

# MALPIGHIACEAE

金虎尾科 jin hu wei ke

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Shrubs, small trees, or woody lianas, pubescence a mix of medifixed (T-shaped) and simple hairs, monoecious or andro-dioecious. Leaves usually opposite, rarely alternate or 3-whorled, petiolate, simple, entire, glands often present either on petiole or on lower surface of leaves; stipules free and deciduous, or connate and ± persistent, sometimes reduced or absent. Inflorescences terminal or axillary, racemose, corymbose or umbellate, solitary or in panicles; pedicels articulate, 2-bracteolate at point of attachment. Flowers bisexual or staminate (in *Ryssopterys*), actinomorphic or zygomorphic. Sepals 5, polysepalous or gamosepalous, imbricate, rarely valvate, one or more large glandular at bases of outside members, rarely eglandular. Petals 5, typically clawed, margin ciliate, dentate or fimbriate. Disk inconspicuous. Stamens 10, obdiplostemonous, sometimes diadelphous with one stamen distinctly larger than others; filaments usually connate at base; anthers introrse, longitudinally dehiscent. Ovary superior, 3-locular, placenta axile, 1-ovuled, pendulous and semianatropous in each locule; styles 3, or connate into 1, persistent. Fruit a schizocarp, carpels 3 or fewer, 1 seed per carpel; schizocarp splitting into winged samaras, indehiscent. Seed embryo large, erect or rarely curved; endosperm lacking.

About 65 genera and ca. 1280 species: tropical and subtropical regions, mainly American; four genera and 21 species (12 endemic) in China.

Two cultivated species were described in FRPS (43(3): 129, 1997): *Malpighia coccigera* Linnaeus, grown in Guangdong and Hainan, and *Thyrallis gracilis* Kuntze, grown in Guangdong and Yunnan (Xishuangbanna).

Chen Shukun & Chen Pangu. 1997. Malpighiaceae. In: Chen Shukun, ed., Fl. Reipubl. Popularis Sin. 43(3): 105–131.

- 1a. Plants androdioecious; flowers bisexual or staminate; petals weakly clawed; only abaxial wing of fruit developing ..... 4. *Ryssopterys*
- 1b. Plants monoecious; flowers bisexual; petals clawed or not clawed; lateral and abaxial wings of fruit well developed, rarely abaxial wing underdeveloped as protrusions.
  - 2a. Stipules connate with petiole base; samaras stellately winged, wings 3 or more ..... 3. *Tristellateia*
  - 2b. Stipules free, inserted on twig between petioles, sometimes reduced or absent; samaras not stellately winged, wings 1–3.
    - 3a. Flowers zygomorphic; petals clawed; style 1; samaras with 1 long abaxial wing and 2 shorter lateral wings ... 2. *Hiptage*
    - 3b. Flowers actinomorphic; petals not clawed; styles 3; samaras with lateral wings connate forming a disklike wing, abaxial wing developing or not ..... 1. *Aspidopterys*

## 1. ASPIDOPTERYS A. Jussieu ex Endlicher, Gen. Pl. 1060. 1840.

盾翅藤属 dun chi teng shu

Woody lianas or lianoid shrubs. Leaves opposite, entire, eglandular; stipule absent or small and deciduous. Inflorescences paniculate, rarely a raceme or cyme, axillary or terminal; peduncles articulated distally; pedicels usually bracteolate. Flowers 5-merous, bisexual, actinomorphic. Sepals 5, sometimes connate at base, eglandular. Petals 5, yellow or white, not clawed, entire, explanate or recurved. Stamens 10; filaments filiform, free or sometimes connate at base; anthers basifixed. Ovary 3-lobed, lobes abaxially flattened, margins ± winged; styles 3, free; stigma capitate. Samaras 3, often attached by a carpophore, each 3-winged; lateral wings connate forming 1 large wing, orbicular to oblong, membranous or leathery, palmately veined, sometimes shortly crested at middle; abaxial wing well developed or absent. Seeds cylindrical, located at center of samara.

About 20 species: tropical Asia; nine species (five endemic) in China.

- 1a. Samara oblong, oblong-lanceolate, or ovate-elliptic, length conspicuously longer than width.
  - 2a. Lianoid shrubs, not ferruginous pubescent; pedicels ca. 8 mm ..... 2. *A. floribunda*
  - 2b. Lianas, ferruginous pubescent; pedicels 2–6 mm.
    - 3a. Pedicels 4–6 mm; ovary sparsely hirsute; samara oblong ..... 1. *A. henryi*
    - 3b. Pedicels 2–2.5 mm; ovary glabrous; samara ovate-elliptic ..... 3. *A. glabriuscula*
- 1b. Samara orbicular to suborbicular, length slightly longer than or equaling width.
  - 4a. Plant glabrescent; leaf blade abaxially glabrous, base of midrib sometimes puberulent.
    - 5a. Leaf blade ovate-elliptic to oblong, midrib base abaxially puberulent ..... 5. *A. concava*
    - 5b. Leaf blade variously subcordate to ovate, midrib base abaxially glabrous.
      - 6a. Leaf blade 7–12 × 4.5–6 cm; cymose panicles terminal ..... 9. *A. microcarpa*

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- 6b. Leaf blade 11–25 × 8–15 cm; racemose panicles axillary ..... 6. *A. cavaleriei*  
 4b. Plant with a persistent pubescence; leaf blade abaxially tomentose or sericeous pubescent.  
 7a. Leaf blade abaxially sericeous pubescent ..... 8. *A. mutans*  
 7b. Leaf blade abaxially tomentose.  
 8a. Leaf blade ovate to ovate-lanceolate, apex caudate-acuminate ..... 4. *A. esquirolii*  
 8b. Leaf blade suborbicular to obovate, apex retuse-acuminate ..... 7. *A. obcordata*

**1. *Aspidopterys henryi*** Hutchinson, Bull. Misc. Inform. Kew 1917(3): 94. 1917.

蒙自盾翅藤 meng zi dun chi teng

*Aspidopterys glabriuscula* A. Jussieu var. *subrotunda* Niedenzu.

Woody lianas; branchlets spreading, subterete, densely ferruginous tomentose. Petiole 7–10 mm, ferruginous hirsute; leaf blade broadly ovate or ovate-orbicular, 8–10 × 5–7 cm, thinly papery, abaxially densely ferruginous tomentose, adaxially glabrous, small concave punctate, base rounded or slightly cordate, apex shortly acuminate; lateral veins 6 pairs, arcuate, hirsute. Racemose panicles terminal or axillary, up to 25 cm, ferruginous pubescent; peduncles ca. 6 cm, up to 15 cm in fruit; bracts hirsute; pedicels fasciculate, slender, articulate, 4–6 mm. Sepals elliptic or elliptic-obovate, ca. 1.5 × 1 mm. Petals obovate, 4–5 × ca. 2 mm. Stamen filaments connate at base, glabrous; anthers broadly elliptic, ca. 1 mm. Ovary sparsely hirsute; style ca. 2.5 mm, glabrous; stigma capitate, subglobose. Samara narrowly oblong, 3.5–4 × 1.5–1.8 cm, sparsely reticulate veined, glabrous; fruit stalk 1.5–2 cm. Fl. Aug–Oct, fr. Oct–Dec.

- Mountain forests; 1100–1700 m. SE and SW Yunnan.

**2. *Aspidopterys floribunda*** Hutchinson, Bull. Misc. Inform. Kew 1917(3): 95. 1917.

多花盾翅藤 duo hua dun chi teng

*Aspidopterys glabriuscula* A. Jussieu var. *brevicuspis* Niedenzu.

Lianoid shrubs; branchlets brown, sparsely pubescent. Petiole 7–10 mm, pubescent; leaf blade elliptic or ovate-elliptic, 7–11 × 4–6.5 cm, thinly papery, both surfaces glabrous, slightly shiny, midrib abaxially and lateral veins adnate pubescent, base rounded or slightly cordate, apex shortly acute-acuminate; lateral veins 4 or 5 pairs, arcuate. Panicles terminal or axillary, typically up to 30 × 15 cm, ferruginous pubescent; bracteoles linear-lanceolate, ca. 1.5 mm, densely ferruginous pubescent; pedicels fasciculate, slender, ca. 8 mm, articulate proximally, ferruginous pubescent under articulation, glabrous above articulation. Sepals elliptic-ovate, ca. 1 mm, apex rounded, glabrous. Petals elliptic-obovate, 3.5–4 mm, glabrous. Stamen filaments glabrous; anthers ca. 0.5 mm. Ovary glabrous; stigma capitate. Samara yellow-brown, oblong or oblong-lanceolate, 3.5–5 × ca. 1.5 × 1.5–2.3 cm, membranous, with distinct reticulate veins, base truncate-rounded, apex gradually attenuate; fruit stalk 1.5–2 cm. Fl. Jul–Aug, fr. Sep–Oct.

- Sparse hill forests, shrub forests; 1400–1700 m. SE Yunnan.

**3. *Aspidopterys glabriuscula*** A. Jussieu, Ann. Sci. Nat., Bot., sér. 2, 13: 267. 1840.

盾翅藤 dun chi teng

*Aspidopterys heterocarpa* J. Arènes.

Lianas, new growth densely ferruginous sericeous. Petioles 6–10 mm, canaliculate, ferruginous pubescent; leaf blade ovate, obovate, or broadly elliptic, 6–11 × 4–6.5 cm, thinly papery, ferruginous pubescent abaxially along midrib, base rounded or subcordate, apex shortly acuminate; lateral veins ca. 4 pairs, arcuate, veinlets reticulate. Panicles terminal or axillary, ca. 15 cm; pedicels 2–2.5 mm, ca. 15 mm in fruit, proximally articulate, above articulation pubescent; basal bracteoles 2, lanceolate. Sepals elliptic, ca. 1 mm, pubescent. Petals elliptic, ca. 3 × 1.5 mm, apex rounded. Stamen filaments ca. 2 mm. Ovary glabrous; stigma capitate. Samara ovate-elliptic, 4.5–5 × 1.5–2.2 cm. Seed linear, ca. 1 cm. Fl. Aug–Sep, fr. Oct–Nov.

Valley forests; 1500–2000 m. Guangxi, Hainan, Yunnan [Bhutan, India, Philippines, Vietnam].

**4. *Aspidopterys esquirolii*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 65. 1912.

花江盾翅藤 hua jiang dun chi teng

Woody lianas; annual growth felty tomentose with gray-yellow hairs. Petioles 1–1.5 cm, tomentose; leaf blade ovate to ovate-lanceolate, 7–13 × 3.5–6 cm, subleathery, abaxially densely felty tomentose, adaxially deep green, sparsely pubescent, base rounded or subcordate, apex caudate-acuminate; lateral veins 4 or 5 pairs, reticulate veins obscure. Cymose panicles axillary, ca. (5–)11 cm; bracts linear, 6–8 mm, densely tomentose; pedicels ca. 10 mm; bracteoles linear. Flowers crowded atop branchlets. Sepals ovate, ca. 1.5 mm, densely gray-yellow tomentose. Petals oblong-obovate, 5–6 × ca. 3 mm, glabrous. Stamen filaments ca. 1.5 mm; anthers oblong. Ovary pubescent; styles 3, 3–3.5 mm, free. Samara suborbicular, 2.5–4 × 2–3.5 cm, subleathery, apex of lateral wings retuse, abaxial wing ca. 12 × 5 mm. Seed lanceolate, villous. Persistent disk yellow-brown, shallowly 3-lobed, lobes deltoid, ca. 1 mm; carpel stalk conic, ca. 1.5 mm. Fl. Jul–Aug, fr. Oct–Dec.

• Mountain forests; 400–800 m. NW Guangxi, SE Guizhou, W Sichuan.

**5. *Aspidopterys concava*** (Wallich) A. Jussieu, Ann. Sci. Nat., Bot., sér. 2, 13: 266. 1840.

广西盾翅藤 guang xi dun chi teng

*Hiraea concava* Wallich, Pl. Asiat. Rar. 1: 13. 1830.

Woody lianas, up to 20 m; young branchlets red-brown tomentose, glabrate, striate, lenticellate, leaf-scars slightly thickened. Petiole 1–2 cm, glabrous or puberulent; leaf blade ovate-elliptic to oblong, (5–)7–10(–12) × 3–5(–8) cm, subleathery, both surfaces glabrous, abaxial midrib puberulent, base

rounded or obtuse, rarely subcordate, apex acuminate; lateral veins 4–7 pairs, anastomosing near margin. Panicles axillary, 5–10 cm, slender, red-brown pubescent, glabrate; pedicels 1–1.5 cm, glabrous, articulate proximally. Sepals ca. 2 × 1 mm, glabrous, apex rounded. Petals white, oblong, 3.5–5 × 1.5–3 mm, glabrous, apex rounded. Ovary glabrous; style 3–4.5 mm. Samara red-brown, suborbicular to orbicular, 2.5–4.5 × 2–2.7 cm, subleathery or dry membranous, apex retuse, abaxial wing ca. 1 cm × 6 mm. Seed linear, villous. Persistent disk dark red-brown, shallowly 3-lobed; carpel stalk trigonous-conic, as long as lobes of disk. Fl. Jul–Aug, fr. Oct–Dec.

Dense forests of limestone mountains, shrub forests of hills; 300–600 m. Guangxi [Cambodia, Indonesia, Laos, Malaysia, Philippines, Thailand, Vietnam].

**6. *Aspidopterys cavaleriei*** H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 458. 1911.

贵州盾翅藤 *gui zhou dun chi teng*

*Aspidopterys dunniana* H. Léveillé.

Scandent lianas; branchlets terete, striate, yellow-brown pubescent, glabrate. Petiole 2.5–7 cm, glabrous; leaf blade ovate or elliptic-ovate to subcordate, 11–25 × 8–15 cm, thinly leathery, abaxially green or ferruginous-red, adaxially olivaceous-green, surfaces glabrous, base rounded or subcordate, apex acute-acuminate; lateral veins 4 or 5 pairs, anastomosing near margin. Racemose panicles axillary, usually 2 inflorescences per axil, 15–25 cm, ferruginous pubescent; pedicels ca. 7 mm, articulate proximally, glabrous; bracteoles 2. Sepals oblong, ca. 1.5 mm, pubescent. Petals yellow-white, oblong, 4–6 mm, glabrous or very sparsely puberulent. Stamens ca. 1/2 as long as petal length; anthers oblong. Ovary glabrous, ca. 1 mm; style ca. 2.5 mm. Samara suborbicular, 3.5–4.5 × 3–3.8 cm, membranous, apex 2-lobed, abaxial wing 15–18 × ca. 3 mm; fruit stalk ca. 1.5 cm. Seed cylindrical. Persistent disk 3-lobed, ca. 1 mm; carpel stalk triangular, ca. 4 mm. Fl. Feb–Apr, fr. Apr–May.

• Valley forests; 200–800 m. Guangdong, Guangxi, Guizhou, Yunnan.

**7. *Aspidopterys obcordata*** Hemsley, Hooker's Icon. Pl. 27: t. 2673. 1901.

倒心盾翅藤 *dao xin dun chi teng*

Woody lianas; branchlets yellow-brown tomentose. Petiole 2–3 cm, densely yellow tomentose; leaf blade orbicular-obcordate or obovate-obcordate, 6–11 × 7–12 cm, thickly papery to papery or thinly leathery, abaxially yellow tomentose, adaxially glabrous, base rounded or shallowly cordate, apex cuspidate or retuse-acuminate. Panicles axillary, shorter than or equaling leaves, densely yellow-brown pubescent; pedicels slender, 5–10 mm, articulate proximally. Sepals oblong, ca. 1.5 mm, apex obtuse, ciliate. Petals white or yellowish, obovate-oblong, to 5 mm, glabrous. Ovary 3-lobed, glabrous. Samara oblong or suborbicular, 2–2.5 cm, apex retuse, abaxial wing ca. 3 mm wide. Fl. Feb–Mar, fr. Apr–May.

• Forests of higher-elevation hills, sparse forests or shrub forests of valleys or mountains; 600–1600 m. Hainan, S Yunnan.

- 1a. Leaf blade thickly papery or thinly leathery, obcordate to suborbicular ..... 7a. var. *obcordata*  
1b. Leaf blade thinly papery or papery, ovate to suborbicular ..... 7b. var. *hainanensis*

**7a. *Aspidopterys obcordata* var. *obcordata***

倒心盾翅藤(原变种) *dao xin dun chi teng* (yuan bian zhong)

*Aspidopterys tomentosa* Blume var. *obcordata* (Hemsley) Niedenzu.

Leaf blade obcordate to suborbicular, thickly papery or thinly leathery, apex retuse-acuminate, acumen triangular. Petals ca. 5 mm. Fl. Feb–Mar, fr. Apr–May.

• Sparse forests or shrub forests of valleys or mountains; 600–1600 m. S Yunnan.

**7b. *Aspidopterys obcordata* var. *hainanensis*** Arènes, Notul. Syst. (Paris) 11: 74. 1943.

海南盾翅藤 *hai nan dun chi teng*

Leaf blade ovate to suborbicular, thinly papery or papery, apex cuspidate. Petals ca. 3.5 mm.

• Forests of higher-elevation hills. Hainan.

**8. *Aspidopterys nutans*** (Roxburgh ex Candolle) A. Jussieu, Ann. Sci. Nat., Bot., sér. 2, 13: 267. 1840.

毛叶盾翅藤 *mao ye dun chi teng*

*Hiraea nutans* Roxburgh ex Candolle, Prodr. 1: 585. 1824; *Aspidopterys lanuginosa* (Wallich) A. Jussieu; *Hiraea lanuginosa* Wallich.

Scandent lianas, new growth densely gray-white sericeous-lanate; branchlets dark purple-brown, terete, striate. Petioles 1.5–3 cm, densely gray-white pubescent; leaf blade papery to thinly coriaceous, ovate, broadly ovate, or subrotund, 9–12 × 5.5–8 cm, abaxially greenish, densely gray-white sericeous, adaxially deep green, slightly shiny, glabrate, base rounded or sometimes subcordate, apex acuminate; lateral veins (4 or) 5 or 6 pairs, parallel, anastomosing near margin, more distinct adaxially. Panicles terminal or axillary, 11–15 cm, densely gray-white sericeous; pedicels 0.8–2 cm, articulate at middle, glabrate; bracteoles 2, subulate. Sepals ovate or broadly elliptic, ca. 1.5 mm, apex rounded, pubescent. Petals oblong-obovate, 4–5 × 2–3 mm. Stamens ca. 1/2 petal in length; anthers oblong. Ovary densely gray-white pubescent; styles 3, free. Samara broadly ovate, 3–3.5 × 2.5–3 cm, apex retuse, abaxial wing absent or narrowly winged. Seed white sericeous. Persistent disk shallowly 3-lobed; stalk longer than lobes of disk. Fl. Aug–Nov, fr. Nov–Dec.

Shrub forests of lower-elevation mountains. S and SW Yunnan [Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

The name *Aspidopterys concava* var. *dasyphylla* Arènes has been misapplied to this species.

**9. *Aspidopterys microcarpa*** H. W. Li ex S. K. Chen, Acta Bot. Yunnan. 18: 405. 1996.

小果盾翅藤 *xiao guo dun chi teng*

Woody lianas, usually scandent; branchlets terete, gla-

brous. Petioles 2–3 cm, glabrous; leaf blade ovate, 7–12 × 4.5–6 cm, thinly leathery, abaxially glabrous, adaxially deep green, both surfaces glaucous, base rounded, apex caudate-acuminate; lateral veins 9 or 10 pairs, parallel, anastomosing near margin, veinlets reticulate, indistinct. Cymose panicles terminal, ca. 25

cm in fruit, glabrous. Flower not seen. Samara milky white, suborbicular, 1–1.2 cm in diam., membranous. Fr. Dec.

Shrub forests of lower-elevation mountains. W Guangxi [Vietnam].

## 2. HIPTAGE Gaertner, Fruct. Sem. Pl. 2: 169. 1790, nom. cons.

风筝果属 feng zheng guo shu

Woody lianas, lianoid shrubs, or small trees. Leaves opposite, leathery or subleathery, entire, sometimes with 2 basal glands on abaxial surface; stipules minute, glandlike, or absent. Racemes axillary or terminal; peduncles bracteate; pedicels articulate, 2-bracteolate at articulation point. Flowers white, sometimes pinkish, fragrant, bisexual, zygomorphic. Calyx with 1 or 2 glands partially adnate to pedicel or eglandular. Sepals 5, imbricate, basally connate. Petals 5, clawed, ± unequal, silky pubescent. Stamens 10, unequal, one much larger than others; filaments connate at base. Ovary shallowly 3-lobed, 3–5 appendages on abaxial surface; style 1, rarely 2, filiform, at first circinate; stigma capitate. Samaras 1–3, each 3-winged; abaxial wing long, erect; lateral wings short, spreading. Seed angular-globose.

About 30 species: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Mauritius, Philippines, Thailand; ten species (seven endemic) in China.

*Hiptage sericea* J. D. Hooker is grown as an ornamental in SE Asia, with plants recorded in China from Guangdong (“Cape Syngmoon”) and Taiwan.

We are unable to treat *Hiptage leptophylla* Hayata (Icon. Pl. Formos. 3: 48. 1913), described from Taiwan, because we have seen no specimens.

### 1a. Calyx eglandular.

2a. Inflorescence yellow-brown appressed pubescent; leaf blade ovate, ovate-lanceolate, or elliptic, base cuneate, apex acuminate ..... 9. *H. minor*

2b. Inflorescence white tomentose; leaf blade lanceolate or obovate-lanceolate, base attenuate, apex acuminate-obtuse or rounded ..... 10. *H. lanceolata*

### 1b. Calyx glandular, glands adnate to pedicel.

3a. Two sepals of calyx glandular ..... 8. *H. luodianensis*

#### 3b. Only 1 sepal of calyx glandular.

#### 4a. Gland of calyx rotund or oblong, not decurrent to pedicel.

5a. Leaf blade oblong, base cordate, apex acute; abaxial wing of samara obovate ..... 5. *H. multiflora*

5b. Leaf blade elliptic to ovate, base cuneate or rounded, apex acuminate; abaxial wing of samara oblong.

6a. Raceme terminal, ca. 11 cm; sepal oblong; leaf base cuneate ..... 6. *H. fraxinifolia*

6b. Raceme axillary, ca. 3 cm; sepal ovate; leaf base rounded or broadly cuneate ..... 7. *H. tianyangensis*

#### 4b. Gland of calyx oblong, oblong-lanceolate, or ovate-oblong, or ± decurrent to pedicel.

7a. Leaf blade abaxially densely yellow-brown or gray-white tomentose; gland of calyx oblong-lanceolate, base decurrent to pedicel ..... 1. *H. candicans*

7b. Leaf blade glabrous, base of midrib sparsely pubescent abaxially; gland of calyx oblong or ovate-oblong, 1/4–1/2 decurrent to pedicel.

8a. Body of samara shortly sericeous, wings glabrous; leaf blade oblong, elliptic-oblong, or ovate-lanceolate ..... 4. *H. benghalensis*

8b. Body and wings of samara pubescent; leaf blade lanceolate, oblong, ovate, or elliptic.

9a. Abaxial wing of samara obovate-oblong, 2.5–3 × ca. 1.2 cm, lateral wings linear-lanceolate, ca. 13 × 5–6 mm; leaf blade lanceolate, oblong, or ovate, 7.5–12 × 3–4.5 cm ..... 2. *H. acuminata*

9b. Abaxial wing of samara narrowly oblanceolate, ca. 3 × 1 cm, lateral wings linear, ca. 15 × 3 mm; leaf blade elliptic, 12.5–17 × 4–7 cm ..... 3. *H. yunnanensis*

### 1. *Hiptage candicans* J. D. Hooker, Fl. Brit. India 1: 419. 1874.

白花风筝果 bai hua feng zheng guo

Erect shrubs, small trees, or lianas; branchlets and leaves densely yellowish or gray-white tomentose. Petiole 5–10 mm; leaf blade oblong or elliptic-oblong, 9–15 × 4–8 cm, abaxially densely yellowish or gray-white tomentose to sparsely pubescent along veins, adaxially glabrate, or both surfaces glabrous, base broadly cuneate or rounded, with or without glands, apex shortly acuminate. Racemes axillary, densely yellow-brown pu-

bescient; pedicels 1.5–2 cm, articulate distally, bracteoles lanceolate. Sepals 4–5 mm, densely yellow-brown pubescent, apex triangular; gland black, oblong-lanceolate, 3–4 mm, base decurrent to pedicel. Petals white or pink, ovate or rotund, 8–11 × 6–8 mm, densely white pubescent. Stamens differing in size, longest up to 15 mm, others 3–4 mm; anthers 1.5–2 mm. Style thin, ca. 12 mm, apex pointed. Samara yellow-brown pubescent, abaxial wing elliptic-lanceolate, 3–3.5 cm, apex rounded or sometimes shallowly lobed, lateral wings 1–1.5 cm, apex rounded or shallowly lobed. Fl. Feb–Mar, fr. Apr–May.

Mountain forests, sparse forests on mountain slopes, shrub forests; 500–1300 m. Yunnan [India, Laos, Myanmar, Thailand].

- 1a. Erect shrubs or small trees ..... 1a. var. *candicans*  
 1b. Lianas ..... 1b. var. *harmandiana*

**1a. *Hiptage candicans* var. *candicans***

白花风箏果(原变种) bai hua feng zheng guo (yuan bian zhong)

*Hiptage arborea* Kurz.

Erect shrubs or small trees; young branches and petioles densely yellowish or gray-white tomentose. Leaf blade abaxial surface densely gray-white tomentose, eglandular. Petals white. Stamen filament 8–10 mm (longest). Style ca. 12 mm. Fl. Feb–Mar, fr. Apr–May.

Sparse forests on mountain slopes, shrub forests; 500–1300 m. Yunnan [India, Myanmar, Thailand].

**1b. *Hiptage candicans* var. *harmandiana* (Pierre) Dop, Bull. Soc. Bot. France 55: 429. 1908.**

越南白花风箏果 yue nan bai hua feng zheng guo

*Hiptage harmandiana* Pierre, Fl. Forest. Cochinch. 17: t. 270 B. 1892.

Lianas; young branches glabrous or sparsely pubescent. Leaf blade surfaces glabrous, shiny, base of abaxial surface with 2 glands. Petals pink. Stamen filament up to 15 mm (longest). Style ca. 10 mm.

Mountain forests. S Yunnan [Laos].

**2. *Hiptage acuminata* Wallich ex A. Jussieu, Ann. Sci. Nat., Bot., sér. 2, 13: 269. 1840.**

尖叶风箏果 jian ye feng zheng guo

Scandent shrubs; young branches terete, densely yellowish brown appressed pubescent, mature branches dark brown, glabrous, lenticellate. Stipule ovate, minute, deciduous; petiole thick, ca. 6 mm, canalicate adaxially, glabrate; leaf blade lanceolate, oblong, or ovate, 7.5–12 × 3–4.5 cm, leathery, both surfaces glabrous, midrib abaxially sparsely pubescent, base broadly cuneate to rounded, abaxially with 2 glands, margin slightly recurved, apex long acuminate; lateral veins 5 or 6 pairs. Racemes axillary or terminal, 4–6 cm, appressed pubescent, 4–10-flowered; pedicels 10–15 mm, articulate proximally or rarely at middle; bracteoles subulate-lanceolate. Sepals elliptic, 4–5 × ca. 3 mm, densely pubescent, apex rounded; gland ovate-oblong, 3–4 mm, ca. 1/4 adnate on pedicel. Petals white with pink, subrotund, 10–11 × ca. 9 mm, apex rounded, base clawed, pubescent, margin very shortly dentiform-fimbriate. Stamens differing in size, longest ca. 10 mm, others 5–7 mm; anthers ovate. Ovary pubescent; style circinate, ca. 1.2 cm. Samara body densely appressed pubescent, wings sparsely hirsute pubescent, abaxial wing obovate-oblong, 2.5–3 × ca. 12 mm, apex rounded, retuse, lateral wings linear-lanceolate, ca. 13 × 5–6 mm. Fl. Mar–Apr, fr. Apr–May.

Forest margins, mountains; ca. 1400 m. Yunnan [Bangladesh, India, Myanmar].

**3. *Hiptage yunnanensis* Huang ex S. K. Chen, Acta Bot. Yunnan. 18: 405. 1996.**

云南风箏果 yun nan feng zheng guo

Small trees; branchlets dark purple, terete, glabrate, lenticellate. Leaf blade elliptic, ca. 12.5 × 4–7 cm, thinly leathery, abaxially yellow-green, rugose, adaxially green, shiny, both surfaces glabrous, base broadly cuneate, abaxially with 2 glands, margin slightly recurved, apex acuminate; lateral veins 5 (or 6) pairs, arcuate, veinlets reticulate. Racemes axillary, 2–3 cm, 6–10-flowered, inflorescence densely gray-brown pubescent; pedicel articulate at middle. Sepals oblong, ca. 6 × 4 mm, apex rounded, ciliate; gland oblong, ca. 4 × 2 mm, 1/4–1/2 decurrent to pedicel. Petals subrotund, ca. 8 mm in diam., densely white lanose, base rounded, clawed, margin ciliate. Ovary and base of style densely white pubescent; style circinate, ca. 14 mm. Samara densely appressed pubescent, abaxial wing narrowly oblanceolate, ca. 3 × 1 cm, apex rounded, irregularly shallowly dentate, lateral wings linear, ca. 1.5 × 0.3 cm. Fl. Apr, fr. Apr–May.

• Shrub forests on riversides; 700–800 m. NW Yunnan.

**4. *Hiptage benghalensis* (Linnaeus) Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 43: 136. 1874.**

风箏果 feng zheng guo

Shrubs or lianas, 3–10 m or more; branchlets and inflorescences densely yellowish brown or silver-gray pubescent; branches glabrate, ferruginous-red or dark gray, with light-colored lenticels. Petiole 5–10 mm, canalicate adaxially; leaf blade leathery, oblong, elliptic-oblong, or ovate-lanceolate, 9–18 × 3–7 cm, young leaves light red, pubescent, old leaves green, glabrous, base broadly cuneate or rounded, abaxially often with 2 glands, apex acuminate; lateral veins 6 or 7 pairs. Racemes axillary or terminal, 5–10 cm, inflorescence yellowish brown pubescent, glabrate; pedicels articulate at middle or distally; bracteoles subulate-lanceolate. Flowers very fragrant. Sepals broadly elliptic or ovate, 5–6 mm, apex rounded, densely yellow-brown pubescent; gland thick, large, oblong, ca. 1/2 adnate on pedicel. Petals white, base yellow maculate, or yellowish or pink, orbicular or broadly elliptic, 8–15 × 5–10 mm, pubescent, apex rounded, base clawed, margin fimbriate. Stamens differing in size, longest 8–12 mm, others 3–5 mm; anthers elliptic, 1–2 mm. Style ca. 12 mm, circinate. Samara body shortly sericeous, wings glabrous, abaxial wing elliptic or obovate-lanceolate, 3.5–5(–7) × 1–1.6 cm, apex entire or retuse, lateral wings lanceolate-oblong, 1.5–3 cm, base of wing with 1 triangular-crested appendage. Fl. Feb–Apr, fr. Apr–May.

Dense forests, sparse forests, shrub forests of valleys, riverbanks, field margins, roadsides; (100–)200–1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Philippines, Thailand, Vietnam].

- 1a. Abaxial surface of samara with triangular appendage; pedicel 1–1.6(–2) cm ..... 4a. var. *benghalensis*  
 1b. Abaxial surface of samara without appendage; pedicel 2–2.5 cm ..... 4b. var. *tonkinensis*

**4a. *Hiptage benghalensis* var. *benghalensis***

风筝果(原变种) feng zheng guo (yuan bian zhong)

*Banisteria benghalensis* Linnaeus, Sp. Pl. 1: 427. 1753; *B. tetraptera* Sonnerat; *Gaertnera obtusifolia* Roxburgh; *Hiptage javanica* Blume; *H. madablota* Gaertner, nom. illeg. superfl.; *H. obtusifolia* (Roxburgh) Candolle; *H. parvifolia* Wight & Arnott.

Leaf blade 9–18 × 3–7 cm. Pedicels 1–1.6(–2) cm, articulate distally. Abaxial surface of samara with triangular-crested appendage. Fl. Feb–Apr, fr. Apr–May.

Dense forests, sparse forests of valleys, riverbanks, roadsides; (100–)200–1900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Philippines, Thailand, Vietnam].

**4b. *Hiptage benghalensis* var. *tonkinensis* (Dop) S. K. Chen**, Fl. Reipubl. Popularis Sin. 43(3): 120. 1997.

越南风筝果 yue nan feng zheng guo

*Hiptage madablota* Gaertner var. *tonkinensis* Dop, Bull. Soc. Bot. France 55: 429. 1908.

Leaf blade larger, ca. 18 × 7.5–8.5 cm. Pedicels 2–2.5 cm, articulate at middle, top thickened. Abaxial surface of samara without appendage.

Sparse forests, shrub forests of valleys, riverbanks, field margins; 500–1400 m. Yunnan [Laos, N Vietnam].

**5. *Hiptage multiflora* F. N. Wei**, Acta Phytotax. Sin. 19: 356. 1981.

多花风筝果 duo hua feng zheng guo

Lianoid shrubs, ca. 2 m; branches terete, with rounded lenticels, slightly rough, glabrate. Leaf blade leathery, oblong, 12–13 × 5–5.5 cm, abaxially glabrous or pubescent only along midrib and lateral veins, adaxially glabrous, base cordate, abaxially with 2 glands, margin recurved when dry, apex acute; lateral veins 6 or 7 pairs, midrib stout. Racemes axillary, multiflorous, densely puberulent; pedicels ca. 1 cm, articulate at middle. Sepals ovate, puberulent, 1 gland per sepal; glands rotund, not decurrent to pedicel. Samara puberulent, apex entire or irregularly serrate, abaxial wing obovate, 2.2–2.5 cm, lateral wings oblong, ca. 1.7 × 0.5 cm.

• Shrub forests on summits of limestone mountains; ca. 600 m. SW Guangxi (Longzhou).

**6. *Hiptage fraxinifolia* F. N. Wei**, Acta Phytotax. Sin. 19: 356. 1981.

白蜡风筝果 bai la feng zheng guo

Lianoid shrubs; young branches densely pubescent, old branches brown, with rounded lenticels. Petiole 5–6 mm, puberulent; leaf blade elliptic or ovate-elliptic, 11–13 × 3–5.5 cm, both surfaces glabrous, except abaxially pubescent along midrib, base cuneate, apex long acuminate; lateral veins 6–9 pairs. Racemes terminal, ca. 11 cm, puberulent. Sepals oblong, puberulent; gland oblong, not decurrent to pedicel. Samara puberulent, apex entire or irregularly serrate, abaxial wing oblong,

ca. 4 × 0.8 cm, lateral wings oblong, ca. 2.8 × 1 cm. Fr. May–Jun.

• Dense forests of valleys; ca. 400 m. S Guangxi.

**7. *Hiptage tianyangensis* F. N. Wei**, Acta Phytotax. Sin. 19: 358. 1981.

田阳风筝果 tian yang feng zheng guo

Lianoid shrubs; branches terete, brown, lenticellate; branchlets gray-brown, puberulent. Leaves opposite; petiole ca. 5 mm; leaf blade ovate or elliptic, 7–12 × 2.5–5.5 cm, base broadly cuneate or rounded, margin recurved, apex acuminate, both surfaces glabrous; lateral veins 6 pairs. Racemes axillary, ca. 3 cm, pedicels pubescent. Sepals ovate, ca. 3 mm, glabrous, apex obtuse, margin ciliate; gland rotund, not decurrent to pedicel. Petals white, ovate-orbicular, asymmetrical, pubescent, margin fimbriate. Stamen filaments glabrous. Ovary deeply 3-lobed, puberulent; style glabrous. Samara puberulent, wings suboblong, apex irregular or serrate, abaxial wing ca. 2.5 × 0.5 cm. Fl. Mar, fr. Apr–May.

• Shrub forests on exposed to sunny slopes or hilltops; ca. 400 m. W Guangxi (Tianyang), Guizhou.

**8. *Hiptage luodianensis* S. K. Chen**, Acta Bot. Yunnan. 18: 409. 1996.

罗甸风筝果 luo dian feng zheng guo

Shrubs, erect or scandent; branches terete, dark purple, glabrous, rough, densely lenticellate; branchlets yellow-brown appressed pubescent, glabrate. Petiole ca. 4 mm, appressed pubescent; leaf blade papery, lanceolate or narrowly ovate-lanceolate, 4–4.5 × 1.5–2 cm, abaxially greenish, glabrous except along midrib sparsely appressed pubescent, adaxially green, glabrous, base broadly cuneate to subrounded, apex long acuminate; lateral veins 5 or 6 pairs. Raceme solitary (only one raceme arising from each leaf scar axil), axillary on leaf scar of second-year branchlets, 3–3.5 cm, 6–14-flowered, yellow-brown appressed pubescent; bracts 2 or 3, ovate-lanceolate, densely pubescent; pedicels ca. 1 cm, articulate at middle; bracteoles linear-lanceolate. Sepals elliptic, ca. 3 × 1.5 mm, apex rounded, pubescent, margin ciliate; glands 2, elliptic, ca. 0.5 mm. Petals white with purple, suborbicular, ca. 8 mm in diam., mid-abaxial surface pubescent, base rounded, clawed, margin fimbriate. Stamens differing in size, longest ca. 8 mm, arched, others ca. 4 mm; anthers oblong, longitudinally dehiscent. Ovary pubescent, winged; style ca. 8 mm, curved. Young fruit and wings densely pubescent; mature fruit not seen. Fl. Mar–Apr.

• Sparse forests on mountain slopes; ca. 500 m. S Guizhou (Luodian).

**9. *Hiptage minor* Dunn**, J. Linn. Soc., Bot. 35: 487. 1903.

小花风筝果 xiao hua feng zheng guo

*Hiptage henryana* Niedenzu.

Erect shrubs, rarely lianoid shrubs, 60–90 cm tall; bark longitudinally rimose; branchlets puberulent, glabrate. Leaves opposite; petiole 3–6 mm; leaf blade leathery, ovate or ovate-lanceolate, 4–8 × 2.3–3.5 cm, both surfaces glabrous, base

cuneate, apex acuminate. Racemes axillary or terminal, shorter than leaves, yellow-brown appressed pubescent; pedicels articulate at middle; bracteoles deciduous. Flowers fragrant. Sepals triangular or subrounded, ca. 2 mm, yellow-brown appressed pubescent, eglandular. Petals white, subrounded, 7–8 mm, margin fimbriate. Stamens conspicuously shorter than petals. Ovary pubescent. Samara glabrous or puberulent, abaxial wing oblong-elliptic, 2.5–3 cm, apex often 2- or 3-lobed or rounded, lateral wings 1–1.5 cm, apex rounded. Fl. Mar–Apr, fr. Apr–May.

• Sparse forests, shrub forests on mountain slopes; 200–1400 m. Guizhou, Yunnan.

**10. *Hiptage lanceolata*** Arènes, Notul. Syst. (Paris) 11: 73. 1943.

披针叶风箏果 pi zhen ye feng zheng guo

Lianoid shrubs; bark gray, becoming red-brown, ± rimose,

yellow-brown lenticellate; young branchlets sparsely puberulent, quickly glabrate. Leaves opposite; petiole 5–7 mm, sparsely pubescent, deciduous, canaliculate adaxially; leaf blade leathery, lanceolate or obovate-lanceolate, ca. 7.5 × 3.5 cm, abaxially sparsely puberulent on veins, glabrate, base attenuate to petiole, eglandular, apex acuminate-obtuse to rounded; lateral veins 10–16 pairs, arcuate, anastomosing near margin, veinlets reticulate. Racemes solitary, dense to sparse, 3–18 cm, white tomentose; pedicels 6–9 mm, white tomentose, articulate at middle. Sepals ovate, apex rounded, ca. 1.5 mm, white sericeous, eglandular. Petals white, ca. 4 mm, apex rounded, proximally sericeous, base arrow-shaped, clawed, less than 1 mm, margin irregularly denticulate. Stamens differing in size, longest ca. 3 cm; filaments glabrous. Ovary villous; style glabrous, 4–4.5 mm. Fruit not seen.

• S and SW Guizhou (Luodian, Xingyi).

### 3. *TRISTELLATEIA* Du Petit-Thouars, Gen. Nov. Madagasc. 14. 1806.

三星果属 san xing guo shu

Woody lianas. Leaves opposite or whorled, stipulate; stipules connate with petiole; leaf blade entire, glandular. Racemes axillary or terminal; pedicels bracteate. Flowers 5-merous, bright yellow, bisexual, actinomorphic. Sepals with or without glands. Petals clawed. Stamens 10, unequal; filaments connate at base, articulate distally. Ovary 3-lobed, globose, often with abaxial appendages; style 1; stigma minute. Samaras 3, each 3–10-winged; wings conic, of unequal lengths, together thus star-shaped.

About 20 species: mainly in Madagascar, also in E Africa, India, and Malaysia to Australia and Pacific islands; one species in China.

**1. *Tristellateia australasiae*** A. Richard in Dumont d'Urville, Voy. Astrolabe 2: 159. 1834.

三星果 san xing guo

Woody lianas, ca. 10 m tall, mostly glabrous. Leaf stipules 2, linear to lanceolate, ca. 1 mm, apex acute; petiole 1–1.5 cm; leaf blade ovate, 6–12 × 4–7 cm, papery or leathery, both surfaces glabrous, base cordate to rounded, with 2 glands adnate to petiole, margin slightly reflexed, apex acute to acuminate.

Racemes terminal or axillary; pedicels 1.5–3 cm; bract 1, articulate distally; bracteoles 2. Flowers 2–2.5 cm in diam. Sepals 5, triangular, ca. 3 × 1.5 mm, eglandular or with very minute glands. Petals 5, yellow, sagittate-ovate, 8–13 × 5–6 mm, clawed, glabrous, entire; claw 2–3 mm. Stamens 3–4 mm. Schizocarp stellate, 1–2 cm in diam. Fl. Aug, fr. Oct.

Forests near seashores. Taiwan (Hengchun peninsula, Lan Yu) [Malaysia, Thailand, S Vietnam; tropical Australia, Pacific islands].

### 4. *RYSSOPTERYS* Blume ex A. Jussieu in Delessert, Icon. Sel. Pl. 3: 21. 1838, nom. cons.

翅实藤属 chi shi teng shu

Woody lianas; branchlets appressed pubescent; andro-dioecious. Leaves opposite or subopposite; stipules rudimentary or developed; leaf blade margins entire, glandular, basal glands adnate to petiole, sometimes abaxial margin dotted with glands. Inflorescences axillary. Flowers 5-merous, fragrant, yellow or white, bisexual or staminate, often rudimentary, actinomorphic. Sepals eglandular. Petals weakly clawed. Stamens 10; filaments connate basally. Ovary 3-lobed, strigose; styles 3, free, filiform; stigma capitate. Samara of 1–3 carpels, each with 1 abaxial wing.

About six species: India, Indonesia, Malaysia, Philippines, to tropical Australia, New Caledonia, and Micronesia; one species in China.

**1. *Ryssopterys timoriensis*** (Candolle) Blume ex A. Jussieu in Delessert, Icon. Sel. Pl. 3: 21. 1838 [*timorensis*].

翅实藤 chi shi teng

*Banisteria timoriensis* Candolle, Prodr. 1: 588. 1824; *Ryssopterys dealbata* A. Jussieu.

Woody lianas, up to 10 m; young branchlets densely pubescent, glabrate. Petiole slender, 1–7 cm, yellow-brown or gray-white puberulent; leaf blade ovate or broadly ovate, 8–12 × 4–7 cm, abaxially glabrous or puberulent, adaxially glabrous,

base slightly cordate, rounded, or truncate, glands 2, black, orbicular, apex acute; lateral veins 4–7 pairs. Inflorescences axillary, gray-white appressed pubescent; bracts ovate, ca. 3 mm, yellow-brown puberulent, apex acute; pedicels articulate at middle; bracteoles ovate, ca. 1.5 mm, yellow-brown puberulent. Sepals connate, deeply 5-lobed, ca. 2 mm, puberulent. Petals 5, yellow, rotund to elliptic, 6–10 mm, ± clawed, margin entire. Stamens 2–4 mm. Samara 2–4 × 1–1.5 cm. Fl. Jul.

Coastal regions. Taiwan (Lan Yu) [Indonesia, Malaysia; Australia, Pacific islands (Micronesia)].