

1. Tribe MUTISIEAE

帚菊木族 zhou ju mu zu

Gao Tiangang (高天刚), Chen Yousheng (陈又生); D. J. Nicholas Hind, Susana Edith Freire

Herbs, subshrubs, shrubs, trees, rarely climbers or ramblers, glabrous or with simple, glandular, malpighiaceae or stellate hairs, often glabrescent. Leaves usually evenly spaced, sometimes rosulate or densely spiraled, usually alternate, rarely opposite, lamina simple, variously shaped, usually herbaceous, venation trinervate, pinnate, sometimes parallel, or very rarely palmate, margin entire or lobed, serrate or denticulate, rarely spiny or pinnatisect, lamina rarely compound and paripinnate. Inflorescences scapose or scapiform, or synflorescences cymose or of corymbose or paniculate, axillary or terminal clusters, sometimes of glomerules, very rarely of pseudocephalia. Capitula small to very large, usually chasmogamous, very rarely cleistogamous, usually monoecious, homogamous or heterogamous, radiate, very rarely ligulate, rarely disciform or discoid, 1- to many flowered; involucre cylindrical to globose or urceolate; phyllaries imbricate, few to many seriate, sometimes uniseriate, rarely calyculate, rarely distant, usually gradate, often papery or herbaceous, usually homomorphic; receptacles flat, convex or rarely conical, scrobiculate, foveolate, fimbriate, or alveolate, glabrous or variously pubescent, usually epaleate. Florets rarely all actinomorphic, usually marginal and disk florets distinct; marginal florets usually variously bilabiate (2/3) or pseudobilabiate (1/4), and often distinctly radiate, sometimes ligulate (0/5), bisexual, female, or neuter, corollas glabrous or variously pubescent; staminodes rarely present; disk florets usually bilabiate (2/3), sometimes actinomorphic (5/0), usually fertile, corollas glabrous or variously pubescent, lobes short or long; stamens usually conspicuously exerted from corolla; filaments glabrous or rarely pubescent or papillate, antheropodia inconspicuous or sometimes distinct and variously enlarged or flattened; anther appendages usually acuminate or apiculate and several times as long as wide, sometimes thickened at apex and knoblike, sometimes truncate or rounded; anthers calcarate and caudate, rarely ecalcarate, tails usually long acute, entire or variously lacinate, sometimes conspicuously branched or pilose; styles usually well exerted from corolla and anther cylinder; style base sometimes with conspicuous nectary, with or without distinctive basal node, glabrous, style shaft usually glabrous, rarely papillose in upper part, style branches usually relatively short, apices acute, obtuse to rounded, or truncate and glabrous to papillose dorsally. Achenes fusiform or sometimes distinctly beaked, terete, ribbed or angled or very rarely flattened, glabrous or variously setuliferous, commonly with twin hairs, or rarely tomentose with long tortuous hairs, or appearing papillate, very rarely with stalked and sticky glands (*Adenocaulon*); carpodium sometimes absent, more often usually a narrow annulus, sometimes cylindrical; pappus sometimes absent but usually of uniseriate, sometimes biseriate to multiseriate, simple, barbellate, subplumose or plumose bristles, sometimes flattened or scalelike, persistent or deciduous, separate or sometimes basally connate.

About 80 genera and ca. 950 species: Africa, Asia, Australia, North and South America; nine genera (two endemic) and 73 species (50 endemic) in China.

Molecular evidence has proposed that a traditionally circumscribed Mutisieae is polyphyletic (Kim et al., *Syst. Bot.* 27: 598–609. 2002). The majority of the Mutisieae s.l. from China consists of *Ainsliaea*, *Myriopsis*, and *Pertya*, and these genera form a distinct clade (recently recognized as the tribe Pertyeae) nested above the Cardueae and the African Mutisieae. *Gerbera* and its allies (*Leibnitzia* and *Piloselloides*) and *Adenocaulon* are nested in the Mutisieae s.s. clade along with other taxa mostly from South America. *Leucomeris* and *Nouelia* are apparently closely related to some South American Mutisieae, recently recognized as the tribe Hyalideae (Panero & Funk, *Proc. Biol. Soc. Washington* 115: 909–922. 2002; Panero & Funk, *Molec. Phylogen. Evol.* 47: 757–782. 2008). To allow easy comparison with FRPS, a conservative concept of the Mutisieae s.l. is followed in the treatment below.

Uechitritzia kokanica (Regel & Schmalhaus) Pobedimova (in Bobrov & Czerepanov, *Fl. URSS* 28: 597. 1963; *Gerbera kokanica* Regel & Schmalhaus, *Izv. Imp. Obshch. Lyubit. Estestv. Moskovsk. Univ.* 34(2): 53. 1882) was recorded from NW China by Pobedimova (loc. cit.) and H. V. Hansen (*Nordic J. Bot.* 8: 73. 1988). It is otherwise endemic to the Pamir-Altai and Tien Shan regions of C Asia, south to Afghanistan and Kashmir, at elevations of 1300–2000 m. It is not included in this treatment because no Chinese material could be traced.

- 1a. Shrubs or small trees; style branches glabrous.
 - 2a. Capitula solitary; florets heteromorphic 1. *Nouelia*
 - 2b. Capitula in a dense terminal cyme or glomerule; florets homomorphic 2. *Leucomeris*
- 1b. Shrubs, subshrubs, or perennial herbs; style branches with short hairs or papillae.
 - 3a. Achenes apically stipitate glandular; pappus absent 3. *Adenocaulon*
 - 3b. Achenes never glandular; pappus usually present.
 - 4a. Florets heteromorphic; perennial herbs.
 - 5a. Dimorphic herbs, with two (vernal and autumnal) phases in one year 4. *Leibnitzia*
 - 5b. Monomorphic herbs, with only one phase in one year.
 - 6a. Marginal female florets 1-seriate 5. *Gerbera*
 - 6b. Marginal female florets 2-seriate 6. *Piloselloides*
 - 4b. Florets homomorphic; shrubs or perennial herbs.
 - 7a. Pappus of plumose bristles or sometimes absent; usually perennial herbs 7. *Ainsliaea*
 - 7b. Pappus of scabrid bristles; usually shrubs.
 - 8a. Phyllaries many, more than 3-seriate, unequal 8. *Pertya*
 - 8b. Phyllaries few, 2- or 3-seriate, subequal 9. *Myriopsis*

1. NOUELIA Franchet, J. Bot. (Morot) 2: 66. 1888.

栌菊木属 lu ju mu shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Large shrubs to small trees. Leaves alternate, petiolate; leaf blade entire or minutely callosely serrulate. Capitula large, solitary, terminal, radiate, heterogamous; involucre campanulate; phyllaries multiseriate, leathery, imbricate, unequal; receptacle flat to convex, alveolate. Florets all bisexual, fertile; marginal florets uniseriate, bilabiate, outer lip 3-toothed to 3-lobed at apex, inner 2-lobed, lobes linear, revolute; central florets many, tubular or slightly bilabiate, deeply 5-lobed, regularly or slightly irregularly, lobes revolute; anther bases long tailed, apex appendaged; styles shallowly divided at apex, style branches short, glabrous, apices obtuse to rounded. Achene cylindrical, ribbed, sericeous; pappus of scabrid bristles, numerous. $2n = 54^*$.

- One species: China.

1. *Nouelia insignis* Franchet, J. Bot. (Morot) 2: 67. 1888.

栌菊木 lu ju mu

Large shrubs to small trees, 3–4 m. Leaves evenly alternate; petiole 2–4 cm; leaf blade oblong to elliptic, 8–26 × 3.5–12 cm, thinly leathery, abaxially tomentose, adaxially glabrous, base obtuse to rounded, margin minutely callosely serrulate, apex obtuse to acuminate. Capitula solitary, large, erect, terminal, radiate, ca. 5 cm in diam.; involucre 2–2.5 cm in diam.;

phyllaries ca. 7-seriate, abaxially tomentulose, outer phyllaries shorter, ovate-triangular, 3–5 mm, median phyllaries oblong, ca. 1.5 cm, inner phyllaries lanceolate or linear, 2–2.5 cm. Marginal florets 1-seriate, corollas white, bilabiate, outer lip ca. 1.5 cm; central florets many, deeply 5-lobed, lobes ca. 8 mm; anther tails ca. 2 mm. Achenes 1.2–1.4 cm; pappus ca. 1.5 cm. Fl. Feb–Jun. $2n = 54^*$.

- Forests, scrub, steep slopes in ravines; 1000–2900 m. SW Sichuan, Yunnan.

2. LEUCOMERIS D. Don, Prodr. Fl. Nepal. 169. 1825.

白菊木属 bai ju mu shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Shrubs or small trees. Leaves alternate, petiolate; leaf blade entire or sparsely serrulate. Capitula in a dense terminal cyme or in a dense many-headed terminal glomerule, homogamous; involucre obconic; phyllaries multiseriate, imbricate; receptacle flat. Florets few, all bisexual, fertile, tubular, corolla deeply 5-lobed, lobes equal or subequal, revolute; anther bases tailed, apex appendaged; styles shallowly divided at apex, style branches short, glabrous, apices obtuse. Achene cylindrical, ribbed, sericeous; pappus of scabrid bristles, 2- or 3-seriate, outer shorter. $2n = 54$.

- Two species: China, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam; one species in China.

1. *Leucomeris decora* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 41: 317. 1872.

白菊木 bai ju mu

Gochnatia decora (Kurz) Cabrera.

Small trees, (1–)3–8(–10) m. Leaves alternate; petiole 1.5–4 cm; leaf blade elliptic or oblong-lanceolate, 6–26 × 2.5–10 cm, papery, abaxially tomentose, adaxially glabrate, base cuneate, often unequal, margin repand, with sparse minutely callose serrae, apex acute, obtuse, or mucronate. Capitula in a dense 6–

14-headed terminal glomerule, 8–10 mm in diam.; involucre 4–7 mm in diam.; phyllaries 6–8-seriate, outer phyllaries ovate, shorter, 1.5–4 mm, lanuginous, median phyllaries broadly ovate or ovate-lanceolate, ca. 6 mm, sparsely lanuginous, inner phyllaries narrowly oblong or linear, 13–15 mm, glabrous. Hysteranthous florets 5–7, corollas white, deeply 5-lobed, lobes 7–8 mm; anther tails ca. 3 mm. Achenes 1–1.2 cm; pappus light red or straw-colored yellowish, 1.3–1.5 cm. Fl. Mar–Apr. $2n = 54$.

- Forests, forest margins, scrub; 1000–1900 m. S and W Yunnan [Myanmar, Thailand, Vietnam].

3. ADENOCAULON Hooker, Bot. Misc. 1: 19. 1829.

和尚菜属 he shang cai shu

Chen Yousheng (陈又生); D. J. Nicholas Hind

Herbs, perennial, from creeping rhizomes, aerial stems usually proximally tomentose and distally stipitate glandular. Leaves simple, alternate, basal and cauline, petiolate (proximal) or sessile (distal); blades ovate to triangular or suborbicular, abaxially tomentose, adaxially glabrate, bases mostly truncate to cordate or hastate, margins coarsely dentate or lobulate to denticulate or entire. Synflorescences of lax panicles. Capitula disciform; involucre campanulate; phyllaries 5–7, 1- or 2-seriate, subequal, ovate to oblong, herbaceous, apices obtuse; receptacles convex, smooth, glabrous, epaleate. Marginal florets female, corollas white or ochroleucous, unequally and deeply 5-lobed; disk florets functionally male, corollas white or ochroleucous, 5-lobed, actinomorphic, corolla tube longer; anther basal appendages (relatively short) entire, apical appendages narrowly triangular; style undivided, style

branches papillate outside. Achenes clavate to obovoid, not beaked, obscurely ribbed, covered with stout red stipitate glands, glands densest in upper half, achenes of inner florets usually glabrous; carpodium annular; pappus absent. $2n = 42, 46, 92$.

About five species: E Asia, Central, North, and South America; one species in China.

1. *Adenocaulon himalaicum* Edgeworth, Trans. Linn. Soc. London 20: 64. 1846.

和尚菜 he shang cai

Adenocaulon adhaerescens Maximowicz; *A. bicolor* Hooker var. *adhaerescens* (Maximowicz) Makino.

Herbs, perennial, from creeping rhizomes. Stems erect, 30–100 cm tall, arachnoid, with stipitate glands on upper portion. Leaves radical and cauline; radical leaves withering before flowering; lower leaf blade broadly ovate or reniform, 7–13 × 11–22 cm, whitish arachnoid abaxially, subglabrous adaxially, base deeply cordate, margin irregularly toothed, apex subacute or obtuse; petioles 10–20 cm, winged; median and upper leaves gradually smaller, winged petiolate; uppermost leaves broadly

lanceolate, becoming bracteate. Capitula ca. 5 mm in diam.; peduncles 2–6 cm, stipitate glandular; involucre subglobose, ca. 2.5 × 5 mm; phyllaries 5–7, 1-seriate, ovate, 2.5–3 × 1.5–2.3 mm, reflexed after flowering; receptacle convex, glabrous. Marginal florets female, 6–12, corollas white, tubular, 1.1–1.5 mm, glabrous, 4- or 5-lobed at apex; disk florets male, 4–12(–22), corollas white, 1.7–2 mm, glabrous, 5-lobed at apex; anther connective rounded at apex, scarcely projecting. Achenes clavate-obovate, 6–7 mm, stipitate glandular. Fl. Jun–Aug, fr. Sep–Nov. $2n = 46$.

Forests, thickets, grassy slopes, streamsides; below 3400 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Japan, Korea, Nepal, Russia].

4. **LEIBNITZIA** Cassini in F. Cuvier, Dict. Sci. Nat. 25: 420. 1822.

大丁草属 da ding cao shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Herbs, perennial. Leaves rosulate, appearing before or with first capitula; leaf blade entire, pinnatifid, or lyrate. Scapes 1–11, bracteate, slender throughout. Capitula terminal on scape, radiate, heterogamous, appearing twice (spring and autumn) in one year, dimorphic, chasmogamous or cleistogamous; involucre obconic, cylindrical, or campanulate; phyllaries 3- or 4-seriate, imbricate; receptacles flat to slightly convex, foveolate to alveolate, glabrous, epaleate. Vernal florets chasmogamous, all fertile, marginal uniseriate, female, bilabiate, with obvious laminae, outer lip 3-toothed at apex, inner 2-lobed, lobes linear; central florets many, bisexual, bilabiate (tubular), laminae reduced. Autumnal florets cleistogamous, all fertile, marginal uniseriate, bilabiate (raylike), with obvious laminae, outer lip 3-toothed at apex, inner lobes strongly reduced; central florets many, bisexual, bilabiate, narrowly tubular, lobes very short, nearly actinomorphic; anther bases long tailed, apex appendages lanceolate; styles shallowly divided at apex, style branches short, abaxially pilose, apices rounded to truncate. Achenes fusiform, sometimes beaked, ribbed, strigose; pappus of fine bristles. $2n = 46$.

Six species: Bhutan, China, India, Japan, Korea, Nepal, Pakistan, Russia; Central and North America (Guatemala, Mexico, United States); four species in China.

1a. Pappus white to dark white or light brown, never violet-purple.

2a. Vernal capitula appearing simultaneously with leaves 1. *L. anandria*

2b. Vernal capitula appearing shortly before leaves 2. *L. pusilla*

1b. Pappus orange-colored to dark yellow or violet-purple, never white.

3a. Achenes rostrate 3. *L. ruficoma*

3b. Achenes beakless 4. *L. nepalensis*

1. *Leibnitzia anandria* (Linnaeus) Turczaninow in Schtscheglow, Ukaz. Otkryt. 8(1): 404. 1831.

大丁草 da ding cao

Tussilago anandria Linnaeus, Sp. Pl. 2: 865. 1753; *Anandria laevipes* Gandoger; *Gerbera anandria* (Linnaeus) Schultz Bipontinus; *G. anandria* var. *densifolia* Mattfeld; *G. anandria* var. *densiloba* Mattfeld; *G. anandria* var. *integripetala* (Hayata) Yamamoto; *G. bonatiana* (Beauverd) Beauverd f. *cavaleriei* (Vaniot & H. Léveillé) H. Léveillé; *G. cavaleriei* Vaniot & H. Léveillé; *G. integripetala* Hayata; *G. pterodonta* Y. C. Tseng; *Perdicium anandria* (Linnaeus) R. Brown; *P. tomentosum* Thunberg.

Herbs, perennial, dimorphic; rhizome covered by marces-

cent petiole. Vernal phase: leaves in basal rosette; petiole 2–4 cm, white lanuginous; leaf blade oblanceolate or obovate-oblong, 2–6 × 1–3 cm, papery, abaxially arachnoid lanate, adaxially subglabrous, base attenuate, obtuse, subtruncate, or shallowly cordate, margin denticulate, sinuate, runcinate, apex mucronate. Scapes 1 or tufted, 5–20 cm, arachnoid lanate; bracts many, subulate or linear, 6–7 mm. Capitula solitary, terminal, radiate, 1–1.5 cm in diam.; involucre obconic; phyllaries ca. 3-seriate, abaxially lanuginous, outer phyllaries linear, ca. 4 mm, inner phyllaries linear-lanceolate, ca. 8 mm. Marginal female florets bilabiate, outer lips oblong, adaxially white, abaxially pink, or both surfaces pink, 3–8 × 1–1.5 mm, inner lips filiform, 1.5–2 mm, coiled; central bisexual florets many, bilabiate, tubular, corolla 6–8 mm, outer lips oblong, ca. 3 mm, inner lips 2.5–3 mm. Achenes fusiform, 5–6 mm, hairy; pappus

dark white, 5–7 mm. Fl. Mar–Jul. Autumnal phase: leaves in basal rosette; petiole 2.5–8.5(–25) cm, arachnoid lignose; leaf blade ovate or ovate-lanceolate, 6–15 × 4–6.5 cm, papery, abaxially arachnoid lanate, adaxially subglabrous, base attenuate, subtruncate, or shallowly cordate, margin denticulate or sinuate, apex mucronate. Scapes 1 or tufted, 15–35 cm, arachnoid lanate; bracts many, subulate or linear, 1–1.5 cm. Capitula solitary, terminal, radiate, 1.5–2 cm in diam.; involucre campanulate; phyllaries ca. 3-seriate, abaxially lanuginous, outer phyllaries linear, 5–6 mm, inner phyllaries linear, 15–16 mm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiate, tubular, corolla ca. 8 mm; central bisexual florets many, bilabiate, tubular, corolla ca. 7 mm. Achenes fusiform, ca. 7 mm, hairy; pappus dark white, 11–12 mm. Fl. Aug–Nov. $2n = 46$.

Mountain slopes, summits, or valleys; 600–2600 m. Throughout China except Xinjiang and Xizang [Japan, Korea, Russia (Sakhalin, Siberia)].

This is a very variable species, especially in the leaf morphology.

2. *Leibnitzia pusilla* (Candolle) S. Gould in H. Hara et al., Enum. Fl. Pl. Nepal 3: 33. 1982.

灰岩大丁草 hui yan da ding cao

Oreoseris pusilla Candolle, Prodr. 7: 17. 1838; *Gerbera anandria* (Linnaeus) Schultz Bipontinus var. *bonatiana* Beauverd; *G. bonatiana* (Beauverd) Beauverd; *G. lanuginosa* (Candolle) Schultz Bipontinus var. *pusilla* (Candolle) J. D. Hooker; *G. lijiangensis* Y. C. Tseng, p.p. maj.; *G. pusilla* (Candolle) Schultz Bipontinus; *G. saxatilis* C. C. Chang ex Y. C. Tseng; *G. serotina* Beauverd; *Leibnitzia bonatiana* (Beauverd) Kitamura; *L. serotina* (Beauverd) Kitamura.

Herbs, perennial, dimorphic; rhizome covered by marcescent leaf sheath. Vernal phase: leaves in rosette, appearing after capitula, subsessile; leaf blade lanceolate, to 12 × 5 mm, papery, abaxially arachnoid lanate, adaxially glabrous, base attenuate or subtruncate, margin denticulate, repand, or runcinate, apex obtuse, rounded, or mucronate. Scapes 1 or tufted, 3–12 cm, arachnoid lanate; bracts many, narrowly lanceolate, 3–6 mm. Capitula solitary, terminal, radiate, 0.8–1.2 cm in diam.; involucre broadly campanulate; phyllaries ca. 3-seriate, oblong, abaxially lanuginous, outer phyllaries ca. 4 mm, inner phyllaries 8–11 mm. Marginal female florets bilabiate, outer lips oblong, ca. 5 mm, inner lips filiform, ca. 4 mm; central bisexual florets many, bilabiate, tubular, corolla 4.5–7 mm. Achenes terete, 3–6 mm, pubescent; pappus white or dark white, 4–6 mm. Fl. Apr–Jun. Autumnal phase: leaves in rosette, appearing after capitula; petiole 1.5–3.5 cm, lanuginous; leaf blade elliptic-oblong or ovate, 3–10 × 1.5–3.5 cm, base subcordate, subtruncate, or attenuate, margin sinuate or crenate, apex rounded or obtuse. Scapes 1 or tufted, 10–30 cm, lanuginous; bracts many, subulate, linear or filiform, 1–2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucre campanulate; phyllaries 3- or 4-seriate, outer phyllaries subulate to linear, 7–13 mm, inner phyllaries lanceolate to oblong or filiform, 1.4–2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiate, tubular, corolla 4–13 mm; central bisexual florets many, bilabiate, tubular, as long as female floret. Achenes fusiform, 6–7 mm;

pappus dark white, 9–11 mm. Fl. Jul–Oct.

Forests, on rocks; 2400–3600 m. Guizhou, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, Nepal].

3. *Leibnitzia ruficoma* (Franchet) Kitamura, J. Jap. Bot. 14: 297. 1938.

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Gerbera ruficoma Franchet, J. Bot. (Morot) 2: 68. 1888.

Herbs, perennial, dimorphic. Vernal phase: no specimens in good state were seen; most specimens are in autumnal phase. Autumnal phase: leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 4–6 cm, narrowly winged, ± lanuginous; leaf blade oblong or spatulate-oblong, 7–11 × 2–3.5 cm, papery, abaxially densely white lanuginous, adaxially glabrescent, base attenuate, decurrent, margin undulate-runcinate, apex rounded or obtuse. Scapes 1 or sometimes 2, 30–52 cm, arachnoid lanuginous; bracts subulate, 0.5–2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucre campanulate; phyllaries 2- or 3-seriate, outer phyllaries linear-subulate, 5–7 mm, inner phyllaries linear, ca. 2.2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiate, outer lips oblong, ca. 1.5 mm, inner lips filiform, reduced; central bisexual florets many, bilabiate, tubular, corolla ca. 5 mm. Achenes fusiform, attenuate into long beak at apex, ca. 9 mm (including beak), pilose, ribbed; pappus orange-colored to dark yellow, ca. 9 mm. Fl. Aug–Sep.

Pinus forests, mountain slopes; 2200–2500 m. Sichuan, Xizang, Yunnan [Bhutan, Nepal].

4. *Leibnitzia nepalensis* (Kunze) Kitamura, J. Jap. Bot. 14: 297. 1938.

尼泊尔大丁草 ni bo er da ding cao

Cleistanthium nepalense Kunze, Bot. Zeitung (Berlin) 9: 350. 1851; *Gerbera connata* Y. C. Tseng; *G. curvisquama* Handel-Mazzetti; *G. kunzeana* A. Braun & Ascherson; *G. lijiangensis* Y. C. Tseng, p.p. min.; *Leibnitzia kunzeana* (A. Braun & Ascherson) Pobedimova.

Herbs, perennial, dimorphic; rhizome covered by marcescent leaf sheath. Vernal phase: puny, leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 2–4 cm; leaf blade ovate, 0.8–2 × 1–1.5 cm, papery, abaxially densely white lanuginous, adaxially glabrous, base truncate or slightly decurrent, margin sparsely denticulate, apex rounded or mucronate. Scapes 1 or tufted, 4.5–7 cm, arachnoid; bracts 2 or 3, subulate, ca. 5 mm. Capitula solitary, terminal, ca. 1 cm in diam.; involucre campanulate; phyllaries ca. 3-seriate, outer phyllaries lanceolate, 4–5 mm, inner phyllaries ovate, 9–10 mm. Florets chasmogamous, marginal female florets 1-seriate, bilabiate, outer lips ovate-lanceolate to oblong, ca. 4.5 mm, inner lips filiform, reduced; central bisexual florets many, bilabiate, tubular. Achenes (immature) terete, ca. 6 mm, sparsely pubescent, ribbed; pappus dark purple, ca. 4 mm. Fl. Jun–Jul. Autumnal phase: larger than vernal phase, leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 5–7 cm, ± lanuginous; leaf blade spatulate to oblong or lyrate, 6–7 × 2–3 cm, papery, abaxially white lanuginous, adaxially glabrous,

base decurrent, margin crenate or undulate, apex rounded or mucronate. Scapes 1 or tufted, 6–35 cm, lanuginous; bracts linear-subulate, ca. 2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucre campanulate; phyllaries 3-seriate, outer phyllaries linear-subulate, ca. 6 mm, inner phyllaries oblong, 1.3–2.2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiate, outer lips oblong, ca. 1 mm, inner lips fili-

form, reduced; central bisexual florets many, bilabiate, tubular, corolla as long as female florets. Achenes fusiform, ca. 5 mm, pilose, apex tapering; pappus violet-purple, 6–7 mm. Fl. Jul–Sep.

Grassy open areas, scrub, forest margins; 3200–4600 m. Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Pakistan].

5. GERBERA Linnaeus, Opera Var. 247. 1758, nom. cons.

火石花属 huó shí huā shù

Gao Tiangang (高天刚); D. J. Nicholas Hind

Berniera Candolle; *Lasiopus* Cassini; *Oreoseris* Candolle.

Herbs, perennial, rhizomatous. Leaves rosulate; leaf blade oblanceolate, oblong, obovate, ovate, or subcircular, papery, herbaceous, or leathery, serrulate, dentate, repand, pinnatifid, or pinnatisect. Scapes 1, rarely many, slender, ebracteate or with few to many bracts. Capitula terminal, radiate, heterogamous, chasmogamous; involucre obconic to broadly campanulate; phyllaries multiseriate, imbricate; receptacles flat, alveolate, glabrous, epaleate. Florets all fertile, marginal uniseriate, female, bilabiate, outer female florets with obvious limbs, rarely tubular (*Gerbera maxima*), outer lip 3-denticulate at apex, inner deeply 2-lobed, lobes filiform, coiled; central florets numerous, bisexual, bilabiate, outer lips 3-toothed at apex, inner deeply 2-lobed; anther bases long tailed, apex appendaged; styles shallowly divided at apex, style branches short, abaxially pilose, apices obtuse, rounded, or subacute. Achenes terete or fusiform, ribbed, pilose or glabrous; pappus of scabrid bristles. $2n = 46, 50$.

About 30 species: Africa, Asia; seven species (four endemic) in China.

There are no species of *Gerbera* in South America. The position of *G. hieracioides* (Kunth) Zardini is disputed. Based on *Oreoseris hieracioides* Kunth, it probably belongs in *Leibnitzia* (known from both Asia and Central and North America) or *Chaptalia* Ventenat, having previously been transferred to *Trichocline* Cassini, as *T. hieracioides* (Kunth) Ferreyra.

Gerbera jamesonii Bolus is cultivated in China.

- 1a. Outer female florets without obvious limbs, tubular 1. *G. maxima*
 1b. Outer female florets with obvious limbs.
 2a. Capitula nodding; scapes ebracteate or 1- or 2-bracteate; achenes glabrous.
 3a. Outer phyllaries ca. 1 mm wide, innermost ca. 3 mm wide, apices acuminate; outer lips of female florets narrow, 3–4 mm wide; staminode apices erect 2. *G. nivea*
 3b. Outer phyllaries ca. 2.5 mm wide, innermost 6–7 mm wide, apices mucronate; outer lips of female florets wide, 6–8 mm wide; staminode apices hamate 3. *G. latiligulata*
 2b. Capitula erect; scapes multibracteate; achenes pilose.
 4a. Phyllary apices acute, acuminate, or mucronate.
 5a. Leaf blade and petiole glabrous 4. *G. raphanifolia*
 5b. Leaf blade abaxial surface densely lanuginous, petiole arachnoid lanate 5. *G. delavayi*
 4b. Phyllary apices rounded or obtuse.
 6a. Leaf blade ovate-oblong to oblong, 17–29 cm, 7–14 cm wide; involucre 4.5–5 cm in diam., phyllaries obviously unequal, apices green, mucronate or subobtuse, innermost oblong 6. *G. rupicola*
 6b. Leaf blade broadly ovate or suborbicular, equally wide and long, 5–10 cm; involucre ca. 2.5 cm in diam., phyllaries subequal, apices rufous, rounded 7. *G. tanantii*

1. *Gerbera maxima* (D. Don) Beauverd, Bull. Soc. Bot. Genève 2: 44. 1910.

箭叶火石花 jian ye huó shí huā

Chaptalia maxima D. Don, Prodr. Fl. Nepal. 166. 1825; *Berniera nepalensis* Candolle, nom. illeg. superfl.; *Gerbera macrophylla* Wallich ex C. B. Clarke, nom. illeg. superfl.; *G. nepalensis* Schultz Bipontinus, nom. illeg. superfl.

Herbs, perennial; rhizome lanuginous. Leaves in basal rosette; petiole 19–30 cm, lanuginous; leaf blade ovate-lanceolate, 11–20 × 5–9 cm, sometimes with few small lobes at base, papery, abaxially densely white lanuginous, adaxially glabrous,

base cordate-sagittate, margin irregularly denticulate, apex acuminate. Scapes 1 or 2, ca. 43 cm or longer, ebracteate, lanuginous. Capitula solitary, terminal, radiate, 2.5–3 cm in diam.; involucre broadly campanulate; phyllaries ca. 4-seriate, outer phyllaries linear-subulate, ca. 1 cm, inner phyllaries linear, ca. 2 cm. Marginal female florets bilabiate, tubular, corolla ca. 8 mm, inner lips oblong, ca. 4 mm; central bisexual florets many, bilabiate, tubular, corolla ca. 8 mm. Achenes (immature) ca. 8 mm, subglabrous, ribbed; pappus whitish tawny, ca. 1 cm. Fl. Aug–Sep.

Forest margins; ca. 2300 m. Xizang [Bhutan, India, Nepal, Pakistan, Thailand].

2. *Gerbera nivea* (Candolle) Schultz Bipontinus, *Flora* 27: 780. 1844.

白背火石花 bai bei huo shi hua

Oreoseris nivea Candolle, *Prodr.* 7: 18. 1838.

Herbs, perennial; rhizome glabrous. Leaves in basal rosette; petiole 1–4 cm, lanuginous; leaf blade obovate-spatulate, 3.5–9 × 1–2.7 cm, papery, abaxially gray lanuginous, adaxially glabrous, base attenuate, margin pinnatilobate to pinnatisect, apex obtuse to acuminate. Scapes 15–25 cm, arachnoid lanate; bracts absent or 1 or 2, subulate, ca. 1 cm. Capitula solitary, nodding, terminal, radiate, 2.5–3 cm in diam.; involucre campanulate; phyllaries 4-seriate, outer phyllaries subulate, ca. 1 cm × 1 mm, base lanuginous, innermost phyllaries oblong-lanceolate, ca. 2 cm × 3 mm. Marginal female florets bilabiate, outer lips light red, long elliptic, 14–15 × 3–4 mm, inner lips ca. 8 mm, coiled, staminode apices erect; central bisexual florets many, bilabiate, corolla ca. 1.1 cm. Achenes terete, ca. 3 mm, glabrous, multiribbed; pappus 8–10 mm. Fl. Aug–Sep.

Alpine meadows, forest margins; 3300–4100 m. W Sichuan, S Xizang, NW Yunnan [Bhutan, India, Nepal].

3. *Gerbera latiligulata* Y. C. Tseng, *Acta Bot. Austro Sin.* 3: 11. 1986.

阔舌火石花 kuo she huo shi hua

Herbs, perennial; rhizome glabrous. Leaves in basal rosette; petiole 3–7 cm, subglabrous; leaf blade obovate-lanceolate or obovate-oblong, 5–9 × 1.5–2 cm, papery, abaxially gray lanuginous, adaxially glabrous, base attenuate, margin pinnatilobate, apex obtuse to acuminate. Scapes 10–25 cm, arachnoid lanate; bracts 1 or 2, linear, ca. 1 cm. Capitula solitary, nodding, terminal, radiate, ca. 4 cm in diam.; involucre broadly campanulate; phyllaries 4-seriate, arachnoid lanate at least at apices, outer phyllaries lanceolate, 0.8–1 cm × ca. 2.5 mm, innermost phyllaries oblong-lanceolate, 2–2.5 cm × 6–7 mm. Marginal female florets bilabiate, outer lips light yellow, elliptic, 18–20 × 6–8 mm, inner lips ca. 1.2 cm, coiled, staminode apices hamate; central bisexual florets many, bilabiate, corolla ca. 1.3 cm. Achenes fusiform, ca. 5 mm, glabrous, multiribbed; pappus yellow-white, 8–10 mm. Fl. Sep.

• Rock fissures. Yunnan (Qiaojia).

4. *Gerbera raphanifolia* Franchet, *J. Bot. (Morot)* 2: 67. 1888.

光叶火石花 guang ye huo shi hua

Herbs, perennial; rhizome fulvous lanuginous. Leaves in basal rosette; petiole 10–15 cm, glabrous; leaf blade oblong or oblong-lanceolate, 15–27 × 6–11 cm, papery, both surfaces glabrous, base attenuate, margin runcinate, apex mucronate. Scapes 30–62 cm, arachnoid lanate; bracts many, subulate, 1–1.5 cm. Capitula solitary, erect, terminal, radiate, 2.5–4 cm in diam.; involucre campanulate; phyllaries 4- or 5-seriate, outer phyllaries linear, ca. 8 mm, sparsely tomentose, inner phyllaries oblong, 1.6–1.9 cm, glabrous. Marginal female florets bilabiate, outer lips light red, strap-shaped, ca. 13 × 2.5 mm, inner lips 6–8 mm; central bisexual florets many, white, bilabiate. Achenes terete, ca. 5 mm, pilose; pappus brownish, ca. 1.2 cm. Fl. Oct–Nov.

• Forests; ca. 2700 m. NW Yunnan.

5. *Gerbera delavayi* Franchet, *J. Bot. (Morot)* 2: 68. 1888.

火石花 huo shi hua

Herbs, perennial; rhizome white lanuginous. Leaves in basal rosette; petiole 1.5–7 cm, arachnoid lanate; leaf blade lanceolate, oblong-lanceolate, or ovate-oblong to ovate, 6–16 × 3–10 cm, leathery, abaxially white lanuginous, adaxially glabrescent, base truncate or subcordate, margin repand, apex obtuse or mucronate. Scapes many, sometimes solitary, 10–45 cm, arachnoid lanate; bracts many, linear-subulate or subulate, 0.5–1.5 cm. Capitula solitary, erect, terminal, radiate, 2–3.5 cm in diam.; involucre turbinate-campanulate; phyllaries 4- or 5-seriate, outer phyllaries subulate, 6–15 mm, inner phyllaries lanceolate, 1.5–4.5 cm. Marginal female florets bilabiate, outer lips light red, oblong to narrowly elliptic, 13–15 × 3–3.5 mm, inner lips 8–9 mm; central bisexual florets many, bilabiate, corolla 1–1.5 cm. Achenes terete, 3–3.5 mm, pilose, ribbed; pappus yellow-white, 1–1.3 cm. Fl. Oct–Apr.

Open places, mountain slopes, forest margins, forests; 1800–3200 m. Guizhou, Sichuan, Yunnan [N Vietnam].

1a. Leaf blade lanceolate or oblong-lanceolate

..... 5a. var. *delavayi*

1b. Leaf blade ovate to ovate-oblong 5b. var. *henryi*

5a. *Gerbera delavayi* var. *delavayi*

火石花(原变种) huo shi hua (yuan bian zhong)

Gerbera uncinata Beauverd.

Leaf blade lanceolate or oblong-lanceolate. Fl. Nov–Feb.

Open places, mountain slopes, forest margins; 1800–3200 m. Sichuan, Yunnan [N Vietnam].

5b. *Gerbera delavayi* var. *henryi* (Dunn) C. Y. Wu & H. Peng, *Acta Bot. Yunnan.* 24: 143. 2002.

蒙自火石花 meng zi huo shi hua

Gerbera henryi Dunn, *J. Linn. Soc., Bot.* 35: 511. 1903.

Leaf blade ovate to ovate-oblong.

• Mountain slopes, forest margins, forests; 1800–3200 m. Guizhou, Yunnan.

6. *Gerbera rupicola* T. G. Gao & D. J. N. Hind, **nom. nov.**

巨头火石花 ju tou huo shi hua

Replaced synonym: *Gerbera macrocephala* Y. C. Tseng, *Acta Bot. Austro Sin.* 3: 12. 1986, not *Gerbera macrocephala* Lessing, *Linnaea* 5: 295. 1830.

Herbs, perennial. Leaves in basal rosette; petiole 5–10 cm, white lanuginous; leaf blade ovate-oblong or oblong, 17–29 × 7–14 cm, papery, abaxially densely lanuginous, adaxially lanuginous, base cordate, margin repand, apex mucronate. Scapes solitary, 17–40 cm, densely white lanuginous; bracts many, subulate, ca. 1.3 cm, abaxially lanuginous. Capitula solitary, erect, terminal, radiate, 5.5–7 cm in diam.; involucre broadly campanulate, 4.5–5 cm in diam.; phyllaries 4- or 5-

seriate, densely white lanuginous, apices green, mucronate or subobtusate, outer phyllaries lanceolate, 4–6 mm, inner phyllaries oblong, 1.5–2 cm. Marginal female florets bilabiate, white, outer lips rounded to narrowly elliptic, 22–24 × 5–6 mm, inner lips 13–15 mm; central bisexual florets many, bilabiate, corolla ca. 2.1 cm. Achenes (immature) terete, ca. 6 mm, densely villos; pappus light yellow, ca. 1.6 cm. Fl. Mar–Apr.

- Steep cliffs in gorges. NW Yunnan (Lijiang, Zhongdian).

7. *Gerbera tanantii* Franchet, J. Bot. (Morot) 7: 155. 1893.

钝苞火石花 *dun bao huo shi hua*

Herbs, perennial. Leaves in basal rosette; petiole longer than blade; leaf blade suborbicular, 5–10 × 5–10 cm, thickly papery, abaxially densely lanuginous, base broadly cordate, margin sinuate, apex obtuse or mucronate. Scapes 30–40 cm; bracts lanceolate. Capitula solitary, terminal, radiate; involucre ca. 2.5 cm in diam.; phyllaries 4-seriate, subequal, abaxially lanuginous, apices rounded and rufous. Marginal female florets bilabiate, corolla ca. 3 cm; central bisexual florets bilabiate. Achenes (immature) hairy; pappus white. Fl. unknown.

- Yunnan.

6. PILOSELLOIDES (Lessing) C. Jeffrey ex Cufodontis, Bull. Jard. Bot. Natl. Belg. 37(3, Suppl.): 1180. 1967.

兔耳一枝箭属 *tu er yi zhi jian shu*

Gao Tiangang (高天刚); D. J. Nicholas Hind

Gerbera sect. *Piloselloides* Lessing, Linnaea 5: 296. 1830.

Herbs, perennial. Leaves rosulate; leaf blade obovate to oblong, entire. Synflorescence scapose, 1 to many per plant, ebracteate, expanded below capitula. Capitula terminal, radiate, heterogamous, chasmogamous; phyllaries 2-seriate; receptacles flat, alveolate, glabrous, epaleate. Florets all fertile, marginal 2-seriate, female, bilabiate, outer series with obvious limb, outer lip 3-denticulate at apex, inner shallowly 2-lobed, lobes filiform, coiled, inner female florets tubular, without obvious limb, outer lip 3-toothed at apex, inner deeply 2-lobed; central florets numerous, bisexual, bilabiate (tubular), outer lips 3-toothed at apex, inner deeply 2-lobed; anther bases long tailed, apex appendages truncate; styles shallowly divided at apex, style branches short, papillose. Achenes fusiform, long beaked, ribbed, finely bristly; pappus of fine bristles.

Two species: Africa, Asia, Australia; one species in China.

1. *Piloselloides hirsuta* (Forsskål) C. Jeffrey ex Cufodontis, Bull. Jard. Bot. Natl. Belg. 37(3, Suppl.): 1180. 1967.

兔耳一枝箭 *tu er yi zhi jian*

Arnica hirsuta Forsskål, Fl. Aegypt.-Arab. 151. 1775; *A. piloselloides* Linnaeus; *Gerbera amabilis* Hance; *G. hirsuta* (Forsskål) Lessing; *G. ovalifolia* Candolle; *G. piloselloides* (Linnaeus) Cassini.

Herbs, perennial; rhizome covered by marcescent petiole. Leaves in basal rosette; petiole 1–7.5 cm, lanuginous; leaf blade obovate, obovate-oblong, or oblong, rarely ovate, 6–16 × 2.5–5.5 cm, papery, abaxially densely white arachnoid lanuginous, adaxially glabrate, base attenuate or obtuse, margin entire, ciliate, apex rounded. Scapes solitary or tufted, 15–30(–45) cm, densely tomentose, ebracteate. Capitula solitary, terminal, radi-

ate, 2.5–4 cm in diam.; involucre disciform; phyllaries 2-seriate, linear or linear-lanceolate, outer phyllaries 8–11 mm, inner phyllaries 1.4–4.8 cm. Marginal florets 2-seriate, female, bilabiate, outer female florets with obvious limbs, corolla 1.6–1.8 cm, outer lip oblanceolate or spatulate-oblong, 3-denticulate at apex, inner shallowly 2-lobed, lobes filiform, coiled, inner female florets tubular, without obvious limbs, corolla 1–1.2 cm; central florets many, bisexual, bilabiate (tubular), corolla ca. 1.2 cm. Achenes fusiform, 4.5–6.5 mm, finely bristly, ribbed, long beaked, beak 7–8 mm, glabrous; pappus mandarin-red or brownish, ca. 1.1 cm. Fl. Feb–May and Aug–Dec.

Grassy open areas, forest margins, disturbed sites; 900–2400 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Laos, Myanmar, Nepal, Thailand, Vietnam; Africa, Australia].

7. AINSLIAEA Candolle, Prodr. 7: 13. 1838.

兔儿风属 *tu er feng shu*

Gao Tiangang (高天刚); Susana Edith Freire, D. J. Nicholas Hind

Diaspananthus Miquel.

Herbs, perennial, rarely subshrubs. Leaves alternate, often in basal rosettes or densely aggregated near median part of stems; blade linear, ovate, elliptic, or orbicular, margin entire, crenate, denticulate, dentate, or lobed. Capitula many in spikes, racemes, or panicles, sometimes nodding, radiate or discoid, homogamous; involucre cylindrical; phyllaries often multiseriate, imbricate; receptacle small, glabrous, epaleate. Florets few, (1–)3(–5), bisexual, all fertile, chasmogamous or cleistogamous or cleistogamous corollas open, deeply irregularly 5-lobed, one of slits much longer than others, lobes linear, reflexed and usually coiled; cleistogamous corolla (if present) closed, tubular, shorter than pappus; anther bases long tailed, apex appendages truncate to rounded, sometimes apiculate; styles shallowly divided at apex, style branches short, abaxially with papillae, apices obtuse to acute, rounded, or truncate. Achenes

terete or fusiform, ribbed, glabrous or pilose; pappus of plumose bristles or sometimes absent in chasmogamous florets, usually uniseriate, more rarely biseriate. $2n = 24, 26$.

About 50 species: Afghanistan, Bangladesh, Bhutan, China, India, Indonesia, Japan, Korea, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam; 40 species (28 endemic) in China; one additional species is incompletely known.

See the revision of *Ainsliaea* by Freire (Ann. Missouri Bot. Gard. 94: 79–191. 2007).

- 1a. Subshrubs; stems much branched 1. *A. pertyoides*
 1b. Perennial herbs; stems not branched.
 2a. Leaves aggregated near or toward median part of stem or above basal part of stem.
 3a. Capitula 1-flowered 2. *A. lancangensis*
 3b. Capitula 2–4-flowered.
 4a. Leaves lobed.
 5a. Leaf blade shallowly pinnately lobed 3. *A. grossedentata*
 5b. Leaf blade palmately lobed.
 6a. Leaf blade 5–14 × 5.5–18 cm, shallowly 5–7-lobed 4. *A. acerifolia*
 6b. Leaf blade (1–)2.5–3.5 × (1–)2–3 cm, deeply lobed with apical lobe elongated 5. *A. apiculata*
 4b. Leaves not lobed.
 7a. Leaf blade linear to elliptic or lanceolate (0.3–1.3 cm wide).
 8a. Leaf blade linear to elliptic, 3–7 mm wide, apex acute, 1-veined 6. *A. walkeri*
 8b. Leaf blade lanceolate, 5–13 mm wide, apex acuminate, 3-veined 7. *A. trinervis*
 7b. Leaf blade lanceolate or ovate (1–12 cm wide).
 9a. Petiole winged 8. *A. foliosa*
 9b. Petiole wingless.
 10a. Leaf blade lanceolate, attenuate at base 7. *A. trinervis*
 10b. Leaf blade ovate, rounded or cordate at base.
 11a. Petiole densely strigose or villous.
 12a. Capitula usually in spikes; florets 3 9. *A. fragrans*
 12b. Capitula in panicles; florets 3 or 4 10. *A. asaroides*
 11b. Petiole glabrous.
 13a. Leaf blade 2–3.5(–7) cm, usually caerulescent, caerulescent-purple, or purplish green abaxially 11. *A. gracilis*
 13b. Leaf blade usually more than 4 cm, green abaxially.
 14a. Achenes glabrous or pilose above; leaf margin entire to shallowly denticulate 12. *A. kawakamii*
 14b. Achenes pilose; leaf margin usually dentate.
 15a. Leaves aggregated near median part of stem 13. *A. macroclinidioides*
 15b. Leaves above basal part of stem.
 16a. Petiole broadly winged, leaf blade margin obscurely denticulate 14. *A. smithii*
 16b. Petiole wingless, leaf blade margin dentate 15. *A. aptera*
 2b. Leaves in basal rosette (rarely specimens with leaves above stem base in *A. apteroides*).
 17a. Leaf blade uniformly narrowed at base 16. *A. mairei*
 17b. Leaf blade abruptly narrowed into petiole.
 18a. Leaves shortly petiolate (petioles 4–10 mm).
 19a. Leaf blade lanceolate; achenes glabrous 17. *A. caesia*
 19b. Leaf blade obovate to pandurate; achenes pilose 18. *A. spicata*
 18b. Leaves long petiolate (petioles more than 10 mm).
 20a. Petiole wholly winged (more than 1.5 mm wide at upper point) or winged in upper half.
 21a. Leaf base cordate 19. *A. bonatii*
 21b. Leaf base rounded or attenuate.
 22a. Involucre 12–18 mm.
 23a. Anther appendages truncate; phyllaries and leaves pilose 20. *A. macrocephala*
 23b. Anther appendages apiculate; phyllaries and leaves glabrous 21. *A. qianiana*
 22b. Involucre less than 10 mm (occasionally equal to 10 mm).
 24a. Leaf margin straight, leaf base rounded, petiole wholly winged 22. *A. latifolia*
 24b. Leaf margin wavy, leaf base cuneate and commonly decurrent into petiole, petiole winged in upper half.
 25a. Achenes glabrous or apically pilose 23. *A. henryi*
 25b. Achenes pilose 24. *A. reflexa*

- 20b. Petiole wingless (leaf blade cuneate in *A. glabra*, *A. nervosa*, and *A. yunnanensis*).
- 26a. Leaf margin dentate, blade obtuse to rounded at apex, discolorous, adaxial surface lanuginous and abaxial surface white tomentose 25. *A. crassifolia*
- 26b. Leaf margin entire to denticulate.
- 27a. Leaf base cordate.
- 28a. Capitula 2-flowered 26. *A. elegans*
- 28b. Capitula 3(or 4)-flowered.
- 29a. Petiole lanuginous or glabrous.
- 30a. Leaf blade 50–80 mm, apex acute to acuminate 27. *A. apteroides*
- 30b. Leaf blade less than 20 mm, apex acute or obtuse.
- 31a. Leaf blade ovate, 7–16 × 5–10 mm; achenes glabrous 28. *A. nana*
- 31b. Leaf blade deltate, 10–15 × 10–15 mm; achenes pilose 29. *A. paucicapitata*
- 29b. Petiole densely strigose.
- 32a. Anther appendages emarginate; achenes pilose above 9. *A. fragrans*
- 32b. Anther appendages apiculate; achenes pilose.
- 33a. Phyllaries apically pilose 30. *A. cavaleriei*
- 33b. Phyllaries glabrous.
- 34a. Leaf blade ± concolorous 31. *A. ramosa*
- 34b. Leaf blade abaxially whitish green, veins red 32. *A. rubrinervis*
- 27b. Leaf base rounded or cuneate.
- 35a. Petiole densely strigose.
- 36a. Leaf blade elliptic 33. *A. angustata*
- 36b. Leaf blade oblong to elliptic.
- 37a. Leaf blade 8–12 cm 34. *A. pingbianensis*
- 37b. Leaf blade 3–7.5 cm 35. *A. fulvipes*
- 35b. Petiole lanuginous or glabrous.
- 38a. Leaf blade elliptic, slightly fleshy, glabrous to subglabrous.
- 39a. Leaf blade broadly elliptic, (2–)3.5–10 mm wide, apex acute-acuminate 36. *A. glabra*
- 39b. Leaf blade linear-elliptic, 1–2.5 mm wide, apex acute 37. *A. nervosa*
- 38b. Leaf blade ovate.
- 40a. Achenes apically pilose 38. *A. parvifolia*
- 40b. Achenes pilose.
- 41a. Leaf surface hairs T-shaped 39. *A. yunnanensis*
- 41b. Leaf surface hairs straight 40. *A. chapaensis*

1. *Ainsliaea pertyoides* Franchet, J. Bot. (Morot) 2: 70. 1888.

腋花兔儿风 ye hua tu er feng

Subshrubs, 0.5–1.2 m tall, much branched. Leaves alternate; petiole 2–5 mm, wingless, strigose; leaf blade ovate or ovate-lanceolate, cauline leaf blade 2.5–5.5 × 1–3 cm, subleathery, palmate-pinnate veined, abaxially villous or tomentose, adaxially glabrous, base cordate, margin entire to callose-denticulate, ciliate, apex acuminate. Capitula subsessile or shortly pedunculate, arranged in leafy panicles, 3-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 6-seriate, subleathery, abaxially glabrous or apically pubescent, outer phyllaries ovate, 2–3 mm, inner narrowly oblong to oblong, ca. 1.2 cm. Florets bisexual, chasmogamous, corollas white, tubular, ca. 1.6 cm, deeply 5-lobed, lobes unequal, anther appendages rounded. Achenes subfusiform, ca. 6 mm, ribbed, densely sericeous; pappus white, ca. 8 mm. Fl. Nov–Jan, Feb–Jun, Sep–Oct.

• Stream banks, rock fissures, moist areas in forests; 1500–2500 m. Guizhou, Sichuan, Yunnan.

- 1a. Leaf blade densely villous abaxially 1a. var. *pertyoides*
 1b. Leaf blade densely white tomentose abaxially 1b. var. *albotomentosa*

1a. *Ainsliaea pertyoides* var. *pertyoides*

腋花兔儿风(原变种) ye hua tu er feng (yuan bian zhong)

Ainsliaea pertyoides f. *sparsiflora* (Vaniot) Beauverd; *A. pertyoides* var. *sparsiflora* (Vaniot) H. Léveillé; *A. sparsiflora* Vaniot.

Leaf blade densely villous abaxially. Fl. Feb–Jun, Sep–Oct.

• Stream banks or moist areas in forests; 1500–2500 m. Guizhou, Sichuan, Yunnan.

1b. *Ainsliaea pertyoides* var. *albotomentosa* Beauverd, Bull. Soc. Bot. Genève 1: 384. 1909 [“*albo-tomentosa*”].

白背兔儿风 bai bei tu er feng

Ainsliaea ovalifolia Vaniot; *A. pertyoides* var. *intermedia* Beauverd; *A. pertyoides* f. *ovalifolia* (Vaniot) Beauverd; *A. pteropoda* Candolle f. *ovalifolia* (Vaniot) H. Léveillé.

Leaf blade densely white tomentose abaxially. Fl. Nov–Jan, Mar–Jun.

• Stream banks, rock fissures, moist areas in dense forests; 1700–2500 m. Guizhou, Sichuan, Yunnan.

2. *Ainsliaea lancangensis* Y. Y. Qian, J. Trop. Subtrop. Bot. 8(2): 161. 2000.

澜沧兔儿风 lan cang tu er feng

Herbs, perennial, 40–70 cm tall. Leaves aggregated near median part of stem; petiole (1.5–)4–9 cm, wingless; leaf blade subrounded, palmatifid, (2–)4–11 × (1.5–)5–12 cm, papery, palmately veined, both surfaces green, subglabrous or abaxially very sparsely villous, base cordate, margin lobed, apex acute. Capitula subsessile, arranged in panicles, 1-flowered; involucre cylindrical, ca. 2 mm in diam.; phyllaries 8- or 9-seriate, papery, abaxially apically puberulent, outer phyllaries ovate, 1–1.3 mm, inner oblong, 1–1.3 cm. Florets bisexual, chasmogamous, corolla tubular, 1.3–1.7 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages apiculate. Achenes subfusiform, 6–7 mm, densely pilose; pappus brownish, 6.5–8.5 mm. Fl. Nov–Jan.

• Forests; ca. 2000 m. Yunnan.

3. *Ainsliaea grossedentata* Franchet, J. Bot. (Morot) 8: 297. 1894.

粗齿兔儿风 cu chi tu er feng

Ainsliaea gracilis Franchet var. *robusta* Diels.

Herbs, perennial, 25–60 cm tall. Leaves aggregated near median part of stem; petiole 3–7 cm, wingless; leaf blade broadly ovate, ovate, or ovate-lanceolate, 3–4.5(–7) × 2–5 cm, papery, palmate-pinnate veined, abaxially sparsely villous, adaxially sparsely strigose, base truncate, obtuse, or shortly attenuate, margin large dentate or sinuate, apex acute, rarely acuminate. Capitula shortly pedunculate, arranged in racemes, 3-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially sparsely pubescent or glabrate, outer phyllaries broadly ovate, 1.5–2.5 mm, inner narrowly elliptic, ca. 1 cm. Florets bisexual, chasmogamous, corollas white, tubular, 1.6–1.7 cm, deeply 5-lobed, lobes linear-oblong, unequal, anther appendages truncate. Achenes subfusiform, ca. 4 mm, glabrous; pappus light brownish, ca. 7 mm. Fl. Sep–Oct.

• Forests; 1200–2100 m. Chongqing, N Guangxi, Guizhou, Hubei, W Hunan, W Jiangxi, Sichuan.

Ainsliaea gracilis var. *robusta* is treated here as a synonym of *A. grossedentata* on account of its leaf margins being shallowly pinnately lobed to dentate (vs. obscurely denticulate in *A. gracilis*).

4. *Ainsliaea acerifolia* Schultz Bipontinus var. *subapoda* Nakai, Bot. Mag. (Tokyo) 30: 290. 1916.

槭叶兔儿风 qi ye tu er feng

Ainsliaea acerifolia var. *affinis* (Miquel) Kitamura; *A. affinis* Miquel.

Herbs, perennial, 40–80 cm tall. Leaves aggregated near median part of stem; petiole 4–12 cm, wingless; leaf blade subrounded, palmatifid, 5–14 × 5.5–18 cm, papery, palmately veined, both surfaces green, abaxially sparsely villous, especially on midvein, adaxially subglabrous, base cordate, margin cleft or lobed, apex acute. Capitula subsessile, arranged in spikes, 3-flowered; involucre cylindrical, ca. 1 cm in diam.; phyllaries 8-seriate, subleathery, abaxially glabrous or apically

pubescent, outer phyllaries broadly ovate or ovate, 1.5–3 mm, inner narrowly elliptic to narrowly oblong, 1.3–1.4 cm. Florets bisexual, chasmogamous, corollas tubular, ca. 1.6 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages apiculate. Achenes terete, ca. 8 mm, glabrous; pappus red-brownish, ca. 10 mm. Fl. Jul–Oct.

Forests; 300–500 m. Jilin, Liaoning [Japan, Korea].

This variety is quite different from *Ainsliaea acerifolia* var. *acerifolia*, found in Japan, in its leaf blades shallowly 5–7-lobed (vs. leaf blades deeply 7–9(–11)-lobed).

5. *Ainsliaea apiculata* Schultz Bipontinus var. *acerifolia* Masamune, Mem. Fac. Sci. Taihoku Imp. Univ. 11: 455. 1934.

五裂兔儿风 wu lie tu er feng

Ainsliaea liukuensis Beauverd; *A. macroclinioides* Hayata var. *secundiflora* (Hayata) Kitamura; *A. secundiflora* Hayata.

Plants perennial, 8–30 cm tall. Leaves basally clustered; petiole 1.5–6 cm, wingless, strigose; leaf blade deeply palmately lobed, with apical lobe elongate (1–)2.5–3.5 × (1–)2–3 cm, papery, blackish green, pale opaque abaxially, slightly glossy adaxially, sparsely strigose on both surfaces; cauline leaves few, much reduced, alternate, shortly petiolate to sessile, ovate to ovate-lanceolate. Capitula subsessile, arranged in spikes, 3-flowered; involucre narrowly obdeltate, ca. 3 mm in diam.; phyllaries 5- or 6-seriate, papery, glabrous, outer phyllaries ovate, ca. 2 mm, inner linear, ca. 10 mm. Florets bisexual, cleistogamous, corolla closed, tubular, minutely 5-lobed, 5–6 mm, hidden in pappus. Achenes narrowly oblong, ca. 5 mm, shortly pilose. Pappus ca. 9 mm. Fl. Feb–Mar, Aug–Oct.

Low hills, mountain slopes. Taiwan [Japan].

This variety is quite different from *Ainsliaea apiculata* var. *apiculata* and *A. apiculata* var. *ovatifolia* Masamune, both found in Japan, in its leaf blades deeply lobed with elongated apical lobe (vs. leaf blades 5-angled or shallowly 5-lobed in *A. apiculata* var. *apiculata* and ovate in *A. apiculata* var. *ovatifolia*).

Ainsliaea secundiflora was treated under *A. macroclinioides* in FRPS (79: 60. 1996, as *A. macroclinioides* var. *secundiflora*). However, analysis of the type specimen of *A. secundiflora* (Nakahara 922) confirms that it possesses leaves similar to those of *A. apiculata*, i.e., leaf blades palmately lobed (vs. not lobed in *A. macroclinioides*).

6. *Ainsliaea walkeri* J. D. Hooker, Bot. Mag. 102: t. 6225. 1876.

华南兔儿风 hua nan tu er feng

Herbs, perennial, 20–40 cm tall. Leaves loosely aggregated near median part of stem; petiole 0.5–1.3 cm, narrowly winged; leaf blade oblong or linear, 3–7 × 0.3–0.7 cm, papery, apparently 1-veined, both surfaces glabrous, base long attenuate, margin sparsely denticulate, apex acuminate and mucronate. Capitula shortly pedunculate, arranged in panicles, (2 or)3-flowered; involucre cylindrical, 2.5–3 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2 mm, inner lanceolate, ca. 1 cm. Florets bisexual, chasmogamous, corollas white, tubular, 4–7.5 mm, deeply 5-lobed, lobes linear, unequal, anther appendages rounded to trun-

cate. Achenes terete, ca. 3 mm, densely pilose; pappus dark white, ca. 6 mm. Fl. Oct–Dec.

• Stream banks, moist areas in dense forests; below 700 m. SW Fujian, S Guangdong, S Guangxi.

7. *Ainsliaea trinervis* Y. C. Tseng, Acta Phytotax. Sin. 31: 367. 1993.

三脉兔儿风 san mai tu er feng

Ainsliaea macroclinioides Hayata var. *oblonga* (Koidzumi) Hatusima; *A. oblonga* Koidzumi.

Herbs, perennial, 30–60 cm tall. Leaves loosely aggregated near median part of stem; petiole 1–1.5 cm, wingless; leaf blade narrowly elliptic, narrowly lanceolate, or lanceolate, 5–9.5 × 0.5–2.5 cm, papery, apparently 3-veined, both surfaces glabrous, base attenuate, slightly decurrent, margin denticulate or obscurely denticulate, apex long acuminate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, 2–3 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2 mm, inner narrowly elliptic, 1–1.2 cm. Florets bisexual, chasmogamous, corollas pink to white, tubular, ca. 9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded to truncate. Achenes terete, ca. 3 mm, densely pilose; pappus dark yellow or light yellow, ca. 8 mm. Fl. Jul–Sep.

Stream banks, moist areas in dense forests; 600–900 m. N Fujian, Guangdong, Guangxi, SW Guizhou, S Jiangxi [Japan].

According to Freire (Ann. Missouri Bot. Gard. 94: 179. 2007), *Ainsliaea oblonga* is very close to *A. trinervis* but differs in having leaf blades lanceolate, 1–2.5 cm wide, with margin obscurely denticulate (vs. narrowly lanceolate, 0.5–1.3 cm wide, with margin denticulate in *A. trinervis*). Further studies will be necessary to determinate whether or not they are conspecific.

8. *Ainsliaea foliosa* Handel-Mazzetti, Acta Horti Gothob. 12: 348. 1938.

异叶兔儿风 yi ye tu er feng

Herbs, perennial, 60–80 cm tall. Leaves loosely aggregated near median part of stem, sometimes alternate in median part of stem; petiole 2.5–5 cm, broadly winged; leaf blade ovate, ovate-lanceolate, or elliptic, 5–10 × 2–5 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base broadly cuneate or abruptly constricted into winged petiole, margin callose-denticulate, rarely repand, apex acute. Capitula subsessile or shortly pedunculate, arranged in racemes or spikes, 4- or 5-flowered; involucre cylindrical, 6–7 mm in diam.; phyllaries 4-seriate, subleathery, abaxially sparsely pubescent, sometimes glabrate when old, outer phyllaries broadly ovate, 2.5–3 mm, inner narrowly elliptic, 0.8–1.1 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous florets pink, corollas deeply 5-lobed, lobes unequal, anther appendages obtuse. Achenes ca. 2 mm, densely pilose; pappus absent. Cleistogamous florets purplish above, corolla closed, tubular, minutely 5-lobed, ca. 5 mm, anthers much reduced, ca. 0.5 mm. Achenes fusiform, 4–5 mm; pappus brownish, 5–6 mm. Fl. Jul–Sep.

• *Abies* forests, scrub, stream banks; 2700–4300 m. W Sichuan, NE Yunnan.

9. *Ainsliaea fragrans* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 236. 1852.

杏香兔儿风 xing xiang tu er feng

Ainsliaea asarifolia Hayata; *A. cordifolia* Franchet & Savatier var. *integrifolia* Maximowicz; *A. fragrans* var. *integrifolia* (Maximowicz) Kitamura; *A. integrifolia* (Maximowicz) Makino; *A. ningpoensis* Matsuda; *A. rubrifolia* Franchet.

Herbs, perennial, 25–60 cm tall. Leaves in basal rosette or above stem base; petiole 1.5–10(–14) cm, wingless, strigose; leaf blade ovate to ovate-lanceolate, 2–11 × 1.5–5 cm, subleathery, palmate-pinnate veined, abaxially commonly purple, red villous, especially along veins, adaxially glabrous or sparsely pilose, base cordate, margin entire or sparsely callose-denticulate, ciliate, apex obtuse or mucronate extended from midvein. Capitula subsessile or shortly pedunculate, arranged in spikes (rarely panicles), 3-flowered; involucre cylindrical, 3–3.5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1.8–2 mm, inner narrowly elliptic, ca. 1.1 cm. Florets bisexual, chasmogamous and cleistogamous in same plant (or at different seasons). Chasmogamous florets white, corollas tubular, ca. 1 cm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete or subfusiform, ca. 4 mm, ribbed, densely villous throughout or on upper part; pappus light brownish, ca. 7 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 8 mm, hidden in pappus. Achenes ca. 5 mm; pappus ca. 12 mm. Fl. Sep–Dec.

Scrub, roadsides, grassy areas by stream banks; near sea level to 1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan].

Ainsliaea asarifolia, *A. integrifolia*, *A. ningpoensis*, and *A. rubrifolia* are treated here as synonyms of *A. fragrans* because there is no diagnostic character to separate them as distinct taxa. All of these have petiole leaves that are ovate to oblong, cordate at the base, with margins remotely callose-denticulate and lanuginous abaxially, especially on the veins. In addition, the differential character mentioned in the protologue of *A. rubrifolia*, i.e., leaves reddish green on the abaxial surface, is a variable feature throughout the range of *A. fragrans*.

10. *Ainsliaea asaroides* Y. S. Ye, J. Wang & H. G. Ye, Nordic J. Bot. 28: 196. 2010.

细辛叶兔儿风 xi xin ye tu er feng

Herbs, perennial, 20–80 cm tall. Leaves above stem base; petiole 2–13 cm, wingless, villous; leaf blade ovate to narrowly ovate, 3–11 × 2–7 cm, subleathery, palmate-pinnate veined, abaxially pale, villous along veins, adaxially glabrous, base cordate to subcordate, margin callose-denticulate, ciliate, apex acute to obtuse or mucronate extended from midvein. Capitula subsessile or shortly pedunculate, arranged in panicles, 3- or 4-flowered; involucre cylindrical, ca. 2 mm in diam.; phyllaries ca. 6- or 7-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2.5 mm, inner narrowly elliptic, 7–10 mm. Florets bisexual, chasmogamous, white, corollas tubular, ca. 6 mm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete or subfusiform, ca. 4 mm, ribbed, villous; pappus brownish, ca. 5 mm. Fl. Jul–Oct, fr. Sep–Nov. $2n = 26^*$.

• Riversides in forests; 600–700 m. Guangdong (Yangchun).

Ainsliaea asaroides is very close if not identical to *A. fragrans*. It may no longer be possible to maintain them as separate species when additional gatherings become available.

11. *Ainsliaea gracilis* Franchet, J. Bot. (Morot) 8: 297. 1894.

纤枝兔儿风 xian zhi tu er feng

Herbs, perennial, 20–60(–100) cm tall. Leaves aggregated near median part of stem; petiole 1.5–6 cm, wingless; leaf blade ovate or ovate-lanceolate, 2–6 × 1.2–3.4 cm, papery, palmate-pinnate veined, abaxially commonly purplish red, sparsely villous, especially on veins, adaxially green, glabrous, base cordate or subcordate, slightly decurrent, margin callose-denticulate, apex acute to acuminate. Capitula shortly pedunculate, arranged in racemes, 3-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2.5 mm, inner linear-oblong, 1–1.2 cm. Florets bisexual, chasmogamous and cleistogamous in same plant. Chasmogamous floret corollas white, tubular, 1–1.3 cm, deeply 5-lobed, lobes linear-lanceolate, unequal, anther appendages rounded. Achenes subfusiform, ca. 5 mm, glabrous or apically pilose; pappus light red, 6–10 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 5 mm, hidden in pappus. Achenes ca. 5 mm; pappus ca. 8 mm. Fl. Sep–Oct.

• Forests; 400–1600 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.

12. *Ainsliaea kawakamii* Hayata, Icon. Pl. Formosan. 8: 72. 1919.

灯台兔儿风 deng tai tu er feng

Ainsliaea hui Diels ex Mattfeld.

Herbs, perennial, 20–70 cm tall. Leaves clustered, above stem base or crowded near midpoint of stem; petiole (2.5–)3.5–8.5 cm, wingless; leaf blade ovate, 5–7(–9.5) × 3–6 cm, papery, palmate-pinnate veined, abaxially paler than adaxial surface, adaxially subglabrous, base rounded or slightly cordate to truncate, margin entire to denticulate, apex obtuse. Capitula shortly pedunculate, arranged in spikes, 3-flowered; involucre campanulate-cylindrical, ca. 3 mm in diam.; phyllaries 6- or 7-seriate, subleathery, glabrous, sparsely pilose above, outer phyllaries ovate, ca. 2.5 mm, inner linear, ca. 7.5 mm. Florets bisexual, usually chasmogamous (occasionally cleistogamous in same plant). Chasmogamous floret corollas white, tubular, ca. 13 mm, deeply 5-lobed, lobes linear-lanceolate, unequal, anther appendages truncate. Achenes oblong, ca. 2.5 mm, glabrous or pilose above; pappus ca. 8 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4.5 mm, hidden in pappus. Achenes ca. 6 mm; pappus ca. 9 mm. Fl. Sep–Nov.

• Forests; 600–1600 m. Anhui, Fujian, Guangdong, Hunan, Taiwan, Zhejiang.

This species and *Ainsliaea macroclinioides* are closely related; leaf blade margin slightly entire (vs. dentate) is the only difference between them. Further studies are needed to clarify the relationships and specific limits between these species.

13. *Ainsliaea macroclinioides* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 25(19): 141. 1908.

阿里山兔儿风 a li shan tu er feng

Ainsliaea dentata Koidzumi; *A. macroclinioides* var. *okinawensis* (Hayata) Kitamura; *A. okinawensis* Hayata; *A. ovata* Koidzumi; *A. yadsimae* Koidzumi.

Herbs, perennial, 25–80 cm tall. Leaves aggregated near median part of stem; petiole 3–11 cm, wingless; leaf blade broadly ovate to deltate or ovate-lanceolate, 4.5–13 × 3–11 cm, papery, palmate-pinnate veined, abaxially sparsely villous, especially on veins, adaxially glabrous or sparsely pilose when young, base shallowly to deeply cordate or rounded, margin dentate to obscurely dentate, apex acute or acuminate to long acuminate. Capitula sessile or shortly pedunculate, arranged in spikes or racemes, 3-flowered; involucre cylindrical, 3–4 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially glabrous or apically pubescent, outer phyllaries ovate, 2.5–3 mm, inner narrowly oblong, ca. 1 cm. Florets bisexual, chasmogamous, corollas tubular, 0.9–1.3 cm, deeply 5-lobed, lobes linear, unequal, anther appendages rounded. Achenes terete, ca. 8 mm, pilose; pappus red-brownish, ca. 10 mm. Fl. Mar, Jul–Oct.

Forests along stream banks; 500–2000 m. Taiwan [Japan].

Ainsliaea macroclinioides is a polymorphic species, with leaf blades varying from ovate-lanceolate with base rounded, apex long acuminate, and margin dentate (in the type specimen from Taiwan) to leaf blades ovate to deltate with base rounded to deeply cordate, apex acuminate, and margin dentate to obscurely dentate (in specimens from the Ryukyu Islands, Japan). Specimens from SE China with entire leaf margins that have been determined as *A. macroclinioides* are referred in the present treatment to *A. kawakamii*.

14. *Ainsliaea smithii* Mattfeld, Acta Horti Gothob. 8: 79. 1933.

紫枝兔儿风 zi zhi tu er feng

Herbs, perennial, 0.8–1.2 m tall. Leaves alternate above basal part of stem, deciduous in flowering seasons; petiole 5.5–11 cm, broadly winged; leaf blade ovate or broadly ovate, 7–12 × 5–9.5 cm, papery, palmate-pinnate veined, both surfaces sparsely pilose, sometimes glabrate when old, base shallowly cordate, margin obscurely denticulate, apex acute to shortly acuminate. Capitula shortly pedunculate, arranged in spikes, 3-flowered; involucre cylindrical, 4–5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 3–4 mm, inner narrowly lanceolate, ca. 1.5 cm. Florets bisexual, cleistogamous, corollas closed, tubular, minutely 5-lobed, ca. 7 mm, hidden in pappus, anther appendages rounded. Achenes subterete, ca. 5 mm, densely pilose; pappus dark white, ca. 9 mm. Fl. Sep–Oct.

• Forests, stream banks; 3000–3400 m. Sichuan, Yunnan.

15. *Ainsliaea aptera* Candolle, Prodr. 7: 14. 1838.

无翅兔儿风 wu chi tu er feng

Ainsliaea aptera f. *paniculata* Kuntze.

Herbs, perennial, 30–70 cm tall. Leaves approximate above basal part of stem, basal ones deciduous in flowering seasons; petiole 7–13(–20) cm, wingless; leaf blade ovate, broadly ovate, or subrounded, 5–15 × 3.5–12 cm, papery, palmate-pinnate veined, both surfaces sparsely pilose, sometimes glabrate when old, base shallowly (rarely deeply) cordate, margin dentate,

apex acute to acuminate. Capitula sessile or shortly pedunculate, arranged in narrow panicles, 3-flowered; involucre cylindrical, ca. 4 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous or sparsely pubescent, outer phyllaries ovate, 1.5–2 mm, inner linear-oblong, 1.1–1.4 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 1.1–1.3 cm, deeply 5-lobed, anther appendages rounded. Achenes oblong, (2–)3–5 mm, densely pilose; pappus 5–8 mm. Cleistogamous floret corollas closed, tubular, minutely 4- or 5-lobed, 5–6 mm, hidden in pappus. Achenes 6–9 mm; pappus 1–1.2 cm. Fl. Apr–Sep.

Forests, scrub or grassy areas of mountain slopes; 1200–3600 m. S Xizang [Afghanistan, Bhutan, India, Nepal, Pakistan].

16. *Ainsliaea mairei* H. Léveillé, Monde Pl. 18: 31. 1916.

药山兔儿风 yao shan tu er feng

Herbs, perennial, 30–75 cm tall. Leaves in basal rosette, sessile; leaf blade lanceolate or narrowly elliptic, 9–18 × 1–3.5 cm, subleathery, palmate-pinnate veined, both surfaces densely gray-white villous, base attenuate, margin ciliate, very sparsely callose-denticulate, apex acute. Capitula sessile, 5–9 clustered, arranged in spikes, 2- or 3-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 5-seriate, subleathery, outer phyllaries ovate, 3–4 mm, abaxially densely villous, inner narrowly elliptic, 1.4–1.5 cm, glabrous. Florets bisexual, chasmogamous, corollas purplish red, tubular, ca. 1.2 cm, deeply 5-lobed, lobes linear, unequal, anther appendages rounded. Achenes obconical, ca. 4.2 mm, densely white villous; pappus dark yellow or yellow-white, 6–9 mm. Fl. Aug–Nov.

• Forest margins, scrub or grassy areas of mountain slopes; 2000–3500 m. Guizhou, Sichuan, Yunnan.

17. *Ainsliaea caesia* Handel-Mazzetti, Beih. Bot. Centralbl., Abt. 2, 56: 469. 1937.

蓝兔儿风 lan tu er feng

Herbs, perennial, 30–75 cm tall. Leaves in basal rosette; petiole 1–6 cm, wingless; leaf blade lanceolate, 4.5–7 × 1.4–3 cm, papery, palmate-pinnate veined, abaxially caerulescent or caerulescent-purple, sparsely villous, especially on veins, adaxially green, glabrate when old, base cuneate or slightly acuminate, margin callose-denticulate, apex acute. Capitula subsessile, arranged in spikes, 3-flowered; involucre obconical, 4–5 mm in diam.; phyllaries 5- or 6-seriate, papery, abaxially glabrous, outer phyllaries ovate, ca. 0.5 mm, median ovate-oblong, 1.5–3 mm, inner linear-lanceolate, 1–1.3 cm. Florets bisexual, cleistogamous, corollas closed, tubular, minutely 5-lobed, 0.4–1 cm, anther appendages truncate. Achenes fusiform, ca. 5 mm, glabrous; pappus dark yellow, ca. 8 mm. Fl. Oct–Nov.

• Forests, stream banks; 900–1200 m. N Guangdong, Jiangxi.

18. *Ainsliaea spicata* Vaniot, Bull. Acad. Int. Géogr. Bot. 12: 117. 1903.

细穗兔儿风 xi sui tu er feng

Ainsliaea latifolia (D. Don) Schultz Bipontinus var. *obovata* (Franchet) Grierson & Lauener; *A. pteropoda* Candolle var. *obovata* Franchet.

Herbs, perennial, 20–60 cm tall. Leaves in basal rosette; petiole short, nearly absent or 3–8 mm, wingless; leaf blade obovate or obovate-rounded, 3–10 × 2–6 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base rounded, abruptly constricted into petiole, margin callose-denticulate, apex obtuse or rounded. Capitula subsessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes; involucre cylindrical, 2–3 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially glabrous or very sparsely pilose, outer phyllaries ovate, 1.5–3 mm, inner narrowly elliptic, ca. 1 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, unequal, anther appendages truncate. Achenes oblong, ca. 4 mm, ribbed, densely white pilose; pappus brownish, ca. 8 mm, sometimes absent. Fl. Nov–Jun and Sep–Oct. Cleistogamous floret corollas closed, tubular, minutely 4-lobed, ca. 4 mm, hidden in pappus. Achenes oblong, 4–5 mm, ribbed, densely pilose; pappus brownish, ca. 7 mm. Fl. Jan–Mar, May, Aug–Nov.

Open forests, forest margins, scrub or grassy areas of mountain slopes; 1100–2000 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [Bangladesh, Bhutan, India, Thailand].

19. *Ainsliaea bonatii* Beauverd, Bull. Soc. Bot. Genève 1: 377. 1909.

心叶兔儿风 xin ye tu er feng

Herbs, perennial, 35–85 cm tall. Leaves in basal rosette; petiole broadly winged; leaf blade ovate or broadly ovate to orbicular, papery, palmate-pinnate veined, both surfaces gray-white lanuginous, sometimes glabrate, base cordate, margin callose-denticulate, apex rounded, obtuse, or acute. Capitula subsessile, 4–6 clustered, arranged in spikes, 3(or 4)-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries 5- or 6-seriate, scarious, abaxially apically strigose, outer phyllaries ovate, 2–2.5 mm, inner linear, ca. 1.2 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, 1.1–1.7 cm, deeply 5-lobed, lobes unequal, anther appendages truncate. Achenes subterete, ca. 5 mm, ribbed, densely pilose; pappus brownish, 6.5–8 mm. Fl. Oct–Nov. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, 3.5–5 mm, hidden in pappus. Achenes subfusiform, ca. 6 mm, ribbed, densely pilose; pappus dark yellow or dark brownish, 6–7 mm. Fl. Aug–Oct.

• Dense forests, stream banks; 900–3500 m. Chongqing, Guizhou, Sichuan, Yunnan.

- 1a. Leaf blade broadly ovate to orbicular 19a. var. *bonatii*
1b. Leaf blade narrowly ovate 19b. var. *multibracteata*

19a. *Ainsliaea bonatii* var. *bonatii*

心叶兔儿风(原变种) xin ye tu er feng (yuan bian zhong)

Ainsliaea bonatii var. *arachnoidea* Beauverd; *A. bonatii* var. *glabra* Beauverd; *A. pteropoda* Candolle var. *platyphylla* Franchet.

Petiole 5–19 cm × 4–18 mm (at upper point); leaf blade broadly ovate to orbicular, 6–11.5 × 5–11.5 cm, apex acute to

subobtuse. Florets usually chasmogamous, occasionally florets cleistogamous at apex of stem.

• Dense forests, stream banks; 900–3000 m. Chongqing, Guizhou, Sichuan, Yunnan.

The lectotype of *Ainsliaea pteropoda* var. *platyphylla* (Yunnan, *J. M. Delavay 607*, P!) shows no diagnostic character that differentiates it from *A. bonatii* var. *bonatii*; the former name is therefore placed into synonymy of the latter.

19b. *Ainsliaea bonatii* var. *multibracteata* (Mattfeld) S. E. Freire, *Ann. Missouri Bot. Gard.* 94: 108. 2007.

薄叶兔儿风 *bao ye tu er feng*

Ainsliaea multibracteata Mattfeld, *Notizbl. Bot. Gart. Berlin-Dahlem* 11: 106. 1931; *A. mattfeldiana* Handel-Mazzetti.

Petiole 5–13 cm × 6–8 mm (at upper point); leaf blade narrowly ovate, 8.5–11 × 5–6 cm, apex acute; cauline leaves alternate, petiolate to sessile, ovate to ovate-lanceolate. Florets usually cleistogamous.

• Dense forests, stream banks; 3000–3500 m. Sichuan.

20. *Ainsliaea macrocephala* (Mattfeld) Y. C. Tseng, *Acta Phytotax. Sin.* 31: 364. 1993.

大头兔儿风 *da tou tu er feng*

Ainsliaea pteropoda Candolle var. *macrocephala* Mattfeld, *Notizbl. Bot. Gart. Berlin-Dahlem* 11: 107. 1931.

Herbs, perennial, 30–60 cm tall. Leaves in basal rosette; petiole 4–9 cm, winged, sparsely pilose; leaf blade ovate or ovate-lanceolate, 3.5–9 × 2.5–4.5 cm, subleathery, palmate-pinnate veined, abaxially densely pilose, adaxially sparsely pilose, base constricted and decurrent into broadly winged petiole, margin callose-denticulate, apex acute to obtuse, rarely mucronate. Capitula sessile, (2 or) 3–5 (or 6) clustered, arranged in spikes, 3-flowered; involucre cylindric, 4–5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially white villous, outer phyllaries ovate, 3.5–5 mm, inner oblong, ca. 1.5 cm. Florets bisexual, chasmogamous, corollas purplish red, tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete, 4–5 mm, densely villous; pappus brownish or dark brownish, 8–9 mm. Fl. Aug–Sep.

• Forests, forest margins, scrub or grassy areas of mountain slopes; 2300–3600 m. Sichuan, Yunnan.

21. *Ainsliaea qianiana* S. E. Freire, *Novon* 12: 453. 2002.

钱氏兔儿风 *qian shi tu er feng*

Herbs, perennial, 50–60 cm tall. Leaves in basal rosette; petiole 10–11 cm, winged; leaf blade elliptic or elliptic to ovate, 7.5–8.5 × 3.5–3.8 cm, subcamose, palmate-pinnate veined, both surfaces glabrous, base abruptly rounded and decurrent into petiole, margin callose-denticulate, apex acute to subobtuse. Capitula sessile, commonly 3–5 clustered, arranged in spikes, 3-flowered; involucre cylindric, 3–4 mm in diam.; phyllaries 5–7-seriate, papery, abaxially glabrous, outer phyllaries linear to ovate, 2.8–3 mm, inner linear to ovate or linear to elliptic, 1.1–1.3 cm. Florets bisexual, chasmogamous, corollas pink,

tubular, ca. 8 mm, deeply 5-lobed, anther appendages apiculate. Achenes oblong, 3–4 mm, densely pilose; pappus light brownish, 6–7 mm. Fl. Oct.

• 3000–3600 m. Sichuan, Yunnan.

22. *Ainsliaea latifolia* (D. Don) Schultz Bipontinus, *Jahresber. Pollichia* 18–19: 190. 1861.

宽叶兔儿风 *kuan ye tu er feng*

Liatrix latifolia D. Don, *Prodr. Fl. Nepal.* 169. 1825; *Ainsliaea heterantha* Handel-Mazzetti; *A. hypoleuca* Diels; *A. latifolia* var. *ramifera* H. Chuang; *A. petelotii* Merrill; *A. pteropoda* Candolle; *A. pteropoda* var. *silhetensis* Candolle; *A. silhetensis* (Candolle) C. B. Clarke.

Herbs, perennial, 30–90(–130) cm tall. Leaves in basal rosette; petiole broadly winged, (2–)4–9(–11) × 4–30 mm (at upper point); leaf blade ovate or narrowly ovate, (2–)5–10 × (1.5–)3–8 cm, papery, palmate-pinnate veined, concolorous, strigose on both surfaces with long straight trichomes, or more commonly slightly discolorous with abaxial surface strigose-lanate and adaxial surface sparsely strigose, base constricted and decurrent into petiole, margin callose-denticulate and straight, apex obtuse or acute. Capitula subsessile or shortly pedunculate, (1 or) 2–4 clustered, arranged in spikes or panicles, 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially ± sparsely pilose, outer phyllaries ovate, ca. 1.5 mm, inner elliptic, ca. 8 mm. Florets bisexual, usually chasmogamous (sometimes without pappus), more rarely cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, 0.8–1.1 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes subfusiform, ca. 5.5 mm, ribbed, densely pilose; pappus absent or present, brownish, 8–10 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4 mm, hidden in pappus. Achenes subfusiform, ca. 6 mm, ribbed, densely pilose; pappus brownish, 8–10 mm. Fl. year-round.

Valleys with evergreen forests, mossy sites in evergreen forests by streams, open forests, roadsides, very dry open places in full sunlight or some shade; 800–3600 m. Guangdong, Guangxi, Guizhou, Hainan, Hubei, Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Indonesia, Kashmir, Myanmar, Nepal, Thailand, Vietnam].

Ainsliaea latifolia most resembles *A. bonatii*, *A. macrocephala*, *A. qianiana*, and *A. spicata*, those species with winged petioles. However, they may be differentiated by their leaf blades, e.g., ovate, concolorous, strigose, and rounded at the base in *A. latifolia* var. *latifolia*. *Ainsliaea bonatii* has cordate leaf blades, whereas *A. spicata* has obovate or obovate to pandurate blades. *Ainsliaea qianiana* is distinguished by its glabrous and somewhat fleshy leaves. *Ainsliaea macrocephala* may be distinguished by its larger involucre, 13–15 mm, as well as by its foliar trichomes T-shaped.

Ainsliaea hypoleuca (*A. petelotii*) was treated as a separate species by Freire (*Ann. Missouri Bot. Gard.* 94: 131. 2007) on account of its strongly discolorous leaves, which are densely white tomentose below and deep green and glabrous above.

“*Perdicium triflorum*” (D. Don, *Prodr. Fl. Nepal.* 169. 1825) belongs here but was not validly published because it was merely cited as a synonym of *Liatrix latifolia* (*Vienna Code*, Art. 34.1(c)). Conse-

quently, the intended new combination "*Ainsliaea triflora*" (Druce, Rep. Bot. Exch. Cl. Brit. Isles 1916: 603. 1917) was not validly published either.

"*Ainsliaea latifolia* var. *taiwanensis*" (S. E. Freire, Ann. Missouri Bot. Gard. 94: 136. 2007), described from China (Taiwan), Indonesia, and Thailand, was not validly published because no Latin description or diagnosis, or reference to such, was provided (*Vienna Code*, Art. 36.1). It is therefore excluded from the present treatment.

23. *Ainsliaea henryi* Diels, Bot. Jahrb. Syst. 29: 628. 1901.

长穗兔儿风 chang sui tu er feng

Herbs, perennial, 10–80 cm tall. Leaves in basal rosette; petiole 2–5 cm, winged in upper half or wingless; leaf blade obovate to oblong or ovate, 2.5–8.5 × 1.5–3 cm, thinly papery, palmate-pinnate veined, abaxially sparsely villous, adaxially subglabrous, base attenuate, rounded, or cuneate, margin slightly repand, callose-denticulate, apex acute to subobtuse. Capitula sessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes, (1–)3-flowered; involucre cylindrical, ca. 2 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially apically pilose, outer phyllaries ovate, 1.5–2 mm, inner linear, 0.7–1.6 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, ca. 7.5 mm, deeply 5-lobed, lobes oblong, anther appendages rounded. Achenes subfusiform, ca. 1.5 mm, ribbed, glabrous, sometimes apically pilose; pappus absent. Fl. Dec–Apr. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 3.2 mm, hidden in pappus. Achenes terete, ca. 6 mm, ribbed, glabrous; pappus dark white to dark yellow, ca. 8 mm. Fl. Jun–Mar.

• Open forests, stream banks; 700–3900 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Sichuan, Taiwan, Yunnan.

The variation patterns of such characters as leaf morphology and achene pubescence within *Ainsliaea henryi* and *A. reflexa* are not clear enough. Extensive field investigation at the population level is needed to clarify this.

- 1a. Leaves obovate, attenuate into petiole,
petiole winged in upper half 23a. var. *henryi*
1b. Leaves ovate, rounded or cuneate at
base, petiole wingless 23b. var. *subalpina*

23a. *Ainsliaea henryi* var. *henryi*

长穗兔儿风(原变种) chang sui tu er feng (yuan bian zhong)

Ainsliaea henryi var. *daguanensis* H. Chuang; *A. latifolia* (D. Don) Schultz Bipontinus subsp. *henryi* (Diels) H. Koyama; *A. undulata* Diels.

Petiole winged in upper half; leaf blade obovate to oblong, 4.5–8.5 × 1.8–3 cm, base attenuate, apex subobtuse. Fl. Jul–Oct, Dec–Mar.

• Open forests, stream banks; 700–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Sichuan, Taiwan, Yunnan.

23b. *Ainsliaea henryi* var. *subalpina* (Handel-Mazzetti) S. E. Freire, Ann. Missouri Bot. Gard. 94: 129. 2007.

亚高山长穗兔儿风 ya gao shan chang sui tu er feng

Ainsliaea reflexa Merrill var. *subalpina* Handel-Mazzetti,

Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 63: 12. 1926; *A. henryi* var. *ovatifolia* C. C. Chang; *A. latifolia* var. *nimborum* (Handel-Mazzetti) Kitamura; *A. morrisonicola* Hayata; *A. reflexa* f. *morrisonicola* (Hayata) Suzuki; *A. reflexa* var. *morrisonicola* (Hayata) Yamamoto; *A. reflexa* var. *nimborum* Handel-Mazzetti.

Petiole long, 3.5–5.5 cm, slender, wingless; leaf blade ovate, 2.5–3.8 × 1.5–2.4 cm, base rounded or cuneate. Fl. Jun–Nov.

• Open forests; 2000–3900 m. Taiwan, Yunnan.

24. *Ainsliaea reflexa* Merrill, Philipp. J. Sci. 1(Suppl. 3): 242. 1906.

长柄兔儿风 chang bing tu er feng

Ainsliaea angustifolia J. D. Hooker & Thomson ex C. B. Clarke var. *luchunensis* H. Chuang; *A. longipetiolata* Merrill; *A. reflexa* var. *lobbiana* Beauverd; ?*A. tonkinensis* Merrill.

Herbs, perennial, 10–60 cm tall. Leaves in basal rosette; petiole 3–9 cm, distal part winged, proximal part wingless, rarely nearly wingless; leaf blade ovate or ovate-lanceolate, 2–7 × 2–5 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base attenuate, margin slightly repand, callose-denticulate, apex acute or obtuse. Capitula sessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes, (1–)3-flowered; involucre cylindrical, 2–3 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous or apically pilose, outer phyllaries ovate, 1.5–2.5 mm, inner lanceolate, ca. 1.2 cm. Florets bisexual, chasmogamous and cleistogamous (in same plant or at different seasons). Chasmogamous floret corollas tubular, 5.5–9 mm, deeply 5-lobed, anther appendages rounded. Achenes terete, ca. 3 mm, ribbed, densely pilose; pappus absent. Fl. Dec–Apr. Cleistogamous floret corollas closed, tubular, minutely 4-lobed, ca. 4 mm, hidden in pappus. Achenes terete, 3–5 mm, ribbed, densely pilose; pappus brownish, ca. 7 mm. Fl. Dec–Jul.

Open forests, forest margins, scrub; 500–3500 m. Guangdong, Hainan, Taiwan, Xizang, Yunnan [Indonesia, Philippines, Vietnam].

Ainsliaea tonkinensis, a rheophyte distributed in Vietnam, is sometimes treated as a synonym of *A. reflexa* (see Freire, Ann. Missouri Bot. Gard. 94: 149. 2007). Further studies are necessary to confirm whether or not they are conspecific.

25. *Ainsliaea crassifolia* C. C. Chang, Sinensia 6: 549. 1935.

厚叶兔儿风 hou ye tu er feng

Herbs, perennial, 40–80 cm tall. Leaves in basal rosette; petiole 4–11 cm, wingless, densely white lanuginous; leaf blade ovate, 9–13 × 6–12 cm, papery, palmate-pinnate veined, abaxially white, densely white lanuginous, adaxially green, sparsely white lanuginous, base cordate, margin obviously dentate, apex obtuse or rounded. Capitula sessile, solitary or 2 or 3 arranged in spikes, 3-flowered; involucre cylindrical, 6–7 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially subglabrous, outer phyllaries ovate, 2–3 mm, inner lanceolate, ca. 11 mm. Florets bisexual, chasmogamous, corollas white or pink, tubular, ca. 1.5 cm, deeply 5-lobed, lobes linear, unequal, anther appendages

rounded. Immature achenes awl-shaped, ca. 2.5 mm, sparsely villous; pappus dark white, 11–12 mm. Fl. Jul–Jan.

• Forests, forest margins, grassy areas of mountain slopes; 2800–3000 m. Sichuan, Yunnan.

26. *Ainsliaea elegans* Hemsley, Hooker's Icon. Pl. 28: t. 2747. 1902.

秀丽兔儿风 xiu li tu er feng

Herbs, perennial, 0.3–1.2 m tall. Leaves in basal rosette; petiole 10–30 cm, wingless, villous; leaf blade cordate or ovate-cordate, 8–22 × 4.5–14 cm, subleathery, palmate-pinnate veined, base deeply cordate, margin sparsely callose-denticulate, ciliate, apex obtuse. Capitula sessile or shortly pedunculate, arranged in panicles, 2(or 3)-flowered; involucre cylindrical, ca. 3.5 mm; phyllaries ca. 5-seriate, subleathery, abaxially apically pilose, outer phyllaries ovate, 3–3.5 mm, inner oblong, 1–1.2 cm. Florets bisexual, chasmogamous, corollas white, tubular, ca. 1.6 cm, deeply 5-lobed, lobes linear, unequal, anther appendages truncate or slightly emarginate. Achenes terete, ca. 5.5 mm, densely white pilose; pappus yellow-white, 8–9 mm. Fl. Nov–Mar.

Limestone forests; 1000–2500 m. Guizhou, Yunnan [Vietnam].

- 1a. Leaf blade abaxially densely white lanuginous 26a. var. *elegans*
 1b. Leaf blade abaxially densely strigose 26b. var. *strigosa*

26a. *Ainsliaea elegans* var. *elegans*

秀丽兔儿风(原变种) xiu li tu er feng (yuan bian zhong)

Ainsliaea elegans var. *tomentosa* Mattfeld; *Pertya esquirolii* H. Léveillé.

Leaf blade abaxially densely white lanuginous, adaxially strigose when young and glabrate when old. Fl. Nov–Mar.

• Limestone forests; 1000–1900 m. Guizhou, Yunnan.

26b. *Ainsliaea elegans* var. *strigosa* Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 107. 1931.

红毛兔儿风 hong mao tu er feng

Leaf blade strigose on both surfaces. Fl. Jan–Mar.

Limestone forests; 1800–2500 m. Yunnan [Vietnam].

27. *Ainsliaea apteroides* (C. C. Chang) Y. C. Tseng, Acta Phytotax. Sin. 31: 363. 1993.

狭翅兔儿风 xia chi tu er feng

Ainsliaea pteropoda Candolle var. *apteroides* C. C. Chang, Sinensia 4: 227. 1934.

Herbs, perennial, 20–50 cm tall. Leaves commonly in basal rosette, sometimes tightly alternate near base of stem; petiole 4–11 cm, wingless; leaf blade ovate, 5–10 × 3.5–6 cm, papery, palmate-pinnate veined, abaxially white tomentose, adaxially pubescent, base cordate, margin denticulate, apex acute to acuminate, rarely obtuse. Capitula sessile, arranged in spikes, 3-flowered; involucre cylindrical, 3–4 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, outer phyllaries ovate or

broadly ovate, 0.8–1.2 mm, inner narrowly elliptic, ca. 1.3 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas purplish red, tubular, 1.2–1.4 cm, deeply 5-lobed, anther appendages truncate. Achenes fusiform, ca. 6 mm, densely white villous; pappus light red, ca. 7 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4 mm, hidden in pappus. Achenes 5–6 mm; pappus ca. 7 mm. Fl. Oct–Feb.

Limestone forests; 1200–1800 m. Sichuan, SE Yunnan [Bhutan, India].

28. *Ainsliaea nana* Y. C. Tseng, Acta Phytotax. Sin. 31: 365. 1993.

小兔儿风 xiao tu er feng

Herbs, perennial, 11–18 cm tall. Leaves in basal rosette; petiole 1–2.3 cm, wingless; leaf blade ovate, 0.7–1.6 × 0.5–1 cm, papery, palmate-pinnate veined, abaxially red, sparsely villous, adaxially sparsely strigose, base shallowly cordate, margin sparsely callose-denticulate, apex mucronate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 5-seriate, abaxially glabrous, outer phyllaries ovate, 1–3.5 mm, inner oblong, ca. 7 mm. Florets bisexual, chasmogamous and cleistogamous. Chasmogamous floret corollas tubular, ca. 9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes fusiform, ca. 5 mm, ribbed, glabrous; pappus dark yellow, 6–8 mm. Cleistogamous floret corollas closed, tubular, ca. 1.5 mm, hidden in pappus. Fl. Aug–Oct.

• Forests; 1200–2400 m. Sichuan.

29. *Ainsliaea paucicapitata* Hayata, Icon. Pl. Formosan. 8: 71. 1919.

花莲兔儿风 hua lian tu er feng

Herbs, perennial, ca. 20 cm tall. Leaves basally clustered; petiole 1–1.5 cm, wingless; leaf blade deltate, 1–1.5 × 1–1.5 cm, palmate-pinnate veined, base cordate, margin obscurely denticulate, apex acute. Capitula sessile, arranged in spikes, 3-flowered; involucre campanulate; outer phyllaries ovate, inner linear to lanceolate. Florets bisexual, chasmogamous, corollas tubular, ca. 10 mm, 5-lobed. Achenes oblong to elliptic, densely pilose; pappus unknown. Fl. Jan.

• About 3000 m. Taiwan.

This species is very similar to *Ainsliaea apiculata* var. *apiculata* in its leaves long petiolate, leaf blades deltate, and capitula arranged in spikes. The only difference is that *A. paucicapitata* has leaf blades shallowly 5-lobed (vs. 5-angled) and leaves basally rosulate (vs. leaves clustered above stem base). No material of this species was available, so the description is based on the original diagnosis and a photograph of the type distributed by TI.

30. *Ainsliaea cavaleriei* H. Léveillé, Fl. Kouy-Tchéou, 82. 1914–1915.

卡氏兔儿风 ka shi tu er feng

Ainsliaea cleistogama C. C. Chang.

Herbs, perennial, 25–80 cm tall. Leaves basally clustered;

petiole (1.5–)3–10 cm, wingless, conspicuously strigose; leaf blade ovate to oblong, 4–13 × (0.5–)3–7 cm, papery, palmate-pinnate veined, abaxially reddish strigose, especially on veins, adaxially sparsely strigose, base deeply cordate, margin obscurely denticulate, apex acute to subobtusate; cauline leaves (when present) similar to radical, 17–30 × 9–16 mm, shortly petiolate and cuneate at base. Capitula sessile or shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, 3–5 mm in diam.; phyllaries 5- or 6-seriate, purple, papery, strigose apically, outer phyllaries ovate, 2–2.5 mm, inner linear to elliptic, 6–10 mm. Florets bisexual, cleistogamous, corollas white, closed, tubular, minutely 5-lobed, 3–3.5 mm, anther appendages shortly apiculate. Achenes oblong-elliptic, 3–4 mm, densely pilose; pappus bristles ca. 6 mm. Fl. May–Jul, Oct–Dec.

- Moist slopes; 300–1100 m. Guangdong, Guangxi, Jiangxi.

This species is very similar to *Ainsliaea fragrans*, *A. ramosa*, and *A. rubrinervis* in its leaf blade ovate to oblong, leaf base deeply cordate, and petioles villous, but it differs by its phyllaries strigose apically.

31. *Ainsliaea ramosa* Hemsley, J. Linn. Soc., Bot. 23: 471. 1888.

莲沱兔儿风 *lian tuo tu er feng*

Herbs, perennial, 25–70 cm tall. Leaves in basal rosette; petiole 4–8 cm, wingless, strigose; leaf blade ovate, ovate-oblong, or ovate-lanceolate, 5–14 × 3–9 cm, subleathery, palmate-pinnate veined, abaxially densely red strigose, adaxially strigose, base deeply cordate, margin sparsely callose-denticulate, ciliate, apex acute or obtuse. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, 3–4 mm in diam.; phyllaries ca. 5-seriate, papery, glabrous, outer phyllaries ovate, 2–2.5 mm, inner oblong, ca. 9 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 7–9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages apiculate. Achenes fusiform, ca. 2 mm, ribbed, densely pilose; pappus dark yellow, 6–8 mm. Fl. Apr–Jun. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 5 mm, hidden in pappus. Achenes ca. 2.5 mm; pappus ca. 6 mm. Fl. Oct–Dec.

- Stream banks, dense forests; 100–800 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan.

This species is very similar to *Ainsliaea cavaleriei*, *A. fragrans*, and *A. rubrinervis* in its leaf blade ovate to oblong, leaf base deeply cordate, and petioles villous, but it differs by its phyllaries glabrous and leaf blade ± concolorous.

32. *Ainsliaea rubrinervis* C. C. Chang, Sinensia 4: 226. 1934.

红脉兔儿风 *hong mai tu er feng*

Herbs, perennial, 15–60 cm tall. Leaves in basal rosette; petiole 1.5–11 cm, wingless, strigose; leaf blade ovate or ovate-lanceolate, 2.5–11 × 1.4–4 cm, subleathery, palmate-pinnate veined, abaxially whitish green, veins red, strigose, adaxially green, sparsely strigose, base cordate, margin entire or obscurely callose-denticulate, ciliate, apex shortly acuminate. Capitula subsessile or shortly pedunculate, solitary or 2 or 3,

arranged in spikes, 3-flowered; involucre cylindrical, 3–4 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially glabrous, outer phyllaries ovate, 2–3 mm, inner narrowly oblong, 9–11 mm. Florets bisexual, chasmogamous, corollas white, tubular, ca. 1 cm, deeply 5-lobed, lobes linear, unequal, anther appendages apiculate. Achenes fusiform, ca. 4.5 mm, ribbed, densely pilose; pappus dark white, ca. 7 mm. Fl. Jun–Jul.

- Forests; 800–1000 m. Sichuan.

This species is very similar to *Ainsliaea cavaleriei*, *A. fragrans*, and *A. ramosa* in its leaf blade ovate to oblong, leaf base deeply cordate, and petioles villous, but it differs by its phyllaries glabrous and leaf blade abaxially whitish green with veins red.

33. *Ainsliaea angustata* C. C. Chang, Sinensia 5: 158. 1934.

马边兔儿风 *ma bian tu er feng*

Herbs, perennial, 20–50 cm tall. Leaves in basal rosette; petiole 2–9 cm, wingless; leaf blade narrowly elliptic to lanceolate, 5–9 × 1–2.5 cm, subleathery, palmate-pinnate veined, abaxially strigose, adaxially sparsely strigose, base attenuate, slightly decurrent, margin entire or sparsely callose-denticulate, apex mucronate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, ca. 4 mm in diam.; phyllaries 4- or 5-seriate, abaxially glabrous, outer phyllaries ovate, 2–3 mm, inner oblong-lanceolate, 7.5–9 mm. Florets bisexual, chasmogamous, corollas tubular, 0.9–1.2 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages acuminate. Achenes subfusiform, ca. 4 mm, densely white pilose; pappus brownish or slightly red, ca. 6.5 mm. Fl. Mar–May, Oct.

- Stream banks, grassy areas; 600–1300 m. Chongqing, S Gansu, S Shaanxi, Sichuan.

34. *Ainsliaea pingbianensis* Y. C. Tseng, Acta Phytotax. Sin. 31: 365. 1993.

屏边兔儿风 *ping bian tu er feng*

Ainsliaea gongshanensis H. Chuang; *A. pingbianensis* var. *malipoensis* H. Chuang.

Herbs, perennial, 30–50 cm tall. Leaves in basal rosette; petiole 4–11 cm, wingless, densely fulvous strigose; leaf blade narrowly oblong or oblong-lanceolate, (7–)8–12 × 3–6 cm, papery, palmate-pinnate veined, both surfaces villous, base rounded, margin callose-denticulate, ciliate, apex obtuse to acute. Capitula shortly pedunculate, arranged in panicles, 3(–5)-flowered; involucre cylindrical, 3–4 mm in diam.; phyllaries ca. 5-seriate, abaxially pilose when young and glabrate when old, outer phyllaries ovate, 1–2.5 mm, inner narrowly elliptic, 7–10 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, ca. 9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages slightly rounded. Immature achenes terete, ca. 3.5 mm, densely dark yellow pilose; pappus dark white, ca. 7 mm. Fl. May. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 5 mm, hidden in pappus. Achenes ca. 4 mm; pappus ca. 7 mm. Fl. Aug–Dec.

- Stream banks, moist areas in forests; 1300–1900 m. Guangdong, Sichuan, Yunnan.

35. *Ainsliaea fulvipes* Jeffrey & W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 175. 1914.

黄毛兔儿风 huang mao tu er feng

Ainsliaea fulvioides H. Chuang; *A. fulvioides* var. *glabriachenia* H. Chuang; *A. lijiangensis* H. Chuang.

Herbs, perennial, 15–45 cm tall. Leaves in basal rosette; petiole 2–7 cm, wingless; leaf blade elliptic or subovate, 3–7.5 × 1.5–4 cm, subleathery, palmate-pinnate veined, both surfaces strigose, base rounded, margin callose-denticulate, apex rounded or obtuse. Synflorescence axis solitary, obscurely bracteate; paraclades in spike. Capitula subsessile or shortly pedunculate, (1 or) 2 or 3, arranged in spikes; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 5-seriate, subleathery, abaxially apically sparsely pilose, outer phyllaries ovate, 2–3 mm, inner oblong or lanceolate, 5–10 mm. Florets bisexual, chasmogamous and cleistogamous. Chasmogamous floret corollas tubular, ca. 9 mm, deeply 5-lobed, anther appendages rounded. Immature achenes oblong, ca. 1.8 mm; pappus brownish, ca. 6 mm. Fl. Sep–Oct. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 3.5 mm, hidden in pappus. Achenes oblong, 3–3.5 mm, commonly densely pilose; pappus ca. 5 mm. Fl. May, Jul–Nov.

• Open forests, forest margins, grassy areas of mountain slopes; 1300–2700 m. Guangdong, Sichuan, Yunnan.

The variation patterns of the differential characters mentioned in the protologues of *Ainsliaea fulvipes*, *A. fulvioides*, *A. fulvioides* var. *glabriachenia*, and *A. lijiangensis*, e.g., achene pubescence and floret type (i.e., both chasmogamous and cleistogamous florets in the same plant or only cleistogamous florets) seem very complex. The present taxonomy is a temporary treatment based on limited specimens, and extensive field investigations at the population levels are needed to clarify their identities.

36. *Ainsliaea glabra* Hemsley, J. Linn. Soc., Bot. 23: 471. 1888.

光叶兔儿风 guang ye tu er feng

Herbs, perennial, 15–80(–150) cm tall. Leaves of variable position, alternate between base and median part of stem, basally clustered, or alternate above base of stem, especially in tiny individuals; petiole 4–18 cm, wingless; leaf blade ovate-lanceolate, lanceolate, oblong-lanceolate, or elliptic, 6–20 × 2–10 cm, subleathery, palmate-pinnate veined, commonly both surfaces glabrous, sometimes adaxially sparsely strigose, base attenuate or cuneate, margin callose-denticulate, apex acuminate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindric, 2–4 mm in diam.; phyllaries (5 or) 6-seriate, papery, abaxially glabrous, rarely apically sparsely pilose, outer phyllaries ovate, 1–2 mm, inner linear, 7–8.5 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 8–10 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes fusiform, ca. 5 mm; pappus white, dark white, or light red, 5–7 mm. Fl. Apr–Oct. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, 2.8–7 mm, hidden in pappus. Achenes fusiform, ca. 4 mm; pappus yellow-white, 5–7.5 mm. Fl. Apr–Oct.

• Stream banks or moist grassy areas in forests, forest margins; 600–2400 m. Chongqing, Fujian, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

1a. Achenes glabrous or apically pilose 36a. var. *glabra*
1b. Achenes densely pilose 36b. var. *sutchuenensis*

36a. *Ainsliaea glabra* var. *glabra*

光叶兔儿风(原变种) guang ye tu er feng (yuan bian zhong)

Ainsliaea lancifolia Franchet.

Achenes glabrous or apically pilose. Fl. Apr–Oct.

• Moist grassy areas in forests, forest margins; 800–2400 m. Guizhou, Sichuan, Yunnan.

36b. *Ainsliaea glabra* var. *sutchuenensis* (Franchet) S. E. Freire, Ann. Missouri Bot. Gard. 94: 125. 2007.

四川兔儿风 si chuan tu er feng

Ainsliaea sutchuenensis Franchet, J. Bot. (Morot) 8: 296. 1894; *A. glabra* var. *tenuicaulis* (Mattfeld) C. C. Chang; *A. plantaginifolia* Mattfeld; *A. tenuicaulis* Mattfeld.

Achenes densely pilose. Fl. Apr–Jul.

• Stream banks or moist grassy areas in forests; 600–2000 m. Chongqing, Fujian, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.

37. *Ainsliaea nervosa* Franchet, Bull. Mus. Hist. Nat. (Paris) 1: 64. 1895.

直脉兔儿风 zhi mai tu er feng

Herbs, perennial, 20–50 cm tall. Leaves mostly in basal rosette; petiole 3–10 cm, wingless; leaf blade ovate or oblong-lanceolate, 5–13 × 1–2.5 cm, leathery, palmate-pinnate veined, both surfaces glabrous or abaxially sparsely strigose, base long attenuate, margin callose-denticulate, not ciliate, apex acute; cauline leaves few, smaller. Capitula shortly pedunculate, arranged in panicles, 2- or 3-flowered; involucre cylindric, 4–5 mm in diam.; phyllaries 4- or 5-seriate, papery, outer phyllaries ovate, 1–2 mm, abaxially glabrous, inner lanceolate, 8–10 mm, abaxially with long glandular trichomes. Florets bisexual, chasmogamous and cleistogamous (at different or same seasons). Chasmogamous floret corollas tubular, 8–8.5 mm, deeply 5-lobed, lobes oblong, anther appendages rounded. Achenes fusiform or obconical-fusiform, ca. 5 mm, ribbed, densely white pilose; pappus dark white, ca. 6 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4.2 mm, hidden in pappus. Achenes fusiform, ca. 2.5 mm; pappus ca. 6 mm. Fl. Apr–Jun.

• Stream banks, moist places or moist grassy areas in forests; 1000–1800 m. Guizhou, Sichuan, NE Yunnan.

38. *Ainsliaea parvifolia* Merrill, Philipp. J. Sci., C, 12: 110. 1917.

小叶兔儿风 xiao ye tu er feng

Herbs, perennial, 11–25 cm tall. Leaves basally clustered; petiole 2–5 cm, wingless, strigose; leaf blade ovate to oblong, 2–3.5 × 1.5–2 cm, subleathery, palmate-pinnate veined, abaxially moderately strigose, adaxially subglabrous, base abruptly

rounded, then cuneately narrowed into petiole, margin denticulate, apex acute-mucronate. Capitula shortly pedunculate, arranged in spikes, 3-flowered; involucre 5- or 6-seriate, narrowly campanulate, ca. 4 mm in diam.; phyllaries dull purple, subleathery, glabrous, outer phyllaries ovate, 1–2 mm, inner linear to elliptic, ca. 10 mm. Florets bisexual, chasmogamous, corollas white, tubular, 8.5–11 mm, anther appendages truncate. Achenes oblong to obovoid, ca. 2 mm, apically pilose; pappus 6.5–8 mm. Fl. Oct.

- Open grassy slopes; 500–1000 m. Guangdong.

This species is similar to *Ainsliaea yunnanensis* in its leaves long petiolate, leaf blades ovate with cuneate base, and capitula sessile but is quite different in its foliar trichomes straight (vs. T-shaped), involucre 8–10 mm (vs. 13–15 mm), and achenes apically pilose (vs. pilose).

39. *Ainsliaea yunnanensis* Franchet, J. Bot. (Morot) 2: 70. 1888.

云南兔儿风 yun nan tu er feng

Ainsliaea latifolia (D. Don) Schultz Bipontinus f. *yunnanensis* (Franchet) Kitamura; *A. pteropoda* Candolle var. *leiophylla* Franchet; *A. scabrada* Dunn.

Herbs, perennial, 20–70 cm tall. Leaves in basal rosette; petiole 2–7.5 cm, wingless; leaf blade ovate or ovate-lanceolate, 2–6 × 1–4 cm, subleathery, palmate-pinnate veined, both surfaces strigose, with long T-shaped hairs and few glandular hairs, base rounded and cuneately narrowed into petiole, margin callose-denticulate, apex acute. Capitula subsessile or shortly pedunculate, commonly 3–6 clustered, arranged in spikes; involucre cylindrical, ca. 6 mm in diam.; phyllaries 5- or 6-seriate, subleathery, abaxially glabrous or very sparsely pilose, outer

phyllaries ovate, 2.5–3.5 mm, inner lanceolate, ca. 1.4 cm. Florets bisexual, chasmogamous, corollas pink to purplish red, tubular, 1.6–1.8 cm, deeply 5-lobed, lobes oblong, unequal, apices revolute, anther appendages rounded. Achenes subfusiform, ca. 5 mm, densely white villous; pappus yellow-white, ca. 9 mm. Fl. Sep–Jan, Mar, May.

- Open forests, forest margins, grassy areas of mountain slopes; 1700–3700 m. Guizhou, Sichuan, Yunnan.

40. *Ainsliaea chapaensis* Merrill, J. Arnold Arbor. 21: 387. 1940.

边地兔儿风 bian di tu er feng

Herbs, perennial, 25–60 cm tall. Leaves in basal rosette; petiole 2–6(–10) cm, wingless, villous or glabrate; leaf blade ovate, 3–6 × 2–4 cm, papery, palmate-pinnate veined, abaxially at least villous on veins, adaxially glabrous or villous on mid-vein, base rounded, margin callose-denticulate, apex obtuse or mucronate. Synflorescence axis solitary, obviously bracteate; paraclades in spike. Capitula 1 or 2 in 1 reduced paraclade, subsessile, 3- or 4-flowered; involucre cylindrical, ca. 3 mm in diam.; phyllaries ca. 5- or 6-seriate, papery, abaxially glabrous or sparsely pilose, outer phyllaries ovate, 2–3 mm, inner oblong, 9–11 mm. Florets bisexual, chasmogamous and cleistogamous. Chasmogamous floret corollas tubular, ca. 1 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages obtuse. Immature achenes terete, ca. 4 mm, ribbed, densely villous; pappus light brownish, ca. 7 mm. Cleistogamous floret corollas closed, cylindrical, ca. 4.2 mm, hidden in pappus. Fl. Dec–Apr.

- Open forests, sandy places near seashores; below 800 m. Guangxi, Hainan [Vietnam].

Incompletely known species

Ainsliaea mollis Diels, Repert. Spec. Nov. Regni Veg. Beih. 12: 514. 1922.

Ainsliaea mollis was treated by Y. C. Tseng (FRPS 79: 34. 1996)

as an accepted species, occurring in Sichuan and Yunnan. It resembles *A. fragrans* in external morphology. No material of this species was available to the present authors. Its identity is dubious.

8. PERTYA Schultz Bipontinus, Bonplandia 10: 109. 1862, nom. cons.

帚菊属 zhou ju shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Macroclinidium Maximowicz.

Shrubs, subshrubs, or perennial herbs, rarely scandent shrubs. Leaves alternate, or tufted on brachyblasts; leaf blade linear, subulate, lanceolate, oblong, or ovate, entire, dentate, or denticulate. Capitula subsessile or pedunculate, in glomerulate, corymbose, or paniculate synflorescences, or solitary, discoid, homogamous; involucre campanulate or cylindrical; phyllaries many, 3-seriate to multiseriate, imbricate, unequal, herbaceous or leathery; receptacle flat, alveolate or not, glabrous or villous around, epaleate. Florets few, bisexual, rarely unisexual, tubular, corollas deeply 5-lobed, regularly or slightly irregularly, rarely obviously irregularly, lobed, lobes linear, revolute; anther bases long tailed, apex appendaged; styles shallowly divided at apex, style branches very short, abaxially with short hairs or papillae, apices obtuse. Achenes terete, obovoid, or obconic, 10-ribbed; pappus setae barbellate, numerous. $2n = 24, 26, 28$.

About 25 species: Afghanistan, China, Japan, Thailand; 17 species (16 endemic) in China.

1a. Leaf blade ovate to broadly ovate, rarely subelliptic on brachyblasts, (2.5–)3–7.5 mm wide, margin serrate, veins 3.

2a. Leaves alternate or tufted; capitulum solitary.

3a. Brachyblast leaves on branchlets elliptic; capitula terminal on branchlets 1. *P. scandens*

- 3b. Brachyblast leaves on branchlets ovate; capitula terminal on long shoots 2. *P. simozawae*
- 2b. Leaves alternate; capitula many, rarely few, in glomerulate or corymbose synflorescences.
- 4a. Capitulum 1-flowered; involucre cylindric, ca. 3 mm in diam. 3. *P. desmocephala*
- 4b. Capitulum 4–12-flowered; involucre campanulate, 5–12 mm in diam.
- 5a. Phyllary apices mucronate to acuminate, pungent 4. *P. pungens*
- 5b. Phyllary apices rounded to obtuse, never pungent.
- 6a. Capitula solitary, paired, or in corymbose synflorescences; leaf blade base broadly cuneate, obtuse, or truncate.
- 7a. Florets all bisexual; involucre narrowly campanulate, 5–6 mm in diam.; achenes glabrous or apices sparsely pubescent, pappus dark white 5. *P. henanensis*
- 7b. Marginal florets female, central florets bisexual; involucre broadly campanulate, ca. 12 mm in diam.; achenes densely hairy, pappus brownish 6. *P. corymbosa*
- 6b. Capitula 3–8 in glomerulate synflorescences; leaf blade base cordate, rarely truncate.
- 8a. Leaf blade apex mucronate or obtuse; florets 9–12 per capitulum 7. *P. pubescens*
- 8b. Leaf blade apex acuminate to caudate; florets 4 or 5 per capitulum 8. *P. cordifolia*
- 1b. Leaf blade linear, oblong, linear-lanceolate, or ovate-lanceolate, rarely subelliptic, 1–6(–15) mm wide, margin entire, vein 1, never 3, rarely with weak lateral veins.
- 9a. Phyllaries multiseriate, at least 6- or 7-seriate; leaf margin strongly revolute.
- 10a. Capitula many and small, 10–15 × 7–10 mm, solitary and terminal on branchlets or subtended by tufted leaves; florets 4–6 per capitulum.
- 11a. Leaves on branchlets homogeneous, leaf margin strongly revolute, terete, apex mucronate 9. *P. phyllicoides*
- 11b. Leaves on branchlets heterogeneous, leaf margin strongly or slightly revolute, dimorphic, one form terete, other form oblong or spatulate-oblong, apex obtuse or rounded 10. *P. berberidoides*
- 10b. Capitula few and large, 2.5–3 × 1.5–2.5 cm, solitary and terminal on branches; florets 7–11 per capitulum.
- 12a. Capitulum terminal, long pedunculate; phyllaries ca. 6-seriate; leaves subterete 11. *P. monocephala*
- 12b. Capitulum terminal or axillary, sessile; phyllaries 16–18-seriate; leaves on branchlets oblong 12. *P. tsoongiana*
- 9b. Phyllaries 3- or 4-seriate, rarely 5-seriate, few; leaf blade flat.
- 13a. Capitulum 1-flowered.
- 14a. Leaf blade oblong to linear, 11–40 × 2–5 mm; capitula solitary, terminal on branchlets; phyllaries 3-seriate 13. *P. uniflora*
- 14b. Leaf blade elliptic or obovate, 2–12 × 1–6 mm; capitula many, in leafy panicles, axillary or terminal; phyllaries 5–7-seriate 14. *P. bodinieri*
- 13b. Capitula multiflored or with only 2 florets in female plants.
- 15a. Involucre narrow, 2–3 mm in diam. 15. *P. discolor*
- 15b. Involucre wide, 5–8 mm in diam.
- 16a. Leaves without lateral veins and reticulate veins 16. *P. angustifolia*
- 16b. Leaves with obvious lateral veins and reticulate veins 17. *P. sinensis*

1. *Pertya scandens* (Thunberg) Schultz Bipontinus, Bonplandia 10: 109. 1862.

长花帚菊 chang hua zhou ju

Erigeron scandens Thunberg in Murray, Syst. Veg., ed. 14, 754. 1784; *Leucomeris scandens* (Thunberg) Schultz Bipontinus; *Pertya scandens* f. *schultziiana* Franchet; *P. scandens* var. *viridis* Nakai.

Shrubs, 1–1.5 m tall. Leaves on long shoots alternate, petiole short, leaf blade ovate, 2.5–3.5 × 1.5–2.5 cm, papery, 3-veined, both surfaces glabrous, base rounded, margin serrate, apex acute or obtuse; leaves on branchlets tufted, 3 or 4, petiole 2–4 mm, 3-veined, leaf blade elliptic or narrowly elliptic, 4–6.5 × 1.5–2.5 cm or 1.5–3 × 0.7–1 cm, abaxially glabrous, adaxially sparsely hispidulous along midvein, base cuneate, margin serrulate, apex acuminate. Capitula solitary, terminal on branchlets, sessile, ca. 3 cm, many flowered; involucre cylindric, ca. 1.5 × 0.8 cm; phyllaries ca. 7-seriate, margin and apices sparsely pilose, outer phyllaries ovate, 1–1.2 mm,

inner narrowly oblong, ca. 1.2 cm. Florets bisexual, corollas tubular, 1.6–1.9 cm, deeply 5-lobed, lobes linear-oblong, unequal. Achenes obconic, ca. 7 mm, densely white hairy, ribbed; pappus white, 0.8–1.1 cm. Fl. Jul–Aug.

Forest margins, open forests. Fujian, Jiangxi [Japan].

2. *Pertya simozawae* Masamune, Trans. Nat. Hist. Soc. Formosa 30: 37. 1940 [*“Simozawai”*].

台湾帚菊 tai wan zhou ju

Pertya scandens (Thunberg) Schultz Bipontinus var. *simozawae* (Masamune) Kitamura.

Shrubs. Leaves on long shoots alternate, petiole 1–3 mm, leaf blade ovate, 2–5 × 1.5–4.5 cm, papery, 3-veined, both surfaces sparsely villous, base rounded, margin mucronulate-dentate, apex acute or obtuse; leaves on branchlets tufted, 3 or 4, leaf blade ovate, deciduous, both surfaces sparsely villous, apex acute. Capitula solitary, terminal on long shoots, ca. 13-flowered; involucre campanulate, 1.4–1.7 cm; phyllaries ca. 7-seriate

ate, outer phyllaries ovate, inner narrowly oblong, ca. 1.2 cm. Florets bisexual, corolla tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, revolute. Achenes obconic, ca. 5.5 mm, densely white villous, ribbed; pappus 1.1–1.2 cm. Fl. Nov.

- Open forests; 300–1400 m. Taiwan.

3. *Pertya desmocephala* Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9: 1032. 1926.

聚头帚菊 *ju tou zhou ju*

Herbs, perennial, 0.5–1 m tall. Leaves alternate; petiole 3–7 mm; leaf blade broadly ovate, 4–7.5 × 2–6.5 cm, papery, 3-veined, both surfaces sparsely villous, glabrate when old, base shallowly cordate or auriculate, margin undulate-serrate, apex acuminate. Capitula 2–5 in glomerulate synflorescences, axillary on upper parts of branches, 1-flowered; peduncle 2–5 mm; involucre cylindrical, 1.1–1.3 cm × ca. 3 mm; phyllaries ca. 7-seriate, abaxially apically pubescent, apices obtuse to slightly acuminate, outer phyllaries ovate, 1.8–2.5 mm, inner linear, 1.1–1.3 cm. Florets bisexual, corolla tubular, 1.3–1.5 cm, deeply 5-lobed, lobes linear, unequal. Achenes fusiform, ca. 9 mm, villous, ribbed; pappus dark white to light brownish, ca. 1.3 cm. Fl. Aug–Nov.

- Forest margins, meadows, roadsides; 500–1200 m. Fujian, Guangdong, Jiangxi, Zhejiang.

4. *Pertya pungens* Y. C. Tseng, Guihaia 5: 334. 1985.

尖苞帚菊 *jian bao zhou ju*

Subshrubs, ca. 1 m tall. Leaves alternate; petiole 3–5 mm; leaf blade ovate, 3–5.5 × 2–4 cm, papery, 3-veined, both surfaces villous, base truncate or subtruncate, margin sparsely callose-denticulate, apex acuminate. Capitula 2–4-clustered on branch terminals, 7-flowered; involucre narrowly campanulate, 1.6–1.9 × ca. 0.6 cm; phyllaries ca. 7-seriate, abaxially glabrous or only outer phyllaries abaxially pubescent, apices acute to acuminate, pungent, outer phyllaries ovate, 1.8–4 mm, inner linear, 1.2–1.3 cm. Florets bisexual, corollas tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, 3–6.5 mm, unequal. Achenes fusiform, 6–7 mm, white villous, ribbed; pappus brownish, 1–1.2 cm. Fl. Oct–Nov.

- Stream banks. Guangdong (Hong Kong, Yangchun), Guangxi.

5. *Pertya henanensis* Y. C. Tseng, Guihaia 5: 330. 1985.

瓜叶帚菊 *gua ye zhou ju*

Herbs, perennial, ca. 1 m tall. Leaves alternate; petiole 5–8 mm; leaf blade ovate to broadly ovate, 5.5–10 × 3–7.5 cm, papery, 3-veined, abaxially villous, adaxially sparsely villous along midvein, base broadly cuneate or sometimes truncate, never cordate, margin hornlike dentate, ciliate, apex acuminate. Capitula solitary or double, axillary on upper part of branches, ca. 2 × 1 cm, 7–9-flowered; peduncle 4–15 mm; involucre cylindrical, ca. 1.5 × 0.5–0.6 cm; phyllaries 6- or 7-seriate, abaxially villous, margin ciliate, outer phyllaries ovate, ca. 2 mm, inner linear, ca. 1.1 cm. Florets bisexual, corolla tubular, 1–1.1 cm, deeply 5-lobed, lobes linear, revolute. Immature achenes terete, ca. 5 mm, glabrous or apically sparsely pubescent, ribbed; pappus dark white, ca. 0.8 cm. Fl. Sep.

- Forests; 900–1100 m. Henan, Sichuan.

6. *Pertya corymbosa* Y. C. Tseng, Guihaia 5: 332. 1985.

疏花帚菊 *shu hua zhou ju*

Subshrubs, 1–3 m tall. Leaves alternate; petiole 3–4 mm; leaf blade ovate or broadly ovate, 6–8 × 4–6 cm, subleathery, 3-veined, both surfaces sparsely villous along veins, adaxially sparsely villous along midvein, base broadly cuneate or obtuse, margin sparsely denticulate on middle and upper part, apex acute to acuminate. Capitula many in corymb, terminal on branches, 10- or 11-flowered; peduncle 1–4 cm; involucre broadly campanulate, 1.2–1.5 × ca. 1.2 cm; phyllaries 8-seriate, abaxially densely pubescent, apices rounded or obtuse, outer phyllaries ovate, 2–3 mm, inner narrowly oblong, ca. 10 mm. Florets bisexual, corollas tubular, 1.2–1.4 cm, deeply 5-lobed, lobes linear. Achenes fusiform, ca. 8 mm, hispid, ribbed; pappus brownish, 1–1.2 cm. Fl. Jul–Oct.

- Dense forests. Guangxi, Hunan.

7. *Pertya pubescens* Y. Ling, Contr. Inst. Bot. Natl. Acad. Peiping 6: 32. 1949.

腺叶帚菊 *xian ye zhou ju*

Pertya cordifolia Mattfeld var. *pubescens* Y. Ling, Contr. Bot. Surv. N.W. China 1(2): 41. 1939.

Subshrubs, 1–2 m tall. Leaves alternate; petiole 3–5(–10) mm; leaf blade broadly ovate or ovate, 5–8 × 4–7 cm, papery, 3-veined, both surfaces densely pubescent, base broadly cordate, subauriculate, sometimes truncate, margin sparsely denticulate, apex acute or obtuse. Capitula solitary or 2 or 3 in glomerulate synflorescences, axillary, 9–12-flowered; peduncle 4–11 mm; involucre narrowly campanulate, 1.1–1.3 cm × 6–8 mm; phyllaries 7- or 8-seriate, abaxially densely sericeous, apices obtuse or acute (inner phyllaries), outer phyllaries broadly ovate, 1–3 mm, inner linear-oblong, 9–10 mm. Florets bisexual, corollas tubular, ca. 1.8 cm, deeply 5-lobed, lobes linear, unequal. Achenes subfusiform, 5–6 mm, sericeous, ribbed; pappus light brownish, 1.1–1.4 cm. Fl. Jul–Oct.

- Open forests, grassy areas of stream banks, roadsides; 600–1000 m. Fujian, Guangdong, Jiangxi, Zhejiang.

8. *Pertya cordifolia* Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 103. 1931.

心叶帚菊 *xin ye zhou ju*

Subshrubs, 1–1.8 m tall. Leaves alternate; petiole 2–4 mm; leaf blade broadly ovate, 5–7 × 3.5–6 cm, papery, 3-veined, both surfaces sparsely hispidulous when young, glabrate when old, base cordate or shallowly cordate, sometimes subtruncate, margin undulate or sparsely denticulate, apex acuminate. Capitula 3–8 in glomerulate synflorescences, axillary, 4- or 5-flowered; peduncle 1–2 cm; involucre narrowly campanulate, ca. 1.2 cm × 5–6 mm; phyllaries ca. 8-seriate, abaxially pubescent, apices obtuse, outer phyllaries ovate, 1.8–4 mm, inner linear-oblong, 8–9 mm. Florets bisexual, corollas tubular, 1.5–1.6 cm, deeply 5-lobed, lobes linear, unequal. Achenes subfusiform, ca. 6 mm, densely hispidulous, ribbed; pappus light brownish, 1–1.2 cm. Fl. Sep–Oct.

• Margins of forests or scrub; 800–1500 m. Anhui, Hunan, Jiangxi.

9. *Pertya phylicoides* Jeffrey, Notes Roy. Bot. Gard. Edinburgh 5: 200. 1912.

针叶帚菊 zhen ye zhou ju

Shrubs, ca. 1 m tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade flat, linear-lanceolate to ovate-oblong, 4–8 × 1–4 mm; leaves on branchlets tufted, 4–6, sessile, leaf blade linear-lanceolate, 3–7 × 1–1.2 mm, abaxially glabrous, adaxially white sericeous, base attenuate, margin entire, strongly revolute, apex mucronate. Capitula solitary, terminal on branches, sessile, ca. 1.5 cm, 4–6-flowered; involucre cylindric, ca. 1 cm × 5 mm; phyllaries 6- or 7-seriate, abaxially sparsely pubescent, margin villous, outer phyllaries ovate, 2–2.5 mm, inner oblong-lanceolate, ca. 1 cm. Florets bisexual, corolla tubular, ca. 1 cm, deeply 5-lobed, lobes oblong-lanceolate, unequal. Achenes terete, 5–6 mm, densely white villous; pappus dark white, ca. 1 cm. Fl. Jun–Sep.

• Dry valleys; 2400–3100 m. Xizang, Yunnan.

10. *Pertya berberidoides* (Handel-Mazzetti) Y. C. Tseng, Guihaia 5: 328. 1985.

异叶帚菊 yi ye zhou ju

Pertya bodinieri Vaniot var. *berberidoides* Handel-Mazzetti, Symb. Sin. 7: 1174. 1936.

Shrubs, 0.5–1.5 m tall. Leaves on long shoots alternate, petiole base expanded, very short, leaf blade flat, ovate or ovate-lanceolate, 5–8 × 2–5 mm, both surfaces subglabrous, base rounded, margin entire or 2-dentate near middle part, apex attenuate; leaves on branchlets tufted, 4–6, sessile, dimorphic, one form flat, oblong to spatulate-oblong, 4–9 × 1–1.7 mm, abaxially glabrous, adaxially white stellate hairy, base attenuate, margin entire, slightly revolute, apex obtuse or rounded, other form strongly revolute, terete or awl-shaped, 2–5 × 0.7–1.2 mm, abaxially glabrous, adaxially densely sericeous, base attenuate, margin entire, strongly revolute, apex obtuse or mucronate. Capitula solitary, terminal on branches, sessile, 7–10 mm in diam., 5- or 6-flowered; involucre cylindric, ca. 6 mm in diam.; phyllaries 6- or 7-seriate, margin ciliate, outer phyllaries ovate, 1.5–2 mm, inner 9–12 mm. Florets bisexual, corollas tubular, 1–1.3 cm, deeply 5-lobed, lobes oblong-lanceolate. Achenes terete, ca. 6 mm, densely white villous; pappus dark white, ca. 1.1 cm. Fl. Jun–Sep.

• Mountain slopes, dry valleys; 2400–3200 m. Sichuan, Xizang, Yunnan.

11. *Pertya monocephala* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 212. 1914.

单头帚菊 dan tou zhou ju

Shrubs, 30–80 cm tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade not seen; leaves on branchlets tufted, 4–6, rarely 9, sessile, leaf blade linear-lanceolate, 5–6 × 1–2 mm, abaxially sparsely arachnoid lanate or subglabrous, adaxially white seri-

ceous, base obtuse, margin entire, strongly revolute, apex mucronate. Capitula few, solitary, terminal on branches, ca. 2.5 cm, 7–11-flowered; peduncle 0.5–2.5 cm; involucre subcampanulate, ca. 2 × 1.5 cm; phyllaries ca. 6-seriate, outer phyllaries ovate, 3–5 mm, inner lanceolate or oblong-lanceolate, ca. 2 cm. Florets bisexual, corollas tubular, ca. 2 cm, deeply 5-lobed, lobes linear. Achenes terete, ca. 8 mm, densely white villous; pappus snow white, 1.3–1.5 cm. Fl. Jan–Feb.

• Dry valleys; 1900–3000 m. Xizang, Yunnan.

12. *Pertya tsoongiana* Y. Ling, Contr. Bot. Surv. N.W. China 1(2): 40. 1939.

巫山帚菊 wu shan zhou ju

Shrubs, 1–1.5 m tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade not seen; leaves on branchlets tufted, 2–5, subsessile, leaf blade oblong, rarely narrowly elliptic, 6–12 × 2–5 mm, abaxially glabrous, adaxially glabrous or sparsely pubescent along midvein, base rounded, margin entire, slightly revolute, apex obtuse or rounded. Capitula very few, solitary, terminal on branchlets or very rarely axillary on long shoots, sessile, 2.5–3 cm, 8–10-flowered; involucre turbinate-campanulate, 2–2.5 × 1.5–1.8 cm; phyllaries 16–18-seriate, abaxially sparsely villous, margin scarious, lacerate, outer phyllaries ovate, ca. 0.5 mm, inner oblong-lanceolate, ca. 1.5 cm. Florets bisexual, corollas tubular, ca. 1.9 cm, deeply 5-lobed, lobes linear, 8–9 mm. Achenes fusiform-terete, 8–9 mm, densely white villous, ribbed; pappus white, ca. 1.2 cm. Fl. Apr–May.

• Mountain slopes; 300–700 m. Chongqing (Wushan).

13. *Pertya uniflora* (Maximowicz) Mattfeld, Notizbl. Bot. Gart. Berlin-Dahlem 11: 105. 1931.

单花帚菊 dan hua zhou ju

Myriopsis uniflora Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 27: 495. 1882.

Shrubs, ca. 1 m tall. Leaves on long shoots alternate, petiole ca. 1 mm, leaf blade oblong or linear-oblong, 11–25 × 2–4 mm, papery, abaxially densely sericeous, adaxially sparsely villous, base attenuate, margin entire, apex mucronate or obtuse; leaves on branchlets tufted, 3–5, leaf blade narrowly oblong to linear-lanceolate, 18–40 × 2–5 mm. Capitula solitary, terminal on branchlets, ca. 1.3 cm, 1-flowered; peduncle 2–4 mm; involucre narrowly cylindric, 9–10 × 2–3 mm; phyllaries ca. 3-seriate, abaxially densely white lanuginous, outer phyllaries ovate, ca. 3.5 mm, inner narrowly linear, 8–10 mm. Florets bisexual, corolla purplish red, tubular, ca. 10 mm, deeply 5-lobed, lobes linear, revolute. Achenes obovoid, ca. 5 mm, white villous, ribbed; pappus white, ca. 8 mm. Fl. Jun–Aug.

• Scrub on mountain slopes; 1900–2100 m. Gansu.

14. *Pertya bodinieri* Vaniot, Bull. Acad. Int. Géogr. Bot. 12: 116. 1903.

昆明帚菊 kun ming zhou ju

Subshrubs, 0.6–1.5 m tall. Leaves on long shoots alternate, petiole 1–3 mm, leaf blade oblong, 5–15 × 3–7 mm, papery,

both surfaces sparsely hispidulous, base attenuate, margin entire, ciliate, apex rounded or mucronate; leaves on branchlets tufted, 3–5, leaf blade subelliptic, 2–4 × 1–3 mm. Capitula many in large leafy panicles, 1-flowered; peduncle (0–)2–5 mm; involucre cylindric, 1.3–1.5 cm × 4–5 mm; phyllaries 5-seriate, abaxially pubescent, outer phyllaries ovate, 2–3 mm, inner narrowly oblong, 1.2–1.4 cm. Florets bisexual, corolla tubular, 1.7–1.9 cm, deeply 5-lobed, lobes linear, revolute. Achenes obovoid, ca. 6 mm, densely white villous, ribbed; pappus white or white-yellow, 1.2–1.5 cm. Fl. Jan–Mar.

- Stream banks; ca. 1900 m. Yunnan.

15. *Pertya discolor* Rehder, *J. Arnold Arbor.* 10: 135. 1929.

两色帚菊 liang se zhou ju

Shrubs, 0.8–2 m tall. Leaves on long shoots alternate, petiole ca. 1 mm, leaf blade linear-lanceolate, 7–30 × 2–4 mm, papery, abaxially densely sericeous, adaxially glabrous or sparsely villous when young, base attenuate, margin entire, apex mucronate; leaves on branchlets tufted, 3 or 4, leaf blade lanceolate or oblanceolate, 10–35 × 2–6 mm. Capitula solitary, terminal on branchlets; peduncle 2–5 mm; female capitula 1–1.1 cm, 2-flowered, male capitula 7–8 mm, 3–5-flowered; involucre cylindric, 2–3 mm in diam.; phyllaries 3-seriate, abaxially densely white lanuginous, outer phyllaries ovate, 2–3 mm, inner narrowly elliptic, ca. 6 mm. Florets unisexual, corollas purplish red, tubular, ca. 7 mm, deeply 5-lobed. Achenes obovoid-oblong or subterete, ca. 5 mm, villous; pappus white, ca. 8 mm. Fl. Jun–Aug.

- Scrub on mountain summits or slopes, coniferous forests; 1900–3200 m. Gansu, Ningxia, Qinghai, Shanxi, Sichuan.

- 1a. Leaf blade adaxially glabrous or sparsely villous when young, abaxially densely sericeous 15a. var. *discolor*
 1b. Leaf blade glabrous on both surfaces or sparsely villous abaxially when young 15b. var. *calvescens*

15a. *Pertya discolor* var. *discolor*

两色帚菊(原变种) liang se zhou ju (yuan bian zhong)

Leaf blade abaxially densely sericeous, adaxially glabrous or sparsely villous when young. Fl. Jun–Aug.

- Scrub on mountain summits, coniferous forests; 1900–3100 m. Gansu, Ningxia, Qinghai, Shanxi, Sichuan.

15b. *Pertya discolor* var. *calvescens* Y. Ling, *Contr. Inst. Bot. Natl. Acad. Peiping* 6: 28. 1949.

同色帚菊 tong se zhou ju

Leaf blade glabrous on both surfaces or sparsely villous abaxially when young. Fl. Jul.

- Scrub on mountain slopes; ca. 3200 m. Gansu.

16. *Pertya angustifolia* Y. C. Tseng, *Guihaia* 5: 328. 1985.

狭叶帚菊 xia ye zhou ju

Shrubs. Leaves on long shoots alternate, subsessile, leaf blade lanceolate or narrowly lanceolate, 2–3.5 × 0.3–0.6 cm, papery, abaxially subglabrous, adaxially sparsely pubescent, base attenuate, margin entire, ciliate, apex acuminate; leaves on branchlets tufted, 3 or 4, subsessile, leaf blade oblong or obovate-oblong. Capitula solitary, terminal on branchlets; peduncle ca. 2 cm × 7–8 mm; involucre broadly campanulate, 5–6 × ca. 5 mm; phyllaries ca. 3-seriate, margin ± arachnoid lanate, outer phyllaries ovate, ca. 3 mm, median obovate-oblong or subelliptic, 6–7 mm, inner oblanceolate, 4.5–6 mm. Florets bisexual, corollas tubular, 7–8.5 mm, deeply 5-lobed, lobes slightly unequal, oblong. Immature achenes obconic, ca. 1 mm, densely hairy; pappus snow white, ca. 6 mm. Fl. Apr.

- Meadows, scrub; ca. 3600 m. Sichuan (Dawu).

17. *Pertya sinensis* Oliver, *Hooker's Icon. Pl.* 23: t. 2214. 1892.

华帚菊 hua zhou ju

Myripnois maximowiczii C. Winkler.

Shrubs, deciduous, 1–2 m tall. Leaves on long shoots alternate, petiole 2–4 mm, leaf blade oblong-lanceolate to lanceolate, 3–5 × 1.2–1.5 cm, papery, both surfaces sparsely pilose or glabrescent, base attenuate or obtuse, margin entire, apex acuminate or mucronate; leaves on branchlets 4–6, tufted, leaf blade oblong-lanceolate to narrowly elliptic, 4–6 × 1.2–1.5 cm or smaller. Capitula solitary, terminal on branchlets, dioecious; peduncle 2–3 cm; female capitula ca. 10 mm, with 4 or 5 florets, male 6–7 mm, with 9–12 florets; involucre narrowly campanulate or subcylindric, 5–8 mm in diam.; phyllaries 4- or 5-seriate, abaxially glabrous or margin sparsely pubescent, outer phyllaries broadly ovate, ca. 2 mm, median obovate, ca. 5 mm, inner oblanceolate, 8–9 mm. Female floret corollas tubular, ca. 9 mm, deeply 5-lobed, lobes unequal; male floret corollas deeply 5-lobed, limbs expanded. Achenes fusiform, ca. 7 mm, 10-ribbed, densely hairy; pappus yellow-white, 7–10 mm. Fl. Jun–Aug.

- Scrub, coniferous forests; 2100–2500 m. Gansu, Henan, Hubei, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.

9. MYRIPNOIS Bunge, *Enum. Pl. China Bor.* 38. 1833.

蚂蚱腿子属 ma zha tui zi shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Shrubs, deciduous. Leaves on long shoots alternate, leaf blade elliptic or suboblong, papery; leaves on branchlets tufted, subsessile, leaf blade broadly lanceolate or ovate-lanceolate. Capitula solitary, terminal on branchlets, subsessile or with short peduncle, dioecious, hysteroanthous; involucre campanulate or subcylindric; phyllaries few, 2- or 3-seriate, imbricate, subequal, herbaceous; receptacle small, glabrous, epaleate. Florets few, female florets tubular, corollas purple, irregularly deeply 5-lobed, often with one slit

deepest; male florets white, tubular, corolla irregularly deeply 5-lobed; anther bases of male florets tailed, apex appendaged, anthers of male florets reduced; styles of female florets shallowly divided at apex, style branches very short, abaxially with short hairs, apices obtuse; styles of male florets nearly undivided, abaxially papillate. Achenes fusiform, densely long setuliferous; pappus setae of female florets numerous, barbellate to subplumose; carpodium annular; pappus setae of male florets of very few scabrid bristles.

- One species: China.

1. *Myriopholis dioica* Bunge, Enum. Pl. China Bor. 38. 1833.

蚂蚱腿子 ma zha tui zi

Shrubs, deciduous, 0.6–1.6 m tall. Leaves on long shoots alternate, petiole 3–5 mm, leaf blade elliptic or suboblong, 2–6 × 1–2 cm, papery, both surfaces villous when young and glabrescent when old, base rounded or cuneate, margin entire, apex mucronate to acuminate; leaves on branchlets tufted, subsessile, leaf blade broadly lanceolate or ovate-lanceolate. Capitula solitary, terminal on branchlets, subsessile or with peduncle ca. 8 mm, dioecious, hysteroanthous, 7–10 mm in diam.; involucre

campanulate or subcylindric, 6–8 mm in diam.; phyllaries 2- or 3-seriate, few, subequal, oblong or suboblong, 8–10 mm, abaxially densely sericeous. Female floret corollas purple, ca. 13 mm, irregularly deeply 5-lobed, often with one slit deepest; male floret corollas white, ca. 13 mm, irregularly deeply 5-lobed. Achenes fusiform, ca. 7 mm, densely hairy; pappus setae of female florets numerous, light white, ca. 10 mm; pappus setae of male florets very few, snow white, 7–8 mm. Fl. Apr–May.

- Open places on mountain slopes; 100–600 m. Hebei, Henan, Hubei, Liaoning, Nei Mongol, Shaanxi, Shanxi.