, base clawed and with separate glands, apex emarginate. Stamens ca. 4 mm; anther connective prolonged, shortly apiculate and with 1 tooth. Ovules 4. Berry red, ovoid-ellipsoid, ca. 8 × 4 mm, slightly pruinose, with short style. Fl. Jun, fr. Aug.

- Thickets on sunny slopes, grassy slopes; 3500–4200 m. Xizang.

**18. *Berberis kangdingensis*** T. S. Ying, Acta Phytotax. Sin. 37: 349. 1999.

康定小檗 kang ding xiao bo

Shrubs, deciduous, ca. 1 m tall. Stems with closely spaced branches; branches pale yellow-brown, terete or subangular, puberulous, sparsely black verruculose; spines (3 or)5-fid, pale yellow, 5–10 mm, slender. Leaves subsessile; leaf blade abaxially yellow-green, adaxially green, narrowly elliptic or obovate-elliptic, 7–11 × 2–4 mm, papery, abaxially not pruinose, midvein conspicuously raised, adaxially with raised midvein, both surfaces with markedly raised reticulate veins, base cuneate, margin entire or occasionally 1- or 2-spinose-serrate on each side, apex acute. Flowers solitary. Pedicels 4–5 mm, glabrous. Sepals in 2 whorls; outer sepals elliptic, ca. 4.5 × 3.5 mm; inner sepals obovate-oblong, ca. 5.5 × 4.1 mm. Petals obovate, ca. 5 × 3.1 mm, base cuneate and with separate elliptic glands, apex emarginate. Stamens ca. 3 mm; anther connective slightly prolonged, rounded, obtuse. Ovules 6 or 7. Berry subglobose, ca. 9 × 8 mm, thickly pruinose, style not persistent. Fl. Jun, fr. Oct–Nov.

- Rock crevices on mountain slopes; 2600–3400 m. Sichuan.

**19. *Berberis campyloptropa*** T. S. Ying in C. Y. Wu, Fl. Xizang, 2: 152. 1985.

弯果小檗 wan guo xiao bo

Shrubs, deciduous, to 1.3 m tall. Branches dark gray or purplish brown, subsulcate, black verruculose; shoots pale red; spines 3-fid or simple, weak, 4–8 mm. Leaves subsessile; leaf blade abaxially grayish white, adaxially dark green, elliptic or oblanceolate, 0.8–2 cm × 3–8 mm, papery, abaxially with markedly raised midvein, adaxially with complanate midvein,

lateral veins 3 or 4 pairs, both surfaces not pruinose, with conspicuous reticulate veins, base cuneate, margin entire or remotely 1–5-spinose-serrate on each side, apex acute. Flowers solitary, sometimes 2- or 3-fascicled. Ovules 2 or 3. Berry red, oblong, 1–1.2 cm × 4–5 mm, slightly pruinose, with bent style. Fl. unknown, fr. Aug.

- Mountain slopes, roadsides; ca. 3700 m. Xizang.

**20. *Berberis everestiana*** Ahrendt, J. Linn. Soc., Bot. 57: 116. 1961.

珠峰小檗 zhu feng xiao bo

Shrubs, deciduous, 20–30 cm tall. Branches purplish black, sulcate, glabrous; shoots pale purplish red; internodes 6–10(–20) mm; spines 3–5-fid, sometimes simple, 8–12 mm. Leaves shortly petiolate; leaf blade abaxially pale yellow-green, adaxially green, obovate, ca. 12 × 4 mm, papery, abaxially not pruinose, base attenuate, margin entire, apex rounded or acute. Flowers solitary. Pedicels 5–9 mm, glabrous; bractlets lanceolate, ca. 4 × 1 mm. Sepals in 2 whorls; outer sepals 6–7 × 4–4.5 mm; inner sepals 7–8 × 5–6 mm. Petals 6–6.5 × 3–3.5 mm, apex entire. Stamens ca. 3 mm; anther connective slightly prolonged, truncate. Ovules 3 or 4. Berry ovoid, 7–10 × 4–6 mm, without or with an extremely short style; seeds purple. Fl. Jun, fr. Aug–Sep.

Narrow valley slopes, valley floors, rocky soils, alpine thickets, alpine meadows; 3800–5000 m. Xizang [Nepal].

**21. *Berberis mianningensis*** T. S. Ying, Acta Phytotax. Sin. 37: 347. 1999.

冕宁小檗 mian ning xiao bo

Shrubs, deciduous, ca. 50 cm tall. Branches dark gray, sulcate, not verruculose; shoots pale yellow, glabrous; spines simple or 3-fid, pale yellow, terete, ca. 1 cm, slender. Leaves subsessile; leaf blade abaxially pale yellow-green, adaxially green, elliptic or narrowly elliptic, occasionally oblanceolate, 1–2 cm × 2–4 mm, papery, abaxially not pruinose, with conspicuously raised midvein, adaxially with slightly raised midvein, with 3 or 4 pairs of lateral veins, both surfaces with inconspicuous reticulate veins, base cuneate, margin entire or 1–3-spinose-serrate on each side, apex acute or rounded. Flowers solitary. Fruit green (immature), obovoid-ellipsoid, 8–9 × 4–5 mm, not pruinose, style persistent and short; seeds 1. Fl. unknown, fr. Jul–Aug.

- Thickets; 2600–2700 m. Sichuan.

**22. *Berberis minutiflora*** C. K. Schneider, Ill. Handb. Laubholz. 2: 914. 1912.

小花小檗 xiao hua xiao bo

*Berberis angulosa* Wallich ex J. D. Hooker & Thomson var. *brevipes* Franchet; *B. brevipes* (Franchet) C. K. Schneider (1908), not Greene (1901); *B. minutiflora* var. *glabramea* Ahrendt; *B. minutiflora* var. *yulungshanensis* S. Y. Bao.

Shrubs, deciduous, to 1.5 m tall. Branches pale yellow, glabrous, sulcate, scarcely black verruculose; shoots dark purple, initially pubescent, becoming glabrous; spines 3-fid, 4–12

mm. Leaves subsessile; leaf blade adaxially deep green, narrowly obovate or oblanceolate, 10–20 × 2.5–4 mm, thickly papery or subleathery, abaxially papillate, not pruinose, adaxially glabrous, both surfaces with inconspicuous reticulate veins, base cuneate, margin entire or 1–3-spinose-serrate on each side, apex acute. Flowers solitary. Pedicels 5–10 mm, slender; bractlets red, ovate, ca. 1.4 cm, apex acute. Sepals in 2 whorls; outer sepals oblong-ovate, ca. 4 × 2.2 mm, apex obtuse; inner sepals oblong-ovate, ca. 5.5 × 3 mm. Petals ca. 4.5 × 2.5 mm, base not clawed, with separate glands, apex incised with acute lobes. Stamens ca. 2.2 mm; anther connective slightly prolonged, rounded. Ovules 2. Berry red, ovoid or ovoid-ellipsoid, 6–9(–12) × 5–7 mm, sometimes slightly pruinose, style not persistent. Fl. Apr–Jun, fr. Sep–Oct.

• Thickets, grassy slopes, rocky slopes, *Pinus densata* forests; 2500–3800 m. Sichuan, Xizang, Yunnan.

**23. *Berberis graminea*** Ahrendt, J. Bot. 80(Suppl.): 110. 1942.

狭叶小檗 xia ye xiao bo

Shrubs, deciduous, low, ca. 30 cm tall. Branches purplish brown; shoots dark green, sparsely black verruculose, glabrous; spines simple, 3(or 5)-fid, concolorous, 6–12 mm. Leaves subsessile; leaf blade abaxially grayish green, adaxially dark green, narrowly obovate, 8–20 × 2–6 mm, papery, abaxially slightly pruinose, scarcely papillose, adaxially with veins branched, scarcely reticulate, base cuneate, margin entire, occasionally 2- or 3-spinose-serrulate on each side, conspicuously revolute, apex acute or near rounded. Flowers solitary. Pedicels 1–3 mm, glabrous; bractlets oblong-elliptic, ca. 2.5 mm. Sepals in 2 whorls; outer sepals oblong-ovate, ca. 5 × 3 mm; inner sepals elliptic-obovate, 6–6.5 × 5–5.3 mm. Petals ca. 5.3 × 4–4.5 mm, base with separate, elliptic glands, apex incised with rounded lobes. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, oblong, 6–8 × 4–5 mm, not pruinose; style persistent and short, or not persistent. Fl. May–Jun, fr. Sep–Oct.

• Grassy mountain slopes, *Pinus* forests; 3000–3600 m. Sichuan.

**24. *Berberis verruculosa*** Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 151. 1906.

疣枝小檗 you zhi xiao bo

Shrubs, evergreen, to 1 m tall. Branches brownish yellow, terete, densely verruculose; shoots yellow green, densely pubescent and verruculose; spines pale yellow, 1–2 cm, adaxially subsulcate. Leaves subsessile; leaf blade abaxially grayish green, adaxially shiny, dark green, obovate-elliptic or elliptic, 1–2 × 0.6–1.1 cm, leathery, abaxially pruinose, densely papillose, midvein conspicuously raised, lateral veins 3 or 4 pairs, adaxially with midvein impressed, both surfaces with inconspicuous reticulate veins, base cuneate, margin slightly revolute, 2–4-spinose-serrate on each side, apex acute. Flowers solitary. Pedicels 4–10 mm, glabrous. Sepals in 3 whorls; outer sepals ovate, ca. 4 × 3 mm; median sepals ovate, ca. 6 × 5 mm; inner sepals obovate, ca. 10 × 8 mm. Petals elliptic or obovate, 5.5–6 × ca. 3 mm, base cuneate, with separate glands, apex emarginate or retuse with rounded lobes. Stamens ca. 3.5 mm; anther connective slightly prolonged, rounded. Ovules 4–6.

Berry oblong-ovoid, 10–12 × 6–7 mm, pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

• Thickets, rock crevices, forests; 1900–3200 m. Gansu, Sichuan, Yunnan.

**25. *Berberis concinna*** J. D. Hooker, Bot. Mag. 79: t. 4744. 1853.

雅洁小檗 ya jie xiao bo

Shrubs, semi-evergreen, low. Stems stout, glabrous, very sulcate; branches shiny, dark red, sometimes scarcely verruculose; internodes 1–2 cm; spines 3-fid, orange, 1–1.3 cm, sulcate. Petiole 1–5 mm; leaf blade abaxially grayish white, adaxially shiny, dark green, oblong-obovate, 1–3 × 0.5–1.4 cm, abaxially papillate, adaxially lateral veins 3 or 4 pairs, base cuneate, margin 3–5-spinose-serrate, apex rounded, mucronulate. Flowers solitary. Pedicels 1.5–2 cm; bractlets red, oblong-triangular, 2–2.5 × 1.5–2 mm. Sepals in 3 whorls; outer sepals oblong-ovate, 4–6 × 3–4 mm, apex subacute; median and inner sepals obovate, equal in size, 9–10 × 6–7 mm. Petals obovate, ca. 6.5 × 4–5 mm, base with concolorous glands, apex emarginate with rounded lobes. Stamens 4–4.5 mm; anther connective not prolonged, truncate. Ovules 6–8. Berry dark red, oblong, 13–16 × 6–8 mm. Fl. Jun–Jul, fr. Sep–Oct.

Habitat unknown; ca. 3700 m. Xizang [India (Sikkim), Nepal].

**26. *Berberis alpicola*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 253. 1939.

高山小檗 gao shan xiao bo

Shrubs, evergreen, to 1.3 m tall. Branches pale gray, sulcate; spines 3-fid, terete, 1–1.5 cm. Leaves shortly petiolate; leaf blade abaxially shiny, pale green, adaxially shiny, green, elliptic to oblong-elliptic, 1–2.5 × 0.7–1 cm, leathery, abaxially not pruinose, midvein and lateral veins markedly raised, adaxially with impressed midvein, lateral veins conspicuous, base cuneate, margin sometimes revolute, 2–8-spinose-serrate on each side, apex acute. Flowers solitary. Pedicels 1.2–1.6 cm, glabrous. Sepals in 2 whorls; outer sepals smaller than inner sepals. Petals 6, base with separate glands. Stamens 9. Ovules 4, sessile. Berry black, ellipsoid, ca. 8 × 5 mm, not pruinose; style persistent, short. Fl. May–Jun, fr. Sep–Oct.

• Streamsides in mountain regions; ca. 3600 m. Taiwan.

**27. *Berberis sibirica*** Pallas, Reise Russ. Reich. 2: 737. 1773.

西伯利亚小檗 xi bo li ya xiao bo

*Berberis borealisinensis* Nakai.

Shrubs, deciduous, to 1 m tall. Branches dark gray, glabrous; shoots reddish brown, puberulous, sulcate; spines 3–9-fid, 3–11 mm, slender, spreading at base to 2 mm wide, or partly leaflike. Petiole 3–5 mm; leaf blade abaxially pale yellow-green, adaxially deep green, obovate, oblanceolate, or obovate-oblong, 1–2.5 cm × 5–8 mm, papery, abaxially not pruinose, both surfaces with conspicuous raised veins, lateral veins 4 or 5 pairs, base cuneate, margin sometimes repand, coarsely 4–7-aristate-dentate on each side, apex rounded, obtuse, or aristate. Flowers solitary. Pedicels 7–12 mm, glabrous. Sepals in 2

whorls; outer sepals oblong-ovate, ca.  $4 \times 2$  mm; inner sepals obovate, ca.  $4.5 \times 2.5$  mm. Petals obovate, ca.  $4.5 \times 2.5$  mm, base with separate glands, apex shortly emarginate. Stamens 2.5–3 mm; anther connective truncate. Ovules 5–8. Berry red, obovoid,  $7-9 \times 6-7$  mm, not pruinose, style not persistent. Fl. May–Jul, fr. Aug–Sep.

Alpine slopes, talus slopes, desert regions, forests; 1400–3000 m. Hebei, Nei Mongol, Shanxi, Xinjiang, NE China [Mongolia, Russia (Siberia)].

**28. *Berberis erythroclada*** Ahrendt, J. Bot. 79(Suppl.): 49. 1941.

红枝小檗 hong zhi xiao bo

*Berberis erythroclada* var. *trulungensis* Ahrendt.

Shrubs, deciduous, to 1.5 m tall. Branches shiny, dark red, glabrous, sulcate; internodes 8–25 mm; spines (3–)5–7(–9)-fid, orange, 5–10 mm. Leaves subsessile; leaf blade abaxially ultimately pale dark green, adaxially dark green, obovate or obovate-elliptic, 1–2.8 cm  $\times$  3–15 mm, papery, abaxially initially slightly grayish pruinose, midvein conspicuously raised, adaxially veins obviously branched or openly reticulate, base cuneate, margin 1–15-spinose-serrate on each side, apex rounded or obtuse. Flowers solitary. Pedicels 1.5–2.5 cm, very slender. Sepals in 2 whorls; outer sepals oblong-elliptic,  $5.5-6.5 \times 3-3.7$  mm; inner sepals obovate,  $7-8 \times 4-4.5$  mm, (sometimes outer and inner sepals equal). Petals obovate,  $5-6.5 \times 2.5-4.5$  mm, base with separate narrowly oblong glands, apex subentire. Stamens 3–4 mm; anther connective slightly prolonged, subtuse. Ovules 6–9, often funiculate. Berry unknown. Fl. Jun–Jul, fr. unknown.

• Slopes; 4000–4300 m. Xizang.

**29. *Berberis fengii*** S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 3. 1985.

大果小檗 da guo xiao bo

Shrubs, deciduous, to 1 m tall. Branches dark brown, sulcate, black verruculose; spines 3-fid, yellow-brown, 1.5–2.5 cm, slender, adaxially slightly sulcate. Petiole 2–3 mm; leaf blade adaxially olivaceous, elliptic or obovate,  $1.5-2.5 \times 0.5-1.5$  cm, papery, abaxially slightly pruinose, midvein and lateral veins obviously raised, reticulate veins conspicuous, adaxially with slightly raised midvein, lateral and reticulate veins conspicuous, base cuneate, margin closely spinulose-subserrulate, apex rounded, mucronate. Flowers unknown. Fruit solitary; stalk ca. 1 cm, stout; berry red, broadly ellipsoid, ca.  $2 \times 1.2-1.4$  cm, blue pruinose, style not persistent; seeds 6 or 7. Fl. unknown, fr. Oct.

• Grassy slopes; 3000–3700 m. Yunnan.

**30. *Berberis paraspecta*** Ahrendt, J. Linn. Soc., Bot. 57: 47. 1961.

鸡脚连 ji jiao lian

Shrubs, evergreen, to 2 m tall. Branches brown; shoots stramineous, glabrous, sulcate; spines 3-fid, concolorous, to 3 cm, stout. Leaves subsessile; leaf blade lanceolate,  $3-6.5 \times 0.7-1$  cm, subleathery, abaxially with raised midvein, lateral veins inconspicuous, adaxially with complanate or slightly impressed

midvein, lateral veins conspicuous, base cuneate, margin 7–15-spinose-serrate on each side, apex acute or shortly acuminate. Flowers solitary. Pedicels 3–4 mm. Berry black, oblong,  $9-12 \times 6-7$  mm, blue pruinose, style not persistent; seeds 1 or 2. Fl. unknown, fr. Nov.

• Forest understories; 2500–2700 m. Yunnan.

**31. *Berberis hobsonii*** Ahrendt, J. Linn. Soc., Bot. 57: 137. 1961.

毛梗小檗 mao geng xiao bo

Shrubs, deciduous, to 2 cm tall. Branches deep gray, sulcate, puberulous; spines simple or 3-fid, weak, 0.6–1.7 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially deep green, obovate or oblanceolate,  $1.5-3.5 \times 0.8-1.5$  cm, abaxially not pruinose, midvein and lateral veins markedly raised, adaxially veins inconspicuous, base cuneate, margin puberulous, entire, occasionally 1- or 2-spinose-serrate on each side, apex obtuse. Flowers 5–10-fascicled or subfascicled. Pedicels 6–12 mm, densely puberulous. Sepals in 2 whorls; outer sepals ca.  $3.5 \times 2$  mm; inner sepals ca.  $5 \times 3$  mm. Petals ca.  $4.5 \times 3$  mm, base with separate glands, apex entire. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 5 or 6. Berries red, subglobose,  $8-9 \times 7-8$  mm, not pruinose, style not persistent. Fl. Jun–Jul, fr. Aug–Sep.

• *Abies* forests, *Quercus* forests, thickets; 3400–4300 m. Xizang.

**32. *Berberis reticulineris*** T. S. Ying, Acta Phytotax. Sin. 37: 305. 1999, not *B. reticulineris* (C. Y. Wu ex S. Y. Bao) Laferrière (1997).

芒康小檗 mang kang xiao bo

Shrubs, deciduous, 1–2 m tall. Branches terete, glabrous; shoots pale gray, sulcate; spines 3-fid, pale yellow, 1–2.5 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially dark green, oblanceolate or elliptic,  $0.7-2.1$  cm  $\times$  3–8 mm, papery, abaxially not pruinose, adaxially glabrous, both surfaces with conspicuous reticulate veins, base attenuate, margin entire or 1–4-spinose-serrate on each side, apex acute. Flowers 3- or 4-fascicled. Pedicels 1–2 mm or 1–1.5 cm, slender, glabrous. Sepals in 3 whorls; outer sepals lanceolate-oblong, ca.  $3 \times 1$  mm; median sepals elliptic, ca.  $4 \times 2$  mm; inner sepals oblong-elliptic or obovate-oblong,  $5.5-6 \times 2.5-2.7$  mm. Petals elliptic, base cuneate, with separate glands, apex acute, incised with acute lobes. Stamens ca. 2.5 mm; anther connective prolonged, rounded. Ovules (2 or)3, very shortly funiculate. Fruit unknown. Fl. Jun–Jul, fr. Aug–Oct.

• Forest margins, sunny slopes; ca. 1600 m or 3400–3900 m. Gansu, Sichuan, Xizang.

1a. Pedicels 10–15 mm; inner sepals

oblong-elliptic ..... 32a. var. *reticulineris*

1b. Pedicels 1–2 mm; inner sepals

obovate-oblong ..... 32b. var. *brevipedicellata*

**32a. *Berberis reticulineris* var. *reticulineris***

芒康小檗(原变种) mang kang xiao bo (yuan bian zhong)

Pedicels 1–1.5 cm, slender, glabrous. Inner sepals oblong-elliptic.

- Forest margins; 3400–3900 m. Sichuan, Xizang.

**32b. *Berberis reticulineris* var. *brevipedicellata*** T. S. Ying, *Acta Phytotax. Sin.* 37: 307. 1999.

无梗小檗 wu geng xiao bo

Pedicels very short, 1–2 mm, glabrous. Inner sepals obovate-oblong.

- Sunny slopes; ca. 1600 m. Gansu.

**33. *Berberis yunnanensis*** Franchet, *Bull. Soc. Bot. France* 33: 388. 1886.

云南小檗 yun nan xiao bo

Shrubs, deciduous, to 1 m tall. Branches yellow-brown; shoots dark red, sulcate, black verruculose; spines 3-fid, 1–2.5 cm, slender. Leaves shortly petiolate; leaf blade abaxially pale green, adaxially dark green, becoming purplish red in autumn, obovate or oblong-obovate, 3–6 × 1–2 cm, papery, abaxially papillose, midvein and lateral veins slightly raised, adaxially with 3 or 4 pairs of lateral veins, base attenuate, cuneate, margin usually entire, occasionally 2- or 3-spinose-serrate on each side, apex rounded or mucronate. Flowers usually 2–4-fascicled, sometimes to 10-flowered. Pedicels 2–4 cm, glabrous. Sepals in 2 whorls; outer sepals oblong-obovate, ca. 5 × 2.5 mm; inner sepals similar to outer sepals in form, 7–8 × 4–5 mm. Petals obovate, ca. 5 × 3 mm, base with separate glands, apex emarginate, with rounded lobes. Stamens ca. 4 mm; anther connective prolonged, subapiculate. Ovules 2 or 3. Berry purplish red, oblong-ovoid, 10–12 × 5–7 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Aug–Oct.

- Understories of *Picea* forests, margins of *Abies* forests, thickets, grassy slopes; 3100–4200 m. Sichuan, Xizang, Yunnan.

**34. *Berberis ulicina*** J. D. Hooker & Thomson, *Fl. Ind.* 1: 227. 1855.

尤里小檗 you li xiao bo

Shrubs, deciduous, to 1 m tall. Branches and shoots pale purplish red, sometimes slightly grayish white, terete; spines 3-fid, pale yellow, 0.8–2.5 cm, stout, adaxially sulcate. Leaves sessile; leaf blade abaxially gray-green, adaxially dark green, linear-oblancoolate, 0.8–2.2 cm × 1–4 mm, abaxially not pruinose, midvein slightly raised, lateral and reticulate veins inconspicuous, adaxially inconspicuously veined, base attenuate, margin 1–3-spinose-serrate on each side, occasionally entire, apex aristate. Flowers 3–5-fascicled, sometimes forming a subracemose inflorescence. Pedicels 2–5 mm. Sepals in 2 whorls; outer sepals lanceolate, 4–4.5 × 0.8–1 mm; inner sepals obovate-oblong, 6–6.5 × 3–3.5 mm. Petals oblanceolate, 5–5.1 × 2–2.2 mm, base clawed, with very separate glands, apex incised with acute lobes. Stamens 3–3.5 mm; anther connective not prolonged, shortly apiculate. Ovary 3–3.2 mm; ovules 3–5. Berry black or red, globose, 3–3.5 × ca. 3 mm, not pruinose, style ca. 0.8 mm; seeds 5. Fl. May–Jun, fr. Jul–Aug. *2n* = 28.

- Slopes, floodlands, mixed forests, streamsides; 2500–3700 m. Xinjiang, W Xizang [Kashmir].

**35. *Berberis nullinervis*** T. S. Ying in C. Y. Wu, *Fl. Xizang.* 2: 141. 1985.

无脉小檗 wu mai xiao bo

Shrubs, deciduous, to 1.5 m tall. Branches dark gray; shoots red, slightly sulcate, glabrous; spines 3-fid, 5–11 mm. Leaves subsessile; leaf blade adaxially green, elliptic or oblanceolate, 1.2–2.1 cm × 5–8 mm, papery, abaxially rugose, veins very inconspicuous, adaxially smooth, midvein impressed, base cuneate, margin entire, occasionally 1- or 2-spinose-serrate on each side, apex acuminate or acute. Flowers 3- or 4-fascicled. Ovules 2. Fruit stalk 8–11 mm, glabrous; berry red, ellipsoid, ca. 9 × 5 mm, scarcely pruinose; style not persistent, sometimes apex slightly bent; seeds 2. Fl. unknown, fr. Aug–Sep.

- Streamsides in thickets, foot of mountains; 4200–4300 m. Xizang (Namling).

**36. *Berberis hypericifolia*** T. S. Ying in C. Y. Wu, *Fl. Xizang.* 2: 140. 1985.

异叶小檗 yi ye xiao bo

Shrubs, deciduous, 1–2 m tall. Branches shiny, purplish red, not sulcate, sparsely black verruculose; internodes 1.2–3 cm; spines simple, concolorous, 6–10 mm. Petiole 2–5 mm; leaf blade abaxially pale yellow-green, brown when dry, adaxially dark green, obovate, occasionally suborbicular, 0.7–2.5 × 0.4–1.7 cm, papery, abaxially with conspicuous midvein and lateral veins, adaxially inconspicuously veined, base cuneate, margin entire, occasionally 1- or 2-spinose-serrate on each side, apex obtuse or rounded, mucronate. Flowers 3–6-fascicled. Pedicels 8–14 mm. Ovules 3. Berry red, oblong, ca. 10 × 5 mm, not pruinose, style not persistent; seeds 3. Fl. unknown, fr. Aug–Sep.

- In slash; ca. 4300 m. Xizang.

**37. *Berberis tsienii*** T. S. Ying, *Acta Phytotax. Sin.* 37: 307. 1999.

永思小檗 yong si xiao bo

Shrubs, deciduous, ca. 1.5 m tall. Branches and shoots dark brown, very conspicuously sulcate, glabrous; spines 3-fid, weak, pale yellow, 2–5 mm. Leaves sessile; leaf blade abaxially yellow-green, adaxially shiny, dark green, elliptic or obovate-elliptic, sometimes obovate, 7–15 × 3–6 mm, papery, abaxially midvein slightly raised, lateral and reticulate veins inconspicuous, not pruinose, adaxially veins inconspicuous, base cuneate, margin 1–3-spinose-serrulate on each side, apex acute. Flowers unknown. Infructescence with 3–6-fascicled berries; fruit stalk purplish red, 3–4 mm, glabrous; berry ellipsoid, 6–8 × ca. 3 mm, not pruinose; style persistent, short; seeds 1. Fl. Jun–Jul, fr. Jul–Aug.

- Thickets; ca. 2100 m. Guizhou.

**38. *Berberis morrisonensis*** Hayata, *J. Coll. Sci. Imp. Univ. Tokyo* 30(1): 25. 1911.

玉山小檗 yu shan xiao bo

Shrubs, deciduous. Branches dark red, sparsely verruculo-

lose; shoots green; spines 3-fid, 1–1.5 cm. Leaves shortly petiolate; leaf blade abaxially pale green, sometimes gray-white, adaxially dark green, obovate or obovate-lanceolate, 1.5–2.5 × 0.5–1 cm, both surfaces with conspicuously raised reticulate veins, base attenuate, margin 4–7-spinose-serrate on each side, apex rounded, obtuse. Flowers 2–5-fascicled, rarely solitary. Pedicels often pendulous, 1.2–2.5 cm, slender. Sepals in 3 whorls; outer sepals lanceolate or narrowly ovate, 4–4.5 × 1.5–2.5 mm, apex acuminate; median sepals oblong-elliptic, 5.5–6.5 × 3–3.5 mm; inner sepals narrowly obovate, ca. 7.5 × 4 mm. Petals broadly elliptic, 5–6 × 3.5–4 mm, apex emarginate. Anther connective obtuse or truncate. Ovules 4–7. Berry scarlet, subglobose, 8–9 × 7–8 mm. Fl. and fr. unknown.

- Alpine areas; 3000–4300 m. Taiwan.

**39. *Berberis yui*** T. S. Ying, Acta Phytotax. Sin. 37: 309. 1999 [“*yui*”].

德浚小檗 *de jun xiao bo*

Shrubs, deciduous, ca. 1.5 m tall. Branches deep gray, not verruculose; shoots pale gray, sulcate; spines 3-fid, pale yellow, 0.5–1.6 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially dark green, oblanceolate or obovate-elliptic, 1–2.5 cm × 4–9 mm, papery, abaxially not pruinose, both surfaces with markedly raised reticulate veins, base attenuate, margin closely 9–16-spinulose-serrulate on each side, apex rounded, obtuse, occasionally acute. Flowers 5–8-fascicled. Pedicels 1.2–1.7 cm, glabrous; bractlets lanceolate, ca. 2.5 × 0.6 mm. Sepals in 3 whorls; outer sepals lanceolate, ca. 4.2 × 1.5 mm; median sepals elliptic, ca. 4.5 × 2 mm; inner sepals elliptic, ca. 4 × 2 mm. Petals obovate, ca. 3.5 × 2 mm, base clawed, with separate glands, apex incised. Stamens ca. 2.5 mm; anther connective prolonged, rounded, obtuse. Ovules 2, funiculate. Fruit unknown. Fl. Jun, fr. unknown.

- Thickets, alpine meadows, grassy slopes; 3600–4200 m. Sichuan.

**40. *Berberis diaphana*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 23: 309. 1877.

鲜黄小檗 *xian huang xiao bo*

*Berberis diaphana* var. *uniflora* Ahrendt.

Shrubs, deciduous, 1–3 m tall. Shoots green; branches gray, sulcate, verruculose; spines 3-fid, pale yellow, 1–2 cm, stout. Leaves shortly petiolate; leaf blade abaxially pale green, adaxially dark green, oblong or obovate-oblong, 1.5–4 × 0.5–1.6 cm, papery, abaxially sometimes slightly pruinose, adaxially with raised lateral and reticulate veins, base cuneate, margin 2–14-spinose-serrate on each side, occasionally entire, apex slightly obtuse. Flowers 2–5-fascicled, occasionally solitary. Pedicels 1.2–2.2 cm. Sepals in 2 whorls; outer sepals subovate, ca. 8 × 5.5 mm; inner sepals elliptic, ca. 9 × 6 mm. Petals ovate-elliptic, 6–7 × 5–5.5 mm, base clawed, with separate glands, apex acute, incised. Stamens ca. 4.5 mm; anther connective truncate. Ovules 6–10. Berry red, ovoid-oblong, 1–1.2 cm × 6–7 mm, occasionally pruinose; style persistent, apex slightly bent. Fl. May–Jun, fr. Jul–Sep.

- Thickets, meadows, forests, forest margins; 1600–3200 m. Gansu, Qinghai, Shaanxi.

**41. *Berberis circumserrata*** (C. K. Schneider) C. K. Schneider in Sargent, Pl. Wilson. 3: 435. 1917.

秦岭小檗 *qin ling xiao bo*

Shrubs, deciduous, to 1 m tall. Branches yellow or yellowish brown, sulcate, sparsely black verruculose; internodes 1.5–4 cm; spines 3-fid, 1.5–3 cm. Leaves very shortly petiolate; leaf blade abaxially gray-white, adaxially dark green, obovate-oblong or obovate, occasionally suborbicular, 1.5–3.5 × 0.5–2.5 cm, papery, abaxially pruinose, both surfaces with conspicuously raised reticulate veins, base attenuate, margin closely 15–40-spinulose-serrulate on each side, apex rounded. Flowers 2–5-fascicled. Pedicels (0.8–)1.5–3 cm, glabrous. Sepals in 2 or 3 whorls; outer sepals oblong-elliptic, 7–8 × 4–5 mm; inner sepals obovate-oblong, 9–10 × 6–7 mm. Petals obovate, 7–7.5 × 4–4.5 mm, base clawed, with separate glands, apex entire or emarginate. Stamens ca. 4 mm; anther connective rounded or truncate. Ovules (3–)6 or 7(or 8). Berry red, ellipsoid or oblong, (1–)1.3–1.5 cm × 5–6(–7) mm, not pruinose, style persistent. Fl. May, fr. Jul–Sep.

- Mountain slopes, ridges, forest margins, thickets, runlet sides; 1400–3500 m. Gansu, Henan, Hubei, Qinghai, Shaanxi.

- 1a. Sepals in 2 whorls; petals entire at apex; ovules (3–)6 or 7(or 8) ..... 41a. var. *circumserrata*
- 1b. Sepals in 3 whorls; petals emarginate at apex; ovules 3–5 ..... 41b. var. *occidentior*

**41a. *Berberis circumserrata* var. *circumserrata***

秦岭小檗(原变种) *qin ling xiao bo* (yuan bian zhong)

*Berberis diaphana* Maximowicz var. *circumserrata* C. K. Schneider in Sargent, Pl. Wilson. 1: 354. 1913; *B. circumserrata* var. *subarmata* Ahrendt.

Pedicels 1.5–3 cm. Sepals in 2 whorls. Petals entire at apices. Ovules (3–)6 or 7(or 8). Fruit 1.3–1.5 cm × 5–6 mm.

- Mountain slopes, forest margins, thickets, runlet sides; 1400–3300 m. Gansu, Henan, Hubei, Qinghai, Shaanxi.

**41b. *Berberis circumserrata* var. *occidentior*** Ahrendt, J. Linn. Soc., Bot. 57: 122. 1961.

多萼小檗 *duo e xiao bo*

Pedicels 0.8–1.5 cm. Sepals in 3 whorls. Petals emarginate at apices. Ovules 3–5. Fruit 1–1.2 cm × 6–7 mm.

- Ridges; ca. 3500 m. SW Gansu.

**42. *Berberis aemulans*** C. K. Schneider in Sargent, Pl. Wilson. 3: 434. 1917.

峨眉小檗 *e mei xiao bo*

*Berberis diaphana* Maximowicz var. *tachiensis* Ahrendt, P.P.

Shrubs, deciduous, to 2 m tall. Branches dark purple, black verruculose; shoots green, sulcate; spines 3-fid, orange, 6–10 mm, adaxially slightly sulcate. Petiole 2–5 mm; leaf blade abaxially pale gray, adaxially dark green, oblong-obovate or elliptic, 2–4 × 1–2 cm, papery, abaxially pruinose, adaxially

with reticulate veins, base cuneate, margin 5–12-spinose-serrate on each side, apex rounded, obtuse. Flowers 2–4-fascicled, occasionally solitary or 2 or 3 flowers in simple racemes. Pedicels 2–3 cm. Sepals in 2 whorls, oblong-elliptic; outer sepals 7–7.5 × 4–4.5 mm; inner sepals 7.5–8 × 4.5–5 mm. Petals oblong, ca. 5 × 3.7 mm, base with separate glands, apex entire. Stamens ca. 4 mm; anther connective prolonged, apiculate. Ovules 7–11. Berry orange, ovoid, 1.5–1.6 cm × 7–8 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Oct.

- Thickets, roadsides, slopes; 2900–3200 m. Sichuan.

**43. *Berberis hypoxantha*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 6. 1985.

黄背小檗 huang bei xiao bo

Shrubs, evergreen, to 2 m tall. Branches black-gray, terete, not spinose. Petiole 4–6 mm; leaf blade abaxially becoming stramineous when dry, adaxially green, oblong or broadly ovate, 3–4 × 2–2.5 cm, leathery, abaxially not pruinose, with inconspicuous lateral and reticulate veins, adaxially with slightly conspicuous lateral veins, base cuneate, apex rounded. Flowers unknown. Fruit stalk 1.8–2 cm, glabrous; berry green (immature), 4–12-fascicled, oblong, pruinose, style not persistent. Fl. unknown, fr. May.

- Forest margins at mountain summits. SE Yunnan (Xichou).

**44. *Berberis holocraspedon*** Ahrendt, J. Bot. 79(Suppl.): 22. 1941.

风庆小檗 feng qing xiao bo

Shrubs, evergreen, 1–2 m tall. Stems terete; branches grayish brown; shoots pale yellow, glabrous, sparsely black verruculose; spines 3-fid, pale yellow, 7–20 mm. Petiole 2–3 mm; leaf blade abaxially gray, adaxially dark green and shiny, oblong-lanceolate or oblong-elliptic, 4–10 × 1.5–2.5 cm, leathery, abaxially sometimes slightly pruinose, with raised midvein, lateral veins conspicuous, adaxially with slightly impressed midvein, lateral veins slightly conspicuous, both surfaces with inconspicuous reticulate veins, base cuneate, margin very slightly revolute, entire or 1- or 2-spinose-subserulate on each side, apex obtuse, apiculate. Flowers unknown. Infructescence with 3–12 fascicled berries; fruit stalk reddish, 1–1.5 cm, stout; berry black, ellipsoid, 7–10 × ca. 6 mm, not pruinose, style not persistent; seeds 2. Fl. unknown, fr. Jun–Nov.

- Dry slopes, thickets, bamboo forests; 1700–3100 m. Yunnan.

**45. *Berberis ziyunensis*** P. K. Hsiao & Z. Yu Li, Acta Bot. Yunnan. 21: 30. 1999.

紫云小檗 zi yun xiao bo

Shrubs, evergreen, 1.5–2.5 m tall. Branches dark gray, terete, glabrous; shoots purplish black, shiny; spines absent or very weak, 3-fid, pale yellow, 5–6 mm. Petiole 2–3 mm; leaf blade abaxially pale yellow, adaxially deep green, elliptic or narrowly elliptic, occasionally oblanceolate, 4–11 × 1–3 cm, thickly leathery, abaxially slightly pruinose, midvein conspicuously raised, lateral veins inconspicuous, adaxially with impressed midvein, lateral veins inconspicuous, base cuneate, margin slightly revolute, entire or inconspicuously 1–3-spinu-

lose-subserulate on each side, apex acuminate or acute. Flowers 4–10-fascicled, sometimes to 25 flowers. Pedicels purplish brown when dry, 1.5–2 cm, glabrous; bractlets triangular-ovate, ca. 2.2 × 1 mm. Outer sepals oblong, ca. 2.2 × 1.9 mm; inner sepals obovate, ca. 4 × 2.5 mm. Petals obovate, ca. 3.5 × 3 mm, base not clawed, with separate glands, apex entire. Stamens ca. 2.3 mm; anther connective truncate. Ovules 2, shortly funiculate. Berry dark red, ellipsoid; style persistent, short. Fl. Mar–Apr, fr. Apr–May.

- Thickets; 1000–1300 m. Guizhou.

**46. *Berberis pingshanensis*** W. C. Sung & P. K. Hsiao, Acta Phytotax. Sin. 12: 387. 1974.

屏山小檗 ping shan xiao bo

Shrubs, evergreen, to 2 m tall. Branches gray; shoots purplish brown, sulcate, glabrous; spines 3-fid, concolorous with shoots, ca. 5 mm. Petiole 2–3 mm; leaf blade abaxially brown when dry, adaxially deep green, elliptic, 8–17 × 3.5–7 cm, subleathery, abaxially not pruinose, midvein conspicuously raised, lateral and reticulate veins slightly raised, adaxially with impressed midvein, lateral veins slightly raised, base broadly cuneate or subrounded, margin entire, apex acute. Flowers 8–20-fascicled. Pedicels purplish brown, 1.5–3 cm, glabrous; bractlets ovate-triangular, ca. 1 mm. Sepals in 2 whorls; outer sepals broadly elliptic, ca. 4 × 3 mm; inner sepals suborbicular or reniform-orbicular, ca. 4 × 4–5 mm. Petals suborbicular, base with separate glands, apex entire or obtusely emarginate. Stamens ca. 2 mm; anther connective truncate. Ovules 2, funicles ca. as long as ovules. Berry black, not or slightly pruinose. Fl. May–Jun, fr. Jun–Jul.

- Roadsides, sides of rocks; ca. 800 m. Sichuan.

**47. *Berberis obovatifolia*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 146. 1985.

裂瓣小檗 lie ban xiao bo

Shrubs, evergreen, low, ca. 0.5 m tall. Stems sulcate; branches gray; shoots pale red, glabrous; spines 3-fid, pale yellow, 8–20 mm. Leaves sessile; leaf blade abaxially shiny, green, adaxially dark green, obovate, 1–2.3 × 0.5–1.4 cm, thinly leathery, abaxially openly reticulate, not pruinose, adaxially openly veined, base cuneate, margin entire, apex rounded, mucronate. Flowers 2–4-fascicled. Sepals in 2 whorls; outer sepals elliptic, ca. 3.6 × 1.6–2 mm; inner sepals oblong-elliptic, ca. 6.5 × 4 mm. Petals broadly elliptic, ca. 4.7 × 3.1 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective truncate. Ovules 2, shortly funiculate. Immature fruit seen, style not persistent. Fl. May, fr. Jun–Jul.

- Beside ditches on mountains; ca. 3900 m. Xizang.

**48. *Berberis wuyiensis*** C. M. Hu, Bull. Bot. Res., Harbin 6(2): 7. 1986.

武夷小檗 wu yi xiao bo

Shrubs, evergreen, 1–1.5 m tall. Branches gray; shoots pale yellow, sulcate, sparsely verruculose; internodes 3–6 cm; spines 3-fid, pale yellow-brown, subterete, 1–2 cm. Petiole 1–3 mm; leaf blade adaxially dark green, oblanceolate or elliptic-

obovate, 3.5–7 × 0.8–1.6 cm, leathery, abaxially not pruinose, midvein markedly raised, lateral veins conspicuous, reticulate veins inconspicuous, adaxially with impressed midvein, lateral and reticulate veins inconspicuous, base cuneate, margin 2–4(–6)-serrate on each side, occasionally entire, apex acute, aristate. Flowers 6–12-fascicled. Pedicels reddish, 8–10 mm; bractlets lanceolate, 1.8–2.5 mm. Sepals in 2 whorls; outer sepals lanceolate or ovate-lanceolate, 3–3.5 mm; inner sepals oblong, 3.5–4.5 mm. Petals obovate, 3–4.5 mm, base slightly clawed, with glands, apex emarginate. Stamens 2.5–3.5 mm; anther connective obtuse or mucronate. Ovules (1 or) 2. Berry elliptic-oblong, ca. 7.5 mm, not pruinose, style persistent. Fl. May–Jun, fr. Jul–Sep.

• Sparse forests, thickets at mountain summits; 1900–2100 m. Fujian, Jiangxi.

**49. *Berberis replicata*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 200. 1919.

卷叶小檗 *juan ye xiao bo*

Shrubs, evergreen, to 1.5 m tall. Branches weak, terete, obviously verruculose; spines 3-fid, pale yellow, 1–2 cm, sulcate. Petiole 1–2 mm; leaf blade adaxially shiny, dark green, oblong-elliptic or oblong-lanceolate, 1.5–3.5(–4.5) cm × 3–5(–8) mm, abaxially pruinose, midvein conspicuously raised, both surfaces with inconspicuous lateral and reticulate veins, base attenuate, margin slightly revolute, entire or 1–3-spinose-serrate on each side, apex acute, aristate. Flowers 3–7-fascicled. Pedicels reddish, 5–13 mm; bractlets ca. 2 mm. Sepals in 2 whorls; outer sepals reddish, ovate or suborbicular, 3.5–4 × ca. 3 mm; inner sepals suborbicular, 6–7 × 5–6 mm. Petals obovate, 5–5.2 × 3.5–4 mm, base clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective truncate or obtuse. Ovules 2, sessile. Berry purplish black, oblong, 6–8 × 3–5 mm, not pruinose; style persistent, short. Fl. and fr. Apr–Jun.

• Thickets, roadsides on mountain slopes; 1800–3000 m. Yunnan.

**50. *Berberis wilsoniae*** Hemsley, Bull. Misc. Inform. Kew 1906: 151. 1906 [*“wilsonae”*].

金花小檗 *jin hua xiao bo*

Shrubs, semi-evergreen, ca. 1 m tall, with arching branches. Branches brownish gray; shoots dark red, sulcate, scarcely black verruculose; spines 3-fid, sometimes simple or absent, pale yellow or pale purplish red, 1–2 cm, slender. Leaves sessile; leaf blade abaxially gray, adaxially dark gray-green, obovate or obovate-spatulate or oblanceolate, 6–25 × 2–6 mm, leathery, abaxially often slightly pruinose, with raised reticulate veins, adaxially with conspicuous reticulate veins, base cuneate, margin entire, occasionally 1- or 2-spinulose-serrulate on each side, apex rounded, obtuse or subacute. Inflorescence a fascicle of 4–7 flowers or a 3–7-flowered raceme. Pedicels brownish, 3–7 mm; bractlets ovate. Sepals in 2 whorls; outer sepals ovate, 3–4 × 2–3 mm; inner sepals obovate-orbicular or obovate, 5–5.5 × 3.5–4 mm. Petals obovate, ca. 4 × 2 mm, apex emarginate, with acute lobes. Stamens ca. 3 mm; anther connective slightly prolonged, obtuse. Ovules 3–5. Berry reddish, subglobose, 6–7 × 4–5 mm, slightly pruinose, style persistent. Fl. Jun–Sep, fr. Jan–Feb of following year.

• Slopes, thickets, rocky beaches, riverbanks, roadsides, forest margins, streamsides, *Pinus* forests, rock crevices, dry slopes; 1000–4000 m. Gansu, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan.

1a. Inflorescence a fascicle of flowers ..... 50a. var. *wilsoniae*  
1b. Inflorescence a raceme ..... 50b. var. *guhtzunica*

**50a. *Berberis wilsoniae* var. *wilsoniae***

金花小檗(原变种) *jin hua xiao bo* (yuan bian zhong)

*Berberis parvifolia* Sprague (1908), not Lindley (1847); *B. stapfiana* C. K. Schneider; *B. subcaulialata* C. K. Schneider; *B. wilsoniae* var. *parvifolia* Ahrendt; *B. wilsoniae* var. *stapfiana* (C. K. Schneider) C. K. Schneider; *B. wilsoniae* var. *subcaulialata* (C. K. Schneider) C. K. Schneider.

Inflorescence with 4–7 fascicled flowers.

• Slopes, thickets, rocky beaches, riverbanks, roadsides, forest margins, streamsides; 1000–4000 m. Gansu, Sichuan, Xizang, Yunnan.

**50b. *Berberis wilsoniae* var. *guhtzunica*** (Ahrendt) Ahrendt, J. Linn. Soc., Bot. 57: 216. 1961.

古宗金花小檗 *gu zong jin hua xiao bo*

*Berberis subcaulialata* var. *guhtzunica* Ahrendt, J. Bot. 79(Suppl.): 76. 1941; *B. wilsoniae* var. *latior* Ahrendt.

Inflorescence a raceme, 3–7-flowered, to 1.5 cm.

• Thickets, roadsides, *Pinus* forests, rock crevices, dry slopes; 1600–3200 m. Guizhou, Shaanxi, Sichuan, Xizang, Yunnan.

**51. *Berberis taliensis*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 252. 1939.

大理小檗 *da li xiao bo*

Shrubs, evergreen, to 1.2 m tall. Stems terete; branches yellow-brown or gray-brown, sulcate, scarcely verruculose; spines 3-fid, pale yellow, 8–20 mm, adaxially conspicuously sulcate. Leaves sessile; leaf blade adaxially shiny, dark green, narrowly elliptic or oblanceolate, 1.2–3 cm × 3–5 mm, leathery, abaxially pruinose, midvein raised, adaxially with impressed midvein, lateral and reticulate veins inconspicuous, base cuneate, margin conspicuously revolute, entire, apex acuminate, mucronate. Flowers 2–7-fascicled. Pedicels brownish gray, 7–12 mm; bractlets ovate, ca. 3 mm. Sepals in 2 whorls; outer sepals ovate-elliptic, ca. 4.5 × 3 mm; inner sepals broadly elliptic, ca. 6 × 4 mm. Petals obovate, ca. 5.5 × 3.5 mm, base cuneate, slightly clawed, with separate glands, apex entire, slightly emarginate. Stamens ca. 3.5 mm; anther connective not prolonged, truncate. Ovules 4, sessile. Berry oblong, 8–12 × ca. 5 mm, white pruinose, style not persistent. Fl. and fr. May–Jul.

• *Pinus* forests; 3000–3900 m. Yunnan.

**52. *Berberis subholophylla*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 13. 1985.

近缘小檗 *jin yuan xiao bo*

Shrubs, evergreen, 1.5–2.5 m tall. Branches gray-brown, terete; shoots yellow-brown, glabrous, not verruculose; spines 3-fid, concolorous, ca. 1 cm. Leaves sessile; leaf blade adaxially deep green, oblong-elliptic or lanceolate, 4–7 × 1–1.7

cm, leathery, abaxially pruinose, midvein raised, lateral veins conspicuous, adaxially with slightly impressed midvein, lateral veins 4–8 pairs, reticulate veins inconspicuous, base cuneate, margin flat, entire or 2–4-spinulose-serrulate on each side, apex obtuse, apiculate. Flowers unknown. Infructescence with 3–8-fascicled berries; fruit stalk ca. 1.6 cm, glabrous; berry ellipsoid or oblong, 6–8 × 3–5 mm, pruinose, style persistent; seeds 3 or 4. Fl. unknown, fr. Jun.

- Mixed forests; 2800–2900 m. Yunnan.

**53. *Berberis insolita*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 257. 1939.

西昌小檗 xi chang xiao bo

*Berberis atrocarpa* C. K. Schneider var. *suijiangensis* S. Y. Bao.

Shrubs, evergreen, 1–2 m tall. Stems terete; branches gray; shoots pale yellow, angulate, sparsely black verruculose; spines 3-fid, pale yellow, ca. 4 cm. Leaves subsessile; leaf blade adaxially dark green, linear-oblong or linear, 4–15 cm × 1.5–10 mm, thinly leathery, adaxially not pruinose, midvein conspicuously raised, lateral veins conspicuous, reticulate veins inconspicuous, base attenuate, margin strongly revolute, 3–26-spinulose-serrulate on each side, apex acuminate. Flowers unknown. Infructescence with 3–11-fascicled berries; fruit stalk dark purplish red, 4–20 mm, glabrous; berry red, ellipsoid, ca. 7 × 4 mm, not or slightly white pruinose; style persistent, short; seeds 1 or 2. Fl. unknown, fr. May–Oct.

- Thickets, forests, roadsides; 1000–2500 m. Guizhou, Sichuan, Yunnan.

**54. *Berberis sanguinea*** Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 194. 1885.

血红小檗 xue hong xiao bo

*Berberis panlanensis* Ahrendt.

Shrubs, evergreen, to 3 m tall. Stems very sulcate; branches dark gray; shoots pale yellow, sparsely black verruculose; spines 3-fid, pale yellow, 1–3 mm. Leaves subsessile; leaf blade abaxially shiny, pale yellow-green, adaxially dark green, linear-lanceolate, 1.5–6 cm × 3–6 mm, slightly leathery, abaxially not pruinose, midvein conspicuously raised, adaxially with obviously impressed midvein, both surfaces with inconspicuous lateral and reticulate veins, base cuneate, margin 7–14-spinulose-serrulate on each side, apex acute or acuminate, aristate. Flowers 2–7-fascicled. Pedicels reddish, 7–20 mm; bractlets red. Sepals in 3 whorls; outer sepals red, ovate, ca. 3 × 2 mm, apex acute; median and inner sepals yellow, elliptic, ca. 5 × 4.5 mm. Petals obovate, ca. 4 × 3 mm, base with separate lanceolate glands, apex slightly emarginate. Stamens ca. 3 mm; anther connective not prolonged, rounded or truncate. Ovules 2 or 3. Berry purplish red, ellipsoid, 7–12 × 4–5 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jul–Oct.

- Thickets, forests, roadsides, streamsides, sunny slopes, grassy slopes; 1100–2700(–3800) m. Hubei, Sichuan.

**55. *Berberis lubrica*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 265. 1939.

亮叶小檗 liang ye xiao bo

Shrubs, evergreen, to 1 m tall. Stems angulate-sulcate, black verruculose; spines 3-fid, concolorous, flat. Petiole 1–3 mm; leaf blade abaxially pale yellow-green, adaxially green, both surfaces shiny, narrowly lanceolate, 6–9 × 1–1.5 cm, leathery, abaxially lateral and reticulate veins inconspicuous, not pruinose, margin markedly revolute, 12–24-spinose-serrate on each side, apex acuminate. Flowers 6–10-fascicled. Pedicels 5–10 mm, glabrous; bractlets ovate, ca. 2.5 × 1.5 mm, apex acute. Sepals in 2 whorls; outer sepals ovate, ca. 3.5 × 2 mm, apex acute; inner sepals obovate, 6–7 × ca. 4.5 mm. Petals oblong-obovate, ca. 3.5 × 2 mm, base cuneate, with separate glands, apex subentire. Stamens ca. 3.5 mm; anther connective conspicuously prolonged, truncate. Ovules 4. Fruit unknown. Fl. May–Jun, fr. unknown.

- Habitat unknown; ca. 2800 m. Sichuan.

**56. *Berberis insignis*** J. D. Hooker & Thomson subsp. ***incrassata*** (Ahrendt) D. F. Chamberlain & C. M. Hu, Notes Roy. Bot. Gard. Edinburgh 42: 537. 1985.

球果小檗 qiu guo xiao bo

*Berberis incrassata* Ahrendt, Gard. Chron., ser. 3, 105: 371. 1939; *B. incrassata* var. *bucalhwangensis* Ahrendt; *B. incrassata* var. *fugongensis* S. Y. Bao.

Shrubs, evergreen, 1–2 m tall. Branches brownish yellow to dark red, terete, glabrous; spines absent. Petiole 2–4 mm; leaf blade abaxially shiny, pale yellow-green, adaxially dark grayish green, elliptic to elliptic-lanceolate, 5–16 × 2–6 cm, leathery, both surfaces not pruinose, abaxially with raised midvein, adaxially with impressed midvein, both surfaces with visible lateral veins, base cuneate, margin coarsely 12–24-aristate-dentate on each side, apex acuminate. Flowers (4–)8–15-fascicled. Pedicels 1–2.4 cm, slender, slightly thickened toward apex, glabrous. Sepals in 3 whorls; outer sepals ovate, ca. 4 × 3 mm, apex acute; median sepals ovate-elliptic, ca. 6 × 5 mm, apex obtuse; inner sepals obovate, ca. 7 × 6 mm. Petals obovate, ca. 6 × 4 mm, base cuneate, with separate glands, apex entire. Stamens ca. 4 mm; anther connective truncate. Ovules 5–7. Berry purplish red or black, subglobose, 6–7 × 5–6 mm, not pruinose, style persistent and conspicuous. Fl. Apr–May, fr. Aug–Oct.

- Thickets, broad-leaved forests, mixed forests, bamboo forests; 1200–2400 m. Xizang, Yunnan.

**57. *Berberis wangii*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 246. 1939.

西山小檗 xi shan xiao bo

*Berberis pruinosa* Franchet var. *viridifolia* C. K. Schneider, p.p.; *B. schneideriana* Ahrendt.

Shrubs, evergreen, 1.5–2 m tall. Stems and branches brownish gray, terete, sulcate; shoots densely black or yellow-brown verruculose; spines 3-fid, terete, 1–3.5 cm. Petiole 2–4 mm; leaf blade abaxially yellow-green, adaxially shiny, dark green, elliptic or elliptic-lanceolate, 6–10 × 1.2–2 cm, leathery, both surfaces not pruinose, abaxially with conspicuously raised midvein, adaxially with slightly impressed midvein, both sur-

faces with conspicuous lateral veins, reticulate veins fine, base cuneate, margin flat, 5–18-spinose-serrate on each side, apex acute, aristate. Flowers 6–17-fascicled. Pedicels 0.8–2 cm. Sepals in 3 whorls; outer sepals triangular, ca. 2.5 mm, apex caudate-acuminate; median sepals oblong, ca. 3 mm, apex acute; inner sepals elliptic, 4–4.5 × 2–2.5 mm, apex obtuse. Petals elliptic, 3–3.5 mm, base not clawed, with ovate glands, apex entire, rounded. Stamens ca. 2.5 mm; anther connective subtruncate. Ovules solitary, shortly funiculate. Berry red, ellipsoid, 7–8 × ca. 3.5 mm, not pruinose, style persistent. Fl. Mar, fr. Aug–Nov.

- Thickets, mixed forests, sandy slopes; 1600–2300 m. Yunnan.

**58. *Berberis pectinocraspedon*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 11. 1985.

疏齿小檗 shu chi xiao bo

Shrubs, evergreen, 2–3 m tall. Branches black gray, terete; shoots brownish gray, scarcely black verruculose; spines 3-fid, concolorous, 7–10 mm, slender. Leaves shortly petiolate; leaf blade abaxially pale brown when dry, adaxially slightly shiny, oblong-elliptic or lanceolate, 4–12 × 1.5–3 cm, leathery, abaxially with obviously raised veins, adaxially with slightly impressed midvein, lateral veins conspicuous, base cuneate, margin closely 25–30-spinulose-suberrulate on each side, apex obtuse. Flowers (10–)15–20-fascicled. Pedicels 1.6–2.2 cm, weak, glabrous; bractlets triangular, apex acute. Sepals in 3 whorls; outer sepals triangular-ovate, ca. 3 × 3 mm, apex acute; median sepals oblong-ovate, ca. 4 × 2 mm, apex mucronate; inner sepals oblong, ca. 4 × 2 mm, apex mucronate. Petals ovate-elliptic, ca. 4 × 3 mm, base attenuate, with separate glands, apex subrounded, mucronate. Stamens ca. 3 mm; anther connective truncate. Ovules solitary; funicles ca. as long as ovules. Berry oblong, not pruinose, style persistent. Fl. and fr. Apr–Aug.

- Thickets; 700–1900 m. Yunnan.

**59. *Berberis kunmingensis*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 8. 1985.

昆明小檗 kun ming xiao bo

Shrubs, evergreen, ca. 2 m tall. Branches yellow-brown, terete, sulcate, black verruculose; spines 3-fid, weak, yellow-brown, 1–1.5 cm. Petiole 8–10 mm; leaf blade abaxially yellow-brown, adaxially dark brown when dry, oblong-lanceolate or oblong-elliptic, 8–14 × 3–5 cm, leathery, abaxially with flat midvein, adaxially with slightly impressed midvein, lateral and reticulate veins conspicuously raised, base cuneate, margin 20–25-spinose-serrate on each side, apex obtuse. Flowers 10–20-fascicled. Pedicels 1.5–1.8 cm, slender. Sepals in 3 whorls; outer sepals ovate, ca. 2.5 × 1.5 mm, apex acute; median sepals lanceolate, ca. 10 × 3 mm; inner sepals obovate-oblong, ca. 12 × 4 mm. Petals obovate, ca. 10 × 2.5 mm, base cuneate, with oblong glands, apex entire. Stamens ca. 3 mm; anther connective truncate. Ovules solitary, shortly funiculate. Berry oblong, ca. 7 × 3 mm, pruinose, style persistent. Fl. and fr. unknown.

- Thickets, forest margins. Yunnan.

**60. *Berberis delavayi*** C. K. Schneider in Sargent, Pl. Wilson. 1: 364. 1913.

显脉小檗 xian mai xiao bo

*Berberis delavayi* var. *wachinensis* Ahrendt; *B. phanera* C. K. Schneider; *B. subcoriacea* Ahrendt.

Shrubs, evergreen, 1–3 m tall. Branches brownish gray or brownish yellow, terete, glabrous, black verruculose; spines 3-fid, concolorous, 1–3 cm, adaxially sulcate. Leaves shortly petiolate; leaf blade abaxially shiny, both surfaces deep green, oblong-elliptic or elliptic-lanceolate, 4.5–7 × 1.2–1.8 cm, leathery, both surfaces not pruinose, abaxially with raised midvein, adaxially with impressed midvein, both surfaces with conspicuous lateral and reticulate veins, base cuneate, margin undulate, slightly revolute, 7–12-spinose-serrulate on each side, apex acute. Flowers 2–6-fascicled. Pedicels green in flower, red in fruit, slender. Sepals in 3 whorls; outer sepals ovate, ca. 3 × 1.5 mm, apex obtuse; median sepals suborbicular or ovate-orbicular, ca. 5 × 4 mm; inner sepals similar to median sepals in form, ca. 7 × 5.5 mm. Petals oblong-obovate, ca. 5.5 × 4.5 mm, base clawed, with separate glands, apex subrounded, obtusely emarginate. Stamens ca. 3.5 mm; anther connective slightly prolonged, truncate. Ovules 3 or 4. Berry ellipsoid, ca. 1.2 × 0.6 cm, thickly blue pruinose, style not persistent. Fl. Jun–Sep, fr. Oct–Dec.

- *Abies* forests, thickets, streamsides, *Pinus* forests; 1800–4000 m. Sichuan, Yunnan.

**61. *Berberis davidii*** Ahrendt, J. Linn. Soc., Bot. 57: 56. 1961.

密叶小檗 mi ye xiao bo

*Berberis densa* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 254. 1939, not Planchon & Linden (1862); *B. wallichiana* Candolle f. *parvifolia* Franchet.

Shrubs, evergreen, ca. 1 m tall. Branches brownish gray, sulcate, black verruculose; shoots brownish yellow, glabrous; spines 3-fid, concolorous, ca. 2 cm, slender, adaxially sulcate. Petiole 2–5 mm; leaf blade abaxially yellowish green, adaxially dark green, elliptic or elliptic-lanceolate, 2–4.5 × 1–1.5 cm, leathery, abaxially not pruinose, midvein obviously raised, lateral veins 4–6 pairs, reticulate veins inconspicuous, base cuneate, apex obtuse, aristate. Flowers 6–8-fascicled. Pedicels weak, to 3 cm, glabrous. Sepals in 3 whorls; outer sepals suborbicular, ca. 2 × 2 mm; median sepals suborbicular, ca. 4 × 4 mm; inner sepals oblong-elliptic, ca. 6 × 3 mm. Petals obovate-elliptic, ca. 5.5 × 3.2 mm, base attenuate, with separate glands, apex rounded, entire. Stamens ca. 4 mm; anther connective prolonged, truncate. Ovules 2. Berry ellipsoid, 8–9 × ca. 7 mm, gray pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

- Grassy slopes, grasslands, riversides; 2000–3500 m. Yunnan.

**62. *Berberis multiovula*** T. S. Ying, Acta Phytotax. Sin. 37: 309. 1999.

多珠小檗 duo zhu xiao bo

Shrubs, evergreen, ca. 1 m tall. Branches and shoots pale gray, sulcate; spines 3-fid, pale yellow, 1–2.3 cm. Leaves sub-

sessile; leaf blade abaxially pale green, adaxially deep green, linear-lanceolate or narrowly elliptic, 1.5–3 cm × 3–5 mm, thinly leathery, both surfaces not pruinose, abaxially with conspicuously raised midvein, adaxially with slightly raised midvein, both surfaces with inconspicuous lateral and reticulate veins, base abruptly narrowed, margin 3–7-spinose-serrate on each side, apex aristate. Flowers 2–4-fascicled. Pedicels 5–11 mm, slender, glabrous. Sepals in 3 whorls; outer sepals triangular-ovate, ca. 3 × 2 mm; median sepals ovate, ca. 4 × 3 mm; inner sepals obovate, ca. 5.5 × 4 mm. Petals elliptic or oblong, ca. 4.1 × 2.2 mm, base not clawed, with separate glands, apex emarginate, lobes rounded. Stamens ca. 3 mm; anther connective prolonged, truncate. Ovules 5. Berry ellipsoid, 8–10 × 3–5 mm, not pruinose, style persistent. Fl. May, fr. Jun–Jul.

- Forest margins; 2900–3000 m. Sichuan.

**63. *Berberis gagnepainii*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 8: 196. 1908 [*“gagnepainii”*].

湖北小檗 hu bei xiao bo

Shrubs, evergreen, 1–2 m tall. Stems terete. Branches dark gray; shoots stramineous, sulcate, scarcely verruculose; spines concolorous, 1–4 cm, stout, adaxially flat or sulcate. Leaves subsessile; leaf blade abaxially yellow-green, adaxially dark green, sometimes grayish green or shiny, lanceolate or ovate-lanceolate to elliptic-lanceolate, 3.5–14 × 0.4–2.5 cm, leathery, abaxially not pruinose, midvein conspicuously raised, lateral veins slightly raised, reticulate veins inconspicuous, adaxially with slightly impressed midvein, lateral and reticulate veins conspicuous, base cuneate, margin 6–20(–40)-spinose-serrate on each side, apex acuminate. Flowers 2–8(–15)-fascicled. Pedicels ca. 3 mm. Sepals in 3 whorls; outer sepals oblong-ovate, ca. 4.5 × 4 mm, apex acute; median sepals elliptic to ovate, ca. 6.5 × 5.5 mm; inner sepals obovate, ca. 8 × 7 mm. Petals obovate, ca. 7 × 6 mm, base cuneate, with separate glands, apex emarginate or obtusely emarginate with obtuse lobes. Ovules 4 or 5. Berry red, oblong-ovoid, 8–10 × ca. 6 mm, slightly blue pruinose, style not persistent. Fl. May–Jun, fr. Jun–Oct.

- Montane thickets, forest margins, forest understories, on sides of rocks; 700–2800 m. Guizhou, Hubei, Sichuan, Yunnan.

- 1a. Leaf blade lanceolate, adaxially dark green, margin 6–20-spinose-serrate on each side ..... 63a. var. *gagnepainii*
- 1b. Leaf blade ovate-lanceolate or elliptic-lanceolate, adaxially very shiny, margin 20–40-spinose-serrate on each side ..... 63b. var. *omeiensis*

**63a. *Berberis gagnepainii*** var. *gagnepainii*

湖北小檗(原变种) hu bei xiao bo (yuan bian zhong)

*Berberis caudatifolia* S. Y. Bao; *B. gagnepainii* var. *filipes* Ahrendt; *B. gagnepainii* var. *lanceifolia* Ahrendt; *B. gagnepainii* f. *pluriflora* Ahrendt.

Leaf blade adaxially dark green, lanceolate, margin 6–20-spinose-serrate on each side.

- Montane thickets, forests, forest margins, on sides of rocks; 700–2700 m. Guizhou, Hubei, Sichuan, Yunnan.

**63b. *Berberis gagnepainii*** var. *omeiensis* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 264. 1939.

眉山小檗 mei shan xiao bo

Leaf blade adaxially very shiny, ovate-lanceolate or elliptic-lanceolate, margin 20–40-spinose-serrate on each side.

- Forest understories, forest margins; 1700–2800 m. Sichuan.

**64. *Berberis triacanthophora*** Fedde, Bot. Jahrb. Syst. 36(Beibl. 82): 43. 1905.

芒齿小檗 mang chi xiao bo

Shrubs, evergreen, 1–2 m tall. Stems terete; branches dark gray or brown; shoots reddish, scarcely verruculose; spines 3-fid, concolorous, 1–2.5 cm. Leaves subsessile; leaf blade abaxially gray-green, adaxially deep green, shiny, linear-lanceolate, oblong-lanceolate, or narrowly elliptic, 2–6 cm × 2.5–8 mm, leathery, abaxially papillose, sometimes slightly pruinose, midvein raised, both surfaces with inconspicuous lateral and reticulate veins, base cuneate, margin occasionally entire or 2–8-spinose-serrate on each side, apex acuminate or acute, aristate. Flowers 2–6-fascicled. Pedicels 1.5–2.5 cm, glabrous; bractlets reddish, ovate, ca. 1 mm. Sepals in 3 whorls; outer sepals ovate-orbicular, ca. 2 × 1.8 mm; median sepals ovate, ca. 3.5 × 2.5 mm, apex acute; inner sepals obovate, ca. 5 × 4 mm, apex obtuse. Petals obovate, ca. 4 × 3 mm, base cuneate, with separate oblong glands, apex emarginate. Stamens ca. 2 mm; anther connective prolonged, truncate. Ovules 2 or 3. Berry blue-black, ellipsoid, 6–8 × 4–5 mm, slightly pruinose. Fl. May–Jun, fr. Jun–Oct.

- Mixed forests; 500–2100 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan.

**65. *Berberis xingwenensis*** T. S. Ying, Acta Phytotax. Sin. 37: 311. 1999.

兴文小檗 xing wen xiao bo

Shrubs, evergreen, to 2.5 m tall. Branches gray-brown, terete, glabrous; spines 3-fid, yellow-brown, ca. 1 cm, slender, adaxially flat. Petiole ca. 5 mm, sometimes leaf subsessile; leaf blade abaxially yellow-green, adaxially dark green, shiny, elliptic-lanceolate or lanceolate, 6–15 × 1.3–4 cm, leathery, abaxially not pruinose, midvein and lateral veins obviously raised, reticulate veins visible, adaxially with slightly impressed midvein, lateral and reticulate veins slightly raised, base cuneate, margin 10–15-spinose-serrate on each side, apex acuminate. Flowers 5–16-fascicled, red. Pedicels 2–2.7 cm, slender. Sepals in 3(or 4) whorls; outer sepals ovate, 2.5–2.8 × 1.5–2 mm, apex acute; median sepals broadly elliptic, 4.5–5 × ca. 4 mm, apex obtuse; inner sepals elliptic, 5–5.2(–6) × 3.5–4 mm, rounded. Petals obovate, 4.5–5.1 × 3.2–4 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 2.8 mm; anther connective prolonged, truncate. Ovules 2. Berry red, pyriform, ca. 6 × 3 mm, not pruinose; style persistent, short. Fl. Apr–May, fr. Jul–Sep.

- Mixed forests on slopes; ca. 1800 m. Sichuan.

**66. *Berberis veitchii*** C. K. Schneider in Sargent, Pl. Wilson. 1: 363. 1913.

巴东小檗 *ba dong xiao bo*

Shrubs, evergreen, 1–1.5 m tall. Stems terete; branches pale grayish yellow, not verruculose; shoots reddish, glabrous; spines 3-fid, pale yellow, 1.5–3 cm, adaxially sulcate. Leaves subsessile; leaf blade abaxially pale yellow, shiny, adaxially dark green, lanceolate, 5–11 × 1–2 cm, thinly leathery, abaxially not pruinose, midvein raised, lateral veins slightly raised, adaxially with impressed midvein, base cuneate, margin slightly undulate, slightly revolute, 10–30-spinose-serrate on each side, apex acuminate. Flowers 2–10-fascicled. Pedicels 1.5–3.5 cm, glabrous; bractlets ovate, ca. 2 × 2 mm. Sepals in 3 whorls; outer sepals reddish brown, oblong-ovate, ca. 3.5 × 3 mm; median sepals obovate, concave, ca. 5 × 4 mm; inner sepals obovate, concave, ca. 7.5 × 5.5 mm. Petals obovate, base clawed, with approximate glands, apex rounded and narrowly incised. Stamens ca. 4 mm; anther connective slightly prolonged, obtuse. Ovules 2–4. Berry ovoid to ellipsoid, ca. 9 × 6 mm, blue pruinose, style not persistent. Fl. May–Jun, fr. Aug–Oct.

- Thickets, forests, forest margins, streamsides; 2000–3300 m. N Guizhou, Hubei, Sichuan.

**67. *Berberis pingbienensis*** S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 12. 1985.

屏边小檗 *ping bian xiao bo*

Shrubs, evergreen, to 2 m tall. Branches brownish gray, terete, sulcate, not verruculose; spines absent. Petiole short; leaf blade abaxially brownish yellow, adaxially yellow-green, not shiny, oblanceolate or obovate, 5–11 × 1.5–2.5 cm, leathery, abaxially with raised midvein and lateral veins, reticulate veins not visible, adaxially with slightly impressed midvein, reticulate veins conspicuous, base cuneate, margin 15–20-spinose-serrate on each side, apex acute. Flowers unknown. Fruit 2- or 3-fascicled; fruit stalk 1.5–2 cm; berry red, subglobose, 5–7 × ca. 4 mm, not pruinose, style not persistent. Fl. unknown, fr. Apr.

- Forest margins on limestone mountains; ca. 1900 m. Yunnan.

**68. *Berberis griffithiana*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 403. 1905.

错那小檗 *cuo na xiao bo*

Shrubs, evergreen, 2–3 m tall. Branches pale yellow, terete, sometimes sulcate, glabrous; spines 3-fid, 1.2–2.5 cm. Leaves sessile; leaf blade abaxially shiny, pale green, adaxially dark green or grayish white, elliptic-lanceolate, 1.2–3.2 cm × 4–9 mm, leathery, abaxially with conspicuously raised midvein, lateral and reticulate veins inconspicuous, adaxially with slightly raised midvein, lateral veins visible, reticulate veins inconspicuous, base cuneate, margin slightly revolute, slightly undulate, 2–4-spinulose-serrulate on each side, apex acute, aristate. Flowers 2–10-fascicled. Pedicels 1.1–2.2 cm; bractlets ovate, ca. 2 × 1 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate, ca. 5 × 4 mm, apex acute; inner sepals oblong-

obovate, ca. 7 × 4.5 mm, rounded, obtuse. Petals obovate, ca. 7 × 4 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 5 mm; anther connective prolonged, apiculate. Ovules 3 or 4. Berry purplish black, pyriform or ellipsoid, 7–9 × 5–6 mm, pruinose, style persistent. Fl. May–Jun, fr. Jul.

Roadsides, forest margins, thickets, *Tsuga* forests, *Rhododendron* forests, bamboo groves, floodlands; 2100–5300 m. Xizang [Bhutan].

- 1a. Leaf blade green, abaxially not pruinose ..... 68a. var. *griffithiana*
- 1b. Leaf blade grayish white, abaxially pruinose ..... 68b. var. *pallida*

**68a. *Berberis griffithiana* var. *griffithiana***

错那小檗(原变种) *cuo na xiao bo* (yuan bian zhong)

*Berberis subpteroclada* Ahrendt; *B. subpteroclada* var. *impar* Ahrendt.

Leaf blade green, abaxially not pruinose.

Roadsides, forest margins, thickets, *Tsuga* forests, *Rhododendron* forests, bamboo groves; 2500–3300 m. Xizang [Bhutan].

**68b. *Berberis griffithiana* var. *pallida*** (J. D. Hooker & Thomson) D. F. Chamberlain & C. M. Hu, Notes Roy. Bot. Gard. Edinburgh 42: 547. 1985.

灰叶小檗 *hui ye xiao bo*

*Berberis wallichiana* Candolle var. *pallida* J. D. Hooker & Thomson, Fl. Ind. 1: 226. 1855; *B. bhutanensis* Ahrendt; *B. leptopoda* Ahrendt; *B. replicata* W. W. Smith var. *dispar* Ahrendt; *B. taronensis* Ahrendt var. *trimensis* Ahrendt.

Leaf blade grayish white, abaxially pruinose.

Thickets, floodlands; 2100–5300 m. SE Xizang [E Bhutan].

**69. *Berberis sublevis*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 83. 1916.

近光滑小檗 *jin guang hua xiao bo*

*Berberis sublevis* var. *exquista* Ahrendt; *B. sublevis* var. *grandifolia* C. K. Schneider; *B. sublevis* var. *microcarpa* (J. D. Hooker & Thomson) Ahrendt; *B. wallichiana* Candolle var. *gracilipes* Ahrendt; *B. wallichiana* var. *microcarpa* J. D. Hooker & Thomson.

Shrubs, evergreen, 1–3 m tall. Branches grayish brown, sulcate, scarcely verruculose; spines 3-fid, concolorous, 1–2 cm, slender, adaxially flat. Leaves shortly petiolate; leaf blade abaxially pale green, adaxially dark green, linear-lanceolate, 4–12 × 1–1.5 cm, thinly leathery, abaxially not pruinose, midvein conspicuously raised, lateral veins slightly raised, adaxially with slightly impressed midvein, lateral veins visible, both surfaces with inconspicuous reticulate veins, base cuneate, margin slightly revolute, closely 10–20-spinose-serrate on each side, sometimes entire, apex acuminate. Flowers 5–30-fascicled. Pedicels 7–15 mm, slender. Sepals in 2 whorls; outer sepals reddish, ovate, ca. 2.5 × 2 mm, apex subacute; inner sepals obovate to oblong-elliptic, ca. 5 × 3 mm. Petals obovate, 5–5.5 × ca. 3 mm, base clawed, with separate glands, apex emarginate.

Stamens ca. 3.5 mm; anther connective obtuse. Ovules solitary; funicles 3–6 × longer than ovules. Berry purplish red, ovoid, 6–7 × 3–3.5 mm, not pruinose; style persistent, short. Fl. and fr. May–Nov.

Thickets, forests, streamsides; 1500–2700 m. Sichuan, Yunnan [NE India to Myanmar].

“*Berberis prainiana* Stapf” belongs here but is a nomen nudum and was therefore not validly published (*Vienna Code*, Art. 32.1(d)).

**70. *Berberis wuliangshanensis*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 14. 1985.

无量山小檗 *wu liang shan xiao bo*

Shrubs, evergreen, to 3 m tall. Branches purplish brown, terete, sulcate, glabrous; internodes 5–8 cm; spines 3-fid, concolorous, 1–3.5 cm, stout, adaxially sulcate, sometimes weak or absent. Petiole 3–5 mm, sometimes leaf subsessile; leaf blade abaxially brownish red, adaxially yellow-green, lanceolate, elliptic-lanceolate, or elliptic, 6–13 × 2–3.5 cm, leathery, abaxially with raised midvein and lateral veins, reticulate veins visible, adaxially with slightly impressed midvein, lateral veins visible, reticulate veins inconspicuous, base cuneate, margin 15–35-spinose-serrate on each side, apex acuminate. Flowers 6–12-fascicled. Pedicels 1.5–2 cm. Sepals in 2 whorls; outer sepals suborbicular, ca. 4 × 3.5 mm, apex rounded; inner sepals elliptic, ca. 7 × 5 mm. Petals obovate, ca. 6 × 3.5 mm, base cuneate, with separate glands, apex entire, rounded. Stamens ca. 4.5 mm; anther connective prolonged, truncate. Ovules solitary. Berry black, oblong-ellipsoid, 7–8 × ca. 3 mm, not or slightly pruinose, style not persistent. Fl. Apr–May, fr. Oct–Nov.

- Evergreen broad-leaved forests, slopes; 1800–2500 m. Yunnan.

**71. *Berberis vernalis*** (C. K. Schneider) D. F. Chamberlain & C. M. Hu, Notes Roy. Bot. Gard. Edinburgh 42: 554. 1985.

春小檗 *chun xiao bo*

*Berberis ferdinandi-coburgii* C. K. Schneider var. *vernalis* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 249. 1939.

Shrubs, evergreen, 1–2 m tall. Branches brownish yellow or stramineous, sulcate, sparsely black verruculose; spines concolorous, terete, 1.5–3.5 cm, stout. Petiole 2–4 mm; leaf blade abaxially brownish yellow, adaxially deep green, shiny, elliptic to elliptic-lanceolate or oblong-elliptic, 3–12 × 0.7–3 cm, leathery, abaxially not pruinose, midvein conspicuously raised, adaxially with slightly impressed midvein, both surfaces with conspicuous lateral veins, reticulate veins slightly visible, base cuneate, margin sometimes slightly revolute, 10–24-spinose-serrate on each side, apex acute, aristate. Flowers 8–30-fascicled. Pedicels 1–2 cm, slender, glabrous. Sepals in 2 whorls; outer sepals ovate, ca. 3 × 1.3 mm, apex acute; inner sepals broadly elliptic, ca. 5 × 3 mm, apex acuminate. Petals obovate, 3.5–4.5 × 1.5–2.5 mm, base clawed, with separate glands, apex entire, rounded. Stamens ca. 3 mm; anther connective truncate. Ovules solitary, subsessile. Berry black, ellipsoid, 5–7 × ca. 4 mm, not pruinose, style persistent. Fl. and fr. Jun–Oct.

- Thickets, forests; 1300–2600 m. Hunan, Yunnan.

**72. *Berberis levis*** Franchet, Bull. Soc. Bot. France 33: 386. 1886.

平滑小檗 *ping hua xiao bo*

*Berberis levis* var. *brachyphylla* Ahrendt; *B. willeana* C. K. Schneider; *B. willeana* var. *serrulata* C. K. Schneider.

Shrubs, evergreen, 0.5–1.5 m tall. Branches brownish gray, terete; shoots brownish yellow, sulcate, densely black verruculose; spines 3-fid, 1–4 cm, stout, terete or adaxially flat. Leaves subsessile; leaf blade adaxially dark yellow-green, elliptic, narrowly elliptic, or lanceolate, 3–10 × 0.7–1.7 cm, leathery, adaxially not pruinose, midvein raised, both surfaces with lateral and reticulate veins inconspicuous, base cuneate, margin 5–15(–20)-spinose-serrate on each side, apex shortly acuminate, aristate. Flowers 7–25-fascicled. Pedicels 1–2 cm, glabrous. Sepals in 2 whorls; outer sepals obovate or triangular, 3–5 × 1–1.5 mm; inner sepals obovate or lanceolate, 4–5 × 1–2 mm. Petals obovate or broadly obovate, 5–6 × ca. 2.5 mm, base cuneate, with separate glands, apex entire or slightly emarginate, rounded or mucronate. Stamens 3–4 mm; anther connective prolonged, obtuse. Ovules solitary, shortly funiculate. Berry black, ellipsoid, 7–8 × 5–6 mm, not or scarcely pruinose, style persistent. Fl. Apr–May, fr. Sep–Nov.

- Evergreen broad-leaved forests, *Pinus* forests, slopes; 2100–2900 m. Sichuan, Yunnan.

**73. *Berberis bergmanniae*** C. K. Schneider in Sargent, Pl. Wilson. 1: 362. 1913.

汉源小檗 *han yuan xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches brownish yellow or brown, sulcate, sparsely black verruculose; spines 3-fid, pale yellow, 1.5–2.5 cm, stout. Petiole short, or leaf subsessile; leaf blade abaxially pale green, adaxially deep green, shiny on both surfaces, oblong-elliptic or elliptic, 3–7 × 1–2 cm, thickly leathery, both surfaces not pruinose, abaxially with markedly raised midvein, adaxially with conspicuously impressed midvein, both surfaces with slightly raised lateral veins, reticulate veins inconspicuous, base cuneate, margin thickened, slightly revolute, not or sometimes undulate, 2–12-spinose-serrate on each side, apex acute or acuminate. Flowers 5–20-fascicled. Pedicels 7–15 mm. Sepals in 2 whorls; outer sepals ovate, ca. 5.5 × 3.5 mm; inner sepals obovate, ca. 7 × 5 mm. Petals obovate, ca. 6 × 5 mm, base clawed, with separate glands, apex rounded, incised. Stamens ca. 4.5 mm; anther connective truncate. Ovules 1 or 2. Fruit stalk dark brown, to 2 cm; berry black, ovoid-ellipsoid or ovoid-globose, 8–9 × ca. 6 mm, blue pruinose, style persistent and conspicuous; seeds 1 or 2. Fl. Mar–May, fr. May–Oct.

- Thickets, forests, sunny slopes; 1200–2500 m. Sichuan.

- 1a. Leaf margin not undulate, 2–12-spinose-serrate on each side ..... 73a. var. *bergmanniae*
- 1b. Leaf margin undulate, 2–6-spinose-dentate on each side ..... 73b. var. *acanthophylla*

**73a. *Berberis bergmanniae* var. *bergmanniae***

汉源小檗(原变种) *han yuan xiao bo* (*yuan bian zhong*)

Leaf blade shiny on both surfaces, margin not undulate, 2–12-spinose-serrate on each side.

- Thickets, forests; 1200–2000 m. Sichuan.

**73b. *Berberis bergmanniae* var. *acanthophylla*** C. K. Schneider in Sargent, Pl. Wilson. 1: 362. 1913.

汶川小檗 wen chuan xiao bo

Leaf blade dark colored adaxially, margin undulate, 2–6-spinose-dentate on each side.

- Sunny slopes, thickets; 2000–2500 m. Sichuan.

**74. *Berberis iteophylla*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 7. 1985.

鼠叶小檗 shu ye xiao bo

Shrubs, evergreen, to 1.5 m tall. Branches brownish gray, terete, sulcate, sparsely black verruculose; shoots pale yellow; spines 3-fid, 1–1.2 cm, slender. Leaves compactly fascicled; petiole ca. 5 mm; leaf blade abaxially pale yellow-green, linear-lanceolate, 9–16 × 1.4–2.4 cm, leathery, abaxially not pruinose, midvein and lateral veins raised, adaxially with conspicuously impressed midvein, lateral veins slightly visible, both surfaces with inconspicuous reticulate veins, base cuneate, margin closely 25–35-spinose-serrate on each side, apex acute. Flowers 12–20-fascicled. Pedicels ca. 1.5 cm, slender, glabrous. Sepals in 2 whorls; outer sepals triangular-ovate, ca. 3 × 2 mm, apex acute; inner sepals oblong, ca. 4 × 3 mm, apex acuminate. Petals obovate, ca. 3 × 2 mm, base attenuate, clawed, with approximate glands, apex rounded, slightly emarginate. Stamens ca. 2 mm; anther connective truncate. Ovules solitary, shortly funiculate. Berry (immature) ellipsoid, not pruinose, style persistent. Fl. and fr. Apr–Aug.

- Slopes, streamsides, thickets, forests; ca. 2200 m. Yunnan (Shuangbai).

**75. *Berberis ferdinandi-coburgii*** C. K. Schneider in Sargent, Pl. Wilson. 1: 364. 1913.

大叶小檗 da ye xiao bo

Shrubs, evergreen, to 2 m tall. Branches sulcate, scarcely black verruculose; spines 3-fid, 7–15 mm, slender, adaxially sulcate. Petiole 2–4 mm; leaf blade abaxially brownish yellow, adaxially shiny, castaneous, elliptic-oblongate, 4–9 × 1.5–2.5 cm, leathery, both surfaces not pruinose, abaxially with raised midvein and lateral veins, adaxially with impressed midvein and lateral veins, both surfaces with visible reticulate veins, base cuneate, margin sometimes slightly revolute, 35–60-spinose-serrate on each side, apex acute, aristate. Flowers 8–18-fascicled. Pedicels 1–2 cm, slender, glabrous; bractlets reddish, ca. 1.5 mm. Sepals in 2 whorls, ovate, ca. 5 × 3 mm. Petals narrowly obovate, 3.5–4.5 × 1.5–2.5 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective truncate. Ovules solitary, sessile. Berry black, ellipsoid or ovoid, 7–8 × 5–6 mm, not or sometimes slightly pruinose, style persistent. Fl. and fr. Jun–Oct.

- Thickets; 100–2700 m. Yunnan.

**76. *Berberis grodtmanniana*** C. K. Schneider, Oesterr. Bot. Z. 67: 32. 1918 [*“grodtmannia”*].

安宁小檗 an ning xiao bo

Shrubs, evergreen, 1–1.5 m tall. Branches dark gray or yellow, stout, very sulcate, not verruculose; spines 3-fid, 1–3 cm, stout, adaxially flat. Leaves sessile; leaf blade abaxially pale green, adaxially deep green, lanceolate, 3–6 × 0.4–1.2 cm, leathery, abaxially not pruinose, midvein conspicuously raised, lateral and reticulate veins inconspicuous, adaxially with impressed midvein, lateral veins slightly visible, base cuneate, margin conspicuously revolute or not, 7–12(–15)-spinose-serrate on each side, apex acute or acuminate, aristate. Flowers 5–10-fascicled. Pedicels (3–)4–12 mm; bractlets ca. 1 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate, ca. 2 × 1 mm, apex acute; inner sepals ovate-elliptic, ca. 5.5 × 3 mm. Petals obovate, 4.5–5 × 2.5–3 mm, apex emarginate. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules solitary, sessile. Berry ellipsoid, 8–9 × ca. 4 mm, not or sometimes slightly pruinose; style persistent, short. Fl. Apr–May, fr. May–Aug.

- Forests, thickets, roadsides, runlet sides; 1900–3500 m. Sichuan, Yunnan.

- 1a. Branches dark gray; leaf margins revolute; pedicels 4–12 mm ..... 76a. var. *grodtmanniana*
- 1b. Branches yellow; leaf margins not revolute; pedicels 3–4 mm ..... 76b. var. *flavoramea*

**76a. *Berberis grodtmanniana* var. *grodtmanniana***

安宁小檗(原变种) an ning xiao bo (yuan bian zhong)

Branches dark gray. Leaf margin conspicuously revolute. Pedicels 4–12 mm.

- *Quercus* forests, thickets, roadsides, mixed forests, runlet sides; 1900–3100 m. Sichuan.

**76b. *Berberis grodtmanniana* var. *flavoramea*** C. K. Schneider in Sargent, Pl. Wilson. 1: 360. 1913.

黄茎小檗 huang jing xiao bo

Branches yellow. Leaf margin not revolute. Pedicels 3–4 mm.

- Forests; 3300–3500 m. Yunnan.

**77. *Berberis julianae*** C. K. Schneider in Sargent, Pl. Wilson. 1: 360. 1913.

豪猪刺 hao zhu ci

*Berberis julianae* var. *oblongifolia* Ahrendt; *B. julianae* var. *patungensis* Ahrendt.

Shrubs, evergreen, 1–3 m tall. Branches yellow-brown or gray-brown; shoots pale yellow, sulcate, scarcely black verruculose; spines 3-fid, concolorous, 1–4 cm, stout, adaxially sulcate. Petiole 1–4 mm; leaf blade abaxially pale green, adaxially deep green, elliptic, lanceolate, or oblanceolate, 3–10 × 1–3 cm, leathery, both surfaces not pruinose, abaxially with raised midvein, lateral veins slightly raised or not, adaxially with im-

pressed midvein, lateral veins slightly visible, both surfaces with inconspicuous reticulate veins, base cuneate, margin 10–20-spinose-serrate on each side, apex acuminate. Flowers 10–25-fascicled. Pedicels 8–15 mm; bractlets ovate, ca.  $2.5 \times 1.5$  mm, apex acute. Sepals in 2 whorls; outer sepals ovate, ca.  $5 \times 3$  mm, apex acute; inner sepals oblong-elliptic, ca.  $7 \times 4$  mm, apex rounded, obtuse. Petals oblong-elliptic, ca.  $6 \times 3$  mm, base clawed, with oblong glands, apex emarginate. Anther connective not prolonged. Ovules solitary. Berry blue-black, oblong,  $7-8 \times 3.5-4$  mm, white pruinose, style persistent. Fl. Mar, fr. May–Nov.  $2n = 28+2B^*$ .

• Slopes, forests, thickets, bamboo groves; 1100–2100 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

**78. *Berberis liophylla*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 247. 1939.

滑叶小檗 hua ye xiao bo

Shrubs, evergreen, 1–2 m tall. Branches brownish gray, terete; shoots brownish yellow, sulcate, glabrous; spines 3-fid, concolorous, 1–2.5 cm, slender, adaxially flat. Leaves subsessile; leaf blade abaxially brownish yellow, adaxially dark yellow-green, elliptic to lanceolate,  $2.5-6 \times 1-1.5$  cm, leathery, both surfaces not pruinose, abaxially with raised midvein, adaxially with slightly impressed midvein, both surfaces with visible lateral veins, reticulate veins inconspicuous, base cuneate, margin sometimes slightly revolute, 5–10-spinose-serrate on each side, apex acute. Flowers 2–10-fascicled. Pedicels 8–15 mm; bractlets ovate, apex acute. Sepals in 2 whorls; outer sepals ovate, ca.  $4 \times 1.5$  mm, apex acute; inner sepals obovate, ca.  $4 \times 2$  mm. Petals obovate, ca.  $3 \times 1.5$  mm, base clawed, with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective prolonged, obtuse. Ovules solitary, subsessile. Berry ellipsoid,  $7-8 \times 3-4$  mm, sometimes pruinose, style persistent. Fl. Mar–Apr, fr. Jun–Sep.

• Forest margins, thickets; 2100–2800 m. Sichuan, Yunnan.

**79. *Berberis taronensis*** Ahrendt, J. Bot. 79(Suppl.): 23. 1941.

独龙小檗 du long xiao bo

Shrubs, evergreen, 1–2 m tall. Branches dark gray, subterete, not verruculose; shoots pale yellow, sometimes sulcate; spines 3-fid, pale yellow, 5–15 mm, adaxially slightly sulcate. Leaves subsessile; leaf blade abaxially pale yellow-green, adaxially shiny, deep green, narrowly oblong-elliptic or oblong-lanceolate,  $2.5-6 \times 0.6-1.5$  cm, leathery, abaxially slightly pruinose, papillose, midvein conspicuously raised, lateral veins slightly raised, adaxially with impressed midvein, lateral veins slightly visible, both surfaces with inconspicuous reticulate veins, base cuneate, margin sometimes slightly revolute, 2–7-spinose-serrate on each side or aristate-dentate, apex acute. Flowers 2–12-fascicled. Pedicels dark red, 1–2.5 cm, slender; bractlets red, ovate, ca. 1 mm, apex acute. Sepals in 2 whorls, obovate; outer sepals ca.  $4 \times 2.5$  mm; inner sepals ca.  $6 \times 4$  mm. Petals ovate, ca.  $5.5 \times 3$  mm, base clawed, with approximate glands, apex entire. Stamens ca. 4 mm; anther connective distinctly prolonged, obtuse. Ovules 3. Berry yellow-green (immature), becoming red (mature), obovoid,  $7-8 \times 4-5$  mm, blue pruinose, style persistent. Fl. May, fr. Jun–Aug.

• Thickets, forests, forest margins; 2000–2600 m. Xizang, Yunnan.

**80. *Berberis photiniifolia*** C. M. Hu, Bull. Bot. Res., Harbin 6(2): 4. 1986 [*“photiniaefolia”*].

石楠小檗 shi nan xiao bo

Shrubs, evergreen, to 2 m tall. Branches dark gray; shoots deep purple, terete, glabrous; internodes 3–6 cm; spines 3-fid, 1–2 cm. Petiole very short; leaf blade adaxially green, shiny, lanceolate,  $4-8.5 \times 1.5-2.8$  cm, leathery, abaxially glaucous, not pruinose, midvein distinctly raised, lateral and reticulate veins conspicuous, adaxially with slightly impressed midvein, lateral veins slightly raised, reticulate veins inconspicuous, base cuneate, margin flat, 8–15-spinose-serrate on each side, apex acuminate. Flowers (2–)4–8-fascicled. Pedicels 1–1.5 cm; bractlets triangular-ovate. Sepals in 2 whorls; outer sepals ovate-oblong, 3–3.5 mm; inner sepals obovate or suborbicular, ca.  $4 \times 3.2$  mm. Petals obovate, ca. 3 mm, base clawed, with separate glands, apex subentire. Stamens ca. 2.5 mm; anther connective truncate. Ovules 3 or 4. Berry ovoid-ellipsoid,  $7-8 \times 4-5$  mm, slightly pruinose, style not persistent. Fl. and fr. unknown.

• Mountain summits; ca. 1000 m. Guangdong.

**81. *Berberis fujianensis*** C. M. Hu, Bull. Bot. Res., Harbin 6(2): 5. 1986.

福建小檗 fu jian xiao bo

Shrubs, evergreen, ca. 1 m tall. Branches deep gray, sulcate; shoots pale yellow, terete, sparsely black verruculose; spines 3-fid, 1–2 cm, adaxially flat or slightly sulcate. Petiole 3–5 mm; leaf blade abaxially shiny, adaxially green, slightly shiny, elliptic or elliptic-lanceolate,  $3-5(-7) \times 1-2(-2.5)$  cm, leathery, both surfaces not pruinose, abaxially glaucous, midvein obviously raised, adaxially with slightly impressed midvein, lateral veins slightly raised, both surfaces with inconspicuous reticulate veins, base attenuate, margin 8–14-spinose-serrate on each side, apex acute or subacuminate. Flowers (2–)4–8-fascicled. Pedicels 4–7 mm, slender; bractlets triangular-ovate, ca. 1.5 mm, apex acute. Sepals in 2 whorls; outer sepals broadly obovate or suborbicular, ca. 3.5 mm, apex rounded. Petals obovate, ca. 3 mm, base clawed, with approximate glands, apex entire, rounded, or slightly emarginate. Stamens ca. 2 mm; anther connective shortly apiculate. Ovules 2 or 3. Berry green (immature), ellipsoid,  $6-7 \times 3-4$  mm, sometimes pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

• Thickets, forest margins, sparse forests; 1400–2100 m. Fujian.

**82. *Berberis atrocarpa*** C. K. Schneider in Sargent, Pl. Wilson. 3: 437. 1917.

黑果小檗 hei guo xiao bo

*Berberis atrocarpa* var. *subintegra* Ahrendt; *B. silvicola* C. K. Schneider var. *angustata* Ahrendt.

Shrubs, evergreen, 1–2 m tall. Branches brownish gray or brownish black, angulate to sulcate, finely black verruculose; spines 3-fid, pale yellow, 1–4 cm, adaxially flat. Petiole short; leaf blade abaxially pale green, adaxially deep green, shiny,

lanceolate or oblong-elliptic, 3–7 × 0.7–1.4 cm, thickly leathery, both surfaces not pruinose, abaxially with obviously raised midvein, adaxially with impressed midvein, both surfaces with indistinct lateral and reticulate veins, base cuneate, margin remotely 5–10-spinose-serrate on each side, occasionally subentire, apex acute. Flowers 3–10-fascicled. Pedicels reddish, 5–10 mm, glabrous. Sepals in 2 whorls; outer sepals oblong-obovate, ca. 4 × 2 mm; inner sepals obovate, ca. 7 × 4 mm. Petals obovate, ca. 6 × 4.5 mm, base cuneate, with separate glands, apex rounded, deeply incised. Stamens ca. 4 mm. Ovules 2, sessile or very shortly funiculate. Berry black, ovoid, ca. 5 × 4 mm, not pruinose, style persistent. Fl. Apr, fr. May–Aug.

• Thickets, *Pinus* forests, margins of evergreen broad-leaved forests, on rocks; 600–2800 m. Hunan, Sichuan, Yunnan.

**83. *Berberis zanlanscianensis*** Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 293. 1915.

鄂西小檗 *e xi xiao bo*

Shrubs, evergreen, 1–2.5 m tall. Branches dark gray, angulate, not verruculose; shoots purplish red, glabrous; spines 3-fid, pale yellow, 1–1.5 cm, sometimes absent. Petiole 2–6 mm; leaf blade abaxially pale green or reddish brown, adaxially deep green, lanceolate, elliptic-lanceolate, or obovate-lanceolate, 3–13 × 1–2.2 cm, leathery, both surfaces not pruinose, abaxially with conspicuously raised midvein and lateral veins, adaxially with impressed midvein, lateral veins slightly raised, both surfaces with slightly visible reticulate veins, base attenuate, margin slightly revolute when dry, 10–20-spinose-serrate on each side, apex subacuminate. Flowers 5–30-fascicled. Pedicels purplish red, 1–2.5 cm. Petals longer than outer sepals. Ovules 1–3. Berry black, ovoid, 7–9 × 4–5 mm, not pruinose; style persistent, short. Seeds 1–3. Fl. Mar–May, fr. May–Sep.

• Roadsides, forests, thickets; 1400–1700 m. Hubei, Sichuan.

**84. *Berberis fallaciosa*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 258. 1939.

南川小檗 *nan chuan xiao bo*

Shrubs, evergreen, 1–3 m tall. Branches dark gray, terete, glabrous; shoots gray, sulcate, scarcely verruculose; spines 3-fid, pale yellow, 1–4 cm. Petiole 2–6 mm; leaf blade abaxially yellow-green, adaxially deep green, lanceolate, elliptic-lanceolate, or obovate-lanceolate, 3–13 × 1–2.2 cm, leathery, abaxially with conspicuously raised midvein, lateral veins slightly raised, adaxially with obviously impressed midvein, lateral veins slightly visible, both surfaces with inconspicuous reticulate veins, base attenuate, margin often revolute, 15–30-spinose-serrate on each side, apex subacuminate. Flowers 2–5-fascicled. Pedicels reddish, 1–2.5 cm; bractlets broadly ovate, apex obtuse. Sepals in 2 whorls, obovate; outer sepals ca. 3.5 × 3 mm; inner sepals ca. 5 × 4 mm. Petals oblong-obovate, ca. 4 × 2.3 mm, base clawed, with approximate glands, apex emarginate. Stamens ca. 3 mm; anther connective slightly prolonged, apiculate. Ovules 2, sessile. Berry obovoid, 6–9 × 5–6 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Oct.

• Thickets, forests, roadsides, streamsides; 1000–2700 m. Hubei, Sichuan.

**85. *Berberis amabilis*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 257. 1939.

可爱小檗 *ke ai xiao bo*

*Berberis amabilis* var. *holophylla* C. Y. Wu & S. Y. Bao.

Shrubs, evergreen, 1–2 m tall. Branches brownish gray, terete; shoots pale yellow, angulate, verruculose, glabrous; spines 3-fid, subterete, sometimes adaxially sulcate, 1–3 cm. Petiole 1–2 mm; leaf blade adaxially green, oblong-elliptic, elliptic-lanceolate, or oblanceolate, 4–8 × 1–1.5 cm, leathery, abaxially white pruinose, with obviously raised midvein, lateral veins conspicuous, adaxially with obviously impressed midvein, lateral veins inconspicuous, both surfaces with inconspicuous reticulate veins, base cuneate, margin usually revolute, 3–6-spinose-serrate on each side, sometimes entire, apex acute, aristate. Flowers 6–25-fascicled. Pedicels red, 1–1.8 cm, slender, glabrous; bractlets ovate, ca. 2 × 1.5 mm, apex acuminate. Sepals in 2 whorls; outer sepals broadly ovate, ca. 5 × 4 mm; inner sepals elliptic or elliptic-oblong, 6–7 × ca. 4 mm. Petals obovate, 6–7 × ca. 4 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 5 mm; anther connective prolonged, apiculate. Ovules 2, sessile. Berry black, ellipsoid, 6–8 × 3–5 mm, not pruinose, style not persistent. Fl. and fr. Jun–Aug.

Thickets, forest margins, shaded places on slopes; 1800–3300 m. Yunnan [N Myanmar].

**86. *Berberis arguta*** (Franchet) C. K. Schneider, Bull. Herb. Boissier, sér. 2, 8: 197. 1908.

锐齿小檗 *rui chi xiao bo*

*Berberis wallichiana* Candolle f. *arguta* Franchet, Bull. Soc. Bot. France 33: 388. 1886.

Shrubs, evergreen, 1–1.5 m tall. Branches stramineous to brownish gray, terete, glabrous; spines 3-fid, concolorous, 2.5–4 cm, stout, adaxially sulcate. Leaves sessile; leaf blade abaxially pale green, adaxially dark green, lanceolate to oblong-lanceolate, 4.5–14 × 1.5–2.5 cm, leathery, abaxially not pruinose, lateral veins 13–16 pairs, both surfaces with obviously raised reticulate veins, base cuneate, margin 30–60-spinose-serrulate on each side, apex acuminate. Flowers 6–8-fascicled. Pedicels red, to 1.5 cm, glabrous. Sepals in 2 whorls; outer sepals broadly ovate, ca. 3.5 × 3 mm, apex obtuse; inner sepals oblong-elliptic, ca. 5 × 3.5 mm, apex obtuse. Petals obovate, ca. 4.5 × 3.5 mm, base clawed, with oblong glands, apex rounded, emarginate. Stamens ca. 4 mm; anther connective truncate. Ovules 2, sessile. Berry black, ellipsoid to globose, 6–8 × 4–5 mm, not pruinose, style persistent and very short; seeds 2. Fl. May–Jun, fr. Sep–Oct.

• Margins of valley forests; 1600–1800 m. Guizhou, Yunnan.

**87. *Berberis jiangxiensis*** C. M. Hu, Bull. Bot. Res., Harbin 6(2): 9. 1986.

江西小檗 *jiang xi xiao bo*

Shrubs, evergreen, ca. 1 m tall. Branches dark brown; shoots pale yellow-green, sulcate, not verruculose; spines 3-fid,

concolorous, 1–2.5 cm. Petiole 1–3 mm; leaf blade adaxially shiny, green, elliptic-oblongate, narrowly lanceolate, or oblong, 1.4–4 × 0.5–1.2 cm, thinly leathery, abaxially pruinose, midvein obviously raised, lateral veins conspicuous, reticulate veins inconspicuous, adaxially with slightly impressed midvein, lateral veins 2–4 pairs, obviously raised, base attenuate, margin 4–7-spinose-serrate on each side, apex acute. Flowers (2 or)3- or 4-fascicled. Pedicels 6–10 mm, slender or stout; bractlets ovate, ca. 3 × 2 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate or suborbicular, 4–4.5 × ca. 4 mm; inner sepals broadly elliptic, ca. 7 × 4.5–5 mm. Petals obovate, 4–4.5 × ca. 2.5 mm, base shortly clawed, with approximate glands, apex emarginate, lobes rounded, obtuse. Stamens ca. 3.5 mm; anther connective truncate. Ovules 2–4. Berry ellipsoid, ca. 9 × 5.5 mm, slightly pruinose; style persistent, short. Fl. Apr–Jun, fr. Jul–Sep.

• Roadsides, rock crevices, sides of rocks, forests, runlet sides; 1500–1800 m. Jiangxi.

- 1a. Leaves elliptic-oblongate or narrowly lanceolate; flowers 3- or 4-fascicled; pedicels slender ..... 87a. var. *jiangxiensis*  
 1b. Leaves oblong; flowers 2- or 3-fascicled; pedicels stout ..... 87b. var. *pulchella*

**87a. *Berberis jiangxiensis* var. *jiangxiensis***

江西小檗(原变种) *jiang xi xiao bo* (yuan bian zhong)

Leaves elliptic-oblongate or narrowly lanceolate. Flowers 3- or 4-fascicled. Pedicels slender.

• Roadsides, rock crevices, forests, runlet sides; 1500–1800 m. Jiangxi.

**87b. *Berberis jiangxiensis* var. *pulchella*** C. M. Hu, Bull. Bot. Res., Harbin 6(2): 10. 1986.

短叶江西小檗 *duan ye jiang xi xiao bo*

Leaves oblong. Flowers 2- or 3-fascicled. Pedicels stout.

• Sides of rocks; ca. 1600 m. Jiangxi.

**88. *Berberis weixinensis*** S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 13. 1985.

威信小檗 *wei xin xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches blackish gray, angulate; spines 3-fid, 5–7 mm, slender. Leaves subsessile; leaf blade abaxially yellow-green, adaxially olivaceous when dry, lanceolate, 10–17 × 2–2.5 cm, leathery, abaxially not pruinose, midvein raised, adaxially with slightly impressed midvein, lateral veins 14–16 pairs, both surfaces with conspicuous reticulate veins, base cuneate, margin flat, 10–25-spinose-serrate on each side, apex acuminate. Flowers unknown. Infructescence with 4–8-fascicled berries; fruit stalk 2–2.5 cm glabrous; berry ellipsoid, 5–6 × 4–5 mm, blue pruinose, style not persistent; seeds 2. Fl. unknown, fr. Jun–Aug.

• Mixed forests; 1400–1500 m. Yunnan.

**89. *Berberis subacuminata*** C. K. Schneider in Sargent, Pl. Wilson. 1: 363. 1913.

亚尖小檗 *ya jian xiao bo*

Shrubs, evergreen, to 2.5 m tall. Branches brownish gray or brownish yellow, terete; shoots pale yellow, sulcate, glabrous; spines simple or 3-fid, pale yellow, 1–2 cm, slender, sometimes absent. Petiole 2–5 mm; leaf blade abaxially yellow-green, adaxially green, lanceolate or elliptic-lanceolate, 4–9 × 1.2–2.2 cm, subleathery, abaxially with raised midvein and lateral veins, adaxially with slightly impressed or flat midvein, lateral veins conspicuous, both surfaces with inconspicuous reticulate veins, base broadly cuneate, margin 8–15-spinose-serrate on each side, apex acuminate. Flowers 2–6-fascicled. Pedicels 1.8–2.2 cm; bractlets ca. 2 × 1.5 mm. Sepals in 2 whorls; outer sepals obovate, ca. 4 × 2 mm; inner sepals broadly obovate, ca. 7 × 5 mm. Petals obovate, ca. 5 × 2.5 mm, base clawed, with approximate glands, apex emarginate. Stamens ca. 4.5 mm; anther connective truncate. Ovules 2 or 3, sessile. Berry subglobose or ellipsoid, 6–7 × ca. 5 mm, slightly pruinose, style not persistent. Fl. Mar–Apr, fr. May–Nov.

• Dry slopes, thickets, mixed forests; 1400–2500 m. Guizhou, Hunan, Yunnan.

**90. *Berberis dongchuanensis*** T. S. Ying, Acta Phytotax. Sin. 37: 312. 1999.

东川小檗 *dong chuan xiao bo*

Shrubs, evergreen, 0.6–1 m tall. Branches dark gray, terete, not verruculose; spines 3-fid, pale yellow, to 1 cm. Leaves subsessile; leaf blade adaxially yellow-green, narrowly elliptic, 3.5–8 × 1–2 cm, thickly leathery, abaxially thickly pruinose, midvein raised, lateral and reticulate veins indistinct, adaxially with obviously impressed midvein, lateral veins slightly conspicuous, base cuneate, margin slightly revolute, coarsely 1–4-aristate-dentate on each side, apex acute. Flowers 3–5-fascicled. Pedicels to 3.5 cm, slender, glabrous. Sepals in 3 whorls; outer sepals triangular-ovate, ca. 2 × 1.5 mm, apex acuminate; median sepals ovate-elliptic, ca. 5.1 × 3 mm; inner sepals broadly elliptic, ca. 6 × 5 mm. Petals obovate, ca. 5 × 4 mm, base clawed, with separate glands, apex rounded, entire. Stamens ca. 3.5 mm; anther connective rounded, obtuse. Ovules 4, shortly funiculate. Fruit unknown. Fl. Apr–May, fr. unknown.

• Rocky cliffs; ca. 2600 m. Yunnan.

**91. *Berberis parapruiosa*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 145. 1985.

拟粉叶小檗 *ni fen ye xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches pale gray; shoots pale yellow, terete; spines 3-fid, concolorous, 1.4–2.7 cm, stout. Leaves subsessile; leaf blade abaxially pale green, adaxially shiny, green, elliptic or oblong-elliptic, 3–8 × 1–2.5 cm, thickly leathery, abaxially not pruinose, midvein and lateral veins raised, adaxially with conspicuous midvein and lateral veins, both surfaces with indistinct reticulate veins, base cuneate, margin sometimes revolute, coarsely 2–6-aristate-dentate on each side, apex acute, aristate. Flowers 2–6-fascicled. Pedicels 1–2 cm, glabrous; bractlets triangular-ovate, ca. 3 × 1.5 mm. Sepals in 3 whorls; outer sepals obovate or ovate-elliptic, ca. 5.1 × 3.8 mm; median sepals elliptic, ca. 8 × 5 mm; inner sepals obovate,

ca.  $7 \times 5$  mm, apex obtuse. Petals obovate, ca.  $5.2 \times 4$  mm, base clawed, with approximate glands, apex entire. Stamens ca. 4 mm; anther connective prolonged, truncate. Ovules 3 or 4, shortly funiculate. Berry green (immature), ellipsoid,  $7-9 \times$  ca. 5 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

- *Tsuga* forests; 2600–2900 m. Xizang.

**92. *Berberis jinshajiangensis*** X. H. Li, J. Trop. Subtrop. Bot. 15: 553. 2007.

小瓣小檗 xiao ban xiao bo

*Berberis micropetala* T. S. Ying, Acta Phytotax. Sin. 37: 313. 1999, not C. K. Schneider (1939).

Shrubs, evergreen, to 1 m tall. Shoots gray, sulcate, not verruculose; spines 3-fid, pale yellow, 1–1.2 cm, terete. Petiole 2–3 mm; leaf blade abaxially brown, adaxially dark green, elliptic or narrowly elliptic,  $1.5-4.5 \times 0.6-1.2$  cm, leathery, both surfaces not pruinose, abaxially papillose, midvein conspicuously raised, adaxially with impressed midvein, both surfaces with indistinct lateral and reticulate veins, base attenuate, cuneate, margin slightly revolute, 12–16-spinose-serrate on each side, apex acute or obtuse. Flowers 5-fascicled. Pedicels stout, 1.2–1.4 mm, but one to 3–4 mm; bractlets rose-pink, ovate, apex acuminate. Sepals in 3 whorls; outer sepals lanceolate,  $2.1-3 \times 1-1.1$  mm, upper part rose-pink; median sepals ovate-elliptic, ca.  $4.1 \times 2$  mm, margin membranous, hyaline, apex rose-pink; inner sepals obovate-elliptic, ca.  $4.3 \times 2$  mm. Petals obovate,  $2.2-2.5 \times 1-1.1$  mm, base clawed, with separate oblong glands, apex entire. Stamens ca. 1.5 mm; anther connective prolonged, truncate. Ovules solitary, shortly funiculate. Fruit unknown. Fl. Apr, fr. unknown.

- Sunny slopes, mixed forests; 2800–3200 m. Yunnan.

**93. *Berberis kawakamii*** Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 24. 1911.

台湾小檗 tai wan xiao bo

*Berberis brevisejala* Hayata; *B. chingshuiensis* T. Shimizu; *B. densifolia* Bijhouwer (1928), not Rusby (1920); *B. formosana* Ahrendt (1941), not H. L. Li (1952); *B. kawakamii* var. *formosana* Ahrendt; *B. nantoensis* C. K. Schneider.

Shrubs, evergreen, 1–2 m tall. Branches dark gray, terete; shoots pale yellow, sulcate, verruculose; spines 3-fid, concolorous, 1.5–2 cm, not sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially dark green, elliptic, ovate-oblong, or oblong-lanceolate to obovate-oblong or oblanceolate,  $2.5-4.5 \times 1-1.5$  cm, leathery, both surfaces not pruinose, abaxially with obviously raised midvein, lateral veins impressed, adaxially with obviously impressed midvein, lateral veins visible, both surfaces with conspicuous reticulate veins, base cuneate, margin 3–8-spinose-serrate on each side, sometimes coarsely 1- or 2-aristate-dentate on each side, apex acute, aristate. Flowers 7–15-fascicled. Pedicels 7–15 mm; bractlets lanceolate, ca.  $2.5 \times 1$  mm, apex acuminate. Sepals in 2 whorls; outer sepals lanceolate or ovate, ca.  $3.5 \times 2$  mm, apex acuminate; inner sepals lanceolate or oblong-elliptic,  $8-9 \times$  ca. 3.5 mm, apex acuminate or obtuse. Petals oblong or oblong-obo-

vate,  $4-5 \times$  ca. 3.2 mm, base cuneate, with separate glands, apex entire or slightly incised. Anther connective slightly prolonged, truncate. Ovules 2 or 3, shortly funiculate. Berry ovoid, ca.  $9 \times 5$  mm, slightly pruinose, style persistent. Fl. Mar–May, fr. Aug–Oct.

- Thickets, forests; 2500–3500 m. Taiwan.

**94. *Berberis bicolor*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 454. 1911.

二色小檗 er se xiao bo

Shrubs, evergreen, 1–2 m tall. Branches pale yellow-brown or slightly gray, terete, glabrous; spines 3-fid, concolorous, 1–1.5 cm. Leaves shortly petiolate; leaf blade abaxially pale green, adaxially deep green, narrowly elliptic or elliptic-lanceolate,  $6-10 \times 1.7-2.2$  cm, thinly leathery, abaxially pruinose, midvein obviously raised, lateral veins slightly raised, adaxially with obviously impressed midvein, lateral veins slightly raised, both surfaces with indistinct reticulate veins, base cuneate, margin 10–25-spinose-serrate on each side, apex acuminate. Flowers 3–6-fascicled, reddish yellow. Pedicels 1–1.2 cm, slender; bractlets triangular-ovate,  $2-2.5 \times 1-1.5$  mm, apex acute. Sepals in 2 whorls; outer sepals elliptic, ca.  $5 \times 3$  mm, apex acute; inner sepals obovate, ca.  $6.2 \times 4$  mm. Petals obovate, ca.  $5 \times 3$  mm, base clawed, with approximate glands, apex emarginate or subentire. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2. Berry (immature) green, ellipsoid, slightly pruinose, style not persistent. Fl. Apr–May, fr. Jun–Aug.

- Forests, shaded places on slopes; 1400–1500 m. Guizhou.

**95. *Berberis chunanensis*** T. S. Ying in S. Y. Jin & Y. L. Chen, Cat. Type Spec. Herb. China (Suppl. II), 52. 2007.

淳安小檗 chun an xiao bo

Shrubs, evergreen, ca. 1 m tall. Branches dark gray, terete; shoots pale yellow; spines 3-fid, pale yellow, 1.2–1.7 cm. Leaves subsessile; leaf blade abaxially pale yellow, adaxially dark green, ovate-elliptic,  $1.5-3.5 \times 0.5-1.3$  cm, leathery, both surfaces not pruinose, abaxially with raised midvein, adaxially with slightly impressed midvein, lateral veins conspicuous, reticulate veins indistinct, base broadly cuneate, margin 3–7-spinose-serrate on each side, apex acuminate, aristate. Flowers 4–8-fascicled. Pedicels pale brownish yellow, 1.2–2 cm, glabrous. Sepals in 2 whorls; outer sepals ovate or ovate-elliptic,  $2.1-3.2 \times 1.1-2.2$  mm; inner sepals elliptic,  $6.5-7.2 \times 4.2-5$  mm. Petals obovate,  $6-6.5 \times 3-3.5$  mm, base broadly cuneate, with separate glands, apex entire, sometimes slightly emarginate. Stamens ca. 5 mm; anther connective prolonged, rounded. Ovules 2 or 3, funiculate. Fruit stalk reddish brown; berry ellipsoid,  $8-12 \times 5-6$  mm, pruinose, style ca. 1 mm. Fl. Apr–May, fr. Jul–Oct.

- Forests, rocky crevices; ca. 500 m. Zhejiang (Chun'an).

**96. *Berberis jinfoshanensis*** T. S. Ying, Acta Phytotax. Sin. 37: 316. 1999.

金佛山小檗 jin fo shan xiao bo

Shrubs, evergreen, 1.5–2 m tall. Branches dark gray,

terete, not verruculose; shoots stramineous, glabrous; spines 3-fid, concolorous, 1–3.5 cm, adaxially slightly sulcate. Petiole 2–4 mm; leaf blade abaxially grayish white or yellow-green, adaxially dark green, elliptic, 3–7 × 1.3–2.5 cm, leathery, abaxially slightly pruinose, midvein and lateral veins raised, adaxially with impressed midvein, lateral veins 5–7 pairs, slightly raised, both surfaces with indistinct reticulate veins, base cuneate, margin 3–10-spinose-serrate on each side, apex acute. Flowers 5–8-fascicled; bracts ovate-triangular, ca. 2 × 1 mm. Pedicels 1.5–2 cm, glabrous; bractlets ovate, ca. 2 × 2 mm. Sepals in 2 whorls; outer sepals obovate, ca. 5 × 3.5 mm; inner sepals oblong, ca. 5.5 × 4 mm. Petals obovate, 5–6 × 4–5.5 mm, base clawed, with approximate ovate glands, apex entire. Stamens 4.2–5 mm; anther connective slightly prolonged, obtuse. Ovules (2 or)3. Berry (immature) black, ellipsoid, 7–8 × 5–6 mm, densely white pruinose, style persistent. Fl. Mar–Apr, fr. May–Aug.

- Mixed forests, weedy slopes; ca. 1600 m. Chongqing.

**97. *Berberis hayatana*** Mizushima, Misc. Rep. Res. Inst. Nat. Resources 35: 31. 1954.

南湖小檗 *nan hu xiao bo*

*Berberis formosana* H. L. Li (1952), not Ahrendt (1941).

Shrubs, evergreen, low. Branches pale gray, slender, sulcate, glabrous; spines 3-fid, weak, 1–1.5 cm, adaxially sulcate. Leaves shortly petiolate; leaf blade abaxially shiny, green, oblong, oblong-lanceolate, or elliptic, 1.5–3 × 0.6–1.2 cm, leathery, abaxially not pruinose, midvein obviously raised, lateral veins 5–7 pairs, adaxially glaucous, midvein slightly impressed, base broadly cuneate, margin flat, 3–7-spinose-serrate on each side, apex acute, aristate. Flowers 2–6-fascicled. Pedicels 8–10 mm, slender, glabrous; bractlets triangular-ovate, ca. 1.5 mm, apex acute. Sepals in 2 whorls; outer sepals broadly ovate or obovate-elliptic, ca. 5 mm, apex acute; inner sepals obovate-elliptic or obovate, ca. 5 mm, apex rounded. Petals obovate, ca. 4 mm, base attenuate, with separate glands, apex emarginate. Stamens ca. 2.5 mm; anther connective slightly prolonged, truncate. Ovules solitary, funiculate. Berry black, ellipsoid or ovoid, 4–6 × ca. 2 mm, pruinose, style not persistent. Fl. and fr. unknown.

- Slopes. Taiwan.

**98. *Berberis cavaleriei*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 454. 1911.

贵州小檗 *gui zhou xiao bo*

*Berberis dolichostemon* Ahrendt; *B. emilii* C. K. Schneider; *B. liophylla* C. K. Schneider var. *conglobata* Ahrendt; *B. praecipua* C. K. Schneider var. *major* Ahrendt.

Shrubs, evergreen, ca. 2 m tall. Branches brownish gray; shoots brownish yellow, very sulcate, sparsely black verruculose; spines 3-fid, 1–2.5 cm, adaxially slightly sulcate or flat. Petiole 1–2.5 mm; leaf blade abaxially yellow-green, adaxially dark green, elliptic or oblong-elliptic, 2.5–6 × 1–1.5 cm, leathery, both surfaces not pruinose, abaxially with conspicuously raised midvein, adaxially with obviously impressed midvein,

both surfaces with slightly prominent lateral veins, reticulate veins indistinct, base cuneate, margin slightly revolute, 6–15-spinose-serrate on each side, apex obtuse or subacute. Flowers 5–20-fascicled. Pedicels 8–20 mm, slender; bractlets ovate, ca. 2.5 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate or narrowly ovate, ca. 3 × 1 mm, apex obtuse or acute; inner sepals obovate or narrowly obovate, 2–4.5 × 1–1.5 mm, apex subacute. Petals ovate or obovate, ca. 5.5 × 2.8 mm, base with separate glands, apex incised. Stamens 2.5–4 mm; anther connective truncate. Ovules solitary, shortly funiculate. Berry black, oblong, 7–8 × ca. 4 mm, not pruinose, style persistent. Fl. Apr–May, fr. Jul–Oct.

- Thickets, roadsides, forests; 900–1800 m. Guizhou, Yunnan.

**99. *Berberis aristatoserrulata*** Hayata, Icon. Pl. Formosan. 3: 13. 1913 [*“aristato-serrulata”*].

密齿小檗 *mi chi xiao bo*

*Berberis mingetsensis* Hayata.

Shrubs, evergreen, ca. 1 m tall. Branches slender, sulcate; spines 3-fid, 2–4 mm, slender. Petiole 2–4 mm; leaf blade adaxially shiny, green, oblong-lanceolate, 5–7 × 1–1.5 cm, thinly leathery, abaxially glaucous, reticulate veins obviously raised, adaxially with indistinct reticulate veins, base cuneate, margin slightly revolute, closely 20–40-spinulose-serrulate on each side, apex obtuse, aristate. Flowers 10–15-fascicled, green-yellow. Pedicels ca. 1 cm; bractlets oblong-ovate, ca. 2.5 mm, apex acuminate. Sepals in 2 whorls, obovate; outer sepals ca. 5 × 4 mm; inner sepals to 5.5 mm. Petals obovate-spatulate, 3–5 × 2–2.5 mm, base with separate glands, apex rounded, incised. Ovules 2, funicles ca. as long as or to 2 × as long as ovules. Berry dark blue-black, ovoid, ca. 7 × 4 mm. Fl. and fr. May–Aug.

- Thickets; 2000–3000 m. Taiwan.

**100. *Berberis silvicola*** C. K. Schneider in Sargent, Pl. Wilson. 3: 438. 1917.

兴山小檗 *xing shan xiao bo*

Shrubs, evergreen, 1–3 m tall. Branches deep gray, angulate, not verruculose; shoots stramineous, glabrous; internodes 3.5–5.5 cm; spines 3-fid, 3–10 mm, slender, sometimes absent. Petiole 1–3 mm; leaf blade abaxially pale green, adaxially deep green, shiny, elliptic or oblong, 2–5 × 1–2 cm, thinly leathery, abaxially not pruinose, midvein obviously raised, lateral and reticulate veins conspicuous, adaxially with obviously impressed midvein, lateral and reticulate veins indistinct, base cuneate or shortly attenuate, margin 12–16-spinose-serrate on each side, apex acute. Flowers 2–5-fascicled. Pedicels 5–12 mm, slender; bractlets ovate, ca. 2.5 × 1 mm, apex acute. Sepals in 2 whorls; outer sepals ovate, ca. 4 × 1.8 mm, apex obtuse; inner sepals obovate, ca. 6 × 3.5 mm, apex rounded. Petals obovate, ca. 5 × 3 mm, base cuneate, with separate glands, apex incised. Stamens 5–8 mm; anther connective slightly prolonged, truncate. Ovules 2. Fruit stalk to 1.5 cm; berry black, oblong, ca. 8 × 4–5 mm, slightly pruinose; style persistent, short. Fl. May–Jun, fr. Jul–Oct.

- Thickets; 1200–2400 m. Hubei.

**101. *Berberis pruinosa*** Franchet, Bull. Soc. Bot. France 33: 387. 1886.

粉叶小檗 fen ye xiao bo

Shrubs, evergreen, 1–2 m tall. Branches brownish gray or brownish yellow, terete, black verruculose; spines 3-fid, concolorous, 2–3.3 cm, stout, adaxially sulcate or flat. Leaves subsessile; leaf blade adaxially shiny, yellow-green or grayish green, elliptic to obovate, 2–6 × 1–2.5 cm, rigidly leathery, abaxially pruinose or not, midvein obviously raised, lateral veins indistinct, adaxially with flat midvein, lateral veins slightly raised, both surfaces with indistinct reticulate veins, base cuneate, margin slightly revolute or flat, usually coarsely 1–6-aristate-dentate on each side, occasionally entire or 3–5-spinose-serrate on each side, apex obtuse or shortly acuminate. Flowers (8–)10–20-fascicled. Pedicels 1–2 cm, slender; bractlets lanceolate, ca. 2 mm, apex acuminate. Sepals in 2 whorls; outer sepals oblong-elliptic, ca. 4 × 2 mm, apex obtuse, rounded; inner sepals obovate, ca. 6.5 × 5 mm, apex rounded. Petals obovate, ca. 7 × 4–5 mm, base clawed, with completely basal glands, apex deeply incised or entire. Stamens ca. 6 mm; anther connective not prolonged, rounded-truncate. Ovules 2 or 3. Berry ellipsoid or subglobose, 6–7 × 4–5 mm, densely white pruinose, style not persistent; seeds 2. Fl. Mar–Apr, fr. Jun–Aug.

• Thickets, forests, forest margins, roadsides; 1800–4000 m. Guizhou, Sichuan, Xizang, Yunnan.

- 1a. Petals deeply incised at apex; leaf margin usually coarsely 1–6-aristate-dentate on each side, occasionally entire ..... 101a. var. *pruinosa*  
 1b. Petals entire at apex; leaf margin usually entire, rarely 3–5-spinose-serrate on each side ..... 101b. var. *barresiana*

**101a. *Berberis pruinosa* var. *pruinosa***

粉叶小檗(原变种) fen ye xiao bo (yuan bian zhong)

*Berberis hibberdiana* Ahrendt; *B. pruinosa* var. *brevipes* Ahrendt; *B. pruinosa* var. *punctata* Ahrendt; *B. pruinosa* var. *viridifolia* C. K. Schneider, p.p.

Leaf margin usually coarsely 1–6-aristate-dentate on each side, occasionally entire. Petals deeply incised at apex.

• Thickets, forests, forest margins, roadsides; 1800–4000 m. Guizhou, Sichuan, Xizang, Yunnan.

**101b. *Berberis pruinosa* var. *barresiana*** Ahrendt, Bull. Misc. Inform. Kew 1939: 266. 1939.

易门小檗 yi men xiao bo

*Berberis pruinosa* var. *tenuipes* Ahrendt.

Leaf margin entire or rarely 3–5-spinose-serrate on each side. Petals entire, rounded at apex.

• Thickets, forests; 1800–2600 m. Yunnan.

**102. *Berberis laojunshanensis*** T. S. Ying, Acta Phytotax. Sin. 37: 318. 1999.

老君山小檗 lao jun shan xiao bo

Shrubs, evergreen, 0.5–1 m tall. Branches dark gray, terete; shoots pale yellow, not verruculose; spines 3-fid, pale yellow, ca. 1 cm. Leaves subsessile; leaf blade adaxially dark green, elliptic or narrowly elliptic, 1–2.3 cm × 4–7 mm, abaxially pruinose, midvein indistinct, adaxially veins indistinct, base attenuate, margin slightly revolute, 5–7-spinose-serrate on each side, apex acuminate, aristate. Flowers 3- or 4-fascicled. Pedicels 1–1.5 cm, glabrous. Sepals in 3 whorls; outer sepals triangular-ovate, ca. 2.1 × 1.2 mm; median sepals ovate, ca. 4 × 2 mm, apex acuminate; inner sepals oblong, 4.6–5 × 2.8–3.5 mm. Petals obovate, ca. 4 × 2 mm, base attenuate, with approximate glands, apex slightly retuse. Stamens ca. 3 mm; anther connective truncate. Ovules 4. Fruit unknown. Fl. May–Jun, fr. unknown.

• Thickets on slopes. Hubei.

**103. *Berberis sargentiana*** C. K. Schneider in Sargent, Pl. Wilson. 1: 359. 1913.

刺黑珠 ci hei zhu

*Berberis recurvata* Ahrendt; *B. simulans* C. K. Schneider.

Shrubs, evergreen, 1–3 m tall. Stems terete; branches grayish brown; shoots reddish, usually not verruculose, rarely scarcely black verruculose; internodes 3–6 cm; spines 3-fid, 1–4 cm, adaxially sulcate. Leaves subsessile; leaf blade abaxially yellow-green or pale green, adaxially shiny, dark green, oblong-elliptic, 4–15 × 1.5–6.5 cm, thickly leathery, abaxially with conspicuously raised midvein, lateral and reticulate veins prominent, adaxially with impressed midvein, lateral veins slightly raised, reticulate veins indistinct, base cuneate, margin 15–25-spinose-serrate on each side, apex acute. Flowers 4–10-fascicled. Pedicels 1–2 cm; bractlets red, ca. 2 × 2 mm. Sepals in 3 whorls; outer sepals with a red band along middle, ovate, ca. 3.5 × 3 mm, apex subacute; median sepals rhombic-elliptic, ca. 5 × 4.5 mm; inner sepals obovate, ca. 6.5 × 5 mm. Petals obovate, ca. 6 × 4.5 mm, base cuneate, with contiguous, orange glands, apex emarginate with rounded lobes. Stamens ca. 4.5 mm; anther connective truncate. Ovules 1 or 2. Berry black, oblong or oblong-ellipsoid, 6–8 × 4–6 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Nov.

• Thickets, roadsides, bamboo forests, streamsides of forest understories; 700–2100 m. Hubei, Sichuan.

**104. *Berberis lempergiana*** Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941.

天台小檗 tian tai xiao bo

Shrubs, evergreen, 1–2 m tall. Branches deep gray, sparsely black verruculose; shoots pale grayish yellow; spines 3-fid, subterete, 1–3 cm, stout. Petiole 1–5 mm; leaf blade abaxially pale green, brownish yellow when dry, slightly shiny, adaxially shiny, dark green, oblong-elliptic or lanceolate, 3.5–8 × 1–2.5 cm, leathery, abaxially not pruinose, midvein obviously raised, lateral and reticulate veins indistinct, adaxially with impressed midvein, lateral veins slightly visible, reticulate veins indistinct, base cuneate, margin 5–12-spinose-serrate on each

side, apex acuminate. Flowers 3–7-fascicled. Pedicels reddish, 7–15 mm; bractlets red, ovate, ca. 1.3 mm. Sepals in 3 whorls; outer sepals ovate-elliptic, ca. 2.5 × 2 mm; median sepals ovate-elliptic, ca. 5.5 × 4 mm; inner sepals obovate, ca. 7 × 6 mm. Petals oblong-obovate, ca. 6 × 4 mm, base cuneate, with contiguous glands, apex emarginate with rounded lobes. Stamens ca. 5 mm; anther connective obviously prolonged, truncate. Ovules 2 or 3, subsessile. Berry deep purple, oblong-ellipsoid or ellipsoid, 7–10 × 5–5.5 mm, pruinose, style persistent; seeds 2 or 3, obovoid-globose or ellipsoid. Fl. Apr–May, fr. Jul–Oct.

- Forests, thickets, streamsides; ca. 1200 m. Zhejiang.

**105. *Berberis soulieana*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 449. 1905.

假豪猪刺 jia hao zhu ci

*Berberis soulieana* var. *paucinervata* Ahrendt; *B. stenophylla* Hance (1882), not Lindley (1864).

Shrubs, evergreen, 1–2(–3) m tall. Branches dark gray, terete, sometimes sulcate, scarcely verruculose; shoots grayish yellow, terete; spines 3-fid, adaxially flat, 1–2.5 cm, stout. Petiole 1–2 mm; leaf blade abaxially yellow-green, adaxially dark green, oblong, oblong-elliptic, or oblong-obovate, 3.5–10 × 1–2.5 cm, very rigidly leathery, abaxially not pruinose, midvein obviously raised, adaxially with impressed midvein, both surfaces with indistinct lateral and reticulate veins, base cuneate, margin 5–18-spinose-serrate on each side, apex acute, aristate. Flowers 7–20-fascicled. Pedicels 5–11 mm; bractlets 2, reddish, ovate-triangular, ca. 2.2 × 1.5 mm, apex acute. Sepals in 3 whorls; outer sepals ovate, ca. 3 × 2.4 mm; median sepals suborbicular, ca. 5 × 4 mm; inner sepals obovate-oblong, ca. 7 × 5 mm. Petals obovate, ca. 5 × 3.8–4 mm, base shortly clawed, with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective slightly prolonged, rounded. Ovules 2 or 3. Berry red when mature, obovoid-oblong, 7–8 × ca. 5 mm, pruinose, style persistent; seeds 2 or 3. Fl. Mar–Apr, fr. Jun–Sep.

- Thickets, streamsides, forests, slopes; 600–1800 m. Gansu, Hubei, Shaanxi, Sichuan.

**106. *Berberis impedita*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 263. 1939.

南岭小檗 nan ling xiao bo

Shrubs, evergreen, 0.5–1 m tall. Branches dark gray, angulate, not verruculose; shoots pale yellow; spines absent or very weak, 3-fid, pale yellow, ca. 1 cm. Petiole 5–8 mm; leaf blade abaxially grayish green or yellowish green, adaxially dark green, elliptic, oblong, or narrowly elliptic, 4–9 × 1.8–3.5 cm, leathery, abaxially with obviously raised midvein and lateral veins, reticulate veins inconspicuous, adaxially with impressed midvein, lateral veins slightly raised, reticulate veins indistinct, base attenuate, margin 8–12-spinose-serrate on each side, apex obtuse or acute. Flowers 2–4-fascicled. Pedicels 8–18 mm; bractlets ovate, ca. 2.5 mm, apex acute. Sepals in 2 whorls; outer sepals elliptic-oblong, 3.5–4.5 × 1.8–2.5 mm; inner sepals elliptic, 5–5.5 × 3–3.5 mm, apex rounded. Petals obovate, ca. 4 × 2.5 mm, apex emarginate. Stamens ca. 3 mm; anther connective slightly thickened with 2 small teeth. Ovules 4–6. Fruit stalk

often reddish. Berry black, oblong, 8–9 × 5–6 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Oct.

- Sunny places on mountain summits, forests, thickets, sparse forests, roadsides; 1400–2800 m. Guangdong, Guangxi, Hunan, Jiangxi, Sichuan.

**107. *Berberis hsuyunensis*** P. K. Hsiao & W. C. Sung, Acta Phytotax. Sin. 12: 388. 1974.

叙永小檗 xu yong xiao bo

Shrubs, evergreen, 1–2 m tall. Branches gray; shoots purplish brown, slightly angulate; internodes 5–6 cm; spines 3-fid, to 1 cm, slender. Petiole 2–3 mm; leaf blade abaxially yellow-green, adaxially green, oblong-elliptic, elliptic, or broadly elliptic, 6–9 × 3–5 cm, thickly leathery, abaxially pruinose, midvein and lateral veins conspicuously raised, adaxially with slightly raised midvein and lateral veins, reticulate veins visible, base cuneate, margin 5–9-spinose-serrate on each side, or above middle 3–5-spinose-serrate on each side, apex acute. Flowers 30–50-fascicled. Pedicels 1.5–2 cm; bractlets triangular, ca. 1 × 1 mm. Sepals in 2 whorls; outer sepals triangular-ovate, ca. 3 × 2.5 mm; inner sepals broadly ovate, ca. 4 × 4 mm, apex obtuse. Petals obovate, ca. 4.5 × 3.5 mm, base clawed, with separate glands, apex slightly emarginate to subrounded. Stamens ca. 2 mm; anther connective prolonged, truncate. Ovules 5 or 6, shortly funiculate or subsessile. Berry black, subglobose, ca. 7 × 6 mm, pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

- Forests, streamsides; 1200–1600 m. Sichuan.

**108. *Berberis deinacantha*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 259. 1939.

壮刺小檗 zhuang ci xiao bo

Shrubs, evergreen, 1–2 m tall. Branches brownish gray, angulate, black verruculose, glabrous; shoots brownish yellow; spines 3-fid, 2.5–5 cm, stout, adaxially sulcate. Petiole 2–4 mm; leaf blade abaxially yellow-green, adaxially dark castaneous, oblong-elliptic, 3–12 × 1.5–3 cm, leathery, both surfaces not pruinose, abaxially with obviously raised midvein, lateral veins slightly raised, adaxially with obviously impressed midvein, lateral veins 12–15 pairs, both surfaces with prominent reticulate veins, base cuneate, margin sometimes slightly revolute, 20–30-spinose-serrate on each side, apex obtuse, aristate. Flowers 6–15(–20)-fascicled, deep yellow. Pedicels 12–15(–20) mm. Sepals in 2 whorls; outer sepals ovate, ca. 4 × 3.5 mm, apex rounded, obtuse; inner sepals obovate or obovate-orbicular, ca. 5.5 × 5 mm. Petals oblong-obovate, ca. 4.5 × 3 mm, base not clawed, with separate glands, apex slightly emarginate. Stamens ca. 3 mm; anther connective prolonged, slightly retuse. Ovules solitary. Berry purplish black, ellipsoid, 6–7 × ca. 4 mm, slightly pruinose, style not persistent. Fl. May, fr. Nov.

- Thickets, forests; 1700–3100 m. Guizhou, Sichuan, Yunnan.

**109. *Berberis valida*** (C. K. Schneider) C. K. Schneider, Mitt. Deutsch. Dendrol. Ges. 55: 40. 1942.

宁远小檗 ning yuan xiao bo

*Berberis deinacantha* C. K. Schneider var. *valida* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 260. 1939.

Shrubs, evergreen, ca. 1.5 m tall. Branches brownish gray, angulate, scarcely black verruculose, glabrous; shoots brownish yellow, glabrous; spines 3-fid, brownish yellow, 1–2 cm, stout, adaxially flat. Petiole 2–3 mm or leaf sessile; leaf blade abaxially yellow-green, adaxially shiny, deep green, elliptic or oblong-elliptic, 4–7 × 1.5–3 cm, leathery, abaxially not pruinose, midvein obviously raised, lateral and reticulate veins conspicuous, adaxially with obviously impressed midvein, lateral and reticulate veins prominent, base cuneate, margin sometimes slightly revolute, 8–16-spinose-serrate on each side, apex acute or rounded, obtuse. Flowers 3–5-fascicled. Pedicels 6–10 mm; bractlets ca. 2 mm. Sepals in 2 whorls; outer sepals ovate, ca. 4 × 3.5 mm; inner sepals obovate-orbicular, ca. 5.5 × 5 mm. Petals oblong-obovate, ca. 4.5 mm, base attenuate, with separate glands, apex emarginate. Ovules solitary. Berry purplish black, ellipsoid, 8–9 × 5–6 mm, not pruinose; style persistent, short. Fl. May–Jun, fr. Nov.

- Thickets; ca. 2000 m. Sichuan, Yunnan.

**110. *Berberis nemorosa*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 246. 1939.

林地小檗 *lin di xiao bo*

Shrubs, evergreen, ca. 1.5 m tall. Branches gray; shoots pale yellow-gray, angulate; internodes 2.5–3 cm; spines yellow-brown, terete, 1–2 cm, slender. Petiole 1–4 mm; leaf blade abaxially ultimately slightly brown, adaxially shiny, green, oblong-elliptic, 2–4 × 1–1.5 cm, leathery, abaxially initially glaucous, pruinose, both surfaces with indistinct reticulate veins, base attenuate, margin slightly revolute, 7–16-spinose-serrate on each side, apex obtuse. Flowers unknown. Ovules solitary, sessile. Inflorescence with 5–7-fascicled berries; fruit stalk reddish, 1.2–1.5 cm; berry ellipsoid, 6–7 mm, white pruinose; style persistent, short. Fl. unknown, fr. Jun.

- Thickets; ca. 1400 m. Guangxi.

**111. *Berberis chingii*** S. S. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 9: 191. 1934.

华东小檗 *hua dong xiao bo*

*Berberis cavaleriei* H. Léveillé var. *pruinosa* Bijhouwer; *B. chingii* subsp. *subdentata* C. M. Hu; *B. chingii* subsp. *wulingensis* C. M. Hu.

Shrubs, evergreen, 1–2 m tall. Branches dark gray; shoots pale yellow, terete or slightly angulate, sparsely black verruculose; spines 3-fid, concolorous, 1–2.5 cm, stout. Petiole 2–4 mm; leaf blade adaxially dark green, sometimes shiny, oblong-obovate or narrowly oblong-elliptic, 2–8 × 0.8–2.5 cm, thinly leathery, abaxially pruinose, midvein raised, lateral veins indistinct, adaxially with obviously impressed midvein, lateral veins 5–10 pairs, both surfaces with inconspicuous reticulate veins, base cuneate, margin above middle 2–10-spinose-serrate on each side, occasionally entire, apex acute. Flowers 4–14-fascicled. Pedicels 7–18 mm; bractlets triangular. Sepals in 2 whorls; outer sepals elliptic, 5–5.5 mm, apex obtuse; inner sepals obovate-oblong, ca. 6.5 mm. Petals obovate, ca. 5.5 × 3 mm, base clawed, with approximate glands, apex emarginate. Stamens ca. 4.5 mm; anther connective prolonged, obtuse.

Ovules 2 or 3. Berry ellipsoid or obovoid-ellipsoid, 6–8 × 4–5 mm, pruinose, style persistent. Fl. Apr–May, fr. Jun–Sep.

- Mixed forests, thickets, runlet sides, limestone slopes; 200–2000 m. Fujian, Guangdong, Hunan, Jiangxi.

**112. *Berberis vinifera*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 142. 1985.

可食小檗 *ke shi xiao bo*

Shrubs, evergreen, 1–3 m tall. Branches grayish black, terete; shoots dark gray, angulate, puberulous; spines 3-fid, concolorous, 4–10 mm. Leaves subsessile; leaf blade abaxially pale gray-brown, adaxially dark green, elliptic or broadly elliptic, rarely obovate, 1.5–4.5 × 0.6–1.8 cm, leathery, abaxially not pruinose, midvein and lateral veins obviously raised, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuously raised dense reticulate veins, base broadly cuneate, margin 1–4-spinose-serrate on each side, occasionally entire, apex rounded. Flowers unknown. Inflorescence with 4–20-fascicled berries; fruit stalk 7–18 mm; berry purplish black, ovoid-globose, 8–10 × 5–7 mm, white pruinose, style 1–2 mm; seeds 4 or 5. Fl. unknown, fr. May–Jul.

- Thickets, mixed forests; 2200–2500 m. Xizang.

**113. *Berberis dumicola*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 249. 1939.

丛林小檗 *cong lin xiao bo*

Shrubs, evergreen, 1–2 m tall. Stems terete; branches pale yellow; shoots reddish, glabrous, brownish black verruculose; spines 3-fid, 1–2 cm, adaxially flat or slightly sulcate. Petiole 4–5 mm; leaf blade abaxially brownish yellow, adaxially dark yellow-castaneous, usually elliptic, 5–9.5 × 1.5–2 cm, leathery, abaxially not pruinose, midvein conspicuously raised, adaxially with obviously impressed midvein, both surfaces with indistinct lateral and reticulate veins, base cuneate, margin 20–40-spinose-serrate on each side, apex subacuminate or acute. Flowers 5–20-fascicled. Pedicels reddish, 8–15 mm; bractlets ovate, apex obtuse or subobtuse. Sepals in 2 whorls; outer sepals slightly reddish, oblong-ovate, ca. 3 × 2.5 mm, apex obtuse; inner sepals oblong-obovate, ca. 6 × 5 mm. Petals oblong-obovate, ca. 6.5 × 5 mm, base clawed, with separate ovate glands, apex rounded, incised to emarginate. Stamens ca. 4.5 mm; anther connective prolonged, shortly apiculate. Ovules 1 or 2; funicles ca. as long as ovules. Berry purplish black, ellipsoid or obovoid-ellipsoid, 8–9 × 4–5 mm, pruinose, style persistent. Fl. Apr–May, fr. Oct.

- Thickets, forest margins, roadsides, sunny slopes; 2000–3000 m. Yunnan.

**114. *Berberis fallax*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 260. 1939.

假小檗 *jia xiao bo*

Shrubs, evergreen, 1–2.5 m tall. Branches brownish gray; shoots brownish yellow, very sulcate, not verruculose; spines 3-fid, 6–20 mm, slender, adaxially sulcate. Leaves subsessile; leaf blade abaxially pale yellow, adaxially dark green, sometimes shiny, oblong-elliptic to lanceolate or broadly elliptic, 2–6 ×

0.8–1.6(–2.2) cm, thinly leathery, abaxially not pruinose, midvein obviously raised, adaxially with slightly impressed midvein, both surfaces with slightly raised lateral veins, reticulate veins slightly conspicuous, base cuneate, margin 7–15-spinose-serrate on each side, apex obtuse, aristate. Flowers 3–7-fascicled. Pedicels 1–2 cm, glabrous. Sepals in 2 whorls; outer sepals ovate, ca. 4.5 × 3 mm, apex subacute; inner sepals broadly elliptic, ca. 6 × 4 mm. Petals obovate, ca. 4 × 2.5 mm, base clawed, with separate glands, apex obtusely emarginate. Stamens ca. 2.5 mm; anther connective prolonged, slightly concave. Ovules 4 or 5, sessile. Berry ellipsoid or subglobose, ca. 8 × 5 mm, not or slightly white pruinose; style short and persistent, or not persistent. Fl. Feb–Mar, fr. Sep–Nov.

- Thickets, forests, forest margins; 1800–3200 m. Yunnan.

- 1a. Leaf blade oblong-elliptic to lanceolate, 2–6 × 0.8–1.6 cm; berry ellipsoid, not pruinose, style persistent ..... 114a. var. *fallax*  
 1b. Leaf blade broadly elliptic, 3–3.5 × 2–2.2 cm; berry subglobose, slightly white pruinose, style not persistent ..... 114b. var. *latifolia*

**114a. *Berberis fallax* var. *fallax***

假小檗(原变种) *jia xiao bo* (*yuan bian zhong*)

Leaf blade oblong-elliptic to lanceolate, 2–6 × 0.8–1.6 cm. Berry ellipsoid, not pruinose; style persistent, short.

- Thickets, forests; 1800–3200 m. Yunnan.

**114b. *Berberis fallax* var. *latifolia*** C. Y. Wu & S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 6. 1985.

阔叶假小檗 *kuo ye jia xiao bo*

Leaf blade broadly elliptic, 3–3.5 × 2–2.2 cm. Berry slightly white pruinose, style not persistent.

- Forest margins; ca. 2100 m. Yunnan.

**115. *Berberis guizhouensis*** T. S. Ying, Acta Phytotax. Sin. 37: 320. 1999.

毕节小檗 *bi jie xiao bo*

Shrubs, evergreen, ca. 1.2 m tall. Branches grayish black, terete, not verruculose; shoots pale gray, sulcate, glabrous, usually only shoots with spines; spines 3-fid, pale yellow, ca. 1.2 cm. Petiole 2–3 mm; leaf blade abaxially brown when dry, adaxially dark green, elliptic, narrowly elliptic, or oblong, 2–6.5 × 0.8–1.6 cm, leathery, abaxially not pruinose, midvein and lateral veins obviously raised, reticulate veins slightly prominent, adaxially with impressed midvein, lateral and reticulate veins slightly conspicuous, base cuneate, margin conspicuously revolute, undulate, 13–20-spinose-serrate on each side, apex acute or subacuminate. Flowers unknown. Inflorescence with 3–6-fascicled berries; fruit stalk pale brown, 1–1.5 cm, glabrous; berry ellipsoid, 7–9 × 4–4.5 mm, not pruinose, style not persistent; seeds 3 or 4. Fl. unknown, fr. Aug–Sep.

- Thickets, dry places; 1300–1400 m. Guizhou.

**116. *Berberis lijiangensis*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 9. 1985.

丽江小檗 *li jiang xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches brownish gray, subterete; shoots stramineous, glabrous; spines 3-fid, 1.5–3 cm. Leaves sessile; leaf blade adaxially olivaceous, oblong-elliptic or narrowly elliptic, (1.5–)3–5 × (0.8–)1.4–1.8 cm, leathery, abaxially pruinose, midvein raised, lateral veins 3–6 pairs, slightly visible, reticulate veins indistinct, adaxially with impressed midvein, lateral veins indistinct, base cuneate, margin thickened, sometimes slightly revolute, 3- or 4-spinose-serrate on each side, apex acute. Flowers 3–6-fascicled. Pedicels 1.2–1.5 cm, glabrous; bractlets ovate, ca. 2.5 mm. Sepals in 2 whorls; outer sepals broadly elliptic, ca. 8 × 7 mm, apex rounded; inner sepals oblong-elliptic, ca. 9 × 7 mm. Petals oblong-obovate, ca. 6 × 4 mm, base attenuate, not clawed, with separate linear glands, apex rounded, entire or slightly retuse. Stamens ca. 5 mm; anther connective prolonged, truncate. Ovules 4 or 5, shortly funiculate. Berry black, oblong, ca. 12 × 5–7 mm, pruinose, style not persistent. Fl. Jun, fr. Sep.

- Forests, forest margins, thickets; 2700–3400 m. Yunnan.

**117. *Berberis xanthoclada*** C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 261. 1939.

梵净小檗 *fan jing xiao bo*

Shrubs, evergreen, 1–2.5 m tall. Branches dark gray, angulate, not verruculose; shoots brownish yellow, obviously sulcate, glabrous; spines concolorous, terete, 1–3 cm. Petiole 2–4 mm; leaf blade abaxially yellow-green, adaxially shiny, dark green, elliptic or broadly elliptic, occasionally ovate, 4–8 × 1.5–3 cm, thinly leathery, abaxially pruinose or occasionally slightly so, midvein conspicuously raised, lateral veins slightly raised, adaxially with obviously impressed midvein, lateral veins slightly conspicuous, both surfaces with indistinct reticulate veins, base attenuate, margin 12–25-spinose-serrate on each side, apex acute, mucronate. Flowers 2–6-fascicled. Pedicels reddish, 7–13 mm; bractlets lanceolate, 4–5 × 1.5–2 mm. Sepals in 2 whorls; outer sepals lanceolate, 5–9 × 2–3.5 mm; inner sepals obovate-oblong, 8–10 × 4–5 mm, apex obtuse. Petals obovate, ca. 5 × 2.2–3 mm, base clawed, with separate glands, apex emarginate. Stamens 3–4 mm; anther connective prolonged, truncate. Ovules 3, shortly funiculate. Berry black, ellipsoid, not pruinose; style persistent, short. Fl. Apr–May, fr. Jun–Oct.

- Thickets, forests, bamboo groves; 1300–2600 m. Guizhou.

**118. *Berberis malipoensis*** C. Y. Wu & S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 10. 1985.

麻栗坡小檗 *ma li po xiao bo*

Shrubs, evergreen, to 2.5 m tall. Branches stramineous, terete, scarcely black verruculose; spines 3-fid, weak, less than 1 cm. Leaves shortly petiolate; leaf blade abaxially yellow-green, adaxially dark green, oblong-ovate or oblong-elliptic, 5–18 × 2–4.5 cm, leathery, abaxially not pruinose, midvein, lateral, and reticulate veins obviously raised, adaxially with midvein impressed, lateral veins conspicuous, reticulate veins indistinct, base cuneate, margin remotely spinose-serrate, apex acuminate. Flowers unknown. Inflorescence with (3–)10–17-

fascicled berries; fruit stalk to 3.5 cm; berry black, ellipsoid, 10–11 × 5–6 mm, not pruinose, style not persistent; seeds 2. Fl. unknown, fr. Nov–Jan of following year.

- Forests on limestone slopes, roadsides; 1000–1800 m. Yunnan.

**119. *Berberis weiningensis*** T. S. Ying, Acta Phytotax. Sin. 37: 326. 1999.

威宁小檗 wei ning xiao bo

Shrubs, evergreen, ca. 1 m tall. Branches grayish brown; shoots pale yellow, angulate, densely puberulous; spines 3-fid, pale yellow, 5–10 mm, slender. Leaves subsessile; leaf blade adaxially deep green, narrowly obovate-elliptic, narrowly elliptic, or obovate, 0.4–2 cm × 2–5 mm, papery, adaxially not pruinose, midvein and lateral veins raised, reticulate veins inconspicuous, base cuneate, margin thickened, slightly revolute, entire or 1–6-spinose-serrate on each side, apex acute or obtuse, aristate. Inflorescence a subumbel, 4–6-flowered, 2–3 cm including peduncle 1.3–2.3 cm; bracts ovate, apex acuminate. Pedicels 3–4 mm, slender, glabrous; bractlets triangular-ovate, 1–1.7 × 0.8–1.1 mm. Flowers golden-yellow, 4–5 mm in diam. Sepals in 2 whorls; outer sepals elliptic, ca. 3.2 × 2.5 mm; inner sepals broadly obovate, ca. 3.5 × 3.2 mm. Petals obovate, ca. 3.1 × 2 mm, base attenuate, not clawed, with separate lanceolate glands, apex incised, lobes acute. Stamens ca. 2.5 mm; anther connective prolonged, rounded. Ovules 3, subsessile. Berry red, ovoid-oblong, 7–9 × 4–6 mm, not pruinose, style ca. 0.5 mm. Fl. May, fr. Jul–Sep.

- Thickets, weedy places on mountain summits; 2100–2500 m. Guizhou.

**120. *Berberis johannis*** Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941.

腰果小檗 yao guo xiao bo

Shrubs, deciduous, 1.5–2 m tall. Branches gray; shoots pale brown, slightly sulcate, glabrous, scarcely black verruculose; spines 3-fid, 0.5–1.5 cm, slender, flat. Leaves subsessile; leaf blade abaxially gray, adaxially dark green, oblanceolate or obovate, 0.8–3 × 0.3–1.2 cm, papery, abaxially slightly pruinose, both surfaces with obviously raised reticulate veins, base cuneate, margin entire, sometimes 2–5-spinose on each side, apex acute or obtuse. Inflorescence an umbel, 3–10-flowered, 2–3 cm including peduncles 3–10 mm, often base with 1 or several fascicled flowers; bracts triangular-ovate, ca. 1 mm. Pedicels 5–12 mm, slender. Sepals in 3 whorls; outer sepals oblong-triangular, ca. 2.5 × 1.5 mm, apex acute; median sepals oblong-ovate, ca. 4 × 2 mm, apex subobtuse; inner sepals elliptic, ca. 5 × 2.5 mm. Petals obovate, ca. 4.5 × 3 mm, base clawed, with approximate obovate glands, apex emarginate, lobes acute. Stamens ca. 2.5 mm; anther connective slightly prolonged, truncate. Ovules 4, funiculate; funicles ca. as long as ovules. Berry shiny, red, oblong-ellipsoid or oblong-ovoid, 11–13 × 3–4.5 mm, contracted at middle, not pruinose, apex usually bent, style not persistent. Fl. May–Jun, fr. Jul–Oct.

- Forests, thickets; 3000–4000 m. Xizang.

**121. *Berberis leboensis*** T. S. Ying, Acta Phytotax. Sin. 37: 328. 1999.

雷波小檗 lei bo xiao bo

Shrubs, deciduous, 1.3–2 m tall. Branches gray-brown, angulate, not verruculose; shoots dark purplish brown, glabrous; spines 3-fid, pale yellow, 1–1.5 cm. Leaves subsessile; leaf blade abaxially grayish white, adaxially dark green, narrowly elliptic or narrowly obovate, 1–1.8 cm × 3–5 mm, papery, abaxially with obviously raised midvein, lateral and reticulate veins conspicuous, adaxially with raised midvein and lateral veins, reticulate veins conspicuous, base attenuate, margin entire or 1–4-spinose-serrate on each side, apex acute, aristate. Inflorescence an umbel or subumbel, 3–7-flowered, 4–5 cm including dark brown peduncle 2.5–3.5 cm; bracts leaflike, ca. 7 mm; bractlets ovate-lanceolate, ca. 2.5 mm. Sepals in 2 whorls; outer sepals ovate-elliptic, ca. 2.8 × 1.5 mm; inner sepals broadly elliptic, 4–4.3 × ca. 3 mm. Petals broadly elliptic, 4–4.5 × ca. 3 mm, base clawed, with separate elliptic glands, apex slightly incised. Stamens ca. 3 mm; anther connective prolonged, rounded, obtuse. Ovules 2, subsessile. Berry (immature) green, obovoid-oblong, 9–10 × 5–6 mm, contracted at lower part, not pruinose, style persistent; seeds 2. Fl. Jun–Jul, fr. Jul–Oct.

- Slopes, thickets, roadsides, weedy places on mountain summits; 2700–3500 m. Sichuan.

**122. *Berberis umbratica*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 135. 1985.

阴生小檗 yin sheng xiao bo

Shrubs, deciduous, ca. 1.2 m tall. Branches gray; shoots shiny, reddish brown, subsulcate, scarcely black verruculose; spines simple or 3-fid, weak, 6–9 mm. Petiole ca. 1 cm; leaf blade abaxially pale green, adaxially deep green, obovate or obovate-lanceolate, 1.5–5 × 0.6–2.1 cm, papery, both surfaces indistinctly veined, base cuneate, margin entire, apex rounded, obtuse, or acute. Inflorescence an umbel, 3–5-flowered, 2–3 cm including glabrous peduncle 6–12 mm. Pedicels 5–11 mm, slender; bractlets ovate, ca. 1.8 × 1 mm. Sepals in 2 whorls; outer sepals ovate-lanceolate, ca. 5.5 × 3 mm; inner sepals elliptic, ca. 6.2 × 4 mm. Petals obovate, ca. 5 × 3 mm, base slightly clawed, with separate glands, apex slightly emarginate or entire. Stamens ca. 3.2 mm; anther connective prolonged, rounded. Ovules 4, shortly funiculate. Fruit unknown. Fl. Jun, fr. unknown.

- *Abies* forests; ca. 3300 m. SE Xizang.

**123. *Berberis gilungensis*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 134. 1985.

吉隆小檗 ji long xiao bo

Shrubs, deciduous, 1–2 m tall. Branches pale purplish red, subterete, not verruculose, glabrous; spines simple or 3-fid, 0.2–2 cm. Leaves subsessile; leaf blade abaxially grayish green, adaxially dark green, oblong or elliptic, 1.5–5 × 1–2.2 cm, papery, abaxially not pruinose, midvein and lateral veins raised, adaxially with flat midvein, lateral veins conspicuous, both surfaces with inconspicuous reticulate veins, base cuneate, margin entire, apex obtuse. Inflorescence a subumbel, 4- or 5-flowered, 2–3.5 cm (including peduncle). Pedicels 5–9 mm, glabrous;

bractlets oblong, ca.  $3.2 \times 1.2$  mm. Sepals in 2 whorls, oblong-elliptic; outer sepals ca.  $5.5 \times 3$  mm; inner sepals ca.  $8 \times 6$  mm. Petals obovate, ca.  $5.2 \times 4$  mm, base with separate glands, apex entire. Stamens ca. 3 mm; anther connective slightly prolonged. Ovules 4. Berry red, oblong, not pruinose, style not persistent. Fl. Jun, fr. Aug–Sep.

- Forests, forest margins; 3200–3400 m. Xizang.

**124. *Berberis multiserrata*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 139. 1985.

粗齿小檗 *cu chi xiao bo*

Shrubs, deciduous, 1–2 m tall. Branches purplish black, subterete, pruinose; spines weak, orange-yellow, flat, 5–7 mm. Leaves sessile; leaf blade abaxially grayish white, adaxially dark green, broadly obovate, occasionally orbicular,  $1.7\text{--}5.5 \times 1.5\text{--}3.5$  cm, thickly papery, abaxially pruinose, midvein and lateral veins raised, adaxially with raised midvein and lateral veins, reticulate veins conspicuous or slightly raised, base cuneate, margin coarsely 2–7-aristate-dentate on each side, rarely entire, apex rounded, sometimes emarginate. Inflorescence a subumbel, 4–8-flowered, ca. 2 cm including purplish black peduncles 3–5 mm. Pedicels 1–1.7 cm, stout, slightly pruinose; bractlets ovate, ca. 2 mm, pruinose, obtuse. Sepals in 2 whorls; outer sepals oblong-elliptic, ca.  $8 \times 4$  mm; inner sepals broadly obovate, ca.  $6 \times 4.1$  mm. Petals obovate, ca.  $6 \times 3.2$  mm, base with separate glands, apex emarginate. Stamens ca. 3.1 mm; anther connective prolonged, rounded, obtuse. Ovules 4. Berry oblong, ca.  $14 \times 5$  mm, pruinose, style not persistent. Fl. Jun, fr. Aug–Sep.

- Forests; 3100–3900 m. Xizang.

**125. *Berberis pulangensis*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 133. 1985.

普兰小檗 *pu lan xiao bo*

Shrubs, evergreen, ca. 1.2 m tall. Branches pale yellow, terete, glabrous; internodes 5–10 mm; spines 3-fid, concolorous, 1–1.5 cm. Leaves sessile; leaf blade abaxially grayish green, adaxially dark green, obovate,  $1\text{--}1.2 \text{ cm} \times 5\text{--}10$  mm, thinly leathery, abaxially not pruinose, both surfaces with veins obviously raised, base cuneate, margin flat, 1–4-spinose-serrate on each side, occasionally entire, apex mucronate. Inflorescence a subumbel, 2–4-flowered,  $1.5\text{--}2.5$  cm, sometimes with few fascicled flowers at base of peduncle; bracts ovate, apex acuminate. Flowers unknown. Fruit stalk 6–10 mm, glabrous; berry red, oblong-ellipsoid,  $8\text{--}9 \times \text{ca. } 4$  mm, not pruinose, style not persistent; seeds 4 or 5. Fl. unknown, fr. Jul.

- Mountain slopes; ca. 3700 m. Xizang.

**126. *Berberis thunbergii*** Candolle, Syst. Nat. 2: 9. 1821.

日本小檗 *ri ben xiao bo*

Shrubs, deciduous, compact, usually ca. 1 m tall. Branches angulate, dark red, not verruculose; shoots reddish green, glabrous; spines simple, occasionally 3-fid, 5–15 mm; internodes 1–1.5 cm. Petiole 2–8 mm; leaf blade abaxially grayish green, adaxially green, obovate, spatulate, or rhombic-ovate,  $1\text{--}2 \times 0.5\text{--}1.2$  cm, thinly papery, abaxially with slightly raised mid-

vein, both surfaces glabrous, with indistinct reticulate veins, base attenuate, cuneate, margin entire, apex mucronate or obtuse. Inflorescence an umbel with subfascicled flowers, (1 or) 2–5-flowered, 1–2 cm. Pedicels 5–10 mm, glabrous; bractlets reddish, ovate-lanceolate, ca. 2 mm. Sepals in 2 whorls; outer sepals reddish, ovate-elliptic,  $4\text{--}4.5 \times 2.5\text{--}3$  mm, apex obtuse; inner sepals broadly elliptic,  $5\text{--}5.5 \times 3.3\text{--}3.5$  mm, apex obtuse. Petals oblong-obovate,  $5.5\text{--}6 \times 3\text{--}4$  mm, base clawed, with approximate glands, apex obtusely emarginate. Stamens 3–3.5 mm; anther connective not prolonged, truncate. Ovules 1 or 2, sessile. Berry shiny, red, ellipsoid, ca.  $8 \times 4$  mm, style not persistent; seeds 1 or 2, brown. Fl. Apr–Jun, fr. Jul–Oct.

Commonly cultivated for ornament in China, especially in large cities [native to Japan].

This is one of the most widely cultivated species of *Berberis*.

**127. *Berberis brachypoda*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 23: 308. 1877.

短柄小檗 *duan bing xiao bo*

Shrubs, deciduous, 1–3 m tall. Branches yellowish gray, glabrous or sparsely pubescent; shoots pale brown, angulate, glabrous or pubescent, sparsely black verruculose; spines 3-fid, rarely simple, concolorous, 1–3 cm, adaxially sulcate. Petiole 3–10 mm, pubescent; leaf blade abaxially yellow-green, adaxially dark green, elliptic, obovate, or oblong-elliptic,  $3\text{--}8(-14) \times 1.5\text{--}3.5(-5)$  cm, thickly papery, abaxially densely villous on veins, adaxially rugose, sparsely puberulous, base cuneate, margin flat, 20–40-spinose-serrate on each side, apex acute or obtuse. Inflorescence a spikelike raceme, 20–50-flowered, 5–12 cm including peduncle 1.5–4 cm. Pedicels ca. 2 mm, pubescent; bractlets red, lanceolate; flowers yellow. Sepals in 3 whorls, margin puberulous; outer sepals reddish, ovate, ca.  $2 \times 1.5$  mm, apex acute; median sepals oblong-obovate, ca.  $3 \times 2.5$  cm; inner sepals obovate-elliptic, ca.  $4.5 \times 3$  mm, apex obtuse. Petals elliptic, ca.  $5 \times 3$  mm, base clawed, with separate glands, apex emarginate or entire, lobes acute. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovules 1 or 2. Berry shiny, scarlet, oblong,  $6\text{--}9 \times \text{ca. } 5$  mm, not pruinose, style persistent. Fl. May–Jun, fr. Jul–Sep.

- Thickets, forests, forest margins, roadsides, wet places; 800–2500 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Shanxi, Sichuan.

**128. *Berberis salicaria*** Fedde, Bot. Jahrb. Syst. 36(Beibl. 82): 42. 1905.

柳叶小檗 *liu ye xiao bo*

*Berberis brachypoda* Maximowicz var. *salicaria* (Fedde) C. K. Schneider; *B. giraldii* Hesse; *B. mitifolia* Stapf.

Shrubs, deciduous, 1–2.5 m tall. Branches yellow-gray, angulate, sparsely pubescent; shoots pale yellow, glabrous, not verruculose; spines 3-fid, rarely simple, concolorous, 1–5 cm. Petiole 1–3 cm; leaf blade abaxially shiny, pale green, adaxially dark green, lanceolate,  $6\text{--}12 \times 1\text{--}4$  cm, papery, abaxially puberulous, veins raised, adaxially glabrous, midvein flat, lateral and reticulate veins conspicuous, base attenuate, margin 15–40-spinose-serrate on each side, apex acute or subacuminate. Inflorescence a spikelike raceme, 25–50-flowered, 7–17 cm;

rachises reddish, sometimes pedunculate; bracts lanceolate, 3–4 mm. Pedicels ca. 2 mm, stout, glabrous; bractlets ovate, apex acute. Sepals in 3 whorls; outer sepals oblong-ovate, ca. 2.5 × 1.5 mm; median sepals oblong-elliptic, ca. 3 × 2 mm; inner sepals obovate, ca. 5 × 4 mm. Petals oblong-obovate, 5–6 × 2.5–3 mm, base clawed, with separate glands, apex emarginate. Stamens 4–4.5 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, obovoid-ellipsoid, 9–10 × ca. 6 mm, slightly pruinose, style not persistent; seeds 1 or 2, brown, oblong, ca. 6 × 2–2.5 mm. Fl. Apr–Jun, fr. Aug–Sep.

• Sparse forests, forest margins; ca. 1200 m. Gansu, Hubei, Shaanxi.

**129. *Berberis gilgiana*** Fedde, Bot. Jahrb. Syst. 36(Beibl. 82): 43. 1905.

涝峪小檗 lao yu xiao bo

Shrubs, deciduous, 1–2 m tall. Branches gray-brown, terete; shoots purplish red, sometimes slightly pubescent; spines simple or 3-fid, concolorous, 5–15 mm. Petiole 1–2 mm; leaf blade abaxially pale green, adaxially dark green, obovate-lanceolate or obovate, 1.5–4 × 0.4–1.5 cm, papery, abaxially densely pubescent, midvein obviously raised, lateral veins slightly raised, adaxially sparsely puberulous, midvein slightly impressed, lateral veins conspicuous, both surfaces with conspicuous reticulate veins, base attenuate, margin entire or 2–9-spinulose-serrulate on each side, apex acute. Inflorescence a spikelike raceme, 10–25-flowered, 3–6 cm including pubescent peduncle 1–3 cm; bracts lanceolate, 1–2 mm. Pedicels 3–5 mm, slender, glabrous; bractlets ovate, apex acute. Sepals in 2 whorls; outer sepals obovate-orbicular, 2–2.3 × ca. 1.5 mm; inner sepals obovate, ca. 2.5 × 2 mm. Petals elliptic, ca. 3 × 2 mm, base clawed, with separate glands, apex emarginate or entire. Stamens ca. 2 mm; anther connective rounded, obtuse. Ovules 1 or 2. Berry red, oblong, 8–9 × 5–6 mm, slightly pruinose, style not persistent; seeds 1 or 2, purplish brown. Fl. Apr–May, fr. Aug–Oct.

• Slopes, valleys; 800–2000 m. Hubei, Shaanxi.

**130. *Berberis stenostachya*** Ahrendt, J. Linn. Soc., Bot. 57: 197. 1961.

短梗小檗 duan geng xiao bo

Shrubs, deciduous, ca. 2 m tall. Branches pale yellow, sulcate, glabrous; young shoots pale red, angulate, puberulous, glabrous when mature; spines 3-fid, 1–3 cm, adaxially sulcate. Petiole 4–10 mm; leaf blade abaxially pale green, adaxially dark green, obovate or obovate-oblong, 2–8 × 0.8–3.5 cm, papery, abaxially densely puberulous and mixed tomentulose, midvein and lateral veins obviously raised, adaxially sparsely puberulous, midvein flat, lateral veins slightly raised, both surfaces with conspicuous reticulate veins, margin very sinuate, 10–20-spinose-serrate on each side, apex obtuse or acute. Inflorescence a spikelike raceme, nutant, 4–6 cm, 20–35-flowered; rachis puberulous. Pedicels 1–2 cm, puberulous; bracts 2–3 mm, puberulous; bractlets red, ovate, ca. 1 mm, apex acute. Sepals in 2 whorls; outer sepals ovate, ca. 2 × 1 mm; inner sepals obovate-elliptic, ca. 3.5 × 1.5 mm. Petals elliptic, ca. 3 × 1.3 mm, base cuneate, with separate elliptic glands, apex emar-

ginate. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, ellipsoid, ca. 6 × 3.5 mm, not pruinose, style not persistent; seeds brown. Fl. May–Jun, fr. Aug–Oct.

• Thickets; ca. 1500 m. Gansu.

**131. *Berberis purdomii*** C. K. Schneider in Sargent, Pl. Wilson. 1: 372. 1913.

延安小檗 yan an xiao bo

Shrubs, deciduous, ca. 1 m tall. Branches dark gray or purplish red, subterete, sometimes sulcate; shoots often purplish brown, glabrous, not verruculose; spines simple, sometimes 3-fid, pale yellow, 1–2(–5) cm. Petiole 2–3 mm, or leaf subsessile; leaf blade adaxially green, narrowly obovate to oblanceolate, 1–4 × 0.4–0.8 cm, papery, both surfaces glabrous, adaxially with slightly raised midvein, both surfaces with conspicuous lateral and reticulate veins, base attenuate, margin entire or 2–15-spinose-serrate on each side, apex acute. Inflorescence a spikelike raceme, 15–25-flowered, 3–5 cm including peduncle 1–2 cm, glabrous; bracts lanceolate, ca. 2 mm. Pedicels 4–5 mm, glabrous; bractlets reddish, subulate-lanceolate, apex caudate. Sepals in 2 whorls; outer sepals obovate-orbicular or ovate-elliptic, ca. 2.2 × 1.5 mm; inner sepals oblong, 3.2–4 × ca. 2.6 mm. Petals obovate-oblong, 3–3.2 × 1.6–2 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 2.2 mm; anther connective not prolonged, truncate. Ovules 1 or 2. Berry black, oblong, 5–6 × 3–4 mm, slightly pruinose, style not persistent; seeds usually 1. Fl. Jun, fr. Jul–Aug.

• Slopes, thickets, hills; 1100–2500 m. Gansu, Qinghai, Shaanxi, Shanxi.

**132. *Berberis vernae*** C. K. Schneider in Sargent, Pl. Wilson. 1: 372. 1913.

匙叶小檗 chi ye xiao bo

*Berberis caroli* C. K. Schneider var. *hoanghensis* C. K. Schneider.

Shrubs, deciduous, 0.5–1.5 m tall. Branches dark gray, slender, angulate, glabrous, black verruculose; shoots reddish purple; spines simple, pale yellow, 1–3 cm, stout. Petiole 2–6 mm; leaf blade abaxially pale green, adaxially shiny, dark green, oblanceolate or spatulate-oblanceolate, 1–5 cm × 3–10 mm, papery, both surfaces glabrous, not pruinose, not papillose, abaxially with slightly raised midvein and reticulate veins, adaxially with flat midvein, lateral veins slightly conspicuous, both surfaces with conspicuous reticulate veins, base attenuate, margin entire, occasionally 1–3-spinose-serrate on each side, apex rounded, obtuse. Inflorescence a spikelike raceme, 15–35-flowered, 2–4 cm including peduncle 5–10 mm, glabrous; bracts ca. 1.3 mm. Pedicels 1.5–4 mm, glabrous; bractlets reddish, lanceolate, ca. 1 mm. Sepals in 2 whorls; outer sepals ovate, 1.5–2.1 × ca. 1 mm, apex acute; inner sepals obovate, 2.5–3 × 1.5–2 mm. Petals obovate-elliptic, 1.8–2 × ca. 1.2 mm, base clawed, with separate glands, apex subacute, entire. Stamens ca. 1.5 mm; anther connective not prolonged, truncate. Ovules 1 or 2, sessile. Berry pale red, oblong, 4–5 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Aug–Sep.

• Floodlands, thickets on slopes; 2200–3900 m. Gansu, Qinghai, Sichuan.

**133. *Berberis poiretii*** C. K. Schneider, Mitt. Deutsch. Dendrol. Ges. 15: 180. 1906 [*“poiretii”*].

细叶小檗 xi ye xiao bo

*Berberis poiretii* var. *bisemilis* P. Y. Li.

Shrubs, deciduous, 1–2 m tall. Branches grayish yellow; shoots purplish brown, angulate, black verruculose; spines absent or simple, sometimes 3-fid, 4–9 mm. Leaves subsessile; leaf blade abaxially pale green or grayish green, adaxially deep green, oblanceolate to narrowly oblanceolate, occasionally lanceolate-spatulate, 1.5–4 cm × 5–10 mm, papery, both surfaces glabrous, abaxially with raised midvein, lateral and reticulate veins conspicuous, adaxially with impressed midvein, base attenuate, margin entire, occasionally few spinulose-serrulate on each side, apex acuminate or acute, mucronulate. Inflorescence a spikelike raceme, 8–15-flowered, 3–6 cm including peduncle 1–2 cm; bracts linear, 2–3 mm. Pedicels 3–6 mm, glabrous; bractlets lanceolate, 1.8–2 mm. Sepals in 2 whorls; outer sepals elliptic or oblong-ovate, ca. 2 × 1.3–1.5 mm; inner sepals oblong-elliptic, ca. 3 × 2 mm. Petals obovate or elliptic, ca. 3 × 1.5 mm, base clawed, with separate glands, apex incised. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovules 1 (or 2). Berry red, oblong, ca. 9 × 4–5 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep. *2n* = 28.

Thickets, forests, deserts, riverbanks in valleys, talus places; 600–2300 m. Hebei, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi [Korea, Mongolia, Russia (Far East)].

**134. *Berberis pallens*** Franchet, Pl. Delavay. 36. 1889.

淡色小檗 dan se xiao bo

Shrubs, deciduous, 1–1.2 m tall. Branches dark reddish, angulate, sometimes slightly pruinose; spines 3-fid, weak, concolorous, 1–2 cm, adaxially flat or sulcate. Leaves subsessile; leaf blade abaxially grayish white, adaxially green, oblanceolate or oblong-obovate, 1.5–3.5 × 0.7–1 cm, thickly papery, abaxially pruinose, midvein conspicuously raised, adaxially with slightly impressed midvein, both surfaces with conspicuous reticulate veins, base cuneate, margin entire, apex rounded, obtuse, aristate. Inflorescence an umbellate raceme, 3–8-flowered, 3–5 cm, not pedunculate. Pedicels 1–1.5 cm, pruinose. Sepals in 3 whorls; outer sepals ovate-lanceolate, 4–4.5 × ca. 1.5 mm; median and inner sepals broadly ovate, both equal in size, 6–6.5 × ca. 5 mm. Petals obovate, ca. 5.5 × 4.5 mm, base attenuate, with separate glands, apex obtusely emarginate. Stamens ca. 3 mm; anther connective prolonged, shortly apiculate. Ovules 1 or 2. Berry red, oblong-ellipsoid, ca. 10 × 4–5 mm, pruinose; style persistent, short. Fl. and fr. May–Aug.

• Thickets; 3000–3500 m. Yunnan.

**135. *Berberis reticulata*** Bijkhouwer, J. Arnold Arbor. 9: 132. 1928.

网脉小檗 wang mai xiao bo

Shrubs, deciduous, 1–2.5 m tall. Branches brownish gray or purplish red, terete, angulate, not verruculose; shoots often

purplish red, glabrous; spines simple or 3-fid, weak, to 1 cm. Petiole 2–12 mm; leaf blade abaxially grayish white, adaxially dark green, obovate, 2–5 × 1–2.5 cm, papery, both surfaces glabrous, abaxially not pruinose, midvein obviously raised, adaxially with impressed midvein, both surfaces with conspicuously raised reticulate veins, base cuneate, margin flat, 10–20-spinose-serrate on each side, apex rounded, obtuse. Inflorescence a subumbellate raceme, 5–10-flowered, 1.5–3 cm, not pedunculate; rachis reddish; bracts ca. 1 mm. Pedicels reddish, 4–7 mm, glabrous. Sepals in 2 whorls; outer sepals elliptic, ca. 6 × 3 mm; inner sepals oblong, 7–7.5 × 4–4.5 mm. Petals obovate, ca. 6 × 3 mm, base clawed, with separate glands, apex obtusely emarginate. Stamens ca. 3.5 mm; anther connective apiculate. Ovules 5 or 6, sessile. Berry scarlet, ovoid, 7–8 × 5–6 mm, not pruinose, style not persistent. Fl. Jun–Jul, fr. Aug–Sep.

• Thickets, forests, slopes; 1400–3000 m. Shaanxi.

**136. *Berberis pruinocarpa*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 16. 1985.

粉果小檗 fen guo xiao bo

Shrubs, deciduous, ca. 1 m tall. Branches brownish gray, angulate, black verruculose; spines usually simple, occasionally 3-fid, weak, concolorous, 8–10 mm. Petiole 1–3 mm; leaf blade abaxially pale green, adaxially dark green, oblong-obovate, ca. 1.2 × 0.4 cm, thickly papery, abaxially not pruinose, midvein and lateral veins conspicuously raised, adaxially with flat midvein, lateral veins 2 or 3 pairs, slightly raised, base cuneate, margin slightly thickened, entire, or 1- or 2-spinose-serrate on each side, apex rounded, apiculate. Flowers unknown. Inflorescence an umbellate raceme, with 3–5 fruit; fruit stalk 5–6 mm, slender, glabrous; berry oblong, 6–7 × 3–4 mm, slightly pruinose, style not persistent; seeds 1. Fl. unknown, fr. Aug.

• Sparse forests; ca. 2700 m. Yunnan.

**137. *Berberis hemsleyana*** Ahrendt, J. Linn. Soc., Bot. 57: 213. 1961.

拉萨小檗 la sa xiao bo

Shrubs, deciduous, to 2 m tall. Branches dark gray, angulate, black verruculose; shoots pale red, sometimes puberulous, sulcate; spines 3-fid, usually orange, 1–3 cm, stout, adaxially sulcate. Leaves subsessile; leaf blade abaxially grayish or pale green, shiny, adaxially dark green, ultimately both surfaces pale green, oblanceolate, 1–2.5 cm × 5–7 mm, papery, both surfaces initially slightly pruinose, often ultimately not pruinose, abaxially with slightly raised midvein and lateral veins, adaxially with flat midvein, lateral veins slightly impressed, both surfaces with inconspicuous reticulate veins, margin entire, sometimes 1–3-spinulose-serrulate on each side, apex obtuse or acuminate. Inflorescence a subumbellate raceme, 4–8-flowered, 1–2.5 cm. Pedicels 8–15 mm, stout, glabrous; bractlets lanceolate, ca. 3.5 × 1 mm. Sepals in 2 whorls; outer sepals elliptic, ca. 5.1 × 2.8 mm; inner sepals obovate, ca. 5.5 × 4 mm, apex obtuse. Petals narrowly obovate, ca. 4.8 × 2 mm, base clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective prolonged, truncate. Ovules 2 or 3. Berry oblong, ca. 10 × 5 mm, slightly pruinose, style not persistent. Fl. May, fr. Sep.

• Thickets, grassy slopes on mountains, rock fractures; 3600–4400 m. Xizang.

**138. *Berberis platyphylla*** (Ahrendt) Ahrendt, J. Linn. Soc., Bot. 57: 145. 1961.

阔叶小檗 *kuo ye xiao bo*

*Berberis yunnanensis* Franchet var. *platyphylla* Ahrendt, J. Bot. 79(Suppl.): 61. 1941.

Shrubs, deciduous, 1–1.5 m tall. Branches brownish gray, angulate, sparsely black verruculose; shoots dark purple, glabrous; spines 3-fid, weak, ca. 1 cm, adaxially sulcate. Petiole 2–5 mm, or leaf sessile; leaf blade abaxially pale green, adaxially deep green, broadly obovate or elliptic, 2–5 × 1–1.4 cm, papery, abaxially sometimes slightly pruinose, midvein obviously raised, adaxially with flat midvein, both surfaces with conspicuous lateral and reticulate veins, base cuneate, margin entire or 2–4-spinose-serrate on each side, apex rounded, aristate. Inflorescence an umbellate raceme, 3–7-flowered, 3–5 cm, including peduncle 2–10 mm, sometimes with few fascicled flowers at base of peduncle. Pedicels 1.2–2 cm, glabrous; bractlets purplish red, lanceolate, ca. 3 mm. Sepals in 2 whorls; outer sepals ovate, ca. 6 × 3 mm; inner sepals oblong-obovate, 6–7 × 3.5–4 mm. Petals obovate, ca. 6 × 3 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 5 mm; anther connective obviously prolonged, apiculate. Ovules 3–5. Berry oblong, ca. 10 × 7 mm, not pruinose, style not persistent. Fl. Jun, fr. Aug–Oct.

• Thickets, forests, forest margins; 3100–3500 m. Sichuan, Xizang, Yunnan.

**139. *Berberis sichuanica*** T. S. Ying, Acta Phytotax. Sin. 37: 329. 1999.

四川小檗 *si chuan xiao bo*

Shrubs, evergreen, 1–1.5 m tall. Branches purplish red or gray, angular; shoots pale yellow, glabrous, not verruculose; spines simple or 3-fid, pale yellow, 1–1.5 cm. Leaves sessile; leaf blade abaxially grayish white, adaxially shiny, green, obovate or obovate-elliptic, 0.8–2 × 0.5–1.1 cm, thinly leathery, abaxially with obviously raised midvein and lateral veins, adaxially with slightly raised midvein and lateral veins, base attenuate, margin entire or 1–5-spinose-serrate on each side, apex rounded, obtuse. Inflorescence an umbellate raceme, 6–15-flowered, 3–4.5 cm including peduncle 4–12 mm, sometimes with few fascicled flowers at base; bracts leaflike, obovate, apex aristate. Pedicels 4–12 mm, glabrous. Sepals in 3 whorls; outer sepals ovate-lanceolate, 1.6–2 × ca. 1 mm; median sepals obovate-elliptic, 2.8–3.1 × 1.5–1.7 mm; inner sepals elliptic, 4–5 × 3–3.2 mm. Petals obovate-elliptic, 4–4.1 × 2.1–2.2 mm, base clawed, with separate glands, apex entire, rounded, obtuse. Stamens ca. 3 mm; anther connective rounded, obtuse. Ovules 3 or 4, sessile. Berry black, subglobose, 8–10 × 6–8 mm, pruinose, style persistent. Fl. Jun–Jul, fr. Aug–Sep.

• Thickets, slopes; 2600–3600 m. Sichuan, Yunnan.

**140. *Berberis mekongensis*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 82. 1916.

湄公小檗 *mei gong xiao bo*

Shrubs, deciduous, 1–2 m tall. Branches brownish gray, angulate, sparsely black verruculose; shoots initially puberulous, often ultimately glabrous; spines 3-fid, pale yellow, 1–2.5 cm, adaxially slightly sulcate. Petiole 3–10 mm; leaf blade adaxially deep yellow-green, obovate or broadly obovate, 1.5–4.5 × 1–2 cm, papery, abaxially papillose, not pruinose, midvein and lateral veins obviously raised, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuous reticulate veins, base cuneate, margin entire or 10–15-spinose-serrate on each side, apex rounded. Inflorescence an umbellate raceme, 6–12-flowered, 3–7 cm, with few fascicled flowers at base; bracts 1–1.5 mm. Pedicels 4–15 mm, glabrous. Sepals in 3 whorls; outer sepals lanceolate, ca. 4 × 1.4 mm; median sepals oblong-elliptic, 5–5.5 × 2–3 mm; inner sepals obovate, 6–6.5 × 3.5–4 mm. Petals obovate, 4–5 × 2.5–3.5 mm, base clawed, with separate glands, apex acute, incised. Stamens ca. 3.5 mm; anther connective prolonged, truncate. Ovules 2–4. Berry red, oblong, 8–10 × 4–6 mm, not pruinose, style not persistent. Fl. Jun–Jul, fr. Oct–Nov.

• Alpine thickets, *Abies* or *Picea* forests, sunny places; 3000–4000 m. Sichuan, Xizang, Yunnan.

**141. *Berberis pseudoamoena*** T. S. Ying in S. Y. Jin & Y. L. Chen, Cat. Type Spec. Herb. China (Suppl. II), 55. 2007.

假美丽小檗 *jia mei li xiao bo*

Shrubs, deciduous, 0.4–2 m tall. Branches dark gray or dark purplish red, sulcate, black verruculose; spines 3-fid, yellow-brown, 5–10 mm. Leaves sessile; leaf blade abaxially pale gray, adaxially green, oblanceolate or narrowly elliptic, 1–2 × 0.3–0.4 cm, papery, abaxially not pruinose, midvein conspicuously raised, lateral veins distinct, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuous reticulate veins, base cuneate, margin slightly thickened, entire or 1–5-spinose-serrate on each side, apex acute or acuminate, occasionally rounded, obtuse. Inflorescence an umbellate raceme, 3–6-flowered, 2.5–5 cm including peduncle 1.5–3 cm; bracts leaflike, ca. 1.3 cm. Pedicels 4–8 mm, glabrous; bractlets lanceolate, ca. 3 mm. Sepals in 3 whorls; outer sepals lanceolate, 3–3.1 × 1–1.2 mm; median sepals obovate, 4.5–4.9 × 3.1–3.5 mm; inner sepals elliptic, 5–5.5 × 3.2–4 mm. Petals obovate, 4–4.2 × 3–3.2 mm, base attenuate, not clawed, with separate glands, apex emarginate or entire, rounded, obtuse. Stamens ca. 2 mm; anther connective apiculate. Ovules 1–3. Fruit stalk to 1.2 cm; berry oblong, 10–12 × 3–5 mm, contracted below middle, not pruinose, style not persistent; seeds 2 or 3. Fl. Jun–Jul, fr. Aug–Sep.

• Alpine thickets, roadsides, weedy places on mountain summits; 2900–3500 m. Sichuan.

**142. *Berberis lepidifolia*** Ahrendt, Bull. Misc. Inform. Kew 1939: 269. 1939.

鳞叶小檗 *lin ye xiao bo*

Shrubs, deciduous, 1–1.5 m tall. Branches dark gray, slender, angulate, black verruculose; shoots pale purplish brown, sulcate, sparsely black verruculose, sometimes puberulous;

spines simple, weak, 3–6(–15) mm, occasionally absent. Leaves subsessile; leaf blade abaxially gray-green, adaxially dark green, narrowly oblanceolate, 1.7–4.5 cm × 1.5–5 mm, papery, abaxially not pruinose, midvein obviously raised, lateral veins slightly raised, reticulate veins indistinct, adaxially with slightly raised midvein and lateral veins, reticulate veins indistinct, base attenuate, margin slightly revolute, entire, apex obtuse or acute. Inflorescence an umbellate raceme, 5–8-flowered, 2–4.5 cm including peduncle 1–2 cm; bracts lanceolate, ca. 1.5 mm. Pedicels 5–10 mm, slender, glabrous. Flowers ca. 4 mm in diam. Sepals in 1 whorl of 3, center red with a yellow margin, ovate, 2–2.5 × 1.3–1.5 mm, subacute. Petals oblong-elliptic, ca. 2.5 × 1.5 mm, base cuneate, with separate ovate-elliptic glands, apex emarginate with acute lobes. Stamens ca. 2 mm; anther connective truncate. Ovules 2, shortly funiculate. Berry black, ovoid-oblong, 8–11 × 5–7 mm, slightly blue pruinose; style persistent, short. Fl. May, fr. Aug.

- Thickets, *Pinus* forests; 3000–3700 m. Sichuan, Yunnan.

**143. *Berberis calcipratorum*** Ahrendt, J. Linn. Soc., Bot. 57: 130. 1961.

钙原小檗 *gai yuan xiao bo*

Shrubs, deciduous, 1–3 m tall. Branches dark red, sulcate, white pruinose; spines simple or 3-fid, orange-yellow, shiny, 8–15 mm, stout. Leaves subsessile; leaf blade abaxially brown, adaxially dark green, narrowly obovate, 1–2.5 × 0.4–1.1 cm, thinly papery, abaxially white pruinose, occasionally not pruinose, midvein and reticulate veins raised, adaxially sometimes with slightly raised reticulate veins, base cuneate, margin slightly thickened, entire, apex obtuse, mucronate. Inflorescence an umbellate raceme or subumbel, 2–5-flowered, 2–3 cm, sometimes with few fascicled flowers at base; rachis pruinose; bracts lanceolate, ca. 2 mm, pruinose, apex acuminate. Pedicels 5–10 mm, white pruinose; bractlets ovate, ca. 3 mm, apex acuminate. Flowers orange. Sepals in 2 whorls; outer sepals elliptic, ca. 5.5 × 4 mm; inner sepals obovate, ca. 7.5 × 4 mm. Petals oblong-obovate, ca. 5.5 × 3.5 mm, base clawed, with separate elliptic glands, apex emarginate. Stamens ca. 3.5 mm; anther connective slightly prolonged, apiculate. Ovules 2–4, shortly funiculate. Berry unknown. Fl. May–Jun, fr. unknown.

- Forests, thickets; 3300–3700 m. Yunnan.

**144. *Berberis weisiensis*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 17. 1985.

维西小檗 *wei xi xiao bo*

Shrubs, evergreen, ca. 1 m tall. Branches dark gray, sparsely black verruculose; shoots purplish red, angulate, pruinose; spines 3-fid, weak, concolorous, 1–1.2 cm, adaxially sulcate. Leaves subsessile; leaf blade adaxially green, elliptic or oblong-obovate, 1.5–2 cm × 6–7 mm, leathery, abaxially pruinose, midvein obviously raised, adaxially midvein slightly raised, lateral veins 2 or 3 pairs, both surfaces with conspicuous reticulate veins, base cuneate, margin slightly thickened, entire, apex rounded, mucronate. Flowers unknown. Infructescence an umbellate raceme with 6 or 7 berries, 2.5–3.5 cm, pedunculate; bracts leaflike, ca. 5 mm; fruit stalk purplish red, 5–12 mm,

glabrous; berry subglobose, ca. 7 × 5 mm, not pruinose, style persistent; seeds 3. Fl. unknown, fr. Oct.

- Roadsides, riversides; ca. 2000 m. Yunnan.

**145. *Berberis amoena*** Dunn, J. Linn. Soc., Bot. 39: 422. 1911.

美丽小檗 *mei li xiao bo*

*Berberis amoena* var. *umbelliflora* Ahrendt; *B. elegans* (Franchet) C. K. Schneider (1905), not K. Koch (1869), nor H. Léveillé (1904); *B. leptoclada* Diels; *B. schneideri* Rehder; *B. sinensis* Desfontaines var. *elegans* Franchet.

Shrubs, deciduous, 0.5–1 m tall. Branches grayish black, sparsely black verruculose; shoots dark red, angulate; spines simple or 3-fid, concolorous, 4–12 mm, adaxially sulcate. Leaves subsessile; leaf blade adaxially dark green, narrowly obovate-elliptic or narrowly elliptic, 10–16 × 3–4 mm, leathery, abaxially pruinose, midvein obviously raised, papillose, lateral veins 2 or 3 pairs, adaxially with conspicuous midvein, base cuneate, margin slightly thickened, entire, occasionally 1- or 2-spinose-serrate on each side, apex obtuse, mucronate. Inflorescence an umbellate raceme, 4–8-flowered, 3–5 cm including peduncle 1–2 cm. Pedicels 4–7 mm, glabrous; bractlets lanceolate, 1.5–2 mm. Sepals in 2 whorls; outer sepals obovate to oblong-elliptic, 2–2.5 × 1–2 mm; inner sepals elliptic, 4–4.5 × 3–3.5 mm. Petals obovate, 3.5–4 × ca. 2.5 mm, base cuneate, with separate glands, apex emarginate, with 2 rounded lobes. Stamens ca. 2.5 mm; anther connective prolonged, apiculate. Ovules 1 or 2. Berry red, oblong, ca. 6 × 3 mm, not pruinose, style persistent; seeds 1. Fl. May–Jun, fr. Jul–Aug.

- Thickets, forests, weedy places; 1600–3100 m. Sichuan, Yunnan.

**146. *Berberis derongensis*** T. S. Ying, Acta Phytotax. Sin. 37: 333. 1999.

得荣小檗 *de rong xiao bo*

Shrubs, evergreen, 1–1.5 m tall. Branches dark gray, black verruculose, angulate; shoots dark purplish red, angulate, not verruculose; internodes 6–12 mm; spines 3(or 5)-fid, pale yellow, 6–12 mm. Leaves subsessile; leaf blade abaxially pale green, adaxially deep green, elliptic or subobovate, 5–15 × 3–5 mm, leathery, abaxially not pruinose, midvein conspicuously raised, adaxially with flat midvein, both surfaces with inconspicuous lateral and reticulate veins, base attenuate, margin entire, apex acute or obtuse. Flowers unknown. Infructescence an umbellate raceme with 4–7 berries, 1.5–3 cm including peduncle 0.8–1.5 cm; bracts lanceolate, ca. 3 mm; fruit stalk 2–4 mm, glabrous; berry black, obovoid-oblong, 7–8 × 3–4 mm, slightly pruinose, style 1–2 mm; seeds 2. Fl. unknown, fr. Aug.

- Thickets on slopes; ca. 3200 m. Sichuan.

**147. *Berberis papillifera*** (Franchet) Koehne, Gartenflora 48: 21. 1899.

乳突小檗 *ru tu xiao bo*

*Berberis thunbergii* Candolle var. *papillifera* Franchet, Pl. Delavay. 36. 1889; *B. finetii* C. K. Schneider.

Shrubs, deciduous, 1.5–2 m tall. Branches brownish gray, puberulous, sparsely verruculose; shoots pale yellow, pubescent; spines simple or 3-fid, weak, 5–12 mm, sometimes absent. Petiole 2–4 mm; leaf blade abaxially grayish white, adaxially deep green, narrowly oblong-obovate, 1–3 cm × 3–8 mm, papery, abaxially papillose, not pruinose, midvein slightly raised, adaxially with flat midvein, lateral veins 2 or 3 pairs, both surfaces with conspicuous reticulate veins, base attenuate, margin entire, apex acute or obtuse. Inflorescence an umbellate raceme, 3–9-flowered, 1.5–3 cm including peduncle 4–8 mm. Pedicels 6–12 mm, slender; bractlets yellow, lanceolate, ca. 3 mm, apex acuminate. Sepals in 2 whorls; outer sepals obovate, ca. 6 × 3 mm; inner sepals obovate, ca. 6 × 4 mm. Petals elliptic, ca. 4.5 × 2.5 mm, apex acute, incised, lobes acute. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovules 1 or 2, sessile. Berry red, oblong-elliptic, 8–8.5 × 4.5–5.5 mm, slightly pruinose, style persistent. Fl. Jun–Jul, fr. Oct–Nov.

- Thickets; 2900–3000 m. Sichuan, SE Xizang, Yunnan.

**148. *Berberis virescens*** J. D. Hooker, Bot. Mag. 116: t. 7116. 1890.

变绿小檗 *bian lü xiao bo*

*Berberis spraguei* Ahrendt var. *pedunculata* Ahrendt.

Shrubs, deciduous, 1–1.5 m tall. Branches dark purplish red or dark gray, terete, scarcely verruculose; shoots pale red, angulate; spines simple or 3-fid, 7–17 mm. Leaves subsessile; leaf blade abaxially pale yellow-green, adaxially dark green, oblong-obovate, 1.5–2.7 cm × 6–10 mm, papery, midvein flat, lateral veins 2 or 3 pairs, abaxially not pruinose, midvein inconspicuous, base cuneate, margin entire, apex obtuse or mucronate. Inflorescence a subumbel or umbellate raceme, 4–6-flowered, 1.5–2.7 cm including peduncle 6–8 mm, sometimes with 1 or 2 fascicled flowers at base. Pedicels 6–11 mm; bractlets oblong-lanceolate, ca. 4 × 2 mm. Flowers pale yellowish green. Sepals in 2 whorls; outer sepals obovate, ca. 6 × 4 mm; inner sepals broadly obovate, ca. 6 × 5 mm. Petals obovate, ca. 5 × 3 mm, base clawed, with separate glands, apex entire. Stamens ca. 3.5 mm; anther connective prolonged, conical-apiculate. Ovules 4 or 5. Berry red, ovoid, 8–10 × 3.5–4.5 mm, not pruinose; style persistent, short. Fl. May–Jun, fr. Jul–Sep.

Thickets on slopes; 3600–4100 m. Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

**149. *Berberis integripetala*** T. S. Ying, Acta Phytotax. Sin. 37: 334. 1999.

甘南小檗 *gan nan xiao bo*

Shrubs, deciduous, ca. 1.5 m tall. Branches purplish black, terete, glabrous, scarcely black verruculose; spines simple, concolorous, 1–2 cm, adaxially sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially green, elliptic or obovate-elliptic, 8–20 × 4–10 mm, papery, abaxially not pruinose, midvein and lateral veins obviously raised, reticulate veins slightly conspicuous, adaxially with slightly raised midvein and lateral veins, reticulate veins inconspicuous, base cuneate, margin entire, apex rounded, obtuse. Inflorescence an umbellate raceme, 3–7-flowered, 3–4 cm including peduncle 1–1.6 cm, glabrous.

Pedicels ca. 1 cm, glabrous. Sepals in 2 whorls; outer sepals elliptic, 3.8–4 × 2–2.1 mm; inner sepals broadly elliptic, 4–4.2 × 3–3.2 mm. Petals elliptic, 5–5.5 × 3–3.4 mm, base cuneate, with separate elliptic glands, apex entire. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 3, shortly funiculate. Fruit unknown. Fl. May, fr. unknown.

- Forests; ca. 1800 m. Gansu.

**150. *Berberis tomentulosa*** Ahrendt, J. Bot. 80(Suppl.): 112. 1942.

微毛小檗 *wei mao xiao bo*

Shrubs, deciduous, 0.5–1 m tall. Branches dark gray, obviously angulate, not verruculose, puberulous; shoots pale yellow, sulcate, puberulous; spines 3-fid, but simple on shoots, weak, pale yellow, 3–10 mm. Leaves subsessile; leaf blade abaxially pale yellow-green, adaxially shiny, deep green, obovate, 5–14 × 2–5.5 mm, papery, abaxially not pruinose, midvein obviously raised, lateral veins 2 or 3 pairs, slightly raised, reticulate veins conspicuous, adaxially with flat or slightly impressed midvein, reticulate veins conspicuous, base cuneate, margin 5–8-spinose-serrate on each side, but mostly entire on shoots, apex rounded. Inflorescence a subumbellate raceme, 5–10-flowered, 1.5–2 cm including peduncle ca. 5 mm; bracts ovate, 1–1.5 mm, apex acuminate. Pedicels 2–4 mm, slightly puberulous, becoming subglabrous; bractlets oblong, ca. 2 × 1 mm. Flowers pale yellow, 5–6 mm in diam. Sepals in 2 whorls; outer sepals broadly oblong, ca. 2.5 × 1.5 mm; inner sepals obovate-oblong, ca. 4 × 2.1 mm. Petals obovate, ca. 3 × 1.5 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 2 mm; anther connective slightly prolonged, rounded, obtuse. Ovules 2. Fruit unknown. Fl. May, fr. unknown.

- Mountain slopes, rocky slopes; ca. 2500 m. Yunnan.

**151. *Berberis tischleri*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 8: 201. 1908.

川西小檗 *chuan xi xiao bo*

*Berberis diaphana* Maximowicz var. *tachiensis* Ahrendt, p.p.; *B. elliotii* Ahrendt; *B. tischleri* var. *abbreviata* Ahrendt.

Shrubs, deciduous, 2–3 m tall. Branches blackish gray; shoots grayish yellow, sulcate, not verruculose; spines 3-fid, pale yellow, 1–2.5 cm, adaxially sulcate. Petiole 2–3 mm; leaf blade abaxially gray-green, adaxially dark green, oblong-obovate or obovate, 1.5–4.5 × 0.8–2.4 cm, thinly papery, abaxially sometimes slightly pruinose, midvein slightly raised, lateral and reticulate veins conspicuous, adaxially with flat midvein, sometimes slightly impressed, lateral and reticulate veins slightly conspicuous, base cuneate, margin entire or 2–8-spinulose-serulate on each side, apex rounded, obtuse. Inflorescence an umbellate raceme, 4–15-flowered, 4–10 cm including peduncle 1–3 cm, glabrous; bracts lanceolate, 2–3 mm. Sepals in 2 whorls; outer sepals narrowly ovate, ca. 5 × 2 mm, apex acute; inner sepals narrowly oblong-obovate, ca. 6.3 × 3.3 mm, apex acute. Petals obovate, ca. 4 × 2 mm, base cuneate, with separate glands, apex emarginate. Stamens ca. 3.5 mm; anther connective slightly prolonged, apiculate. Ovules 3 or 4. Berry red, ovoid-oblong, 1–1.6 cm × 5–6 mm, not pruinose, apex atten-

uate, slightly bent; style persistent, short. Fl. May–Jun, fr. Jul–Sep.

- Thickets, forests; 1500–3800 m. Sichuan, Xizang.

**152. *Berberis silva-taroucana*** C. K. Schneider in Sargent, Pl. Wilson. 1: 370. 1913.

华西小檗 hua xi xiao bo

Shrubs, deciduous, 1–3 m tall. Branches dark gray, angulate, scarcely verruculose; shoots purplish brown or pale yellow, glabrous; spines simple or absent, occasionally 3-fid, 3–7 mm. Petiole 0.5–2.5 cm, sometimes leaf sessile, glabrous; leaf blade adaxially deep green, obovate, oblong-obovate, or sub-orbicular, 2–6 × 0.7–3.5 cm, papery, abaxially glaucous, not pruinose, midvein and lateral veins raised, both surfaces with conspicuous reticulate veins, adaxially with slightly raised or flat midvein and lateral veins, base narrowly cuneate or abruptly contracted, margin entire or inconspicuously few spinulose-serrulate on each side, apex rounded, obtuse, mucronate. Inflorescence an umbellate raceme, loosely 6–12-flowered, 3–8 cm including peduncle 3–10 mm, glabrous, sometimes with few fascicled flowers at base; pedicels 0.5–2 cm, pedicels of fascicled flowers to 3 cm. Sepals in 2 whorls; outer sepals obovate, ca. 4 × 3.5 mm; inner sepals obovate, ca. 6 × 4.5 mm. Petals obovate, ca. 4.5 × 3.5 mm, base with separate glands, apex subentire. Stamens ca. 3.5 mm; anther connective apiculate. Ovules 2, sessile. Berry red, oblong, 9–10 × 4–5 mm, not pruinose, style not persistent. Fl. Apr–Jun, fr. Jul–Oct.

- Thickets, forests, forest margins, riversides, roadsides; 1600–3800 m. Fujian, Gansu, Sichuan, Xizang, Yunnan.

**153. *Berberis tsarongensis*** Stapf, Bot. Mag. 156: t. 9332. 1933.

察瓦龙小檗 cha wa long xiao bo

*Berberis tsarongensis* var. *megacarpa* Ahrendt, p.p.

Shrubs, deciduous, ca. 1.5 m tall. Branches brownish gray; shoots purplish red, angulate, sparsely black verruculose; spines simple or 3-fid, weak, 1–1.7 cm. Leaves sessile; leaf blade abaxially grayish green, adaxially green, obovate or oblong-elliptic, 1.2–3.5 × 0.6–1.2 cm, thinly papery, abaxially papillose, not pruinose, midvein slightly raised, lateral veins 2 or 3 pairs, conspicuous, adaxially with flat midvein, both surfaces with inconspicuous reticulate veins, margin entire or 1–4-spinose-serrate on each side, apex rounded, obtuse. Inflorescence an umbellate raceme, 4–6-flowered, 1.5–3.5 cm including peduncle 5–9 mm. Pedicels weak, 8–20 mm, glabrous; bractlets ca. 2 mm, apex acute. Sepals in 2 whorls; outer sepals oblong-elliptic, 3–4 × ca. 2 mm; inner sepals obovate, ca. 5 × 4 mm. Petals oblong-obovate, ca. 5.5 × 3.5 mm, base cuneate with separate ovate glands, apex emarginate, lobes rounded, obtuse. Stamens ca. 3.5 mm; anther connective rounded, apiculate. Ovules 2. Berry red, oblong-ellipsoid, 8–15 × 4–7 mm, not pruinose, style not persistent; seeds 2. Fl. Apr–May, fr. Jun–Oct.

- Thicket-meadows, slopes, forest margins, mixed forests; 2900–3900 m. Xizang, Yunnan.

**154. *Berberis atroviridiana*** T. S. Ying, Acta Phytotax. Sin. 37: 336. 1999.

那觉小檗 na jue xiao bo

Shrubs, deciduous, ca. 1 m tall. Branches purplish red, terete, black verruculose; spines 3-fid, weak, pale brown, 5–10 mm. Petiole 1–2 mm; leaf blade abaxially brown, adaxially deep green, obovate, 1–2.3 × 0.6–1.1 cm, papery, abaxially not pruinose, midvein obviously raised, lateral and reticulate veins conspicuous, adaxially with slightly raised midvein, lateral veins 3 or 4 pairs, reticulate veins inconspicuous, base cuneate, margin slightly revolute, entire, or 1–5-spinulose-serrulate on each side, apex rounded, obtuse. Inflorescence an umbellate raceme, 4–10-flowered, 3–5 cm including peduncle 1.7–3 cm, glabrous; bracts ovate, apex acuminate. Flowers unknown. Fruit stalk 2–3 mm, stout, glabrous; berry oblong-ellipsoid, 7–8 × 3–4 mm, not pruinose, style not persistent; seeds 2. Fl. unknown, fr. Sep.

- *Quercus* forests; ca. 3200 m. SE Xizang.

**155. *Berberis daochengensis*** T. S. Ying, Acta Phytotax. Sin. 37: 336. 1999.

稻城小檗 dao cheng xiao bo

Shrubs, deciduous, ca. 1.5 m tall. Branches dark gray, terete, angulate, black verruculose; spines absent. Petiole 3–4 mm; leaf blade abaxially pale green, adaxially green, obovate or narrowly obovate, 1.5–3 × 0.6–1.2 cm, papery, both surfaces puberulous, abaxially with obviously raised midvein and lateral veins, adaxially with slightly raised midvein and lateral veins, both surfaces with obviously raised reticulate veins, base cuneate, margin entire or occasionally 1- or 2-spinulose-serrulate on each side, apex rounded, apiculate. Inflorescence a raceme, 7–12-flowered, 2.5–4.5 cm including peduncle 1–1.5 cm; rachis and peduncle puberulous; bracts purplish red, ovate, 1–1.5 mm, apex acuminate. Flowers unknown. Fruit stalk 4–5 mm, puberulous; berry pale green (immature), oblong, 8–9 × 3–4 mm, not pruinose, style not persistent; seeds 1. Fl. unknown, fr. Jul–Sep.

- Field margins, streamsides, roadsides; ca. 3400 m. Sichuan.

**156. *Berberis pubescens*** Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 273. 1910.

柔毛小檗 rou mao xiao bo

Shrubs, deciduous, ca. 1 m tall. Branches grayish yellow, glabrous; shoots reddish, pubescent; internodes 1–2 cm; spines simple, 1–2.5 cm, adaxially sulcate. Petiole 7–10 mm; leaf blade abaxially pale green, adaxially deep green, obovate, 2–4 × 0.5–1 cm, papery, both surfaces pubescent, abaxially with raised midvein and lateral veins, reticulate veins prominent, adaxially with slightly impressed midvein and lateral veins, reticulate veins inconspicuous, base attenuate to decurrent petiole, margin revolute, mostly entire, rarely few spinulose on each side, apex mucronate. Inflorescence a raceme, 2–4 cm including peduncle 1–1.5 cm, glabrous; bracts ca. 1 mm. Pedicels 4–6 mm, glabrous. Flowers unknown. Berry oblong, 4–7 × 3–4 mm, not pruinose, style not persistent; seeds 1. Fl. unknown, fr. Aug.

- Mountain slopes. Hubei, Shaanxi.

**157. *Berberis kongboensis*** Ahrendt, J. Bot. 80(Suppl.): 97. 1942.

工布小檗 gong bu xiao bo

*Berberis amoena* Dunn var. *moloensis* Ahrendt.

Shrubs, deciduous, ca. 2 m tall. Branches dark purplish red, shiny, not verruculose; shoots shiny, red, glabrous; spines 3-fid, pale yellow, 1–2.5 cm, adaxially sulcate. Petiole 2–5 mm; leaf blade adaxially deep green, oblanceolate, 1–5 × 0.5–1.5 cm, papery, adaxially with conspicuous midvein and lateral veins, reticulate veins conspicuous, base narrowly cuneate, margin entire, apex acute, mucronate. Inflorescence a raceme, loosely 7–25-flowered, 3–8 cm including peduncle 1–2 cm; bracts 3–5 mm, apex acuminate. Pedicels 1–2 cm, slender, glabrous. Sepals in 2 whorls; outer sepals oblong-ovate, ca. 6.5 × 2.5 mm; inner sepals oblong-elliptic, ca. 8.5 × 4 mm. Petals obovate, ca. 4.5 × 3 mm, base cuneate, with separate lanceolate glands, apex retuse with 2 rounded lobes. Stamens ca. 3 mm; anther connective slightly prolonged, apiculate. Ovules 3, one of these sessile. Berry ?red, oblong, not pruinose, style not persistent. Fl. May, fr. Jun–Aug.

• Forests; 2700–3200 m. Xizang.

**158. *Berberis agricola*** Ahrendt, J. Linn. Soc., Bot. 57: 192. 1961.

暗红小檗 an hong xiao bo

Shrubs, deciduous, 0.8–2 m tall. Branches dark gray, terete; shoots dark red, sparsely black verruculose, glabrous; internodes 1.5–3 cm; spines 3-fid, pale yellow, 1–1.5 cm, adaxially sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially deep green, obovate, 1.2–2.5 × 0.7–1.5 cm, papery, abaxially not pruinose, midvein and lateral veins markedly raised, adaxially with raised midvein and lateral veins, both surfaces with conspicuous reticulate veins, base cuneate, margin entire or occasionally 1–3-spinose-serrate on each side, apex rounded, obtuse. Inflorescence a raceme, 15–30-flowered, often verticillate, rarely compound below, 4–7.5 cm, sometimes pendulous; peduncle 1–2 cm, slender, glabrous; bracts ca. 1.5 mm. Pedicels 5–7 mm, weak, glabrous; bractlets ovate, ca. 2.2 × 1.2 mm. Flowers ca. 1 cm in diam. Sepals in 2 whorls; outer sepals elliptic, 3–3.2 × 1.5–2 mm; inner sepals elliptic-obovate, ca. 5.5 × 3.2 mm. Petals elliptic, ca. 4.5 × 3 mm, base clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective slightly prolonged, rounded, obtuse, or truncate. Ovules 2, shortly funiculate. Fruit unknown. Fl. Jun, fr. unknown.

• Thickets on mountain slopes, roadsides; 3200–3600 m. Xizang.

**159. *Berberis forrestii*** Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941.

金江小檗 jin jiang xiao bo

Shrubs, deciduous, 1–2 m tall. Branches pale yellow, angulate, sparsely black verruculose; shoots shiny, red, often ultimately becoming brownish yellow; spines 3-fid, concolorous, 1–2 cm. Petiole 3–8 mm; leaf blade abaxially grayish green, adaxially dark green, oblong-obovate, 2–6 × 1–1.8 cm,

papery, abaxially sometimes slightly pruinose, lateral veins slightly raised, reticulate veins conspicuous, adaxially with flat or slightly raised midvein, lateral veins 3–5 pairs, base cuneate, margin entire or 3- or 4-spinose-serrate on each side, apex rounded. Inflorescence a raceme, 10–20-flowered, 6–12 cm including peduncle 1–4 cm; bracts 2–2.5 mm, apex acuminate. Pedicels 7–20 mm, slender; bractlets red, triangular, ca. 3 × 1 mm. Flowers 8–10 mm in diam. Sepals in 3 whorls; outer sepals lanceolate, 4–4.5 × ca. 1.5 mm; median and inner sepals oblong-obovate, 5–6 × 3–4 mm. Petals obovate-elliptic, 4–5 × 2–3 mm, base cuneate, with approximate but not contiguous glands, apex distinctly emarginate, lobes acute. Stamens 2.5–3 mm; anther connective prolonged, shortly apiculate. Ovules 1 or 2. Berry shiny, red, oblong-ovoid, 9–11 × 7–8 mm, not pruinose, style not persistent. Fl. Jun, fr. Jul–Oct.

• Roadsides, thickets, *Pinus* forests; 2700–3600 m. Yunnan.

**160. *Berberis racemulosa*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 129. 1985.

短序小檗 duan xu xiao bo

Shrubs, deciduous, 0.6–1.5 m tall. Branches gray; shoots pale yellow, sometimes puberulous; spines 3-fid, pale yellow, 0.7–2.2 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially green, obovate or elliptic-obovate, 1–2.8 × 0.5–1.4 cm, papery, abaxially not pruinose, midvein and lateral veins raised, both surfaces with inconspicuous reticulate veins, base cuneate, margin thickened, entire, apex acute, aristate. Inflorescence a raceme, 9–15-flowered, 1–2.8 cm, sometimes compound at base; peduncle 3–7 cm, glabrous. Pedicels 3–5 mm, slender. Sepals in 3 whorls; outer sepals ovate, 1.5–2 × 1–1.5 mm; median sepals elliptic-ovate, 3–3.2 × 1.5–2 mm; inner sepals broadly elliptic, 4.2–5 × 3–3.5 mm. Petals elliptic-obovate, 3–3.5 × 1.5–1.8 mm, base cuneate, with separate elliptic glands, apex emarginate, lobes acute. Stamens ca. 3 mm; anther connective not prolonged, apiculate. Ovules 2(–5). Berry ellipsoid, 5–7 × 3–4 mm, pruinose, style persistent. Fl. May–Jun, fr. Jul–Aug.

• Field margins, floodlands, weedy places in valleys, beside houses; 3200–3600 m. Xizang.

**161. *Berberis retusa*** T. S. Ying, Acta Phytotax. Sin. 37: 338. 1999.

心叶小檗 xin ye xiao bo

Shrubs, deciduous, 2–3 m tall. Branches black gray; shoots grayish brown, sparsely verruculose, angulate, glabrous; spines simple or absent, dark gray, ca. 1 cm. Petiole 1–2 mm; leaf blade abaxially pale green, adaxially green, obcordate or sub-cuneate, 8–14 × 6–9 mm, papery, both surfaces glabrous, abaxially with obviously raised midvein, lateral veins slightly raised, adaxially with slightly raised midvein and lateral veins, both surfaces with raised reticulate veins, base cuneate, margin entire, apex slightly retuse or truncate. Inflorescence a raceme, 6–12-flowered, sometimes subverticillate on upper rachis, 1.6–2.2 cm; peduncle 0.5–1 cm, glabrous; bracts lanceolate, ca. 1.5 mm. Flowers unknown. Fruit stalk ca. 6 mm, glabrous; berry ellipsoid, 8–9 × 5–6 mm, pruinose, style persistent; seeds 2. Fl. unknown, fr. Aug.

- Sunny dry valleys; ca. 3000 m. Sichuan, Yunnan.

**162. *Berberis virgetorum*** C. K. Schneider in Sargent, Pl. Wilson. 3: 440. 1917.

庐山小檗 *lu shan xiao bo*

*Berberis chekiangensis* Ahrendt; *B. pingjiangensis* Q. L. Chen & B. M. Yang.

Shrubs, deciduous, 1.5–2 m tall. Branches grayish yellow, angulate, not verruculose; shoots purplish brown; spines simple, occasionally 3-fid, 1–4 cm, adaxially sulcate. Petiole 1–2 cm; leaf blade abaxially grayish white, adaxially dark yellow-green, oblong-rhombic, 3.5–8 × 1.5–3.5(–7) cm, thinly papery, abaxially with obviously raised midvein and lateral veins, adaxially with slightly raised midvein, lateral veins conspicuous, base cuneate, attenuate to petiole, margin completely entire, sometimes slightly undulate, apex acute. Inflorescence a raceme, 3–15-flowered, 2–5 cm including peduncle 1–2 cm; bracts lanceolate, 1–1.5 mm, apex acuminate. Pedicels 4–8 mm, slender, glabrous. Sepals in 2 whorls; outer sepals oblong-ovate, 1.5–2 × 1–1.2 mm; inner sepals oblong-obovate, ca. 4 × 1–1.8 mm, apex obtuse. Petals elliptic-obovate, 3–3.5 × 1–1.8(–2.5) mm, base clawed, with separate oblong glands, apex obtuse, entire. Stamens ca. 3 mm; anther connective not prolonged, obtuse. Ovules solitary, sessile. Berry red, oblong-ellipsoid, 8–12 × 3–4.5 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Oct.

- Montane thickets, forests, riversides, beside houses; 200–1800 m. Anhui, Fujian, Jiangxi, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Zhejiang.

**163. *Berberis humidoubrosa*** Ahrendt, J. Bot. 80(Suppl.): 115. 1942 [*“humido-umbrosa”*].

阴湿小檗 *yin shi xiao bo*

Shrubs, deciduous, 1.5–2.5 m tall. Branches grayish black; shoots purplish red, angulate, sparsely black verruculose; spines simple or 3-fid, 1–2 cm. Petiole 1–2 mm; leaf blade abaxially pale gray, adaxially dark green, oblong-obovate, 1–2 cm × 4–6 mm, papery, abaxially sparsely papillose, midvein obviously raised, both surfaces with raised reticulate veins, base cuneate, attenuate to decurrent petiole, margin entire, apex rounded. Inflorescence a raceme, 4–8-flowered, 2–3 cm including peduncle 0.3–1.5 cm, glabrous; bracts 1–1.5 mm. Pedicels 4–9 mm, glabrous. Sepals in 2 whorls; outer sepals ovate, ca. 2.8 × 1.8 mm, apex obtuse; inner sepals obovate, ca. 3 × 2.5 mm. Petals obovate, ca. 3.3 × 2.5 mm, base with separate elliptic glands, apex entire. Stamens ca. 2.3 mm; anther connective prolonged, truncate. Ovules 2. Berry red, obovoid, 7–8 × 4.5–5 mm, densely blue or violet pruinose, style persistent and conspicuous. Fl. May–Jul, fr. Aug–Oct.

- Rainforests, thickets in arid valleys, shaded wet places; 2800–4000 m. Xizang.

**164. *Berberis sabulicola*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 133. 1985.

砂生小檗 *sha sheng xiao bo*

Shrubs, semi-evergreen, ca. 1 m tall. Shoots pale yellow;

branches gray, slightly sulcate; internodes 0.5–1 cm; spines 3-fid, sometimes simple, pale yellow, 8–14 mm. Leaves subsessile; leaf blade abaxially shiny, green, adaxially dark green, obovate, 8–11 × 3–6 mm, papery, abaxially with raised midvein, lateral veins slightly raised, reticulate veins conspicuous, adaxially with slightly raised midvein and lateral veins, reticulate veins inconspicuous, base cuneate, margin entire, apex rounded. Inflorescence a raceme, 3–5-flowered, 1.5–2 cm including peduncle 3–7 mm. Pedicels 4–6 mm, glabrous. Sepals in 2 whorls; outer sepals elliptic, ca. 3 × 1.5 mm; inner sepals obovate-suborbicular, ca. 3.5 × 3 mm. Petals obovate, ca. 3.2 × 2 mm, base very clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective prolonged, apiculate. Ovules 3. Berry pale yellow (immature), oblong, slightly pruinose, style not persistent. Fl. May, fr. Jun–Aug.

- Rock fractures, talus deposits; ca. 3800 m. Xizang.

**165. *Berberis feddeana*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 665. 1905.

异长穗小檗 *yi chang sui xiao bo*

Shrubs, deciduous, 1–2 m tall. Branches pale grayish yellow, terete, not verruculose; shoots reddish, glabrous; spines simple, weak, 2–8 mm, sometimes absent. Petiole 6–15 mm; leaf blade abaxially pale green, adaxially dark green, obovate or oblong-obovate, 2–8 × 2.2–5 cm, papery, both surfaces glabrous, abaxially with obviously raised midvein, reticulate veins conspicuous, adaxially with flat or slightly impressed midvein, lateral and reticulate veins conspicuous, base cuneate, margin entire, or inconspicuously many spinulose-serrulate, apex rounded, obtuse or acute. Inflorescence a raceme, 18–60-flowered, 7–18 cm including peduncle 1–3 cm, glabrous; bracts triangular-lanceolate, 1–2 mm. Pedicels 4–8 mm; bractlets reddish, lanceolate, 1.5–2 mm. Sepals in 2 whorls; outer sepals oblong, 2.5–3 × 1.3–1.5 mm; inner sepals obovate-oblong, 4–4.5 × 2–2.5 mm. Petals elliptic, 3–3.5 × 1.5–1.8 mm, base shortly clawed, with separate glands, apex emarginate. Ovules 2. Berry red, oblong, 8–10 × 4–6 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Sep.

- Thickets, forest margins, streamsides on mountains; 800–3000 m. Hubei, Qinghai, Shaanxi, Sichuan.

**166. *Berberis haoi*** T. S. Ying, Acta Phytotax. Sin. 37: 339. 1999.

洮河小檗 *tao he xiao bo*

Shrubs, deciduous, ca. 1 m tall. Branches purplish brown, angulate, glabrous, sparsely black verruculose; spines simple or 3-fid, pale yellow, 1–1.5 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially green, narrowly obovate-lanceolate or narrowly elliptic, 1–2.2 cm × 3–6 mm, papery, abaxially not pruinose, glabrous, midvein obviously raised, lateral veins 2 or 3 pairs, raised, reticulate veins conspicuous, adaxially with flat midvein, reticulate veins inconspicuous, base cuneate, margin slightly thickened, entire, apex acute, aristate. Inflorescence a raceme, 6–10-flowered, 2.5–3.5 cm including peduncle 7–12 mm, occasionally with 1 or 2 fascicled flowers at base, glabrous. Flowers unknown. Fruit stalk 4–5 mm; bracts ovate, ca. 1 mm, apex acute. Berry oblong-ellipsoid, 5–6 × 2–2.5 mm,

slightly pruinose, style not persistent; seeds 2. Fl. unknown, fr. Jun.

- Riverbanks; ca. 1800 m. Gansu.

**167. *Berberis jamesiana*** Forrest & W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 81. 1916.

川滇小檗 *chuan dian xiao bo*

*Berberis integerrima* Franchet, Bull. Soc. Bot. France 33: 386. 1886, not Bunge (1843), nor K. Koch (1869); *B. jamesiana* var. *leucocarpa* (W. W. Smith) Ahrendt; *B. jamesiana* var. *sepium* Ahrendt; *B. leucocarpa* W. W. Smith; *B. nummularia* Bunge var. *sinica* C. K. Schneider.

Shrubs, deciduous, 1–3 m tall. Branches dark gray or purplish black, terete; shoots purple, not verruculose; spines simple or 3-fid, 1.5–3.5 cm, stout, adaxially slightly sulcate. Petiole 1–3 mm; leaf blade adaxially shiny, green, elliptic or oblong-obovate, 2.5–8 × 1–4 cm, subleathery, adaxially with obviously raised midvein, both surfaces not papillose, lateral and reticulate veins conspicuous, base cuneate, margin entire or closely spinulose, apex rounded or retuse. Inflorescence a raceme, 9–20-flowered, sometimes to 40-flowered and compound below, 7–10 cm; peduncles 0.5–3 cm. Pedicels 7–10 mm, slender, glabrous; bractlets ovate, 2–2.5 × ca. 1.5 mm, apex acute. Sepals in 2 whorls; outer sepals oblong-obovate, ca. 3 × 2 mm; inner sepals narrowly obovate, ca. 4.5 × 2.5 mm. Petals obovate or narrowly oblong-elliptic, ca. 4.5 × 2 mm, base clawed, with separate glands, apex emarginate, lobes acute. Stamens ca. 3 mm; anther connective prolonged, slightly apiculate. Ovules 2. Berry initially creamy white, finally light red, subglobose, ca. 10 × 7–8 mm, translucent, not pruinose, style not persistent. Fl. Apr–May, fr. Jun–Sep.

- Thickets, forests, forest margins, riversides, mountain slopes; 2100–3600 m. Sichuan, Xizang, Yunnan.

**168. *Berberis iliensis*** Popov, Ind. Sem. Hort. Bot. Almaat. Acad. Sci. URSS 3: 3. 1936.

伊犁小檗 *yi li xiao bo*

*Berberis nummularia* Bunge var. *schrenkiana* C. K. Schneider.

Shrubs, deciduous, 1–2.5 m tall. Branches dark gray or purplish red, terete; shoots pale purplish red, shiny, not verruculose, glabrous; spines simple or 3-fid, concolorous, 1–3 cm, adaxially sulcate. Petiole 3–15 mm; leaf blade abaxially grayish green, adaxially green, oblong-elliptic or cuneate, papery, abaxially with obviously raised midvein, adaxially with flat midvein, both surfaces with raised reticulate veins, margin entire. Inflorescence a raceme, 10–25-flowered, 3–5 cm including peduncle ca. 5 mm; bracts 1–1.5 mm. Pedicels 5–10 mm, glabrous; bractlets ovate, ca. 1.5 × 1 mm. Sepals in 2 whorls; outer sepals elliptic, ca. 2.8 × 1.8 mm; inner sepals obovate, 3.8–4 × ca. 2.5 mm. Petals obovate, ca. 3.5 × 2 mm, base clawed, with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2, with funicles ca. as long as ovules. Berry shiny, red, ovoid-ellipsoid, 5.5–6 × 3.5–4 mm, not pruinose. Fl. May–Jun, fr. Jul–Sep.

Dry regions, sandy places on river beaches, grassy slopes, roadsides, field margins; 600–2000 m. Xinjiang [Kazakhstan].

**169. *Berberis farreri*** Ahrendt, J. Linn. Soc., Bot. 57: 192. 1961.

陇西小檗 *long xi xiao bo*

Shrubs, deciduous, 1–3 m tall. Branches dark gray, angulate, not verruculose; shoots pale purplish red, glabrous; internodes 2–3 cm; spines absent, sometimes spines simple or 3-fid, concolorous, 3–25 mm, adaxially sulcate. Petiole 3–15 mm; leaf blade abaxially green, adaxially dark green, elliptic-obovate, 1.3–4.5 × 0.3–1.5 cm, papery, abaxially not pruinose, midvein and lateral veins obviously raised, adaxially with slightly impressed or flat midvein, lateral veins slightly raised, both surfaces with conspicuous reticulate veins, base abruptly contracted to decurrent petiole, margin 10–20-spinose-serrate on each side, but entire on shoots, apex obtuse. Inflorescence a raceme, 15–20-flowered, 3–4 cm. Pedicels 5–11 mm, slender, glabrous. Flowers ca. 8 mm in diam. Sepals in 2 whorls; outer sepals broadly obovate, ca. 3 × 2.5 mm, apex rounded; inner sepals narrowly obovate, ca. 5.3 × 2.3 mm, apex rounded. Petals narrowly obovate, ca. 4 × 1.8 mm, base clawed, with separate oblong glands, apex obtuse, subtire. Stamens ca. 2.5 mm; anther connective not prolonged, obtuse. Ovules 2. Berry red, ellipsoid, ca. 9 × 6 mm, not pruinose; style persistent, short. Fl. May–Jun, fr. Jul–Sep.

- Mountain slopes, thickets; 1600–3100 m. Gansu.

**170. *Berberis honanensis*** Ahrendt, Gard. Ill. 64: 426. 1944.

河南小檗 *he nan xiao bo*

Shrubs, deciduous, 1.5–3 m tall. Branches gray, terete, sometimes sulcate, glabrous; shoots pale yellow, sometimes pale purplish yellow, sparsely black verruculose; spines absent, occasionally simple, less than 1 cm, slender. Petiole to 1.5 cm; leaf blade abaxially pale green, adaxially deep green, elliptic or oblong-elliptic, rarely obovate, 2.5–8 × 0.5–3 cm, thinly papery or papery, abaxially not pruinose, midvein obviously raised, lateral and reticulate veins slightly raised, adaxially with flat or slightly impressed midvein, lateral and reticulate veins conspicuous, base cuneate, margin 20–40-spinose-serrate on each side, apex acute or rounded, obtuse. Inflorescence a raceme, 8–14-flowered, 4–6 cm including peduncle 1.5–2.5 cm, glabrous; bracts lanceolate, ca. 2 mm. Pedicels 4–9 mm, slender, glabrous; bractlets lanceolate, ca. 3 × 1 mm. Sepals in 3 whorls; outer sepals elliptic, ca. 3 × 2.5 mm; median sepals broadly elliptic, ca. 4.2 × 3 mm; inner sepals obovate-elliptic, ca. 5.5 × 3.2 mm. Petals elliptic, ca. 5 × 3 mm, base clawed, with separate glands, apex entire. Stamens ca. 3.3 mm; anther connective prolonged, apiculate. Ovules 2. Berry red, oblong, 8–11 × 6–8 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Jul–Sep.

- Thickets, forests, slopes, sides of rocks; 1100–1600 m. Henan.

**171. *Berberis pingwuensis*** T. S. Ying, Acta Phytotax. Sin. 37: 339. 1999.

平武小檗 *ping wu xiao bo*

Shrubs, deciduous, 2–2.5 m tall. Branches dark gray, ter-

ete, sparsely black verruculose; shoots dark purple; spines absent or 3-fid, 0.6–2 cm. Petiole ca. 1 cm; leaf blade abaxially pale green, becoming brown when dry, shiny, adaxially deep green, broadly elliptic or oblong-elliptic, 4–9 × 1.5–3.5 cm, few leaves 1.5–2 cm × 6–8 mm, thickly papery, abaxially glabrous, not pruinose, lateral and reticulate veins obviously raised, adaxially with slightly impressed midvein, lateral and reticulate veins conspicuous, base cuneate, margin 20–35-spinose-serrate on each side, apex acute or rounded, obtuse. Inflorescence a raceme, 20–35-flowered, 5–14 cm including peduncle 1–2 cm, glabrous. Pedicels 2–3 mm; bractlets ovate-lanceolate, 2–3 mm. Sepals in 4 whorls; outer sepals ovate, ca. 1.1 × 0.7 mm, apex acuminate; median outer sepals broadly lanceolate, ca. 2 × 1 mm; median inner sepals ovate-elliptic, ca. 3 × 2 mm; innermost sepals elliptic, ca. 5 × 3.2 mm. Petals in 2 whorls, base subclawed, with separate glands; outer petals obovate-oblong, ca. 4 × 2 mm, apex slightly emarginate; inner petals elliptic, ca. 4.2 × 2.2 mm, apex entire. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2, shortly funiculate. Berry red, ovoid-ellipsoid, 10–12 × 5–7 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

- Forests, forest margins; ca. 1800 m. Sichuan.

**172. *Berberis tianshuiensis*** T. S. Ying, Acta Phytotax. Sin. 37: 341. 1999.

天水小檗 tian shui xiao bo

Shrubs, deciduous, ca. 2 m tall. Branches pale brown or dark gray, angulate, sparsely black verruculose; shoots pale yellowish brown, angulate, not verruculose; spines simple or 3-fid, 1–3 cm, adaxially sulcate. Petiole to 1.7 cm, sometimes leaf subsessile; leaf blade abaxially pale green or gray, adaxially green, elliptic or obovate, occasionally oblong-elliptic, (0.7–)2–6 × (0.4–)1–2.7 cm, thinly papery, abaxially glabrous, not pruinose, veins obviously raised, adaxially with flat or slightly impressed midvein, lateral and reticulate veins conspicuous, base abruptly contracted to petiole, margin 12–25-spinose-serrate on each side, leaves on shoots usually entire, apex rounded, obtuse. Inflorescence a raceme, 5–8-flowered, 3–4 cm, sometimes compound below; bracts lanceolate, ca. 1.5 mm. Pedicels ca. 1 cm, glabrous. Sepals in 2 whorls; outer sepals suborbicular or ovate-orbicular, ca. 3.5 × 3.1 mm; inner sepals suborbicular, ca. 4.8 × 4.6 mm. Petals elliptic, ca. 5 × 3.5 mm, base clawed, with separate glands, apex emarginate, lobes acute. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovules 3, sessile. Berry red, oblong, 10–12 × 5–6 mm, not pruinose, style ca. 1 mm. Fl. May, fr. Jun–Sep.

- Forests, streamsides; 1700–2100 m. Gansu.

**173. *Berberis henryana*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 664. 1905.

川鄂小檗 chuan e xiao bo

Shrubs, deciduous, 2–3 m tall. Branches grayish yellow or dark brown; shoots reddish, subterete, inconspicuously angulate; spines simple or 3-fid, concolorous, 1–3 cm, sometimes absent. Petiole 4–15 mm; leaf blade abaxially gray-green, adaxially dark green, elliptic or obovate-elliptic, 1.5–3(–6) × 0.8–1.8(–3) cm, papery, both surfaces glabrous, abaxially often

slightly pruinose, midvein raised, lateral and reticulate veins conspicuous, adaxially with slightly impressed midvein, lateral and reticulate veins slightly conspicuous, base cuneate, margin inconspicuously 10–20-spinulose-serrulate on each side, apex rounded, obtuse. Inflorescence a raceme, 10–20-flowered, 2–6 cm including peduncle 1–2 cm; bracts 1–1.5 mm. Pedicels 5–10 mm, glabrous; bractlets lanceolate, 1–1.5 mm, apex acuminate. Sepals in 2 whorls; outer sepals oblong-obovate, 2.5–3.5 × 1.5–2 mm; inner sepals obovate, 5–6 × 4–5 mm. Petals oblong-obovate, 5–6 × 4–5 mm, base with separate glands, apex incised. Stamens 3.5–4.5 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, ellipsoid, ca. 9 × 6 mm, not pruinose; style persistent, short. Fl. May–Jun, fr. Jul–Sep.

- Thickets, forests, forest margins, weedy places; 1000–2500 m. Gansu, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan.

**174. *Berberis kansuensis*** C. K. Schneider, Oesterr. Bot. Z. 67: 288. 1918.

甘肃小檗 gan su xiao bo

Shrubs, deciduous, to 3 m tall. Branches pale brown; shoots reddish, angulate; spines weak, simple or 3-fid, concolorous, 1–2.4 cm, adaxially sulcate. Petiole 1–2 cm; leaf blade abaxially gray, adaxially dark green, suborbicular or broadly elliptic, 2.5–5 × 2–3 cm, papery, abaxially slightly pruinose, midvein obviously raised, adaxially with slightly impressed midvein, both surfaces with raised lateral and reticulate veins, base attenuate to decurrent petiole, margin 15–30-spinose-serrate on each side, apex rounded. Inflorescence a raceme, 10–30-flowered, 2.5–7 cm including peduncle 0.5–3 cm; bracts 1–1.5 mm. Pedicels 4–8 mm, often verticillate; bractlets reddish, ca. 1.4 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate, ca. 2.5 × 1.5 mm, apex acute; inner sepals oblong-elliptic, ca. 4.5 × 2.5 mm. Petals oblong-elliptic, ca. 4.5 × 2 mm, base shortly clawed, with separate obovate glands, apex emarginate, lobes acute. Stamens ca. 3 mm; anther connective slightly prolonged, rounded or truncate. Ovules 2, funiculate. Berry red, oblong-obovoid, 7–8 × 5–6 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Aug.

- Thickets, mixed forests; 1400–2800 m. Gansu, Ningxia, Qinghai, Shaanxi, Sichuan.

**175. *Berberis anhweiensis*** Ahrendt, J. Linn. Soc., Bot. 57: 185. 1961.

安徽小檗 an hui xiao bo

Shrubs, deciduous, 1–2 m tall. Branches grayish yellow or pale yellow, angulate, sparsely black verruculose; shoots dark purple; internodes 2–4 cm; spines simple or 3-fid, 1–1.5 cm. Petiole 5–15 mm; leaf blade abaxially pale green, adaxially deep green, suborbicular or broadly elliptic, 2–6 × 1.5–3 cm, thinly papery, both surfaces glabrous, abaxially slightly pruinose, midvein and lateral veins obviously raised, adaxially with raised midvein and lateral veins, both surfaces with conspicuous reticulate veins, base contracted to petiole, margin 15–40-spinose-serrate on each side, apex rounded, obtuse. Inflorescence a raceme, 10–27-flowered, 3–7.5 cm including peduncle 1–1.5 cm, glabrous; bracts ca. 1 mm. Pedicels 4–7 mm, glabrous; bractlets ovate, ca. 1 mm. Sepals in 2 whorls; outer

sepals oblong, 2.5–3 × 1.3–1.5 mm; inner sepals obovate, ca. 4.5 × 3 mm. Petals elliptic, 4.8–5 × ca. 2.5 mm, base cuneate, with separate glands, apex entire. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, ellipsoid or obovoid, ca. 9 × 6 mm, not pruinose, style not persistent. Fl. Apr–Jun, fr. Jul–Oct.  $2n = 28^*$ .

• Thickets, forests, roadsides; 400–1800 m. Anhui, Hubei, Zhejiang.

**176. *Berberis dasystachya*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 23: 308. 1877.

直穗小檗 zhi sui xiao bo

*Berberis dolichobotrys* Fedde; *B. kansuensis* C. K. Schneider var. *procera* Ahrendt.

Shrubs, deciduous, 2–3 m tall. Branches yellow-brown, terete, very sparsely verruculose; shoots purplish red; spines simple, 5–15 mm, sometimes absent or occasionally 3-fid, to 4 cm. Petiole 1–4 cm; leaf blade abaxially yellow-green, adaxially dark yellow-green, oblong-elliptic, broadly elliptic, or sub-orbicular, 3–6 × 2.5–4 cm, papery, abaxially glabrous, not pruinose, midvein obviously raised, adaxially with slightly raised midvein and lateral veins, base cuneate, rounded, or cordate, margin 25–50-spinulose-serrulate on each side, apex rounded, obtuse. Inflorescence a raceme, erect, 15–30-flowered, 4–7 cm including peduncle 1–2 cm, glabrous. Pedicels 4–7 mm; bractlets lanceolate, ca. 2 × 0.5 mm. Sepals in 2 whorls; outer sepals lanceolate, ca. 3.5 × 2 mm; inner sepals obovate, ca. 5 × 3 mm, base slightly clawed. Petals obovate, ca. 4 × 2.5 mm, base clawed, with separate oblong-elliptic glands, apex entire. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovules 1 or 2. Berry red, ellipsoid, 6–7 × 5–5.5 mm, not pruinose, style not persistent. Fl. Apr–Jun, fr. Jun–Sep.

• Thickets, forests, forest margins, streamsides, grasslands; 800–3400 m. Gansu, Hebei, Henan, Hubei, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.

**177. *Berberis amurensis*** Ruprecht, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 15: 260. 1857.

黄芦木 huang lu mu

*Berberis vulgaris* Linnaeus var. *amurensis* (Ruprecht) Regel.

Shrubs, deciduous, 2–3.5 m tall. Branches pale yellow or gray, slightly sulcate, not verruculose; internodes 2.5–7 cm; spines 3-fid, rarely simple, 1–2 cm. Petiole 5–10 mm; leaf blade abaxially pale green, adaxially dark green, obovate-elliptic, elliptic, or ovate, 5–10 × 2.5–5 cm, papery, abaxially with slightly raised midvein and lateral veins, reticulate veins slightly conspicuous, adaxially with impressed midvein and lateral veins, reticulate veins inconspicuous, base cuneate, margin 40–60-spinulose-serrulate on each side, apex acute or rounded. Inflorescence a raceme, 10–25-flowered, 4–10 cm including peduncle 1–3 cm. Pedicels 5–10 mm. Sepals in 2 whorls; outer sepals obovate, ca. 3 × 2 mm; inner sepals obovate, 5.5–6 × 3–3.4 mm. Petals elliptic, 4.5–5 × 2.5–3 mm, base slightly clawed, with separate glands, apex emarginate. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovules 2. Berry red,

oblong, ca. 10 × 6 mm, not or slightly blue pruinose at base, style not persistent. Fl. Apr–May, fr. Aug–Sep.  $2n = 28, 42$ .

Thickets, sparse forests, valleys, forest margins, streamsides, sides of rocks; 1100–2900 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Japan, Korea, Russia (Siberia)].

**178. *Berberis shensiana*** Ahrendt, Gard. Chron., ser. 3, 112: 155. 1942.

陕西小檗 shan xi xiao bo

Shrubs, deciduous, ca. 1.5 m tall. Branches dark gray, angulate, glabrous; shoots stramineous or pale purplish red, sparsely black verruculose; spines 3-fid or simple, pale yellow, 1–2 cm, adaxially slightly sulcate. Petiole ca. 1 cm; leaf blade abaxially pale green, adaxially green, elliptic or obovate, 1.5–4.5 × 0.5–1.7 cm, papery, abaxially glabrous, not pruinose, midvein obviously raised, lateral and reticulate veins conspicuous, adaxially with slightly impressed midvein, lateral and reticulate veins inconspicuous, sometimes conspicuous, base cuneate, margin 10–20-spinulose-serrulate on each side, apex acute or rounded, obtuse. Inflorescence a raceme, 4–8-flowered, 1.5–3.5 cm including peduncle ca. 5 mm, sometimes compound below; bracts ovate, ca. 1.3 mm. Pedicels 5–8 mm, slender, glabrous; bractlets lanceolate, ca. 3 × 1 mm. Sepals in 2 whorls; outer sepals elliptic, 4.5–5 × 2.5–3 mm; inner sepals oblong-elliptic, ca. 6 × 4 mm. Petals obovate-elliptic, 5–5.5 × 3–3.5 mm, base clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective slightly prolonged, apiculate. Ovules 5 or 6. Berry red, oblong, 7–8 × 4–5 mm, not pruinose; style persistent and very short, or not persistent. Fl. May–Jun, fr. Jul–Sep.

• Thickets, slopes, woodlands, roadsides; 1200–3000 m. Shaanxi.

**179. *Berberis hersii*** Ahrendt, Gard. Ill. 64: 426. 1944.

南阳小檗 nan yang xiao bo

*Berberis amurensis* Ruprecht var. *licentii* Ahrendt.

Shrubs, deciduous, 1–3 m tall. Branches grayish black, terete; shoots grayish yellow, angulate, sparsely black verruculose; spines absent or simple, occasionally 3-fid, weak, concolorous, 3–6 mm. Petiole 6–15 mm; leaf blade abaxially grayish brown, adaxially green, obovate, obovate-elliptic, or elliptic, 2.5–5 × 1–1.8 cm, thinly papery, abaxially with obviously raised midvein and lateral veins, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuously raised reticulate veins, base cuneate, margin 15–30-spinulose-subserulate on each side, apex acute. Inflorescence a raceme, 15–30-flowered, 3–5 cm, sometimes compound below; peduncles 5–15 mm; bracts 1–1.5 mm. Pedicels dark red, 2–8 mm, slender; bractlets red, ca. 2 × 1 mm, apex acute. Sepals in 2 whorls; outer sepals ovate, 3–3.5 × 2–2.5 mm, apex obtuse; inner sepals obovate, 4.5–5 × 3–3.5 mm. Petals elliptic, 4–4.5 × 2.5–3 mm, base slightly clawed, with separate oblong glands, apex slightly emarginate. Stamens ca. 2.5 mm; anther connective not prolonged, truncate, or retuse. Ovules 2. Berry red, ellipsoid, ca. 9 × 5.5 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Aug–Oct.

• Thickets, forests, forest margins, roadsides; 700–2100 m. Hebei, Shandong, Shanxi.

**180. *Berberis pseudotibetica*** C. Y. Wu ex S. Y. Bao, Acta Phytotax. Sin. 25: 159. 1987.

假藏小檗 *jia zang xiao bo*

Shrubs, deciduous, ca. 1 m tall. Branches grayish black, sparsely black verruculose; spines simple or 3-fid, concolorous, 5–25 mm. Petiole 1–3 mm; leaf blade abaxially pallid, adaxially deep green, narrowly oblong-obovate, 2.5–3 cm × 6–10 mm, thinly leathery, abaxially with conspicuously raised midvein and lateral veins, reticulate veins prominent, adaxially with slightly raised midvein and lateral veins, reticulate veins inconspicuous, base cuneate, margin flat, 2–5-spinose-serrate on each side, apex obtuse, aristate. Flowers unknown. Infructescence with 3–10 berries, 3–4 cm; berry deep red, oblong-ellipsoid, 7–10 × 4–5 mm, not pruinose; style persistent, short; seeds 2. Fl. unknown, fr. Jul.

• Streamsides in thickets, *Pinus* forests; 800–3200 m. Yunnan.

**181. *Berberis dubia*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 663. 1905.

置疑小檗 *zhi yi xiao bo*

Shrubs, deciduous, 1–3 m tall. Branches grayish black, slightly sulcate, sparsely black verruculose; shoots purplish red, shiny, conspicuously sulcate; spines simple or 3-fid, concolorous, 0.7–2 cm. Petiole 1–3 mm; leaf blade abaxially pale yellow, adaxially deep green, narrowly obovate, 1.5–3 × 0.5–1.8 cm, papery, both surfaces glabrous, not pruinose, abaxially with conspicuously raised midvein and lateral veins, adaxially with obviously raised midvein and lateral veins, both surfaces with markedly raised reticulate veins, base attenuate, margin 6–14-spinulose-serrulate on each side, apex subacuminate. Inflorescence a raceme, 5–10-flowered, 1–3 cm; peduncle 5–10 mm. Pedicels weak, 3–6 mm, glabrous; bractlets lanceolate, 1.5 × 1 mm, apex acute. Sepals in 2 whorls; outer sepals ovate, ca. 2.5 × 1.5 mm; inner sepals broadly obovate, ca. 4.5 × 3.5 mm. Petals elliptic, ca. 3.5 × 2.5 mm, base cuneate, with separate glands, apex shortly emarginate. Stamens ca. 2.5 mm; anther connective prolonged, shortly apiculate. Ovules 2. Berry red, obovoid-ellipsoid, ca. 8 × 4 mm, not pruinose, style not persistent. Fl. May–Jun, Aug–Sep.

• Thickets, forests, stony slopes, river beaches; 1400–3900 m. Gansu, Nei Mongol, Ningxia, Qinghai.

**182. *Berberis potaninii*** Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 41. 1891 [*“potanini”*].

少齿小檗 *shao chi xiao bo*

*Berberis leichtensteinii* C. K. Schneider.

Shrubs, evergreen, 1–2 m tall. Branches dark purplish red or dark gray, glabrous; shoots grayish yellow, sometimes, angulate, sparsely black verruculose; spines 3-fid, (1.5–)2–6 cm, stout, adaxially slightly sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially deep green, shiny, lanceolate, obovate, or narrowly obovate, 2–4 × 0.3–1.8 cm, leathery, abaxially sometimes densely papillose, midvein obviously raised,

lateral and reticulate veins inconspicuous, adaxially veins inconspicuous, base attenuate or cuneate, margin often thickened, 1–4-spinose-serrate on each side, rarely entire, apex acute, mucronate. Inflorescence a raceme, 4–12-flowered, 2–4 cm. Pedicels 5–15 mm, glabrous. Sepals in 2 whorls; outer sepals elliptic to obovate, 4–5 × 3–4 mm, apex obtuse; inner sepals obovate, 5–7 × 4–5 mm. Petals obovate, 4.3–5 × 3–3.5 mm, base truncate, with separate lanceolate glands, apex entire. Stamens 4–5 mm; anther connective obtuse. Ovules 1 or 2, sessile. Berry red, oblong or oblong-globose, 7–8 × 5–6 mm, not pruinose, sometimes slightly so, style persistent and conspicuous. Fl. Apr–May, fr. Aug–Oct.

• Sunny slopes, roadsides, streamsides, valleys; 400–2100 m. Gansu, Shaanxi, Sichuan.

**183. *Berberis centiflora*** Diels, Notes Roy. Bot. Gard. Edinburgh 5: 167. 1912.

多花大黄连刺 *duo hua da huang lian ci*

*Berberis pruinosa* Franchet var. *centiflora* (Diels) Handel-Mazzetti.

Shrubs, evergreen, 1–2 m tall. Branches brownish gray or brownish yellow, terete, glabrous, not verruculose; spines 3-fid, concolorous, ca. 1.5 cm, slender. Petiole 1–4 mm; leaf blade abaxially pale green, adaxially shiny, yellow-green, oblong-obovate or oblanceolate, 3–9 × 1–3 cm, leathery, abaxially with obviously raised midvein, lateral veins 8–12 pairs, conspicuous, adaxially with slightly impressed midvein, both surfaces with inconspicuous reticulate veins, base cuneate, margin sometimes slightly revolute, 10–20-spinose-serrate on each side, apex obtuse, apiculate. Inflorescence a fascicle of 15–30 flowers or 2–4-flowered raceme 5–6 cm. Pedicels 1.5–4 cm, glabrous, not pruinose; bractlets ca. 2 × 1.5 mm. Sepals in 2 whorls; outer and inner sepals obovate, equal in size, ca. 5.5 × 4 mm. Petals obovate, ca. 6.5 × 5 mm, base clawed, with separate lanceolate glands, apex slightly retuse. Stamens ca. 5 mm; anther connective prolonged, shortly apiculate. Ovules 4–6. Berry oblong-ellipsoid, ca. 7 × 6 mm, not pruinose; style persistent, short. Fl. Mar–Apr, fr. Jun–Oct.

• Roadsides in valleys; 1800–2700 m. Yunnan.

**184. *Berberis tenuipedicellata*** T. S. Ying, Acta Phytotax. Sin. 37: 343. 1999.

细梗小檗 *xi geng xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches dark gray or dark purplish red, terete, sparsely black verruculose, glabrous; shoots dark purplish red, angulate; spines simple or 3-fid, 0.6–1.5 cm. Petiole 2–3 mm, sometimes leaf subsessile; leaf blade abaxially shiny, brown, adaxially green, obovate or obovate-elliptic, 0.8–2(–3.5) × 0.5–1.2 cm, thinly leathery, abaxially not pruinose, midvein and lateral veins obviously raised, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuously raised reticulate veins, base attenuate, margin 10–25-spinose-serrate on each side, apex rounded, obtuse, or acute. Inflorescence a raceme, 3–10-flowered, 1–3.5 cm, often with 1–3 fascicled flowers at base. Pedicels 5–12 mm, very slender, glabrous. Flowers unknown. Berry red, subglobose, 9–

10 × 8–9 mm, not pruinose, style not persistent, apex cavity-like; seeds 2 or 3. Fl. unknown, fr. May–Jun.

• Thickets, field margins, streamsides, roadsides; 2300–3100 m. Sichuan.

**185. *Berberis mouillacana*** C. K. Schneider in Sargent, Pl. Wilson. 1: 371. 1913.

变刺小檗 *bian ci xiao bo*

*Berberis boschanii* C. K. Schneider.

Shrubs, deciduous, 1.5–3 m tall. Branches dark gray, sulcate; shoots sometimes reddish, not verruculose; spines simple, sometimes 3-fid or absent, pale yellow, terete, 3–18 mm. Petiole 2–5 mm, or leaf sessile; leaf blade abaxially green, adaxially shiny, green, obovate or oblong-obovate, 1–6 × 0.5–3.5 cm, papery, abaxially not pruinose, not papillose, midvein slightly raised, lateral and reticulate veins conspicuous, adaxially with flat or slightly impressed midvein, lateral and reticulate veins inconspicuous, base cuneate, margin entire, occasionally inconspicuously 1–8-spinulose-serrate on each side, apex rounded, obtuse. Inflorescence usually a raceme with few fascicled flowers at base, or occasionally a subumbellate raceme with 4–12 flowers, 2–5 cm. Pedicels 3–15 mm, glabrous; bractlets lanceolate, ca. 3 × 1 mm, apex acuminate. Sepals in 2 whorls; outer sepals narrowly elliptic, 4–4.5 × 2–2.2 mm; inner sepals elliptic, 6–6.5 × 3–3.5 mm. Petals broadly elliptic, ca. 4.5 × 3 mm, base with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective truncate. Ovules 2–4. Berry ovoid-ellipsoid, 9–10 × 5–6 mm, not pruinose, style persistent. Fl. Apr–May, fr. Jul–Sep.

• Floodlands, forests, forest margins, roadsides on slopes; 2000–3500 m. Qinghai, Sichuan.

**186. *Berberis franchetiana*** C. K. Schneider, Oesterr. Bot. Z. 67: 223. 1918.

滇西北小檗 *dian xi bei xiao bo*

*Berberis franchetiana* var. *glabripes* Ahrendt.

Shrubs, deciduous, 1–2 m tall. Branches brownish gray, obviously sulcate, glabrous, rarely black verruculose; spines 3-fid, weak, 1–1.5 cm, adaxially slightly sulcate. Petiole 2–4 mm; leaf blade abaxially pale gray, adaxially deep green, narrowly obovate, 2–3.5 cm × 6–10 mm, papery, both surfaces not pruinose, abaxially with slightly raised midvein, adaxially with flat midvein, lateral veins 2 or 3 pairs, branched, both surfaces with inconspicuous reticulate veins, margin entire, apex obtuse or acute. Inflorescence a raceme, 3–8-flowered, 2–4 cm, often with few fascicled flowers at base. Pedicels 7–18 mm; bractlets lanceolate, ca. 2.8 mm. Sepals in 3 whorls; outer sepals lanceolate, ca. 4.5 × 1.1 mm; median sepals oblong-obovate, ca. 6 × 3.5 mm; inner sepals obovate, ca. 7 × 5.5 mm. Petals elliptic, ca. 5 × 3.5 mm, base clawed, with separate lanceolate glands, apex acute, emarginate. Stamens ca. 3.8 mm; anther connective not prolonged. Ovules 2. Berry red, oblong-ovoid, 9–10 × 4.5–6 mm, not pruinose, upper part sometimes bent; style persistent, short. Fl. Jun, fr. Aug–Oct.

• Montane thickets, forest margins; 3000–4100 m. Sichuan, Yunnan.

**187. *Berberis lecomtei*** C. K. Schneider in Sargent, Pl. Wilson. 1: 373. 1913.

光叶小檗 *guang ye xiao bo*

*Berberis franchetiana* C. K. Schneider var. *macrobotrys* Ahrendt; *B. humidumbrosa* Ahrendt var. *inornata* Ahrendt; *B. thunbergii* Candolle var. *glabra* Franchet; *B. tsarongensis* Stapf var. *megacarpa* Ahrendt, p.p.

Shrubs, deciduous, 1–2 m tall. Branches brownish yellow, angulate, glabrous, sparsely black verruculose; shoots brownish red; spines simple or 3-fid, 2–15 mm, slender, sometimes absent. Petiole 2–5 mm; leaf blade abaxially grayish green, adaxially dark green, narrowly obovate, 1.2–3.5 × 0.5–1.4 cm, papery, abaxially not pruinose, midvein and lateral veins slightly raised, reticulate veins conspicuous, adaxially with conspicuous midvein and lateral veins, reticulate veins indistinct, margin flat, entire. Inflorescence a raceme, 4–16-flowered, 1.5–4 cm, with few fascicled flowers at base, glabrous. Pedicels 4–10 mm, glabrous; bractlets red, 1.5–2 × ca. 1 mm. Sepals in 2 whorls; outer sepals broadly ovate, 2.5–3 × ca. 2.5 mm, apex acute; inner sepals elliptic, 3–4 × 2.5–3.5 mm. Petals obovate, 4–5 × 2–3 mm, base clawed, with separate to subapproximate oblong glands, apex emarginate, lobes acute. Stamens ca. 2.5 mm; anther connective slightly prolonged, truncate or obtusely subconical. Ovules 2, sessile. Berry deep red, shiny, oblong or oblong-obovoid, 8–10 × 4.5–5 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Aug–Oct.

• Montane forests, forest margins, weedy slopes, thickets, roadsides, streamsides; 2500–4200 m. Sichuan, Xizang, Yunnan.

**188. *Berberis microtricha*** C. K. Schneider, Oesterr. Bot. Z. 67: 223. 1918.

小毛小檗 *xiao mao xiao bo*

Shrubs, deciduous, 1–1.5 m tall. Branches brownish gray, puberulous, not verruculose; shoots reddish, densely puberulous; spines absent, simple, or 3-fid, weak, concolorous, 4–8 mm. Leaves sessile; leaf blade abaxially pale gray, adaxially dark green, narrowly obovate, 1–2 cm × 4–8 mm, papery, abaxially papillose, not pruinose, midvein slightly raised, lateral veins 2 or 3 pairs, branched, both surfaces with inconspicuous reticulate veins, base cuneate, margin slightly revolute, entire, apex rounded or acute. Inflorescence a raceme, 2–7-flowered, 1.5–2.5 cm, glabrous, with few fascicled flowers at base; bracts ca. 1.5 mm. Pedicels weak, 5–12 mm, glabrous. Sepals in 2 whorls; outer sepals oblong, ca. 3.5 × 2 mm; inner sepals elliptic, ca. 5 × 2.5 mm. Petals oblong-elliptic, ca. 5 × 2.8 mm, base with separate oblong-obovate glands, apex rounded, entire. Stamens ca. 3 mm; anther connective prolonged, truncate. Ovules 2. Berry red, ellipsoid, 6–7 × ca. 4 mm, not pruinose, style not persistent. Fl. May–Jun, fr. Jul–Sep.

• Thickets; 2500–3000 m. Sichuan, Yunnan.

**189. *Berberis dawoensis*** K. Meyer, Repert. Spec. Nov. Regni Veg. Beih. 12: 379. 1922.

道孚小檗 *dao fu xiao bo*

Shrubs, deciduous, 1–2 m tall. Branches brownish gray or

brownish black, sulcate, sparsely black verruculose; shoots pale yellow or purplish red; spines 3-fid, weak, 6–25 mm, adaxially slightly sulcate. Petiole 1–4 mm; leaf blade abaxially ultimately pale green, adaxially deep green, oblong-obovate, 1–3 × 0.7–1.3 cm, papery, both surfaces glabrous, abaxially initially pruinose, ultimately not pruinose, midvein slightly raised, adaxially with flat or slightly impressed midvein, both surfaces with conspicuous reticulate veins, base cuneate, margin 6–10-spinose-serrate on each side, occasionally entire, apex rounded, obtuse. Inflorescence a raceme, 5–10-flowered, 2–4 cm, sometimes with few fascicled flowers at base. Pedicels 7–12 mm, slender, but pedicels of fascicled flowers to 1.8 cm, glabrous. Sepals in 2 whorls; outer sepals obovate, 6–8 × ca. 4.5 mm; inner sepals obovate, 6.5–8.5 × 4–6 mm. Petals broadly elliptic, 5–7 × 3–5 mm, base cuneate, with approximate obovate glands, apex emarginate, lobes acute. Stamens 3–4 mm; anther connective prolonged, obtuse. Ovules 2. Berry red, oblong-ovoid, ca. 10 × 5 mm, slightly pruinose; style persistent, short; seeds 2. Fl. Apr–May, fr. Sep–Oct.

• Thickets, forests, forest margins; 3000–3900 m. Sichuan, Yunnan.

**190. *Berberis heteropoda*** Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 102. 1841.

异果小檗 *yi guo xiao bo*

Shrubs, deciduous, 2–3 m tall. Branches dark red, terete, not verruculose; spines simple or 3-fid, pale purplish red, subterete, 5–30 mm. Petiole 3–10 mm; leaf blade abaxially pale green, slightly shiny, adaxially green, obovate-elliptic, 2–6 × 1–4 cm, thickly papery, both surfaces glabrous, not pruinose, abaxially with slightly raised midvein, lateral veins 2–4 pairs, conspicuous, adaxially with flat or slightly raised midvein, lateral veins raised, both surfaces with raised reticulate veins, base broadly cuneate, margin entire or indistinctly spinose-serrate, apex rounded. Inflorescence a raceme or umbellate raceme, 4–9-flowered, 2–5 cm, with few fascicled flowers at base, glabrous; bracts ovate-lanceolate, 1.5–3 mm. Pedicels 9–17 mm. Sepals in 2 whorls; outer sepals elliptic, ca. 5 × 4 mm, apex rounded; inner sepals obovate, ca. 7 × 5 mm. Petals obovate-spatulate, ca. 6 × 4 mm, base cuneate, with separate glands, apex rounded, entire. Stamens ca. 4.5 mm; anther connective prolonged, apiculate. Ovules 4–6, funiculate. Berry black, subglobose, 10–12 × 9–10 mm, slightly pruinose, style not persistent. Fl. May–Jun, fr. Jul–Oct.

Forests, sparse forests, thickets, floodlands, stony slopes, arid steppe lands; 900–3200 m. Xinjiang [Russia].

**191. *Berberis kaschgarica*** Ruprecht, Sert. Tiansch. 38. 1869.

喀什小檗 *ka shi xiao bo*

Shrubs, deciduous, ca. 1 m tall. Branches purplish red, shiny, terete, glabrous; internodes ca. 1 cm; spines 3-fid, pale yellow, 1–2.5 cm, adaxially slightly sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially green, oblanceolate, 1–2.5 cm × 2–5 mm, papery, both surfaces not pruinose, abaxially with raised midvein, adaxially with slightly raised midvein, lateral veins 2 or 3 pairs, inconspicuous, both surfaces with inconspicuous reticulate veins, base cuneate, margin en-

tire, occasionally 1- or 2-spinose-serrate on each side, apex acute, aristate. Inflorescence a raceme, 5–9-flowered, 1.5–3 cm, often with 1 or more fascicled flowers at base, glabrous; bracts ovate-triangular, ca. 2 mm. Pedicels 4–10 mm, but pedicels of fascicled flowers to 1.3 cm; bractlets lanceolate, ca. 1.5 mm. Sepals in 2 whorls; outer sepals elliptic, ca. 3 × 1.5 mm; inner sepals obovate, ca. 4.5 × 3 mm. Petals oblong, ca. 4 × 2 mm, base cuneate, with separate glands, apex emarginate. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovules 5. Berry black, ovoid-globose, ca. 8 × 6 mm, not pruinose, style persistent. Fl. May–Jun, fr. Jun–Aug.

• Valley floors, steppe lands, slopes, forest margins, thickets; 1900–2800 m. Xinjiang.

The specific epithet was spelled “*kaschgarica*” in the protologue, although “*kasgarica*” has been commonly used.

**192. *Berberis dielsiana*** Fedde, Bot. Jahrb. Syst. 36(Beibl. 82): 41. 1905.

首阳小檗 *shou yang xiao bo*

Shrubs, deciduous, 1–3 m tall. Branches grayish brown, sulcate, sparsely verruculose; shoots purplish red; spines simple, terete, 3–15 mm, but spines on shoots to 2.5 cm. Petiole ca. 1 cm; leaf blade abaxially initially gray, ultimately green, adaxially dark green, elliptic or elliptic-lanceolate, 4–9 × 1–2 cm, thinly papery, both surfaces glabrous, abaxially initially slightly pruinose, midvein slightly raised, lateral veins visible, adaxially with flat midvein, lateral veins inconspicuous, both surfaces not reticulate, base attenuate, margin 8–20-spinose-serrate on each side, but on shoots margin entire, apex acuminate or acute. Inflorescence a raceme, 6–20-flowered, 5–6 cm including peduncle 0.4–1.5 cm, sometimes compound below, glabrous. Pedicels 3–5 mm, glabrous; bractlets red, lanceolate, 2–2.5 × ca. 0.7 mm. Sepals in 2 whorls; outer sepals oblong-ovate, 2–2.5 × 0.8–1 mm, apex acute; inner sepals obovate, 4–4.5 × ca. 3 mm. Petals elliptic, 5–5.5 × ca. 3 mm, base with separate glands, apex emarginate. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2. Berry red, oblong, 8–9 × 4–5 mm, not pruinose, style not persistent. Fl. Apr–May, fr. Aug–Sep.

• Slopes, forests, thickets, streamsides; 600–2300 m. Gansu, Hebei, Henan, Hubei, Shaanxi, Shandong, Shanxi.

**193. *Berberis dictyoneura*** C. K. Schneider in Sargent, Pl. Wilson. 1: 374. 1913.

松潘小檗 *song pan xiao bo*

*Berberis brachystachys* T. S. Ying.

Shrubs, deciduous, 1–2 m tall. Branches dark gray, sulcate, sparsely verruculose; shoots pale purplish red; spines 3-fid or simple, concolorous, 1–2 cm, adaxially slightly sulcate. Petiole 2–8 mm; leaf blade abaxially yellow-green, adaxially dark grayish green, elliptic or elliptic-obovate, 1–3.5 × 0.4–1.5 cm, papery, both surfaces glabrous, not pruinose, abaxially with conspicuously raised midvein, adaxially with slightly impressed midvein, both surfaces with dense, obviously raised reticulate veins, base cuneate, margin closely 5–7-spinose-serrate on each side, apex rounded or obtuse. Inflorescence a raceme, 7–14-

flowered, 2–3 cm, sometimes with few fascicled flowers at base; bracts ovate, ca. 1 mm. Pedicels 4–6 mm, glabrous; bractlets ca.  $2.5 \times 1.3$  mm, apex acute. Sepals in 2 whorls; outer sepals oblong, 4–4.8  $\times$  2.3–2.8 mm; inner sepals obovate, 5.5–6.5  $\times$  3.5–4 mm. Petals obovate, 5–5.8  $\times$  3–3.5 mm, base clawed, with separate ovate glands, apex entire. Stamens ca. 3.5 mm; anther connective prolonged, apiculate. Ovules 1 or 2. Berry pink or pale red, obovoid-oblong, 8–10  $\times$  5–6 mm, not pruinose, style not persistent. Fl. Apr–Jun, fr. Jul–Sep.

• Thickets, forests, weedy slopes, roadsides; 1700–4200 m. Gansu, Qinghai, Shanxi, Sichuan, Xizang.

**194. *Berberis nutanticarpa*** C. Y. Wu ex S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 15. 1985.

垂果小檗 *chui guo xiao bo*

Shrubs, deciduous, ca. 1 m tall. Branches brownish gray, sulcate, sparsely verruculose, glabrous; spines 3-fid or simple, pale yellow, 1–2.5 cm. Petiole 2–3 mm; leaf blade abaxially pale green, sometimes grayish white, adaxially deep green, obovate or elliptic-obovate, 2.5–5  $\times$  1–2 cm, papery or thickly so, abaxially with obviously raised midvein and lateral veins, adaxially with flat or slightly raised midvein, lateral veins 5–7 pairs, base cuneate, margin remotely 10–14-spinose-serrate on each side, occasionally entire, apex rounded or acute. Flowers unknown. Inflorescence a raceme with 5–8 berries, 4.5–6 cm including peduncle 1.5–2 cm, nutant; bracts lanceolate, 4–5 mm; fruit stalk 1.5–3.5 cm, glabrous; berry red, ellipsoid, 9–12  $\times$  4–5 mm, slightly pruinose, style not persistent; seeds 2. Fl. unknown, fr. Oct.

• Weedy slopes, alpine meadows; 3000–3700 m. Sichuan, Xizang, Yunnan.

**195. *Berberis bracteata*** (Ahrendt) Ahrendt, J. Linn. Soc., Bot. 57: 163. 1961.

长苞小檗 *chang bao xiao bo*

*Berberis dictyoneura* C. K. Schneider var. *bracteata* Ahrendt, J. Bot. 80(Suppl.): 111. 1942.

Shrubs, deciduous, less than 1 m tall. Branches dark gray, obviously sulcate, not verruculose; shoots pale yellow, sometimes dark purplish red; spines weak, 3-fid, concolorous, 1–1.5 cm. Petiole 1–3 mm; leaf blade adaxially shiny, green, obovate or elliptic-obovate, 1.7–4  $\times$  0.7–1.7 cm, papery, both surfaces glabrous, not pruinose, adaxially with slightly raised midvein and lateral veins, both surfaces with conspicuously raised reticulate veins, base cuneate, margin coarsely 10–12-aristate-dentate on each side, apex rounded, obtuse. Inflorescence a raceme, 5–8-flowered, compound below, 2–3 cm, glabrous; bracts lanceolate, 4–5 mm, apex acuminate. Pedicels 5–6(–9) mm, glabrous. Flowers ca. 7 mm in diam. Sepals in 2 whorls; outer sepals oblong, 4–4.5  $\times$  2–2.5 mm; inner sepals obovate, 5.5–6.5  $\times$  3.5–4 mm. Petals obovate, 5–5.5  $\times$  3–3.5 mm, base clawed, with separate glands, apex entire. Stamens ca. 3 mm; anther connective prolonged, subapiculate. Ovules 1 or 2. Fruit unknown. Fl. Jul–Aug, fr. unknown.

• Sunny rocky slopes, weedy places within *Abies* forests; 3200–3300 m. Yunnan.

**196. *Berberis batangensis*** T. S. Ying, Acta Phytotax. Sin. 37: 344. 1999.

巴塘小檗 *ba tang xiao bo*

Shrubs, deciduous, 0.5–1.5 m tall. Branches dark gray, terete; shoots dark purplish, sulcate, glabrous; spines 3-fid, concolorous, 1–1.5 cm. Leaves subsessile; leaf blade abaxially gray, adaxially pale green, obovate or narrowly obovate, 0.4–2 cm  $\times$  2–7 mm, papery, abaxially glabrous, not pruinose, midvein obviously raised, adaxially with slightly raised midvein, both surfaces with conspicuously raised reticulate veins, base cuneate, margin thickened, entire, apex rounded or retuse. Inflorescence a raceme, 5–10-flowered, 1–1.5 cm, often with few fascicled flowers at base. Pedicels ca. 3 mm, glabrous, sometimes slightly pruinose; bractlets ovate, ca. 1 mm, apex acuminate. Sepals in 3 whorls; outer sepals ovate, 1.2–1.5  $\times$  ca. 1 mm; median sepals ovate-orbicular, ca. 3  $\times$  2 mm; inner sepals elliptic, 4–4.2  $\times$  3–3.2 mm. Petals obovate, 2.8–3.1  $\times$  1.8–2 mm, base clawed, with approximate glands, apex emarginate, lobes acute. Stamens ca. 1.2 mm; anther connective not prolonged, truncate. Ovules 4. Fruit unknown. Fl. Jun–Jul, fr. unknown.

• Thickets, field margins; 2600–3000 m. Sichuan.

**197. *Berberis ignorata*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 661. 1905.

烦果小檗 *fan guo xiao bo*

*Berberis virescens* J. D. Hooker var. *ignorata* (C. K. Schneider) Ahrendt.

Shrubs, deciduous, 1–3 m tall. Branches gray, terete, sparsely verruculose; shoots shiny, purplish black; spines simple, sometimes 3-fid, 5–15 mm. Petiole 2–3 mm, or leaf subsessile; leaf blade abaxially gray, adaxially dark green, narrowly obovate, 1–3.5  $\times$  0.4–1.5 cm, papery, abaxially slightly pruinose, midvein slightly raised, adaxially with flat or slightly raised midvein, lateral veins 4 or 5 pairs, reticulate veins inconspicuous, base cuneate, margin entire, sometimes 1–5-spinose-serrate on each side, apex rounded or acute. Inflorescence a raceme or subumbellate raceme, 3–9-flowered, 2–3.5 cm, often with few fascicled flowers at base; bracts ca. 1.5 mm. Pedicels 5–10 mm, slender, glabrous; bractlets broadly lanceolate, ca. 3  $\times$  1 mm. Sepals in 3 whorls; outer sepals oblong-ovate, 4–4.5  $\times$  2–2.5 mm; median sepals elliptic, ca. 5  $\times$  2.5 mm, apex obtuse; inner sepals elliptic-obovate, 5.2–6  $\times$  3.7–4 mm. Petals obovate, 4.5–5  $\times$  ca. 3 mm, base with separate glands, apex emarginate, lobes rounded. Stamens ca. 4 mm; anther connective prolonged, obtuse. Ovules 3 or 4,  $\pm$  not funiculate. Berry red, oblong, 10–13  $\times$  5–7 mm, not pruinose, style not persistent. Fl. May, fr. Aug–Sep.

Forests, thickets, mixed forests; 2700–3800 m. Xizang [Bhutan, India (Sikkim)].

**198. *Berberis jiulongensis*** T. S. Ying in S. Y. Jin & Y. L. Chen, Cat. Type Spec. Herb. China (Suppl. II), 54. 2007.

九龙小檗 *jiu long xiao bo*

Shrubs, evergreen, 1–2 m tall. Branches dark gray, angulate; shoots purplish red, sparsely black verruculose. Spines

simple, purplish red, 5–10 mm. Leaves shortly petiolate; leaf blade abaxially pale green, adaxially green, obovate-lanceolate or narrowly obovate, 1.5–3.5 cm × 5–8 mm, thinly leathery, abaxially not pruinose, midvein obviously raised, lateral veins conspicuous, adaxially with inconspicuous midvein and lateral veins, both surfaces with markedly raised reticulate veins, base attenuate, margin entire, apex rounded, obtuse, aristate. Inflorescence a corymbose panicle, 20–30-flowered, 4–10 cm, often with 1–3 racemes fascicled at base, sometimes flowers verticillate at apex of inflorescence; bracts leaflike, ca. 1 cm. Pedicels ca. 2 mm. Sepals in 3 whorls; outer sepals triangular-ovate or ovate, 2–2.5 × 1.6–2 mm; median sepals broadly elliptic or suborbicular, ca. 3.2 × 2.8–3 mm; inner sepals broadly obovate, 4.5–5 × 4.1–4.5 mm. Petals obovate or obovate-elliptic, 4–4.5 × 3–3.5 mm, base clawed, with separate glands, apex emarginate. Stamens 3.5–4 mm; anther connective prolonged, obtuse or truncate. Ovules 3 or 4, shortly funiculate. Fruit unknown. Fl. Jun, fr. unknown.

- Thickets, slopes, floodlands, valleys; 2300–2500 m. Sichuan.

**199. *Berberis contracta*** T. S. Ying, Acta Phytotax. Sin. 37: 322. 1999.

德钦小檗 *de qin xiao bo*

Shrubs, deciduous, to 2 m tall. Branches gray, terete, sparsely black verruculose; spines simple or 3-fid, pale yellow, 1–2 cm. Leaves sessile; leaf blade abaxially pale green, adaxially green, narrowly elliptic, 1–3.5 cm × 5–10 mm, papery, abaxially not pruinose, glabrous, midvein and lateral veins raised, adaxially with flat midvein, lateral veins 3–5 pairs, both surfaces with obviously raised reticulate veins, base cuneate, margin 1–4-spinose-serrate on each side, occasionally entire, apex acute or obtuse. Inflorescence a corymbose panicle, 15–20-flowered, 1.5–5 cm including peduncle 3–12 mm, sometimes with 1 or 2 racemes fascicled at base; bracts triangular-ovate, ca. 1 mm, apex acuminate. Pedicels 2–5 mm, slender; bractlets lanceolate, ca. 1.3 mm. Sepals in 2 whorls; outer sepals ovate-lanceolate, ca. 2 × 1 mm; inner sepals oblong, 3 × 2 mm, translucent. Petals obovate-elliptic, ca. 2.5 × 1.3 mm, translucent, base clawed, with separate inconspicuous glands, apex entire or emarginate. Stamens ca. 2 mm; anther connective slightly prolonged, rounded, obtuse. Ovules 2, shortly funiculate. Berry oblong, 7–8 × 2.5–3 mm, slightly pruinose, style persistent; seeds 1. Fl. Jul, fr. Jul–Sep.

- Thickets; 2500–3000 m. Yunnan.

**200. *Berberis aggregata*** C. K. Schneider, Bull. Herb. Boissier, sér. 2, 8: 203. 1908.

堆花小檗 *dui hua xiao bo*

*Berberis aggregata* var. *integrifolia* Ahrendt; *B. brevipaniculata* C. K. Schneider.

Shrubs, semi-evergreen or deciduous, 2–3 m tall. Branches dark brown, sulcate, glabrous; shoots pale brown, slightly puberulous, sparsely black verruculose; spines 3-fid, pale yellow, 8–15 mm. Leaves sessile or shortly petiolate; leaf blade abaxially pale yellow-green or grayish white, adaxially dark

yellow-green, obovate-oblong or obovate, 8–25 × 4–15 mm, subleathery, abaxially with raised midvein, adaxially with slightly impressed midvein, both surfaces with conspicuous reticulate veins, base cuneate, margin 2–8-spinose-serrate on each side, sometimes entire, apex rounded, obtuse, aristate. Inflorescence a congested panicle, 10–30-flowered, 1–2.5 cm, subsessile; bracts slightly longer than pedicels, 1.5–3 mm. Pedicels 1–3 mm; bractlets ovate, ca. 1 mm, apex acute. Sepals in 2 whorls, elliptic; outer sepals ca. 2.5 × 1.8 mm; inner sepals ca. 3.5 × 2.5 mm. Petals obovate, ca. 3.5 × 2 mm, base clawed, with oblong glands, apex emarginate. Stamens 2–2.5 mm; anther connective prolonged, obtuse. Ovules 2, subsessile. Berry red, subglobose or ovoid-globose, 6–7 mm, not pruinose, style persistent. Fl. May–Jun, fr. Jul–Sep.

- Thickets, forests, roadsides, floodlands; 1000–3500 m. Gansu, Hubei, Qinghai, Shanxi, Sichuan.

**201. *Berberis luhuoensis*** T. S. Ying, Acta Phytotax. Sin. 37: 323. 1999.

炉霍小檗 *lu huo xiao bo*

Shrubs, deciduous, ca. 1.2 m tall. Branches dark gray, angulate, sparsely black verruculose; spines simple or 3-fid, yellow-brown, ca. 1 cm, sometimes absent. Petiole 2–6 mm; leaf blade abaxially yellow-green, adaxially deep green, obovate or obovate-elliptic, (1.5–)2–4 × 0.8–2 cm, papery, abaxially not pruinose, midvein and lateral veins obviously raised, adaxially with slightly impressed midvein, lateral veins slightly raised, both surfaces with conspicuous reticulate veins, base attenuate, margin 2–16-spinose-serrate on each side, sometimes entire, apex rounded or obtuse. Inflorescence a panicle, 30–60-flowered, to 13 cm including peduncle ca. 4.5 cm, sometimes with few fascicled flowers at base; rachis and peduncle puberulous. Pedicels 2–3 mm, glabrous; bractlets lanceolate, 2.5–3.2 mm. Sepals in 3 whorls; outer sepals narrowly elliptic, 2.8–3.1 × 1.2–1.5 mm; median sepals elliptic, ca. 4 × 2.3 mm; inner sepals suborbicular, ca. 4 × 3.1 mm. Petals elliptic, base clawed, with separate elliptic glands, apex emarginate, lobes acute. Stamens ca. 2.2 mm; anther connective not prolonged, truncate. Ovules 2, shortly funiculate. Berry oblong, 7–8 × 2–2.1 mm, slightly pruinose, style not persistent. Fl. Jul, fr. Aug.

- Slopes of plateaus, valleys; 2100–3100 m. Sichuan.

**202. *Berberis sherriffii*** Ahrendt, J. Bot. 79(Suppl.): 77. 1941.

短苞小檗 *duan bao xiao bo*

Shrubs, deciduous, ca. 2 m tall. Branches gray, terete, sparsely black verruculose; shoots dark pale red; spines simple, weak, concolorous, 1–1.5 cm. Petiole 1–5 mm; leaf blade abaxially yellow-green, adaxially dark green, obovate, 1–3.5 × 0.7–1.5 cm, papery, abaxially not pruinose, midvein obviously raised, adaxially with flat midvein, lateral veins 3 or 4 pairs, both surfaces with conspicuous reticulate veins, base cuneate, margin entire, occasionally 2- or 3-spinose-serrate on each side, apex obtuse. Inflorescence a panicle, 15–20-flowered, 3–5 cm; rachis flexuose, glabrous; bracts 1–1.5 mm. Pedicels 2–4 mm, glabrous; bractlets oblong, ca. 2 mm, apex acute. Sepals in 3 whorls; outer sepals oblong, ca. 3.5 × 2.5 mm, apex acute;

median sepals oblong-elliptic, ca.  $4.3 \times 3.5$  mm; inner sepals obovate, ca.  $6 \times 5$  mm. Petals obovate, ca.  $5 \times 3.8$  mm, base clawed, with remote glands, apex slightly emarginate, lobes acute. Stamens ca. 3 mm; anther connective slightly prolonged, shortly apiculate. Ovules 1 or 2 (or 3). Berry purplish red, oblong or ovoid-oblong,  $6-9 \times 3-4$  mm, slightly blue pruinose, style not persistent. Fl. Jun–Jul, fr. Aug–Oct.

- Forest margins; 2000–3300 m. Xizang.

**203. *Berberis prattii*** C. K. Schneider in Sargent, Pl. Wilson. 1: 376. 1913.

短锥花小檗 duan zhui hua xiao bo

*Berberis aggregata* C. K. Schneider var. *prattii* (C. K. Schneider) C. K. Schneider; *B. oblanceolata* (C. K. Schneider) Ahrendt; *B. polyantha* Hemsley var. *oblanceolata* C. K. Schneider; *B. prattii* var. *laxipendula* Ahrendt; *B. prattii* var. *recurvata* C. K. Schneider.

Shrubs, deciduous, 2–3 m tall. Branches pale yellow, angulate, sparsely verruculose, sometimes puberulous; shoots purplish red, puberulous; spines simple or 3-fid, weak, brownish yellow, terete, 5–15 mm. Petiole 1–3 mm; leaf blade abaxially grayish green, adaxially yellow-green, sometimes shiny, obovate-elliptic or obovate,  $1-3(-4) \times 0.5-1.5$  cm, papery, abaxially initially pruinose, often ultimately not pruinose, closely papillose, midvein slightly raised, adaxially with slightly raised or flat midvein, both surfaces with obviously raised reticulate veins, base cuneate or attenuate, margin entire, apex rounded or obtuse. Inflorescence a panicle, 15–80-flowered, 5–15 cm, narrow, glabrous or puberulous; bracts 1–2.5 mm. Pedicels 2.5–4 mm, glabrous; bractlets absent. Sepals in 3 whorls; outer sepals lanceolate,  $4-5 \times 1.2-2$  mm, apex acuminate; median sepals ovate-lanceolate,  $4-5 \times 1.5-2$  mm, apex subacuminate; inner sepals obovate, ca.  $5.5 \times 4$  mm. Petals narrowly obovate, ca.  $4.5 \times 2.3$  mm, base clawed, with separate oblong glands, apex emarginate, lobes acute. Stamens ca. 2.5 mm; anther connective prolonged, obtuse. Ovules 2, sessile. Berry shiny, pink, ovoid, ca.  $6.5 \times 4.5$  mm, not pruinose, style not persistent. Fl. Jun–Jul, fr. Sep–Oct.

- Thickets; 2100–3400 m. Sichuan, Xizang.

**204. *Berberis beaniana*** C. K. Schneider in Sargent, Pl. Wilson. 3: 439. 1917.

康松小檗 kang song xiao bo

Shrubs, deciduous, 1.5–2.5 m tall. Branches grayish yellow, sulcate, sparsely verruculose, glabrous; shoots green; spines 3-fid, pale yellow, 1–2.5 cm. Petiole 1–3 mm; leaf blade abaxially gray, adaxially shiny, deep green, narrowly elliptic to ovate-elliptic,  $2-5 \times 0.6-1.3$  cm, papery, abaxially pruinose, finely papillose, midvein obviously raised, adaxially with impressed midvein, reticulate veins conspicuous, base cuneate, margin slightly revolute, 5–10-spinose-serrate on each side, apex acute to acuminate. Inflorescence a panicle, loosely 10–20 flowered, 2–4 cm, broad, glabrous; bracts ca. 1.5 mm. Pedicels 6–15 mm. Sepals in 3 whorls; outer sepals yellow, without discoloration, oblong-ovate,  $2-3 \times 1-1.3$  mm; median sepals

oblong-ovate,  $4-5 \times 2.3-3.3$  mm, apex subobtusate; inner sepals obovate,  $6-6.5 \times 3.5-4.5$  mm. Petals obovate, ca.  $5 \times 3-3.5$  mm, base cuneate with separate oblong glands, apex subentire or slightly emarginate. Stamens 3–3.5 mm; anther connective slightly prolonged, rounded. Ovules 3 or 4, sessile. Berry dark red, ovoid-oblong,  $9-10 \times 5-6$  mm, densely mauve pruinose, style not persistent. Fl. Jun, fr. Oct–Nov.

- W Sichuan.

This species is known only from the type gathering (at A and OXF), a cultivated plant grown at the Royal Botanic Gardens, Kew, from seed (*E. H. Wilson Veitch Exped. no. 1930*) collected in 1904 from an unspecified location in W Sichuan.

**205. *Berberis francisci-ferdinandi*** C. K. Schneider in Sargent, Pl. Wilson. 1: 367. 1913.

大黄檗 da huang bo

Shrubs, deciduous, 1–3 m tall. Branches grayish brown or reddish brown, subterete; shoots reddish brown, scarcely verruculose; spines simple, rarely 3-fid, 0.5–2 cm, adaxially sulcate, sometimes absent. Petiole 5–15 mm; leaf blade abaxially pale yellow-green, adaxially green, shiny, ovate to elliptic,  $2-7 \times 1-3$  cm, papery, both surfaces glabrous, abaxially not pruinose, midvein obviously raised, adaxially with slightly impressed midvein, both surfaces with slightly visible reticulate veins, base contracted to decurrent petiole, margin 15–30-spinulose-serrulate on each side, apex acute or subacute. Inflorescence a panicle, 20–40-flowered, 5–14 cm including peduncle 1–3 cm, glabrous; bracts linear-subulate, 3–3.5 mm. Pedicels 4–10 mm, slender; bractlets reddish, 1.5–2 mm, apex acute. Sepals in 3 whorls; outer sepals ovate, ca.  $2.4 \times 1.5$  mm, apex acute; median sepals ovate, ca.  $3 \times 2$  mm; inner sepals obovate,  $3.3-4.3 \times 2-2.5$  mm. Petals oblong,  $3.5-4.5 \times 2.5-3$  mm, base cuneate, with separate oblong glands, apex acute, slightly incised. Stamens 2.5–3.5 mm; anther connective slightly prolonged, rounded. Ovules 2, sessile. Berry scarlet, obovoid-ellipsoid,  $10-12 \times 4-6$  mm, not pruinose, style  $\pm$  persistent. Fl. May–Jun, fr. Jul–Oct.

- Thickets, forests, weedy slopes; 1400–4000 m. Gansu, Shanxi, Sichuan, Xizang.

**206. *Berberis trichiata*** T. S. Ying in C. Y. Wu, Fl. Xizang. 2: 125. 1985.

毛序小檗 mao xu xiao bo

Shrubs, deciduous, 1–2 m tall. Branches pale brown, sparsely black verruculose, sulcate, puberulous, often ultimately glabrous; spines 3-fid, occasionally simple, pale yellow, 1–2 cm, stout. Leaves sessile; leaf blade abaxially pale green, adaxially green, obovate or obovate-oblong,  $1.2-3.5 \times 0.7-1.5$  cm, herbaceous, abaxially puberulous on veins initially, ultimately glabrous, midvein obviously raised, lateral veins slightly raised, adaxially with flat midvein, lateral veins 4–6 pairs, both surfaces with conspicuous reticulate veins, base cuneate, margin 2–12-spinose-serrate on each side, but sometimes entire on leaves of upper branches, apex rounded. Inflorescence a panicle, 15–40-flowered, 3–5.5 cm, puberulous; peduncles 1–1.7

cm, sometimes compound at base; bracts triangular-lanceolate, 1–2 mm. Pedicels 2–6 mm, slender, puberulous; bractlets narrowly ovate, ca.  $3 \times 1.5$  mm. Sepals in 2 whorls; outer sepals ovate, ca.  $3.6 \times 3$  mm; inner sepals suborbicular or obovate, ca.  $5 \times 3$  mm. Petals ovate-elliptic, ca.  $4 \times 2.2$  mm, base clawed, with separate glands, apex emarginate. Stamens ca. 2.1 mm; anther connective prolonged, subapiculate. Ovules 2, subsessile. Berry unknown. Fl. Jun, fr. unknown.

- Forest margins; ca. 3500 m. Xizang.

**207. *Berberis gyalaiica*** Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941.

波密小檗 bo mi xiao bo

*Berberis gyalaiica* var. *maximiflora* Ahrendt; *B. gyalaiica* var. *minuata* Ahrendt; *B. taylorii* Ahrendt.

Shrubs, deciduous, 1.2–3 m tall. Branches deep gray or purplish brown, puberulous, ultimately glabrous; spines simple, occasionally 3-fid, pale yellow, 6–12 mm. Leaves subsessile or very shortly petiolate; leaf blade abaxially grayish green, adaxially dark green, obovate-elliptic,  $1.2\text{--}3.2 \times 0.7\text{--}1.7$  cm, papery, abaxially with obviously raised midvein and lateral veins, adaxially with raised midvein, lateral veins much branched, both surfaces with conspicuous reticulate veins, base cuneate, margin entire, occasionally 2–4-spinose-serrate on each side, apex acute or rounded. Inflorescence a panicle, 10–45-flowered, 4–11 cm including peduncle 1–3 cm, rachises and peduncles puberulous; bracts 1.5–4 mm, usually longer than pedicels. Pedicels 1.5–3 mm, glabrous; bractlets ovate,  $3\text{--}3.2 \times$  ca. 2 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate, ca.  $3.5 \times 3$  mm, apex acute; inner sepals obovate, ca.  $5.5 \times 4$  mm. Petals obovate, ca.  $4.6 \times 3.5$  mm, base clawed, with separate glands, apex incised, rounded, lobes obtuse. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules (1–)3 or 4 (or 5). Berry purplish black, oblong-ovoid,  $9\text{--}10 \times 4\text{--}5$  mm, slightly pruinose, style not persistent. Fl. Jun–Jul, fr. Oct.

- Thickets, forest understories, roadsides; 2000–3200 m. Xizang.

**208. *Berberis kerriana*** Ahrendt, J. Linn. Soc., Bot. 57: 91. 1961.

南方小檗 nan fang xiao bo

Shrubs, evergreen, ca. 2 m tall. Stems pale yellow, terete, glabrous; branches deep red, becoming red-brown, and soon yellow-brown; shoots reddish; internodes 1–2 cm; spines discolorous, pale yellow, 2–3.5 cm, slender. Leaves adaxially slightly shiny, oblanceolate,  $2.5\text{--}4.5 \times 0.7\text{--}1.3$  cm, slightly stiffly leathery, abaxially white pruinose, with veins more distinct, adaxially veins branched, scarcely subreticulate, base attenuate, margin entire, sometimes toward apex 3–5-spinose-serrate on each side, apex acute. Inflorescence a panicle, 6–12-flowered, 3–5 cm; bracts ca. 1 mm. Pedicels 7–14 mm. Ovules 2 or 3. Berry black, oblong,  $9\text{--}10 \times 5\text{--}6$  mm, excluding a very short but distinct style, gray pruinose. Fl. May, fr. Oct.

- China (without precise locality).

This species is known only from the type (at BM), a cultivated plant that once grew at the Royal Horticultural Society's garden in Wisley, Surrey, United Kingdom, reputedly from *Kerr 39*, collected in some unspecified part of China in 1935.

**209. *Berberis polyantha*** Hemsley, J. Linn. Soc., Bot. 29: 302. 1892.

刺黄花 ci huang hua

Shrubs, semi-evergreen, 1.5–2(–4.5) m tall. Branches grayish brown, sulcate, sparsely verruculose; spines simple, occasionally 3-fid, 1–3 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially shiny, dark green, oblong-obovate or obovate,  $0.8\text{--}4.5 \times 0.5\text{--}1.7$  cm, leathery, abaxially not pruinose, midvein raised, adaxially with flat or impressed midvein, both surfaces with obviously raised close reticulate veins, base cuneate, margin 3–10-spinose-serrate on each side, sometimes entire, apex rounded. Inflorescence a panicle, broad and much branched, 30–100-flowered, 5–15 cm including peduncle 0.3–2 cm, glabrous; bracts 1.5–2.5 mm. Pedicels 2–4 mm, glabrous; bractlets triangular, 1–1.5 mm. Sepals in 2 whorls; outer sepals ovate, ca.  $3.5 \times 2$  mm, apex acute; inner sepals obovate,  $4.5\text{--}6.5 \times 2.5\text{--}3$  mm. Petals obovate,  $3.5\text{--}4 \times$  ca. 2 mm, base clawed, with separate oblong glands, apex incised, lobes acute. Stamens ca. 3 mm; anther connective prolonged, obtuse. Ovules 2, subsessile. Berry dark red or dark reddish brown, narrowly ovoid,  $7\text{--}8 \times 3\text{--}4$  mm, pruinose, style conspicuous, to 1.5 mm; seeds purple. Fl. May–Jul, fr. Aug–Oct.

- Sunny slopes, thickets, forests, forest margins, roadsides, grassy slopes; 2000–3600 m. Sichuan, Xizang.

**210. *Berberis sikkimensis*** (C. K. Schneider) Ahrendt, J. Bot. 80(Suppl.): 85. 1942.

锡金小檗 xi jin xiao bo

*Berberis chitria* Buchanan-Hamilton ex Ker Gawler var. *sikkimensis* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 453. 1905; *B. sikkimensis* var. *baileyi* Ahrendt; *B. sikkimensis* var. *glabramea* Ahrendt.

Shrubs, semi-evergreen, 1.5–2.5 m tall. Branches dark gray, glabrous or scarcely verruculose; shoots pale yellow, glabrous, sulcate; spines 3-fid, pale yellow, 0.5–2 cm, adaxially slightly sulcate. Leaves shortly petiolate; leaf blade abaxially yellow-green, adaxially deep green, obovate or obovate-elliptic,  $1.5\text{--}2.7 \text{ cm} \times 5\text{--}10$  mm, leathery, abaxially pruinose, becoming glabrous, scarcely papillose, midvein slightly raised, lateral veins 2–4 pairs, adaxially slightly shiny, midvein flat, both surfaces with conspicuous reticulate veins, base cuneate, margin entire, sometimes 1–5-spinose-serrate on each side, apex acute or rounded, mucronate. Inflorescence a panicle or raceme, 3–20-flowered, 3–5 cm including peduncle 0.5–2 cm. Pedicels 4–8 mm, glabrous; bractlets yellow, sepals, ca.  $2 \times 1.6$  mm, apex acute. Sepals in 2 whorls; outer sepals ovate,  $3.5\text{--}4 \times 2.5\text{--}3$  mm, apex acute; inner sepals broadly elliptic,  $7\text{--}8 \times$  ca. 5 mm. Petals obovate, ca.  $6 \times 4$  mm, base clawed, with separate glands, apex entire or slightly crenulate. Stamens ca. 6 mm; anther connective prolonged, subapiculate. Ovules 4. Berry

dark red, narrowly ovoid, ca.  $15 \times 4.5$  mm, not pruinose, often slightly curved, style ca. 1.5 mm. Fl. May–Jun, fr. Jul–Aug.

Mixed forests, forest margins, thickets; 2000–3000 m. Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

**211. *Berberis coryi*** Veitch, Gard. Chron., ser. 3, 52: 321. 1912.

贡山小檗 gong shan xiao bo

Shrubs, semi-evergreen. Leaves spatulate,  $10\text{--}25 \times 8\text{--}12$  mm, abaxially glaucous, base cuneate, margin entire, apex retuse. Inflorescence a panicle, 7–20-flowered, 3–5 cm, sometimes reduced to a short raceme or subfascicle; bracts shorter than pedicels. Pedicels 4–5 mm. Berry pinkish red, oblong-globose,  $5\text{--}6 \times 4.5\text{--}6$  mm, style ca. 0.5 mm. Fl. Jul, fr. Dec.

• Rocks, cliffs, dry rocky slopes on mountains; 3000–3300 m. Yunnan.

**212. *Berberis metapolyantha*** Ahrendt, J. Bot. 79(Suppl.): 75. 1941.

万源小檗 wan yuan xiao bo

Shrubs, semi-evergreen, 1–2 m tall. Branches puberulous, sulcate; spines 3-fid or simple, 1–1.5 cm. Leaves subsessile; leaf blade abaxially pallid, becoming grayish brown when dry, adaxially dark green, obovate or obovate-oblong,  $1.5\text{--}2.7 \times 0.7\text{--}1.2$  cm, subleathery, both surfaces with conspicuous reticulate veins, base cuneate, margin entire, rarely 1–3-spinose-serrate on each side, apex rounded. Inflorescence a panicle, 10–14-flowered, 3–5 cm, sometimes compound below, apex rounded; bracts 2–3 mm, apex acuminate. Pedicels 3–5 mm, puberulous; flowers ca. 6 mm in diam.; bractlets lanceolate, ca. 1.5 mm, apex acuminate. Sepals in 2 whorls; outer sepals ovate, ca.  $2.5 \times 1.5$  mm, apex acute; inner sepals elliptic, ca.  $4 \times 2$  mm. Petals obovate, ca.  $3.5 \times 2.8$  mm, base with separate glands, apex emarginate, rounded. Stamens ca. 2.5 mm; anther connective slightly prolonged, shortly apiculate. Ovules 3 or 4. Berry red, oblong-globose, ca.  $6.5 \times 6$  mm, not pruinose, style persistent. Fl. Jun, fr. Oct.

• Mountain slopes, roadsides; 1500–2700 m. Sichuan, Yunnan.

**213. *Berberis xanthophlaea*** Ahrendt, J. Bot. 79(Suppl.): 73. 1941.

黄皮小檗 huang pi xiao bo

Shrubs, deciduous, 1–2(–3) m tall. Branches dark gray, terete, not verruculose; shoots pale yellow, slightly shiny; spines simple, sometimes 3-fid, concolorous, terete, 0.5–1.5 cm. Leaves subsessile; leaf blade abaxially initially gray, ultimately shiny, pale green, adaxially green, obovate or oblanceolate,  $1.5\text{--}6.5 \times 0.8\text{--}2$  cm, papery, abaxially slightly pruinose, ultimately not pruinose, both surfaces with midvein and lateral veins conspicuous, reticulate veins inconspicuous, base cuneate, margin entire, apex obtuse or rounded. Inflorescence a panicle, 10–45-flowered, 6–9(–12) cm including peduncle  $1.5\text{--}4(–7)$  cm, glabrous, sometimes rachis with leaflike bracts. Pedicels 5–12 mm; bractlets ovate,  $1.3\text{--}3 \times 1\text{--}2$  mm, apex acute. Sepals in 2 whorls; outer sepals elliptic,  $3\text{--}5 \times 2\text{--}4$  mm; inner sepals ellip-

tic-obovate,  $5\text{--}5.6 \times 3\text{--}3.5$  mm. Petals obovate,  $3.5\text{--}5 \times 2.5\text{--}4$  mm, base obviously clawed, with slightly separate glands, apex emarginate. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovules 2, shortly funiculate. Berry red, oblong-obovoid,  $7\text{--}9 \times 5\text{--}6$  mm, blue pruinose, style persistent. Fl. Jun–Jul, fr. Aug–Oct.

• Thickets, forests, streamsides, valleys; 2800–4000 m. Xizang.

**214. *Berberis concolor*** W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 11: 199. 1919.

同色小檗 tong se xiao bo

Shrubs, deciduous, 1.5–2 m tall. Branches pale yellow or dark gray, subterete, sometimes very sparsely verruculose; shoots brownish yellow or dark red, slightly sulcate; spines 3-fid, concolorous, 1.5–2.5 cm. Leaves subsessile; leaf blade abaxially pale green, adaxially green, narrowly obovate or obovate,  $1\text{--}2.7 \text{ cm} \times 3\text{--}9$  mm, thickly papery, abaxially not pruinose, midvein obviously raised, adaxially with flat midvein, lateral veins 3–5 pairs, both surfaces with distinctly raised, much-branched lateral veins, reticulate veins conspicuous, base cuneate, margin entire, occasionally 1–3-spinose-serrate on each side, apex obtuse. Inflorescence a panicle, 10–20-flowered, 3–7 cm; bracts lanceolate, 1–2.5 mm. Pedicels 6–7 mm, glabrous. Sepals in 2 whorls; outer sepals broadly ovate,  $2.5\text{--}3 \times 2\text{--}2.5$  mm; inner sepals obovate,  $4\text{--}4.5 \times 3\text{--}3.5$  mm. Petals obovate, ca.  $3.5 \times 2.5$  mm, base shortly clawed, with separate glands, apex slightly incised. Stamens ca. 3 mm; anther connective slightly prolonged, truncate. Ovules 1 or 2. Berry dark red to red-purple, ellipsoid,  $7\text{--}8 \times 5\text{--}6$  mm, slightly blue pruinose, with short style. Fl. May–Jun, fr. Jul–Aug.

• Thickets; 2300–3600 m. Yunnan.

**215. *Berberis beijingsensis*** T. S. Ying, Acta Phytotax. Sin. 37: 324. 1999.

北京小檗 bei jing xiao bo

Shrubs, deciduous, ca. 1 m tall. Branches stramineous or pale brownish stramineous, sulcate, glabrous, sparsely black verruculose; spines simple, occasionally 3-fid, concolorous, 5–8 mm, adaxially slightly sulcate. Leaves subsessile; leaf blade abaxially pale green, adaxially green, narrowly oblanceolate,  $1\text{--}4 \text{ cm} \times 3\text{--}6$  mm, thinly papery, abaxially glabrous, not pruinose, midvein distinctly raised, adaxially with slightly raised midvein, both surfaces with conspicuously raised lateral and reticulate veins, base attenuate, margin entire, apex acute. Inflorescence a panicle, 15–30-flowered, 3–7 cm including peduncle 1–1.5 cm, glabrous; bracts lanceolate, 2–3.5 mm. Pedicels 2–5 mm, glabrous; bractlets lanceolate, ca. 2 mm. Sepals in 2 whorls; outer sepals elliptic,  $2\text{--}2.5 \times 1\text{--}1.3$  mm; inner sepals obovate,  $3\text{--}3.5 \times 1.5\text{--}1.8$  mm. Petals elliptic,  $3\text{--}3.2 \times 1.2\text{--}1.5$  mm, base cuneate, with separate glands, apex emarginate or entire. Stamens ca. 2.1 mm; anther connective not prolonged, truncate. Ovules solitary, funiculate. Fruit unknown. Fl. May–Jun, fr. unknown.

• Thickets on slopes; ca. 100 m. Hebei, Shandong.

## Additional names based on Chinese material

Editors' note. The following names, all based on Chinese material, have not been accounted for in the above treatment by Ying Junsheng (see the comments at the beginning of the genus). This appendix is provided for information only, and no taxonomic opinions are expressed.

- Berberis acuminata* Franchet, Bull. Soc. Bot. France 33: 387. 1887. Described from Yunnan.
- Berberis ambigua* Ahrendt, J. Bot. 79(Suppl.): 60. 1941. Described from cultivated material reputedly grown from seed collected in Yunnan.
- Berberis angulosa* Wallich ex J. D. Hooker & Thomson var. *fasciculata* Ahrendt, J. Bot. 79(Suppl.): 42. 1941. Described from Xizang.
- Berberis approximata* Sprague var. *campylogyna* Ahrendt, J. Bot. 79(Suppl.): 53. 1941 (*B. dictyophylla* Franchet var. *campylogyna* (Ahrendt) Ahrendt, J. Linn. Soc., Bot. 57: 128. 1961). Described from Yunnan.
- Berberis aridocalida* Ahrendt, Bull. Misc. Inform. Kew 1939: 273. 1939 ["*arido-calida*"]. Described from cultivated material reputedly grown from seed collected in Gansu.
- Berberis atropasina* Ahrendt, Gard. Chron., ser. 3, 112: 155. 1942. Described from cultivated material reputedly grown from seed collected in Yunnan.
- Berberis bodinieri* H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 454. 1911, not (Gagnepain) Laferrrière (1997). Described from Yunnan.
- Berberis buchananii* C. K. Schneider var. *tawangensis* Ahrendt, J. Bot. 79(Suppl.): 37. 1941. Described from Xizang.
- Berberis calliantha* Mulligan, Gard. Chron., ser. 3, 97: 394. 1935. Described from Xizang.
- Berberis caroli* C. K. Schneider, Bull. Herb. Boissier, sér. 2, 5: 459. 1905. Described from Nei Mongol.
- Berberis chinensis* Poir., Encycl. 8: 617. 1808. Described from cultivated material in Paris and said to be native to China.
- Berberis consimilis* C. K. Schneider, Oesterr. Bot. Z. 66: 324. 1916. Described from cultivated material reputedly grown from seed collected in Sichuan.
- Berberis dasystachya* Maximowicz var. *pluriflora* P. Y. Li, Acta Phytotax. Sin. 10: 213. 1965. Described from Gansu and Qinghai.
- Berberis faberi* C. K. Schneider, Oesterr. Bot. Z. 67: 215. 1918. Described from Sichuan.
- Berberis faxoniana* C. K. Schneider, Oesterr. Bot. Z. 66: 325. 1916. Described from cultivated material reputedly grown from seed collected in Sichuan or Yunnan.
- Berberis franchetiana* C. K. Schneider var. *gombalana* C. Y. Wu & S. Y. Bao, Bull. Bot. Res., Harbin 5(3): 15. 1985. Described from Yunnan.
- Berberis gagnepainii* C. K. Schneider var. *subovata* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 264. 1939. Described from Sichuan.
- Berberis heteropsis* Ahrendt, J. Linn. Soc., Bot. 57: 213. 1961. Described from Guizhou and Sichuan.
- Berberis hookeri* Lemaire subsp. *longipes* D. F. Chamberlain & C. M. Hu, Notes Roy. Bot. Gard. Edinburgh 42: 533. 1985. Described from Xizang.
- Berberis humidoumbrosa* Ahrendt var. *dispersa* Ahrendt, J. Linn. Soc., Bot. 57: 160. 1961. Described from Xizang.
- Berberis insignis* J. D. Hooker & Thomson var. *zelaica* Ahrendt, J. Bot. 79(Suppl.): 9. 1941. Described from Xizang.
- Berberis integerrima* Bunge var. *stenophylla* Maximowicz, Fl. Tangut. 29. 1889. Described from Gansu.
- Berberis jaeschkeana* C. K. Schneider var. *bimbilaica* Ahrendt, J. Bot. 79(Suppl.): 65. 1941. Described from Xizang.
- Berberis jingguensis* G. S. Fan & X. W. Li, J. Trop. Subtrop. Bot. 5(3): 1. 1997. Described from Yunnan.
- Berberis kartanica* Ahrendt, J. Bot. 79(Suppl.): 68. 1941. Described from Xizang.
- Berberis mairei* Ahrendt, J. Linn. Soc., Bot. 57: 76. 1961. Described from Yunnan.
- Berberis oblanceifolia* C. M. Hu, Bull. Bot. Res., Harbin 6(2): 12. 1986. Described from Hunan.
- Berberis oritrepha* C. K. Schneider, Oesterr. Bot. Z. 67: 293. 1918. Described from Shaanxi.
- Berberis orthobotrys* Bienert ex Aitchison var. *rupestris* Ahrendt, J. Linn. Soc., Bot. 57: 143. 1961. Described from Xizang.
- Berberis petrogena* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 253. 1939. Described from Yunnan.
- Berberis pingbaensis* M. T. An, Bull. Bot. Res., Harbin 28: 641. 2008. Described from Guizhou.
- Berberis poiretii* C. K. Schneider f. *weichangensis* C. K. Schneider in Sargent, Pl. Wilson. 1: 372. 1913. Described from Hebei.
- Berberis praecipua* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 46: 248. 1939. Described from Hunan and Yunnan.
- Berberis pseudothunbergii* P. Y. Li, Acta Phytotax. Sin. 10: 211. 1965. Described from Gansu and Shaanxi.
- Berberis rockii* Ahrendt, J. Bot. 79(Suppl.): 72. 1941. Described from Yunnan.
- Berberis sanei* T. Husain, Datt, Arti Garg & R. R. Rao, Bull. Mus. Natl. Hist. Nat., B, Adansonia 17: 69. 1995. Described from Xizang.
- Berberis sinensis* Desfontaines var. *angustifolia* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 2: 416. 1873 (*B. poiretii* C. K. Schneider var. *angustifolia* (Regel) Nakai, Fl. Sylv. Kor. 21: 66. 1936). Described from N and NE China.
- Berberis sphaera* Fedde, Bot. Jahrb. Syst. 36(Beibl. 82): 44. 1905. Described from Shaanxi.
- Berberis spraguei* Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941. Described from cultivated material apparently originally collected in Yunnan.
- Berberis stearnii* Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941. Described from cultivated material apparently originally collected in Yunnan.
- Berberis subsessiliflora* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 22: 293. 1915. Described from Hubei.
- Berberis tarokoensis* S. Y. Lu & Yuen P. Yang, Fl. Taiwan, ed. 2, 2: 581. 1996. Described from Taiwan.
- Berberis tibetica* C. K. Schneider, Repert. Spec. Nov. Regni Veg. 6: 268. 1909. Described from cultivated material reputedly grown from seed collected in Sichuan or Yunnan.
- Berberis trichohaematoides* Ahrendt, J. Bot. 79(Suppl.): 62. 1941. Described from Xizang.
- Berberis tsangpoensis* Ahrendt, Gard. Chron., ser. 3, 109: 101. 1941. Described from Xizang.
- Berberis uniflora* F. N. Wei & Y. G. Wei, Guihaia 15: 218. 1995. Described from Guangxi.
- Berberis wanhuashanensis* Yue Jin Zhang, Acta Bot. Boreal.-Occid. Sin. 11: 258. 1991. Described from Shaanxi.
- Berberis xinganensis* G. H. Liu & S. Q. Zhou, Fl. Intramongol., ed. 2, 2: 712. 1991. Described from Nei Mongol.
- Berberis zayulana* Ahrendt, J. Bot. 79(Suppl.): 64. 1941. Described from Xizang.

### 3. MAHONIA Nuttall, Gen. N. Amer. Pl. 1: 211. 1818, nom. cons.

十大功劳属 shi da gong lao shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

*Odostemon* Rafinesque.

Shrubs or small trees, evergreen, 0.3–8 m tall. Spines absent. Leaves imparipinnate, alternate, sessile or petiolate; petiole to 14 cm; leaflets 3–41; lateral leaflets usually sessile; terminal leaflet sessile or petiolulate; margins of leaflets entire, variously toothed, or with coarse or fine serrations. Inflorescence terminal, of (1–)3–18-fascicled simple or branched racemes or panicles, 3–35 cm, subtended by leafletlike bracts. Pedicel 1.5–24 mm, subtending bract shorter or longer than pedicel. Flowers yellow, with 3 whorls of sepals and 1 whorl of petals, with or without glands at base of petals. Anther connective not prolonged, apiculate or conspicuously prolonged. Ovary ellipsoid; ovules 1–7; styles absent or to 3 mm, persistent on mature fruit. Fruit berries, bluish or black, often glaucous. Seeds 1–7.

About 60 species: mainly in E and SE Asia, also in W North America, Central America, and W South America; 31 species (27 endemic) in China; six additional species (five endemic) are insufficiently known.

Most of the Chinese wild populations of *Mahonia* have been extirpated, probably as a result of over-collecting for medicinal use, and the plants now being described are probably individuals that vary only in minor ways from the relatively few specimens that exist in herbaria.

Ahrendt (J. Linn. Soc., Bot. 57: 1–410. 1961) recognized two “groups” in *Mahonia*: “Orientales” and “Occidentales.” All of the Asian species of *Mahonia*, plus a single North American species from the Pacific Northwest, *M. nervosa* (Pursh) Nuttall, are in the “Orientales.”

See the paper by J. Y. Wu, H. N. Qin, D. Y. Xue, and K. X. Zhou, “Study on seed morphology of *Mahonia* (Berberidaceae)” (Guihaia 30: 155–160. 2010).

1a. Inflorescences panicles.

2a. Petals retuse; pedicels 6–11 mm, bracts 2–3 mm; teeth per upper leaflet 4–11; ovules 5 or 6 ..... 1. *M. bracteolata*

2b. Petals emarginate or incised; pedicels 2.5–3 mm or 13–24 mm, bracts 1–2 mm or 4.5–7 mm; teeth per upper leaflet 1–5; ovules 1–4.

3a. Petals emarginate; inflorescences 25–35 cm; leaflets 2 or 3 pairs, abaxially pruinose; pedicels 13–24 mm ..... 2. *M. gracilipes*

3b. Petals incised; inflorescences 11–18 cm; leaflets 5–9 pairs, abaxially not pruinose; pedicels 2.5–3 mm ..... 3. *M. monyulensis*

1b. Inflorescences racemes.

4a. Inflorescence of branched racemes.

5a. Petals incised; leaflets 12–20 pairs; ovules 2 or 3 ..... 4. *M. oiwakensis*

5b. Petals emarginate; leaflets 4–9 pairs; ovules 4–7.

6a. Bracts longer than pedicels; fruit obovoid, style less than 0.5 mm; leaf blade basally cuneate ..... 5. *M. calamicaulis*

6b. Bracts shorter than to slightly longer than pedicels; fruit globose, style 2–3 mm; leaf blade basally oblique, rounded ..... 6. *M. duclouxiana*

4b. Inflorescence of unbranched racemes.

7a. Petals entire.

8a. Petioles 3.5–14 cm; leaflets entire or with 1–3 inconspicuous teeth near apex ..... 9. *M. shenii*

8b. Petioles 0.5–2.5 cm; leaflets with teeth.

9a. Leaflets remote, not contiguous, apex acuminate or caudate-acuminate, margin with 9–23 teeth on each side; anther connective not prolonged; fruit globose ..... 7. *M. taronensis*

9b. Leaflets contiguous, apex acute, margin with 2–7 teeth on each side; anther connective prolonged; fruit obovoid ..... 8. *M. subimbricata*

7b. Petals emarginate or incised.

10a. Leaves petiolate, petiole 2.5–9 cm.

11a. Inner sepals lanceolate or obovate; anther connective prolonged.

12a. Leaflets subrhombic or elliptic, margin with 2–4 teeth on each side; inner sepals obovate ..... 10. *M. breviracema*

12b. Leaflets lanceolate, margin 8–20-spinose-serrate on each side; inner sepals lanceolate ..... 11. *M. setosa*

11b. Inner sepals oblong or elliptic; anther connective not prolonged.

13a. Inflorescence 1- or 2-fascicled racemes; leaflets ovate or ovate-elliptic, basally truncate ..... 12. *M. decipiens*

13b. Inflorescence 4–10-fascicled racemes; leaflets basally cuneate.

14a. Leaflets 2 or 3 pairs, oblong-ovate or elliptic, shortly petiolate ..... 13. *M. paucijuga*

14b. Leaflets 2–9 pairs, lanceolate to elliptic-lanceolate or elliptic, sessile.

15a. Leaflets 2–5 pairs; pedicels ca. as long as bracts; glands of petals distinct ..... 14. *M. fortunei*

15b. Leaflets 6–9 pairs; pedicels much longer than bracts; glands of petals distinct or sometimes indistinct ..... 15. *M. eurybracteata*

10b. Leaves subsessile or petiole less than 2 cm.

- 16a. Leaflets entire ..... 16. *M. microphylla*  
 16b. Leaflets spinose-serrate.  
 17a. Leaflets lanceolate, elliptic-lanceolate, or ovate-oblong.  
 18a. Leaflets 6–9 pairs, margin 3–9-spinose-serrate on each side; base of petals with glands ..... 15. *M. eurybracteata*  
 18b. Leaflets 8–12 pairs, margin 35–65-spinulose-serrulate on each side; base of petals without glands ..... 17. *M. leptodonta*  
 17b. Leaflets oblong, ovate, broadly elliptic, or rhombic.  
 19a. Veins on adaxial surface of leaflets reticulate, obviously raised, margin of leaflets 2–11-spinose-serrate on each side ..... 18. *M. retinervis*  
 19b. Veins on adaxial surface of leaflets reticulate, flat or inconspicuous, margin of leaflets 2–16-dentate on each side.  
 20a. Abaxial surface of leaflets pruinose; fruit 10–12 mm in diam. .... 19. *M. bealei*  
 20b. Abaxial surface of leaflets yellowish green, not pruinose; fruit less than 10 mm in diam.  
 21a. Floral bracts longer than pedicels.  
 22a. Racemes 3–9 per fascicle, 5–9 cm; apex of petals slightly emarginate.  
 23a. Racemes 5–9 per fascicle; fruit not pruinose; leaflets serrate, with 4–7(–11) teeth on each side ..... 20. *M. longibracteata*  
 23b. Racemes 3–5 per fascicle; fruit pruinose; leaflets spinose-serrate, with 10–16 teeth on each side ..... 21. *M. polyodonta*  
 22b. Racemes 8–15 per fascicle, 7–19 cm; apex of petals incised.  
 24a. Anther connective prolonged; ovules 2–6; leaf blade adaxially dark green and shiny ..... 22. *M. napaulensis*  
 24b. Anther connective not prolonged; ovules 2; leaf blade adaxially green ..... 23. *M. cardiophylla*  
 21b. Floral bracts shorter than to ca. as long as pedicels.  
 25a. Margin of leaflets 1–3(–6)-dentate on each side ..... 24. *M. nitens*  
 25b. Margin of leaflets 4–10-dentate on each side.  
 26a. Leaflets markedly overlapping.  
 27a. Inflorescence 3–6 racemes; anther connective prolonged; leaflets 8–18 pairs ..... 25. *M. conferta*  
 27b. Inflorescence 9 or 10 racemes; anther connective not prolonged; leaflets 5–7 pairs ..... 26. *M. imbricata*  
 26b. Leaflets separate or sometimes contiguous.  
 28a. Pedicels shorter than floral bracts; anther connective prolonged, rounded; petals 1.8–2 mm wide ..... 31. *M. hancockiana*  
 28b. Pedicels longer than or ca. as long as floral bracts; anther connective not prolonged, truncate; petals 2–2.8 mm wide.  
 29a. Fruit globose or pyriform, style not persistent; petiolar glands indistinct; leaflets 8–13 pairs ..... 27. *M. bodinieri*  
 29b. Fruit ovoid, obovoid, or ellipsoid, persistent style short; petiolar glands conspicuous; leaflets 4–9 pairs.  
 30a. Pedicels ca. as long as or slightly longer than floral bracts; leaf blade shiny, apically acute, cuspidate ..... 28. *M. sheridaniiana*  
 30b. Pedicels markedly longer than floral bracts; leaf blade apically acute or acuminate, sometimes aristate.  
 31a. Leaflets 4–6 pairs, margin 2–4-dentate on each side; pedicels 6–7 mm; ovules 4–7 ..... 29. *M. japonica*  
 31b. Leaflets 5–9 pairs, margin 2–9-spinose-serrate on each side; pedicels 2.5–4 mm; ovules 2 ..... 30. *M. fordii*

**1. *Mahonia bracteolata*** Takeda, Notes Roy. Bot. Gard. Edinburgh 6: 228. 1917.

鹤庆十大功劳 he qing shi da gong lao

*Berberis bracteolata* (Takeda) Laferrière; *B. bracteolata* var. *zhongdianensis* (S. Y. Bao) Laferrière; *B. caesia* (C. K. Schneider) Laferrière; *Mahonia bracteolata* var. *zhongdianensis* S. Y. Bao; *M. caesia* C. K. Schneider.

Shrubs, 1.5–2 m tall. Leaves abaxially pale grayish green, adaxially dull grayish green, ovate, 14–25 × 8–14 cm; leaflets 3–8 pairs, contiguous, lowest pair 0.7–1.5 cm above base of petiole, oblong-lanceolate, 2.5–12 × 1.5–3 cm, thick, rigid, abaxially slightly pruinose, veins ± obscure, adaxially indis-

tinctly veined, base broadly cuneate, margins of lower leaflets with 2 or 3 teeth, those of upper leaflets with 4–11 teeth, apex acuminate; rachis stout, ca. 2 mm in diam.; internodes 2–3 cm, decreasing apically. Inflorescence 4–9-fascicled panicles, 7–19 cm; bracts of inflorescence ovate to ovate-lanceolate, 10–15 × 7–10 mm. Pedicel 6–11 mm; floral bracts ovate, 2–3 mm, apically acute. Sepals yellow; outer sepals ovate, 2–3 × 1.5–2 mm; median sepals ovate, 4–6 × 3–4 mm, apically obtuse; inner sepals elliptic, 7–8 × 3.5–4 mm. Petals yellow, oblong-elliptic, 6–7.5 × 2.5–3 mm, base with distinct glands, apex slightly retuse. Stamens 3.5–4.5 mm; anther connective prolonged, ca. 1.5 mm, rounded to truncate. Ovary ca. 5 mm; ovules 5 or 6. Berry slightly pruinose, subglobose, 5–7 mm in diam.; style persistent, ca. 1.5 mm. Fl. Aug–Nov, fr. Sep–Jan.

- Thickets, open hillsides; 1900–2500 m. Sichuan, Yunnan.

**2. Mahonia gracilipes** (Oliver) Fedde, Bot. Jahrb. Syst. 31: 128. 1901.

细柄十大功劳 xi bing shi da gong lao

*Berberis gracilipes* Oliver, Hooker's Icon. Pl. 18: t. 1754. 1887; *B. subtriplinervis* Franchet; *Mahonia gracilipes* var. *rhombica* Z. F. Pan & Z. P. Song; *M. subtriplinervis* (Franchet) Fedde.

Shrubs, 0.3–1 m tall. Leaves adaxially dark green, elliptic to narrowly elliptic, 20–41 × 7–11 cm; leaflets 2 or 3 pairs, subsessile, lowest pair 3.5–10 cm above base of petiole, abaxially white pruinose, venation reticulate, raised on both surfaces; rachis stout, 2–3 mm in diam.; internodes 5–7 cm; petiolule 2–5.5 cm; lowest leaflets oblong, 6–11 × 2–5 cm, only slightly smaller than others, apically becoming oblong to oblanceolate, 8–14.5 × 3–7.3 cm, base cuneate, margin entire below middle, 1–5-spinose-serrate on each side; terminal leaflet 8–14.5 × 3–7.3 cm. Inflorescence 3–5 simple or branched fascicles of racemes, loosely flowered, (6–)25–35 cm; bracts of inflorescence lanceolate, 2–2.5 cm × 4–7 mm. Pedicel 1.3–2.4 cm, slender; floral bracts 1–2 mm. Sepals purple; outer sepals ovate, 2.2–3 × 1.5–2 mm, apically acute; median sepals elliptic, 4.5–5 × 2.1–2.8 mm, apically acute; inner sepals elliptic, 5–5.5 × 2.2–3.2 mm. Petals yellow, oblong, 4–5 × 2–2.6 mm, base with distinct glands, apex emarginate with acute lobes. Stamens 2–3 mm; anther connective not prolonged, truncate. Ovary ca. 2 mm; ovules 3 or 4; style short. Berry black, pruinose, globose, 5–8 mm in diam. Fl. Apr–Aug, fr. Sep–Nov.

- Broad-leaved evergreen and mixed broad-leaved evergreen and deciduous forests, forest margins, shaded slopes; 700–2400 m. Sichuan, NE Yunnan.

**3. Mahonia monyulensis** Ahrendt, J. Linn. Soc., Bot. 57: 303. 1961.

门隅十大功劳 men yu shi da gong lao

*Berberis monyulensis* (Ahrendt) Laferrière.

Shrubs. Leaves abaxially pale yellowish green, adaxially slightly shiny, green, narrowly elliptic, 20–27 × 9–16 cm; leaflets 5–9 pairs, contiguous or slightly overlapping, lowest pair smaller than others, 1–1.5 cm above base of petiole, abaxially with raised veins, adaxially with indistinct veins; rachis 2–3 mm in diam.; internodes decreasing in length apically, 1.5–4 cm; lowest leaflets broadly ovate to suborbicular, 2–3.5 × 1.2–2.3 cm, apically becoming ovate to oblong-ovate, 3.5–9 × 2–5 cm, base truncate to obliquely rounded, margin with 2 or 3 teeth on each side, apex sharply acute, cuspidate. Inflorescence 5–11-fascicled panicles, 11–18 cm; bracts of inflorescence lanceolate to ovate-lanceolate, 2.5–4 × 0.6–1.5 cm. Pedicel 2.5–3 mm; floral bracts ovate, 4.5–7 × 1.2–2 mm. Sepals golden yellow; outer sepals oblong-ovate, 2.5–3.1 × 1.5–2 mm; median sepals elliptic-ovate, 4–5.5 × 2.7–3 mm; inner sepals elliptic, 6–6.2 × 3–4 mm. Petals golden yellow, oblong to elliptic-obovate, 4.5–5.2 × 2.1–2.3 mm, base with distinct glands, apex narrowly incised, lobes obtuse. Stamens ca. 3.5 mm; anther connective not prolonged, truncate. Ovary ca. 4 mm; ovules 3. Berry unknown. Fl. Mar–Apr, fr. unknown.

- Riverbanks; ca. 2300 m. SE Xizang.

**4. Mahonia oiwakensis** Hayata, Icon. Pl. Formosan. 6: 1. 1916.

阿里山十大功劳 a li shan shi da gong lao

*Berberis caelicolor* (S. Y. Bao) Laferrière; *B. discolorifolia* (Ahrendt) Laferrière; *B. lomariifolia* (Takeda) Laferrière; *B. lomariifolia* var. *estylis* (C. Y. Wu ex S. Y. Bao) Laferrière; *B. oiwakensis* (Hayata) Laferrière; *Mahonia alexandri* C. K. Schneider; *M. caelicolor* S. Y. Bao; *M. discolorifolia* Ahrendt; *M. hainanensis* C. M. Hu, Ze X. Li & F. W. Xing; *M. lomariifolia* Takeda; *M. lomariifolia* var. *estylis* C. Y. Wu ex S. Y. Bao; *M. morrisonensis* Takeda.

Trees, 1–7 m tall. Leaves abaxially yellowish green, adaxially dark green, oblong-elliptic, 15–42 × 8–15 cm; leaflets 12–20 pairs, lowest pair 0.5–1 cm above base of petiole, abaxially slightly veined or veins obscure; rachis 2–3 mm thick; internodes 1.5–5 cm, decreasing in length apically, petiolule 5–10 mm or leaflets sometimes sessile; lowest leaflets ovate to suborbicular, 1.5–3 × 1–1.5 cm, apically becoming ovate-lanceolate or lanceolate, 2–10 × 1–2.5 cm, base rounded, margin 2–9-spinose-serrate on each side, apex cuspidate-acuminate; terminal leaflet 4–6.5 × 0.9–1.5 cm. Inflorescence 7–18-fascicled racemes, 9–25 cm; bracts of inflorescence broadly lanceolate to ovate, 1.5–3 cm × 6–10 mm. Pedicel (2–)5–6 mm; floral bracts ovate, 3–3.5 × 1.5–1.8 mm. Outer sepals golden yellow, ovate to suborbicular, 1.2–3 × 1.1–2 mm; median sepals elliptic to ovate, (3–)5–6 × 2.5–3 mm; inner sepals golden yellow, elliptic to oblong, 5–7 × 2.6–3.5 mm. Petals golden yellow, oblong, 4.5–6.5 × 2–2.8 mm, base with distinct glands, apex narrowly incised, acute. Stamens 3–4 mm; anther connective slightly prolonged, subapiculate or rounded. Ovary 3.2–4 mm; ovules 2 or 3; style 0.5–1 mm. Berry blue or bluish black, pruinose, ovoid, 6–8 × 5–6 mm; style persistent, ca. 1 mm. Fl. Aug–Nov, fr. Nov–May.

- Broad-leaved forests, thickets, forest margins, slopes; 600–3800 m. Guizhou, Hong Kong (probably introduced), Sichuan, Taiwan, Xizang, Yunnan.

*Mahonia oiwakensis* is one of a number of plants with a disjunct distribution on Taiwan and in C and SW China.

**5. Mahonia calamicaulis** Sparre & C. E. C. Fischer subsp. **kingdon-wardiana** (Ahrendt) T. S. Ying & Boufford in T. S. Ying, Fl. Reipubl. Popularis Sin. 29: 222. 2001.

察隅十大功劳 cha yu shi da gong lao

*Mahonia veitchiorum* (Hemsley & E. H. Wilson) C. K. Schneider var. *kingdon-wardiana* Ahrendt, J. Linn. Soc., Bot. 57: 302. 1961; *Berberis veitchiorum* Hemsley & E. H. Wilson var. *kingdon-wardiana* (Ahrendt) Laferrière.

Shrubs, 0.6–1.5 m tall. Leaves abaxially pale yellowish green, adaxially dull green, oblong, 20–33 × 10–14 cm; leaflets 4–7 pairs, lowest pair ca. 1 cm above base of petiole, abaxially not pruinose, veins slightly raised; rachis 2–3 mm in diam.; internodes 2.5–4.5 cm; leaflets subsessile or petiolule to ca. 4 cm, elliptic to elliptic-lanceolate, thickly leathery, rigid, lowest leaflets 4–6 × 1.5–3 cm, remaining ones increasing in size from middle of leaf upward, 7–11.5 × 2.5–4 cm, base broadly cune-

ate, margin prominently serrate with 5–9 teeth on each side, apex caudate-acuminate; terminal leaflet larger. Inflorescence 5–7 simple or sometimes shortly branched fascicles of racemes, 6–12 cm; bracts of inflorescence triangular to ovate-oblong, 1.5–2 cm × 6–8 mm. Pedicel 4–6 mm; floral bracts narrowly lanceolate, 6–9 × 1–1.5 mm. Sepals bright yellow; outer sepals ovate-lanceolate, 3.5–4 × 2–2.5 mm; median sepals broadly obovate, 4.5–5 × 2–2.5 mm; inner sepals elliptic, 5–5.5 × 3–3.2 mm. Petals bright yellow, narrowly obovate, 4.5–5 × 1.5–1.7 mm, base with distinct glands, apex slightly emarginate, lobes obtuse. Stamens 3.2–3.5 mm; anther connective not prolonged, truncate. Ovary ellipsoid, ca. 3 mm; ovules 4; style ca. 0.5 mm. Berry purple, ± pruinose, obovoid, 1–1.3 cm × 7–10 mm. Fl. Apr–May, fr. Jun–Jul.

• Evergreen broad-leaved forests, temperate rain forests; 2500–3000 m. SE Xizang.

*Mahonia calamicaulis* subsp. *calamicaulis*, with leaflet margins spinulose toothed and apex acute, is restricted to India (Assam).

**6. *Mahonia duclouxiana*** Gagnepain, Bull. Soc. Bot. France 55: 87. 1908.

长柱十大功劳 chang zhu shi da gong lao

*Berberis borealis* (Takeda) Laferrière var. *parryi* (Ahrendt) Laferrière; *B. dolichostylis* (Takeda) Laferrière; *B. duclouxiana* (Gagnepain) Laferrière; *B. duclouxiana* var. *hilaica* (Ahrendt) Laferrière; *B. flavida* (C. K. Schneider) Laferrière; *B. flavida* var. *integrifoliola* (Handel-Mazzetti) Laferrière; *B. keikoe* Laferrière; *B. siamensis* (Takeda) Laferrière; *B. tsailunii* Laferrière; *Mahonia borealis* Takeda var. *parryi* Ahrendt; *M. dolichostylis* Takeda; *M. duclouxiana* var. *hilaica* Ahrendt; *M. flavida* C. K. Schneider; *M. flavida* f. *integrifoliola* Handel-Mazzetti; *M. mairei* Takeda; *M. siamensis* Takeda.

Shrubs, 1.5–4 m tall. Leaves abaxially yellowish green, adaxially dull to slightly shiny, oblong to oblong-elliptic, 20–70 × 10–22 cm, thinly papery to thinly leathery; leaflets 4–9 pairs, obliquely arranged, separate to remote, sessile, lowest pair ca. 1 cm above base of petiole, abaxial veins distinctly raised, adaxial veins reticulate, indistinctly raised; rachis 3–5 mm in diam.; internodes 2.5–11 cm, decreasing in length apically; leaflets narrowly ovate or oblong-ovate to narrowly oblong-ovate or elliptic-lanceolate, increasing in length but decreasing in width from base to apex, lowest leaflets 1.5–3 × 1.2–2 cm, those above 4.5–16 × 1.5–5 cm, base rounded, oblique, margin with 3–12 teeth on each side, apex acuminate or acute, sometimes terminal leaflet much larger, to 18 × 4 cm, sessile or (more commonly) petiolule 1–3 cm. Inflorescence 4–15 simple or shortly branched fascicles of racemes, 8–30 cm; bracts of inflorescence broadly lanceolate to ovate, 2–3.5 cm × 5–8 mm. Pedicel 3.2–6 mm; floral bracts broadly lanceolate to ovate, 3–6.5 × 1.5–2.5 mm. Sepals yellow; outer sepals ovate to triangular-ovate, 1.1–3 × 1.1–5 mm; median sepals ovate or ovate-oblong to elliptic, 2.2–5 × 1.9–2.5 mm; inner sepals oblong to elliptic, 3.2–8 × 2–3.6 mm. Petals yellow, oblong to elliptic, 3–7.2 × 1.6–3.5 mm, base with distinct glands, apex emarginate, lobes obtuse. Stamens 3.5–5.5 mm; anther connective conspicuously prolonged, truncate or rounded. Ovary 5–6 mm in diam.; ovules 4–7; style 2–3 mm. Berry deep purple,

pruinose, globose to subglobose, 5–8 mm in diam.; style persistent, 2–3 mm. Fl. Nov–Apr, fr. Mar–Jun.

Forests, thickets, roadsides, in light shade, dry slopes; 1800–2700 m. Guangxi, Sichuan, Yunnan [India, Myanmar, Thailand].

**7. *Mahonia taronensis*** Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 181. 1923.

独龙十大功劳 du long shi da gong lao

*Berberis tibetensis* Laferrière.

Shrubs, 1–1.5 m tall. Leaves abaxially yellowish green, adaxially dull olivaceous-green, narrowly obovate to oblanceolate, 18–40(–65) × 7–17(–30) cm; leaflets 5–10 pairs, lowest pair smaller, ca. 1 cm above base of petiole, abaxially midvein and lateral veins conspicuously raised, adaxially midvein obviously impressed, lateral veins inconspicuous; leaflets lanceolate to ovate-lanceolate, 4–13(–20) × 1.5–3(–6) cm, thin, base broadly cuneate or subrounded, margin with 9–23 teeth on each side, apex acuminate to caudate-acuminate. Inflorescence 3–5-fascicled racemes, 5–8 cm; bracts of inflorescence ovate to ovate-oblong, 1–2 cm × ca. 7 mm. Pedicel 2–2.5 mm; floral bracts lanceolate, 4–5 × 0.7–1 mm. Flowers pale greenish yellow. Outer sepals ovate, ca. 1.9 × 1 mm; median sepals oblong-elliptic, ca. 2.3 × 1.5 mm; inner sepals oblong, ca. 3.5 × 2 mm. Petals oblong-obovate, ca. 3 × 1.5 mm, base with distinct glands, apex entire. Stamens ca. 2 mm; anther connective not prolonged, truncate. Ovary ca. 2.5 mm; ovules 2–4. Berry blue, pruinose, globose, ca. 6 mm in diam.; style persistent, short. Fl. Oct–Jan, fr. Feb–Jul.

• Forests; 1500–2900 m. SE Xizang, Yunnan.

**8. *Mahonia subimbricata*** Chun & F. Chun, J. Arnold Arbor. 29: 420. 1948.

靖西十大功劳 jing xi shi da gong lao

*Berberis subimbricata* (Chun & F. Chun) Laferrière.

Shrubs, ca. 1.5 m tall. Leaves abaxially ± shiny, yellowish green, adaxially dull, elliptic to oblanceolate, 12–22 × 3–5 cm; leaflets 8–13 pairs, close or overlapping, lowest pair 5–10 mm above base of petiole, abaxially initially slightly grayish pruinose, adaxial primary veins 3, slightly impressed, veinlets obscure; rachis 2–3 mm in diam.; internodes 1–2 cm, slightly decreasing in length apically; leaflets ovate to narrowly ovate, lowermost much smaller than others and with only 1 or 2 teeth on each side, gradually larger apically, 1.5–3.5 × 1–1.5 cm, base rounded or subcordate, margin with 2–7 teeth on each side, apex acute, sharply cuspidate; terminal leaflet oblong-ovate, 3–5 cm, base rounded or subcordate, apex acuminate, petiolule ca. 0.5 cm. Inflorescence 9–13-fascicled racemes, 5–9 cm; bracts of inflorescence ovate, 1.2–1.5 cm × 5–8 mm. Pedicel 2.2–3 mm; floral bracts ovate-oblong, 2–3 × 1.2–1.5 mm. Sepals yellow; outer sepals broadly ovate, ca. 2 × 1.5 mm; median sepals oblong-ovate, ca. 3 × 2 mm; inner sepals oblong-obovate, ca. 3 × 2 mm. Petals yellow, narrowly elliptic, ca. as long as inner sepals or slightly shorter, base with distinct glands, apex entire, obtuse. Stamens ca. 2.5 mm; anther connective prolonged, obtuse. Ovary ca. 2 mm; ovules 1 or 2. Berry black, pruinose, obovoid, ca. 8 × 5 mm. Fl. Sep–Nov, fr. Nov–May.

- Thickets, woodlands; ca. 1900 m. Guangxi, Yunnan.

**9. Mahonia shenii** Chun, J. Arnold Arbor. 9: 127. 1928.

沈氏十大功劳 shen shi shi da gong lao

*Berberis shenii* (Chun) Laferrière.

Shrubs, 0.6–2 m tall. Leaves abaxially pale to yellowish green, shiny, ovate-elliptic, 23–40 × 13–22 cm; leaflets 1–6 pairs, lowest pair 3.5–14 cm above base of petiole, abaxial veins 3–5, reticulate venation indistinct, adaxial main veins 3, faint to prominent, impressed or slightly raised; rachis 1.5–2.5 mm in diam.; internodes 2.5–8 cm, decreasing in length apically; leaflets sessile, basal pair scarcely smaller than others; lateral leaflets narrowly to broadly elliptic or obovate, 6–13 × 1–5 cm, base cuneate to broadly so, margin thickened, entire or with 1–3 inconspicuous teeth near apex, apex acute to acuminate; terminal leaflet oblong-elliptic to broadly obovate, 10–15 × 3–6 cm, margin entire or with 1 or 2 inconspicuous teeth near apex, petiolule 1.5–6.5 cm. Inflorescence 6–10-fascicled racemes, ca. 10 cm; bracts of inflorescence lanceolate, 1–2 cm × 3–5 mm. Pedicel 2–3 mm, slender; floral bracts ovate, ca. 1 × 0.8 mm. Sepals yellow; outer sepals ovate, ca. 2 × 1–1.6 mm; median sepals ovate-elliptic to elliptic, 4–4.1 × 2–3 mm; inner sepals obovate-elliptic, 4.5–4.6 × 2.2–3 mm. Petals yellow, obovate-oblong, ca. 3.6 × 1.6–2 mm, base with indistinct glands, apex entire, rounded. Stamens ca. 2.5 mm; anther connective not prolonged, truncate. Ovary 1.8–2 mm; ovules 2; stigma ca. 0.3 mm. Berry blue pruinose, globose to subglobose, 6–7 mm in diam.; style not persistent. Fl. Apr–Sep, fr. Oct–Dec.

- Mixed broad-leaved deciduous and evergreen forests, thickets, rocky slopes; 400–1500 m. Guangdong, NE Guangxi, SE Guizhou, S Hunan.

**10. Mahonia breviracema** Y. S. Wang & P. K. Hsiao, Acta Phytotax. Sin. 23: 309. 1985.

短序十大功劳 duan xu shi da gong lao

*Berberis breviracema* (Y. S. Wang & P. K. Hsiao) Laferrière; ?*Mahonia monodens* J. Y. Wu, H. N. Qin & S. Z. He.

Shrubs, ca. 1 m tall. Leaves abaxially pale green, adaxially green, ovate or ovate-elliptic, 14–16 × 6–8 cm; leaflets 3 or 4 pairs, lowest pair ca. 4 cm above base of petiole; rachis 1–2 mm in diam.; internodes 2.5–3 cm, ca. equidistant, abaxial veins raised, adaxial veins impressed; leaflets elliptic to subrhombic, 3–6.6 × 1.2–3 cm, slightly decreasing in size from base to apex, leathery, base cuneate, margin with 2–4 teeth on each side, apex acute to acuminate; terminal leaflet larger than others, 5.5–6.5 × 2.5–3 cm, sessile. Inflorescence 5–8-fascicled racemes, 3–8 cm; bracts of inflorescence lanceolate, 1–1.5 cm × 3–6 mm. Pedicel 2–2.5 mm; floral bracts ovate, 1–1.2 × 0.6–0.8 mm. Outer sepals ovate, 1.6–1.8 × 1–1.1 mm; median sepals obovate-oblong, 3.7–3.8 × 1.7–1.8 mm; inner sepals obovate, ca. 4 × 2.1 mm. Petals elliptic, 3.5–3.6 × 1.3–1.4 mm, base with distinct glands, apex emarginate. Stamens ca. 2.1 mm; anther connective prolonged, rounded. Ovary ca. 1.7 mm; ovules 2; style 0.3–0.5 mm. Berry unknown. Fl. Oct–Nov, fr. unknown.

- Open rocky slopes in thickets; ca. 600 m. Guangxi (Lingui, ?Tiandeng), ?Guizhou (Guiyang).

*Mahonia breviracema* is cultivated in Yan Shan Botanical Garden, Guangxi Institute of Botany, Guilin, from where the type specimen (S. K. Lee 200582, IBK) was collected. *Mahonia monodens*, described from Guangxi (Tiandeng) and Guizhou, is tentatively included in synonymy, but we have not been able to compare the limited number of specimens available to determine the appropriateness of this placement.

**11. Mahonia setosa** Gagnepain, Bull. Soc. Bot. France 55: 86. 1908.

刺齿十大功劳 ci chi shi da gong lao

*Berberis setosa* (Gagnepain) Laferrière.

Shrubs, ca. 1.5 m tall. Leaves abaxially pale yellowish green, becoming golden yellow when dry, adaxially dull, ca. 25 × 14 cm; leaflets 4–8 pairs, lowest pair 2.5–3.5 cm above base of petiole, abaxial veins 3, both surfaces with raised reticulate veins; rachis slender, 1–2 mm in diam.; internodes 1–2 cm; leaflets lanceolate to linear-lanceolate, 1.8–8 × 0.8–1.2 cm, thickly papery, base cuneate, margin 8–20-spinose-serrulate or setose-serrate, apex acuminate. Inflorescence 3–5-fascicled racemes, 3–5 cm; bracts of inflorescence narrowly triangular, apically acute. Pedicel slender; floral bracts lanceolate. Sepals yellow; outer sepals narrowly triangular, apex acute; median and inner sepals lanceolate, subequal. Petals yellow, scarcely shorter than inner sepals, base clawed, with distinct glands, apex slightly retuse. Stamens long; anther connective prolonged, subconical, obtuse. Ovary conical; ovules 2, stipitate. Berry unknown. Fl. Oct, fr. unknown.

- Sichuan, Yunnan.

The cuneate base and the spinose-serrulate or setose margins of the leaflets of *Mahonia setosa* are distinct in the genus.

**12. Mahonia decipiens** C. K. Schneider in Sargent, Pl. Wilson. 1: 379. 1913.

鄂西十大功劳 e xi shi da gong lao

*Berberis decipiens* (C. K. Schneider) Laferrière.

Shrubs, 1–2 m tall. Leaves abaxially pale, adaxially dull green, elliptic, 15–20 × 7–11 cm; leaflets 2–7 pairs, lowest pair 4–6 cm above base of petiole, abaxial veins slightly branched, veins slightly raised on both surfaces; rachis ca. 2 mm in diam.; internodes 2.5–3.5 cm; leaflets separate or sometimes contiguous, ovate to ovate-elliptic, lowest similar to others, ovate, 3–5.5 × 1.5–3 cm, those above ovate to ovate-elliptic, 4.5–7 × 2.5–3.5 cm, base subtruncate, margin with 3–6 teeth on each side, apex acute; terminal leaflet much larger, 7.5–9.5 × 3.5–5 cm, petiolule 1.5–2 cm. Inflorescence 1 or 2 racemes, 4–6 cm; bracts of inflorescence ovate to narrowly ovate, 1–1.5 cm × 4–7 mm. Pedicel 2.5–3 mm; floral bracts ovate, 2–2.5 × ca. 1.5 mm. Sepals yellow; outer sepals ovate, 2.3–2.5 × 1.5–2 mm; median sepals broadly ovate, 3–3.5 × 2–2.5 mm; inner sepals elliptic, 5–6 × 3–4 mm. Petals yellow, obovate, 5–5.5 × 3–3.2 mm, base with distinct glands, apex emarginate, acute. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovary ca. 2.5 mm; ovules 2; style ca. 0.3 mm. Berry unknown. Fl. Apr–Aug, fr. unknown.

- Forests, thickets; 800–1500 m. W Hubei.

**13. *Mahonia paucijuga*** C. Y. Wu ex S. Y. Bao, *Acta Phytotax. Sin.* 25: 151. 1987.

景东十大功劳 *jing dong shi da gong lao*

*Berberis paucijuga* (C. Y. Wu ex S. Y. Bao) Laferrière.

Shrubs, 1–3 m tall. Leaves adaxially deep green, ovate, 17–30 × 10–15 cm; leaflets 2 or 3 pairs, lowest pair 2–8 cm above base of rachis, adaxial veins obviously raised, reticulate; rachis 2–3 mm in diam.; internodes 2–3 cm; leaflets shortly petiolulate, oblong-ovate or elliptic, 6–12 × 2.5–5.5 cm, thickly leathery, base broadly cuneate, margin 6–16-spinose-serrate on each side, apex acuminate or mucronate; terminal leaflet elliptic, ca. 2 cm, petiolulate. Inflorescence 4–6-fascicled racemes; bracts of inflorescence ovate, ca. 10 × 6 mm. Pedicel 4–5 mm; floral bracts linear-lanceolate, 8–12 mm, apex long acuminate. Sepals yellow; outer sepals narrowly triangular, ca. 2.5 mm; median sepals elliptic, ca. 6 × 3 mm, 3-veined, apex rounded; inner sepals oblong, ca. 5 mm. Petals yellow, oblong, ca. 5 × 2.4 mm, base with distinct glands, apex deeply emarginate, lobes obtuse. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovary ca. 3 mm; ovules 2; style absent. Berry slightly pruinose, narrowly ellipsoid, ca. 4 mm; style not persistent. Fl. Apr–May, fr. May–Jul.

• Open forests, along trails; 2500–3000 m. Yunnan.

**14. *Mahonia fortunei*** (Lindley) Fedde, *Bot. Jahrb. Syst.* 31: 130. 1901.

十大功劳 *shi da gong lao*

*Berberis fortunei* Lindley, *J. Roy. Hort. Soc.* 1: 231. 1846; *B. fortunei* var. *szechuanica* (Ahrendt) Laferrière; *Mahonia fortunei* var. *szechuanica* Ahrendt.

Shrubs, 0.5–2(–4) m tall. Leaves abaxially pale yellowish green, occasionally slightly glaucous, adaxially dull to deep green, obovate to obovate-elliptic, 10–28 × 8–18 cm; leaflets 2–5 pairs, lowest pair similar to others, 2–9 cm above base of petiole, abaxial veins branched, raised, adaxial veins indistinct; rachis 1–2 mm in diam.; internodes 1.5–4 cm, slightly decreasing in length apically; leaflets sessile or subsessile, narrowly lanceolate to narrowly elliptic, 4.5–14 × 0.9–2.5 cm, base cuneate, margin with 5–10 spinose teeth on each side, apex acute. Inflorescence 4–10-fascicled racemes, 3–7 cm; bracts of inflorescence lanceolate to triangular-ovate, 5–20 × 3–5 mm. Pedicel 2–2.5 mm; floral bracts ovate, 1.5–2.5 × 1–1.2 mm, apically acute. Sepals yellow; outer sepals ovate to triangular-ovate, 1.5–3 × ca. 1.5 mm; median sepals oblong-elliptic, 3.8–5 × 2–3 mm; inner sepals oblong-elliptic, 4–5.5 × 2.1–2.5 mm. Petals yellow, oblong, 3.5–4 × 1.5–2 mm, base with distinct glands, apex emarginate, lobes acute. Stamens 2–2.5 mm; anther connective not prolonged, truncate. Ovary 1.1–2 mm; ovules 2; style absent. Berry purplish blue, pruinose, globose, 4–6 mm in diam. Fl. Jun–Sep, fr. Sep–Nov.  $2n = 28^*$ .

• Forests, scrub thickets, roadsides, along streams, margins of cultivated fields; 300–2000 m. Chongqing, NE Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang.

This species is widely cultivated in China and also cultivated in Indonesia, Japan, and the United States.

Dippel (*Handb. Laubholz.* 3: 109. 1893) included the name "*Mahonia fortunei* Hort." in synonymy but within the treatment of this plant as *Berberis*, not *Mahonia*.

**15. *Mahonia eurybracteata*** Fedde, *Bot. Jahrb. Syst.* 31: 127. 1901.

宽苞十大功劳 *kuan bao shi da gong lao*

Shrubs, 0.5–2(–4) m tall. Leaves abaxially yellowish green, adaxially dark green, oblong-oblongeolate or oblong, 18–45 × 7–15 cm, with 5–9 pairs of obliquely ascending, mostly separate or sometimes contiguous leaflets; lowest pair of leaflets similar to and close to others, ca. 5 cm above base of petiole, abaxial venation open and raised, adaxial lateral veins inconspicuous; rachis 2–3 mm in diam.; internodes decreasing in length upward, 3–6 cm; leaflets linear or narrowly elliptic to elliptic-lanceolate or narrowly ovate, lowest 2.5–6 × 0.4–1.2 cm, those above increasing in length from base to apex, becoming 4–12.5 × 0.5–4 cm, base cuneate, margin 3–9-spinose-serrate, apex acuminate; terminal leaflet scarcely larger, 8–10 × 1.2–4 cm, sessile or petiolule to ca. 3 cm. Inflorescence 4–10-fascicled racemes, 5–10 cm; bracts of inflorescence ovate to ovate-oblong, 1–1.5 cm × 6–10 mm. Pedicel 1.5–5 mm, slender; floral bracts ovate, 1.2–3 × 0.8–2 mm. Sepals yellow; outer sepals ovate to ovate-oblong, 2–4.5 × 1–2 mm; median sepals elliptic, 3–4.5 × 1.6–2.8 mm; inner sepals elliptic, 3–5 × 1.8–3 mm. Petals elliptic or oblong, 3–4.3 × 1–2 mm, glands at base distinct or sometimes indistinct, apex slightly emarginate, lobes obtuse or rounded. Stamens 2–2.6 mm; anther connective not prolonged, truncate. Ovary 2–2.5 mm; ovules 2; stigma ca. 0.5 mm. Berry blue or reddish purple, pruinose, obovoid or oblong, 4–5 × 2–4 mm; style persistent. Fl. Jul–Nov, fr. Nov–May of following year.

• Forests, forest margins, streamsides, thickets, weedy slopes, open rocky ground; 200–2000 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

- 1a. Leaflets ca. 2 cm or more wide;  
pedicels 3–5 mm ..... 15a. subsp. *eurybracteata*  
1b. Leaflets ca. 1.5 cm or less wide;  
pedicels 1.5–2 mm ..... 15b. subsp. *ganpinensis*

**15a. *Mahonia eurybracteata* subsp. *eurybracteata***

宽苞十大功劳(原亚种) *kuan bao shi da gong lao* (yuan ya zhong)

*Berberis berberidifolia* (P. K. Hsiao & Y. S. Wang) Laferrière; *B. confusa* (Sprague) Laferrière; *B. eurybracteata* (Fedde) Laferrière; *Mahonia berberidifolia* P. K. Hsiao & Y. S. Wang; *M. confusa* Sprague; *M. ganpinensis* (H. Léveillé) Fedde var. *confusa* (Sprague) C. K. Schneider; *M. zemanii* C. K. Schneider.

Shrubs, 0.5–2(–4) m tall. Leaves oblong-oblongeolate, 25–45 × 8–15 cm, with 6–9 pairs of leaflets; leaflets ca. 2 cm or more wide. Pedicel 3–5 mm.

• Broad-leaved evergreen and bamboo forests, forest margins,

thickets, weedy slopes, open rocky ground; 300–2000 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

**15b. *Mahonia eurybracteata* subsp. *ganpinensis*** (H. Léveillé) T. S. Ying & Boufford in T. S. Ying, Fl. Reipubl. Popularis Sin. 29: 232. 2001.

安坪十大功劳 an ping shi da gong lao

*Berberis ganpinensis* H. Léveillé, Bull. Soc. Agric. Sarthe 59: 317. 1904; *B. confusa* var. *bournei* (Ahrendt) Laferrière; *Mahonia confusa* var. *bournei* Ahrendt; *M. ganpinensis* (H. Léveillé) Fedde.

Shrubs, (0.4–)0.5(–2) m tall. Leaves oblong, 18–35 × 7–14 cm, with 5–7 pairs of leaflets; leaflets ca. 1.5 cm or less wide. Pedicel 1.5–2 mm.

• Forests, forest margins, streamsides; 200–1200 m. Guizhou, Hubei, Sichuan.

**16. *Mahonia microphylla*** T. S. Ying & G. R. Long, Acta Phytotax. Sin. 37: 282. 1999.

小叶十大功劳 xiao ye shi da gong lao

Shrubs, ca. 1 m tall. Leaves abaxially pale yellowish green, adaxially green, narrowly elliptic, 17–20 × 3.5–4.5 cm, with 10–14 pairs of leaflets, lowest pair similar to others, close to 5–10 mm above base of petiole, abaxially venation inconspicuous, adaxially midvein slightly impressed, lateral veins slightly conspicuous; rachis 2–3 mm in diam.; internodes 1–2 cm; lowest pair of leaflets ovate or narrowly ovate, 1–1.5 cm × 5–9 mm, those above increasing in length from base to apex, becoming 1.5–2.5 × 0.8–1.2 cm, ovate to ovate-elliptic, base slightly oblique, rounded, or slightly cordate, apex acuminate; terminal leaflet larger than others, ovate-elliptic, 3–4.5 × 1–1.5 cm, sessile or petiolule 6–10 mm. Inflorescence 3–12-fascicled racemes, 4–13 cm; bracts of inflorescence ovate-lanceolate, 1–1.5 cm × ca. 5 mm. Pedicel 3–4 mm; floral bracts ovate, 2–2.2 × ca. 1 mm, apex acuminate. Flowers golden yellow, with sweet fragrance. Outer sepals ovate, ca. 2 × 1–1.1 mm; median sepals obovate-oblong, 3.4–3.8 × 2.1–2.2 mm, apex obtuse, rounded; inner sepals elliptic, 4.8–5 × 2.5–3 mm, apically obtuse. Petals narrowly elliptic, 4–4.1 × 1.8–2 mm, base with distinct glands, apex emarginate. Stamens ca. 2.5 mm; anther connective not prolonged, rounded. Ovary ovoid, ca. 2 mm; ovules 2 or 3; style absent. Berry bluish black, slightly pruinose, subglobose, 7–9 × 6–8 mm; style not persistent. Seeds usually 2. Fl. Oct–Nov, fr. Dec–Jan of following year.

• Forests and thickets on mountain ridges, summits of limestone mountains; 600–700 m. Guangxi (Rong'an).

**17. *Mahonia leptodonta*** Gagnepain, Bull. Soc. Bot. France 85: 166. 1938.

细齿十大功劳 xi chi shi da gong lao

*Berberis leptodonta* (Gagnepain) Laferrière.

Shrubs, (0.6–)1–2(–3) m tall. Leaves abaxially yellowish green, adaxially dull green, oblong, 15–18 × 10–14 cm, with 8–12 pairs of contiguous or slightly overlapping leaflets, lowest pair 0.5–1.5 cm above base of petiole, abaxially with raised

veins, adaxially with slightly impressed midvein, lateral veins indistinct; rachis 1–2.5 mm in diam.; internodes 1–3(–7) cm, decreasing in length upward; lowest leaflets suborbicular to ovate, 0.7–4 × 0.8–1.5 cm, those above lanceolate to narrowly ovate-oblong, (4.5–)7–10(–14) × 1.5–3 cm, base rounded to subcordate, margin finely 35–65(–130)-spinulose-serrulate on each side, apex caudate-acuminate. Inflorescence 5- or 6-fascicled racemes, 6–7 cm; bracts of inflorescence not seen. Pedicel 5–8 mm; floral bracts oblong, ca. 2 mm. Sepals yellow; outer sepals ovate, ca. 2 mm, apically acute; median sepals oblong, ca. 5 mm; inner sepals oblong, ca. 5 mm. Petals oblong, ca. 3 mm, base without glands, apex rounded, entire. Stamens ca. 2 mm, dilated below anthers; anther connective not prolonged, shortly mucronate. Ovary ca. 1.8 mm; ovules unknown; style absent. Berry unknown. Fl. Aug–Sep, fr. unknown.

• Forests, bamboo thickets, weedy slopes; 200–1500 m. Sichuan, Yunnan.

The combination of very thin leaflets with up to 130 spinulose serrulations on the margins and petals without glands is unique in *Mahonia* and instantly identifies *M. leptodonta*.

**18. *Mahonia retinervis*** P. K. Hsiao & Y. S. Wang, Acta Phytotax. Sin. 23: 310. 1985.

网脉十大功劳 wang mai shi da gong lao

*Berberis reticulineria* (C. Y. Wu ex S. Y. Bao) Laferrière (1997), not *B. reticulineria* T. S. Ying (1999); *B. retinervis* (P. K. Hsiao & Y. S. Wang) Laferrière (1997), not *B. retinervis* Triana & Planchon ex Weddell (1861); *Mahonia reticulineria* C. Y. Wu ex S. Y. Bao.

Shrubs, ca. 1 m tall. Leaves abaxially pale yellowish green, adaxially dull to slightly shiny green, elliptic, 15–23 × 9–12 cm, with 3–9 pairs of leaflets, lowest pair 0.5–1.2 cm above base of petiole, abaxially with 5–7 basal veins distinctly raised, reticulate veins indistinct, adaxially with distinctly raised reticulation; rachis 1.5–2.2 mm in diam.; internodes 2–5 cm; leaflets sessile, increasing in length and width from base to apex, thickly leathery, lowest pair of leaflets ovate, 1.5–3 × 1.2–2 cm, margin 2–11-spinose-serrate on each side, those above oblong-ovate or ovate-orbicular, 6–8 × 2.8–3.7 cm, base subrounded, oblique, margin indistinctly 3–11-spinose-serrate on each side, apex acuminate; terminal leaflet broadly ovate-orbicular, larger, 7–8 × ca. 5 cm, petiolule 2.5–3.2 cm. Inflorescence 5–10-fascicled racemes, 4–8 cm; bracts of inflorescence ovate-lanceolate, 1.5–2 cm × 7–9 mm. Pedicel 3–4.5 mm; floral bracts ovate to oblong, 2–3 × ca. 1 mm, apex acuminate or obtuse. Flowers pale yellow, ca. 3 mm in diam. Berry bluish black, slightly pruinose, oblong, ca. 7 × 4 mm; style persistent. Seeds 1. Fl. Aug–Sep, fr. Oct–Dec.

• Thickets on rocky slopes, open slopes; 1000–1500 m. Guangxi, Yunnan.

**19. *Mahonia bealei*** (Fortune) Carrière, Fl. Serres 10: 166. 1854.

阔叶十大功劳 kuo ye shi da gong lao

*Berberis bealei* Fortune, Gard. Chron. 1850: 212. 1850; *B. bealei* var. *planifolia* J. D. Hooker; *Mahonia bealei* var. *plani-*

*folia* (J. D. Hooker) Ahrendt; *M. japonica* Thunberg var. *bealei* (Fortune) Fedde; *M. japonica* var. *planifolia* (J. D. Hooker) H. Léveillé.

Shrubs or small trees, 0.5–4(–8) m tall. Leaves abaxially sometimes yellowish green, adaxially dull grayish green, narrowly obovate to oblong, 27–51 × 10–20 cm, with 4–10 pairs of leaflets, lowest pair 0.5–2.5 cm above base of petiole, abaxially very or slightly glaucous, venation indistinct on both surfaces; rachis 2–4 mm in diam.; internodes 3–10 cm, decreasing in length apically; leaflets increasing in length but decreasing in width from base to apex, thick, rigid, lowest pair ovate, 1.2–3.5 × 1–2 cm, with 1 or 2 teeth, those above suborbicular to ovate or oblong, 2–10.5 × 2–6 cm, base rounded, oblique, sometimes cordate, margin with 2–6 teeth on each side, apex cuspidate; terminal leaflet much larger, 7–13 × 3.5–10 cm, petiolule 1–6 cm or leaflets appearing sessile because of a basal lobe. Inflorescence erect, 3–9-fascicled racemes, 7–26 cm; bracts at base of inflorescence ovate to ovate-lanceolate, 1.5–4 × 0.7–1.2 cm. Pedicel 4–6 mm; floral bracts broadly ovate or ovate-lanceolate, 3–5 × 2–3 mm, apically obtuse. Sepals yellow; outer sepals ovate, 2.3–2.5 × 1.5–2.5 mm; median sepals elliptic, 5–6 × 3.5–4 mm; inner sepals oblong-elliptic, 6.5–7 × 4–4.5 mm. Petals obovate-elliptic, 6–7 × 3–4 mm, base with distinct glands, apex slightly emarginate, with rounded lobes. Stamens 3.2–4.5 mm; anther connective 1.1–1.3 mm, rounded to truncate. Ovary oblong-ovoid, ca. 3.2 mm; ovules 3 or 4; style short. Berry dark purple, pruinose, ovoid, ca. 1.5 × 1–1.2 cm; persistent style nearly absent. Fl. Sep–Jun of following year, fr. Mar–May.  $2n = 28^*$ .

• Forests, forest margins, weedy slopes, streamsides, roadsides, thickets; 500–2000 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Zhejiang.

This species is cultivated in Japan, Mexico, the warmer parts of Europe and the United States, and is naturalized in the SE United States.

**20. *Mahonia longibracteata*** Takeda, Notes Roy. Bot. Gard. Edinburgh 6: 236. 1917.

长苞十大功劳 chang bao shi da gong lao

*Berberis longibracteata* (Takeda) Laferrière.

Shrubs, 0.5–3 m tall. Leaves abaxially pale yellowish green, adaxially shiny, oblong, 14–23 × 6–11 cm, with 4 or 5 pairs of leaflets, lowest pair ca. 1 cm above base of petiole, abaxially with inconspicuously raised venation, adaxially with fairly close finely impressed reticulation; rachis 2–3 mm in diam.; internodes 2.5–4 cm, decreasing in length upward; lowest leaflets ovate, 1.5–2 × 1.2–2.2 mm, with 2 or 3 teeth on each side, those above oblong to ovate-lanceolate, 3–8 × 2–3.5 cm, base suboblique, cuneate-rounded, margin with (3 or) 4–7(–11) teeth on each side, apex mucronate or acuminate; terminal leaflet largest, petiolule 0.4–1.5 cm. Inflorescence 5–9-fascicled racemes, 6–9 cm; bracts of inflorescence narrowly ovate, 1.5–2 cm × 6–7 mm. Pedicel ca. 5 mm; floral bracts lanceolate, 7–9 × ca. 2.5 mm. Sepals yellow; outer sepals broadly lanceolate, 3–6 × 1–2.5 mm; median sepals oblong, 4–6 × 2–3 mm; inner sepals oblong-obovate, 5–6 × 2.5–3 mm. Petals oblong-elliptic, 4.1–4.5 × 2–3 mm, base with indistinct glands, apex entire. Stamens ca. 3 mm; anther connective narrow, not prolonged,

truncate. Ovary ca. 2.2 mm; ovules 2. Berry bright red, not pruinose, oblong, ca. 10 × 6 mm. Fl. Mar–May, fr. May–Oct.

• Forests, thickets, shaded slopes, sometimes in *Tsuga* forests; 1900–3300 m. SE Sichuan, Yunnan.

**21. *Mahonia polyodonta*** Fedde, Bot. Jahrb. Syst. 31: 126. 1901.

峨眉十大功劳 e mei shi da gong lao

*Berberis pachakshirensis* (Ahrendt) Laferrière; *B. polyodonta* (Fedde) Laferrière; *B. veitchiorum* Hemsley & E. H. Wilson; *Mahonia pachakshirensis* Ahrendt; *M. veitchiorum* (Hemsley & E. H. Wilson) C. K. Schneider.

Shrubs, 0.5–2 m tall. Leaves abaxially pale yellowish green, adaxially dull green, slightly shiny, oblong, 15–30 × 5–10 cm, with 4–8 pairs of leaflets, lowest pair 0.5–2.5(–4) cm above base of petiole, abaxially venation reticulate and raised, adaxially venation distinct, veins and veinlets sometimes impressed; rachis 2–2.5 mm in diam.; internodes (1.5–)3–6 cm, decreasing (rarely increasing) in length upward; leaflets sessile, lowest pair obovate-oblong, 2.5–6 × 1.2–2.3 cm, those above elliptic to ovate-oblong, 4–9 × 2–3 cm, base broadly cuneate to rounded, oblique, margin with 10–16 spinose teeth on each side, apex acuminate; terminal leaflet 8–12 × 2.4–3.7 cm, petiolule ca. 2 cm. Inflorescence 3–5-fascicled racemes, 5–6 cm; bracts of inflorescence ovate-lanceolate, ca. 2 × 1 cm. Pedicel 2–3(–6) mm; floral bracts broadly lanceolate, 6–11 × 3–5 mm. Flowers bright to sulfur-yellow. Outer sepals ovate, 3–4 × 2–2.5 mm; median sepals oblong-elliptic, 4–4.5 × 2–2.6 mm; inner sepals oblong, ca. 5 × 2.6–3 mm. Petals oblong, 3.5–4.2 × 2–2.1 mm, base with distinct glands, apex acutely emarginate, lobes rounded. Stamens ca. 3 mm; anther connective not prolonged, truncate. Ovary 2.7–3 mm; ovules 2. Berry bluish black, slightly pruinose, obovoid, 5–5.6 × 3–4 mm; style persistent, short, 0.5–1 mm. Fl. Mar–May, fr. May–Aug.

Forests, scrubby slopes, bamboo thickets, roadsides, rocky areas; (1300–)1800–3100 m. NE Guizhou, W Hubei, Sichuan, Xizang, Yunnan [India (Assam), Myanmar].

**22. *Mahonia napaulensis*** Candolle, Syst. Nat. 2: 21. 1821.

尼泊尔十大功劳 ni bo er shi da gong lao

*Berberis acanthifolia* (Wallich ex G. Don) Wallich ex Walpers; *B. gautamae* Laferrière; *B. griffithii* (Takeda) Laferrière; *B. leschenaultii* Wallich ex Wight & Arnott; *B. longlinensis* (Y. S. Wang & P. K. Hsiao) Laferrière; *B. manipurensis* (Takeda) Laferrière; *B. miccia* Walpers, nom. illeg. superfl.; *B. napaulensis* (Candolle) Laferrière; *B. napaulensis* var. *leschenaultii* (Wallich ex Wight & Arnott) J. D. Hooker & Thomson; *B. pomensis* (Ahrendt) Laferrière; *B. salweenensis* (Ahrendt) Laferrière; *Mahonia acanthifolia* Wallich ex G. Don; *B. griffithii* Takeda; *M. leschenaultii* (Wallich ex Wight & Arnott) Takeda; *M. longlinensis* Y. S. Wang & P. K. Hsiao; *M. manipurensis* Takeda; *M. miccia* Buchanan-Hamilton ex D. Don, nom. illeg. superfl.; *M. napaulensis* var. *leschenaultii* (Wallich ex Wight & Arnott) Fedde; *M. pomensis* Ahrendt; *M. salweenensis* Ahrendt; *M. sikkimensis* Takeda.

Shrubs or small trees, 1–7 m tall. Leaves abaxially yellowish green, ± shiny, adaxially dark green, ± shiny, elliptic to ovate, 17–61 × 7–19 cm, with 5–12 pairs of leaflets, lowest 0.5–2(–4) cm above base of petiole, abaxially venation reticulate, raised, adaxially main veins impressed, others impressed or slightly raised; rachis 2–4 mm in diam.; internodes (1–)2–5(–8.3) cm, decreasing in length upward; leaflets oblong, oblong-ovate, or ovate to ovate-lanceolate, lowest 1.3–3.7 × 1.2–2.4 cm, those above 2–9.5 × 1.5–5 cm, base broadly cuneate, rounded, or sometimes subcordate, oblique, margin with 3–10 teeth on each side, apex acute, acuminate, or cuspidate; terminal leaflet larger, 6–10 × 2–3 cm, sessile or petiolule to ca. 2.5 cm. Inflorescence 3–18-fascicled racemes, 7–23 cm; bracts of inflorescence oblong to ovate or ovate-lanceolate, 1–3.5 × 0.5–1.5 cm. Pedicel 3–9 mm; floral bracts lanceolate, ovate, or oblong, 2–6 × 1–3 mm. Flowers yellow to deep yellow, mildly fragrant. Outer sepals triangular-ovate or ovate to suborbicular, 2–3.2 × 1–2.4 mm; median sepals ovate to oblong, 3.5–5.2 × 2–3.3 mm; inner sepals elliptic to oblong-elliptic, 5–7 × 2.6–3.5 mm. Petals elliptic to oblong-elliptic, 3.6–7 × 1.6–3.2 mm, base with glands distinct or sometimes indistinct, apex emarginate to narrowly clawed. Stamens 3.5–7 mm; anther connective prolonged, apiculate to rounded. Ovary 3.2–4 mm; ovules 2–6; style 0.7–1.5 mm. Berry bluish black, pruinose, oblong, 5–7 mm in diam. Fl. Jun–Jan, fr. Jan–Jul.  $2n = 28$ .

Forests, forest margins, thickets; 1200–3000 m. S Sichuan, SE Xizang, Yunnan [Bhutan, India, Myanmar, Nepal; cultivated in Australia, S Europe, Indonesia, Sri Lanka, and other parts of the world].

**23. *Mahonia cardiophylla*** T. S. Ying & Boufford in T. S. Ying, Fl. Reipubl. Popularis Sin. 29: 308. 2001.

宜章十大功劳 *yi zhang shi da gong lao*

Shrubs, 1–2 m tall. Leaves abaxially yellowish green, adaxially dull, elliptic, 20–40 × 8–15 cm, with 8–10 pairs of leaflets, lowest pair 1–1.5 cm above base of petiole, abaxially with raised veins, adaxially with conspicuously impressed veins; rachis 2–3 mm in diam.; internodes 2–4.5(–7) cm, decreasing in length apically; leaflets thickly leathery, lowest pair ovate, 2–3 × 1–2 cm, with 2 or 3 teeth, those above ovate to ovate-elliptic, 3–9 × 2–4 cm, base cordate or sometimes rounded, margin sometimes with 3–8 teeth on each side, apex cuspidate; terminal leaflet 4–7 × 2.3–3.5 cm, petiolule 1–2 cm. Inflorescence 5–13-fascicled racemes, 10–17 cm; bracts of inflorescence ovate, 1–2 cm × 6–10 mm. Pedicel 2.5–3 mm; floral bracts ovate-lanceolate, 3–5 × 1.2–2 mm. Sepals yellow; outer sepals triangular-ovate, 2.7–2.8 × 1.5–1.6 mm; median sepals ovate, 4.5–4.7 × 2.1–2.2 mm; inner sepals elliptic, 5–5.1 × 2.4–2.5 mm. Petals obovate, 4.3–4.5 × 2–2.3 mm, base with distinct glands, apex incised. Stamens ca. 3.2 mm; anther connective not prolonged, truncate. Ovary ca. 2.5 mm; ovules 2; style ca. 0.5 mm. Berry bluish purple, pruinose, ovoid, 7–10 × 4–7 mm; style persistent. Fl. Feb–Apr, fr. May–Jun.

• Forests; 1500–1700 m. Guangxi, S Hunan, SE Sichuan, SE Yunnan.

**24. *Mahonia nitens*** C. K. Schneider in Sargent, Pl. Wilson. 1: 379. 1913.

亮叶十大功劳 *liang ye shi da gong lao*

*Berberis nitens* (C. K. Schneider) Laferrière (1997), not Schrader (1838); *B. schochii* (C. K. Schneider ex Handel-Mazzetti) Laferrière; *Mahonia schochii* C. K. Schneider ex Handel-Mazzetti.

Shrubs, 0.5–1.5 m tall. Leaves shiny, abaxially yellowish green, adaxially dull green, narrowly oblong to elliptic, 16–43 × 4.5–13 cm, with 5–8 pairs of leaflets, lowest pair 0.5–2 cm above base of petiole, both surfaces with slightly raised open reticulation; rachis 1.5–2.5 mm in diam.; internodes 2.5–7 cm, longest in middle and decreasing toward both ends or decreasing in length upward; leaflets sessile, basal pair smaller than others, oblong, 2–4 × 1–1.5 cm, with 1–3 teeth on each side, those above ovate to elliptic, 5–14 × 1.5–3.8 cm, base cuneate, with 1–6 coarse sinuate-spinose teeth on each side, apex caudate-acuminate to attenuate, cuspidate; terminal leaflet longer but sometimes narrower than lateral leaflets, petiolule 2–3 cm. Inflorescence 5–10-fascicled racemes, 9–15 cm; bracts of inflorescence lanceolate to ovate, 1–2.5 cm × 5–8 mm. Pedicel 1.5–3 mm; floral bracts ovate-lanceolate to ovate or oblong-ovate, 2–4 × 1.3–2 mm. Flowers yellow, sometimes pink. Outer sepals ovate to oblong-elliptic, 1.5–3.5 × 1–1.8 mm; median sepals narrowly ovate to oblong, 3.3–3.5 × 2–2.5 mm; inner sepals elliptic, 3.5–4.5 × 2–2.7 mm. Petals oblong to oblong-elliptic, 2.7–4 × 1.5–2 mm, base with distinct glands, apex emarginate. Stamens 1.8–3.1 mm; anther connective not or slightly prolonged, truncate or rounded. Ovary 1.3–2.5 mm; ovules 2(or 3). Berry bluish purple, pruinose, ovoid, 7–10 × 4–7 mm; style persistent, 1–2 mm. Fl. Jun–Oct, fr. Oct–Mar.

• Mixed forests, thickets, streamsides, slopes; 600–2000 m. Guizhou, Sichuan.

**25. *Mahonia conferta*** Takeda, Notes Roy. Bot. Gard. Edinburgh 6: 230. 1917.

密叶十大功劳 *mi ye shi da gong lao*

*Berberis henryi* Laferrière.

Shrubs or small trees, 1.5–5 m tall. Leaves abaxially ± shiny to dull pale green, adaxially shiny, elliptic to narrowly oblanceolate, 8–38 × 5–10 cm, thickly leathery, with 8–18 overlapping pairs of leaflets, lowest pair ca. 1 cm above base of petiole, abaxially loosely veined, adaxially veins indistinct; internodes decreasing in length upward, 1.7–3.5 cm; leaflets sessile, increasing in length upward, width decreasing slightly upward, so that leaflet shape changes from broadly ovate to narrowly ovate or oblong, 2.5–7 × 2–3 cm, thick, rigid, base truncate, oblique, proximal margin with 2 or 3 teeth, distal margin with 3–5 teeth, apex a bent cup, 1.5–2.3 cm × 5–8 mm; terminal leaflet ca. 7 × 3 cm, petiolule ca. 1.2 cm. Inflorescence 3–6-fascicled racemes, 11–18 cm; bracts of inflorescence ovate to ovate-lanceolate, 10–15 × 5–7 mm. Pedicel 5–5.5 mm; floral bracts broadly lanceolate, 4.5–5 × 1.6–2.3 mm. Sepals yellow; outer sepals oblong-ovate, 2.7–3 × 1.5–2.2 mm; median sepals broadly elliptic, 5–5.1 × ca. 3 mm; inner sepals oblong-ovate, 8–9 × 4–4.5 mm. Petals oblong-obovate, 7–8 × 3.5–4.2 mm, base with distinct glands, apex emarginate. Stamens ca. 5 mm; anther connective prolonged, shortly apiculate. Ovary ellipsoid, ca. 5.5 mm; ovules 3; style ca. 1.5 mm. Berry ellipsoid, slightly pruinose, ca. 10 × 5–6 mm; style persistent. Fl. Jun–Oct, fr. Oct–Dec.

- Forests, shaded places on slopes; 1500–2100 m. Yunnan.

*Mahonia conferta* is probably not distinct from *M. napaulensis*, with which it should be combined.

**26. *Mahonia imbricata*** T. S. Ying & Boufford in T. S. Ying, Fl. Reipubl. Popularis Sin. 29: 309. 2001.

遵义十大功劳 zun yi shi da gong lao

Shrubs, 1.5–4 m tall. Leaves abaxially yellowish green, adaxially dull, narrowly obovate-elliptic to oblong, 15–20 × 7–10 cm, with 5–7 pairs of leaflets, lowest pair ca. 5 mm above base of petiole, abaxially with raised veins, adaxially with impressed veins; rachis 1.5–2 mm in diam.; internodes 1.5–2.5 cm, decreasing slightly in length apically; leaflets thick, lowest suborbicular, 1–3 × 1–1.5 cm, margin 2- or 3-spinose-serrate, those above narrowly ovate to ovate-elliptic, 3–6.5 × 1.3–2.5 cm, base rounded to slightly cordate, oblique, margin with 2–5 teeth on each side, apex cuspidate; terminal leaflet larger than others, ca. 7.5 × 3 cm, petiolule ca. 1.5 cm. Inflorescence 9- or 10-fascicled racemes, 8–13 cm; bracts of inflorescence ovate, 1.5–2 cm × 5–7 mm. Pedicel 3–4 mm; floral bracts ovate, 3.5–4 × 2–2.2 mm, apex obtuse. Sepals yellow; outer sepals ovate, 2.7–3 × 1.3–1.5 mm; median sepals elliptic, ca. 4.5 × 2.5–2.6 mm; inner sepals elliptic to oblong, 5–5.2 × ca. 3 mm. Petals elliptic, 4.5–5 × ca. 2 mm, base with distinct glands, apex incised. Stamens 2.5–2.8 mm; anther connective not prolonged, truncate. Ovary 2.5–3 mm; ovules 2. Immature berry pruinose. Fl. Mar–Apr, fr. Apr–Jul.

- Slopes in evergreen broad-leaved forests, thickets; 1200–2400 m. Guizhou, Yunnan.

**27. *Mahonia bodinieri*** Gagnepain, Bull. Soc. Bot. France 55: 85. 1908.

小果十大功劳 xiao guo shi da gong lao

*Berberis bodinieri* (Gagnepain) Laferrière (1997), not H. Léveillé (1911); *B. elegans* H. Léveillé (1904), not K. Koch (1869); *B. japonica* (Thunberg) R. Brown var. *trifurca* (Lindley & Paxton) Rehder; *B. leveilleana* (C. K. Schneider) Laferrière; *B. trifurca* Lindley & Paxton; *Mahonia elegans* Rehder; *M. japonica* (Thunberg) Candolle var. *trifurca* (Lindley & Paxton) Ahrendt; *M. leveilleana* C. K. Schneider.

Shrubs or small trees, 0.5–4 m tall. Leaves abaxially yellowish green, adaxially dark green, lucid, obovate-oblong, 20–50 × 10–25 cm, with 8–13 pairs of leaflets, lowest pair close to base of petiole, abaxially coarsely reticulate, with raised veins; rachis stout, 2–4 mm in diam.; internodes (2–)5–9 cm, decreasing in length upward; leaflets shortly petiolulate or sessile, lowest suborbicular, 2.5–3 × 1.5–2.5 cm, those above becoming oblong to broadly lanceolate, 5–16.5 × 2.5–5.5 cm, base oblique, truncate to cuneate, margins of lowest leaflets with 1–3 coarse teeth 5–15 mm, middle leaflets with 3–10 smaller teeth 3–10 mm, upper leaflets with few (sometimes 1 or 2) fine teeth 2–3 mm; terminal leaflet 5–15 × 1.5–5.5 cm, petiolule 1–2 cm. Inflorescence 5–11-fascicled racemes, 10–22(–25) cm; bracts of inflorescence lanceolate, 2–3 cm × 5–7 mm. Pedicel 1.5–5 mm; floral bracts narrowly ovate, 1.5–4 × 0.7–2.5 mm. Sepals yellow; outer sepals ovate, ca. 3 × 2 mm;

median sepals elliptic, 4.5–5 × ca. 2.5 mm; inner sepals narrowly elliptic, ca. 5.5 × 3 mm. Petals oblong, subequal to median sepals, 4.5–5 × 2–2.4 mm, base with indistinct glands, apex emarginate. Stamens 2.2–3 mm; anther truncate and 3-denticulate at apex; anther connective not prolonged. Ovary ca. 2 mm; ovules 2; style absent. Berry purplish black, pruinose, globose or sometimes pyriform, 4–6 mm in diam.; style not persistent. Fl. Jun–Sep, fr. Aug–Dec.

- Broad-leaved evergreen forests, mixed broad-leaved evergreen and deciduous forests, *Juniperus* forests, scrub thickets, forest margins, streamsides; 100–1800 m. Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Zhejiang.

**28. *Mahonia sheridaniana*** C. K. Schneider in Sargent, Pl. Wilson. 1: 384. 1913.

长阳十大功劳 chang yang shi da gong lao

*Berberis fargesii* (Takeda) Laferrière; *B. huiliensis* (Handel-Mazzetti) Laferrière; *B. sheridaniana* (C. K. Schneider) Laferrière; *Mahonia fargesii* Takeda; *M. huiliensis* Handel-Mazzetti.

Shrubs, 0.3–3 m tall. Leaves abaxially pale, adaxially dull to ± shiny, elliptic to oblong-oblong-lanceolate, 17–36 × 8–14 cm, with 4–9 pairs of leaflets, lowest pair 7–10 mm above base of petiole, abaxially with venation slightly branched and slightly raised, adaxially indistinctly veined; internodes 1.5–5 cm, decreasing in length upward; leaflets separate or sometimes contiguous, ovate to ovate-lanceolate, thick, rigid, lowest pair 1.2–3 × 0.8–1.5 cm, increasing in size upward and becoming 3–9.5 × 1.5–3.6 cm, base broadly rounded to subtruncate or subcordate, slightly oblique, margin with 2–5 teeth on each side, apex acute, cuspidate; terminal leaflet equal to or much larger than others, 6.5–11 × 2.5–4 cm, petiolule 0.8–2.5 cm. Inflorescence 4–10-fascicled racemes, 5–18 cm; bracts of inflorescence broadly lanceolate to ovate, 1–2 × 0.5–1.2 cm. Pedicel 3–5 mm; floral bracts ovate, 2–3.5 × 1–1.7 mm. Sepals yellow; outer sepals narrowly ovate or ovate to ovate-lanceolate, 2.5–4.5 × 1.5–1.6 mm; median sepals ovate to ovate-lanceolate, 4.5–6 × 2–3 mm; inner sepals elliptic, 5.5–8.2 × 3–3.8 mm. Petals obovate or elliptic to oblong, 5–6.5 × 2–2.8 mm, base with distinct glands, apex emarginate. Stamens 3–4 mm; anther connective not prolonged, truncate. Ovary 2–3 mm; ovules 2 or 3; style ca. 0.3 mm. Berry bluish black or dark purple, pruinose, ovoid to ellipsoid, 8–10 × 4–7 mm; style persistent, short. Fl. Mar–Apr, fr. Apr–Jun.

- Evergreen broad-leaved forests, bamboo forests, thickets, trailsides, slopes; 1200–2600 m. SC Hubei, Sichuan.

**29. *Mahonia japonica*** (Thunberg) Candolle, Syst. Nat. 2: 22. 1821.

台湾十大功劳 tai wan shi da gong lao

*Ilex japonica* Thunberg in Murray, Syst. Veg., ed. 14, 168. 1784; *Berberis japonica* (Thunberg) R. Brown; *B. japonica* var. *gracillima* (Fedde) Rehder; *B. tikushiensis* (Hayata) Laferrière; *Mahonia japonica* var. *gracillima* Fedde; *M. tikushiensis* Hayata.

Shrubs, ca. 1 m tall. Leaves abaxially pale green, adaxially deep green, oblong, 15–27 × 5–10 cm, with 4–6 pairs of sessile

leaflets, lowest pair ca. 0.5 cm above base of petiole, abaxially not pruinose, with branched raised venation; rachis 2–3 mm in diam.; internodes 2–4 cm, decreasing in length upward; leaflets ovate, lowest 1.8–2.7 × 1.2–2 cm, becoming larger upward, 3.5–7 × 2–4 cm, base oblique and ± cordate, margin with 2–4 teeth on proximal side, 3–7 teeth on distal margin, apex acute; terminal leaflet larger, ± cordate at base, petiolule 1–2 cm. Inflorescence 5–10-fascicled drooping racemes, 5–10 cm; bracts of inflorescence ovate to ovate-lanceolate, 0.8–1.5 cm × 4–7 mm, apically acuminate. Pedicel 6–7 mm; floral bracts ovate, 3.5–4 × 2–2.5 mm, apex obtuse. Sepals yellow; outer sepals ovate, 2.5–2.7 × 2.2–2.3 mm, apically obtuse; median sepals broadly obovate, 3.3–3.5 × 2.8–2.9 mm; inner sepals obovate-oblong, 6–6.4 × 3.4–3.5 mm. Petals elliptic, 5.5–6 × 2.5–2.6 mm, base with distinct glands, apex emarginate. Stamens ca. 3.3 mm; anther connective slightly prolonged, rounded. Ovary ca. 3.4 mm; ovules 4–7. Berry dark purple, ± pruinose, ovoid, ca. 8 × 4 mm; style persistent and short, or not persistent. Fl. Dec–Apr, fr. Apr–Aug.  $2n = 28^*$ .

- Forests, thickets; 800–3400 m. Taiwan.

This species is cultivated extensively in Japan and sporadically in the warmer parts of Europe and the United States.

**30. *Mahonia fordii*** C. K. Schneider in Sargent, Pl. Wilson. 1: 383. 1913.

北江十大功劳 bei jiang shi da gong lao

*Berberis fordii* (C. K. Schneider) Laferrière.

Shrubs, 0.8–1.5 m tall. Leaves abaxially pale, adaxially dull, oblong to narrowly oblong, 20–35 × 7–11 cm, with 5–9 pairs of remote leaflets, lowest pair 1–1.5 cm above base of petiole, abaxially not veined, adaxially slightly veined; rachis 1.5–2.5 mm in diam.; internodes decreasing in length apically, 2–7 cm; lowest pair of leaflets narrowly ovate, 3.5–4.5 × 1.5–2.4 cm, those above narrowly ovate to elliptic-ovate, equal in size, 5–8 × 1.8–2.7 cm, base broadly rounded to cuneate, margin 2–9-spinose-serrate, apex acuminate; terminal leaflet similar to others but slightly larger, petiolule 1.5–2 cm. Inflores-

cence 5–7-fascicled racemes, 6–15 cm; bracts of inflorescence ovate to ovate-lanceolate, 1–1.5 cm × 6–8 mm. Pedicel 2.5–4 mm; floral bracts broadly ovate, 1.5–2 × 0.6–1 mm. Sepals yellow; outer sepals ovate, ca. 2 × 1.6 mm; median sepals elliptic, 3.5–4 × 2.5–3 mm, apically obtuse; inner sepals obovate-elliptic, 4–4.5 × ca. 3 mm. Petals elliptic, ca. 4 × 2.3 mm, base with distinct glands, apex emarginate. Stamens ca. 2.6 mm; anther connective not prolonged, truncate. Ovary ca. 2.3 mm; ovules 2. Berry (immature only) obovoid, ca. 7 × 5 mm; style persistent, short. Fl. Jul–Sep, fr. Oct–Dec.

- Forests, thickets; 800–900 m. Chongqing, Guangdong.

**31. *Mahonia hancockiana*** Takeda, Notes Roy. Bot. Gard. Edinburgh 6: 231. 1917.

滇南十大功劳 dian nan shi da gong lao

*Berberis hancockiana* (Takeda) Laferrière.

Shrubs, ca. 1.5 m tall. Leaves abaxially pale, adaxially dull grayish green, oblong-obovate, 19–32 × 10–15 cm, with 4–9 pairs of sessile leaflets, lowest pair 0.5–2 cm above base of petiole, abaxially with branched veins and primary veins ± raised, adaxially ± not veined; rachis ca. 2 mm in diam.; internodes decreasing upward, 2–6 cm; lowest leaflets narrowly ovate, 1.5–4 × 1–2 cm, middle leaflets elliptic, 3–11 × 1.8–2.8 cm, base broadly cuneate or rounded, margin with apiculate to shallowly serrate teeth, apex cuspidate-acuminate; terminal leaflet similar to middle leaflets, petiolule 1–2 cm. Inflorescence 4–15-fascicled racemes, 12–19 cm; bracts of inflorescence lanceolate, ca. 2.5 × 0.5 cm. Pedicel 2–3 mm; floral bracts ovate, 3–3.5 × 1.5–1.8 mm. Flowers deep yellow (? or violet). Outer sepals ovate, 2–3 × 1.5–2 mm, apically obtuse; median sepals ovate-elliptic, 4.5–5 × 2.4–3 mm; inner sepals obovate-elliptic, 4.6–6 × 2.6–3.2 mm. Petals elliptic, 4–4.4 × 1.8–2 mm, base with distinct glands, apex emarginate with rounded lobes. Stamens ca. 3.2 mm; anther connective prolonged, rounded. Ovary ca. 3.5 mm; ovules 4 or 5; style ca. 1 mm. Berry unknown. Fl. Feb, fr. unknown.

- Mixed forests, rocky hills; 1000–3200 m. SE Yunnan.

#### Insufficiently known species

***Mahonia annamica*** Gagnepain, Bull. Soc. Bot. France 55: 84. 1908.

*Berberis annamica* (Gagnepain) Laferrière.

This species was described from Vietnam and reported for Guangxi. We have not seen specimens from Guangxi and are unsure of its placement.

***Mahonia bijuga*** Handel-Mazzetti, Symb. Sin. 7: 331. 1931.

This species was described from Sichuan (“Lose-schan s von S of Ningyüen,” 3300 m), based on *H. v. Handel-Mazzetti 1430* (?W), but we have not seen the type.

***Mahonia dulongensis*** H. Li, Ann. Bot. Fenn. 46: 469. 2009.

This species was recently described from Yunnan (Gongshan, Dulong Jiang, 1620 m, 5 Nov 2005), based on *Gaoligongshan Biodiversity Survey 21834* (holotype, KUN; isotypes, CAS, E).

***Mahonia hypoleuca*** Takeda, Notes Roy. Bot. Gard. Edinburgh 6: 238. 1917.

*Berberis nivea* (C. K. Schneider) Laferrière; *Mahonia nivea* C. K. Schneider.

Both *Mahonia hypoleuca* and *M. nivea* are based on *A. Henry 9863*, from Mengtze, Yunnan, which is without flowers and fruit and the only collection known.

***Mahonia jingxiensis*** J. Y. Wu, M. Ogisu, H. N. Qin & S. N. Lu, Bot. Stud. (Taipei) 50: 487. 2009.

This species was recently described from Guangxi (Jingxi Xian, Sanhe Xiang, Niansi Tun, ca. 500 m, 23 Oct 2007), based on *J. Y. Wu & M. Ogisu 1023* (holotype, PE; isotype, IBK).

***Mahonia lushuiensis*** T. S. Ying & H. Li, Ann. Bot. Fenn. 46: 472. 2009.

This species was recently described from Yunnan (Lushui County, Luzhang Township, 325 m, 19 May 2005), based on *Gaoligongshan Biodiversity Survey 24522* (holotype, KUN; isotypes, CAS, E).

**4. SINOPODOPHYLLUM** T. S. Ying, *Acta Phytotax. Sin.* 17(1): 15. 1979.

桃儿七属 tao er qi shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

Herbs, perennial. Rhizomes stout, shortly nodose; aerial stems erect, with large brown scales at base. Leaves 2, simple, petio-  
lulate; base cordate, apex 3–5-dissected, usually to ca. midway or more, sometimes partitions 2- or 3-lobed. Inflorescence terminal.  
Flowers appearing before leaves, bisexual, solitary, pink, large. Sepals 6, caducous. Petals 6, open. Anthers basifixed, dehiscent  
longitudinally. Pistils 1; ovary ellipsoid, 1-loculed, with numerous ovules. Fruit a berry. Seeds numerous, without fleshy arils. Pollen  
grains in tetrads.  $2n = 12^*$ ,  $14^*$ .

One species: E Afghanistan, Bhutan, China, N India, Kashmir, Nepal, and Pakistan.

*Sinopodophyllum* was included within *Podophyllum* by Shaw (in Stearn, *Gen. Epimedium*, 258. 2002).

**1. Sinopodophyllum hexandrum** (Royle) T. S. Ying in C. Y. Wu, *Fl. Xizang*. 2: 119. 1985.

桃儿七 tao er qi

*Podophyllum hexandrum* Royle, *Ill. Bot. Himal. Mts.* 1: 64. 1834; *P. emodi* Falconer ex Royle; *P. emodi* var. *chinense* Sprague; *Sinopodophyllum emodi* (Falconer ex Royle) T. S. Ying.

Plants 20–50 cm tall. Stems solitary, angulate, glabrous. Leaf petiole 10–25 cm; leaf blade orbicular, not peltate, 11–20 × 18–30 cm, thinly papery, abaxially pubescent, adaxially glabrous, base cordate, 3–5-dissected to ca. midway or more, often

partitions 2- or 3-lobed, apex of lobes acute or acuminate, margin entire or coarsely dentate, teeth apiculate. Petals obovate or obovate-oblong, 2.5–3.5 × 1.5–1.8 cm, apex slightly sinuate. Stamens ca. 1.5 cm; filaments slightly shorter than anthers, 4–6 mm; anthers linear, 5–7 × 1.2–1.9 mm, apex rounded, obtuse; anther connective not prolonged. Pistils ca. 1.2 cm; ovary with parietal placentation; style short, 1–3 mm. Berry red, ovoid-globose, 4–7 × 2.5–4 cm, fleshy. Seeds maroon, ovoid-triangular. Fl. May–Jun, fr. Jul–Sep.

Forests, thickets, wet forest margins, weedy places, meadows; 2200–4300 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [E Afghanistan, Bhutan, N India, Kashmir, Nepal, Pakistan].

**5. PLAGIORHEGMA** Maximowicz, *Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans* 9 [Prim. Fl. Amur.]: 34. 1859.

鲜黄连属 xian huang lian shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

Herbs, perennial. Rhizome slender, with dense fibrous roots branched; aerial stems absent. Leaves basal, simple, long petio-  
late; leaf blade suborbicular in gross outline, not lobed, glabrous, base deeply cordate, venation palmate. Inflorescence terminal; flowers  
solitary, pale purple. Sepals 6, caducous, petal-form. Petals 6. Stamens opposite petals; filaments flat. Pistils 1; stigma disciform;  
ovules numerous, placentation marginal. Capsules leathery, obliquely dehiscent longitudinally. Seeds numerous, black.  $2n = 12$ .

One species: China, Korea, and Russia.

*Plagiorhegma* was included within *Jeffersonia* by Stearn (*Gen. Epimedium*, 222. 2002).

**1. Plagiorhegma dubium** Maximowicz, *Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans* 9 [Prim. Fl. Amur.]: 34. 1859.

鲜黄连 xian huang lian

*Jeffersonia dubia* (Maximowicz) Benth & J. D. Hooker ex Baker & S. Moore; *J. manchuriensis* Hance.

Plants 10–30 cm tall, glabrous. Rhizome with cross section bright yellow, producing 4–6 foliage leaves or flowering shoots per year; aerial stems absent. Leaf petiole 10–30 cm, glabrous; leaf blade abaxially grayish green, suborbicular, 6–8 × 9–10 cm, membranous, base deeply cordate, margin entire or

repand, apex obtusely emarginate, apiculate. Scapes 15–20 cm. Sepals caducous, purplish red, oblong-lanceolate, ca. 6 mm, striate, glabrous. Petals 6, obovate, ca. 1 × 0.6 cm, base attenuate. Stamens ca. 6 mm; filaments flat, ca. 2 mm; anthers ca. 4 mm. Pistil ca. 4 mm, glabrous; ovules numerous; style ca. 2 mm; stigma rugosely undulate on margin. Capsules yellowish brown, fusiform, ca. 1.5 cm, obliquely dehiscent from top toward base; style ca. 3 mm. Fl. May–Jun, fr. Sep–Oct.

Needle-leaved forests, mixed forests, thickets, shaded and wet places on slopes; 500–1100 m. Jilin, Liaoning [Korea, Russia (along Amur River)].

**6. DYSOSMA** Woodson, *Ann. Missouri Bot. Gard.* 15: 338, t. 46. 1928.

鬼臼属 gui jiu shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

Herbs, perennial. Rhizomes creeping, short, stout, with numerous fibrous roots; aerial stems erect, simple, glabrous, with large

scales at base. Leaves peltate, large, 3–9-parted or lobed. Inflorescence of few fascicled flowers or a subumbel. Flowers perfect, nutant. Sepals 6, membranous, caducous. Petals 6, dark purplish red. Filaments decumbent, flat; anthers introrsely dehiscent; anther connective wide and usually prolonged; pollen grains 3-colpate, subspheroidal or suboblate, sexine thicker than nexine, foveolate. Pistils solitary; ovary 1-loculed; ovules numerous; stigma globose. Berry red or purplish red. Seeds numerous, without arils.  $2n = 12$ .

Between seven and ten species: China and N Vietnam; seven species (six endemic) in China; three additional species (all endemic, described under *Podophyllum*) are insufficiently known.

*Dysosma* was included within *Podophyllum* by Shaw (in Stearn, Gen. *Epimedium*, 269. 2002).

- 1a. Leaves opposite, flowers attached at base of petiole.  
 2a. Lobes of leaf apically 3-fid; petals oblong, to 6 cm ..... 7. *D. delavayi*  
 2b. Lobes of leaf apically not divided; petals obovate-elliptic, ca. 3 cm.  
 3a. Leaf blade glabrous, palmately lobed, lobes triangular-ovate ..... 5. *D. pleiantha*  
 3b. Leaf blade pubescent on both surfaces, palmately parted, lobes cuneate-oblong ..... 6. *D. tsayuensis*
- 1b. Leaves alternate, flowers attached near or far from base of blade.  
 4a. Flowers attached far from base of blade; petals obovate, 1.4–1.6 cm ..... 4. *D. aurantiocaulis*  
 4b. Flowers attached near base of blade; petals oblong, lanceolate, or obovate, 2.4–10 cm.  
 5a. Leaf lobes apically 3-fid; petals elliptic-lanceolate ..... 1. *D. majoensis*  
 5b. Leaf lobes apically not divided; petals spatulate-obovate or oblong-loriform.  
 6a. Leaves 4–9-lobed or deeply divided; petals spatulate-obovate; berry ca. 4 cm, ellipsoid or ovoid ..... 2. *D. versipellis*  
 6b. Leaves mostly undivided; petals oblong-loriform; berry 1.7–2.7 cm, globose ..... 3. *D. difformis*

**1. *Dysosma majoensis*** (Gagnepain) M. Hiroe, Pl. Basho's & Buson's Hokku Lit. 8(3): 328. 1973 [*"majoense"*].

贵州八角莲 *gui zhou ba jiao lian*

*Podophyllum majoense* Gagnepain, Bull. Soc. Bot. France 85: 167. 1938; *Dysosma guangxiensis* Y. S. Wang; *D. lichuanensis* Z. Zheng & Y. J. Su; *D. majoensis* var. *emeiensis* J. L. Wu & P. Zhuang; *P. guangxiense* (Y. S. Wang) J. M. H. Shaw.

Plants ca. 50 cm tall. Rhizomes brown, stout, nodose, fibrous roots numerous. Stems erect, angulate, puberulent. Leaves alternate; petiole 4–20 cm; leaf blade abaxially grayish purple, adaxially dark green, reniform-orbicular, 10–20 × ca. 20 cm, thinly papery, abaxially puberulent, deeply 4–6-divided, lobes 3-fid at apex, margin remotely serrulate. Inflorescence a fascicle or sometimes an umbel. Pedicel grayish white, 1–3 cm, long puberulent. Flowers 2–5, attached near base of blade, purple. Sepals pale green, elliptic, unequal in size, 7–15 mm, glabrous. Petals elliptic-lanceolate, ca. 9 × 1.5 cm. Stamens ca. 1.8 cm; filaments nearly as long as or sometimes shorter than anthers; anther connective conspicuously prolonged. Ovary oblong; stigmas shield-shaped, ca. 1.5 mm in diam. Berry red when mature, oblong. Fl. Apr–Jun, fr. Jun–Sep.

• Forests, bamboo forests; 1300–1800 m. Guangxi, Guizhou, Hubei, Sichuan, Yunnan.

The specific epithet is often misspelled *"majoensis"* in Chinese publications.

**2. *Dysosma versipellis*** (Hance) M. Cheng ex T. S. Ying, Acta Phytotax. Sin. 17(1): 18. 1979.

八角莲 *ba jiao lian*

*Podophyllum versipelle* Hance, J. Bot. 21: 362. 1883; *P. esquirolii* H. Léveillé.

Plants 40–150 cm tall. Rhizomes stout, with numerous fibrous roots; aerial stems erect, pale green, unbranched, glabrous. Leaves alternate; petiole of lower leaves 12–25 cm, peti-

ole of upper leaves 1–3 cm; leaf blade suborbicular, to 30 cm in diam., thinly papery, abaxially pubescent, venation obviously raised, adaxially glabrous, palmately 4–9-lobed; lobes broadly triangular, ovate, or ovate-oblong, 2.5–4 cm, base 5–7 cm wide, margin remotely serrate, apex acute, not lobed. Inflorescence 5–8-fascicled flowers. Pedicel pendulous, slender, pubescent. Flowers attached near base of blade, red. Sepals oblong-elliptic, 0.6–1.8 cm × 3–8 mm, outside puberulent, inside glabrous, apex acute. Petals spatulate-obovate, ca. 2.5 × 0.8 cm, glabrous. Stamens ca. 1.8 cm; filaments shorter than anthers; anther connective slightly prolonged, glabrous, acute. Ovary ellipsoid, glabrous; style short; stigma shield-shaped. Berry ellipsoid or ovoid, ca. 4 × 3.5 cm. Seeds numerous. Fl. Mar–Jun, fr. May–Sep.  $2n = 12^*$ .

• Forests, thickets, shaded and wet places by streams, bamboo forests; 300–2400 m. Anhui, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shanxi, Yunnan, Zhejiang.

*Podophyllum versipelle* was treated by Shaw (in Stearn, Gen. *Epimedium*, 276–282. 2002) as comprising two subspecies: subsp. *versipelle* ("Leaf lobes elobulate, upper leaf with 4–7 lobes on one side, lobes shallow 1/5–1/3 of radius; inflorescence 4–9 flowered; pedicels with hairs") and subsp. *boreale* J. M. H. Shaw ("Leaf lobes often with lobules, upper leaf with 4 or 5 lobes on one side, lobes deep, 1/2–2/3 of radius; inflorescence 4–10(–19) flowered; pedicels glabrous or rarely hairy").

Within *Podophyllum versipelle* subsp. *boreale*, Shaw (loc. cit.) recognized two varieties: *P. versipelle* var. *boreale* (lobes of leaves with convex margins, lobes entire or trilobulate; pedicels and leaves abaxially glabrous) and *P. versipelle* var. *sichuanense* J. M. H. Shaw (lobes of leaves with concave margins, lobes usually trilobulate; pedicels and leaves abaxially hairy).

**3. *Dysosma difformis*** (Hemsley & E. H. Wilson) T. H. Wang ex T. S. Ying, Acta Phytotax. Sin. 17(1): 19. 1979.

小八角莲 *xiao ba jiao lian*

*Podophyllum difforme* Hemsley & E. H. Wilson, Bull. Misc. Inform. Kew 1906: 152. 1906; *Dysosma tonkinensis*

(Gagnepain) Hiroe; *P. tonkinense* Gagnepain; *P. triangulum* Handel-Mazzetti.

Plants 15–30 cm tall. Rhizomes usually terete, slender, with numerous fibrous roots. Stems erect, sometimes purplish red, glabrous. Leaves alternate, obliquely peltate, unequal in size, sharply diversiform; petioles unequal in length, 3–11 cm, glabrous; leaf blade adaxially sometimes purplish red, 5–11 × 7–15 cm, thinly papery, both surfaces glabrous, base often rounded, entire or lobed, margin sparsely inconspicuously serrate. Inflorescence 2–5-fascicled flowers. Pedicel 1–2 cm, nodding, sparsely white pubescent. Flowers attached near base of blade. Sepals oblong-lanceolate, 2–2.5 cm × 2–5 mm, outside pubescent, inside glabrous, apically acuminate. Petals pale brownish red, oblong-lanceolate, 4–5 × 0.8–1 cm, glabrous, apex rounded. Stamens ca. 2 cm; filaments ca. 0.8 cm; anthers ca. 1.2 cm; anther connective conspicuously prolonged. Pistil ca. 0.9 cm; ovary urceolate; style ca. 2 mm; stigma shield-shaped. Berry globose, 1.7–2.7 cm. Fl. Apr–Jun, fr. Jun–Sep.

Dense forests; 700–1800 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan [Vietnam].

Shaw (in Stearn, Gen. *Epimedium*, 280. 2002) treated *Podophyllum tonkinense* as a synonym of *P. versipelle* subsp. *versipelle*.

**4. *Dysosma aurantiocaulis*** (Handel-Mazzetti) Hu, Bull. Fan Mem. Inst. Biol., Bot. 8: 37. 1937.

云南八角莲 yun nan ba jiao lian

*Podophyllum aurantiocaulis* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 61: 163. 1924; *Dysosma furfuracea* S. Y. Bao; *D. mairei* (Gagnepain) Hiroe; *P. aurantiocaulis* subsp. *furfuraceum* (S. Y. Bao) J. M. H. Shaw; *P. mairei* Gagnepain; *P. sikkimense* R. Chatterjee & Mukerjee; *P. sikkimense* var. *majus* R. Chatterjee & Mukerjee.

Plants 30–50 cm tall. Rhizomes brown, short, stout, with numerous fibrous roots. Stems erect, pale stramineous, 3–5 mm in diam., angulate, glabrous. Leaves alternate; petiole of lower leaves 12–22 cm, petiole of upper leaves 3–7 cm, all petioles angulate; leaf blade abaxially pale green, adaxially deep green, suborbicular or reniform in gross outline, sharply diversiform, 7–8 × 13–15 cm, thinly papery, abaxially on veins scurfy squamulate, sometimes mixed pubescent, adaxially glabrous, 5–8-lobed, lobe margin scarcely inconspicuously serrulate. Inflorescence 2–5-fascicled flowers. Pedicel nutant, 3–6 cm, glabrous. Flowers attached far from base of blade, purple or pink. Sepals narrowly oblong, 10–12 × 4–5 mm, glabrous. Petals obovate or suborbicular, 1.4–1.6 × 1–1.2 cm, apex rounded. Stamens ca. 8 mm; filaments flat, shorter than anthers; apex of anther connective not prolonged. Pistil ca. 8 mm; ovary subglobose; style ca. 1 mm; stigma disciform, margin rugosely undulate. Berry pale green (immature), subglobose, ca. 8 mm in diam. Seeds numerous. Fl. May–Jun, fr. Jun–Aug.

• Deciduous broad-leaved forests; 2800–3000 m. Yunnan [Myanmar].

Shaw (in Stearn, Gen. *Epimedium*, 299–306. 2002) recognized two subspecies of *Podophyllum aurantiocaulis*, which he separated into subsp. *aurantiocalis* (“Leaf lobes long, obovate to lanceolate; sinuses deep, penetrating 1/2–2/3 of radius; flowers usually in petiole fork; an-

thers 5–7.5(–9) mm long”) and subsp. *furfuraceum* (“Leaf lobes short, triangular, sinuses shallow penetrating 1/4–1/3 of radius; flowers borne on petiole; anthers 3.5–4.5 mm”).

**5. *Dysosma pleiantha*** (Hance) Woodson, Ann. Missouri Bot. Gard. 15: 339. 1928.

六角莲 liu jiao lian

*Podophyllum pleianthum* Hance, J. Bot. 21: 175. 1883; *Dysosma chengii* (S. S. Chien) Hiroe; *D. hispida* (K. S. Hao) Hiroe; *P. chengii* S. S. Chien; *P. hispidum* K. S. Hao; *P. onzoi* Hayata; *P. pleianthum* var. *album* Masamune.

Plants 20–60(–80) cm tall. Rhizomes creeping, stout, nodose, with numerous fibrous roots; aerial stems erect, solitary, glabrous. Leaves opposite; petiole 10–28 cm, angulate, glabrous; leaf blade abaxially pale yellowish green, adaxially dark green, usually shiny, suborbicular in gross outline, 16–33 cm in diam., papery, both surfaces glabrous, 5–9-lobed; lobes broadly triangular-ovate, margin spinose-serrulate, apex acute. Inflorescence 5–8-fascicled flowers. Pedicel 2–4 cm, often nodding, glabrous. Flowers attached at base of petiole, purplish red. Sepals caducous, elliptic-oblong or ovate-oblong, 1–2 × ca. 0.8 cm. Petals 6–9, purplish red, obovate-oblong, 3–4 × 1–1.3 cm. Stamens falcate-inflexed, ca. 2.3 cm; filaments flat, 7–8 mm; anthers ca. 1.5 cm; anther connective prolonged. Ovary oblong, ca. 1.3 cm; ovules numerous; style ca. 3 mm. Berry purplish black, obovoid-oblong or ellipsoid, ca. 3 × 2 cm. Fl. Mar–Jun, fr. Jul–Sep.  $2n = 12^*$ .

• Forests, streamsides, grassy slopes in valleys; 400–1600 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang.

Shaw (in Stearn, Gen. *Epimedium*, 279. 2002) treated *Podophyllum hispidum* as a synonym of *P. versipelle* subsp. *versipelle*, and, based on flower color, recognized two varieties of *P. pleianthum*: var. *pleianthum* (“petals dark maroon red”) and var. *album* (“petals white”).

**6. *Dysosma tsayuensis*** T. S. Ying, Acta Phytotax. Sin. 17(1): 20. 1979.

西藏八角莲 xi zang ba jiao lian

Plants 50–90 cm tall. Rhizomes creeping, stout, with numerous fibrous roots; aerial stems 35–55 cm high, unbranched, glabrous, angulate, scaly brown at base. Leaves opposite; petiole centrally attached, 11–25 cm; leaf blade abaxially pale yellowish green, adaxially deep green, orbicular or suborbicular in gross outline, papery, both surfaces strigose, palmately 5–7-parted to ca. midway; lobes cuneate-oblong, 8–12 × 4–7 cm, margin spinose-serrulate, ciliolate, apex acute. Inflorescence 2–6-fascicled flowers. Pedicel 2–4 cm, glabrous. Flowers attached at base of petiole, large, 4–5 cm in diam. Sepals 6, caducous, elliptic, 1.3–1.5 cm × 5–6 mm. Petals 6, white, obovate-elliptic, 2.7–2.8 × 1–1.1 cm. Stamens ca. 1 cm; filaments flat, ca. 2 mm; anthers introrse; anther connective wide, not prolonged. Pistils nearly as long as stamens; ovary stipitate; ovules numerous; style ca. 2 mm; stigma inflated, rugosely undulate. Berry red, ovoid or ovoid-ellipsoid, ca. 3 cm; style ± persistent. Seeds numerous. Fl. May, fr. Jul.

• *Picea*, *Abies*, and *Pinus* forests and openings in forests; 2500–3500 m. Xizang.

Shaw (in Stearn, Gen. *Epimedium*, 304. 2002) treated *Dysosma*

*tsayuensis* as a synonym of *Podophyllum aurantiocaulae* subsp. *aurantiocalae*.

7. **Dysosma delavayi** (Franchet) Hu, Bull. Fan Mem. Inst. Biol., Bot. 8: 37. 1937.

川八角莲 chuan ba jiao lian

*Podophyllum delavayi* Franchet, Bull. Mus. Hist. Nat. (Paris) 1: 63. 1895; *Dysosma veitchii* (Hemsley & E. H. Wilson) L. K. Fu ex T. S. Ying; *D. veitchii* var. *longipetala* J. L. Wu & P. Zhuang; *P. delavayi* var. *longipetalum* J. M. H. Shaw; *P. veitchii* Hemsley & E. H. Wilson.

Plants 20–50 cm tall. Rhizomes creeping, short, stout, fibrous roots slightly stout. Leaves opposite; petiole white, 7–10 cm, pubescent; leaf blade abaxially pale yellowish green or dark purplish red, adaxially dark green, sometimes purplish green, suborbicular in gross outline, to 22 cm in diam., papery, abaxially venation pubescent, often ultimately glabrous, adaxially glabrous, 4- or 5-parted to ca. midway; lobes cuneate-

oblong, apex 3-lobed, lobules subtriangular, margin scarcely spinulose-suberrulate, apex acuminate. Inflorescence 2–6-fascicled flowers, rarely umbellate. Pedicel nutant, 1.5–2.5 cm, densely white pubescent. Flowers large, attached at base of petiole, dark purplish red. Sepals caducous, oblong-obovate, ca. 2 cm, outside pubescent. Petals purplish red, oblong, 4–6 cm, apex rounded, obtuse. Stamens ca. 3 cm; filaments flat, shorter than anthers; anther connective conspicuously prolonged, to 9 mm. Pistils short, only ca. 1/2 as long as stamens; ovary ellipsoid; stigma large, rugosely undulate. Berry scarlet when mature, obovoid-ellipsoid, 3–5 × 3–3.5 cm. Seeds numerous, white. Fl. Apr–May, fr. Jun–Sep.  $2n = 12^*$ .

• Forests, streamsides, shaded wet places; 1200–2500 m. Guizhou, Sichuan, Yunnan.

Shaw (in Stearn, Gen. *Epimedium*, 294–295. 2002) reported *Podophyllum delavayi* from S Shaanxi and recognized two varieties of the species: var. *delavayi* (“petals 3.5–7 cm long, 3–5 mm wide”) and var. *longipetalum* (“petals 8–10 cm long, ca. 9 mm wide”).

### Insufficiently known species

Shaw (in Stearn, Gen. *Epimedium*, 283, 285, 297. 2002) recognized three species of *Podophyllum*, below, that we have not seen, or for which we have seen inadequate material. The descriptions and key characters (in quotes) provided here are taken from Shaw’s treatment.

**Podophyllum glaucescens** J. M. H. Shaw, New Plantsman 6(3): 162. 1999.

Plants to 40 cm tall. Mature leaves 2, glabrous, membranous, abaxially glaucescent, adaxially dark green, shiny; lower leaf trapezoid, 4-lobed, sinuses shallowly undulate, margin minutely toothed, apex of lobes shortly acuminate; upper leaf roughly pentagonal, with 4 obvious and 2 obscure lobes, ca. 20 cm across. Inflorescence inserted on petiole of upper leaf ca. 2 cm below blade, 7-flowered. Pedicel thin, 4–6 cm, swollen near apex, densely hairy. Sepals narrowly ovate, ca. 14 × 6 mm, margins membranous. Petals 6, reddish purple, ovate-lanceolate, 10–12 × 5–6 mm, apex acute or slightly toothed. Stamens 6, ca. 1 cm; filaments flattened, 2–3 mm; anthers 6–7 mm, apical mucro 1.5–2 mm. Ovary ovoid, ca. 5 × 3 mm; style 2–3 mm; stigma peltate, corrugated, ca. 3 mm in diam. Mature fruit and seeds unknown.

• Moist woodlands; ca. 1200 m. Guangxi.

On the basis of petal size and leaf blade color, Shaw (in Stearn, Gen. *Epimedium*, 285–286. 2002) distinguished *Podophyllum glaucescens* (“petals less than 1.2 cm; leaves abaxially glaucous”) from *P. difforme* and *P. versipelle* (“petals more than 1.5 cm; leaves abaxially pale green”). Shaw (loc. cit.) also speculated that *P. glaucescens* may be of hybrid origin from a cross between those two species, which he distinguished from each other by their leaf lobes and flower number (*P. difforme* with “upper leaf irregularly and indistinctly lobed; inflorescence 1–3-flowered” vs. *P. versipelle* with “upper leaf 4–7-lobed; inflorescence 4–9-flowered”).

**Podophyllum hemsleyi** J. M. H. Shaw & Stearn, New Plantsman 6(3): 161. 1999.

Plants to 40 cm. Stems grooved. Leaves 2, abaxially glaucous green, adaxially dark green, to 35 cm in diam., lobed to 4/5 of radius, sinuses rounded, lobes spatulate-oblong, abaxially with prominent main veins, margin with fine teeth, apex of lobes rounded, tip acute to acuminate. Inflorescence inserted on petiole ca. 2 cm below blade, 4-flowered. Pedicel glabrous, 3–4

cm, dilated to 2 mm wide below receptacle. Sepals ovate-lanceolate, 14–16 mm, outer sepals 6–8 mm wide, inner sepals 3–4 mm wide, glabrous, entire, apex rounded. Petals dark red, 3–3.5 cm, oblong-spatulate, widest below apex, entire, apex rounded. Stamens 6; filaments flattened, 7–8 mm; anthers 9–10 mm. Ovary globose to pyriform, 6–7 × ca. 4 mm; style 2–3 × ca. 1 mm; stigma globose, corrugated, 3–5 mm across. Berry and seeds unknown.

• Forests; 1500–1800 m. W Hubei.

This is apparently known from only three collections made by E. H. Wilson between 1901 and 1909. It was reported by Shaw to be most similar to *Podophyllum versipelle* subsp. *boreale*. Shaw separated *P. hemsleyi* by its “lobes of leaves spatulate-oblong, to 4/5 of leaf radius; inflorescence 4-flowered, on petiole 2 cm below lamina” and *P. versipelle* by its “lobes of leaves obovate to oblong, 1/2–2/3 of leaf radius; inflorescence 4–19-flowered, on petiole just below upper leaf.”

**Podophyllum trilobulum** J. M. H. Shaw, New Plantsman 7: 158. 2000 [*“trilobulum”*].

Plants 20–25(–40) cm tall. Stem and petioles with fine short linear hairs. Leaves 2, lobed, lobes trilobulate, margin finely toothed; lower leaf 18–28 cm wide, lobes 7, sinuses to 2/3 of radius, rounded, keyhole-shaped; upper leaf ca. 15 cm wide, lobes 5, strongly retarded on adaxial margin, reduced to few large teeth. Inflorescence inserted at or above midpoint on petiole of upper leaf, 2–5-flowered. Pedicel 2.2–2.5 cm, apically dilated, brown pilose, hairs linear. Petals purplish red, ovate-lanceolate, tapering gradually to acute apex, 4–5 × 8–10 mm. Anthers ca. 6 mm. Fruit unknown.

• Forests; ca. 1600 m. Sichuan (Emei Shan).

*Podophyllum trilobulum* is most similar to *Dysosma delavayi*. Shaw separated *P. delavayi* by its “inflorescence in fork of petioles” and *P. trilobulum* by its “inflorescence along petiole just below leaf, at or above midpoint of upper leaf or held above leaves on elongated peduncle.”

**7. DIPHYLLEIA** Michaux, Fl. Bor.-Amer. 1: 203, t. 19–20. 1803.

山荷叶属 shan he ye shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

Herbs, perennial, with thickened creeping rhizomes and coarse fibrous roots; rhizomes formed of distinct annual increments, producing stout 2(or 3)-leaved stem separating at base in autumn along marked articulation, leaving broad bowl-like excavation on rhizome. Leaves alternate; blade petiolate and peltate [except in *Diphylleia grayi* F. Schmidt, in which upper leaf sessile or subsessile and attached at sinus], transversely oblong to reniform-orbicular, pubescent or sparsely pubescent with unicellular hairs, palmately veined with main veins connected by secondary reticulate veins, 2-cleft with divisions shallowly to coarsely lobed and prominently dentate. Inflorescence terminal, pedunculate, usually a many-flowered cyme or umbel; branches glabrous or pubescent. Flowers pedicellate, actinomorphic, 3-merous. Sepals 6 in 2(or 3) whorls, white or pale green. Petals 6 in 2 whorls, white. Stamens opposite petals; anthers basifixed, longitudinally dehiscent; thecae separating from connective and ultimately attached only at apex; pollen conspicuously spiny. Ovary ellipsoid, 1-loculed; placentation parietal near base of ovary; ovules 2–11, anatropous; style absent or short and thickened; stigma peltate, cristate. Fruit berries, dark blue or purplish black, glaucous, globose or broadly ellipsoid. Seeds reddish brown, oblong to ovoid.  $n = 6$ .

Three species: discontinuous distribution in E Asia and SE North America; one species (endemic) in China.

**1. *Diphylleia sinensis*** H. L. Li, J. Arnold Arbor. 28: 443. 1947.

南方山荷叶 nan fang shan he ye

*Diphylleia cymosa* Michaux subsp. *sinensis* (H. L. Li) T. Shimizu.

Plants 40–80 cm tall. Petiole of lower leaf 7–20 cm, of upper leaf (2.5–)6–13 cm; blade peltate, reniform or reniform-orbicular to transversely oblong, 19–40 × 20–46 cm in lower leaf and 6.5–31 × 19–42 cm in upper leaf, abaxially whitish pubescent, sparsely so or subglabrous adaxially, 2-cleft with divisions undulate or shallowly 3–6-lobed, margin irregularly dentate with teeth apiculate. Inflorescence 4.2–35 cm including peduncle, 3.5–10 cm in diam.; branches pubescent or glabrescent

in fruit; peduncle 3.5–28 cm, solitary, occasionally bifurcate. Pedicel 0.4–3.7 cm. Flowers (8–)15–51. Outer sepals lanceolate to linear-lanceolate, 2.3–3.5 × 0.7–1.2 mm; inner sepals broadly elliptic to subcircular, 4–4.5 × 3.8–4 mm. Outer petals narrowly to broadly obovate, 5–8 × 2.5–5 mm; inner petals narrowly elliptic to narrowly obovate, 5.5–8 × 2.5–3.5 mm. Stamens ca. 4 mm; laminar filaments 1.7–2 mm; anthers ca. 2 × 0.6 mm. Ovary ellipsoid, 3–4 × 1.8–2 mm; ovules 5–11; style absent or represented by slight constriction at summit of ovary; stigma ca. 0.3 × 1 mm. Berry dark blue or purplish black, slightly pruinose, globose to broadly ellipsoid, 1–1.5 cm × 6–10 mm. Seeds 2–4, ovoid. Fl. May–Jun, fr. Jul–Aug.  $2n = 12^*$ .

• Moist deciduous and coniferous forests, thickets, bamboo thickets; 1900–3700 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.

**8. EPIMEDIUM** Linnaeus, Sp. Pl. 1: 117. 1753.

淫羊藿属 yin yang huo shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

*Aceranthus* C. Morren & Decaisne; *Vindicta* Rafinesque.

Herbs, perennial, deciduous or evergreen. Rhizome sympodial, short or horizontally creeping, stout. Stems solitary or caespitose, glabrous, squamate at base. Leaves basal or cauline, simple or compound; petioles of basal leaves longer than those of cauline; leaflets ovate, ovate-lanceolate, or suborbicular, basally cordate, lateral lobes asymmetric, with outer basal lobe longer than inner, usually spiny on margin, apex acute or acuminate. Flowering stem leafless or with 1–4 leaves, opposite or rarely alternate. Inflorescence simple or compound, with terminal raceme or panicle, few or many flowered, glabrous or glandular. Flowers dimerous. Sepals 8 in 2 whorls; inner sepals petaloid. Petals 4, flat, or saccate and prolonged outward into nectariferous pouches or spurs shorter or longer than sepals. Stamens 4, opposite petals; filaments glabrous; anthers dehiscent by 2 oblong valves, curling upward; pollen grains elliptic, smooth, with 3 longitudinal furrows. Ovary with parietal placentation; ovules 6–15; style slender; stigma slightly dilated. Capsule loculicidal. Seeds with conspicuous fleshy aril.  $2n = 12$ .

About 50 species: China, India (W Himalaya), Japan, Korea, Russia (Far East), S Europe, and N Africa; 41 species (40 endemic) in China; eight additional species (seven endemic) are insufficiently known.

See Stearn, The Genus *Epimedium* and Other Herbaceous Berberidaceae [hereafter Gen. *Epimedium*]. 2002.

*Epimedium cavaleriei* H. Léveillé (Cat. Pl. Yun-Nan, 18. 1916) is a synonym of *Stauntonia cavaleriana* Gagnepain (Bull. Soc. Bot. France 55: 47. 1908) in the Lardizabalaceae (see Fl. China 6: 452. 2001).

1a. Leaves simple.

2a. Inflorescences panicles ..... 1. *E. simplicifolium*

2b. Inflorescences racemes.

- 3a. Petals without spurs; stem leaf 1; plant 15–25 cm tall ..... 2. *E. parvifolium*
- 3b. Petals with spurs; stem leaves 2, opposite; plant 20–60 cm tall.
- 4a. Leaf blade oblong to suborbicular; sepals 4 in 1 whorl; petals purple, saccate ..... 3. *E. zhushanense*
- 4b. Leaf blade ovate to ovate-elliptic; sepals 8 in 2 whorls; petals yellow, horn-shaped ..... 4. *E. glandulosopilosum*
- 1b. Leaves compound.
- 5a. Petals without spurs.
- 6a. Flowering stem leaf 1 ..... 5. *E. platypetalum*
- 6b. Flowering stem leaves 2–4.
- 7a. Flowering stem leaves 2.
- 8a. Rachis and pedicels glandular pubescent; leaflets abaxially pubescent or tomentose ..... 6. *E. pubescens*
- 8b. Rachis and pedicels glabrous; leaflets abaxially glabrous or strigose.
- 9a. Base of terminal leaflet truncate or rounded; petals suborbicular, apex slightly involute, ca. 1 mm ..... 7. *E. truncatum*
- 9b. Base of terminal leaflet cordate; petals saccate, 1.5–4 mm.
- 10a. Apex of terminal leaflet unlobed; apex of sepals unlobed ..... 8. *E. sagittatum*
- 10b. Apex of terminal leaflet 2–5-lobed; apex of sepals 2-lobed ..... 9. *E. lobophyllum*
- 7b. Flowering stem leaves 2–4.
- 11a. Rachis and pedicels glandular pubescent; leaves 3(or 5 or 7)-foliolate; inner sepals purple ..... 10. *E. ecalcaratum*
- 11b. Rachis and pedicels glabrous; leaves trifoliolate; inner sepals white.
- 12a. Leaflets lanceolate to narrowly lanceolate, abaxially lanose; petals flat, apex slightly involute ..... 11. *E. borealiguizhouense*
- 12b. Leaflets ovate, elliptic, or lanceolate, abaxially strigose; petals saccate.
- 13a. Inflorescence 70–210-flowered; inner sepals ovate; petals orange-yellow and red; leaflets 5–11 mm ..... 12. *E. myrianthum*
- 13b. Inflorescence 300–400-flowered; inner sepals lanceolate; petals pale yellow; leaflets 12–14 mm ..... 13. *E. multiflorum*
- 5b. Petals with spurs.
- 14a. Inflorescences racemes.
- 15a. Flowering stem leaf 1.
- 16a. Leaves biternate, leaflets 9 ..... 14. *E. koreanum*
- 16b. Leaves trifoliolate, leaflets 3 or 5.
- 17a. Leaflets 5 (occasionally 3), abaxially glabrous ..... 15. *E. flavum*
- 17b. Leaflets 3, abaxially pubescent.
- 18a. Spurs 2.2–2.6 cm; inner sepals pale rose ..... 16. *E. brachyrrhizum*
- 18b. Spurs shorter than 2 cm; inner sepals white.
- 19a. Leaflets narrowly ovate or ovate, abaxially pubescent along midvein; inner sepals narrowly elliptic, 11–20 mm ..... 17. *E. leptorrhizum*
- 19b. Leaflets ovate or suborbicular, abaxially puberulent; inner sepals lanceolate, ca. 12 mm ..... 18. *E. pauciflorum*
- 15b. Flowering stem leaves 2.
- 20a. Rachis and pedicels glandular pubescent.
- 21a. Inner sepals narrowly lanceolate, white or pinkish, reflexed; spurs shorter than inner sepals ..... 24. *E. fargesii*
- 21b. Inner sepals ovate or narrowly ovate, pale yellow, not reflexed; spurs longer than inner sepals.
- 22a. Leaflets ovate or broadly ovate; spurs 7–12 mm, not curved ..... 25. *E. ensiense*
- 22b. Leaflets narrowly ovate; spurs 20–25 mm, curved.
- 23a. Leaflets abaxially strigose; inner sepals narrowly ovate, apex acuminate ..... 26. *E. franchetii*
- 23b. Leaflets abaxially villous or subglabrous; inner sepals suboblong, apex acute ..... 27. *E. lishihchenii*
- 20b. Rachis and pedicels glabrous.
- 24a. Inner sepals ovate; leaflets abaxially strigose.
- 25a. Spurs 4–5 mm, pale yellow, curved; bracts spinulose-serrulate; leaflets abaxially appressed whitish puberulent ..... 19. *E. shuichengense*
- 25b. Spurs 15–16 mm, purple, slightly curved; bracts entire; leaflets abaxially glaucous, with sparse minute prostrate hairs ..... 20. *E. epsteinii*
- 24b. Inner sepals elliptic, lanceolate, or cymbiform; leaflets abaxially puberulent or glabrous.
- 26a. Leaflets abaxially glabrous; inner sepals cymbiform, reddish; petals pale yellow ..... 21. *E. fangii*
- 26b. Leaflets abaxially puberulent; inner sepals elliptic or lanceolate, white; petals white.
- 27a. Pedicels 2.5–5 cm; inner sepals elliptic; spurs horn-shaped, slightly curved, ca. 2.5 cm ..... 22. *E. latisepalum*
- 27b. Pedicels 2–3 cm; inner sepals lanceolate; spurs subulate, curved, 1.5–1.8 cm ..... 23. *E. ogisui*
- 14b. Inflorescences panicles.
- 28a. Leaves biternately compound, leaflets 9, occasionally 5.

- 29a. Flowering stem leaves 2, 9-foliolate; flowers white or pale yellow; spurs shorter than inner sepals, ca. 2 mm ..... 40. *E. brevicornu*
- 29b. Flowering stem leaves 3, 9-foliolate or occasionally 5-foliolate; flowers yellow; spurs longer than inner sepals, ca. 15 mm ..... 41. *E. elongatum*
- 28b. Leaves ternately compound, leaflets 3 or 5.
- 30a. Leaflets 5, rarely 3 ..... 28. *E. davidii*
- 30b. Leaflets 3.
- 31a. Rachis and pedicels glabrous.
- 32a. Leaflets abaxially glabrous.
- 33a. Leaflet margin remotely spinose-serrate; spur of petals much shorter than inner sepals, curved, blunt ..... 29. *E. dolichostemon*
- 33b. Leaflet margin closely spinose-serrulate; spur of petals longer than inner sepals, slightly curved, subulate ..... 30. *E. mikinorii*
- 32b. Leaflets abaxially hairy.
- 34a. Leaflets abaxially strigose, margin undulate; inner sepals ovate, pale green ..... 31. *E. chlorandrum*
- 34b. Leaflets abaxially lanate or glabrous, margin flat; inner sepals broadly elliptic, pale yellow .... 32. *E. wushanense*
- 31b. Rachis and pedicels, or only pedicels, glandular pubescent.
- 35a. Spur of petals shorter than inner sepals.
- 36a. Leaflets abaxially conspicuously puberulent; inner sepals lanceolate, ca. 12 mm; spur of petals brown ..... 33. *E. stellulatum*
- 36b. Leaflets glabrous or pilose along veins; inner sepals elliptic, ca. 6 mm; spur of petals yellow ..... 34. *E. reticulatum*
- 35b. Spur of petals longer than inner sepals.
- 37a. Leaflets lanceolate, margins undulate-sinuate and sparsely spinose-serrate; outer sepals apically emarginate ..... 35. *E. ilicifolium*
- 37b. Leaflets ovate to lanceolate, margins flat; outer sepals apically entire.
- 38a. Leaflets ovate to lanceolate, abaxially densely strigose ..... 36. *E. acuminatum*
- 38b. Leaflets ovate, abaxially sparsely pubescent or nearly glabrous.
- 39a. Leaflets abaxially glaucescent, terminal leaflet oblong; spurs straight ..... 37. *E. hunanense*
- 39b. Leaflets abaxially glaucous, terminal leaflet ovate; spurs curved.
- 40a. Inner sepals narrowly ovate, ca. 6 mm; spurs 20–35 mm, pale yellow; inflorescence a panicle; blade length:width ratio 2 ..... 38. *E. rhizomatosum*
- 40b. Inner sepals narrowly lanceolate, 15–17 mm; spurs 15–20 mm, pale purplish red; inflorescence a raceme; blade length:width ratio 2.5 ..... 39. *E. sutchuenense*

**1. *Epimedium simplicifolium*** T. S. Ying, Acta Phytotax. Sin. 13(2): 51. 1975.

单叶淫羊藿 dan ye yin yang huo

Herbs, 30–55 cm tall. Rhizomes brown, stout, squamate at upper part. Leaves simple, basal and cauline; petiole of stem leaf 5–7 cm, glabrous; leaf blade adaxially green, ovate or broadly elliptic-ovate, 7–19 × 8–10 cm, papery, abaxially densely sericeous, veins conspicuously raised, adaxially glabrous, reticulate veins conspicuous, base deeply or shallowly cordate with lobes rounded, subequal, margin closely spinulose-subserulate, apex acute. Flowering stem with 2 opposite leaves. Inflorescence a terminal panicle, 12–22 × 8–10 cm, usually 15–32-flowered; rachis glabrous. Pedicel 1–2.5 cm, puberulent. Flowers yellow. Sepals 8 in 2 whorls; outer sepals obovate, ca. 4 × 2 mm, apex obtuse; inner sepals ovate, ca. 6 × 4 mm, membranous, apex acute. Petals curved upward, reddish purple, horn-shaped, much longer than inner sepals, ca. 2 cm. Stamens 4, pale yellow, ca. 3 mm; filaments shorter than anthers; anthers valved. Pistil obliquely terete; style ca. 1 mm. Capsules obliquely terete, glabrous; style rostriform. Fl. Apr–May, fr. May–Jun.

• Slopes in valleys; ca. 1100 m. Guizhou.

**2. *Epimedium parvifolium*** S. Z. He & T. L. Zhang, Guihaia 14: 25. 1994.

小叶淫羊藿 xiao ye yin yang huo

*Epimedium elachyphyllum* Stearn, nom. illeg. superfl.

Herbs, 15–25 cm tall, glabrous. Rhizome apparently creeping, longer than 15 cm, 1.5–3 mm in diam. Leaves simple, basal and cauline; leaf blade adaxially dark green, broadly ovate, 2.5–3.5 × 3–4 cm, abaxially sparsely puberulent, often pruinose, reticulate veins conspicuous, adaxially glabrous, base deeply cordate with rounded lobes subequal, margin remotely spinose-serrate, apex acuminate. Flowering stem with 1 simple leaf at base of rachis. Raceme 8–10 cm, 8–12-flowered; rachis glabrous. Pedicel 1–2 cm, glabrous; bracts ovate, ca. 1.5 mm. Flowers purple. Sepals in 2 whorls; outer sepals 4, purple, 2 of them lanceolate, ca. 3 × 1.2 mm, others ovate, ca. 3.5 × 2.5 mm; inner sepals 4, yellow, lanceolate, ca. 3 × 1.2 mm. Petals 4, purple, suboblong, ca. 1.2 mm, without spur. Stamens 4, ca. 2.5 mm; filaments flat; anthers ca. 1.8 mm, apex obtuse. Pistil ca. 2 mm; style ca. 1 mm. Capsules ca. 1 cm; style ca. 3 mm. Seeds 1 or 2, brown, reniform, ca. 3.5 mm, glabrous. Fl. Apr–May, fr. May–Jun.

• Forests, thickets; 1300–1400 m. Guizhou (Songtao).

**3. *Epimedium zhushanense*** K. F. Wu & S. X. Qian, Acta Phytotax. Sin. 23: 71. 1985.

竹山淫羊藿 zhu shan yin yang huo

Herbs, 40–60 cm tall. Rhizome short, stout. Flowering stem brown, terete, squamate at base, with 2 opposite leaves. Leaves simple, basal and cauline; petiole 5.5–6 cm, tomentose at base and apex; leaf blade adaxially deep green, oblong to suborbicular, 10–14 × 7–11 cm, abaxially densely sericeous-tomentose, adaxially glabrous, base deeply cordate, with rounded lobes subequal, margin slightly repand or irregularly denticulate, apex obtuse. Racemes usually many loosely flowered, ca. 30 cm, glandular. Pedicel 1.5–5 cm, slender; bracts ovate, ca. 2 mm. Flowers purple. Sepals 4 in 1 whorl, petaloid, ovate-lanceolate, 9–11 × ca. 3.5 mm, apex obtuse. Petals 4, purple, saccate, ca. 1.7 cm, base cucullate, apex long attenuate. Stamens 4, ca. 4 mm; filaments flat, shorter than anthers; anthers valved, valves revolute, apex of anther connective apiculate. Style 2.5–3 mm; stigma slightly quadrilobate or inconspicuous. Fruit unknown. Fl. Jun–Jul, fr. unknown.

• Forests, roadsides; ca. 1200 m. NW Hubei.

**4. *Epimedium glandulosopilosum*** H. R. Liang, Acta Phytotax. Sin. 28: 323. 1990.

腺毛淫羊藿 xian mao yin yang huo

Herbs, 20–50 cm tall. Rhizome short, stout, usually irregularly nodose. Flowering stem glandular pubescent and pilose. Leaves simple, basal and cauline; basal leaves broadly ovate, ca. 9 × 6.5 cm, petiole ca. 24 cm; cauline leaves opposite, petiole 3–6.5 cm, glandular pubescent and puberulent, leaf blade adaxially deep green, ovate to ovate-elliptic, 5–8.5 × 2.5–5.5 cm, abaxially densely golden yellow villous, adaxially glabrous, base deeply cordate with acute lobes nearly equal, margin spinose-serrate, apex acuminate. Racemes 8–24-flowered, 6–23 × 3–6 cm; rachis and pedicels glandular pubescent. Pedicel 1–3 cm; bracts ovate, 1–2 mm. Flowers yellow. Sepals 8 in 2 whorls; outer sepals narrowly ovate, 8–9 × 4–5 mm; inner sepals similar to outer sepals in size and shape. Petals spurred, yellow, horn-shaped, ca. 1.3 cm. Stamens ca. 4 mm; filaments flat, ca. 1 mm; anthers valved, valves revolute, apex of anther connective apiculate. Ovary terete; style ca. 2 mm; stigma quadrilobate or inconspicuous. Capsules 5–10 mm; style 3–4 mm. Fl. Apr–May, fr. May–Jun.

• 800–900 m. Sichuan.

**5. *Epimedium platypetalum*** K. Meyer, Repert. Spec. Nov. Regni Veg. Beih. 12: 380. 1922.

茂汶淫羊藿 mao wen yin yang huo

*Epimedium platypetalum* var. *tenue* B. L. Guo & P. K. Hsiao.

Herbs, 10–25 cm tall. Rhizome stout, irregularly nodose. Leaves basal and cauline, trifoliolate; petioles pilose with long reddish hairs forming conspicuous tufts at nodes; leaflets adaxially deep green, broadly ovate to suborbicular, 2–4 × 1.6–3 cm, abaxially papillose and sparsely pilose, adaxially glabrous, base deeply cordate with subequal lobes rounded and nearly

touching, terminal leaflet similar to lateral leaflets in shape, margin spinose-serrate, apex rounded or acute. Flowering stem with 1 trifoliolate leaf. Raceme simple, 4–8 cm, 2–8-flowered. Pedicel 5–10 mm, slender, glandular pubescent. Flowers pale yellow, campanulate. Outer sepals triangular-lanceolate, 2–2.5 × ca. 0.7 mm; inner sepals broadly ovate, 4–5 × 2.5–3 mm, apically acute or shortly acuminate. Petals oblong or obovate-oblong, ca. 8 × 4–5 mm, flat, without spur, apex rounded. Stamens ca. 3 mm; filaments ca. 1 mm; anthers ca. 2 mm. Pistil ca. 4 mm. Capsules 1–2 cm; style 2–3 mm. Fl. Apr–May, fr. May–Jun.

• Forests; 1600–2800 m. Shaanxi, Sichuan.

**6. *Epimedium pubescens*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 23: 309. 1877.

柔毛淫羊藿 rou mao yin yang huo

*Epimedium coactum* H. R. Liang & W. M. Yan; *E. pubescens* var. *cavaleriei* Stearn; *E. pubescens* subsp. *primarium* Stearn.

Herbs, 20–70 cm tall. Rhizome short, stout, sometimes elongated. Leaves basal and cauline, trifoliolate; cauline leaves opposite; petiolules ca. 2 cm, sparsely pubescent; leaflets adaxially deep green, shiny, ovate, narrowly ovate, or lanceolate, 3–15 × 2–8 cm, leathery when mature, abaxially densely pubescent to tomentose with numerous fine multicellular spreading or curled gray hairs densest along primary veins and at insertion of petiolule, base deeply or shallowly cordate with usually rounded lobes, those of lateral leaflets unequal, margin spinose-serrate, apex acuminate or shortly acuminate. Flowering stem with 2 opposite trifoliolate leaves. Panicle loose, 30- to more than 100-flowered, 10–20 cm, with peduncle 3–5-flowered, usually rachis and pedicels glandular pubescent. Pedicel 1–2 cm. Flowers ca. 1 cm in diam. Outer sepals purplish, broadly ovate, 2–3 mm; inner sepals white, lanceolate or narrowly lanceolate, 5–7 × 1.5–3.5 mm, apically acute or acuminate. Petals pale yellow, saccate, much shorter than inner sepals, blunt. Stamens prolonged, ca. 4 mm; anthers ca. 2 mm. Pistil ca. 4 mm; style ca. 2 mm. Capsules oblong; style long rostrate. Fl. Apr–May, fr. May–Jun.  $2n = 12^*$ .

• Forests, thickets, slopes, shaded and wet places; 300–2000 m. Anhui, Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan.

**7. *Epimedium truncatum*** H. R. Liang, Acta Phytotax. Sin. 28: 322. 1990.

偏斜淫羊藿 pian xie yin yang huo

Herbs, 50–80 cm tall, glabrous throughout. Rhizome creeping, short, stout, nodose. Leaves basal and cauline, trifoliolate; cauline leaves opposite; leaflets abaxially pale green, adaxially dark green, ovate, 7.5–15 × 3.5–9 cm, leathery, abaxially with conspicuously raised veins, base of terminal leaflet truncate or obtuse, base of lateral leaflets oblique but not cordate, margin remotely spinose-serrate, apex acute or acuminate. Flowering stem with 2(or 3) trifoliolate opposite leaves. Panicle many (ca. 50) flowered, ca. 28 × 7 cm. Pedicel 7–15 mm, slender. Flowers ca. 4 mm in diam. Outer sepals 4, outer pair purple, suborbicular, ca. 2 mm, inner pair white, ca. 2.5 mm; inner

sepals 4, lanceolate, ca. 2 mm. Petals 4, suborbicular, ca. 1 mm, base broadly cuneate, without spur, apex slightly involute. Stamens ca. 2.2 mm; filaments flat, ca. 0.7 mm; anthers ca. 1.5 mm, valved, apex of anther connective obtuse. Pistil ca. 2.2 mm; style ca. 1 mm. Capsules ca. 1.5 cm; style rostriform, ca. 5 mm. Fl. Apr–May, fr. May–Jun.

- Forest margins; 600–1000 m. Hunan (Baojing).

**8. *Epimedium sagittatum*** (Siebold & Zuccarini) Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 23: 309. 1877.

三枝九叶草 san zhi jiu ye cao

Herbs, 30–50 cm tall. Rhizome short, stout, nodose, with numerous fibrous roots. Leaves basal and cauline, trifoliolate; leaflets ovate to ovate-lanceolate, 5–19 × 3–8 cm, leathery, abaxially sparsely strigose or glabrous, adaxially glabrous, base deeply or shallowly cordate, apex acute or acuminate, terminal leaflet with equal rounded lobes or oblong, lateral leaflets oblique with outer lobe large, deltoid and acute, inner lobe smaller and rounded, margin closely spinulose-subserulate. Flowering stem with 2 opposite trifoliolate leaves. Panicle 10–20(–30) × 2–4 cm, 20–60-flowered, sometimes with lower peduncles 3-flowered, usually glabrous, occasionally scarcely glandular pubescent. Pedicel ca. 1 cm, glabrous. Flowers white or yellow, ca. 8 mm or less in diam. Outer sepals 4, purple spotted, apex blunt, outer pair narrowly ovate, ca. 3.5 × 1.5 mm, inner pair oblong-ovate, ca. 4.5 × 2 mm; inner sepals white, ovate-deltoid, ca. 4 × 2 mm, apex acute. Petals brownish yellow, saccate, 1.5–4 mm, blunt. Stamens prolonged, 3–5 mm; anthers 2–3 mm. Pistil ca. 3 mm; style longer than ovary. Capsules ca. 1 cm; style ca. 6 mm. Fl. (unknown in var. *glabratum*) Apr–May, fr. (Apr–)May–Jul.  $2n = 12^*$ .

- Forests, weedy places on slopes, thickets, streamsides, rock crevices; 200–1800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Zhejiang.

- 1a. Leaflets abaxially sparsely strigose or glabrous; terminal leaflet narrowly ovate to lanceolate; flowers white ..... 8a. var. *sagittatum*  
 1b. Leaflets abaxially glabrous; terminal leaflet oblong; flowers yellow ..... 8b. var. *glabratum*

**8a. *Epimedium sagittatum* var. *sagittatum***

三枝九叶草(原变种) san zhi jiu ye cao (yuan bian zhong)

*Aceranthus sagittatus* Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(2): 175. 1845; *A. macrophyllum* Blume ex K. Koch; *A. triphyllum* K. Koch; *Epimedium coactum* H. R. Liang & W. M. Yan var. *longtouhu* H. R. Liang; *E. sagittatum* var. *oblongifoliolatum* Z. Cheng; *E. sinense* Siebold ex Miquel.

Leaflets abaxially sparsely strigose or glabrous; terminal leaflet narrowly ovate to lanceolate. Flowers white. Fl. Apr–May, fr. May–Jul.

- Forests, weedy places on slopes, thickets, streamsides, rock crevices; 200–1800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Zhejiang.

**8b. *Epimedium sagittatum* var. *glabratum*** T. S. Ying, Acta Phytotax. Sin. 13(2): 53. 1975.

光叶淫羊藿 guang ye yin yang huo

Leaflets abaxially glabrous; terminal leaflet oblong. Flowers yellow. Fl. unknown, fr. Apr–May.

- Forests; ca. 700 m. Guizhou, Hubei.

**9. *Epimedium lobophyllum*** L. H. Liu & B. G. Li, Acta Phytotax. Sin. 37: 288. 1999.

裂叶淫羊藿 lie ye yin yang huo

Herbs, 30–70 cm tall. Rhizome compact, rigid. Leaves basal and cauline, trifoliolate; petiole 6–9.5 cm; basal leaves smaller than cauline leaves; lateral leaflets narrowly ovate, entire, base shallowly cordate, sinus widely open, lobes unequal, inner lobe rounded, outer lobe acute, margin spinulose-serulate, apex acuminate; petiolule of terminal leaflet 5–7 cm; terminal leaflet obovate to ovate or obovate-elliptic, 9–14 × 4–6.4 cm, base shallowly cordate, sinus open, lobes rounded, margin spinulose-serrulate, apex (2 or)3(–5)-lobed, lobes acuminate, abaxially glaucous, glabrous except main veins pilose. Inflorescence terminal, paniculate, (8–)25–34 cm, glabrous, many flowered; peduncles 7–17 mm, mostly 5-flowered. Flowers white or yellowish, 3–4.5 mm in diam. Outer sepals 4, ovate to elliptic, 2–3.5 mm, apex 2-lobed; inner sepals 4, obovate or ovate-lanceolate, 2–3.5 × ca. 1.5 mm. Petals suborbicular, 1.5–3 × ca. 1.3 mm, slightly saccate. Stamens 3–4 mm; anthers ca. 1.5 mm. Ovary narrowly ovoid, 3–3.5 mm; ovules 2–6. Capsules 1.3–1.7 cm, beak 4–5 mm. Seeds 2–6, ca. 3.5 mm. Fl. Apr–Jul, fr. Jul–Sep.

- Forests; 700–1500 m. Hunan.

**10. *Epimedium ecalcaratum*** G. Y. Zhong, Acta Phytotax. Sin. 29: 89. 1991.

无距淫羊藿 wu ju yin yang huo

Herbs, 30–65 cm tall. Rhizome creeping, nodose, with numerous fibrous roots. Leaves basal and cauline, 3(or 5 or 7)-foliolate; petiole of basal leaf 3–15 cm; cauline leaf opposite or alternate, petiole 2–4 cm, sparsely brownish villous, but densely so at base and apex; leaflets adaxially deep green, ovate or narrowly ovate, 2.5–4.5 × 1.4–2.6 cm, leathery, abaxially sparsely white strigose on veins, adaxially glabrous, base deeply cordate, apex acute, terminal leaflet with equal rounded lobes, lateral leaflets oblique with outer lobe large and rounded, inner lobe smaller and rounded, margin remotely spinose-serrate. Inflorescence a raceme or sometimes subpaniculate, erect, 7–33 cm, slender; rachis, peduncle, and pedicels brownish red glandular pubescent. Pedicel 8–21 mm, slender. Flowers yellow, 8–10 mm in diam. Outer sepals caducous, pale purple, elliptic to broadly ovate, ca. 3 × 2 mm, membranous; inner sepals purple, lanceolate, 2.5–3.5 × ca. 1.5 mm. Petals yellow, sometimes purple spotted, obovate-orbicular, 6–8 × 4–5 mm, base cucullate, apex rounded, obtuse. Stamens ca. 4.5 mm; anthers ca. 1.5 mm, valved, valves revolute. Pistil longer than stamens. Capsule terete, short, 6–8 mm; style ca. 3 mm. Seeds reddish brown, shiny, reniform. Fl. and fr. May–Aug.

- Forests, thickets, rocky slopes; 1100–2100 m. Sichuan.

**11. *Epimedium borealiguizhouense*** S. Z. He & Y. K. Yang, J. Pl. Resources Environ. 2(4): 51. 1993 [*"baieali-guizhouense"*].

黔北淫羊藿 qian bei yin yang huo

Herbs, 40–60 cm tall. Rhizome nodose, short, with numerous fibrous roots. Leaves basal and cauline, trifoliolate; leaflets lanceolate to narrowly lanceolate, 13–18 × 2.5–4 cm, thickly leathery, abaxially sparsely lanose, adaxially glabrous, base cordate, apex acuminate or long acuminate, terminal leaflet with subequal rounded lobes, lateral leaflets oblique with outer lobe large, cuneate and acuminate, inner lobe much smaller and rounded, margin spinose-serrate. Flowering stem with 2 opposite trifoliolate leaves, occasionally 3 leaves whorled. Panicle without conspicuous peduncle, many (up to 150) flowered, 30–35 cm, usually glabrous. Pedicel 1–2 cm, glabrous. Flowers ca. 6 mm in diam. Outer sepals caducous, purple, elliptic, ca. 3.5 × 1.5–3 mm; inner sepals white, ovate, ca. 2.5 × 1 mm. Petals yellow, obovate, ca. 2 mm, apex involute, without spur. Stamens ca. 4 mm; filaments ca. 1.5 mm; anthers ca. 2.5 mm. Pistil ca. 4 mm; ovules 3 or 4; style ca. 2.5 mm. Capsule ca. 1 cm; style ca. 4 mm. Fl. Mar–Apr, fr. Apr–May.

- Streamsides in valleys; 300–500 m. Guizhou (Yanhe).

**12. *Epimedium myrianthum*** Stearn, Kew Bull. 53: 218. 1998.

天平山淫羊藿 tian ping shan yin yang huo

*Epimedium sagittatum* (Siebold & Zuccarini) Maximowicz subsp. *pyramidale* (Franchet) Stearn; *E. sagittatum* var. *pyramidale* (Franchet) Stearn; *E. sinense* Siebold ex Miquel var. *pyramidale* Franchet.

Herbs, 30–60 cm tall. Rhizome short, stout, with numerous fibrous roots. Leaves basal and cauline, leathery, trifoliolate; leaflets of basal leaves mostly ovate, 5–6 × 3–4 cm, apex acute; leaflets of cauline leaves adaxially shiny, mostly narrowly ovate, sometimes elliptic or lanceolate, 6–11 × 2–6 cm, abaxially glaucous, with extremely minute appressed hairs, adaxially glabrous, base moderately cordate, apex long acuminate, lobes of terminal leaflet rounded, those of lateral leaflets unequal with lobes rounded or acute, margin flat, closely spinulose-serrate. Flowering stem with 2 opposite, or sometimes 3 or 4 whorled, long petiolate leaves. Inflorescence paniculate, loosely 70–210-flowered, 18–34 × 7–9 cm, glabrous. Pedicel 5–15 mm. Flowers minute. Outer sepals black, obtuse, unequal in length, one pair ca. 2 mm, other pair ca. 3.5 mm; inner sepals white, narrowly ovate, ca. 4 × 1.5–2 mm, apically acute. Petals orange-yellow and red, slipper-shaped, shorter than inner sepals, 2–2.5 mm, apically obtuse. Stamens exposed, pale yellow, ca. 4 mm; filaments ca. 2 mm; anthers ca. as long as filaments. Pistil ca. 5.2 mm; style ca. 2.8 mm. Fruit unknown. Fl. Apr–Jul, fr. unknown.

- Dense forests, thickets, roadsides, streamsides; 700–1500 m. Guangxi, Hubei, Hunan.

**13. *Epimedium multiflorum*** T. S. Ying, Fl. Reipubl. Popularis Sin. 29: 310. 2001.

多花淫羊藿 duo hua yin yang huo

Herbs, ca. 80 cm tall. Rhizome short, stout. Leaves basal and cauline, trifoliolate; leaflets abaxially pale green, adaxially green, elliptic or oblong, sometimes narrowly ovate, 12–14 × 5–6 cm, membranous, abaxially sparsely white strigose or glabrous, adaxially glabrous, base cordate, apex acuminate or long acuminate, terminal leaflet with equal rounded lobes, lateral leaflets quite oblique with outer lobes large, acute and deltoid, inner lobes smaller and rounded, margin spinose-serrate. Flowering stem with 2 opposite, or 3 or 4 whorled, trifoliolate leaves. Inflorescence compound, many (300–400) flowered, ca. 25 × 15 cm, base of rachis with 1–5 peduncles 20–30-flowered, usually glabrous. Pedicel 5–10 mm, glabrous; bracts lanceolate, ca. 1 mm. Flowers minute, ca. 3 mm in diam. Outer sepals purplish red, oblong, ca. 3.5 × 1.5 mm; inner sepals white, lanceolate, ca. 3 × 1 mm. Petals pale yellow, oblong, saccate, 1.2–2 × 0.6–1 mm, without spur. Stamens ca. 3 mm; filaments ca. 1 mm; anthers valved. Pistil 5–7 mm; style 3–4 mm. Fruit unknown. Fl. Apr–May, fr. unknown.

- Slopes in valleys, roadsides, streamsides; 500–800 m. Guizhou (Wangmo, Yinjiang, Yuping).

**14. *Epimedium koreanum*** Nakai, Fl. Sylv. Kor. 21: 63. 1936.

朝鲜淫羊藿 chao xian yin yang huo

*Epimedium cremeum* Nakai & Maekawa ex Honda; *E. grandiflorum* C. Morren subsp. *koreanum* (Nakai) Kitamura; *E. grandiflorum* var. *koreanum* (Nakai) K. Suzuki; *E. sulphurellum* Nakai (1944), not C. Morren (1849).

Herbs, 15–40 cm tall. Rhizome creeping, 3–5 mm in diam. Leaves basal and cauline, biternate, usually 9-foliolate; leaflets abaxially pallid, adaxially dark green, ovate, 3–13 × 2–8 cm, papery, abaxially glabrous or sparsely puberulent, adaxially glabrous, base deeply cordate with usually rounded lobes, base of lateral leaflets conspicuously oblique with outer lobe large, deltoid, and acute, inner lobe smaller and rounded, margin minutely serrate, apex acute or acuminate. Flowering stem with 1 biternate leaf. Inflorescence a simple raceme, 4–16-flowered, 10–15 cm, glabrous or pilose. Pedicel 1–2 cm. Flowers white, pale yellow, deep rose, or violet, 2–4.5 cm in diam. Outer sepals reddish, oblong, 4–5 mm; inner sepals narrowly ovate to lanceolate, flat, 8–18 × 3–6 mm, apically acute. Petals usually much longer than inner sepals, rounded; spurs slender, elongate, tapering-subulate, 1–2 cm. Stamens ca. 6 mm; anthers ca. 4.5 mm; filaments ca. 1.5 mm. Pistil ca. 8 mm; ovary ca. 4.5 mm; style ca. 3.5 mm. Capsules narrowly fusiform, ca. 6 mm; style ca. 2 mm. Seeds 6–8. Fl. Apr–May, fr. May.  $2n = 12$ .

- Forests, thickets; 400–1500 m. Anhui, Jilin, Liaoning, Zhejiang [Japan, N Korea].

**15. *Epimedium flavum*** Stearn, Bot. Mag., n.s., 12: 21. 1995.

天全淫羊藿 tian quan yin yang huo

Herbs, 15–30 cm tall. Leaves basal and cauline, nearly leathery when mature, basal leaves mostly with 5 leaflets, sometimes 3, cauline leaves with 3 or 5 leaflets; leaflets ovate, to 4 × 3 cm, both surfaces glabrous, base cordate with lobes rounded and slightly diverging or separated by a narrow sinus,

those of lateral leaflets moderately unequal, margin remotely spinose-serrate, apex acuminate. Flowering stem with 1 leaf or 2 leaves at same height or at different heights. Inflorescence simple, racemose, loosely few flowered (3–10-flowered), ca. 6 cm. Pedicel to 2 cm, with short glandular hairs. Flowers large, ca. 3 cm in diam. Outer sepals caducous; inner sepals spreading horizontally, pale sulfur-yellow, lanceolate, ca.  $11 \times 4$  mm, apex obtuse. Petals pale sulfur-yellow, slightly longer than inner sepals; spur elongated, subulate, slightly curved, ca. 1.3 cm, expanded at base into a lamina ca. 8 mm high. Stamens included, ca. 3 mm; filaments pale sulfur-yellow, ca. 0.5 mm; anthers pale sulfur-yellow, ca. 2.5 mm. Fruit unknown. Fl. Apr, fr. unknown.

- About 2000 m. Sichuan (Erlang Shan, Tianquan).

**16. *Epimedium brachyrrhizum*** Stearn, Kew Bull. 52: 659. 1997.

短茎淫羊藿 duan jing yin yang huo

Herbs, ca. 23 cm tall. Rhizome short, compact, clump-forming. Leaves basal and cauline, trifoliolate; leaflets adaxially deep green, ovate or narrowly ovate,  $6\text{--}10 \times 3.5$  cm, leathery, abaxially glabrous except for hairy thickened insertion of secondary petiole, adaxially glabrous, base deeply cordate, base of terminal leaflet with equal rounded lobes, those of lateral leaflets unequal with outer lobe large, deltoid, and acute, inner lobe smaller and rounded, margin closely spinulose subserrulate, apex acuminate. Flowering stem with 1 leaf. Inflorescence simple, racemose, loosely few flowered (6–12-flowered), ca. 14 cm. Pedicel ca. 2 cm, sparsely glandular pubescent. Flowers large, ca. 4 cm in diam. Outer sepals obovate,  $3.5\text{--}4$  mm, apically obtuse; inner sepals pale rose, lanceolate,  $20\text{--}22 \times$  ca. 6 mm. Petals basally rose, elsewhere white, slightly longer than inner sepals; spur strongly curved, elongate,  $2.2\text{--}2.6$  cm, nearly lamina-less. Stamens prolonged, ca. 4 mm; filaments whitish, ca. 1 mm, slender; anthers yellow, valved. Pistil ca. 6 mm; style ca. 2.5 mm; stigma ruminant. Fl. Apr–May, fr. unknown.

- Forests on slopes; 600–1200 m. Guizhou (Fanjing Shan).

**17. *Epimedium leptorrhizum*** Stearn, J. Bot. 71: 343. 1933.

黔岭淫羊藿 qian ling yin yang huo

*Epimedium macranthum* H. Léveillé, Fl. Kouy-Tchéou, 48. 1914–1915, not Morren & Decaisne (1834).

Herbs, 12–30 cm tall. Rhizome long creeping, 1–2 mm in diam.; internodes sometimes to 20 cm. Leaves basal and cauline, trifoliolate; petiole reddish pubescent; leaflets adaxially dark green, narrowly ovate or ovate,  $3\text{--}10 \times 2\text{--}5$  cm, leathery, abaxially often glaucous, papillose and reddish pubescent on midvein and lateral veins, especially dense at insertion of petiolules, adaxially glabrous, base deeply cordate with usually rounded lobes nearly touching, those of lateral leaflets unequal, margin closely spinose-serrate, apex long acuminate. Flowering stem with 1 trifoliolate leaf, or occasionally 2 opposite leaves. Inflorescence simple, racemose, 4–12-flowered, 12–25 cm, glandular. Pedicel 1–2.5 cm, glandular. Flowers white, tinged with rose or deep rose, large,  $3.5\text{--}4$  cm in diam. Outer sepals

ovate-oblong, 3–4 mm, apex obtuse; inner sepals white, narrowly elliptic,  $11\text{--}20 \times 4\text{--}7$  mm, apex acute. Petals longer than inner sepals, horn-shaped, to 2 cm, tapering from swollen but lamina-less base. Stamens ca. 4 mm; anthers ca. 3 mm, valved, revolute. Capsules oblong, 1.5–2 cm; style rostriform. Fl. Mar–Apr, fr. Apr–May.

- Forests, thickets; 400–1500 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

**18. *Epimedium pauciflorum*** K. C. Yen, Guihaia 14: 124. 1994.

少花淫羊藿 shao hua yin yang huo

Herbs, 6–20 cm tall. Rhizome long creeping, 1–3 mm in diam.; internodes sometimes to 20 cm. Leaves basal and cauline, trifoliolate; leaflets ovate or suborbicular,  $1.3\text{--}2.5 \times 1.2\text{--}2.5$  cm, abaxially sparsely puberulent, adaxially glabrous, base deeply cordate with rounded lobes nearly touching, those of lateral leaflets conspicuously unequal, margin coarsely serrate, apex acute or shortly acuminate. Flowering stem with 1 trifoliolate leaf. Inflorescence simple, racemose, few flowered (ca. 3-flowered), 4–7 cm; rachis and pedicels glandular, pubescent. Pedicel 1–2.3 cm; bracts ovate, 0.8–1.4 mm. Outer sepals caducous, narrowly obovate, ca.  $4 \times 3$  mm; inner sepals white, broadly lanceolate, ca.  $12 \times 5$  mm, apex obtuse. Petals declined, white, horn-shaped, longer than inner sepals, blunt spurs ca. 1.7 cm. Stamens 4; anthers ca. 2.5 mm, valved. Pistil ca. 6 mm; style 2–2.8 mm. Fruit unknown. Fl. Mar–Apr, fr. unknown.

- Weedy slopes; ca. 1700 m. Sichuan.

**19. *Epimedium shuichengense*** S. Z. He, Acta Bot. Yunnan. 18: 209. 1996.

水城淫羊藿 shui cheng yin yang huo

Herbs, 15–30 cm tall. Rhizome creeping, longer than 15 cm, 1.5–2.5 mm in diam. Leaves basal and cauline, trifoliolate; petiole of basal leaf 10–17 cm, petiole of cauline leaf 3–6 cm; leaflets ovate,  $4\text{--}5.5 \times 2\text{--}2.5$  cm, abaxially appressed whitish puberulent, adaxially glabrous, base deeply cordate with lobes rounded or acute, those of lateral leaflets conspicuously unequal, margin spinose-serrulate, apex long acuminate. Flowering stem with 2 trifoliolate opposite leaves. Inflorescence simple, racemose, few flowered (6–9-flowered), 6–7 cm, glabrous or sparsely glandular pubescent; bracts broadly lanceolate, ca. 1.5 mm, spinulose-serrulate, apex dentiform. Flowers ca. 1 cm in diam. Outer sepals purple, lanceolate, ca.  $5 \times 2$  mm; inner sepals pale yellow, ovate, ca.  $4 \times 3$  mm. Petal spur curved, yellow, shortly horn-shaped, 4–5 mm. Stamens ca. 4 mm; filaments ca. 2 mm. Pistil ca. 4 mm; style ca. 2 mm. Capsules ca. 1 cm; style ca. 3 mm. Fl. Apr–May, fr. May–Jun.

- Thickets on slopes; ca. 1800 m. Guizhou (Shuicheng).

**20. *Epimedium epsteinii*** Stearn, Kew Bull. 52: 662. 1997.

紫距淫羊藿 zi ju yin yang huo

Herbs, ca. 15 cm tall. Rhizome long creeping, slender, 2–3 mm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially deep green, ovate,  $4\text{--}5 \times 2\text{--}3$  cm, abaxially glaucous,

with sparse minute prostrate hairs, adaxially glabrous, base shallowly cordate with lobes separated by a moderately broad sinus, those of terminal leaflet rounded, lateral leaflets with smaller lobe rounded and larger lobe acute, margin closely spinulose-subserulate, apex acuminate. Flowering stem with 2 opposite leaves or only 1 leaf. Inflorescence simple, racemose, 6–15-flowered, ca. 6 cm or longer; bracts entire. Pedicel ca. 3 cm, glabrous. Flowers large, ca. 3 cm in diam. Outer sepals caducous, greenish, suborbicular, 2.5–3.5 mm; inner sepals white, ovate, ca. 13 × 9 mm, apex acute. Petals pale purple, slightly longer than inner sepals; spur basally deeper purple, slightly curved, subulate, elongated, 1.5–1.6 cm, basally expanded to 5 mm high. Stamens enclosed, ca. 4 mm; filaments ca. 0.5 mm. Pistil ca. 4.2 mm; style ca. 3 mm. Fruit unknown. Fl. Apr, fr. unknown.

• Forest margins, shaded places by streamsides; 400–1000 m. Hunan (Tianping Shan).

**21. *Epimedium fangii*** Stearn, Bot. Mag., n.s., 12: 18. 1995.

方氏淫羊藿 *fang shi yin yang huo*

Herbs, ca. 25 cm tall. Rhizome long creeping, slender, 1.5–2 mm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially pale green, narrowly ovate, 4–8 × 2.5–5.5 cm, leathery, abaxially glaucous, nearly glabrous except for scattered appressed minute hairs, adaxially glabrous, base moderately cordate with lobes rounded and separated by a narrow sinus, those of lateral leaflets moderately unequal, margin spinulose-serrulate, apex obtuse or nearly acute. Inflorescence simple, racemose, loosely 6–10-flowered, to 13 cm. Pedicel ca. 2 cm, glabrous. Flowers pale yellow, large, ca. 4.5 cm in diam. Outer sepals caducous, 2.5–3.5 mm; inner sepals spreading horizontally, reddish, cymbiform, ca. 6 × 2.5 mm, obtuse. Petals pale yellow, much longer than inner sepals; spur nearly straight and horizontally spreading, subulate, elongated, ca. 2.2 cm, expanded at base into a lamina ca. 1 cm high. Stamens included, ca. 3.5 mm; filaments ca. 1 mm; anthers pale yellow, ca. 2.5 mm, valved. Capsules unknown. Fl. Apr, fr. unknown.

• Forests; 1800–1900 m. Sichuan (Emei Shan).

A natural hybrid swarm (*Epimedium × omeiense* Stearn, Bot. Mag., n.s., 12: 22. 1995) reportedly results when *Epimedium fangii* and *E. acuminatum* occur together (see also Stearn, Gen. *Epimedium*, 183. 2002).

**22. *Epimedium latisepalum*** Stearn, Bot. Mag. (Kew Mag.) 10: 180. 1993.

宽萼淫羊藿 *kuan e yin yang huo*

Herbs, ca. 30 cm tall. Rhizome creeping, slender. Leaves basal and cauline, trifoliolate; petiole to 10 cm; leaflets adaxially deep green, narrowly ovate, 6–9 × 2.5–4 cm, leathery, abaxially glaucous, with short erect scattered hairs, adaxially glabrous, base deeply cordate with lobes acute or rounded and touching or slightly overlapping, those of lateral leaflets unequal, margin spinulose-subserulate, apex shortly acuminate or acute. Flowering stem with 2 trifoliolate opposite leaves. Inflorescence simple, racemose, loose, few flowered (ca. 8-flowered), ca. 20 cm. Pedicel 2.5–5 cm, glabrous. Flowers pendulous, large, 4–5 cm in diam. Outer sepals caducous, green, ob-

long, 3–5 mm, margin emarginate or repand; inner sepals spreading horizontally, white, elliptic, ca. 16 × 8–9 mm, apically shortly acuminate. Petals white but slightly yellowish or purplish tinged at base, much longer than inner sepals; spur slightly curved, horn-shaped, elongated, ca. 2.5 cm, basally expanded into lamina ca. 7 mm. Stamens included, ca. 4 mm; anthers yellow, ca. 2.5 mm, valved, apex blunt. Pistil ca. 7 mm; style ca. 3.5 mm. Fl. and fr. unknown.

• About 900 m. Sichuan (Baoping).

*Epimedium latisepalum* was described from plants cultivated in the Royal Botanic Gardens, Kew, but originally from Sichuan.

**23. *Epimedium ogisui*** Stearn, Bot. Mag. (Kew Mag.) 10: 182. 1993.

芦山淫羊藿 *lu shan yin yang huo*

Herbs, 25–35 cm tall. Rhizome long creeping, slender, ca. 1 mm in diam. Leaves basal and cauline, basal leaves with 1 or 3 leaflets, petiole 5–13 cm. Flowering stem with 2 trifoliolate opposite leaves, petiole 2–5 cm; leaflets adaxially deep green, ovate or narrowly ovate, 3–6 × 1–3 cm, abaxially glaucous, nearly glabrous except for scattered erect short hairs, adaxially glabrous, base moderately cordate with lobes rounded and separated by a narrow sinus, those of lateral leaflets moderately unequal, margin spinulose-subserulate, apex acute. Inflorescence simple, racemose, loosely 3–12-flowered, 12–14 cm. Pedicel 2–3 cm, glabrous. Flowers white, ca. 2.5 cm in diam. Outer sepals caducous, 2–3.5 mm; inner sepals spreading, white, lanceolate, 16–19 × 7–9 mm, apex acuminate. Petals white, ca. as long as inner sepals; spur slightly curved, subulate, elongated, 1.5–1.8 cm, basally expanded into lamina 7–8 mm high. Stamens included, ca. 4.5 mm; filaments flat, ca. 1.5 mm; anthers ca. 3 mm, valved, revolute, apex obtuse. Pistil ca. 6 mm. Fruit unknown. Fl. Apr, fr. unknown.

• Rocky cliffs by waterfalls; 900–1000 m. Sichuan (Lushan).

**24. *Epimedium fargesii*** Franchet, J. Bot. (Morot) 8: 281. 1894.

川鄂淫羊藿 *chuan e yin yang huo*

Herbs, 30–70 cm tall, sometimes to 80 cm tall. Rhizome creeping, stout, 2–8 mm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially dark green, narrowly ovate, 4–15 × 1.3–7 cm, leathery, abaxially glaucous, glabrous or sparsely pilose, adaxially glabrous, both surfaces with conspicuous reticulate veins, base deeply cordate with usually rounded lobes, those of lateral leaflets unequal, outer lobe large, deltoid, and acute, inner lobe smaller and rounded, margin closely spinose-serrate, apex acuminate. Flowering stem normally with 2 (abnormally 3) trifoliolate opposite leaves. Inflorescence simple, racemose, or compound with lower peduncles loosely 2- or 3-flowered, rachis glandular pubescent, 14–25-flowered, 14–30 cm. Pedicel 1.5–4 cm, glandular pubescent. Flowers purplish red, ca. 2 cm. Outer sepals violet-tinged, narrowly ovate, 3–4 × ca. 1.5 mm, apex blunt; inner sepals reflexed, white or pinkish, narrowly lanceolate, 1.5–1.8 cm × ca. 4 mm, apically acuminate. Petals dark violet, much shorter than inner sepals, slightly 2- or 3-lobed; spur straight, cylindrical-subulate, blunt, 7–8 mm.

Stamens conspicuously prolonged, ca. 9 mm; anthers purple, 3–4 mm. Ovary ca. 1.3 cm. Capsules included; style ca. 2 cm. Fl. Mar–Apr, fr. Apr–Jun.

• Coniferous and broad-leaved mixed forests, thickets; 200–1700 m. Hubei, Sichuan.

**25. *Epimedium enshiense*** B. L. Guo & P. K. Hsiao, *Acta Phytotax. Sin.* 31: 194. 1993.

恩施淫羊藿 *en shi yin yang huo*

Herbs, 25–70 cm tall. Rhizome shortly creeping, nodes many. Leaves basal and cauline, usually trifoliolate, rarely basal leaves simple; leaflets abaxially glaucous, slightly pruinose, adaxially dark green, ovate or broadly ovate, 3.2–9.5 × 2.5–6 cm, leathery, abaxially glabrous or sparsely white pubescent, adaxially glabrous, base cordate with lobes rounded, base of terminal leaflet with subequal lobes rounded, those of lateral leaflets slightly unequal, rounded or obtuse, margin remotely spinose-serrate, apex acuminate or shortly acuminate. Flowering stem with 2 trifoliolate opposite leaves. Inflorescence simple, racemose, 10–20-flowered, 14–33 cm, glandular. Flowers large, 1.5–2.5 cm in diam. Outer sepals 4, pale brown, outer pair ovate-orbicular, ca. 1.5 mm, inner pair ovate, ca. 2.5 × 1.5 mm; inner sepals pale yellow, ovate, 6–7 × 3.2–3.7 mm, apically acute. Petal spur pale yellow, horn-shaped, longer than inner sepals, 7–12 mm, base lamina-less. Stamens slightly prolonged, ca. 3 mm; anther ca. 2 mm, valved. Capsules 1–1.4 cm; style ca. 5 mm. Seeds 10. Fl. Apr–May, fr. May–Jun.

• Slopes; ca. 400 m. Hubei (Enshi).

**26. *Epimedium franchetii*** Stearn, *Kew Bull.* 51: 396. 1996.

木鱼坪淫羊藿 *mu yu ping yin yang huo*

Herbs, 20–60 cm tall. Rhizome compact, ca. 7 mm in diam. Leaves basal and cauline, trifoliolate, leathery; basal petioles 4–10 cm; leaflets abaxially occasionally reddish tinged, adaxially shiny, narrowly ovate, 9–14 × 6–7 cm, abaxially glaucous, with extremely minutely appressed hairs, adaxially glabrous, base deeply cordate with a narrow sinus, lobes of terminal leaflet equal and obtuse or acute, those of lateral leaflets unequal with inner lobe smaller and acute or obtuse, outer lobe much longer and acuminate, margin closely spinose-serrate, apex acute or acuminate. Flowering stem with 2 trifoliolate opposite leaves or 3 whorled leaves. Inflorescence simple, 14–25-flowered, 15–30 cm. Pedicel 1–3 cm, glandular hairy. Flowers large, ca. 4.5 cm in diam. Outer sepals caducous, green, to 5 mm; inner sepals pale yellow, narrowly ovate, ca. 10 × 4–5 mm, apically acuminate. Petals pale sulfur-yellow, much longer than inner sepals; spur much curved, subulate, elongate, ca. 2 cm, lamina-less. Stamens exposed, ca. 4.5 mm; filaments pale yellow, ca. 2 mm; anthers pale yellow, valved. Pistil ca. 5 mm. Fruit unknown. Fl. Apr, fr. unknown.

• Forests; ca. 1200 m. Guizhou, Hubei.

**27. *Epimedium lishihchenii*** Stearn, *Kew Bull.* 52: 664. 1997.

时珍淫羊藿 *shi zhen yin yang huo*

*Epimedium membranaceum* K. Meyer subsp. *orientale* Stearn.

Herbs, 30–40 cm tall. Rhizome long creeping, slender, 2–3 mm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially dark green, narrowly ovate, 5–11 × 3.5–5 cm, leathery, abaxially glaucous, with long multicellular hairs or subglabrous, base cordate with a narrow or open sinus, lobes of terminal leaflet equal and obtuse, those of lateral leaflets unequal, with inner one smaller and rounded or obtuse, outer one longer and acute, margin closely spinulose-subserulate, apex acuminate or sometimes acute. Flowering stem with 2 opposite leaves. Inflorescence simple, 5–11-flowered, 7–12 cm. Pedicel 1–2 cm, glandular hairy. Flowers yellow, large. Outer sepals caducous, 4–5 mm, with white margins; inner sepals appressed to petals, yellowish, ovate or narrowly oblong, 10–11 × 6–7 mm, apically acute. Petals pale sulfur-yellow, much longer than inner sepals, lamina-less; spur strongly curved, subulate, elongated, 2–2.5 cm. Stamens exposed, pale yellow, ca. 5 mm; filaments ca. 1 mm; anthers ca. 3.5 mm. Pistil ca. 7 mm. Fruit unknown. Fl. Apr–May, fr. unknown.

• Forests on slopes. Jiangxi (Lu Shan).

**28. *Epimedium davidii*** Franchet, *Nouv. Arch. Mus. Hist. Nat., sér. 2*, 8: 195. 1885 [*“davidii”*].

宝兴淫羊藿 *bao xing yin yang huo*

*Epimedium membranaceum* K. Meyer.

Herbs, 30–50 cm tall. Rhizome shortly creeping, stout. Leaves basal and cauline, (3 or)5-foliolate, basal leaf usually much shorter than flowering stem leaf, 12–25 cm; leaflets abaxially glaucescent, adaxially deep green, shiny, ovate or broadly ovate, 6–12 × 2–5 cm, leathery or papery, abaxially papillose and sparsely pubescent with short appressed hairs, both surfaces with distinct reticulate veins, base deeply or shallowly cordate with subequal rounded lobes, margin spinose-serrate, apex obtuse or acute. Flowering stem with 2 trifoliolate opposite leaves, rarely alternate or 3 leaves. Panicle loosely 6–24-flowered, 15–25 cm. Pedicel 1.5–2 cm, slender, glandular. Flowers pale yellow, 2–3 cm in diam. Outer sepals ovate, 2–4 mm, blunt; inner sepals pale reddish, narrowly ovate, 6–7 × 3–4 mm, apex acute. Petals much longer than inner sepals, lamina distinct, petaloid, rounded, forming a cup 7–13 mm deep; spur slender, curved, subulate, 1–1.5 cm. Stamens included, 3–4 mm; filaments flat, ca. 7 mm; anthers ca. 4 mm, valved. Ovary ca. 5 mm. Capsule 1.5–2 cm; style ca. 5 mm, rostrate. Fl. Apr–May, fr. May–Aug.

• Forests, thickets, mixed forests by streams, rock crevices; 1400–3000 m. Sichuan, Yunnan.

**29. *Epimedium dolichostemon*** Stearn, *Kew Bull.* 45: 685. 1990.

长蕊淫羊藿 *chang rui yin yang huo*

Herbs, ca. 30 cm tall. Rhizome shortly creeping. Leaves basal and cauline, trifoliolate; leaflets adaxially deep green, ovate-lanceolate or lanceolate, to 8 × 3 cm, leathery, abaxially glabrous, base deeply cordate with subequal acute lobes, those of lateral leaflets unequal, acuminate, margin remotely spinose-serrate, apex acuminate. Flowering stem with 2 trifoliolate op-

posite leaves. Panicle loosely many flowered (to 38-flowered), ca. 15 cm, with lower peduncles 1–2 cm, each 2- or 3-flowered at base of rachis. Pedicel 1–1.5 cm, glabrous. Outer sepals caducous, 2.5–3 mm; inner sepals white, narrowly elliptic, 8–9 × ca. 2.5 mm. Petals reddish purple, cucullate, much shorter than inner sepals, ca. 3 mm, with slight lamina and blunt incurved spur. Stamens conspicuously prolonged, ca. 8 mm; filaments yellowish, 4.5–5 mm; anthers ca. 2.5 mm, valved, revolute. Fruit unknown. Fl. Apr, fr. unknown.

• Habitat unknown, described from plants in cultivation in England; ca. 1400 m. Sichuan (Shizhu).

**30. *Epimedium mikinorii*** Stearn, Kew Bull. 53: 214. 1998.

直距淫羊藿 zhi ju yin yang huo

Herbs, 30–40 cm tall. Rhizome shortly repent, compact. Leaves basal and cauline, trifoliolate; leaflets adaxially dark green, lanceolate, 8–11 × 3–4 cm, leathery, abaxially glaucous, glabrous, base cordate with equal lobes rounded, those of lateral leaflets oblique with outer lobe large and acute, inner lobe smaller and rounded, margin closely spinose-serrulate, apex long acuminate. Flowering stem with 2 trifoliolate opposite leaves. Panicle ca. 30-flowered, ca. 18 cm, glabrous, with lower peduncles 3–5-flowered. Pedicel ca. 1 cm. Flowers large. Outer sepals caducous, oblong, ca. 3.5 mm; inner sepals rose-tinged, elliptic, 11–12 × 4–5.5 mm. Petals much longer and narrower than inner sepals, with yellow-edged lamina ca. 3.5 mm high; spur slightly curved, nearly straight, purple, subulate, elongated, 1.7–2 cm. Stamens enclosed, whitish, ca. 3 mm; filaments ca. 1 mm; anthers ca. 2 mm, valved. Pistil ca. 5.8 mm; style slightly curved. Fruit unknown. Fl. Apr, fr. unknown.

• Forests on slopes; ca. 700 m. Hubei (Enshi).

**31. *Epimedium chlorandrum*** Stearn, Kew Bull. 52: 660. 1997.

绿药淫羊藿 lu yao yin yang huo

Herbs, 35–65 cm tall. Rhizome compact. Leaves basal and cauline, trifoliolate; leaflets adaxially green, mottled with brown when young, narrowly ovate or sub lanceolate, 5–11 × 2–4.5 cm, leathery, abaxially glaucous, with numerous minutely appressed hairs, base moderately cordate, terminal leaflet with equal rounded lobes, lateral leaflets oblique with outer lobe large and obtuse or rounded, inner lobe smaller and rounded, margin slightly undulate, sparsely or closely spinulose-subserulate, apex shortly acuminate. Panicle 12–30-flowered, 25–36 cm, lower peduncles 3–5-flowered. Pedicel ca. 2.5 cm, glabrous. Flowers large, ca. 4 cm in diam. Outer sepals caducous, green, 2–3 mm; inner sepals not appressed to petals, greenish, narrowly ovate, unequal, outer pair ca. 8 × 4.5 mm, inner pair ca. 10 × 4.5 mm. Petals pale yellow, much longer than inner sepals; spur strongly curved, subulate, elongated, lamina-less. Stamens prolonged, ca. 4.5 mm; filaments white, with slightly pink tinge; anthers green, ca. 3 mm; pollen green. Fruit unknown. Fl. Apr, fr. unknown.

• Forests on slopes; ca. 900 m. Sichuan (Baoping).

**32. *Epimedium wushanense*** T. S. Ying, Acta Phytotax. Sin. 13(2): 55. 1975.

巫山淫羊藿 wu shan yin yang huo

Herbs, evergreen, 50–80 cm tall. Rhizome short, stout, nodose. Leaves basal and cauline, trifoliolate; leaflets lanceolate to narrowly lanceolate, 9–23 × 1.8–4.5 cm, leathery, abaxially lanate or becoming glabrous, adaxially glabrous, base cordate, terminal leaflet with equal rounded lobes, lateral leaflets oblique with outer lobe large, deltoid, and acute, inner lobe smaller and rounded, margin coarsely aristate-dentate, apex acuminate or long acuminate. Flowering stem with 2 trifoliolate opposite leaves. Panicle many flowered (25–70-flowered), 15–30(–50) cm; rachis glabrous. Pedicel 1–2 cm, sparsely glandular pubescent or glabrous. Flowers pale yellow, to 3.5 cm in diam. Outer sepals suborbicular, 2–5 × 1.5–3 mm; inner sepals pale yellow, broadly elliptic, 3–15 × 1.5–8 mm, apex obtuse. Petals slightly curved, pale yellow or sometimes purplish at base, horn-shaped, longer than inner sepals, 0.6–2 cm. Stamens ca. 5 mm; filaments 1–1.5 mm; anthers ca. 4 mm, valved, revolute. Pistil ca. 5 mm; ovary obliquely terete; ovules 10–12. Capsule ca. 1.5 cm; style ca. 4.5 mm, rostrate. Fl. Apr–May, fr. May–Jun.

• Forests, thickets, weedy places, crevices; 300–1700 m. Chongqing, Guangxi, Guizhou, Hubei, Sichuan.

**33. *Epimedium stellulatum*** Stearn, Kew Bull. 48: 810. 1993.

星花淫羊藿 xing hua yin yang huo

Herbs, 20–35 cm tall. Rhizome shortly creeping. Leaves basal and cauline, trifoliolate; leaflets adaxially dark green, shiny, ovate, 8–9 × 4–7 cm, leathery, abaxially conspicuously puberulent, base deeply cordate, terminal leaflet with equal rounded lobes, lateral leaflets moderately oblique with outer lobe and inner lobe smaller, acute, margin spinose-serrate, apex acute or shortly acuminate. Flowering stem with 2 trifoliolate opposite leaves, rarely with 1 leaf. Panicle loosely 20–40-flowered, 15–20 cm, with lower peduncles to 3 cm, each 3-flowered. Pedicel 5–15 mm, with numerous glandular hairs; bracteole ca. 2.2 mm, apex shortly acuminate. Outer sepals 4, caducous, unequal, 2.5–3 mm; inner sepals white, lanceolate, ca. 12 × 3 mm, apically acuminate. Petals nearly straight, brown suffuse but orange toward base, much shorter than inner sepals, ca. 2.5 mm, with slight lamina and blunt spur. Stamens conspicuously prolonged, ca. 3.5 mm; filaments yellowish, ca. 1.5 mm; anthers yellow, ca. 2 mm, valved. Pistil ca. 4.5 mm; style ca. 2.5 mm. Fruit unknown. Fl. Apr, fr. unknown.

• Slopes; ca. 900 m. Hubei, Sichuan.

**34. *Epimedium reticulatum*** C. Y. Wu ex S. Y. Bao, Acta Phytotax. Sin. 25: 156. 1987.

革叶淫羊藿 ge ye yin yang huo

Herbs, 30–40 cm tall. Rhizome purplish red, shortly creeping. Leaves basal and cauline, trifoliolate; petiole of basal leaves ca. 20 cm, petiole of cauline leaves 5–6 cm; leaflets adaxially dark green, ovate, 5–7 × 3.5–5 cm, thickly leathery, glabrous, abaxially pilose in axils of veins, adaxially with 5 slightly impressed veins, both surfaces with conspicuous reticulate veins, base deeply cordate with usually rounded lobes, those of lateral leaflets conspicuously unequal, margin spinose-

serrate, apex acute or acuminate. Flowering stem with 2 opposite trifoliolate leaves, sometimes 3 or 4 leaves whorled. Panicle 40–45-flowered, 30–35 cm, with lower peduncles 2–20-flowered; rachis glandular pubescent. Pedicel ca. 1.5 cm, slender, glandular pubescent. Flowers yellow. Outer sepals oblong, ca. 5 mm; inner sepals elliptic, ca. 6 mm, apex rounded. Petal spur yellow, horn-shaped, shorter than inner sepals, ca. 4.5 mm. Stamens ca. 3 mm; filaments flat, short. Capsule 1.2–1.5 cm; style rostrate. Seeds 3–5, reniform. Fl. Apr–May, fr. Jun–Jul.

- Forests; ca. 1100 m. Sichuan.

**35. *Epimedium ilicifolium*** Stearn, Kew Bull. 53: 213. 1998.

镇坪淫羊藿 zhen ping yin yang huo

Herbs, 28–42 cm tall. Rhizome compact. Leaves basal and cauline, trifoliolate; leaflets adaxially glossy, lanceolate, 8–11 × 3–4 cm, leathery, abaxially puberulent, adaxially glabrous, base cordate with an open sinus and acute lobes, terminal leaflet with equal rounded lobes, lateral leaflets oblique with outer lobe large and inner lobe smaller, margin undulate-sinuate and sparsely spinose-serrate, apex long acuminate. Flowering stem with 2 opposite trifoliolate leaves. Panicle loosely 25–32-flowered, 18–23 cm. Pedicel ca. 2 cm, glandular. Flowers yellow, large. Outer sepals caducous, black, white-margined, obovate, ca. 4.2 × 4 mm, apex emarginate; inner sepals pale yellow, elliptic or narrowly ovate, 10–12 × 5–6 mm, apex acute. Petals pale yellow, much longer than inner sepals, ca. 2 mm; spur strongly curved, subulate, elongated, basal lamina ca. 7 mm high. Stamens enclosed, yellow, ca. 4 mm; filaments ca. 1 mm; anthers ca. 3 mm, valved. Pistil ca. 5.5 mm; style ca. 3 mm. Fruit unknown. Fl. Apr, fr. unknown.

- 1600–1700 m. Shaanxi (Zhenping).

**36. *Epimedium acuminatum*** Franchet, Bull. Soc. Bot. France 33: 109. 1886.

粗毛淫羊藿 cu mao yin yang huo

*Epimedium komarovii* H. Léveillé.

Herbs, 30–70 cm tall. Rhizome stout, short, sometimes long creeping, 0.5–2.5 cm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially deep green, narrowly ovate or lanceolate, 3–18 × 1.5–7 cm, thinly leathery, abaxially glaucous, with dense or sparse shortly appressed fairly stout bristles, sometimes nearly glabrous, adaxially glabrous, base cordate, terminal leaflet with equal rounded lobes, lateral leaflets oblique with outer lobes large and rounded, inner lobes smaller and rounded, margin closely spinose-serrate, apex long acuminate. Flowering stem with 2 trifoliolate opposite leaves, sometimes 3-whorled. Panicle 10–50-flowered, 12–25 cm, with lower peduncles loosely 3–5-flowered, glabrous or glandular pubescent. Pedicel 1–4 cm. Flowers yellow, white, rose-purple, or pale violet, large, 3–4 cm in diam. Outer sepals 4, outer pair ovate-oblong, ca. 3 × 2 mm, inner pair broadly obovate, ca. 4.5 × 4 mm; inner sepals ovate-elliptic, 8–12 × 3–7 mm, apically acute. Petals curving outward, horn-shaped, much longer than inner sepals, 1.5–2.5 cm, tapering from swollen but lamina-less base. Stamens 3–4 mm; anthers ca. 2.5 mm, valved, revolute. Capsule ca. 2 cm; style long rostrate. Seeds numerous. Fl. Apr–May, fr. May–Jul.  $2n = 12^*$ .

- Forests, thickets, bamboo forests, weedy slopes; 300–2400 m. Guangxi, Guizhou, Sichuan, Yunnan.

**37. *Epimedium hunanense*** (Handel-Mazzetti) Handel-Mazzetti, Symb. Sin. 7: 324. 1931.

湖南淫羊藿 hu nan yin yang huo

*Epimedium davidii* Franchet var. *hunanense* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 62: 131. 1925; *E. kunawarensense* S. Clay.

Herbs, ca. 40 cm tall. Rhizome shortly creeping, 3–5 mm in diam. Leaves basal and cauline, trifoliolate; leaflets abaxially glaucous, adaxially deep green, oblong-elliptic or narrowly ovate, 10–13 × ca. 6 cm, leathery, abaxially papillose and sparsely pubescent or nearly glabrous, adaxially glabrous, base deeply cordate, terminal leaflet with equal rounded lobes, lateral leaflets conspicuously oblique with outer lobe large, deltoid, and acute or rounded, inner lobe smaller and rounded, margin closely spinulose-subserulate, apex acuminate. Flowering stem with 2 trifoliolate opposite leaves. Panicle loosely 10–20-flowered, nearly glabrous, with lower peduncles 2- or 3-flowered. Pedicel 1–2 cm, sparsely glandular pubescent. Flowers yellow, ca. 3.5 cm in diam. Outer sepals oblong-elliptic, ca. 4 × 2 mm, apex obtuse; inner sepals broadly elliptic, 5–6 × 3–4 mm, apically obtuse. Petals nearly cylindrical and horizontally spreading, much longer than inner sepals, with distinct petaloid rounded lamina forming a cup ca. 8 mm deep and fairly stout; spurs straight, 1.5–1.8 cm, blunt. Stamens ca. 4 mm; filaments ca. 1 mm; anther ca. 3 mm, valved, revolute. Capsules narrowly ellipsoid, ca. 1.3 cm; style 2–3 mm, rostrate. Fl. Mar–Apr, fr. Apr–Jun.

- Forests, thickets, slopes, roadsides; 400–1400 m. Guangxi, Hubei, Hunan.

**38. *Epimedium rhizomatosum*** Stearn, Kew Bull. 53: 220. 1998.

强茎淫羊藿 qiang jing yin yang huo

Herbs, 38–42 cm tall. Rhizome creeping, elongated, ca. 8 cm or longer, slender, 1.5–2 mm in diam. Leaves basal and cauline, trifoliolate; leaflets adaxially green, narrowly ovate, 4–6 × 2–3 cm, leathery, abaxially glaucous, with scattered minute erect hairs, adaxially glabrous, base shallowly cordate, with narrow sinus and basal lobes rounded or acute, lateral leaflets conspicuously oblique with outer lobe large, inner lobe smaller, margin closely spinulose-subserulate, apex acuminate. Flowering stem with 2 opposite or alternate leaves. Panicle 5–30-flowered, 9–30 cm, with lower peduncles 2–5-flowered. Pedicel 1.5–2 cm, glandular hairy. Flowers large, 4–6 cm in diam. Outer sepals caducous, white with purple tinge, ca. 4 mm; inner sepals appressed, white or reddish, narrowly ovate, ca. 6 × 2.5 mm, apically acute. Petals pale yellow, much longer than inner sepals; spur curved, subulate, elongated, 2–3.5 cm, lamina-less. Stamens nearly enclosed, pale yellow, ca. 3.5 mm; filaments ca. 1.5 mm; anthers ca. 2 mm, valved. Pistil ca. 4.3 mm. Capsules ca. 2.5 cm; style ca. 7 mm. Fl. Apr, fr. Jul.

- Forests, thickets; 2000–2200 m. Sichuan.

**39. *Epimedium sutchuenense*** Franchet, J. Bot. (Morot) 8: 282. 1894.

四川淫羊藿 *si chuan yin yang huo*

Herbs, 15–60 cm tall. Rhizome long creeping, 1–4 mm in diam., with internodes to 14 cm. Leaves basal and cauline, trifoliolate; leaflets adaxially green, ovate or narrowly ovate, 5–13 × 2–5 cm, thinly leathery, abaxially glaucous, papillose, sparsely gray pubescent, reticulate veins conspicuous, adaxially glabrous, base deeply cordate, terminal leaflet with equal rounded lobes, lateral leaflets conspicuously oblique with outer lobe large and acute, inner lobe smaller and rounded, apex long acuminate. Flowering stem with 2 trifoliolate opposite leaves. Inflorescence simple, racemose, 4–10-flowered, 8–15 cm, glandular. Pedicel 1.5–2.5 cm, glandular. Flowers rose or mauve-purple, 3–4 cm in diam. Outer sepals 4, outer pair ovate, ca. 3 mm, apex rounded, inner pair broadly obovate, ca. 4 mm; inner sepals reflexed, narrowly lanceolate, 1.5–1.7 cm × ca. 3 mm, apex long acuminate. Petals reflexed, pale purplish red, spur horn-shaped, ca. as long as inner sepals or slightly longer, 1.5–2 cm, lamina-less. Stamens prolonged, 4–5 mm; filaments 1–2 mm; anthers 3–4 mm, valved. Capsules 1.5–2 cm; style rostrate. Fl. Mar–Apr, fr. May–Jun.

• Forests, thickets, grasslands, streamsides; 400–1900 m. Guizhou, Hubei, Sichuan.

**40. *Epimedium brevicornu*** Maximowicz, Trudy Imp. S.-Peterburgsk. Bot. Sada 11: 42. 1889.

淫羊藿 *yin yang huo*

*Epimedium rotundatum* K. S. Hao.

Herbs, 20–60 cm tall. Rhizome short, clumped, 3–5 mm in diam. Leaves basal and cauline, usually biternate, 9-foliolate, rarely 5-foliolate; leaflets abaxially glaucous, adaxially usually shiny, ovate or broadly ovate, 1.5–7.5 × 1–6 cm, papery or thickly so, abaxially glabrous or scarcely pubescent, adaxially with conspicuous reticulate veins, base deeply cordate, terminal leaflet with equal rounded lobes, lateral leaflets slightly oblique with outer lobes large and acute or rounded, inner lobe smaller

and rounded, margin spinose-serrate, apex rounded or acute to acuminate. Flowering stem with 2 opposite usually biternate leaves. Panicle 10–35 cm, loosely 20–50-flowered; rachis and pedicel glandular. Pedicel 5–20 mm. Flowers white or pale yellow, ca. 1.5 cm in diam. Outer sepals dark green, ovate-triangular, 1–3 mm; inner sepals white or pale yellow, lanceolate, ca. 10 × 4 mm. Petals much shorter than inner sepals, with slight lamina and blunt spurs; spur narrow, conical, 2–3 mm. Stamens exerted, 3–4 mm; anthers ca. 2 mm, valved. Capsules ca. 1 cm; style 2–3 mm, rostrate. Fl. May–Jun, fr. Jun–Aug.

• Forests, thickets, slopes; 600–3500 m. Gansu, Henan, Hubei, Qinghai, Shaanxi, Shanxi, Sichuan.

**41. *Epimedium elongatum*** Komarov, Trudy Imp. S.-Peterburgsk. Bot. Sada 29: 139. 1908.

川西淫羊藿 *chuan xi yin yang huo*

Herbs, 25–60 cm tall. Rhizome moderately long creeping, 2–5 mm in diam. Leaves basal and cauline, bi- or triternate, 9-foliolate or occasionally 5-foliolate; leaflets adaxially green, ovate or suborbicular, 1.5–7.5 × 1–6 cm, papery, abaxially sparsely pubescent or glabrous, adaxially glabrous, both surfaces with conspicuous reticulate veins, base deeply cordate, terminal leaflet with equal rounded lobes, lateral leaflets slightly oblique with outer lobe large and rounded or acute, inner lobe smaller and rounded, margin spinose-serrate, apex rounded or acute. Flowering stem with 3 alternate or rarely opposite leaves, upper biternate or trifoliolate, lower biternate or triternate. Panicle 17–30-flowered, 15–30 cm, sparsely glandular, with lower peduncles 3–5-flowered. Pedicel 1–2 cm, sparsely glandular. Flowers yellow, large, 2.5–3 cm in diam. Outer sepals whitish, ovate, 3–4 × ca. 2 mm, blunt; inner sepals purple, lanceolate, ca. 4 × 1.5 mm, apically acute. Petals yellow, longer than inner sepals; spur horizontally spreading or upwardly curved, ca. 1.5 cm, slender, lamina-less. Stamens slightly prolonged, ca. 3 mm; anthers ca. 2 mm, valved, revolute. Pistil ca. 4 mm. Capsules elongated, 2–2.5 cm, slender; style ca. 8 mm. Fl. May–Jun, fr. Jun–Jul.

• Forests, forest margins, thickets; 2600–3700 m. Sichuan.

#### Insufficiently known species

***Epimedium baojingense*** Q. L. Chen & B. M. Yang, Acta Phytotax. Sin. 20: 482. 1982 [*“baojingensis”*].

*Epimedium baojingense* is known only from the type gathering (Hunan: Baojing County, Lüdong Shan, 23 Apr 1956, B. M. Yang 34, holotype, HNNU). As mentioned by Stearn (Gen. *Epimedium*, 113. 2002), *E. baojingense* has stem leaves with only a single leaflet, as in *E. simplicifolium*. It is reported to differ from *E. simplicifolium* by having a simple inflorescence with dark yellow hairs.

***Epimedium campanulatum*** Ogisu, Kew Bull. 51: 401. 1996.

According to the author, *Epimedium campanulatum* is morphologically similar to *E. ecalcaratum* G. Y. Zhong and *E. platypetalum* K. I. Meyer. *Epimedium campanulatum* is reported to differ from *E. ecalcaratum* in having 1 or 2 leaves per flowering stem, and basal and cauline leaves with only 3, never 5 or 7, leaflets. *Epimedium campanulatum* differs from *E. platypetalum* in having compact or shortly creeping rhizomes and compound, rarely simple, inflorescences. It flowers in mid

to late May and occurs at ca. 2000 m in Sichuan (Duijiangyan).

***Epimedium grandiflorum*** C. Morren, Belgique Hort. 2: 141. 1852.

*Epimedium grandiflorum* was described from cultivated plants brought to Belgium (Ghent) from Japan by Philipp Franz von Siebold in 1830. Stearn includes in the range of *E. grandiflorum* “southern Manchuria,” but we have seen no specimens from China. The reports of *E. grandiflorum* in the Flora of Anhui (see X. H. Qian, Fl. Anhui 2: 346. 1986) and Flora of Zhejiang (see C. S. Ding, Fl. Zhejiang 2: 307–320. 1992) are probably based on plants here treated as *E. koreanum*.

***Epimedium jingzhouense*** G. H. Xia & G. Y. Li, Nordic J. Bot. 27: 472. 2009.

*Epimedium jingzhouense* is known only from the type gathering (Hunan: Jingzhou County, Pukou village, 300 m, 8 Apr 2008, Xia *et al. s.n.*, holotype, ZJFC).

***Epimedium pseudowushanense*** B. L. Guo, Acta Phytotax. Sin. 45: 814. 2007.

According to the authors, *Epimedium pseudowushanense* is morphologically similar to *E. wushanense* but differs in flower structure. It differs from *E. mikinorii* in having leaves abaxially villous and glaucous, more slender spurs, 10–15 mm, inner sepals broadly ovate or ovate, and purplish or yellow petals with purple lamina. Its flowering time is from Mar–Apr, fruiting is in May, and it occurs at 900–1400 m in Guangxi and Guizhou.

***Epimedium pudingense*** S. Z. He, Y. Y. Wang & B. L. Guo, Ann. Bot. Fenn. 47: 226. 2010.

*Epimedium pudingense* is known only from the type gathering (Guizhou: Puding County, 1300 m, 13 Apr 1995, S. Z. He 95413, holotype, HGCM).

***Epimedium qingchengshanense*** G. Y. Zhong & B. L. Guo, Acta Phytotax. Sin. 45: 817. 2007.

*Epimedium qingchengshanense* is reported to differ from *E. fargesii* in having smaller flowers but larger rounded petal lamina and purple filaments. Its flowering time is from May–Jun and it occurs at 900–1500 m in Sichuan (Qingcheng Shan).

***Epimedium shennongjiaense*** Yan J. Zhang & J. Q. Li, Novon 19: 567. 2009 [*shennongjiaensis*].

*Epimedium shennongjiaense* is known only from the type gathering (Hubei: cultivated at Wuhan Botanical Garden from material collected at Muyuping, Shennongjia National Nature Reserve, 30 Mar 2007, Y. J. Zhang 148, holotype, HIB; isotype, HIB).

## 9. GYMNOSPERMIUM Spach, Hist. Nat. Vég. Phan. 8: 66. 1839.

牡丹草属 mu dan cao shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

Herbs, perennial, glabrous. Tuber subglobose or irregular; stem erect, herbaceous, branchless. Stem with 1 terminal leaf, bi- or triternate, rarely trifoliolate; leaflets thinly herbaceous, slightly pruinose. Inflorescence simple, racemose, terminal. Pedicel with bract at base. Flowers yellow. Sepals 6, petaloid. Petals 6, nectary-like, much shorter than sepals. Stamens distinct, opposite petals and equal in number; anthers dehiscing by 2 apical flaps. Pistil simple; ovary 1-loculed; ovules 2–4; placentation basal; style short or slender; stigma truncate. Capsule less than 8 mm in diam., valved. Seeds 2–4; aril whitish.  $x = 8$ .

Six to eight species: north temperate zone; three species (one endemic) in China.

- 1a. Leaves bipinnate or tripinnate; inflorescence 13–16-flowered; pedicel 3–4 cm; sepals 7–10 mm ..... 1. *G. kiangnanense*  
 1b. Leaves trifoliolate; inflorescence 5–10-flowered; pedicel 1–2.5 cm; sepals 5–8 mm.  
 2a. Leaflets 3-divided; ovules 2 or 3; pedicel 2–2.5 cm ..... 2. *G. microrrhynchum*  
 2b. Leaflets palmately 5-divided; ovules 4; pedicel ca. 1 cm ..... 3. *G. altaicum*

**1. *Gymnospermium kiangnanense*** (P. L. Chiu) H. Loconte, Canad. J. Bot. 67: 2315. 1989.

江南牡丹草 jiang nan mu dan cao

*Leontice kiangnanensis* P. L. Chiu, Acta Phytotax. Sin. 18: 96. 1980.

Herbs, 20–40 cm tall. Tuber subglobose, 3–5 cm in diam., sometimes to 8 cm; section of tuber yellow. Stem erect or decumbent, usually black-purple, glabrous, but slightly pruinose. Leaf terminal, 2–3 × ternately compound, 6–10 × 9–18 cm; pinnules adaxially pale green, obovate or ovate-oblong, 2.5–3.5 × 1.5–2.5 cm, abaxially slightly glaucous, 2- or 3-parted, margin entire. Raceme terminal, 13–16-flowered, 13–25 cm; bracts triangular-ovate or reniform, apex acute. Pedicel 3–4 cm. Flowers yellow, 1.1–1.8 cm in diam. Sepals narrowly elliptic or oblong-obovate, 7–10 × 5–6 mm, apically obtuse. Petals ca. 2 mm. Stamens 4–7 mm. Pistil shortly stipitate; ovary rhomboid-ovoid; ovules 2 or 3; style short; stigma truncate. Capsule subglobose, 5-valved. Seeds greenish brown, obovoid. Fl. Mar–Apr, fr. Apr–May.

- Forest margins; 700–800 m. Anhui, Zhejiang.

**2. *Gymnospermium microrrhynchum*** (S. Moore) Takhtajan, Bot. Zhurn. (Moscow & Leningrad) 55: 1192. 1970.

牡丹草 mu dan cao

*Leontice microrrhyncha* S. Moore, J. Linn. Soc., Bot. 17: 377. 1879; *L. microrrhyncha* f. *venosa* (S. Moore) Kitagawa; *L.*

*microrrhyncha* var. *venosa* S. Moore.

Herbs, ca. 30 cm tall. Tuber ca. 2 cm in diam. Stem erect, stramineous, herbaceous, succulent, with 1 leaf. Stipules 2, large, apex shallowly 2- or 3-lobed; leaf trifoliolate or biternate compound, herbaceous; petiolule ca. 2 cm; leaf blade abaxially pale green, adaxially green, 3-divided, lobes oblong to oblong-lanceolate, 3–4 cm, entire, apex blunt. Raceme terminal, simple, 5–10-flowered; peduncle ca. 8 cm. Pedicel 2–2.5 cm, slender; bracts broadly ovate, ca. 5 × 6 mm. Flowers pale yellow. Sepals 5 or 6, obovate, ca. 5 × 3 mm, apex blunt. Petals ca. 3 mm, apex truncate. Stamens ca. 4 mm. Pistil shortly stipitate or subsessile; ovary ovoid; ovules 2 or 3; style short; stigma truncate. Capsule globose, ca. 6 mm in diam., 5-valved. Seeds usually 2. Fl. Apr–May, fr. May–Jun.

Forests, forest margins; ca. 100 m. Jilin, Liaoning [Korea].

**3. *Gymnospermium altaicum*** (Pallas) Spach, Hist. Nat. Vég. Phan. 8: 67. 1839.

阿尔泰牡丹草 a er tai mu dan cao

*Leontice altaica* Pallas, Acta Acad. Sci. Imp. Petrop. 2: 255. 1779.

Herbs, ca. 15 cm tall. Tuber subglobose, ca. 1.5 cm in diam. Stem erect, herbaceous, green. Stipules 2, ca. 7 × 4 mm, entire; cauline leaf 1, terminal, trifoliolate, thin in texture; leaflets abaxially pale green, adaxially green, 4- or 5-palmatisect, segments oblong or oblong-lanceolate, 2–2.5 cm × 7–10 mm,

margin entire, apex blunt. Raceme terminal, simple, 7–9-flowered, 4–5 cm; peduncle ca. 1.5 cm; bracts broadly elliptic or ovate, 7–9 × 6–7 mm. Pedicel ca. 1 cm, slender. Flowers yellow. Sepals 6, elliptic, ca. 8 × 3 mm. Petals 6, opposite sepals, yellowish brown, longitudinally half-tubular, ca. 2 mm, apex aristate. Stamens opposite petals, ca. 4 mm; filaments thin, ca.

2.2 mm; anthers valved. Pistil ca. 4.5 mm; ovules 4, obovoid, basal; style ca. 2.5 mm. Capsule unknown. Fl. Mar–Apr, fr. unknown.

Foot of mountains, along trails; ca. 200 m. Xinjiang [Russia (Siberia)].

## 10. LEONTICE Linnaeus, Sp. Pl. 1: 312. 1753.

囊果草属 nang guo cao shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

*Leontopetalon* Miller.

Herbs, perennial, with tubers, glabrous. Stem erect, herbaceous, unbranched. Cauline leaves usually 2(–5), alternate, 2–3 × pinnately compound, stipulate. Raceme simple, terminal, bracteate. Flowers yellow. Sepals 6, petaloid. Petals 6, yellow, nectary-like, much shorter than sepals. Stamens distinct. Pistil simple; carpels 1; ovary inflated, not stipitate or shortly so; ovules 2–4; placentation basal. Achene globose, utricle-like, indehiscent or irregularly lacerate on top of fruit. Seeds in fruit, usually 2; aril absent.

About three or four species: north temperate zone; one species in China.

### 1. *Leontice incerta* Pallas, Reise Russ. Reich. 3: 726. 1776.

囊果草 nang guo cao

*Leontice vesicaria* Willdenow.

Herbs, 5–20 cm tall. Tuber ovoid, globose, or irregular, 2–5 cm in diam. Stem pale brown, terete, shiny at base, with few lanceolate scales at base. Cauline leaves 2; petiole 3–5 cm, sheathed at base; leaf blade 2 or 3 × pinnately compound, pinnules abaxially yellowish green, adaxially deep green, elliptic or obovate, entire, abaxially inconspicuously veined, adaxially 3–

5-basinerved, both surfaces glabrous, entire. Raceme terminal, 4–6 cm; peduncle 2–2.4 cm; bracts suborbicular or broadly ovate, apex blunt, fleshy. Pedicel to 1.2 cm, stout, glabrous. Sepals yellow, bluish purple spotted on outside, elliptic or ovate, longer than petals. Petals obovate, base clawed. Stamens distinct; anthers valved. Carpel 1; ovules 2–4. Achene pale purple in upper part, subglobose, large, to 2.5–4.5 cm in diam., bladderlike inflated, indehiscent, with conspicuous reticulate veins. Seeds 2, black-brown. Fl. Apr, fr. May.

Slopes of hills in desert regions, *Haloxylon* forests; ca. 600 m. Xinjiang [Kazakhstan].

## 11. CAULOPHYLLUM Michaux, Fl. Bor.-Amer. 1: 204, t. 21. 1803.

红毛七属 hong mao qi shu

Ying Junsheng (应俊生 Ying Tsun-shen); David E. Boufford, Anthony R. Brach

*Phtheirotheca* Maximowicz ex Regel.

Herbs, perennial, deciduous, glabrous. Rhizome creeping, stout, nodose, with numerous fibrous roots. Aerial stem erect. Leaves alternate, 2 or 3 × ternately compound, broadly ovate in overall outline; petiole short or leaves sessile; pinnules petiolulate or sessile, ovate, obovate, or broadly lanceolate, undivided or lobed, venation pinnate or palmate, margin entire. Inflorescences terminal, compound cymes. Flowers 3-merous; bracteoles 3 or 4, sepaloïd, caducous. Sepals 6, petaloïd, yellow, red, purple, or green. Petals 6, fan-shaped or obovate, nectary-like. Stamens distinct; anthers dehiscing by 2 apically hinged flaps; pollen prolate, 3-colporate, exine reticulate. Ovary bladderlike; placentation basal; styles eccentric. Fruit not developing, ovary wall soon rupturing and seed coat becoming fleshy and fruitlike. Seeds 2, raised on elongating stalk, naked at maturity, globose; seed coat tunic-blue, fleshy, glaucous.  $x = 8$ .

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

### 1. *Caulophyllum robustum* Maximowicz, Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 9 [Prim. Fl. Amur.]: 33. 1859.

红毛七 hong mao qi

*Leontice robusta* (Maximowicz) Diels.

Herbs, to 80 cm tall. Rhizomes short, stout, nodose. Stem leaves 2; terminal leaflet usually petiolulate, lateral leaflets subsessile; leaflets abaxially pale green or grayish white, adaxially green, ovate, oblong, or broadly lanceolate, 4–8 × 1.5–5 cm, both surfaces glabrous, base broadly cuneate, margin entire,

sometimes 2- or 3-lobed, apex acuminate. Flowers pale yellow, 7–8 mm in diam.; bracteoles usually 3. Sepals obovate, 5–6 × 2.5–3 mm, apex rounded. Petals much smaller than sepals, base clawed. Stamens opposite petals, ca. 2 mm; filaments longer than anthers. Pistils shorter than stamens; ovules 2, stipitate; funiculus thickened, 7–8 mm. Seeds naked at maturity, 6–8 mm in diam.; seed coat blue, fleshy, glaucous; aril absent. Fl. May–Jun, fr. Jul–Sep.  $2n = 16$ .

Forests, bamboo thickets, *Cathaya* forests, moist places in valleys; 900–3500 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [Japan, Korea, Russia].