

14. CHRYSOSPLENIUM Linnaeus, Sp. Pl. 1: 398. 1753.

金腰属 *jin yao shu*

Pan Jintang (潘锦堂); Hideaki Ohba

Herbs perennial, small, usually with stolons, bulbs, or bulbils. Leaves alternate or opposite, petiolate, exstipulate, simple. Inflorescence a cyme surrounded by bracteal leaves, rarely flower solitary. Hypanthium ± adnate to ovary. Sepals 4(or 5), imbricate in bud. Petals absent. Disc absent, obscure, or distinctly (4 or)8-lobed, sometimes surrounded by brown papillae. Stamens 4 or 8(or 10); filaments subulate; anthers 2-loculed, laterally dehiscent; pollen grains minute, 3-colporoidate, with fine reticulum. Carpels 2, usually connate proximally; ovary subsuperior, semi-inferior, or subinferior, 1-loculed; placentas 2, parietal; ovules many; styles 2, free; stigmas punctate. Fruit a capsule, with 2 subequal or distinctly unequal carpels. Seeds many, ovoid to ellipsoid, smooth, papillose, tuberculate, puberulous, sulcate, or other texture.

About 65 species: Africa, America, Asia, Europe; 35 species (20 endemic) in China.

1a. Cauline leaves opposite; bulbs and bulbils absent.

2a. Capsule not truncate at apex, carpels subequal then erect or divergent.

3a. Stems and leaves pilose; seeds with undulate, transverse lines 26. *C. hebetatum*

3b. Stems and leaves glabrous, but sparsely brown papillose at axils and on leaves adaxially; seeds smooth,

glabrous 25. *C. nepalense*

2b. Capsule subtruncate and retuse at apex, carpels subequal, horizontal; if capsule apex not truncate then carpels distinctly unequal and divaricate.

4a. Capsule truncate at apex, carpels distinctly unequal, divaricate.

5a. Seeds sulcate, ridges papillose 30. *C. pilosum*

5b. Seeds not sulcate, papillose or puberulous.

6a. Disc distinct; ovary usually semi-inferior 29. *C. cavaleriei*

6b. Disc obscure or absent; ovary semi-inferior or subsuperior.

7a. Terminal sterile branch leaves sometimes brown papillose abaxially; cauline leaves, flowering stems, inflorescence branches, pedicels, and bracteal leaves glabrous 27. *C. sinicum*

7b. Terminal sterile branch leaves not brown papillose abaxially; flowering stems, inflorescence branches, and pedicels brown pilose; cauline leaves and bracteal leaves glabrous except margin ± ciliate 28. *C. lectus-cochleae*

4b. Capsule subtruncate and retuse at apex, carpels subequal, horizontal.

8a. Flowering stems brown pilose; cauline leaves brown pilose adaxially; seeds smooth, glabrous 31. *C. ramosum*

8b. Flowering stems glabrous or brown papillose; cauline leaves glabrous or brown papillose

adaxially;

seeds 13–16-sulcate, ridges marked by transverse lines (?except in *C. lixianense*).

9a. Cauline leaves sparsely brown papillose on both surfaces; flowers unisexual (plants dioecious); female flowers with stamens absent and disc 8-lobed, surrounded by sparse, brown papillae; male

flowers with pistil obsolete and disc not surrounded by papillae 35. *C. biondianum*

9b. Cauline leaves glabrous; flowers bisexual.

10a. Stolons arising from leaf axils, glabrous; cauline leaves distinctly obtusely 7–9-dentate 34. *C. qinlingense*

10b. Stolons absent; cauline leaves obscurely 7–12-crenate.

11a. Cauline leaves broadly ovate or orbicular to flabellate, sparsely brown papillose abaxially; bracteal leaves sparsely brown papillose abaxially; sepals broadly suborbicular, apex retuse, with 1 brown papilla 32. *C. delavayi*

11b. Cauline leaves reniform to broadly orbicular, glabrous; bracteal leaves glabrous; sepals broadly

ovate to broadly orbicular, apex obtuse to acute 33. *C. lixianense*

1b. Cauline leaves alternate, sometimes only 1 or absent; bulbs or bulbils sometimes present.

12a. Seeds smooth, glabrous.

13a. Disc distinctly 8-lobed.

14a. Stolons arising from leaf axils; proximal cauline leaves scalelike, distal ones ovate to broadly so or subspatulate to broadly obovate.

15a. Distal cauline leaves ovate to broadly so, base rounded-cuneate; cyme remotely flowered or flowers solitary at leaf axils, pedicel barely 1.9 cm; sepals spreading, subrhombic 11. *C. axillare*

15b. Distal cauline leaves subspatulate to broadly obovate, base cuneate; cyme 7–10-flowered, pedicel barely 0.7 cm; sepals erect, broadly orbicular 12. *C. carnosum*

14b. Stolons absent; leaves reniform or broadly orbicular-reniform.

- 16a. Plants 8.5–32.7 cm tall; stems glabrous; cauline leaves glabrous on both surfaces 9. *C. griffithii*
16b. Plants 5–6.3 cm tall; stems brown crisped villous; cauline leaves brown pilose on both surfaces 10. *C. fuscopunctulosum*
- 13b. Disc obscure or absent.
- 17a. Leaves not reniform.
- 18a. Distal cauline leaves lanceolate to narrowly oblanceolate; sepals retuse at apex; styles and capsular carpels embedded in calyx, not visible 8. *C. absconditicapsulum*
- 18b. Distal cauline leaves broadly obovate or broadly ovate; sepals obtuse at apex; styles or capsular carpels partly visible above calyx.
- 19a. Distal cauline leaves broadly obovate; stamens 1.6–2.2 mm, visible above calyx .. 6. *C. oxygraphoides*
19b. Distal cauline leaves broadly ovate; stamens 1–1.5 mm, not visible above calyx 7. *C. sikangense*
- 17b. Leaves reniform.
- 20a. Stolons absent.
- 21a. Plants to 20 cm or more tall; stem brown pilose and papillose at leaf axils, elsewhere glabrous, with 1 leaf; basal leaves shallowly 15–26-dentate at margin; sepals subspreading 1. *C. forrestii*
- 21b. Plants barely 10 cm tall; stem brown pilose or papillose, usually without leaves; basal leaves shallowly 7–15-dentate at margin; sepals erect 2. *C. nudicaule*
- 20b. Stolons present.
- 22a. Bulbs absent; stolons usually subterranean, scaly; basal leaves pilose adaxially, cauline leaf usually 1, ± pubescent 3. *C. serreanum*
- 22b. Bulb 1, subterranean; stolons above ground, glabrous; leaves glabrous.
- 23a. Leaves, bracteal leaves, and sepals distinctly brown spotted; flower solitary or cyme 2- or 3-flowered 5. *C. uniflorum*
- 23b. Leaves, bracteal leaves, and sepals not distinctly brown spotted; cyme 6–15-flowered 4. *C. giraldianum*
- 12b. Seeds papillose or puberulous.
- 24a. Disc obscure or absent.
- 25a. Stems glabrous; basal leaves reniform to orbicular-reniform 13. *C. chinense*
- 25b. Stems brown villous; basal leaves broadly ovate to orbicular, or obovate to elliptic, sometimes oblong.
- 26a. Sterile branches absent; basal leaf margin 20–36-crenate, sometimes obscurely so; stamens shorter than sepals; capsule rostrums ca. 0.5 mm 16. *C. glossophyllum*
- 26b. Sterile branches arising from proximal cauline leaf axils; basal leaf margin (7–)13–17-crenate, or undulate-crenulate to entire; stamens subequaling or longer than sepals; capsule rostrums 1–4 mm.
- 27a. Basal leaves broadly ovate to broadly subelliptic, (0.5–)2.1–4.2 × (0.7–)2–3.7 cm, brown pilose on both surfaces along veins and at margin, base usually subtruncate to subcordate, margin (7–)13–17-crenate; sepals usually orbicular; stamens 1–2 mm, subequaling sepals; capsule rostrums ca. 1 mm 14. *C. davidianum*
- 27b. Basal leaves obovate, 2.3–19 × 1.3–11.5 cm, glabrous abaxially, brown pilose adaxially, base cuneate, margin undulate-crenulate or entire; sepals subovate to broadly ovate; stamens 4–6.5 mm, distinctly longer than sepals; capsule rostrums 3–4 mm 15. *C. macrophyllum*
- 24b. Disc distinct, if obsolete then surrounded by dense, brown papillae.
- 28a. Disc usually obsolete, surrounded by dense, brown papillae.
- 29a. Sterile branches present; stolons absent; basal leaves present; cauline leaf margin 5–9-crenate, teeth obtuse at apex 22. *C. lanuginosum*
- 29b. Sterile branches absent; stolons sometimes present; basal leaves absent; cauline leaf margin shallowly 7–9-dentate, teeth retuse at apex.
- 30a. Stolons arising from proximal cauline leaf axils; leaves subflabellate to ± semiorbicular, brown pilose and papillose adaxially near base and at sinus, base broadly cuneate to truncate, margin shallowly 7–9-dentate; bracteal leaves flabellate to nearly semiorbicular, brown pilose adaxially near base; disc obsolete, surrounded by dense, brown papillae 24. *C. taibaishanense*
- 30b. Stolons absent; leaves subreniform, brown pilose on both surfaces and at margin, base cordate,

- margin shallowly 9-dentate; bracteal leaves subreniform to broadly suborbicular, glabrous on both surfaces; disc 8-lobed, surrounded by sparse, brown papillae 23. *C. jienningense*
- 28b. Disc usually 8-lobed, rarely 4-lobed, not surrounded by brown papillae.
- 31a. Stems glabrous; cauline leaf petiole glabrous; basal leaves reniform to orbicular-reniform or broadly ovate to subreniform, cauline leaves broadly suborbicular or broadly ovate.
- 32a. Stolons arising from basal leaf axils; basal leaves reniform to orbicular-reniform, pilose adaxially, margin obtusely 12–18-dentate; cauline leaves broadly suborbicular, margin obtusely 5-dentate; inflorescence branches and pedicels glabrous; seeds sparsely puberulous . 20. *C. flagelliferum*
- 32b. Stolons absent; basal leaves broadly ovate to subreniform, glabrous on both surfaces, margin 8-crenate, teeth usually overlapping at margin; cauline leaves usually broadly subovate, margin 7- or 8-crenate; inflorescence branches and pedicels ± brown papillose; seeds densely papillose 21. *C. microspermum*
- 31b. Stems ± brown pilose; petiole brown villous at base; leaves orbicular to reniform.
- 33a. Plants ca. 27 cm tall; basal leaves brown spotted; petiole 2.5–14 cm; leaf blade 2.3–8.5 × 2.4–8.5 cm, glabrous on both surfaces, margin undulate or 34–37-crenate, teeth colorless and narrow at margin; flowers 5–6 mm in diam. 17. *C. hydrocotylifolium*
- 33b. Plants 8–15.5 cm tall; basal leaves unspotted; petiole 1.5–8 cm; leaf blade 0.6–2.2 × 0.9–2.5 cm, glabrous abaxially, pilose adaxially, margin shallowly 15–17-dentate or obscurely crenate; flowers ca. 3 mm in diam.
- 34a. Stems pilose; leaves subglabrous abaxially, margin shallowly dentate; inflorescence branches pilose; stamens (2 or)4(or 8); disc usually 4-lobed 18. *C. japonicum*
- 34b. Stems pilose near base, elsewhere glabrous; leaves glabrous abaxially, margin crenate or obscurely so; inflorescence branches glabrous; stamens 8; disc not 4-lobed 19. *C. wuwenchenii*

1. *Chrysosplenium forrestii* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 282. 1912.

贡山金腰 gong shan jin yao

Herbs (3.5–)8.4–22.8 cm tall. Stems brown pilose and papillose at leaf axils, elsewhere glabrous. Basal leaves with petiole (2.3–)9–13 cm; leaf blade reniform, (1.4–)3–5.2 × (1.7–) 3–7 cm, abaxially and at sinus brown pilose and papillose, adaxially glabrous, margin shallowly 15–26-dentate, teeth retuse at apex. Cauline leaf 1; petiole 0.6–9 cm, sparsely brown papillose; leaf blade reniform, (1.1–)2–3.4 × (1.5–)4.1–5.2 cm, abaxially and at sinus sparsely brown papillose, adaxially glabrous, margin shallowly 22–29-dentate, teeth mainly not overlapping at margin and apex retuse. Cyme 3.3–4.3 cm; bracteal leaves reniform to flabellate, 0.7–2.8 × 0.8–3.5 cm, abaxially brown pilose, adaxially glabrous, brown papillose and pilose at sinus, margin shallowly 5–15-dentate, teeth retuse at apex. Pedicel 0.3–4 mm. Sepals subspreading, ± overlapping, broadly orbicular, ca. 2.1 × 2–3 mm, apex obtuse. Stamens shorter than sepals; filaments ca. 0.9 mm. Ovary semi-inferior; styles ca. 0.3 mm. Capsule ca. 3 mm, apex subtruncate, retuse; rostrums ca. 0.4 mm. Seeds dark brown, shiny, ovoid, 0.9–1 mm, smooth, glabrous. Fl. and fr. May–Oct.

Forests, alpine scrub meadows, alpine rock clefts; 3600–4700 m. SE Xizang, NW Yunnan [Bhutan, N India, N Myanmar, Nepal].

2. *Chrysosplenium nudicaule* Bunge in Ledebour, Fl. Altaic. 2: 114. 1830.

裸茎金腰 luo jing jin yao

Herbs 4.5–10 cm tall. Stems sparsely papillose and pilose, usually leafless. Basal leaves with petiole 1–7.5 cm, proximally brown pilose; leaf blade reniform, ca. 0.9 × 1.3 cm, leathery, both surfaces glabrous, brown

pilose and papillose at sinus, margin shallowly (7–)11–15-dentate, teeth broadly orbicular, ca. 3 × 4 mm, usually overlapping at margin, retuse and 1-verrucose at apex. Cyme dense, ca. 1.1 cm, subglabrous; bracteal leaves broadly ovate to flabellate, 3–6.8 × 2.8–8.1 mm, leathery, abaxially glabrous, adaxially sparsely brown pilose, brown pilose at sinus, shallowly 3–9-dentate, teeth broadly orbicular, ± overlapping at margin, 1-verrucose at apex. Hypanthium brown pilose. Sepals erect, ± overlapping, broadly orbicular, 1.8–2 × 3–3.5 mm, brown pilose and papillose at sinus, apex obtuse. Stamens 8, ca. 1.1 mm. Carpels subequal; ovary semi-inferior; styles 0.6–0.8 mm. Capsule ca. 3.4 mm, apex retuse; carpels subequal; rostrums ca. 0.7 mm. Seeds dark brown, shiny, ovoid, 1.3–1.6 mm, smooth, glabrous.

Rock clefts; 2500–4800 m. Gansu, Qinghai, ?Shaanxi, Xinjiang, E Xizang, NW Yunnan [Mongolia, Nepal, Russia].

3. *Chrysosplenium serreanum* Handel-Mazzetti, Oesterr. Bot. Z. 80: 341. 1931.

五台金腰 wu tai jin yao

Chrysosplenium alternifolium Linnaeus subsp. *sibiricum* (Seringe) Hultén; *C. alternifolium* var. *sibiricum* Seringe; *C. sibiricum* (Seringe) Kharkevich.

Herbs 6.5–19.5 cm tall, not brown spotted. Stolons with scalelike leaves brown pilose at margin. Basal leaves with petiole 2.5–4 cm, pilose; leaf blade reniform to orbicular-reniform, 0.8–2.5 × 1–3 cm, both surfaces and margin pilose, sometimes glabrous abaxially, margin 8–11-crenate, teeth 1-verrucose at apex. Cauline leaf usually 1, rarely absent; petiole 1.5–4 cm, brown

pilose; leaf blade reniform, 0.4–1 × 0.7–1.7 cm, ± pilose, base subcordate to cordate, margin 5–9-crenate. Cyme 1.5–3 cm; bracteal leaves brown pilose and papillose at axil, leaf blade ovate or broadly subovate to broadly orbicular, 0.4–1.5 × 0.3–2 cm, glabrous, base cuneate to broadly so, margin 2–7-crenate, rarely entire. Flowers yellow, 3–4 mm in diam.; pedicel glabrous or pilose. Sepals erect, broadly ovate to orbicular, 1.5–2 × 1.4–2 mm, glabrous, apex obtuse. Stamens 8, ca. 1 mm. Ovary semi-inferior; styles erect or divergent, ca. 0.7 mm. Capsule 2.6–3 mm, apex retuse; carpels subequal; rostrums 0.5–0.7 mm. Seeds dark brown, shiny, ovoid, 0.9–1 mm, smooth, glabrous. Fl. and fr. May–Jul.

Forests, riversides; 1700–2800 m. Hebei, Heilongjiang, Nei Mongol, Shanxi [Japan, Korea, Mongolia, Russia].

4. *Chrysosplenium giraldianum* Engler, Bot. Jahrb. Syst. 36 (Beibl. 82): 49. 1905.

纤细金腰 xian xi jin yao

Herbs 7–17 cm tall, not distinctly brown spotted. Bulb 1, subterranean. Stolons above ground, glabrous. Basal leaves absent. Cauline leaves with petiole 1.4–2.4 cm; leaf blade usually reniform, 0.7–2.3 × 0.9–3 cm, glabrous, base usually cordate, rarely broadly cuneate, margin 7–17-crenate, teeth retuse and 1-verrucose at apex. Cyme 1–2.5 cm, 6–15-flowered; bracteal leaves with petiole 0.2–1.8 cm, brown papillose at axil, leaf blade broadly ovate to reniform, 0.3–2.5 × 0.3–3 cm, glabrous, base usually cordate, margin 5–13-crenate, teeth retuse (sometimes entire) and 1-verrucose at apex. Flowers green, ca. 3.7 mm in diam.; pedicel 1.2–1.8 mm. Sepals erect, broadly ovate, 1.2–1.6 × 1.2–1.9 mm, glabrous, apex obtuse. Stamens 8, ca. 0.5 mm. Ovary semi-inferior; styles horizontal, ca. 0.2 mm. Disc absent. Capsule 1.8–2.7 mm, apex truncate, retuse; carpels subequal; rostrums ca. 0.8 mm. Seeds dark brown, shiny, subovoid, 0.8–1 mm, smooth, glabrous. Fl. and fr. Jun–Sep.

• Forests, shaded and wet places in ravines; 1400–2200 m. S Gansu, NW Henan, Shaanxi.

5. *Chrysosplenium uniflorum* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 27: 472. 1881.

单花金腰 dan hua jin yao

Herbs (2–)6.5–15 cm tall. Bulb 1, subterranean. Stolons arising from leaf axils, filiform, glabrous. Stems glabrous; internodes sometimes very short. Leaves alternate, brown spotted, proximal ones scalelike, margin entire, distal ones with petiole 1–1.9 cm, brown papillose at axil; leaf blade reniform, 0.8–1.3 × 0.9–1.7 cm, both surfaces glabrous, base ± cordate, margin 7–11-crenate, teeth brown papillose at sinus, retuse and 1-verrucose at apex. Flower solitary or cyme 2- or 3-flowered; bracteal leaves brown papillose at axil, leaf blade ovate to orbicular-cordate, 3–13 × 2.5–13 mm, both surfaces glabrous, base rounded to cordate, margin 5–11-crenate. Pedicel nearly absent. Sepals erect, broadly ovate to broadly subobovate, 2–3 × 2.2–3 mm, brown papillose at sinus, elsewhere glabrous, apex

obtuse or retuse. Stamens 8; filaments 1–1.6 mm. Pistil 2.6–4.1 mm; ovary semi-inferior, styles 0.9–1.1 mm. Disc obscure. Capsule ca. 3 mm, apex retuse; rostrums ca. 1 mm. Seeds dark brown, shiny, ovoid, ca. 1 mm, smooth, glabrous. Fl. and fr. Jul–Aug.

Forests, alpine meadows, alpine rock clefts; 2400–4700 m. Gansu, Qinghai, S Shaanxi (Taibai Shan), W Sichuan, E Xizang, NW Yunnan [Nepal].

6. *Chrysosplenium oxygraphoides* Handel-Mazzetti, Symb. Sin. 7: 428. 1931.

鸦跖花金腰 ya zhi hua jin yao

Chrysosplenium ludlowii H. Hara.

Herbs 1–1.5 cm tall. Rhizomes thick. Sterile branches well developed, arising from leaf axils together with stolons. Stems thick, subcarnose, brown papillose at leaf axils, elsewhere glabrous. Cauline leaves 2 or 3, alternate; petiole 2–2.5 mm, margin brown glandular pilose; leaf blade broadly obovate, 3.6–3.8 × 4.1–4.4 mm, leathery or subcarnose, glabrous, base cuneate, margin 5-crenate. Cyme usually 3-flowered; bracteal leaves with petiole ca. 1 mm, brown papillose at axil, leaf blade ovate to broadly so, 4.1–4.4 × 3–5.3 mm, base cuneate, margin 5-crenate. Flowers sessile, yellow, 4.5–5.2 mm in diam. Sepals orbicular to broadly so, 1.5–1.6 × 1.2–3 mm, glabrous, apex obtuse. Stamens 8, 1.6–2.2 mm, longer than sepals. Ovary semi-inferior, ca. 1.9 mm; styles divergent, ca. 2 mm. Fl. and fr. May–Aug.

• Alpine rock clefts, meadows by water; 3200–4300 m. SW Sichuan, SE Xizang.

7. *Chrysosplenium sikangense* H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 75. 1957.

西康金腰 xi kang jin yao

Herbs 3.5–4.5 cm tall. Stems brown papillose at leaf axils, elsewhere glabrous. Leaves alternate; petiole 1–3.1 mm; leaf blade broadly ovate, 2–4 × 2.5–6 mm, glabrous, base broadly cuneate, margin 6-crenate. Cyme 0.8–1.1 cm, ca. 3-flowered; bracteal leaves with petiole 2–3 mm, brown papillose at axil, leaf blade broadly ovate to flabellate, 4–4.6 × 4.2–5.6 mm, subcarnose, base broadly cuneate, margin 5- or 6-crenate. Pedicel very short, glabrous. Sepals erect, orbicular-square to broadly suborbicular, 1.5–1.9 × 2–3 mm, glabrous, apex subtruncate. Stamens 1–1.5 mm. Ovary semi-inferior. Disc obscure. Capsule 4–4.4 mm; carpels subequal; rostrums ca. 0.6 mm. Seeds dark brown, shiny, ovoid, ca. 1 mm, smooth, glabrous. Fl. and fr. Jul–Sep.

• Scree slopes; 3700–4100 m. SE Xizang, NW Yunnan.

8. *Chrysosplenium absconditcapsulum* J. T. Pan in C. Y. Wu, Fl. Xizang. 2: 450. 1985.

蔽果金腰 bi guo jin yao

Herbs caespitose, 3.4–4.4 cm tall, glabrous except brown papillose at leaf and bracteal leaf axils. Stems much branched; stolons 2 or 3, arising from leaf axils. Distal sterile branch leaves with petiole 1–1.4 mm; leaf blade

ovate, 4.7–5.4 × 2.2–2.6 mm, base cuneate, margin 5-crenate. Cauline leaves alternate, sessile, narrowly ovate or lanceolate to narrowly oblanceolate, 4.4–6.7 × 1.5–2 mm, margin irregularly 14–17-dentate on proximal leaves, 5-dentate on distal ones, teeth 1-verrucose at apex. Pleiochasium 1.3–2.8 cm, ca. 9-flowered; bracteal leaves narrowly ovate, ca. 4.5 × 2.1 mm, base gradually narrowed into a petiole ca. 1.7 mm, margin 3–5-crenate. Flowers green, campanulate; pedicel 0.8–1.5 mm. Sepals subelliptic to orbicular-square, 1.5–1.6 × 1.4–2.4 mm, apex retuse. Stamens 8; filaments 0.8–0.9 mm. Ovary subinferior, ca. 2.7 mm; styles erect, ca. 1 mm. Disc absent. Capsule with carpels subequal, embedded in calyx, not visible. Seeds dark brown, shiny, subellipsoid, ca. 1 mm, smooth, glabrous. Fl. and fr. Jun–Aug.

• About 3700 m. S Xizang (Lhasa Shi).

9. *Chrysosplenium griffithii* J. D. Hooker & Thomson, J. Proc. Linn. Soc., Bot. 2: 74. 1858.

肾叶金腰 shen ye jin yao

Herbs caespitose, (3–)8.5–33 cm tall. Stems simple, glabrous or brown pilose, sometimes also brown papillose. Basal leaf 1 or absent; petiole 7.3–8.7 cm, sparsely brown papillose and pilose; leaf blade reniform, 0.7–3 × 1.2–4.6 cm, margin 7–9-lobed, lobes broadly subovate, 2–8.5 × 3–6 mm, mainly not overlapping at margin. Cauline leaves alternate; petiole 3–5 cm, brown papillose and pilose at axil; leaf blade reniform, 2.3–5 × 3.2–6.5 cm, both surfaces glabrous, margin 11–15-lobed, lobes subelliptic to subovate, 0.6–1.5 cm × 6–11 mm, sometimes brown papillose and pilose at sinus, usually retuse and 1-verrucose at apex, rarely 3-crenate. Cyme 38–100 cm, remotely many flowered; bracteal leaves with petiole 0.8–1.5 cm, brown papillose and pilose at axil, leaf blade reniform, flabellate, or broadly ovate to orbicular, 0.3–3 × 0.4–4.3 cm, sometimes brown papillose and pilose at sinus, margin 3–12-lobed, lobes subovate to subelliptic, 2–13 × 2–11 mm. Flowers yellow, 4.2–4.6 mm in diam.; pedicel 0.3–1.1 cm, brown papillose and pilose. Sepals spreading, orbicular to broadly rhombic-ovate, 1.3–2.6 × 1.5–3 mm, margin usually entire, rarely irregularly dentate, apex obtuse. Stamens 8; filaments 0.3–0.5 mm. Ovary semi-inferior; styles ca. 0.4 mm. Disc 8-lobed. Capsule ca. 3 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 0.4 mm. Seeds dark brown, shiny, ovoid, 0.7–1 mm, smooth, glabrous. Fl. and fr. May–Sep.

Forests, forest margins, alpine meadows, alpine rock clefts; 2500–4800 m. S Gansu, S Qinghai, S Shaanxi, N and W Sichuan, SE Xizang, N Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

- 1a. Stems glabrous; leaf blade thinly herbaceous 9a. var. *griffithii*
- 1b. Stems brown pilose; leaf blade thickly leathery 9b. var. *intermedium*

9a. *Chrysosplenium griffithii* var. *griffithii*

肾叶金腰(原变种) shen ye jin yao (yuan bian zhong)

Plants 8.5–33 cm tall. Stems glabrous. Leaf blade thinly herbaceous. Fl. and fr. May–Sep.

Forests, forest margins alpine meadows, alpine rock clefts; 2500–4800 m. S Gansu, S Shaanxi (Taibai Shan), N and W Sichuan, SE Xizang, N Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

9b. *Chrysosplenium griffithii* var. *intermedium* (H. Hara) J. T. Pan, Acta Phytotax. Sin. 24: 92. 1986.

居间金腰 ju jian jin yao

Chrysosplenium nudicaule Bunge var. *intermedium* H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 65. 1957.

Plants 3–14 cm tall. Stems brown pilose, sometimes also brown papillose. Leaves thickly leathery. Fl. and fr. Aug–Sep.

Forest margins, alpine meadows, alpine rock clefts; 3100–4800 m. S Qinghai, NW Sichuan, SE Xizang, NW Yunnan [Bhutan, Nepal].

10. *Chrysosplenium fuscopunctulosum* Z. P. Jien, Acta Phytotax. Sin. 8: 339. 1963.

褐点金腰 he dian jin yao

Herbs 5–6.3 cm tall. Stems simple, brown crisped villous. Basal leaf 1 or absent; petiole ca. 1.7 cm, brown pilose; leaf blade broadly orbicular-reniform, 3–8 × 5–12 mm, both surfaces glabrous, base cordate, margin ca. 13-crenate, teeth retuse at apex, with 1 brown, short hair. Cauline leaves 1 or 2, alternate; petiole 5–6 mm, brown crisped villous; leaf blade subreniform, 4.5–7 × 7–8 mm, both surfaces brown pilose, base ± cordate, margin 5–9-crenate. Cyme 1.1–2.1 cm, 3–11-flowered; bracteal leaves with petiole 1.2–3.5 mm, glabrous or brown pilose, leaf blade broadly ovate to broadly orbicular, 2.7–3 × 3.2–4 mm, both surfaces glabrous or brown pilose, sometimes papillose, base broadly cuneate to truncate, margin (2 or)3–6-crenate, teeth retuse and 1-verrucose at apex. Flowers 4.2–4.5 mm in diam.; pedicel brown pilose. Sepals spreading, brown spotted, broadly rhombic-orbicular, 1.3–1.8 × 1.4–2.4 mm, margin entire, apex obtuse. Stamens 8; filaments ca. 0.5 mm. Ovary semi-inferior; styles erect or divergent, 0.5–0.6 mm. Disc 8-lobed. Capsule ca. 2 mm, apex retuse; carpels subequal; rostrums ca. 0.8 mm. Seeds dark brown, shiny, ellipsoid, smooth, glabrous. Fl. and fr. Jun–Jul.

• Rock clefts in forest understories; ca. 3600 m. NW Yunnan.

11. *Chrysosplenium axillare* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 23: 341. 1877.

长梗金腰 chang geng jin yao

Chrysosplenium tianschanicum Krassnov.

Herbs 18–30 cm tall. Sterile branches arising from leaf axils. Stems glabrous. Basal leaves absent. Cauline

leaves several, alternate, proximal ones smaller, scalelike, sessile, distal ones with petiole 0.4–1.9 cm, glabrous; leaf blade ovate to broadly so, 0.9–2.9 × 1–1.7 cm, glabrous, base rounded-cuneate, margin ca. 12-crenate. Cyme remotely flowered or flowers solitary at bracteal leaf axils; bracteal leaves with petiole 1–7 mm, leaf blade ovate to broadly so, 2.8–15 × 1.2–12 mm, glabrous, base broadly cuneate to rounded, margin 10–12-crenate, teeth brown 1-verrucose at apex. Flowers green, ca. 7.2 mm in diam.; pedicel slender, 0.6–1.9 cm, glabrous. Sepals spreading, subrhombic, 1.9–2.8 × 2.8–3.3 mm, glabrous, apex obtuse or retuse, brown 1-verrucose. Stamens ca. 1.2 cm. Ovary semi-inferior; styles 0.5–0.9 mm. Disc distinctly 8-lobed. Capsule retuse at apex; carpels subequal; rostrums ca. 0.7 mm. Seeds dark brown, shiny, subovoid, ca. 1.6 mm, smooth, glabrous. Fl. and fr. Jul–Sep.

Forests, scrub, rock clefts; 2800–4500 m. S Gansu, SE Qinghai, S Shaanxi (Taibai Shan), Xinjiang [Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

12. *Chrysosplenium carnosum* J. D. Hooker & Thomson, J. Proc. Linn. Soc., Bot. 2: 73. 1858.

肉质金腰 rou zhi jin yao

Chrysosplenium tibeticum Limpricht.

Herbs 9–10 cm tall. Stolons arising from leaf axils. Stems brown papillose at leaf axils, elsewhere glabrous. Basal leaves absent. Cauline leaves alternate, proximal ones scalelike, ca. 5.2 × 2 mm, distal ones with petiole ca. 3 mm; leaf blade subspatulate to broadly obovate, ca. 8 × 8 mm, both surfaces glabrous, base broadly cuneate, margin ca. 7-crenate, teeth brown 1-verrucose at apex. Cyme 3–5 cm, remotely 7–10-flowered; branches ± brown papillose; bracteal leaves with petiole 1.2–2.2 mm, ± brown papillose at axil, leaf blade broadly ovate, 7–12 × 6–10 mm, both surfaces glabrous, base broadly cuneate, margin 5–9-crenate, teeth brown 1-verrucose at apex. Flowers green; pedicel nearly 7 mm. Sepals erect, broadly orbicular, ca. 1.2 × 1.9–2.2 mm, glabrous, apex subtruncate. Stamens 8, ca. 0.8 mm. Ovary semi-inferior; styles ca. 0.5 mm. Disc obscurely 8-lobed. Capsule 3–4 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums shorter. Seeds red-brown, shiny, ovoid, 0.9–1 mm, smooth, glabrous. Fl. and fr. Jul–Aug.

Alpine scrub meadows, alpine rock clefts; 4400–4700 m. W Sichuan, E Xizang [Bhutan, N India, N Myanmar, Nepal, Sikkim].

13. *Chrysosplenium chinense* (H. Hara) J. T. Pan, Acta Phytotax. Sin. 24: 93. 1986.

乳突金腰 ru tu jin yao

Chrysosplenium alternifolium Linnaeus var. *chinense* H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 74. 1957.

Herbs 6.5–15.5 cm tall. Stolons present. Stems glabrous. Basal leaves with petiole 0.5–8.5 cm, red-brown pilose; leaf blade reniform to orbicular-reniform, 0.7–1.6 ×

0.9–1.85 cm, both surfaces and margin glabrous, base cordate, margin shallowly 5–9-dentate, teeth usually retuse and brown 1-verrucose at apex. Cauline leaf 1 or absent; petiole 5–10 mm, brown pilose near axil; leaf blade broadly ovate to broadly orbicular, 5–8 × 6–12 mm, base broadly cuneate to subtruncate, margin shallowly 5–7-dentate. Cyme 1–4.5 cm; bracteal leaves with petiole 1.5–5 mm, brown papillose or pilose near axil, leaf blade ovate or broadly so to broadly obovate, 3–11 × 2.5–12 mm, base cuneate to broadly so, margin entire or 2–5-crenate. Flowers yellow-green, ca. 4 mm in diam.; pedicel very short, usually pilose. Sepals suberect, broadly ovate to orbicular, 1.1–2 × 2–2.2 mm, glabrous, apex obtuse. Stamens 8; filaments 0.5–1.1 mm. Ovary semi-inferior; styles ca. 1 mm. Disc absent. Capsule ca. 2.5 mm, apex retuse; carpels subequal; rostrums ca. 0.4 mm. Seeds dark brown, shiny, ovoid, ca. 1 mm, papillose. Fl. and fr. May–Aug.

• Shaded and wet places in forest understories, rock clefts in ravines. N Hebei, N Shanxi (Wutai Shan).

14. *Chrysosplenium davidianum* Decaisne ex Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 23: 343. 1877. 锈毛金腰 xiu mao jin yao

Chrysosplenium briquetii Terracciano; *C. davidianum* var. *alpinum* H. Hara.

Herbs caespitose, (1–)3.5–19 cm tall. Rhizomes transversely elongate, densely brown villous. Sterile branches well developed. Stems brown crisped villous. Basal leaves with petiole 1–3 cm, densely brown crisped villous; leaf blade broadly ovate to broadly subelliptic, (0.5–)2.1–4.2 × (0.7–)2–3.7 cm, both surfaces brown villous along veins and margin, base subtruncate to subcordate, margin (7–)13–17-crenate. Cauline leaves (1 or 2)–5, alternate; petiole 5–6 mm, brown pilose; leaf blade broadly ovate to subflabellate, 3–7 × 3.5–7 mm, both surfaces and margin brown pilose, base broadly cuneate, margin 7–9-crenate, apex obtuse. Cyme 0.5–4 cm, many flowered; bracteal leaves with petiole 1.2–3.5 mm, pilose, leaf blade orbicular-flabellate, 3.1–11.2 × 3.1–9 mm, pilose to subglabrous, base broadly cuneate, margin 3–7-crenate. Flowers yellow; pedicel 1–5 mm, brown pilose. Sepals usually orbicular, 1–2.6 × 1.1–3.1 mm, glabrous, apex obtuse or retuse. Stamens 8, 1–2 mm. Ovary semi-inferior; styles 0.8–2 mm. Disc absent. Capsule ca. 3.8 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 1 mm. Seeds dark brown, ovoid, ca. 1 mm, papillose. Fl. and fr. Apr–Aug. $2n = 72^*$.

• Shaded and wet grassy places in forest understories, rock clefts in ravines; 1500–4100 m. ?Guizhou, W Sichuan, N and W Yunnan.

15. *Chrysosplenium macrophyllum* Oliver, Hooker's Icon. Pl. 18: t. 1744. 1888.

大叶金腰 da ye jin yao

Chrysosplenium barbeyi Terracciano; *Triplostegia mairei* H. Lévillé.

Herbs 17–21 cm tall. Sterile branches 23–35 cm. Stems brown pilose. Basal leaves several, petiolate; leaf blade

obovate, 2.3–19 × 1.3–11.5 cm, leathery, abaxially glabrous, adaxially brown pilose, base cuneate, margin entire or obscurely undulate-crenulate, apex obtuse. Cauline leaf usually 1; leaf blade narrowly elliptic, 1.2–1.7 × 0.5–0.75 cm, abaxially glabrous, adaxially and marginally brown pilose, margin usually ca. 13-crenate. Pleiochasium 3–4.5 cm; branches brown pilose or subglabrous; bracteal leaves with petiole 3–10 mm, leaf blade ovate to broadly so, 0.6–2 cm × 5–14 mm, base cuneate, margin usually 9–15-crenate, sometimes obscurely so, apex subacute. Sepals subovate to broadly ovate, 3–3.2 × 2.5–3.9 mm, glabrous, apex retuse. Stamens longer than sepals, 4–6.5 mm. Ovary semi-inferior; styles erect, ca. 5 mm. Disc absent. Capsule 4–4.5 mm, apex neither truncate nor retuse; carpels subequal; rostrums 3–4 mm. Seeds dark brown, subovoid, ca. 0.7 mm, densely papillose. Fl. and fr. Apr–Jun.

• Forests, shaded and wet places in ravines; 1000–2200 m. S Anhui, ?Fujian, N Guangdong, ?Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, E Sichuan, E Yunnan, Zhejiang.

16. *Chrysosplenium glossophyllum* H. Hara, J. Jap. Bot. 17: 19. 1941.

舌叶金腰 she ye jin yao

Chrysosplenium guangxiense H. G. Ye & G. C. Zhang. Herbs 14.5–26 cm tall. Stems brown pilose. Basal leaves with petiole 2.5–8 cm, brown pilose; leaf blade subelliptic, 4.3–8.5 × 2.7–4.3 cm, abaxially glabrous, adaxially brown hispid, base rounded to subcordate, margin 20–36-crenate, sometimes obscurely so. Pleiochasium 5–9.5 cm, remotely flowered; branches brown pilose proximally; proximal bracteal leaves with petiole 1.3–1.8 cm, brown pilose, leaf blade subovate, 2.7–3 × 1.7–1.9 cm, abaxially glabrous, adaxially and marginally brown hispid, base broadly cuneate, margin ca. 15-crenate; distal bracteal leaves with petiole 1.5–6 mm, leaf blade ovate to broadly obovate, 2.5–15 × 2–10 mm, glabrous, margin 5–9-crenate, teeth brown 1-verrucose at apex. Pedicel 1.5–5 mm, glabrous. Sepals broadly orbicular, ca. 2 × 2.6–3.1 mm, glabrous, apex obtuse. Stamens 8, ca. 0.7 mm. Ovary semi-inferior; styles short. Disc absent. Capsule ca. 3 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 0.5 mm. Seeds dark brown, shiny, subovoid, ca. 0.5 mm, papillose. Fl. and fr. Apr–Jul.

• Shaded and wet places in ravines; 1000–1400 m. NW Guangxi (Tianlin Xian), C Sichuan (Guan Xian).

17. *Chrysosplenium hydrocotylifolium* H. Léveillé & Vaniot in H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 441. 1911.

天胡荽金腰 tian hu sui jin yao

Herbs ca. 27 cm tall. Stems brown pilose, usually leafless. Basal leaves with petiole 2.5–14 cm, proximally mostly brown villous; leaf blade brown spotted, orbicular, 2.3–8.5 × 2.4–8.5 cm, both surfaces glabrous, sometimes pilose adaxially or on both surfaces, base reniform, margin undulate or 34–39-crenate, teeth narrowly colorless at margin, retuse and 1-verrucose at apex. Pleiochasium 10–12 cm; branches

barely 7.5 cm, brown pilose; bracteal leaves with petiole 3.5–9 mm, brown villous at axil, leaf blade broadly ovate, 0.5–1.6 × 0.5–1.4 cm, glabrous, sometimes pilose adaxially on proximal leaves, base cuneate, margin 5–8-crenate. Flowers green, 5–6 mm in diam. Sepals spreading, brown spotted, broadly orbicular, ca. 1.8 × 2.4 mm, glabrous, apex obtuse, brown 1-verrucose. Stamens 8; filaments ca. 0.3 mm. Ovary subinferior; styles ca. 0.3 mm. Disc 8-lobed. Capsule 5–5.5 mm, apex subtruncate, retuse; carpels subequal; rostrums ca. 0.2 mm. Seeds dark brown, shiny, subovoid, ca. 1 mm, papillose. Fl. and fr. Apr–Nov.

• Forests, shaded places on limestone hills, limestone clefts; 1300–2400 m. N Guangdong, ?Guangxi, Guizhou, C and SE Sichuan, E Yunnan.

1a. Leaf blade and bracteal leaf

blade glabrous 17a. var. *hydrocotylifolium*

1b. Leaf blade and proximal bracteal

leaf blade pilose, at least adaxially.

2a. Leaf blade and proximal bracteal

leaf blade pilose adaxially 17b. var. *emeiense*

2b. Leaf blade pilose on both

surfaces 17c. var. *guangdongense*

17a. *Chrysosplenium hydrocotylifolium* var. *hydrocotylifolium*

天胡荽金腰(原变种) tian hu sui jin yao (yuan bian zhong)

Chrysosplenium esquirolii H. Léveillé.

Leaf blade and bracteal leaf blade glabrous on both surfaces. Fl. and fr. Apr–Jul.

• Limestone clefts; 1300–2400 m. ?Guangxi, Guizhou, E Yunnan.

17b. *Chrysosplenium hydrocotylifolium* var. *emeiense* J. T. Pan, Acta Phytotax. Sin. 24: 94. 1986.

峨眉金腰 e mei jin yao

Leaf blade and proximal bracteal leaf blade pilose adaxially. Fl. and fr. May–Nov.

• Forests; ca. 1500 m. C and SE Sichuan (Emei Shan, Pengshui Xian).

17c. *Chrysosplenium hydrocotylifolium* var. *guangdongense* S. J. Xu & Z. X. Li, Acta Phytotax. Sin. 32: 364. 1994.

广东金腰 guang dong jin yao

Leaf blade pilose on both surfaces.

• Shaded places on limestone hills. N Guangdong (Ruyuan Yao Zu Zizhixian).

18. *Chrysosplenium japonicum* (Maximowicz) Makino, Bot. Mag. (Tokyo) 23: 71. 1909.

日本金腰 ri ben jin yao

Herbs caespitose, 8.5–15.5 cm tall. Bulbils present or not near stem base. Stems pilose. Basal leaves with petiole 1.5–8 cm, pilose; leaf blade reniform, 0.6–1.6 × 0.9–2.5 cm, abaxially subglabrous, adaxially pilose, base cordate, reniform, subtruncate, or cuneate, margin

shallowly ca. 15-dentate, teeth retuse at apex. Cauline leaves alternate, similar to basal ones; petiole ca. 2 cm, pilose; leaf blade ca. 1.1 × 1.3 cm, abaxially subglabrous, adaxially pilose, margin shallowly ca. 11-dentate. Cyme 1.5–4 cm, densely flowered; branches pilose; bracteal leaves with petiole 0.5–6 mm, pilose, leaf blade ovate to subflabellate, 5–12 × 5–14 mm, glabrous, base broadly cuneate, margin 3–9-dentate. Flowers subsessile, green, ca. 3 mm in diam. Sepals erect, broadly ovate, 0.6–1.4 × 1–1.4 mm, glabrous, apex obtuse or acute. Stamens usually (2 or)4(or 8), 0.3–0.4 mm. Ovary subinferior; styles 0.2–0.3 mm. Disc usually 4-lobed. Capsule 4–5 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 0.2 mm. Seeds dark brown, ellipsoid, 0.6–0.7 mm, puberulous. Fl. and fr. Mar–Jun.

Forests, ravine forests, wet places in ravines; 400–600 m. Anhui, Jiangxi, Jilin, Liaoning, Zhejiang [Japan, Korea].

- 1a. Bulbils present near stem base; leaf blade cordate or reniform at base 18a. var. *japonicum*
1b. Bulbils absent near stem base; leaf blade subtruncate or cuneate at base 18b. var. *cuneifolium*

18a. *Chrysosplenium japonicum* var. *japonicum*

日本金腰(原变种) ri ben jin yao (yuan bian zhong)
Chrysosplenium alternifolium Linnaeus var. *japonicum* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 23: 343. 1877.

Bulbils present near stem base. Leaf blade cordate or reniform at base. $2n = 24$.

Forests, wet places in ravines; ca. 500 m. Anhui, Jiangxi, Jilin, Liaoning, Zhejiang [Japan, Korea].

18b. *Chrysosplenium japonicum* var. *cuneifolium* X. H. Guo & X. P. Zhang, Acta Phytotax. Sin. 36: 365. 1998.

楔叶金腰 xie ye jin yao

Bulbils absent near stem base. Leaf blade subtruncate or cuneate at base.

• Ravine forests; 400–600 m. N and SE Anhui (Banqiao, Ningguo Xian).

19. *Chrysosplenium wuwenchenii* Z. P. Jien, Acta Phytotax. Sin. 8: 337. 1963.

韞珍金腰 yun zhen jin yao

Herbs 8–12.5 cm tall. Sterile branches arising from stem base. Stems cespitose, proximally pilose, distally glabrous. Basal leaves with petiole 2.5–3 cm, proximally pilose; leaf blade reniform to orbicular-reniform, 0.8–2.2 × 0.9–2.5 cm, abaxially glabrous, adaxially pilose, base reniform, margin obscurely 15–17-crenate. Cauline leaf usually 1; petiole 1.8–2.5 cm, proximally pilose, brown glandular hairy at axil; leaf blade reniform, 0.6–1.3 × 1–1.5 cm, abaxially and marginally glabrous, adaxially pilose, margin 9–13-crenate (teeth 1-verrucose at apex), apex obtuse. Cyme 4–12.5 cm; branches glabrous; bracteal leaves with petiole 0.5–3 mm, glabrous except papillose at axil, leaf blade broadly subovate to broadly suborbicular, 3.8–7 ×

4.1–10 mm, glabrous, base truncate-rounded to broadly cuneate, margin obscurely 4–9-undulate-dentate or entire. Flowers yellow-green; pedicel glabrous. Sepals broadly subovate, 1.2–1.3 × 1.5–2 mm, apex obtuse or acute. Stamens 8; filaments ca. 1 mm. Ovary subinferior; styles ca. 0.8 mm. Disc distinct. Capsule ca. 2.4 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 0.8 mm. Seeds dark brown, subovoid, ca. 0.8 mm, papillose. Fl. and fr. May–Jun.

• Rock clefts; 2000–2500 m. SE Sichuan (Nanchuan Xian).

20. *Chrysosplenium flagelliferum* F. Schmidt, Reis. Amurland., Bot. 134. 1868.

蔓金腰 man jin yao

Herbs cespitose. Stolons arising from basal leaf axils. Stolon leaves alternate, subreniform, larger apically on stolons, 0.6–1 × 1–1.9 cm, adaxially pilose, margin obtusely 5–8-dentate. Stems glabrous. Basal leaves with petiole 3–13 mm; leaf blade reniform to orbicular-reniform, 1.2–3.8 × 1.5–5.3 cm, abaxially glabrous, adaxially pilose, base cordate, margin obtusely 12–18-dentate. Cauline leaves 3 or 4, alternate; petiole 0.6–1 cm; leaf blade broadly suborbicular, 4–8 × 5–10 mm, glabrous, margin obtusely 5-dentate. Cyme 3.5–6.3 cm, remotely flowered; branches glabrous; bracteal leaves with petiole 1.6–3 mm, pilose, leaf blade broadly ovate or obovate to broadly orbicular, 2–7 × 1.8–8.3 mm, base subcuneate to obliquely cuneate, margin obtusely 3–5-dentate. Flowers ca. 4.6 mm in diam.; pedicel glabrous. Sepals subspreading, ovate to subrhombic, 1.9–2 × 1.2–2 mm, glabrous, apex obtuse or acute. Stamens 8, ca. 0.9 mm. Ovary semi-inferior; styles ca. 0.7 mm. Disc distinct. Capsule ca. 3 mm, apex subtruncate, retuse; carpels subequal; rostrums ca. 0.7 mm. Seeds dark brown, shiny, ellipsoid, 0.7–0.8 mm, sparsely puberulous. Fl. and fr. May–Jul. $2n = 24$.

Shaded and wet places in forest understories, riversides; 400–500 m. ?Hebei, Heilongjiang, Jilin, Liaoning [Japan, Korea, Mongolia, Russia].

21. *Chrysosplenium microspermum* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 3, 2: 109. 1890.

微子金腰 wei zi jin yao

Herbs (1.3–)5–12 cm tall. Sterile branches arising from basal leaf axils, slender, with alternate leaves. Stems glabrous except brown papillose at leaf axils. Basal leaves with petiole ca. 8.4 mm, glabrous; leaf blade broadly ovate to subreniform, ca. 4 × 5.3 mm, both surfaces glabrous, base reniform or subtruncate, sinus brown papillose, margin 8-crenate, teeth usually broadly orbicular, overlapping at margin. Cauline leaves usually 3, alternate; petiole 7–8 mm, glabrous; leaf blade usually broadly subovate, 4.1–6 × ca. 5 mm, both surfaces glabrous, margin 7- or 8-crenate, teeth brown 1-verrucose at sinus. Cyme 0.8–1.1 cm, 5–9-flowered; branches brown papillose; bracteal leaves with petiole 0.7–5 mm, leaf blade broadly ovate, 1.8–6

× 1.5–6.3 mm, base broadly cuneate, margin 3–5-crenate. Flowers ca. 2.5 mm in diam.; pedicels ± brown papillose. Sepals ovate to broadly so, 0.9–1 × 1–1.2 mm, apex obtuse. Stamens 8; filaments ca. 0.3 mm. Ovary semi-inferior; styles ca. 0.4 mm. Disc 8-lobed. Capsule ca. 2.4 mm, apex subtruncate, retuse; carpels horizontal, subequal; rostrums ca. 0.4 mm. Seeds brown, subovoid, ca. 0.4 mm, tuberculate. Fl. and fr. Apr–Sep.

• Wet places in ravines; 1800–2900 m. W Hubei, S Shaanxi (Taibai Shan), E Sichuan.

22. *Chrysosplenium lanuginosum* J. D. Hooker & Thomson, J. Proc. Linn. Soc., Bot. 2: 74. 1858.

绵毛金腰 mian mao jin yao

Herbs 7–22 cm tall. Rhizomes to 20 cm. Sterile branches arising from basal leaf axils, 5–25 cm, brown villous. Stems brown pilose or subglabrous. Basal leaves with petiole 0.8–5 cm, sometimes only 4–6 mm, brown villous; leaf blade ovate or broadly so to subelliptic, 0.4–4.5 × 0.3–2.9 cm, both surfaces and margin ± brown pilose, sometimes densely brown crisped villous adaxially, base usually broadly cuneate, rarely subcordate, margin obscurely 9–17-undulate-crenate or shallowly 5–8-dentate, teeth retuse and 1-verrucose at apex. Cauline leaves 1–3, alternate; petiole 0.5–1.7 cm, brown villous; leaf blade broadly ovate or flabellate to elliptic, 2–10 × 1.6–10 mm, both surfaces and margin ± brown pilose, sometimes glabrous abaxially, base cuneate, margin 5–9-crenate. Cyme 5–9.5 cm, remotely flowered; branches glabrous or pilose; bracteal leaves with petiole 1.5–7 mm, glabrous or pilose, leaf blade obliquely broadly ovate or subflabellate to obovate, 3–11 × 4–12 mm, glabrous on both surfaces, but brown pilose adaxially on most proximal leaf, base broadly cuneate to truncate, margin 5–11-crenate, teeth sometimes with 1 brown hair at apex. Flowers green, 4.2–6.2 mm in diam. Sepals spreading, brown spotted, broadly ovate to broadly reniform-orbicular, 1.5–2.2 × 2.2–3 mm, apex obtuse or shortly acuminate, sometimes retuse and then margin sparsely brown ciliate. Stamens 8, ca. 0.8 mm. Ovary subinferior; styles 0.6–0.7 mm. Disc obsolete, surrounded by brown papillae. Capsule 3.2–3.5 mm, apex subtruncate, retuse; carpels subequal; rostrums ca. 0.8 mm. Seeds dark brown, subovoid, 0.6–1 mm, papillose. Fl. and fr. Apr–Jul.

Forests, wet places and rock clefts in ravines; 1100–3800 m. ?Guangxi, ?Guangxi, Guizhou, Hubei, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

- 1a. Basal leaf blade shallowly dentate at margin..... 22d. var. *gracile*
- 1b. Basal leaf blade crenate or undulate-crenate at margin, sometimes minutely or obscurely so.
 - 2a. Basal leaf blade densely narrowly brown crisped villous at margin 22b. var. *pilosomarginatum*

- 2b. Basal leaf blade sparsely villous on both surfaces and at margin.
- 3a. Sepals sparsely brown ciliate at margin, apex retuse .. 22c. var. *ciliatum*
- 3b. Sepals not ciliate at margin, apex obtuse.
 - 4a. Basal leaf blade usually elliptic, rarely broadly ovate, margin obscurely 9–17-undulate-crenate 22a. var. *lanuginosum*
 - 4b. Basal leaf blade ovate to orbicular-ovate, margin 8–10-crenate .. 22e. var. *formosanum*

22a. *Chrysosplenium lanuginosum* var. *lanuginosum*

绵毛金腰(原变种) mian mao jin yao (yuan bian zhong) *Chrysosplenium adoxoides* J. D. Hooker & Thomson ex Maximowicz; *C. dunnianum* H. Léveillé & Vaniot; *C. henryi* Franchet; *C. lanuginosum* var. *dunnianum* (H. Léveillé & Vaniot) H. Hara; *C. lanuginosum* var. *yunnanense* H. Hara.

Plants 8–22 cm tall. Basal leaves with petiole 0.8–5 cm; leaf blade usually elliptic, rarely broadly ovate, 1.3–4.5 × 1.2–2.9 cm, both surfaces and margin sparsely villous, base broadly cuneate, rarely subcordate, margin obscurely 9–17-undulate-crenate. Sepals not ciliate at margin, apex obtuse. Fl. and fr. Apr–Jun.

Rock clefts in ravines; 1100–1600 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal].

22b. *Chrysosplenium lanuginosum* var. *pilosomarginatum* (H. Hara) J. T. Pan, Acta Phytotax. Sin. 24: 96. 1986.

毛边金腰 mao bian jin yao *Chrysosplenium pilosomarginatum* H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 78. 1957.

Basal leaf blade margin minutely or obscurely crenate or undulate-crenate, densely narrowly brown crisped villous. Fl. and fr. May–Jun.

• Wet places in ravines; ca. 1800 m. NE Yunnan (Yiliang Xian).

22c. *Chrysosplenium lanuginosum* var. *ciliatum* (Franchet) J. T. Pan, Acta Phytotax. Sin. 24: 96. 1986.

睫毛金腰 jie mao jin yao *Chrysosplenium ciliatum* Franchet, Bull. Soc. Philom. Paris 8(2): 120. 1890.

Basal leaf blade sparsely villous on both surfaces and at margin, margin minutely or obscurely crenate or undulate-crenate. Sepals sparsely brown ciliate at margin, apex retuse. Fl. and fr. Apr–Jul.

Forests, rock clefts in ravines; 1600–2500 m. W Hubei, Sichuan, Yunnan [Sikkim].

22d. *Chrysosplenium lanuginosum* var. *gracile* (Franchet) H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 82. 1957.

细弱金腰 xi ruo jin yao

Chrysosplenium gracile Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 8: 234. 1886.

Plants slender, 7–11 cm tall. Basal leaves few; petiole 4–6 mm; leaf blade broadly subovate, 0.4–1.2 × 0.3–1.1 cm, base broadly cuneate, not subcordate, margin shallowly 5–8-dentate, teeth retuse and 1-verrucose at apex.

• Forests; 2200–3800. Sichuan, E Xizang.

22e. *Chrysosplenium lanuginosum* var. *formosanum* (Hayata) H. Hara, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 7: 83. 1957.

台湾金腰 tai wan jin yao

Chrysosplenium formosanum Hayata, Icon. Pl. Formos. 3: 103. 1913.

Basal leaf blade ovate to orbicular-ovate, 1–1.8 × 0.7–1.3 cm, both surfaces and margin sparsely villous, base often broadly cuneate, margin 8–10-crenate. Bracteal leaf blade orbicular-ovate, margin obtusely 4–6-crenate. Sepals not ciliate at margin, apex obtuse.

• Forests. Taiwan.

23. *Chrysosplenium jienningense* W. T. Wang in W. T. Wang & M. X. Nie, Bull. Bot. Res., Harbin 2(1–2): 48. 1981.

建宁金腰 jian ning jin yao

Herbs 11.5–12.5 cm tall. Sterile branches absent. Stems distally branched, brown crisped villous. Cauline leaves 2 or 3, alternate; petiole 1–1.2 cm, brown crisped villous; leaf blade subreniform, 0.6–0.8 × 0.7–1.3 cm, both surfaces and margin brown pilose, base cordate, margin ca. 9-crenate (teeth retuse and 1-verrucose at apex), apex obtuse. Cyme remotely flowered; branches glabrous; bracteal leaves with petiole 0.8–3 mm, brown glandular pilose at axil, elsewhere glabrous, leaf blade subreniform to broadly suborbicular, 2.5–5.5 × 3–8 mm, both surfaces glabrous, base subcordate to rounded-truncate, margin 5–7-crenate, teeth sparsely brown ciliate at margin, 1-verrucose at apex. Flowers yellow-green, ca. 5 mm in diam. Sepals spreading, broadly ovate to broadly orbicular, 1.3–1.7 × 1.9–2.3 mm, apex obtuse. Stamens 8; filaments ca. 0.4 mm. Ovary subinferior; styles ca. 0.3 mm. Disc 8-lobed, surrounded by brown papillae. Fl. Jun.

• Shaded places at riversides; ca. 700 m. W Fujian (Jianning Xian), ?Zhejiang.

24. *Chrysosplenium taibaishanense* J. T. Pan, Acta Phytotax. Sin. 24: 97. 1986.

太白金腰 tai bai jin yao

Herbs 7–11 cm tall. Stolons arising from proximal leaf axils. Stems brown pilose. Basal leaves absent. Cauline leaves alternate; petiole 0.9–1.4 cm, brown papillose and pilose adaxially and at axil; leaf blade subflabellate to nearly semiorbicular, 0.4–1 × 0.6–1.5 cm, abaxially glabrous, adaxially brown papillose and pilose near base, base broadly cuneate to truncate, margin shallowly 7–9-dentate (teeth retuse at apex), apex

obtuse. Cyme 2- or 3-flowered; branches glabrous; bracteal leaves with petiole 1.5–3 mm, adaxially brown pilose, brown papillose and pilose at axil, leaf blade flabellate to nearly semiorbicular, 0.6–1.2 × 0.7–1.5 cm, abaxially glabrous, adaxially brown pilose near base, margin shallowly 3–9-dentate (teeth retuse at apex), apex obtuse. Flowers ca. 5 mm in diam.; pedicel barely 0.5 mm. Sepals spreading, broadly ovate to orbicular, 1.5–2 × 1.9–2 mm, adaxially with a transverse line of brown papillae, apex obtuse or acute. Stamens 8; filaments ca. 0.4 mm. Ovary subinferior; styles ca. 0.3 mm. Disc obsolete. Capsule ca. 3 mm, apex subtruncate, retuse; carpels subequal; rostrums ca. 0.5 mm. Seeds dark brown, subovoid, ca. 0.8 mm, tuberculate. Fl. and fr. Jun–Aug.

• Ravines; ca. 2100 m. S Shaanxi (Taibai Shan).

25. *Chrysosplenium nepalense* D. Don, Prodr. Fl. Nepal. 210. 1825.

山溪金腰 shan xi jin yao

Chrysosplenium guebriantianum Handel-Mazzetti; *C. nepalense* var. *yunnanense* (Franchet) Franchet; *C. sulcatum* Maximowicz; *C. yunnanense* Franchet.

Herbs 5.5–21 cm tall. Sterile branches arising from leaf axils. Stems glabrous. Leaves opposite; petiole 2–15 mm, brown papillose adaxially and at axil; leaf blade ovate to broadly so, 0.3–1.8 × 0.5–1.8 cm, abaxially glabrous, adaxially sometimes brown papillose, base broadly cuneate to subtruncate, margin 6–16-crenate, apex obtuse. Cyme 1.3–6 cm, 8–18-flowered; bracteal leaves brown papillose at axil, leaf blade broadly ovate, 3.2–6.8 × 3.2–6.5 mm, base usually broadly cuneate, rarely oblique, margin 5–10-crenate. Flowers yellow-green, ca. 3 mm in diam.; pedicel glabrous. Sepals erect, broadly subovate, 1.1–1.3 × 1–1.2 mm, glabrous, apex obtuse. Stamens 8, ca. 0.5–1 mm. Ovary subinferior; styles ca. 0.2 mm. Disc absent. Capsule ca. 2.6 mm; carpels subequal; rostrums ca. 0.4 mm. Seeds red-brown, ellipsoid, ca. 1 mm, smooth, glabrous. Fl. and fr. May–Jul. $2n = 24$.

Forests, meadows, rock clefts; 1500–5900 m. Sichuan, Xizang, Yunnan [Bhutan, N India, N Myanmar, Nepal, Sikkim].

26. *Chrysosplenium hebetatum* Ohwi, Repert. Spec. Nov. Regni Veg. 36: 52. 1934.

大武金腰 da wu jin yao

Herbs 4–10 cm tall. Rhizomes elongate. Sterile branches arising from leaf axils, villous. Stems sparsely villous. Basal leaves petiolate; leaf blade broadly ovate, 0.7–1.5 × 0.7–1.5 cm, sparsely villous, base broadly cuneate, margin obscurely 6–8-crenate. Cauline leaves 4–6, opposite; petiole 2–4 mm, villous; leaf blade broadly orbicular-ovate or subrhombic to flabellate, 5–10 × 5–10 mm, pilose, base broadly cuneate, margin 4–6-crenate. Cyme few flowered; bracteal leaves obovate, small, base cuneate, margin 2–6-crenate. Flowers green, 2–3 mm in diam. Sepals erect, broadly ovate to orbicular, 1.5–2 mm, apex obtuse. Stamens 8; filaments

ca. 1 mm. Capsule with carpels erect; rostrums 0.5–0.8 mm. Seeds dark brown, subellipsoid, ca. 0.5 mm, glabrous, with transverse, undulate lines. Fr. Apr–May.

• Forests. Taiwan.

27. *Chrysosplenium sinicum* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, Sér. 3, 23: 348. 1877.

中华金腰 zhong hua jin yao

Chrysosplenium chamaedryoides Engler ex Diels; *C. chingii* H. Hara ex E. Walker; *C. lushanense* W. T. Wang; *C. pseudofauriei* H. Léveillé; *C. trachyspermum* Maximowicz.

Herbs (3–)10–20(–33) cm tall. Sterile branches well developed, arising from proximal leaf axils, glabrous. Stems glabrous. Leaves usually opposite; petiole 6–10 mm, sometimes brown papillose near axil; leaf blade orbicular to broadly ovate, 6–10.5 × 7.5–11.5 mm, glabrous, base broadly cuneate, margin obtusely 12–16-dentate, apex obtuse. Cyme 2.2–3.8 cm, 4–10-flowered; branches glabrous; bracteal leaves with petiole 1–7 mm, brown papillose near axil, leaf blade narrowly to broadly ovate, 0.4–1.8 cm × 9–10 mm, glabrous, base broadly cuneate to oblique, margin obtusely 5–16-dentate. Flowers yellow-green; pedicel glabrous. Sepals erect, ± broadly ovate, 0.8–2.1 × 1–2.4 mm, apex obtuse. Stamens 8, ca. 0.4 mm. Disc absent. Capsule 7–10 mm; carpels divaricate, distinctly unequal; rostrums 0.3–1.2 mm. Seeds dark brown, shiny, ellipsoid to broadly ovoid, 0.6–0.9 mm, papillose. Fl. and fr. Apr–Aug.

Forests, shaded and wet places in ravines; 500–3600 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangxi, Jilin, Liaoning, Qinghai, Shaanxi, Shanxi, Sichuan, ?Zhejiang [Korea, Mongolia, Russia].

28. *Chrysosplenium lectus-cochleae* Kitagawa, Bot. Mag. (Tokyo) 48: 909. 1934.

林金腰 lin jin yao

Chrysosplenium amabile Kitagawa; *C. baicalense* Maximowicz var. *lectus-cochleae* (Kitagawa) A. I. Baranov & Skvortzov; *C. sphaerospermum* Maximowicz var. *amabile* (Kitagawa) A. I. Baranov & Skvortzov.

Herbs 11–15 cm tall. Sterile branches arising from proximal cauline leaf axils, brown crisped villous. Stems brown pilose. Cauline leaves opposite; petiole 3–8 mm, brown pilose; leaf blade brown spotted, subflabellate, 0.4–8 × 0.3–11 mm, glabrous except brown ciliate at margin, base cuneate, margin 5–9-crenate. Cyme 1.3–3.5 cm; branches pilose; bracteal leaves with petiole 4–6 mm, brown papillose at axil, leaf blade brown spotted, broadly ovate or broadly obovate to flabellate, 0.6–2 × 0.4–1.7 cm, both surfaces glabrous, base oblique or cuneate to rounded, margin shallowly 5–7-dentate, ciliate. Flowers yellow-green; pedicel pilose. Sepals erect, broadly subovate, 1.1–2.5 × 1.8–2.6 mm, apex obtuse. Stamens 8; filaments 0.5–0.8 mm. Ovary subsuperior; styles ca. 0.5 mm. Disc absent. Capsule 2.4–6 mm; carpels distinctly unequal;

rostrums 0.8–1 mm. Seeds dark brown, subovoid, 0.8–1 mm, papillose. Fl. and fr. May–Aug.

• Forests, shaded and wet places or rock clefts at forest margins; 400–1800 m. Heilongjiang, Jilin, Liaoning.

29. *Chrysosplenium cavaleriei* H. Léveillé & Vaniot, Repert. Spec. Nov. Regni Veg. 9: 441. 1911.

滇黔金腰 dian qian jin yao

Chrysosplenium nepalense D. Don var. *cavaleriei* (H. Léveillé & Vaniot) H. Hara; *C. nepalense* var. *vegetum* H. Hara.

Herbs 9–22 cm tall. Sterile branches arising from near stem base. Stems glabrous. Cauline leaves opposite; petiole 0.7–1 cm, sparsely brown papillose; leaf blade broadly ovate to subflabellate, 0.9–1.3 × 1–1.4 cm, adaxially (rarely abaxially) sparsely brown papillose, base broadly cuneate to subtruncate, brown 1-papillate at sinus, margin obtusely 14–19-dentate. Pleiochasium 1.7–6.5 cm, many flowered; branches glabrous; bracteal leaves with petiole 1–2 mm, sparsely brown papillose adaxially and at axil, leaf blade broadly ovate, 3–12 × 3.3–12 mm, adaxially (rarely abaxially) sparsely brown papillose, base broadly cuneate or subtruncate to oblique, brown 1-papillate at sinus, margin obtusely 5–15-dentate. Flowers yellow-green, 3.8–6.5 mm in diam.; pedicel glabrous. Sepals spreading, broadly ovate or broadly subelliptic to broadly orbicular, 1–2.5 × 1–4 mm, apex obtuse. Stamens 8, 0.1–1 mm. Ovary semi-inferior; styles 0.2–0.3 mm. Disc distinct, surrounded by brown papillae. Capsule ca. 5.4 mm; carpels unequal; rostrums ca. 0.2 mm. Seeds dark brown, subovoid, 0.8–0.9 mm, densely papillose. Fl. and fr. Apr–Jul.

• Wet places in forest understories, rock clefts in ravines; 1300–3000 m. Guizhou, Hubei, EC Hunan (Heng Shan), Sichuan, Yunnan.

30. *Chrysosplenium pilosum* Maximowicz, Prim. Fl. Amur. 122. 1859.

毛金腰 mao jin yao

Herbs 14–16 cm tall. Sterile branches arising from proximal cauline leaf axils, densely brown hairy. Stems brown pilose. Cauline leaves opposite; petiole ca. 3.5 mm, brown pilose; leaf blade flabellate, ca. 0.85 × 1.1 cm, both surfaces and margin glabrous or brown pilose, base cuneate, margin obscurely 6-undulate-crenate or distinctly obtusely dentate, apex subtruncate. Cyme ca. 2 cm; branches glabrous; bracteal leaves with petiole 1–2 mm, pilose, leaf blade subflabellate, 1–1.3 cm × 8.5–11 mm, both surfaces and margin glabrous or pilose, margin obscurely 3–5-undulate-crenate or distinctly obtusely dentate, apex obtuse to subtruncate. Pedicel glabrous. Sepals brown spotted, broadly ovate to broadly subelliptic, 1.8–2.2 × ca. 2 mm, apex obtuse. Stamens 8, ca. 1 mm. Ovary semi-inferior; styles ca. 1 mm. Disc absent. Capsule ca. 5.5 mm; carpels unequal; rostrums ca. 1 mm. Seeds dark brown, broadly ellipsoid, ca. 1 mm, ca. 17-sulcate, ridges papillose. Fl. and fr. Apr–Jun. $2n = 24$.

Shady and wet places in forest understories, rock clefts in ravines; 1500–3500 m. ?Anhui, S Gansu, ?Guangdong, Hebei, Heilongjiang, Hubei, EC Hunan, Jilin, Liaoning, ?Nei Mongol, E Qinghai, Shaanxi, Shanxi, E Sichuan, E Zhejiang [Korea, Russia].

- 1a. Cauline and bracteal leaves brown pilose abaxially and marginally, margin distinctly obtusely dentate . 30b. var. *valdepilosum*
- 1b. Cauline and bracteal leaves glabrous abaxially and marginally, margin obscurely undulate-crenate.
 - 2a. Leaves brown pilose adaxially 30c. var. *pilosopetiolum*
 - 2b. Leaves glabrous on both surfaces 30a. var. *pilosum*

30a. Chrysosplenium pilosum var. **pilosum**

毛金腰(原变种) mao jin yao (yuan bian zhong)

Chrysosplenium umbellatum Kitagawa.

Cauline and bracteal leaves glabrous on both surfaces and marginally, margin obscurely undulate-crenate. Seeds deeply sulcate.

Shaded and wet places in forest understories. Heilongjiang, Jilin, Liaoning [Korea, Russia].

30b. Chrysosplenium pilosum var. **valdepilosum** Ohwi, Rept. Spec. Nov. Regni Veg. 36: 52. 1934.

柔毛金腰 rou mao jin yao

Chrysosplenium villosum Franchet.

Cauline and bracteal leaves brown pilose abaxially and marginally, glabrous adaxially, margin distinctly obtusely dentate. Seeds shallowly sulcate.

Shady and wet places in forest understories, rock clefts in ravines; 1500–3500 m. ?Anhui, S Gansu, Hebei, Heilongjiang, Hubei, Jilin, Liaoning, E Qinghai (Xunhua Salar Zu Zizhixian), Shaanxi, Shanxi, E Sichuan, E Zhejiang (Tiantai Shan) [Korea].

30c. Chrysosplenium pilosum var. **pilosopetiolum** (Z. P. Jien) J. T. Pan, Acta Phytotax. Sin. 24: 206. 1986.

毛柄金腰 mao bing jin yao

Chrysosplenium pilosopetiolum Z. P. Jien, Acta Phytotax. Sin. 8: 339. 1963.

Cauline and bracteal leaves glabrous abaxially and marginally, brown pilose adaxially, margin obscurely undulate-crenate.

• ?Guangdong, EC Hunan (Heng Shan).

31. Chrysosplenium ramosum Maximowicz, Prim. Fl. Amur. 121. 1859.

多枝金腰 duo zhi jin yao

Herbs 12.5–22 cm tall. Sterile branches well developed, brown pilose. Stems slender, brown pilose. Cauline leaves opposite; petiole ca. 5 mm, brown pilose adaxially, marginally, and at axil; leaf blade broadly ovate, ca. 6 × 6.5 mm, adaxially brown pilose, base rounded, margin ca. 12-crenate, teeth brown 1-ciliate at apex. Cyme ca. 3.6 cm, ca. 14-flowered; branches glabrous; bracteal leaves with petiole 0.7–2 mm, brown papillose at axil, leaf blade broadly ovate to broadly suborbicular, 4–6.7 × 4–8 mm, glabrous, base broadly

cuneate or oblique to subtruncate, margin obscurely 4–8-crenate. Flowers ca. 3.4 mm in diam. Sepals spreading, broadly elliptic, 0.9–1.3 × 1–1.3 mm, brown papillose at sinus, apex obtuse or acute. Stamens 8; filaments ca. 0.5 mm. Ovary subinferior; styles ca. 0.4 mm. Disc distinctly 8-lobed, surrounded by sparse, brown papillae. Capsule subtruncate and retuse at apex; carpels horizontal, subequal; rostrums ca. 0.4 mm. Seeds black, narrowly subvoid, ca. 1 mm, smooth, glabrous. Fl. and fr. May–Aug. 2n = 12, 24.

Wet places in forest understories; 900–1000 m. Heilongjiang, Jilin, ?Liaoning [Japan, Russia].

32. Chrysosplenium delavayi Franchet, Bull. Soc. Bot. France 32: 7. 1885.

肾萼金腰 shen e jin yao

Chrysosplenium holochlorum Ohwi; *C. pumilum* Franchet; *C. subargenteum* H. Léveillé & Vaniot.

Herbs 4.5–13 cm tall. Sterile branches arising from proximal cauline leaf axils. Stems glabrous. Cauline leaves with petiole 3–7 mm, brown papillose and pilose at axil; leaf blade broadly ovate or orbicular to flabellate, 2.2–15 × 3–16 mm, abaxially sparsely brown papillose, adaxially glabrous, base broadly cuneate, margin 7–12-crenate (teeth obscure, brown 1-papillate at apex), apex obtuse. Flower solitary or cyme 2–5-flowered, 1–1.4 cm; branches glabrous; bracteal leaves with petiole 2–5.6 mm, brown papillose near axil, leaf blade usually broadly ovate, 2–5 × 2.4–5 mm, abaxially (rarely adaxially) sparsely papillose, margin 6–9-crenate, teeth brown 1-papillate at apex. Flowers yellow-green, ca. 8.7 mm in diam.; pedicel 0.3–1.9 cm, glabrous. Sepals spreading, broadly suborbicular, 1.9–3 × 3–5 mm, margin sometimes overlapping, apex retuse, brown 1-papillate. Stamens 8, ca. 0.6 mm. Ovary subinferior; styles ca. 0.4 mm. Disc 8-lobed, surrounded by sparse, brown papillae. Capsule subtruncate and retuse at apex; carpels horizontal, subequal; rostrums ca. 0.4 mm. Seeds dark brown, ovoid, 0.7–1 mm, 13–15-sulcate, ridges with transverse lines. Fl. and fr. Mar–Jun.

Forests, scrub, rock clefts in ravines; 400–2800 m. SE Anhui (Ningguo Xian), ?Guangdong, Guangxi, Guizhou, Hubei, Hunan, ?Jiangsu, Sichuan, Taiwan, Yunnan [N Myanmar].

33. Chrysosplenium lixianense Z. P. Jien ex J. T. Pan, Acta Phytotax. Sin. 24: 207. 1986.

理县金腰 li xian jin yao

Herbs 13–17 cm tall. Sterile branches arising from leaf axils. Stems glabrous, sometimes sparsely brown papillose. Cauline leaves opposite; petiole 6–12 mm, brown papillose at axil; leaf blade subreniform to broadly orbicular, 6.5–10 mm × 1–1.3 cm, both surfaces glabrous, base subcordate to broadly cuneate, margin 8–10-crenate (teeth brown 1-verrucose at sinus), apex obtuse. Cyme 2–4-flowered; bracteal leaves papillose at axil, leaf blade subreniform, 4–6 × 4–9.5

mm, both surfaces glabrous, base subcordate, margin 6–10-crenate, teeth usually brown 1-papillate at sinus and brown 1-verrucose at apex. Pedicel 3–8 mm, glabrous. Sepals spreading, broadly ovate to broadly orbicular, 1.3–1.5 × 1.5–2 mm, apex obtuse or acute. Stamens 8, ca. 0.6 mm. Ovary subinferior; styles ca. 0.5 mm. Disc distinctly 8-lobed, surrounded by brown papillae. Fl. and fr. Jun–Jul.

- NC Sichuan (Li Xian, Maowen Qiang Zu Zizhixian).

34. *Chrysosplenium qinlingense* Z. P. Jien ex J. T. Pan, Acta Phytotax. Sin. 24: 208. 1986.

陕甘金腰 shan gan jin yao

Herbs 5.5–9.5 cm tall. Stolons arising from leaf axils, glabrous. Stems glabrous. Cauline leaves 2–4, opposite; petiole 0.3–1 cm, brown papillose at axil; leaf blade flabellate, 4–14 mm × 0.9–2 cm, both surfaces glabrous, base broadly cuneate to subtruncate, margin obtusely 7–9-dentate (teeth retuse and 1-verrucose at apex), apex obtuse. Cyme ca. 3 cm; branches glabrous; bracteal leaves with petiole 1.1–1.2 mm, globose tuberculate at axil, leaf blade broadly suborbicular or flabellate to broadly ovate, 2–7 × 2–7.5 mm, both surfaces glabrous, base cuneate to broadly so, margin obtusely 3–7-dentate, teeth usually retuse and 1-verrucose at apex. Flowers ca. 4.7 mm in diam. Sepals spreading, broadly ovate, 1.4–1.7 × 1.7–1.8 mm, apex obtuse or acute. Stamens 8; filaments ca. 0.6 mm. Ovary subinferior; styles ca. 0.5 mm. Disc distinctly 8-lobed, surrounded by sparse, brown papillae. Capsule ca. 2.8 mm, apex subtruncate, retuse; carpels subequal; rostrums ca. 0.5 mm. Seeds black, ovoid, ca. 1 mm, ca. 16-sulcate, ridges with transverse lines. Fl. and fr. Jul–Aug.

- Shaded and wet places in forest understories in ravines; 1600–2600 m. S Gansu (Tianshui Shi), S Shaanxi (Taibai Shan).

35. *Chrysosplenium biondianum* Engler, Bot. Jahrb. Syst. 36 (Beibl. 82): 50. 1905.

秦岭金腰 qin ling jin yao

Chrysosplenium duplocrenatum Handel-Mazzetti.

Herbs 8–28 cm tall. Sterile branches arising from leaf axils. Stems glabrous. Cauline leaves opposite; leaf blade subflabellate, 0.9–2 cm × 5–12 mm, both surfaces sparsely brown papillose, base gradually narrowed into a petiole, margin obtusely 8–12-dentate (teeth retuse at apex), apex obtuse. Cyme 2.2–3.3 cm; branches glabrous; bracteal leaves with petiole 0.7–3 mm, leaf blade broadly subobovate to subflabellate, 2.8–9 × 3–9 mm, both surfaces glabrous, base cuneate, margin obtusely 3–7-dentate (teeth retuse at apex), apex subtruncate or obtuse. Flowers unisexual (plants dioecious). Male flowers: stamens 8, ca. 0.6 mm; pistil obsolete; disc 8-lobed, not surrounded by brown papillae. Female flowers: yellow-green, 5–6 mm in diam.; sepals spreading, broadly ovate to broadly suborbicular, 1.7–2 × 2–2.5 mm, apex obtuse; stamens absent; ovary subinferior; styles 0.2–0.6 mm; disc 8-lobed, surrounded by sparse, brown papillae. Capsule ca. 4 mm, apex subtruncate, retuse; rostrums ca. 0.6 mm.

Seeds dark brown, ovoid, ca. 0.9 mm, sulcate, ridges with transverse lines. Fl. and fr. May–Jul.

- Shaded and wet places in forest understories; 1000–2000 m. S Gansu, SW Shaanxi.

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