

6. AJUGA Linnaeus, Sp. Pl. 2: 561. 1753.

筋骨草属 jin gu cao shu

Plants annual, biennial or perennial, herbaceous, rarely shrubs. Leaves simple; leaf blade papery, margin dentate to incised, rarely subentire. Verticillasters 2- to many flowered, in false spikes; floral leaves similar to stem leaves or gradually reduced to bracts, rarely dissimilar, larger than stem leaves. Flowers subsessile. Calyx ovoid to globose, campanulate to funnelliform, 10-veined, sometimes with inconspicuous accessory veins; teeth 5, slightly irregular. Corolla purple to blue, rarely yellow or white, 2-lipped, often persistent in fruit; tube straight to slightly curved, base slightly bent/swollen; throat slightly dilated, villous annulate, rarely glabrous inside; upper lip straight, entire to 2-lobed; lower lip elongate, 3-lobed, with middle lobe obcordate to nearly flabellate and lateral lobes oblong. Stamens 4, didynamous, exerted from upper lip, involute in bud, anterior 2 longer; filaments straight to slightly curved; anther cells 2, apically confluent. Style subequally 2-cleft, lobes subulate. Nutlets obovoid, triquetrous, netted on back, lateral-ventral side with an areole 1/2–2/3 its length, with an elaiosome.

About 40–50 species: Asia, Europe, especially in the Near East; 18 species in China.

- 1a. Verticillasters 2(–4, rarely more)-flowered, widely spaced; floral leaves similar to stem leaves; fertile branches (only) erect to ascending.
 - 2a. Base of corolla tube not villous annulate inside; leaf base cordate to subtruncate 1. *A. lobata*
 - 2b. Base of corolla tube villous annulate inside; leaf base cuneate to subtruncate, decurrent.
 - 3a. Leaves spatulate, 2–3×4–6 mm 2. *A. pygmaea*
 - 3b. Leaves ovate to oblong, more than 10 mm wide.
 - 4a. Leaves 3–5.3×2.5–3.8 cm, ovate to ovate-oblong, basally cuneate to subtruncate, slightly decurrent 3. *A. sciaphila*
 - 4b. Leaves 2–3.4×1.2–2.3 cm, oblong to ovate-oblong, basally cuneate to decurrent 4. *A. nubigena*
- 1b. Verticillasters 6- or more flowered, close together; floral leaves unlike stem leaves (except in *A. linearifolia*); plants erect, rarely trailing.
 - 5a. Floral leaves longer than flowers, whitish yellow, white, or purple 5. *A. lupulina*
 - 5b. Floral leaves equal to or slightly shorter than flowers, rarely longer, green or purplish.
 - 6a. Corolla tube (1.5–)2–3 cm, upper lip 2-lobed 6. *A. ovalifolia*
 - 6b. Corolla tube less than 1.6 cm, rarely to 2 cm, upper lip shallowly 2-lobed.
 - 7a. Floral and stem leaves similar, of 1 color; stem leaves linear to linear-lanceolate 18. *A. linearifolia*
 - 7b. Floral and stem leaves dissimilar; stem leaves of other shapes.
 - 8a. Corolla tube erect to slightly curved, not saccate or bent above annulus of hairs.
 - 9a. Calyx ciliate along veins and teeth margin, villous to puberulent apically, glabrous basally, or subglabrous throughout.
 - 10a. Stems 25–40 cm tall, purplish red or greenish purple, glabrous, gray villous only on younger parts; leaves ovate-oblong to narrowly oblong, 4–7.5×3.2–4 cm, irregularly double dentate 7. *A. ciliata*
 - 10b. Stems less than 20 cm tall, sometimes to 30 cm, not brightly colored, densely gray pubescent to gray villous; leaves ovate to lanceolate-oblong, less than 3.2 cm wide, margin repand.
 - 11a. Inflorescences 1–3 cm; floral leaves usually shorter than flowers; calyx white villous on teeth 9. *A. campylanthoides*
 - 11b. Inflorescences ca. 6 cm; floral leaves much longer than flowers; calyx ciliate along veins and apical teeth margin 11. *A. forrestii*
 - 9b. Calyx strigose, villous, or lanate-villous throughout, especially on teeth.
 - 12a. Calyx strigose; corolla tube slightly curved; stamens nearly included; plants subprostrate, basally stoloniferous 10. *A. campylantha*
 - 12b. Calyx villous or lanate-villous; corolla tube straight; stamens slightly exerted; plants erect or stoloniferous.
 - 13a. Stems erect, unbranched, 6–21 cm tall, densely gray lanate or silky 8. *A. multiflora*
 - 13b. Plants with stolons and erect fertile stems ca. 10 cm tall, gray villous or lanate-villous 12. *A. bracteosa*
 - 8b. Corolla tube slightly swollen, shallowly saccate to bent above annulus of hairs.
 - 14a. Calyx teeth lanceolate to lanceolate-triangular; plants spreading ascending or with stolons 13. *A. pantantha*
 - 14b. Calyx teeth narrowly triangular to broadly ovate; plants erect, sometimes trailing-ascending.
 - 15a. Corolla 6–8(–9) mm; calyx teeth ovate to ovate-triangular; stamens exerted ca. 1/2 their length.
 - 16a. Corolla white, upper lip shorter than lateral lobes of lower lip; calyx teeth ovate-triangular 16. *A. dictyocarpa*
 - 16b. Corolla blue, blue-purple, or purple, upper lip nearly as long as lateral lobes of lower lip; calyx teeth ovate to broadly ovate 17. *A. macrosperma*
 - 15b. Corolla more than 8 mm; calyx teeth narrowly or short triangular; stamens exerted 1/4–1/3 their length.
 - 17a. Leaves spatulate to suboblong; plants prostrate, with basal leaves at anthesis 14. *A. decumbens*
 - 17b. Leaves broadly oblong to obovate-elliptic; plants erect or rarely prostrate,

branched at base, without basal leaves at anthesis 15. *A. nipponensis*

1. *Ajuga lobata* D. Don, Prodr. Fl. Nepal. 108. 1825.

匍枝筋骨草 pu zhi jin gu cao

Herbs perennial, erect, stoloniferous, 7–12 cm tall. Branches trailing, rooting at nodes, brownish villous/pilose. Petiole 2–4(–5) cm; leaf blade circular to elliptic-circular, 2–2.5×1.8–2.4 cm, sparsely strigose, densely so on abaxial veins, basal blades purplish, base cordate to subtruncate, margin irregularly crenate, ciliate, apex rounded to obtuse. Floral leaves similar to stem leaves. Flowers solitary. Pedicel 3–4 mm. Calyx campanulate, ca. 5 mm, slightly swollen; teeth ovate-lanceolate, 1/2 or more as long as calyx, posterior tooth slightly shorter and somewhat obtuse, ciliate. Corolla purple or reddish purple, tubular, straight, 1.3–1.5 cm, pubescent, not hairy annulate inside; upper lip erect, semicircular, emarginate; lower lip with middle lobe flabellate, 2-lobed, lateral lobes oblong-lanceolate. Nutlets ca. 2 mm, netted on back, with an areole to 4/5 of nutlet length. Fl. Apr–May, fr. May–Jul.

Dense forests; 1500–3000 m. Xizang, Yunnan [Bhutan, India (Sikkim), N Myanmar, Nepal].

2. *Ajuga pygmaea* A. Gray, Mem. Amer. Acad. Arts, n.s. 6: 402. 1858.

台湾筋骨草 tai wan jin gu cao

Herbs procumbent, stoloniferous. Internodes of stolons 4–6 cm. Leaves in a rosette, petiolate; leaf blade spatulate, 2–3 cm×4–6 mm, sparsely strigose, base cuneate, decurrent, margin 1- or 2-undulate-dentate, ciliate, apex widely obtuse to rounded. Floral leaves similar. Flowers sky blue, solitary in apical axils. Calyx campanulate, ca. 4 mm, 10-veined; teeth oblong, ca. 1/2 as long as calyx, obtuse, ciliate, pilose. Corolla ca. 1.2 cm, tubular; tube straight, pilose, villous annulate inside; upper lip straight, 2-lobed, with obtusely triangular lobes; lower lip 2–3×as long as upper lip, with middle lobe narrowly obovate-triangular, base truncate, apex emarginate; lateral lobes quadrate, almost as long as middle lobe. Nutlets ca. 2 mm, areole to 2/3 of nutlet length.

Jiangsu, Taiwan [Japan].

3. *Ajuga sciaphila* W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 193. 1920.

喜荫筋骨草 xi yin jin gu cao

Herbs perennial, stoloniferous. Stems erect, 10–30 cm tall, villous to pilose. Petiole 1.3–2(–3.7) cm; leaf blade ovate to ovate-elliptic, 3–5.3×2.5–3.8 cm, papery, strigose and densely so abaxially on veins, base cuneate to subtruncate and decurrent, margin irregularly to coarsely crenate, apex obtuse to subrounded. Verticillasters widely spaced, 2–(6)-flowered. Pedicel 3–6(–12) mm, villous. Calyx campanulate, sparsely villous, 5.5–7 mm; teeth subequal, ovate-triangular to triangular, ciliate, ca. 1/2 as long as calyx. Corolla blue or purplish blue with purple lines; tube straight, 1.5–1.8 cm, sparsely pubescent, villous annulate and puberulent inside; upper lip semicircular, emarginate; middle lobe of lower lip 0.9–1.1 cm, triangular-obcordate, 2-lobed; lateral lobes oblong, to 5 mm. Nutlets obovoid, triquetrous, glabrous, netted on back, with an areole adaxially. Fl. Jun–Jul.

• Grassy slopes, moist riverbanks in pine forests, broad-leaved forests; 2500–3700 m. Sichuan, Yunnan.

4. *Ajuga nubigena* Diels, Notizbl. Bot. Gart. Berlin-Dahlem 9: 1030. 1926.

高山筋骨草 gao shan jin gu cao

Herbs perennial, stoloniferous. Stolons ca. 10 cm, pilose or villous especially on younger parts. Fertile branches erect, ca. 6 cm tall. Petiole 1–2 cm, sometimes narrowly winged; leaf blade purplish green or purplish red abaxially, elliptic to ovate-elliptic, 2–3.4×1.2–2.3 cm, papery, pilose, base cuneate to decurrent, margin irregularly coarse crenate, apex obtuse to subrounded. Verticillasters 2-flowered, subapical, 2 or 3 together. Pedicel 2–4 mm. Calyx campanulate, ca. 7 mm; teeth ovate-triangular, subregular, ca. 1/2 as long as calyx, ciliate. Corolla purplish with purple spots or lines, tubular, 1–2×as long as calyx, sparsely pubescent, villous annulate inside; upper lip straight, apex emarginate; middle lobe of lower lip 5–7 mm, flabellate, apex emarginate, lateral lobes linear-oblong. Nutlets glabrous, with an areole adaxially. Fl. May–Aug, fr. Jul–Sep.

• Sparse forests, rocky crevices in alpine regions; 2500–4800 m. Sichuan, Xizang, Yunnan.

5. *Ajuga lupulina* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 23: 391. 1877.

白苞筋骨草 bai bao jin gu cao

Herbs perennial, rhizomatous. Stems robust, erect, angles and nodes villous. Petiole narrowly winged, basally amplexicaul; leaf blade lanceolate to rhombic-ovate, 5–11×1.8–3 cm, base cuneate-decurrent, margin remotely undulate-crenate, inconspicuously crenate-dentate, to subentire, apex obtuse. Floral leaves white-yellow, white, or greenish purple, reduced apically, ovate to broadly ovate, 3.5–5×1.8–2.7 cm, base rounded, amplexicaul, margin entire to dentate, apex acuminate. Calyx campanulate to subfunnelform, 7–9 mm, slightly swollen in front, with inconspicuous accessory veins; teeth narrowly triangular, 1/2 or more as long as calyx, regular, apically acuminate, ciliate. Corolla white, whitish green, or whitish yellow with purple lines, narrowly funnelform, (1.1–)1.8–2.5 cm, sparsely villous; tube slightly swollen to saccate near base, villous annulate inside, curved; upper lip straight, 2-lobed, with subcircular lobes; lower lip projected, with middle lobe narrowly flabellate, ca. 6.5 mm, apex emarginate; lateral lobes semicircular, deltate to oblong, ca. 3 mm. Nutlets slightly swollen at middle, areole almost 1/2 as long as adaxial side of nutlet. Fl. Jul–Sep, fr. Aug–Oct.

• Sandy areas along riverbanks, alpine grasslands, grassy slopes near villages, crevices of steep rocky slopes; 1300–4200 m. Gansu, Hebei, Qinghai, Shanxi, Sichuan, Xizang, Yunnan.

- 1a. Floral leaves entire; leaf blade lanceolate-oblong to lanceolate, adaxially glabrous or very sparsely pilose, abaxially villous on veins or sparsely pilose near apex; plants 8–25 cm tall 5a. var. *lupulina*
- 1b. Floral leaves dentate; leaf blade ovate-circular to rhombic-ovate, pilose; plants more than 25 cm tall 5b. var. *major*

5a. *Ajuga lupulina* var. *lupulina*

白苞筋骨草 bai bao jin gu cao

Plants 8–25 cm tall. Leaf blade lanceolate-oblong to lanceolate, adaxially glabrous or very sparsely pilose,

abaxially villous on veins or sparsely pilose near apex. Floral leaves entire.

• Sandy areas along riverbanks, alpine grasslands, crevices of steep rocky slopes; 1300–3500 m. Gansu, Hebei, Qinghai, Shanxi, Sichuan, Xizang.

5b. *Ajuga lupulina* var. *major* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 242. 1912.

齿苞变种 *chi bao bian zhong*

Plants more than 25 cm tall; leaf blade ovate to rhombic-ovate, pilose, veins abaxially conspicuously elevated. Floral leaves more than 2.5 cm wide, dentate.

• Grasslands near alpine forests, grassy slopes near villages; 2800–4200 m. Sichuan, Yunnan.

6. *Ajuga ovalifolia* Bureau & Franchet, J. Bot. (Morot) 5: 150. 1890.

圆叶筋骨草 *yuan ye jin gu cao*

Herbs annual. Stems 3–23(–30) cm tall, erect, white villous, unbranched. Petiole 0.7–2 cm, narrowly winged, greenish white, sometimes red or greenish purple; leaf blade (3–)4–8×(1.5–)2.2–7 cm, sparsely strigose, base cuneate-decurrent, margin undulate to irregularly crenate, ciliate, apex obtuse to rounded. Inflorescences terminal, subcapitate, 2–3 cm, of 3 or 4 verticillasters; basal floral leaves green, red, or blue, shaded purplish, ovate to elliptic, 1.5–4.5 cm, crenate to entire, ciliate. Calyx tubular-campanulate, 5–8 mm, glabrous or ciliate on margin; teeth narrowly triangular to linear-lanceolate, to 1/2 as long as calyx. Corolla red-purple to blue, tubular, slightly curved, 1.5–3 cm, pilose, villous annulate inside; upper lip 2-lobed, with circular and equal lobes; lower lip with flabellate middle lobe slightly larger than circular lateral lobes. Fl. Jun-Aug, fr. Sep.

• Grassy slopes, thickets; 2800–3700 m. Gansu, Sichuan.

- 1a. Stems 10–23(–30) cm tall, with 3 or more pairs of leaves; leaf blade oblong-elliptic to broadly ovate-elliptic, 4–8×2.2–5 cm; corolla 2–2.5 cm 6a. var. *ovalifolia*
- 1b. Stems 3–6(–12) cm tall, with 2 or occasionally 3 pairs of leaves; leaf blade narrowly lanceolate to broadly ovate or subrhombic, (3–)4–6×(1.5–)3–7 cm; corolla 1.5–2(–3) cm 6b. var. *calantha*

6a. *Ajuga ovalifolia* var. *ovalifolia*

圆叶筋骨草 *yuan ye jin gu cao*

Stems 10–23(–30 or more) cm tall, with 3 or more pairs of leaves. Leaf blade oblong-elliptic to broadly ovate-elliptic, 4–8×2.2–5 cm. Corolla 2–2.5 cm.

• Sandy, grassy, barren slopes, thickets; 2800–4300 m. Gansu, Sichuan.

6b. *Ajuga ovalifolia* var. *calantha* (Diels ex Limpricht) C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 23. 1974.

美花变种 *mei hua bian zhong*

Ajuga calantha Diels ex Limpricht, Repert. Spec. Nov. Regni Veg. Beih. 12: 475. 1922; *A. ovalifolia* var. *calantha* (Diels ex Limpricht) C. Y. Wu & C. Chen f. *albiflora* Sun ex C. Y. Wu & C. Chen; *A. ovalifolia* var. *calantha* f. *angustifolia* (Diels) C. Y. Wu & C. Chen; *A. calantha* var. *angustifolia* Diels; *A. ovalifolia* var. *angustifolia* (Diels ex Limpricht) Handel-Mazzetti.

Stems 3–6(–12) cm tall, with 2 (or 3) pairs of leaves. Leaf blade narrowly lanceolate to broadly ovate to subrhombic, (3–)4–6 × (1.5–)3–7 cm, basally decurrent. Corolla 1.5–2(–3) cm.

• Sandy, grassy, barren slopes; 3000–4300 m. Gansu, Sichuan.

7. *Ajuga ciliata* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 125. 1833.

筋骨草 *jin gu cao*

Herbs perennial. Stems erect, 25–40 cm tall, purplish red or greenish red. Petiole 1 cm or more, sometimes purple-red, amplexicaul, gray pilose or ciliate only on margin; leaf blade ovate-elliptic to narrowly elliptic, 4–7.5×3.2–4 cm, strigose or pilose, base cuneate-decurrent, margin irregularly double dentate, ciliate, apex obtuse to acute. Inflorescences terminal, 5–10 cm, of crowded verticillasters; floral leaves sometimes purplish red, ovate, 1–1.5 cm, base cuneate, margin entire to slightly incised, apex acute. Calyx funnelform-campanulate, 7–8 mm, glabrous; teeth pilose, ciliate, narrowly triangular, 1/2 or more as long as calyx, apically acute, regular. Corolla tube 2× or more as long as calyx, pilose, puberulent, villous annulate inside; upper lip straight, apex rounded and emarginate; lower lip enlarged, elongated, with middle lobe obcordate and lateral lobes linear-oblong. Nutlets adaxially swollen at middle, areole covering almost entire adaxial side. Fl. Apr-Aug, fr. Jul-Sep.

• Streamsides, moist grasslands, moist areas in forests, dense grass; 300–2500 m. Gansu, Hebei, Hubei, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

- 1a. Plants glabrous or subglabrous.
- 2a. Corolla white to pale rose or red; calyx teeth narrowly triangular 7b. var. *glabrescens*
- 2b. Corolla whitish green; calyx teeth ovate 7c. var. *ovatisepala*
- 1b. Plants conspicuously hairy.
- 3a. Plants pilose or strigose except for gray villous on younger stems 7a. var. *ciliata*
- 3b. Plants villous or densely white villous.
- 4a. Abaxial leaf surface purplish red; corolla purple with blue lines; plants villous 7d. var. *hirta*
- 4b. Abaxial leaf surface greenish; corolla tube whitish, limb blue or purple; plants densely white villous 7e. var. *chanetii*

7a. *Ajuga ciliata* var. *ciliata*

筋骨草 *jin gu cao*

Plants pilose or strigose except gray villous on younger parts of stem.

• Streamsides, moist grasslands, moist areas in forests; 300–1800 m. Gansu, Hubei, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang.

Used medicinally for hemolysis, tonsillitis, and sore throat.

7b. *Ajuga ciliata* var. *glabrescens* Hemsley, J. Linn. Soc., Bot. 26: 315. 1890.

微毛变种 *wei mao bian zhong*

Ajuga ciliata f. *glabrescens* (Hemsley) Kudô.

Leaf blade glabrous, subglabrous, or puberulent, broadly elliptic to elliptic-ovate. Calyx sparsely puberulent or subglabrous. Corolla white to pale rose or red.

• Grassy slopes, forests; 1100–2500 m. Gansu, Hubei, Shaanxi, Sichuan.

7c. *Ajuga ciliata* var. *ovatisepala* C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 25. 1974.

卵齿变种 luan chi bian zhong

Plants glabrous or subglabrous. Leaf blade membranous, 7–13×2–2.5 cm. Calyx funnelform, sparsely puberulent, teeth ovate with pilose margin. Corolla whitish green, 1–1.5 cm.

• Grassy areas; 2500 m. Sichuan.

7d. *Ajuga ciliata* var. *hirta* C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 25. 1974.

长毛变种 chang mao bian zhong

Plants villous. Leaf blade 5–8(–13)×3–4.5(–8) cm, papery, abaxially purplish red. Calyx teeth triangular to narrowly triangular with villous-ciliate margin.

• Forests; 2000 m. Sichuan.

7e. *Ajuga ciliata* var. *chanetii* (H. Léveillé & Vaniot) C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 26. 1974.

陕甘变种 shan gan bian zhong

Ajuga chaneti H. Léveillé & Vaniot, Repert. Spec. Nov. Regni Veg. 8: 258. 1910; *A. ciliata* f. *chanetii* (H. Léveillé & Vaniot) Kudô; *A. ciliata* var. *chanetii* f. *pauciflora* C. Y. Wu & C. Chen.

Plants densely gray villous. Calyx teeth villous-ciliate, hairs longer than those on corolla tube. Corolla tube whitish, limb blue or purple.

• Low grass; 1800 m. Gansu, Hebei, Shaanxi.

8. *Ajuga multiflora* Bunge, Mém. Acad. Imp. Sci. St. Pétersbourg. Divers Savans 2: 125. 1833.

多花筋骨草 duo hua jin gu cao

Herbs perennial. Stems erect, unbranched, 6–23 cm tall. Basal leaves often in a rosette, petiolate, upper leaves sessile to petiolate, sometimes alternate; petiole 0.7–2 cm; leaf blade lanceolate to ovate-oblong, 1.5–4×1–1.5 cm, adaxially densely villous-strigose, abaxially sparsely villous-ciliate, margin villous-ciliate. Apical verticillasters crowded, forming dense spikes 3–10 cm; apical floral leaves reduced, lanceolate to ovate, margin subentire or entire. Calyx broadly campanulate, 5–7 mm, lanate-villous; teeth regular, subulate-triangular, to 2/3 as long as calyx, apically acute, villous-ciliate. Corolla blue-purple or blue, tubular, 1–1.8 cm, puberulent, villous annulate inside; upper lip straight, with 2 circular lobes; middle lobe of lower lip flabellate, lateral lobes oblong. Nutlets adaxially swollen at middle, areole to 2/3 as long as adaxial side of nutlet. Fl. Apr-May, fr. May-Jun.

Sparse grass on slopes, thickets, riverbank grasslands. Anhui, Hebei, Heilongjiang, Jiangsu, Liaoning, Nei Mongol [Korea, Russia].

1a. Plants 13–23 cm tall; basal leaves in a rosette, ovate-oblong; upper leaf blades broadly ovate to subcircular, coarsely serrate; corolla to 1.8 cm 8b. var. *serotina*

1b. Plants 6–20 cm tall; basal leaves not in a rosette, elliptic-oblong to elliptic-ovate; upper leaf blades lanceolate to oblong-lanceolate, undulate to undulate-crenate; corolla 1–1.2 cm.

2a. Stems and inflorescences densely gray lanate-

villous; inflorescences ca. 10 cm;

upper leaves opposite, sessile 8a. var. *multiflora*

2b. Stems and inflorescences densely long sericeous; inflorescences ca. 4 cm; upper leaves alternate, petiolate 8c. var. *brevispicata*

8a. *Ajuga multiflora* var. *multiflora*

多花筋骨草 duo hua jin gu cao

Ajuga amurica Freyn; *A. lanosa* Sun.

Plants 6–20 cm tall. Stems densely lanate-villous. Basal stem leaves petiolate, apical ones sessile; leaf blade elliptic-oblong to elliptic-ovate, margin slightly undulate to undulate-crenate. Inflorescences ca. 10 cm, densely lanate-villous; floral leaves similar to stem leaves, reduced apically, lanceolate to ovate. Corolla 1–1.2 cm.

Sparse grassy slopes, thickets, riverbank grasslands. Anhui, Hebei, Heilongjiang, Jiangsu, Liaoning, Nei Mongol [Korea, Russia].

Used medicinally as a diuretic in Korea.

8b. *Ajuga multiflora* var. *serotina* Kitagawa, Lin. Fl. Mansh. 375. 1939.

莲座变种 lian zuo bian zhong

Plants 13–23 cm tall. Basal leaves in a rosette, ovate-oblong; upper leaves broadly ovate to subcircular, coarsely serrate. Floral leaves broadly ovate to subcircular, coarsely serrate. Corolla to 1.8 cm.

• Heilongjiang, Liaoning.

8c. *Ajuga multiflora* var. *brevispicata* C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 26. 1974.

短穗变种 duan sui bian zhong

Plants ca. 12 cm tall. Stems densely long sericeous. Upper leaves alternate, long petiolate, lanceolate to oblong-lanceolate. Inflorescences 3–4 cm, densely long sericeous; floral leaves lanceolate, long sericeous.

• Liaoning.

9. *Ajuga campylanthoides* C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 26. 1974.

康定筋骨草 kang ding jin gu cao

Herbs stoloniferous. Stems erect, 2.5–18 cm tall, unbranched, white villous. Petiole 4–7 mm, grooved, narrowly winged; leaf blade lanceolate-oblong to broadly ovate, 2.5–4×1–2(–3) cm, strigose, ciliate, base cuneate-decurrent, margin undulate-dentate, upper leaves sometimes entire, apex rounded to obtuse. Verticillasters in terminal spikes 1–3 cm, rarely in basal leaf axils; floral leaves reduced apically, ovate to sublanceolate. Pedicel ca. 2 mm. Calyx funnelform, ca. 4 mm, glabrous, inconspicuous 5-veined; teeth narrowly triangular to triangular-ovate, to 1/2 as long as calyx, ciliate on margin, white villous. Corolla white or reddish, tubular, straight, 1.2–1.8 cm, apically sparsely puberulent, villous annulate inside; upper lip straight, circular, apex emarginate, ciliate; lower lip glabrous, with middle lobe obcordate and lateral lobes oblong. Nutlets unknown. Fl. Jul-Sep.

• Grassy slopes, streamsides; 2000–2800 m. Gansu, Sichuan, Xizang, Yunnan.

1a. Plants (5–)8–18 cm tall; stems and abaxial surface of leaf greenish; leaf blade ovate to oblong-lanceolate; corolla white 9a. var. *campylanthoides*

1b. Plants 2.5–7 cm tall; stems and abaxial surface of leaf purplish red; leaf blade broadly ovate; corolla reddish 9b. var. *subcaulis*

9a. *Ajuga campylanthoides* var. *campylanthoides*

康定筋骨草 kang ding jin gu cao

Plants (5–)8–18 cm tall. Stems greenish. Leaf blade ovate to lanceolate-oblong, abaxially greenish. Corolla white.

- Grassy slopes; 2200–2800 m. Sichuan, Xizang, Yunnan.

9b. *Ajuga campylanthoides* var. *subcaulis* C. Y. Wu & C. Chen, Acta Phytotax. Sin. 12: 28. 1974.

短茎变种 duan jing bian zhong

Plants 2.5–7 cm tall. Stems purplish red. Leaf blade broadly ovate, abaxially purplish red. Corolla reddish.

- Sloping grasslands on sandy, stony soils, streamsides; 2000–2600 m. Gansu.

10. *Ajuga campylantha* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 243. 1912.

弯花筋骨草 wan hua jin gu cao

Herbs perennial, prostrate, 6–16 cm tall, densely brownish floccose-villous/strigose. Petiole less than 1.5 cm; leaf blade elliptic to oblong-lanceolate, rarely lanceolate, 4–6.5×1.5–2.6 cm, strigose, base cuneate, margin undulate-serrate to crenate, ciliate, apex obtuse to sometimes acute. Inflorescences terminal, less than 3 cm, of many crowded verticillasters; floral leaves ovate, base rounded, margin subentire to undulate-crenate. Pedicel short to obsolete. Calyx campanulate, 5–6 mm, strigose, especially on teeth; teeth triangular-ovate, to 2/3 as long as calyx, ciliate. Corolla white with purple lines, tubular, slightly incurved, villous, villous annulate inside; upper lip straight, lobes circular, almost as long as lateral lobes of lower lip, ciliate; middle lobe of lower lip obcordate, lateral lobes oblong, ciliate. Nutlets adaxially swollen at middle, areole covering most of adaxial side. Fl. May–Aug, fr. Jun–Sep.

- Alpine and *Rhododendron* thickets, pine forests, pastures; 2800–3500 m. Yunnan.

Used medicinally.

11. *Ajuga forrestii* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 242. 1912.

痢止蒿 li zhi hao

Ajuga mairei H. Léveillé.

Herbs erect, perennial, stoloniferous. Stems 6–20(–30 or more) cm tall, gray pubescent or villous, base woody, branched; branches gray pubescent or villous. Petiole 0–8 mm, narrowly winged; leaf blade ovate to lanceolate-oblong, 4–8(–12)×1.8–3.5(–4.5) cm, densely gray pubescent or villous, base cuneate-decurrent, margin undulate-serrate to crenate, ciliate, apex obtuse to rounded. Inflorescences terminal, ca. 6 cm. Pedicel short or absent. Calyx funnelform, 5–6.5 mm, ciliate along veins and margin; teeth purple, ovate, to 1/2 as long as calyx, subregular. Corolla purplish, purplish blue, or blue, tubular, straight, 7–11 mm, sparsely pubescent, obliquely villous annulate inside; upper lip straight, circular, apex emarginate; middle lobe of lower lip narrowly obcordate, with dark purple lines; lateral lobes linear-oblong. Nutlets areole to 2/3 or more as long as adaxial side of nutlet. Fl. Apr–Aug, fr. May–Oct.

- Patches in moist grasslands, grassy streamsides, open roadsides; 1700–4000 m. Sichuan, Xizang, Yunnan.

Used medicinally for dysentery and ascariasis in NW Yunnan.

12. *Ajuga bracteosa* Wallich ex Benth, Pl. Asiat. Rar. 1: 59. 1830.

九味一枝蒿 jiu wei yi zhi hao

Herbs perennial, erect, stoloniferous. Stems branched from base, 10–30 cm tall, gray villous or lanate-villous especially on young parts. Basal petioles 1–1.5 cm; basal leaf blade spatulate to oblanceolate, 2–4×0.7–1.2 cm; stem blades sessile or subsessile, obovate to subcircular, 1–1.5×0.6–1 cm, pilose or strigose, base cuneate-decurrent, margin inconspicuously to irregularly undulate-crenate, ciliate, apex obtuse to subrounded. Basal verticillasters widely spaced, apical verticillasters in dense spikes; basal floral leaves densely lanate-villous, incised, ciliate. Calyx campanulate, 4.5–6 mm, villous especially on teeth; teeth subulate-triangular, regular, 1/2 or more as long as calyx, apically acute, margin villous-ciliate. Corolla purple or purplish with dark purple spots, tubular, slightly exerted, puberulent, yellowish glandular, villous annulate inside; upper lip straight, apex emarginate; middle lobe of lower lip obcordate, lateral lobes oblong. Nutlets oblong to oblong-obovoid, adaxially swollen at middle, areole to 2/3 or more as long as adaxial side of nutlet. Fl. Apr–Jun, fr. May–Jun (or later).

Grassy slopes. Sichuan, Yunnan [Afghanistan, India, Myanmar, Nepal].

Used medicinally to stop bleeding and reduce inflammation.

13. *Ajuga pantantha* Handel-Mazzetti, Symb. Sin. 7: 911. 1936.

散瘀草 san yu cao

Herbs perennial, spreading-ascending or with stolons. Stems 1 to few, 7–32 cm tall, basally leafless, densely gray villous or lanate-villous. Petiole obsolete to 5 mm, grooved, narrowly winged, villous; leaf blade oblong-obovate to triangular-obovate, 1.5–3×0.8–1.8 cm, black when dry, abaxially reddish, pilose, base cuneate-decurrent, margin irregularly, remotely serrate to subentire, ciliate, apex obtuse to 3-lobed. Verticillasters 4–8-flowered. Pedicel absent to obsolete. Calyx purple, funnelform, 5–7 mm, villous; teeth lanceolate to lanceolate-triangular, more than 1/2 as long as calyx, villous-ciliate. Corolla rose to purple-red or purple-blue, tubular, straight, base slightly bent, 8–10 mm, pilose or sparsely puberulent, yellowish glandular, villous annulate inside; upper lip erect, circular, apex emarginate; middle lobe of lower lip obovate, apex emarginate, lateral lobes oblong. Nutlets brown, areole to 1/2 as long as adaxial side of nutlet. Fl. Aug–Nov, fr. Oct.

- Dry, sloping areas in low grass; 2400–2700 m. Yunnan.

Used medicinally.

14. *Ajuga decumbens* Thunberg, Syst. Veg. ed. 14, 525. 1784.

金疮小草 jin chuang xiao cao

Herbs annual or biennial, stoloniferous. Stems 10–30 cm tall, white villous or lanate-villous especially on young parts. Basal leaves numerous, longer than stem leaves; petiole 1–2.5 cm or more, narrowly winged, purplish green or greenish, villous; leaf blade 3–6(–14)×1.5–2.5(–5) cm, sparsely strigose to pilose, base attenuate-decurrent, ciliate, apex obtuse to

rounded. Verticillasters many flowered, basally widely spaced, apically crowded in interrupted spikes 7–12 cm; apical floral leaves bractlike, lanceolate. Pedicel short. Calyx funnellform, 5–8 mm, margin pilose; teeth triangular, to 1/2 as long as calyx. Corolla tubular, straight, basally slightly swollen, 8–10 mm, pilose, villous annulate inside; upper lip of limb straight, circular, apex emarginate; middle lobe of lower lip narrowly flabellate to obcordate, lateral lobes oblong to subelliptic. Nutlets areole to nearly 2/3 as long as adaxial side of nutlet. Fl. Mar-Jul, fr. May-Nov.

Streamsides, roadsides, wet grassy slopes, wet areas in bamboo forests; 400–2300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

- 1a. Stems erect, rarely trailing, to 30 cm tall; leaves oblanceolate to nearly oblong, irregularly dentate; corolla white or whitish green, 1.5–2 cm 14b. var. *oblancifolia*
1b. Stems ascending to prostrate, 10–20 cm; leaves spatulate to obovate-lanceolate, irregularly undulate-crenate to subentire; corolla bluish or reddish purple, 0.8–1 cm 14a. var. *decumbens*

14a. *Ajuga decumbens* var. *decumbens*

金疮小草 jin chuang xiao cao

Stems erect, rarely trailing, 20–30 cm tall. Leaf blade oblanceolate to suboblong, margin irregularly dentate. Corolla white or whitish green, 1.5–2 cm.

Streamsides, roadsides, wet grassy slopes; 400–1400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

Used medicinally.

14b. *Ajuga decumbens* var. *oblancifolia* Sun ex C. H. Hu, Acta Phytotax. Sin. 11: 35. 1966.

狭叶变种 xia ye bian zhong

Stems ascending to prostrate, 10–20 cm. Leaf blade spatulate to obovate-lanceolate, margin irregularly undulate-crenate to subentire. Corolla bluish or reddish purple, 0.8–1 cm.

• Wet areas in bamboo forests, roadsides; 1500–2300 m. Guizhou, Sichuan.

15. *Ajuga nipponensis* Makino, Bot. Mag. (Tokyo) 23: 67. 1909.

紫背金盘 zi bei jin pan

Ajuga decumbens Thunberg var. *pallescens* (Maximowicz) Handel-Mazzetti; *A. genevensis* Linnaeus var. *pallescens* Maximowicz; *A. labordei* Vaniot; *A. matsumurana* Kudô; *A. nipponensis* Makino var. *pallescens* (Maximowicz) C. Y. Wu & C. Chen; *A. pallescens* Price & Metcalf.

Herbs annual or biennial. Stems rarely prostrate or ascending, (8–)10–20 cm or more tall, villous or pilose, base purplish. Basal leaves absent or few; petiole 1–1.5 cm, to 2.5 cm in basal leaves, narrowly winged, sometimes purplish green; leaf blade obovate, broadly elliptic to subcircular or spatulate, 2–4.5×1.5–2.5 cm, sparsely strigose or pilose, base cuneate-decurrent, margin dentate to undulate-crenate, ciliate, apex obtuse. Verticillasters many flowered, apical ones in

crowded terminal spikes; apical floral leaves bractlike, ovate to broadly lanceolate, 0.8–1.5 cm, margin entire to incised. Calyx campanulate, 3–5 mm, villous apically and on margin; teeth triangular, to 1/2 as long as calyx, apically acuminate. Corolla bluish or blue-purple, rarely whitish, with dark lines, tubular, (6–)8–11 mm, base slightly swollen, sparsely pubescent, villous annulate inside; upper lip straight, 2-lobed; middle lobe of lower lip flabellate, with apex truncate to emarginate, lateral lobes narrowly oblong. Nutlets areole to 3/5 as long as adaxial side of nutlet. Fl. Apr-Jun (E China), Dec-Mar (SW China), fr. Jan-May.

Field margins, wet areas on grasslands, sunny slopes, forests; 100–2300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

A folk remedy for traumatic injuries and inflammation caused by various diseases.

16. *Ajuga dictyocarpa* Hayata, Icon. Pl. Formos. 8: 84. 1919.

网果筋骨草 wang guo jin gu cao

Herbs ascending, sometimes stoloniferous. Stems 20–30 cm tall, pubescent, branched apically. Petiole narrowly winged, 1–3 cm; leaf blade obovate to oblong-obovate, rarely triangular-obovate, 3–4(–10)×2(–5) cm, subglabrous, pubescent along midrib, base cuneate to decurrent, margin coarsely dentate to irregularly crenate, sparsely ciliate, apex obtuse to subrounded. Verticillasters 12- or more flowered, in terminal spikes 5–12 cm; apical floral leaves bractlike, ovate to ovate-lanceolate, margin dentate to entire, smallest ca. 8×4 mm. Calyx campanulate, 3.5–4.5×3–3.5 mm; teeth ovate-triangular, to 1/2 as long as calyx, ciliate, sparsely villous. Corolla white, tubular, straight, slightly bent, 6–8 mm, tube glabrous, limb ± villous, villous annulate inside; upper lip semicircular, 2-lobed; lower lip projected, with middle lobe narrowly cordate, ca. 2×1.5 mm, apex emarginate; lateral lobes oblong, ca. 1.5×1 mm. Nutlets areole to 2/3 length of adaxial side of nutlet. Fl. and fr. Mar-Jun.

Wet grasslands. Fujian, Guangdong, Jiangxi, Taiwan [Japan (Ryukyu Islands), Vietnam].

17. *Ajuga macrosperma* Wallich ex Bentham, Pl. Asiat. Rar. 1: 58. 1830.

大籽筋骨草 da zi jin gu cao

Herbs erect or prostrate, sometimes stoloniferous, hairy or glabrous. Stems 15–40 cm or more tall, pilose or subglabrous when old, young parts densely white villous. Petiole 2–5 cm or more, narrowly winged, sometimes purplish, pilose; leaf blade oblanceolate, ovate-lanceolate to elliptic-ovate, 4–10(–15)×1.8–4.5(–6.5) cm, villous to strigose, base cuneate-decurrent, margin undulate to irregularly undulate-crenate, ciliate, apex obtuse to acute. Verticillasters 6–12-flowered, in axils of apical and mid stem leaves, apically forming spikes; apical floral leaves bractlike, ovate-lanceolate, slightly longer than verticillasters. Pedicel very short or obsolete. Calyx funnellform, 5–6 mm, veins strigose; teeth ovate, to 1/3 as long as calyx, apically rounded, strigose, gray villous-ciliate at margin. Corolla blue to purple, tubular, 7–9 mm, obliquely spreading, slightly curved near middle, glabrous or pilose, villous annulate inside; upper lip oblong, straight, lobes subovate; middle lobe of lower lip narrowly cordate, emarginate at apex; lateral lobes oblong, as long as or slightly longer than upper lip. Nutlets areole 2/3–

3/4 as long as adaxial side of nutlet. Fl. Jan-Mar, fr. Mar-May (or later).

Shady areas in forests, limestone forests, ravines, grassy roadsides; 400–2600 m. Guangdong, Guangxi, Guizhou, Taiwan, Yunnan [Bhutan, India (Sikkim), Laos, Myanmar, Nepal, Thailand, Vietnam].

- 1a. Plants ± hairy; stems erect, sometimes stoloniferous; calyx teeth ovate to broadly ovate; corolla pilose 17a. var. *macrosperma*
1b. Plants glabrous; stems flaccid, prostrate, rooting; calyx teeth rounded apically; corolla glabrous 17b. var. *thomsonii*

17a. *Ajuga macrosperma* var. *macrosperma*

大籽筋骨草 da zi jin gu cao

Plants ± hairy. Stems erect, sometimes with stolons. Calyx teeth ovate to broadly ovate. Corolla pilose.

Shady areas in forests, ravines, grassy roadsides; 400–2600 m. Guangdong, Guangxi, Guizhou, Taiwan, Yunnan [Bhutan, Laos, Myanmar, Nepal, Thailand, Vietnam].

Used medicinally for nephritis.

17b. *Ajuga macrosperma* var. *thomsonii* (Maximowicz) J. D. Hooker, Fl. Brit. India 4: 704. 1885.

无毛变种 wu mao bian zhong

Ajuga thomsonii Maximowicz, Mélanges Biol. Bull. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 11: 821. 1883.

Plants glabrous. Stems flaccid, rooting, prostrate. Calyx teeth very short, rounded apically. Corolla glabrous.

Limestone forests; 1700 m. Yunnan [India (Sikkim)].

18. *Ajuga linearifolia* Pampanini, Nouv. Giorn. Bot. Ital., n.s. 17: 703. 1910.

线叶筋骨草 xian ye jin gu cao

Ajuga pachyrrhiza Kitagawa.

Herbs erect, branched, perennial. Stems 25–40 cm tall, white glandular villous or glandular lanate, purplish red, young branches green. Leaves sessile; leaf blade linear-lanceolate to linear, 4–9×0.5–1.5 cm, adaxially sparsely strigose, abaxially hairy on veins, base attenuate-decurrent, amplexicaul, margin ± incised to undulate, villous-ciliate, apex rounded. Verticillasters forming ill-defined terminal spikes. Calyx funnelform, 6–7 mm; teeth narrowly triangular to linear-lanceolate, to 3/5 as long as calyx, apically acuminate, margin densely villous-ciliate. Corolla white or bluish, with purple-blue spots, tubular, erect, included, sparsely puberulent, villous annulate inside; upper lip straight, rounded, apex emarginate; lower lip 6–8 mm, middle lobe flabellate, apex rounded to emarginate; lateral lobes linear-oblong. Nutlets areole nearly as long as adaxial side of nutlet. Fl. Apr-May(-Nov), fr. Jun(-Nov).

• Dry, grassy slopes, ravines; 700–900 m. Hebei, Hubei, Liaoning, Shaanxi, Shanxi.

