

## HELWINGIACEAE

青莢叶科 qing jia ye ke

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Shrubs, rarely small trees, dioecious, evergreen or deciduous. Leaves simple, alternate, petiolate, stipulate; stipules 2, early deciduous, divided or not; blade margins glandular serrate or crenate; veins pinnate. Inflorescences umbels, sessile, borne on midvein of leaf blade, rarely on petiole of leaves on upper part of young branches. Flowers 3- or 4(or 5)-merous, green or purple-green, unisexual; calyx teeth 3 or 4(or 5); petals 3 or 4(or 5); floral disk flat, fleshy. Staminate flowers 3–20 per umbel; stamens 3 or 4(or 5), alternate petals; anther locules 2. Carpellate flowers 1–4 per umbel; style short; stigma lobes 3 or 4(or 5), reflexed; ovary inferior, locules 3 or 4(or 5); ovules 1 per locule, pendulous, apotropous, with dorsal raphe. Fruit berries, drupelike. Seeds (stones) 1–4(or 5), with grooves and ridges when dry, crowned by persistent calyx and style; endosperm smooth; embryo straight.

One genus and four species: Bhutan, China, N India, Japan, S Korea, N Myanmar, Nepal, Sikkim, Thailand, N Vietnam; four species (one endemic) in China.

Soong Tzepu. 1990. *Helwingia*. In: Fang Wenpei & Hu Wenkuang, eds., Fl. Reipubl. Popularis Sin. 56: 20–35.

### 1. *HELWINGIA* Willdenow, Sp. Pl. 4: 634, 716. 1806, nom. cons., not *Helvingia* Adanson (1763).

青莢叶属 qing jia ye shu

Shrubs evergreen or deciduous, 1–2 m tall, rarely small trees to 8 m tall. Leaves petiolate; petiole rounded; leaf blade linear-lanceolate to broadly ovate, papery, subleathery, or leathery, glabrous or pubescent; veins 5–9, inconspicuous or conspicuous. Flowers ca. 3–5 mm in diam. Petals green or reddish purple, triangular ovate, valvate. Fruit green when young, turning red and eventually black when mature, subglobose, ovoid, or oblong, green when young.

Geographical distribution is the same as that of the family.

*Helwingia argyi* H. Léveillé & Vaniot is a synonym of *Stemona japonica* (Blume) Miquel in the Stemonaceae (see Fl. China 24: 70. 2000).

- 1a. Shrubs, rarely small trees; leaves papery, thickly papery, or papery; veins on adaxial surface conspicuous.
  - 2a. Leaves ovate, ovate-rounded, or broadly elliptic, rarely ovate lanceolate; stipules linear or filiform, divided, rarely undivided; secondary and smaller lateral veins of leaves conspicuous ..... 1. *H. japonica*
  - 2b. Leaves narrowly elliptic or oblong lanceolate, rarely ± diamond-shaped; ratio of length to width 3 or greater; stipules often 2(or 3)-divided, rarely undivided; secondary and smaller lateral veins of leaves inconspicuous ..... 2. *H. himalaica*
- 1b. Small trees or shrubs; leaves leathery or subleathery, rarely thickly papery; veins on adaxial surface inconspicuous.
  - 3a. Leaves linear-lanceolate or lanceolate, 4–15 × 0.4–2 cm, margins sparsely glandular serrate ..... 3. *H. chinensis*
  - 3b. Leaves obovate-oblong, oblong, rarely oblanceolate, larger, 9–15 × 3–5 cm, margins densely glandular serrate ..... 4. *H. omeiensis*

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**1. *Helwingia japonica*** (Thunberg) F. Dietrich, Nachtr. Vollst. Lex. Gärtn. 3: 660. 1817.

青莢叶 qing jia ye

Shrubs 1–2 m tall, deciduous; bark dark brown or grayish black, smooth; young branches green, glabrous, smooth, with conspicuous leaf scars. Leaf petiole 1–5(–6) cm; stipules threadlike, divided apically or rarely undivided; leaf blade abaxially light green, grayish white, or glaucous green, ovate, obovate-elliptic, ovate-rounded, rarely elliptic or ovate lanceolate, 3.5–9(–18) × 2–6(–8.5) cm, papery, glabrous, veins 5–7(or 8), conspicuous, raised abaxially, slightly impressed adaxially, base broadly cuneate or ± rounded, margin spiculate serrate to spiculate crenate, apex acuminate, rarely caudate-acuminate. Umbels between middle and lower 1/3 of midvein, rarely on upper part of young branches; staminate umbels 3–12(–18)-flowered; carpellate umbels 1–3-flowered. Flowers pedicellate. Petals light green, 1–5 mm. Carpellate flowers: style 3–5-divided. Fruit subglobose or ellipsoid, ca. 4–8 mm in diam., nearly sessile. Seeds 3–5, lobes 3–5. Fl. Apr–May, fr. Aug–Oct.

Forests, woods, thickets, valleys, slopes, streamsides, roadsides; 100–3400 m. Anhui, Fujian, SE Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Japan, S Korea, N Myanmar].

*Helwingia rusciflora* Hemsley (J. Linn. Soc., Bot. 23: 341. 1888, not Willdenow, 1806) is based on a mixed collection, of which part is *H. japonica* var. *japonica* and part is var. *hypoleuca*.

- 1a. Leaves oblong, narrowly elliptic, or ovate elliptic, rarely lanceolate ..... 1d. var. *zhejiangensis*
- 1b. Leaves ovate, ovate-rounded, or broadly elliptic.
  - 2a. Veins of abaxial surface of leaves papillate ..... 1c. var. *papillosa*
  - 2b. Veins of abaxial surface of leaves not papillate.
    - 3a. Abaxial surface of leaves with powder, grayish white or glaucous green ..... 1b. var. *hypoleuca*
    - 3b. Abaxial surface of leaves light green ..... 1a. var. *japonica*

**1a. *Helwingia japonica* var. *japonica***

青莢叶(原变种) qing jia ye (yuan bian zhong)

*Osyris japonica* Thunberg in Murray, Syst. Veg., ed. 14, 881. 1784; *H. japonica* var. *szechuanensis* (W. P. Fang) W. P. Fang & T. P. Soong; *H. rusciflora* Willdenow, nom. illeg. superfl.; *H. szechuanensis* W. P. Fang.

Leaf blade ovate, ovate-rounded, or broadly elliptic, 3–13(–18) × 1.5–9 cm, abaxially light green and not papillate, margin serrate. Fruit 2–5 in a cluster on middle of midvein, crowned by 3–5-lobed stigma.

Moist rich soils in woods; below 3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Japan, S Korea, N Myanmar].

**1b. *Helwingia japonica* var. *hypoleuca*** Hemsley ex Rehder in Sargent, Pl. Wilson. 2: 570. 1916.

白粉青莢叶 bai fen qing jia ye

*Helwingia japonica* var. *grisea* W. P. Fang & T. P. Soong.

Leaf blade ovate to ovate-elliptic, 3–1.5 × 2–6.5 cm, abaxially often glaucous, grayish white or glaucous green, not papillate, margin serrate or crenate. Fruit 1 or 2 at middle part of midvein, crowned by 3–5-lobed stigma.

- Thickets; 1200–2800 m. N Guizhou, W Hubei, S Shaanxi, Sichuan, NE Yunnan.

**1c. *Helwingia japonica* var. *papillosa*** W. P. Fang & T. P. Soong, Fl. Sichuan. 1: 473. 1981.

乳突青莢叶 ru tu qing jia ye

Leaf blade ovate to ovate-elliptic, 3–12 × 2–6.5 cm, abaxially light green, veins and leaf surface with small white papillae, margin serrate. Fruit often solitary, lobes (grooves) 4 or 5, crowned by 4- or 5-divided stigma.

- Streamsides in *Abies* or *Tsuga* forests and in thickets; 2100–3400 m. SE Gansu, S Shaanxi, NE and SW Sichuan.

**1d. *Helwingia japonica* var. *zhejiangensis*** (W. P. Fang & T. P. Soong) M. B. Deng & Yo. Zhang, J. Pl. Resour. Environ. 11(3): 58. 2002.

台湾青菜叶 tai wan qing jia ye

*Helwingia zhejiangensis* W. P. Fang & T. P. Soong, J. Sichuan Univ., Nat. Sci. Ed. 1982(1): 73. 1982; *H. japonica* subsp. *taiwaniana* Yuen P. Yang & H. Y. Liu.

Leaf blade oblong, ovate-oblong, narrowly elliptic, or lanceolate, 5–12(–15) × 1.5–4(–6) cm, papery, margin glandular serrate. Fruit not seen.

- Woods by streams, valleys, slopes, roadsides; 100–2500 m. Taiwan, Zhejiang.

**2. *Helwingia himalaica*** J. D. Hooker & Thomson ex C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 726. 1879.

西域青菜叶 xi yu qing jia ye

*Helwingia chinensis* Batalin f. *oblanceolata* S. S. Chien; *H. himalaica* var. *gracilipes* W. P. Fang & T. P. Soong; *H. himalaica* var. *lanceolata* Deb; *H. himalaica* var. *nanchuanensis* (W. P. Fang) W. P. Fang & T. P. Soong; *H. himalaica* f. *oblanceolata* (S. S. Chien) W. P. Fang & T. P. Soong; *H. himalaica* var. *parvifolia* H. L. Li; *H. himalaica* var. *prunifolia* W. P. Fang & T. P. Soong; *H. japonica* (Thunberg) F. Dietrich var. *himalaica* (J. D. Hooker & Thomson) Franchet; *H. japonica* var. *nanchuanensis* W. P. Fang; *H. omeiensis* (W. P. Fang) H. Hara & S. Kurosawa var. *oblanceolata* (S. S. Chien) H. Hara & S. Kurosawa.

Shrubs 2–3 m tall, deciduous; young branches yellow-brown, slender; leaf scars ± inconspicuous. Leaf petiole 1–5(–7) cm; stipules ca. 2 mm, not or 1–3-divided; leaf blade adaxially shiny green, abaxially light green, oblong-lanceolate, rarely oblanceolate or ± diamond-shaped, 5–11(–18) × 2.5–4(–5) cm, thickly papery, veins (5–)7–9, secondary and smaller lateral veins inconspicuous, base broadly cuneate to cuneate, margin glandular spiculate serrate, apex caudate-acuminate. Umbels between mid point and lower 1/3 of midvein on adaxial surface, rarely on upper part of young branches. Flowers of staminate umbels 8–20, pedicellate, 4-merous, rarely 3-merous, light green, 5–8 mm, pedicellate. Flowers of carpellate umbels (1–)3 or 4(or 5), pedicellate, 4-merous, light green, 5–6 mm; stigma 3- or 4(or 5)-divided. Fruit subglobose to oblong, ca. 5–8 mm in diam.; pedicel 1–2(–6) mm. Seeds 3 or 4, 3- or 4-ridged. Fl. Apr–May, fr. Aug–Oct.

Woods, woodland margins; (1000–)1700–3000 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim, N Vietnam].

**3. *Helwingia chinensis*** Batalin, Trudy Imp. S.-Peterburgsk. Bot. Sada 13: 97. 1893.

中华青菜叶 zhong hua qing jia ye

Shrubs evergreen, 1–2 m tall; bark dark gray or light grayish brown; young branches purplish green. Leaf petiole 0.5–2 (–4) cm; stipules narrowly linear; leaf blade abaxially light green, linear-lanceolate or narrowly lanceolate, rarely elliptic or ovate-lanceolate, 4–15 × 0.4–2(–4) cm, leathery, rarely thickly papery, veins 6–8, inconspicuous, base cuneate or ± rounded, margin sparsely glandular spiculate-serrate, rarely crenate, sometimes revolute, apex long acuminate. Umbels near mid point of midvein on adaxial surface of blade or on upper part of young branches. Flowers of staminate umbels 4 or 5, 3–5-merous; pedicel 2–10(–14) mm. Flowers of carpellate umbels 1–3, nearly sessile or pedicel to 2 mm; stigma 3–5-divided. Fruit oblong, ca. 5–7(–9) mm in diam. Seeds 3–5, 3–5-ridged (grooved); pedicel 1–2 mm. Fl. Apr–May, fr. Aug–Oct.

Broad-leaved forests, mixed woods, thickets on slopes; 1000–2600 m. S Gansu, Guizhou, W Hubei, Hunan, S Shaanxi, Sichuan, SE Xizang, Yunnan [N Myanmar, Thailand].

- 1a. Leaves leathery or subleathery, narrowly lanceolate or linear lanceolate, 4–15 × 0.4–2 cm, sparsely glandular; margins spiculate-serrate ..... 3a. var. *chinensis*
- 1b. Leaves thickly papery, broadly lanceolate, oblanceolate, or ovate-lanceolate, 4–10 × 1–4 cm, margins spiculate-crenate ..... 3b. var. *crenata*

**3a. *Helwingia chinensis* var. *chinensis***

中华青菜叶(原变种) zhong hua qing jia ye (yuan bian zhong)

*Helwingia chinensis* var. *agenuina* Wangerin; *H. chinensis* var. *longipedicellata* Wangerin; *H. chinensis* var. *longipetiolata* Wangerin; *H. chinensis* var. *macrocarpa* Pampanini; *H. chinensis* var. *microphylla* W. P. Fang & T. P. Soong; *H. chinensis* var. *stenophylla* (Merrill) W. P. Fang & T. P. Soong; *H. himalaica* J. D. Hooker & Thomson ex C. B. Clarke var. *stenophylla* Merrill.

Leaf blade narrowly lanceolate to linear lanceolate, (2–)4–15 × (0.3–)0.4–2 cm, leathery or subleathery, sparsely

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glandular spiculate-serrate, margin sometimes revolute.

Mixed woods on slopes; 1000–2600 m. S Gansu, Guizhou, W Hubei, Hunan, S Shaanxi, Sichuan, Yunnan [N Myanmar, Thailand].

**3b. *Helwingia chinensis* var. *crenata*** (Lingelsheim ex Limpricht) W. P. Fang, *Acta Phytotax. Sin.* 1: 171. 1951.

钝齿青菜叶 *dun chi qing jia ye*

*Helwingia*      *crenata*      Lingelsheim      ex      Limpricht,      Repert.      Spec.

Nov. Regni Veg. Beih. 12: 453. 1922; *H. chinensis* f. *megaphylla* W. P. Fang; *H. chinensis* f. *oblanceolata* S. S. Chien; *H. himalaica* var. *crenata* (Lingelsheim ex Limpricht) H. L. Li.

Leaf blade lanceolate, oblanceolate, or ovate-lanceolate, 4–10(–15) × 1–4 cm, thickly papery, margin spiculate-crenate.

- Mixed woods; 1400–1900 m. SE Gansu, Guizhou, S Shaanxi, Sichuan, Yunnan.

**4. *Helwingia omeiensis*** (W. P. Fang) H. Hara & S. Kurosawa in H. Hara, Fl. E. Himalaya, Third Rep. 410. 1975.

峨眉青菜叶 e mei qing jia ye

*Helwingia himalaica* J. D. Hooker & Thomson ex C. B. Clarke f. *omeiensis* W. P. Fang, Acta Phytotax. Sin. 1: 169. 1951; *H. omeiensis* var. *oblonga* W. P. Fang & T. P. Soong.

Trees or shrubs, evergreen, 3–4(–8) m tall; bark not seen; young branches green. Leaf petiole 1–5 cm; stipules 2, linear-lanceolate or awnlike; leaf blade abaxially light green, with conspicuous yellow-brown streaks or speckles when dry, oblong or obovate-oblong, rarely oblanceolate, 9–15 × 3–5 cm, leathery, veins inconspicuous adaxially, base cuneate, margin glandular spiculate-serrate on apical 2/3, apex shortly acuminate or acuminate to caudate. Staminate umbels many, 5–20(–30)-flowered, on lower 1/3 of leaf; pedicels 3–7 mm. Carpellate umbels 1–4(–6)-flowered; pedicel ca. 2–4 mm. Staminate flowers 3–5-merous, purplish white. Carpellate flowers 3- or 4(or 5)-merous, green; stigma 3- or 4(or 5)-divided. Fruit subglobose to narrowly ellipsoid, ca. 9 mm. Seeds 3 or 4(or 5), lobes 3 or 4(or 5); pedicel 1–2 mm. Fl. Apr–May, fr. Jul–Aug.

- Moist habitats in woods and on slopes; 600–1700 m. SE Gansu, N Guangxi, Guizhou, Hubei, Hunan, S Shaanxi, Sichuan, Yunnan.