

5. GYMNOSPORA (Wight & Arnott) Bentham & J. D. Hooker, Gen. Pl. 1: 359, 365. 1862,
nom. cons.

裸实属 *luo shi shu*

Liu Quanru (刘全儒); A. Michele Funston

Celastrus sect. *Gymnosporia* Wight & Arnott, Prodr. Fl. Ind. Orient. 159. 1834.

Shrubs or small trees, usually erect, glabrous or pubescent; branches often thorny. Leaves alternate or fasciculate, entire or serrate, estipulate. Inflorescences axillary, fasciculate, cymose, or flowers solitary. Flowers bisexual, (4 or)5-merous. Disk fleshy, annular, (4 or)5-angled or lobed, intrastaminal; anthers longitudinally dehiscent, introrse. Ovary (2 or)3-locular, base confluent with disk; ovules erect, 2 per locule. Capsule obovoid or nearly globose, leathery, loculicidally dehiscent. Seeds usually 3–6, ellipsoid; aril basal to enveloping seed.

About 80 species: tropics and subtropics of both the Old and New Worlds, but mainly tropics of Africa and Asia; 11 species (seven endemic) in China.

- 1a. Twigs thornlike, bearing leaves and flowers, bearing needlelike thorns.
- 2a. Twigs and petioles pubescent with short dense hairs, gradually glabrescent; leaf blade usually 1–5 cm.
 - 3a. Capsule 2-valved, 5–8 mm; peduncle 0.5–1 cm; flowers 3–5 mm in diam.; petiole shorter than 3 mm ... 1. *G. diversifolia*
 - 3b. Capsule 3-valved, 1–1.2 cm; peduncle 1–2 cm; flowers 5–8 mm in diam.; petiole 3–8 mm 2. *G. berberoides*
- 2b. Twigs and petioles glabrous; leaf blade usually 3–7(–12) cm.
 - 4a. Leaf blade leathery, broadly obovate or broadly elliptic, rounded or obcordate, netting veins obvious 3. *G. orbiculata*
 - 4b. Leaf blade papery or subleathery, narrowly elliptic or elliptic-lanceolate, netting veins not obvious 4. *G. variabilis*
- 1b. Twigs without an apical thorn, bearing many thorns, rarely few thorned or unarmed.
 - 5a. Twigs unarmed.
 - 6a. Leaf blade elliptic-lanceolate or oblanceolate, 3.5–6.5 × 0.5–1.5 cm, lateral veins 6–9 pairs 10. *G. tiaoloshanensis*
 - 6b. Leaf blade obovate, ca. 5 × 3 cm, lateral veins 4–6 pairs 11. *G. emarginata*
 - 5b. Twigs thorny, thorns often axillary.
 - 7a. Ovary with 2 carpels; capsule 2-valved 5. *G. esquirolii*
 - 7b. Ovary with 3 carpels; capsule 3-valved.
 - 8a. Aril saccate; cymes usually dichotomous; thorns thick 8. *G. royleana*
 - 8b. Aril cupulate, only covering seed at base or not exceeding the middle; cymes usually monochasial; thorns slender.
 - 9a. Leaf blade broadly obovate, obovate, or elliptic, 1–2 cm; petiole 1–2 mm; peduncle 2–5 mm 7. *G. jinyangensis*
 - 9b. Leaf blade lanceolate, narrowly elliptic, narrowly obovate, or oblanceolate, 2–8(–14) cm; petiole 2–8(–12) mm; peduncle 1–3(–4.5) cm.
 - 10a. Leaf blade lanceolate, 6.5–8 cm, subleathery; petiole 5–8 mm; peduncle 2–4.5 cm 6. *G. rufa*
 - 10b. Leaf blade narrowly elliptic, narrowly obovate, or oblanceolate, 2–8(–14) cm, papery; petiole 2–7(–12) mm; peduncle 1–3 cm 9. *G. graciliramula*

1. *Gymnosporia diversifolia* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 459. 1881.

变叶裸实 *bian ye luo shi*

Celastrus diversifolius (Maximowicz) Hemsley; *Maytenus diversifolia* (Maximowicz) Ding Hou; *M. garanbiensis* C. E. Chang.

Shrubs or small trees, 1–3 m tall. Twigs spiny, pallid brown, densely covered with rust-colored punctiform short bristles, glabrescent with age. Petiole 1–3 mm; leaf blade obovate, broadly obovate, or obovate-lanceolate, 1–4.5 × 1–1.8 cm, papery, or leathery with age, base cuneate, margin crenate, apex rounded or emarginate. Cymes axillary, dichotomous; peduncle 0.4–1 cm; bracts and bracteoles shorter than ca. 1 mm. Flowers white or light yellow, 3–5 mm in diam.; sepals triangular-ovate. Ovary confluent with disk; styles absent. Capsule subobovoid, red or purple, 5–7 mm at greatest width, 4-loculed, 2-valved.

Seeds ellipsoid, 3–4 mm in diam., black-brown, basally covered by aril. Fl. Jun–Sep, fr. Aug–Dec.

Sparse forests, mountain slopes, seashores, roadsides; below 100 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Japan (including Ryukyu Islands), Malaysia, Philippines, Thailand, Vietnam].

2. *Gymnosporia berberoides* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 38. 1917.

小檗裸实 *xiao bo luo shi*

Maytenus berberoides (W. W. Smith) S. J. Pei & Y. H. Li.

Thorny shrubs, 1–2 m tall; branches sturdy, spiny, 1–5 cm, thorns terminal, sometimes axillary; twigs and petioles densely pubescent with short hairs, gradually glabrescent with age. Petiole 3–8 mm; leaf blade broadly obovate or elliptic, 1.2–5 × 1–3 cm, thickly papery or leathery, base cuneate, margin shallowly serrate or subentire, apex rounded or emarginate; lateral veins

4–7 pairs, tenuous, webbing with veinlets. Cymes axillary in spiny short branches, monochasial or first dichotomous; peduncle tenuous and long, 1–2 cm; pedicel 5–8 mm; bracts shorter than ca. 1 mm. Flowers white-green, 5–8 mm in diam.; sepals triangular-ovate or oblong-ovate; petals oblong or oblong-ovate. Filament ca. 1.5 mm. Ovary with thick and short style. Capsule subobovoid, 1–1.2 cm, 3-valved. Seeds ellipsoid, 3–4 mm in diam., basally covered by white aril. Fl. Apr–Oct, fr. Jul–Dec.

- River valleys, riversides; 300–2400 m. Sichuan, Yunnan.

3. *Gymnosporia orbiculata* (C. Y. Wu ex S. J. Pei & Y. H. Li) Q. R. Liu & Funston, **comb. nov.**

圆叶裸实 yuan ye luo shi

Basionym: *Maytenus orbiculata* C. Y. Wu ex S. J. Pei & Y. H. Li, Acta Bot. Yunnan. 3: 239. 1981; *M. berberoides* (W. W. Smith) S. J. Pei & Y. H. Li var. *acutissima* S. J. Pei & Y. H. Li.

Shrubs, 1–3 m tall; branches sturdy, apex spiny, short branches growing near apex. Petiole usually sturdy, 5–8 mm; leaf blade broadly obovate or broadly elliptic, rarely rounded or obcordate, 3–7 × 2–5 cm, leathery to thickly leathery, base cuneate, margin acutely serrate, apex shortly acute, rounded or emarginate; lateral veins 7–12 pairs, more obvious on abaxial surface. Cymes axillary or 2 or 3 aggregating in upper spiny short branches, 3 or 4 × branched, dichotomous or monochasial; peduncle slightly flat, 1–2 cm; branches and pedicels slightly short, 2–5 mm. Flowers white, 3–4 mm in diam.; sepals triangular or ovate-rounded; petals oblong or oblong-ovate. Capsule subobovoid, 8–10 mm, 3-valved. Fl. May–Jun, fr. Aug–Nov.

- Dry calcareous mountain slopes; 800–1500 m. Yunnan.

4. *Gymnosporia variabilis* (Hemsley) Loesener, Bot. Jahrb. Syst. 29: 446. 1900.

刺茶裸实 ci cha luo shi

Celastrus variabilis Hemsley, J. Linn. Soc., Bot. 23: 124. 1886; *Maytenus arborea* H. Shao; *M. variabilis* (Hemsley) C. Y. Cheng.

Shrubs, to 5 m tall; twigs spiny, glabrous; terminal thorns sturdy, axillary ones slightly tenuous. Petiole 3–6 mm; leaf blade elliptic, narrowly elliptic, or elliptic-lanceolate, 3–12 × 1–4 cm (or varying sizes), papery, base cuneate, margin crenate, apex acute or obtuse; veins and veinlets tenuous. Cymes axillary, 1–3 × dichotomous; peduncle 0.3–1.3 cm; bracteoles ca. 1 mm. Flowers light yellow, 5–6 mm in diam.; sepals ovate; petals oblong, slightly longer than stamens. Disk slightly rounded and thick. Ovary confluent with disk for ca. 1/3 of length; styles short; stigma 3-lobed. Capsule subobovoid, red or purple, 1.2–1.5 mm, 3-valved. Seeds subellipsoid, ca. 7 × 4–5 mm, brown, shiny, basally covered by light yellow shallowly cupulate aril. Fl. Jun–Oct, fr. Jul–Dec.

- Rocky mountain slopes, meadows; 100–800 m. Guangxi, Guizhou, Hubei, Sichuan, Yunnan.

Maytenus arborea H. Shao (Bull. Bot. Res., Harbin 20: 127. 2000 [“*arborea*”]) was described from cultivated material in the Nanning Arboretum in Guangxi. Its affinity to *Gymnosporia variabilis* needs further study.

5. *Gymnosporia esquirolii* H. Léveillé, Chin. Rev. 18. 1916.

贵州裸实 gui zhou luo shi

Maytenus esquirolii (H. Léveillé) C. Y. Cheng; *M. mengziensis* H. Shao.

Small shrubs, 1–2 m tall; branches tenuous, black when dry, short branches spiny, 5–10 mm, thorns needlelike. Petiole 2–5 mm; leaf blade broadly elliptic or narrowly ovate, sometimes ovate-lanceolate, 2–8 × 0.5–2.5 cm, papery, slightly thick in fruit, base cuneate, margin shallowly serrate or crenate, apex shortly acute; lateral veins 5–7 pairs, webbing sparsely with veinlets, obvious on both surfaces. Cymes axillary, 1–4-flowered, monochasial; peduncle very tenuous, 0.5–1.7 cm; pedicel 3–5 mm, slightly elongate when fructiferous. Flowers white, ca. 4 mm in diam.; sepals oblong; petals narrowly ovate. Disk small. Ovary subconical; stigma slightly 2-lobed. Capsule obconical, ca. 7 mm, light reddish, usually 2-valved. Seeds reddish brown, basally covered by small aril. Fl. Jun.

- Forests, scrub, mountain slopes. S Guizhou (Luodian), Yunnan.

This species is rare in occurrence. Hong Shao (Bull. Bot. Res., Harbin 20: 126. 2000) described *Maytenus mengziensis* from Yunnan. Its affinity to *Gymnosporia esquirolii* needs further study.

6. *Gymnosporia rufa* (Wallich) M. A. Lawson in J. D. Hooker, Fl. Brit. India 1: 670. 1875.

淡红美登木 dan hong mei deng mu

Celastrus rufus Wallich in Roxburgh, Fl. Ind. 2: 397. 1824; *Maytenus rufa* (Wallich) Cufodontis.

Trees; branches slender, glabrous, sparsely spiny; thorns slender, 1.2–2.5 cm. Petiole 5–8 mm; leaf blade lanceolate, 6.5–8[–11] × 2–3.5 cm, subleathery, abaxially pale, adaxially green, base cuneate, margin serrate, apex acuminate; lateral veins 7–9 pairs, obvious on both surfaces. Cymes fascicled at axils, dichotomous; peduncle slender, 2–4.5 cm, with several conglomerate bracts at base, bracts reddish brown, lanceolate, 2–3 mm; pedicel tenuous, 5–8 mm when fruiting. Flowers not seen, purportedly 3–4 mm in diam. Capsule obtriangular, 0.6–1 cm, purplish, 3-valved. Seeds black. Fl. Jun.

Evergreen forests; 1700–2000 m. Xizang (Zhangmu) [Bhutan, India, Myanmar, Nepal].

7. *Gymnosporia jinyangensis* (C. Y. Cheng) Q. R. Liu & Funston, **comb. nov.**

金阳美登木 jin yang mei deng mu

Basionym: *Maytenus jinyangensis* C. Y. Cheng, J. Sichuan Univ., Nat. Sci. Ed. 1985(2): 88. 1985.

Shrubs, 0.5–1.5 m tall, spiny, glabrous; thorns slender, 1–1.8 cm; biennial branches thorny. Petiole very short, 1–2 mm; leaf blade broadly obovate, obovate, or elliptic, 1–2 × 0.6–2.4 cm, subleathery, base subrounded, broadly cuneate or cuneate,

margin crenate, apex subrounded, rarely retuse or shortly acute; lateral veins 3–5 pairs, tenuous. Cymes fascicled in short branches, ca. 3-flowered, 2–4 × branched, monochasial; peduncle slender and short, ca. 5 mm; bracts small, narrowly lanceolate, ca. 0.8 mm; pedicel slightly short, 1–2 mm. Flowers small, ca. 2 mm in diam.; sepals ovate, ca. 0.5 mm, ciliate; petals oblong-ovate, white, ca. 1.5 mm. Filament very short or absent. Ovary without style; stigma 3-lobed. Capsule reddish, obovoid, 5–8 mm, 6–9 mm in diam., 3-valved. Seeds red-brown, oblong-ellipsoid, basally covered by small aril. Fl. Jun–Aug, fr. Aug–Dec.

• Forest margins, scrub, mountain slopes; 500–1300 m. Sichuan, Yunnan.

8. *Gymnosporia royleana* Wallich ex M. A. Lawson, Fl. Brit. India 1: 620. 1875.

被子裸实 bei zi luo shi

Maytenus royleana (Wallich ex M. A. Lawson) Cufodontis; ?*M. yimenensis* H. Shao.

Shrubs, with very spiny straight or slightly zigzag branches; thorns sturdy, 1–2.5 cm, axillary on annual branches. Petiole 2–4 mm; leaf blade obovate or elliptic, 1.5–4 × 0.5–2 cm, thickly papery, base cuneate, margin entire or not obviously crenate, apex acute or obtuse, rarely rounded; lateral veins 5 or 6 pairs, quite tenuous. Cymes 1 to several, fascicled, 1–7-flowered; peduncle 2–5 mm when fruiting; branches and pedicels ca. 5 mm when fruiting. Petals white, oblong-ovate (flowers not seen). Capsule obtriangular, ca. 1 mm, dehiscing into 3 valves. Seeds long ellipsoid, black, ca. 6 mm; aril red, nearly covering seed. Fr. Jun.

Mountain slopes. ?Xinjiang, ?Xizang, ?Yunnan [Afghanistan, India, Kashmir, Pakistan].

Only one specimen is known from China, *Liou Tchen-Neo 5892* (PE), collected between Xinjiang and Kashmir and Pakistan.

Hong Shao (Bull. Bot. Res., Harbin 20: 126. 2000) described *Maytenus yimenensis* from Yunnan. Its affinity to *Gymnosporia royleana* needs further study.

9. *Gymnosporia graciliramula* (S. J. Pei & Y. H. Li) Q. R. Liu & Funston, **comb. nov.**

细梗裸实 xi geng luo shi

Basionym: *Maytenus graciliramula* S. J. Pei & Y. H. Li, Res. Bull. Trop. Pl. 13: 13. 1979; ?*M. guangnanensis* H. Shao; *M. longlinensis* C. Y. Cheng & W. L. Sha; *M. oligantha* C. Y. Cheng & W. L. Sha; *M. pseudoracemosa* S. J. Pei & Y. H. Li; *M. thyriflora* S. J. Pei & Y. H. Li.

Shrubs, 1–2 m tall; twigs slender, with slender thorns or unarmed, old branches usually with sturdy thorns. Petiole 2–7(–12) mm; leaf blade narrowly elliptic, narrowly obovate, oblanceolate, or elliptic, 2–8(–14) × 1–4(–6) cm, papery or thickly papery, base cuneate or narrowly cuneate, margin crenate, apex acute, shortly acute, or obtuse; lateral veins tenuous, 6–9 pairs. Cymes axillary, 1–6 × branched, monochasial; peduncle slender, various in length, usually 1–2 cm, up to 3 cm when fruiting; branches and pedicels slightly short, 3–5 mm,

0.5–1 cm when fruiting. Flowers small, white, 2–5 mm in diam.; sepals broadly ovate; petals oblong. Filament ca. 1 mm. Stigma 3-lobed. Capsule red-brown, subobovoid, 6–12 mm, 3-valved. Seeds oblong, 5–7 mm, basally covered by white aril. Fl. Jun–

Sep, fr. Sep–Dec.

• Dry calcareous mountain slopes; 800–1500 m. Guangxi, Yunnan.

Maytenus guangnanensis H. Shao (Bull. Bot. Res., Harbin 20: 125. 2000) is described from Yunnan. Its affinity to *Gymnosporia graciliramula* needs further study.

10. *Gymnosporia tiaoloshanensis* Chun & F. C. How, Acta Phytotax. Sin. 7: 52. 1958.

吊罗裸实 diao luo luo shi

Maytenus tiaoloshanensis (Chun & F. C. How) C. Y. Cheng.

Small shrubs, erect when young, vinelike with age, 1–2 m tall; thorns not seen. Petiole 2–5 mm; leaf blade elliptic-lanceolate or oblanceolate, 3.5–6.5 × 0.5–1.5 cm, thickly papery or slightly leathery, base cuneate, margin serrate, apex obtuse; lateral veins 6–9 pairs, weakly webbed with veinlets, tenuous and obvious. Cymes axillary, long and slender, 1 or 2 × dichotomously branched or 3–5 × monochasially branched; peduncle very tenuous, 0.5–1 cm; pedicel 3–5 mm, both slightly elongate when fruiting; bracts and bractlets triangular-lanceolate, ca. 1 mm. Flowers white, 2–2.5 mm in diam.; sepals semi-

Fl. China 11: 474–477. 2008.

orbicular; petals oblong. Disk thick, cupulate. Ovary subglobose; style absent; stigma slightly 2-lobed. Capsule obcordate, 5–8 mm, white, usually 2-valved. Aril small, covering seed at base. Fl. and fr. Dec–Feb.

• Sparse or dense forests, mountain valleys, riversides, roadsides. Hainan.

11. *Gymnosporia emarginata* (Willdenow) Thwaites, Enum. Pl. Zeyl. 409. 1864.

台湾裸实 tai wan luo shi

Celastrus emarginatus Willdenow, Sp. Pl. 1: 1128. 1798; *Catha emarginata* (Willdenow) G. Don; *Gymnosporia trilocularis* Hayata; *Maytenus emarginata* (Willdenow) Ding Hou.

Small shrubs, 1–3 m tall; branches gray-brown, shallowly longitudinally fluted, unarmed. Petiole sturdy, 3–5 mm; leaf blade obovate, 3.5–5 × 1.7–3.3 cm, leathery, base cuneate, margin remotely crenate, sometimes glandular spotted in sinus of teeth, apex rounded or subtruncate; lateral veins 4–6 pairs, quite tenuous. Cymes axillary, 1 or 2 × branched; peduncle 1–1.5 cm. Flowers white; calyx lobes deltoid; petals obovate-oblong or oblong, entire, obtuse. Stamens inserted abaxially on disk margin; anther broadly ovoid. Ovary 3-celled; style very short; stigma 3. Capsule subobovoid, trilocular, 7–8 mm in diam., dehiscent into 3 broadly rounded valves, ca. 5 mm. Seeds ellipsoid, red, ca. 3 mm, with small aril at base.

Thickets along seashores, open areas. Taiwan [Sri Lanka; Australia].

Fl. China 11: 474–477. 2008.