

28. ERITRICHIUM Schrader, Comment. Soc. Regiae Sci. Gott. 4: 186. 1820.

齿缘草属 *chi yuan cao shu*

Plants perennial or annual, appressed strigose or villous. Leaves alternate. Cymes terminal, not branched or branched and paniculate, rarely 1-flowered. Fruiting pedicel erect or deflexed. Calyx 5-parted to base or nearly so; lobes vertical to reflexed, enlarged in fruit. Corolla blue, light blue, or light purple, rarely yellow or white, campanulate-rotate to campanulate-tubular; throat with appendages, rarely appendages obscure or absent; lobes overlapping in bud, erect or divaricate at anthesis. Stamens included; anthers orbicular, ovate to oblong. Style and stigma solitary, usually not exceeding nutlets. Gynobase flattened-fastigiate or semiglobose to 1 mm, wider than tall at base. Nutlets 4, all or some developed, turbinate to ovoid or triangular-ovoid and dorsiventrally compressed; abaxially usually discoid, ribs or margin usually winged, dentate or with glochids.

About 50 species: mainly in Asia, a few in Europe and North America; 39 species in China.

- 1a. Herbs annual or biennial.
- 2a. Corolla campanulate-rotate 24. *E. heterocarpum*
- 2b. Corolla campanulate-tubular.
- 3a. Stems numerous, cespitose or diffuse, branched at base or not.
- 4a. Stems several, cespitose; inflorescences racemelike; corolla light blue, light purple, or yellow, appendages obscure 28. *E. tangkulaense*
- 4b. Stems diffuse, prostrate; flowers solitary, axillary or extra-axillary; corolla white, appendages transverse linear 29. *E. axillare*
- 3b. Stems single or few, markedly erect, much branched above.
- 5a. Flowers few, widely spaced; marginal glochids of nutlets needlelike, remote at base 27. *E. acicularum*
- 5b. Flowers numerous, crowded; marginal glochids of nutlets lanceolate, base usually confluent into a wing.
- 6a. Nutlets with dense tubercles and bristles, marginal glochids ciliate, attachment scar slightly above middle adaxially 25. *E. echinocaryum*
- 6b. Nutlets glabrous or sparsely pubescent, attachment scar at middle or slightly below adaxially 26. *E. thymifolium*
- 1b. Herbs perennial.
- 7a. Stems slightly longer than basal leaves or not, base with crowded withered leaves and persistent petioles becoming cushionlike, or unbranched stems in leaf clusters forming rosettes.
- 8a. Stems single or several, basal leaves forming a rosette 38. *E. villosum*
- 8b. Stems numerous, becoming cushionlike.
- 9a. Corolla campanulate-tubular.
- 10a. Stems usually ca. as long as basal leaves; leaf blade glabrous except for a few short hairs near apex of abaxial surface 39. *E. hemisphaericum*
- 10b. Stems longer than basal leaves; leaf blade appressed white pubescent or spreading pilose.
- 11a. Stems 5–10 cm tall; leaf blade oblanceolate, apex obtuse; inflorescences 3–10-flowered; calyx lobes not reflexed in fruit; nutlets 1–1.2 mm excluding marginal glochids, marginal glochids free or nearly so at base 22. *E. lasiocarpum*
- 11b. Stems 2–5 cm tall; leaf blade oblong to broadly elliptic or obovate, apex obtuse to acute; inflorescences 1–4-flowered; calyx lobes reflexed in fruit; nutlets 1.8–2 mm excluding marginal glochids, marginal glochids confluent below middle forming a broad wing 23. *E. qofengense*
- 9b. Corolla campanulate-rotate.
- 12a. Marginal rib of nutlet winged or with prickles, usually without glochids.
- 13a. Nutlet margin winged, wing erose at margin 21. *E. humillimum*
- 13b. Nutlet margin prickly, rarely with some glochids.
- 14a. Leaf blade spatulate; nutlets ca. 1 mm 19. *E. pectinatociliatum*
- 14b. Leaf blade narrowly elliptic; nutlets ca. 2 mm 20. *E. angustifolium*
- 12b. Marginal rib of nutlet with glochids at apex.
- 15a. Leaves with stiff bristles arising from basal tubercles abaxially; corolla white 18. *E. deqinense*
- 15b. Leaves grayish strigose or with short appressed hairs abaxially; corolla blue or whitish.
- 16a. Plants 3–5 cm; leaf blade spatulate, 2–4 mm wide; attachment scar of nutlet below middle adaxially 17. *E. sinomicrocaryum*

- 16b. Plants 5–15 cm; leaf blade spatulate-lanceolate or obovate-lanceolate, 4–8 mm wide; attachment scar of nutlet above middle adaxially.
- 17a. Basal leaves linear, indistinctly petiolate, 3–3.5 mm wide; limb of corolla ca. 4 mm wide 15. *E. kangdingense*
- 17b. Basal leaves ovate-lanceolate, distinctly petiolate, 4–8 mm wide; limb of corolla 5–6 mm wide 16. *E. laxum*
- 7b. Stems much longer than basal leaves, widely spaced, not cushion forming.
- 18a. Pedicel very short, 0.3–0.7 mm in fruit; leaf blade sparsely pubescent with tubercle-based bristles adaxially 7. *E. fetisovii*
- 18b. Pedicel 1 mm or more, often much longer in fruit; leaf blade sparsely appressed white pubescent, strigose or appressed white sericeous.
- 19a. Pedicel erect to ascending, never curved.
- 20a. Leaf blade spatulate to ovate, sparsely appressed white pubescent or, if stem leaves narrowly lanceolate, strigose; nutlets dorsiventrally compressed or nearly so.
- 21a. Plants unequally strigose; leaf blade 3–8 mm wide; nutlets with fine tubercles and bristles abaxially 35. *E. borealisinense*
- 21b. Plants sparsely appressed pubescent; leaf blade 3–5 mm wide; nutlets glabrous or only short hispid abaxially.
- 22a. Basal leaves spatulate, adaxially glabrous or sparsely spreading pilose; nutlets glabrous or with few short hairs, 2–3.5 mm excluding marginal glochids 30. *E. spathulatum*
- 22b. Basal leaves ovate-lanceolate, adaxially with few long appressed hairs; nutlets minutely hispid, 1.7–2 mm excluding marginal glochids 31. *E. fruticosum*
- 20b. Leaf blade lanceolate to linear, densely appressed white sericeous; nutlets turbinate.
- 23a. Marginal glochids of nutlet mostly anchorlike at apex 32. *E. canum*
- 23b. Marginal glochids of nutlet absent or not clearly anchorlike at apex.
- 24a. Margin of nutlet not winged, usually without glochids, or sometimes with few fine teeth 37. *E. mandshuricum*
- 24b. Margin winged, with comblike, usually bluish teeth, apex sometimes with glochids.
- 25a. Pedicel 10–20 mm; marginal glochids of nutlets slender, irregular 34. *E. incanum*
- 25b. Pedicel 3–5 mm; marginal glochids of nutlets triangular to triangular-lanceolate.
- 26a. Basal leaves ca. 2 cm; marginal glochids of nutlets curved toward center 33. *E. gracile*
- 26b. Basal leaves 3–6 cm; marginal glochids of nutlets not curved toward center 36. *E. pauciflorum*
- 19b. Pedicel curved, sometimes pendulous.
- 27a. Stem leaves oblong-linear to oblong-oblancheolate, 2–3 mm wide.
- 28a. Stems branched; fruiting pedicel ca. 1 mm; nutlets with marginal glochids ca. 1.2 mm 12. *E. sessilifructum*
- 28b. Stems not branched; fruiting pedicel 5–10 mm; nutlets with marginal glochids ca. 0.4 mm.
- 29a. Nutlets adaxially glabrous, marginal glochids confluent 13. *E. longifolium*
- 29b. Nutlets adaxially pubescent, marginal glochids free 14. *E. subjacquemontii*
- 27b. Stem leaves lanceolate to ovate, (4–)7–15 mm wide.
- 30a. Corolla blue.
- 31a. Marginal glochids of nutlets confluent into a broad wing 9. *E. petiolare*
- 31b. Marginal glochids of nutlets free at base.
- 32a. Stem leaves oblanceolate to elliptic, abruptly constricted into a conspicuous petiole; pedicel 1.5–2 cm in fruit; attachment scar of nutlet above middle adaxially 10. *E. longipes*
- 32b. Stem leaves lanceolate to linear, sessile; pedicel not exceeding 1 cm in fruit; attachment scar of nutlet below middle adaxially 11. *E. medicarpum*
- 30b. Corolla white.
- 33a. Leaf blade ovate to elliptic, apex obtuse 3. *E. pseudolatifolium*
- 33b. Leaf blade lanceolate to ovate-lanceolate, apex acuminate to acute.
- 34a. Marginal ribs of nutlets without glochids.
- 35a. Plants less than 10 cm; pedicel 0.5–1 mm; marginal ribs of nutlets with triangular teeth 4. *E. confertiflorum*
- 35b. Plants 20–50 cm tall; pedicel 5–10 mm at anthesis, to 2–4 cm

- in fruit; marginal ribs of nutlets with a few fine emergences 5. *E. pendulifructum*
- 34b. Marginal ribs of nutlets with glochids.
 - 36a. Glochids of nutlet rib margin 0.5–1.2 mm.
 - 37a. Leaf blade acuminate to acute at apex, with few hairs abaxially; abaxial surface of nutlets ovate-triangular, attachment scar slightly below middle adaxially 1. *E. pamiricum*
 - 37b. Leaf blade acute to rounded at apex, pubescent; abaxial surface of nutlets ovate to broadly ovate, attachment scar at middle adaxially 2. *E. latifolium*
 - 36b. Glochids of nutlet rib margin not exceeding 0.5 mm.
 - 38a. Plants densely spreading hispid; fruiting pedicel to 1.5 cm; anchorlike marginal glochids of nutlets triangular 8. *E. deltodentum*
 - 38b. Plants pubescent; fruiting pedicel 3–5 mm; anchorlike marginal glochids of nutlets free at base 6. *E. oligacanthum*

1. *Eritrichium pamiricum* B. Fedtschenko, Trudy Imp. S.-Peterburgsk. Bot. Sada 21: 385. 1903.

帕米尔齿缘草 pa mi er chi yuan cao

Hackelia pamirica (B. Fedtschenko) Brand.

Herbs perennial, (15–)20–25(–30) cm tall. Stems several, cespitose, sparsely pubescent, with persistent withered leaves and branches at base. Petiole of basal leaves 3–6 cm, to 1 cm in stem leaves; leaf blade lanceolate to elliptic-lanceolate, 3–5.5 × 0.8–1.5 cm, pubescent, abaxially more densely pubescent, apex acuminate to acute. Inflorescences 2–4, terminal on stems, usually 4–10-flowered, forming 1 or 2 verticillasters on branches. Pedicel 3–6 mm, erect at anthesis, elongated in fruit, sparsely pubescent. Calyx lobes erect, ovate-oblong, ca. 1 mm at anthesis, to 1.5 mm in fruit, strigose, apex acute. Corolla white, campanulate-rotate; tube 0.7–1 mm; appendages lunate, papillate, apex 2-cleft; limb ca. 6 mm wide; lobes orbicular-ovate, 1.5–2 mm. Anthers broadly elliptic, ca. 0.5 mm. Style ca. 1 mm. Gynobase ca. 1 mm. Nutlets dorsiventrally compressed, 2–3 × 1–1.5 mm excluding marginal glochids, keeled adaxially, finely tuberculate and slightly hispid; disc ovate-triangular, flat or slightly convex, densely hispid; marginal glochids 0.2–0.5 mm, free or slightly united at base, anchorlike at apex; attachment scar below middle adaxially. Fl. and fr. Jun-Jul.

Grasslands; ca. 3200 m. Xinjiang (Hotan Xian) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

2. *Eritrichium latifolium* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 407. 1842.

宽叶齿缘草 kuan ye chi yuan cao

Herbs perennial, 15–20 cm tall. Stems several, cespitose, not branched, pubescent, with persistent withered leaves and branches at base. Basal leaves several; petiole 3–5 cm; leaf blade lanceolate to elliptic-lanceolate, 4.5–6 × 1.5–2 cm, pubescent, base attenuate, apex rounded to obtuse; stem leaves lanceolate, 1–4 cm × 5–12 mm, base cuneate, apex pungent. Inflorescences 2 or 3, terminal on stems. Pedicel 3–6 mm, sparsely pubescent, lowest pedicel to 3 cm. Calyx lobes ovate-oblong to ovate-lanceolate, ca. 1 mm, slightly enlarged in fruit, densely appressed pubescent outside, subglabrous inside. Corolla white, campanulate-rotate; tube ca. 1 mm;

appendages nearly semiorbicular, fleshy, distinctly exerted, basal center papillate; limb 5.5–6 mm wide; lobes obovate, 1.5–2 mm. Anthers oblong. Gynobase ca. 1 mm. Style ca. 1 mm. Nutlets dorsiventrally compressed, 2.5–3 × 1.5–2 mm excluding marginal glochids, sparsely pubescent adaxially; disc ovate to broadly ovate, slightly convex, with many hairs; marginal glochids triangular-lanceolate, 0.5–1.2 mm, free or confluent into a wing; attachment scar at middle adaxially, ovate. Fl. and fr. Jun-Jul.

Meadows, thickets, marshes, forest margins; 2000–3200 m. Xinjiang [Kazakhstan].

3. *Eritrichium pseudolatifolium* Popov in Komarov, Fl. URSS 19: 708. 1953.

对叶齿缘草 dui ye chi yuan cao

Herbs perennial, 15–30 cm tall. Stems several, cespitose, frequently bifurcate branched, pubescent, with persistent withered leaves and branches at base. Petiole of basal leaves 3–9 cm; leaf blade ovate to elliptic, 1–2.5 × 0.8–1.3 cm, abaxially short appressed pubescent, adaxially glabrescent, base rotund, apex obtuse; stem leaves 4 or 5, uppermost becoming involucre, ± sessile, ovate to broadly ovate, 1–1.5 cm × 6–10 mm. Inflorescences axillary or extra-axillary. Pedicel 4–7 mm, sparsely pubescent. Calyx lobes erect at anthesis, divaricate in fruit, linear-oblong to ovate-oblong, ca. 1.5 mm, appressed pubescent outside, glabrescent inside. Corolla white, campanulate-rotate; tube ca. 2 mm; appendages trapeziform, distinctly exerted, with an emergence inside; limb ca. 7 mm wide; lobes broadly obovate, or suborbicular. Anthers subglobose, ca. 0.5 mm in diam. Gynobase ca. 0.5 mm. Style ca. 0.1 mm. Nutlets dorsiventrally compressed, short pubescent, ca. 1.5 × 1 mm excluding marginal glochids, base rounded and obtuse, apex acuminate; disc ovate to narrowly ovate, slightly convex; marginal glochids triangular to lanceolate, free; attachment scar above middle adaxially, ovate.

Moist stream banks, alpine crevices; 3000–3400 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

4. *Eritrichium confertiflorum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 35. 1980.

密花齿缘草 mi hua chi yuan cao

Herbs perennial, less than 10 cm tall. Stems several, cespitose, not branched, densely short appressed pubescent, persistent withered leaves and persistent branches at base. Petiole of basal leaves 2–5 cm; leaf blade ovate-lanceolate to ovate-elliptic, 1.5–4.5 cm × 5–12 mm, short appressed pubescent, base broadly cuneate, apex acuminate to acute; stem leaves 3–6, petiolate below, ± sessile above, 2 leaves of contiguous inflorescences subopposite, becoming involucrel. Inflorescences 2 or 3, terminal, 1–4 cm. Pedicel 0.5–1 mm, sparsely pubescent. Calyx lobes linear to linear-lanceolate, 2–2.5 mm, slightly enlarged in fruit, appressed pubescent outside, with few short hairs inside. Corolla white, campanulate-rotate; appendages trapeziform, distinctly exserted, ca. 1 mm, each with a tubercle inside; limb ca. 6 mm wide; lobes obovate, ca. 2.5 mm. Anthers elliptic, ca. 1 mm. Gynobase ca. 0.5 mm. Nutlets dorsiventrally compressed, ca. 2.5 × 1.5 mm, adaxially glabrous or with few hairs, keeled above attachment scar; disc ovate-triangular, slightly convex, glabrous or sparsely pubescent, with distinct midvein, marginal rib slightly protruding, frequently with several triangular teeth on middle and below, tips not anchorlike; attachment scar slightly above middle adaxially, ovate to suborbicular. Fl. and fr. Jul-Aug.

- Alpine crevices; ca. 2200 m. Xinjiang (Ürümqi Shi).

5. *Eritrichium pendulifructum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 36. 1980.

垂果齿缘草 chui guo chi yuan cao

Herbs perennial, 20–50 cm tall. Stems arcuate ascending, 2–3 mm in diam., densely pubescent. Petiole of basal leaves 2–3 cm; stem leaves short petiolate or ± sessile, ovate-lanceolate to elliptic, 2–3 cm × 6–12 mm, pubescent, base cuneate to broadly cuneate, apex acuminate to acute. Inflorescences widely spaced, conjugately terminating stem, to 25 cm in fruit. Pedicel 5–10 mm at anthesis, to 2–4 cm in fruit, pubescent; bracts linear. Calyx lobes erect, linear to lanceolate, ca. 1.5 mm at anthesis, enlarged in fruit, divaricate or reflexed, pubescent. Corolla white, campanulate-rotate; appendages low trapeziform, slightly exserted; limb 5–6 mm wide; tube ca. 1.5 mm; lobes obovate, ca. 2.5 mm. Anthers oblong, ca. 1 mm. Gynobase ca. 0.5 mm. Style ca. 1 mm. Nutlets dorsiventrally compressed; adaxially sparsely pubescent, keeled above attachment scar; disc ovate to ovate-triangular, slightly convex, sparsely pubescent, marginal rib with a few fine emergences; attachment scar below middle adaxially, prominent, becoming carpophore to 0.8 mm. Fl. Aug.

- Foothills; ca. 2300 m. Xinjiang (Heshuo Xian).

6. *Eritrichium oligacanthum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 37. 1980.

疏刺齿缘草 shu ci chi yuan cao

Herbs perennial, 30–40 cm tall. Stems numerous, cespitose, not branched, pubescent. Petiole of basal leaves

2.5–4 cm; leaf blade ovate to elliptic, 2.5–4.5 × 1.5–2 cm, sparsely pubescent, base rounded to attenuate, apex acute to rounded; stem leaves short petiolate to sessile, oblong to narrowly elliptic. Inflorescences 2 or 3, terminal, few flowered, 2–6 cm, ebracteate. Pedicel 3–5 mm, somewhat pubescent. Calyx lobes narrowly ovate to ovate, ca. 1.5 mm at anthesis, slightly enlarged in fruit, with many white hairs outside, sparsely short pubescent inside. Corolla white, campanulate-rotate; tube ca. 1.5 mm; appendages low trapeziform, slightly exserted, ca. 0.5 mm, with a papillate emergence; lobes suborbicular to obovate, ca. 2.5 mm. Anthers oblong, ca. 0.5 mm. Gynobase ca. 1 mm. Nutlets dorsiventrally compressed, ca. 2.5 mm excluding marginal glochids, sparsely pubescent; adaxially convex, somewhat pubescent, sparsely tuberculate; disc broadly ovate; marginal glochids 0.3–0.5 mm, free; attachment scar at middle adaxially, ovate. Fl. Jul.

- Mountains; ca. 2700 m. Xinjiang (Hejing Xian).

7. *Eritrichium fetisovii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 340. 1879.

短梗齿缘草 duan geng chi yuan cao

Herbs perennial, 30–40 cm (or more) tall. Stems 1 or 2, not cespitose, not branched, sparsely pubescent. Basal and lower stem leaves long petiolate, green, oblong-lanceolate, to 5–6 cm × (6–)8–10 mm, sparsely pubescent, adaxially with bristles borne on white tubercles, apex obtuse; upper stem leaves sessile, lanceolate, apex acute. Inflorescences small, elongated in fruit. Pedicel very short, distinct only in fruit, 0.3–0.7 mm. Calyx lobes ovate, ca. 2 mm, gray pubescent, apex obtuse. Corolla white, campanulate-rotate; appendages 0.8–1 mm, thick, 2-lobed at apex; limb to 5 mm; lobes ovate, rounded. Gynobase very short, to 1 mm. Nutlets dorsiventrally compressed, ca. 3 mm, glabrous or pubescent; disc with marginal glochids confluent into a narrow scariosus dentate wing. Fl. Jun-Jul, fr. Jul.

Damp places between cliffs and in shrubs along streams. W Xinjiang (Yeli River basin) [Kyrgyzstan].

8. *Eritrichium deltodontum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 38. 1980.

三角刺齿缘草 san jiao ci chi yuan cao

Herbs perennial, 20–30 cm tall. Stems cespitose, erect to ascending, densely pubescent. Petiole of basal leaves 2–4 cm, pubescent; leaf blade narrowly elliptic to oblanceolate, 2–3 × ca. 1 cm, densely white hispid, base attenuate, apex acute; stem leaves ± sessile, elliptic to ovate, 1–2 cm × 4–10 mm. Inflorescences terminal on stems and branches, to 10 cm in fruit, becoming racemose. Pedicel pubescent, 3–5 mm at anthesis, elongated to 1.5 cm. Calyx lobes linear, ca. 2 mm, narrowly ovate to ovate, ca. 1.5 mm at anthesis, slightly enlarged in fruit, with many white hairs outside, sparsely short pubescent inside. Corolla white, campanulate-rotate; tube ca. 1.5 mm; appendages transversely oblong, distinctly exserted from throat; lobes suborbicular, ca. 2 mm wide. Anthers ovate, ca. 0.5 mm. Gynobase ca. 1 mm. Nutlets dorsiventrally compressed, ca. 2.5 mm excluding marginal

glochids, sparsely pubescent, adaxially tuberculate and somewhat pubescent; disc triangular-ovate, slightly convex, with many hairs; marginal glochids triangular, free or somewhat confluent at base; attachment scar at middle or slightly below adaxially, becoming carpophorelike. Fl. Jul.

- Valley meadows; ca. 2800 m. Xinjiang.

9. *Eritrichium petiolare* W. T. Wang in W. T. Wang, Y. S. Lian & J. Q. Wang, Acta Phytotax. Sin. 18: 516. 1980.

具柄齿缘草 ju bing chi yuan cao

Herbs perennial, to 20 cm tall. Stems several, cespitose, not branched or only branched above. Basal leaves oblanceolate to narrowly oblong, 2–8 cm × 2–10 mm, base attenuate into a petiole, apex obtuse to rounded; stem leaves ± sessile, 1 or 2 leaves subtending inflorescences, wider and involucrelike; leaf blade oblanceolate-oblong to oblong, 1.5–2.5 cm. Inflorescences terminal, becoming racemose. Fruiting pedicel to 1.3 cm, sparsely pubescent; bracts narrowly ovate to ovate. Calyx lobes ovate to ovate-oblong, 2–2.5 mm, short appressed pubescent outside, sparsely short appressed pubescent inside above middle. Corolla blue, campanulate-rotate; tube ca. 2 mm; appendages low trapeziform, slightly surpassing throat, pubescent apically and laterally, with an obovate emergence inside; lobes elliptic, ca. 3 mm. Stamens inserted at middle of corolla tube; anthers ovate, ca. 0.6 mm. Gynobase ca. 0.5–0.7 mm in fruit. Nutlets dorsiventrally compressed, ca. 2.5 × 2 mm excluding marginal glochids, glabrous or sparsely pubescent, adaxially keeled, abaxially slightly convex; marginal glochids triangular, usually bluish, confluent at base into a broad wing; attachment scar at middle adaxially. Fl. and fr. Jul-Aug.

- Mountain meadows, rock crevices, thickets, ravines; 4500–5100 m. Xizang.

- 1a. Plants to 10 cm tall; leaf blade densely appressed pubescent; inflorescences 1–3 cm 9b. var. *subturbinatum*
- 1b. Plants 10–20 cm tall; leaf blade with sparse or spreading hairs; inflorescences 5–10 cm.
 - 2a. Plants sparsely short appressed pubescent; inflorescences ca. 10 cm 9a. var. *petiolare*
 - 2b. Plants spreading villous; inflorescences ca. 5 cm 9c. var. *villosum*

9a. *Eritrichium petiolare* var. *petiolare*

具柄齿缘草 (原变种) ju bing chi yuan cao (yuan bian zhong)

Plants 10–20 cm tall, sparsely short appressed pubescent. Leaf blade 3–10 mm wide. Inflorescences to 10 cm. Fl. and fr. Jul-Aug.

- Mountain meadows, rock crevices. Xizang.

9b. *Eritrichium petiolare* var. *subturbinatum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 516. 1980.

陀果具柄齿缘草 tuo guo ju bing chi yuan cao

Plants not greater than 10 cm tall. Leaf blade 2–4 mm wide, densely minute strigose. Inflorescences 1–3 cm.

- Rocky crevices on open slopes, gravelly areas, thickets; ca. 5100 m. Xizang.

9c. *Eritrichium petiolare* var. *villosum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 516. 1980.

柔毛具柄齿缘草 rou mao ju bing chi yuan cao

Plants 10–20 cm tall, spreading villous. Inflorescences ca. 5 cm.

- Ravines, rock crevices; 4500–5000 m. Xizang.

10. *Eritrichium longipes* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest Inst., Harbin 9: 40. 1980.

长梗齿缘草 chang geng chi yuan cao

Herbs perennial, 15–25 cm tall. Stems several, cespitose, not branched or branched above, short appressed pubescent. Petiole of lower stem leaves ca. 3 cm; leaf blade oblanceolate to oblong, 2–4 cm, base attenuate, apex rounded to acuminate; upper stem leaves short petiolate or ± sessile, narrowly ovate to elliptic, 1.5–3 cm, base broadly cuneate, apex acute. Inflorescences terminal, to 10 cm in fruit; bracts leaflike. Pedicel 2–5 mm at anthesis, to 1.5–2 cm in fruit, appressed pubescent. Calyx lobes erect at anthesis, divaricate in fruit, lanceolate to linear, ca. 2 mm, appressed pubescent. Corolla blue, campanulate-rotate; tube ca. 2 mm; appendages low trapeziform, slightly surpassing throat, ca. 0.5 × 1 mm; limb ca. 5 mm wide; lobes suborbicular, ca. 3 mm. Anthers elliptic, ca. 1 mm. Nutlets dorsiventrally compressed, ca. 1.5 × 1.3 mm excluding marginal glochids; adaxially protruding, sparsely pubescent; abaxially ovate, slightly convex, minutely hispid, marginal glochids free; attachment scar above middle adaxially, ovate, smooth. Fl. Jul.

- Shaded rocky slopes, rocky crevices; ca. 3700 m. Qinghai (Yushu Xian).

11. *Eritrichium medicarpum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest Inst., Harbin 9: 41. 1980.

青海齿缘草 qing hai chi yuan cao

Herbs perennial, 10–40 cm tall. Stems single or several and cespitose, appressed pubescent. Petiole of basal leaves 3–4 cm; leaf blade oblanceolate, 2–4 cm × 4–6 mm, appressed pubescent; stem leaves sessile, lanceolate to linear, 2–4 cm × 3–7 mm. Inflorescences terminal or axillary above, 5–10-flowered, frequently extra-axillary outside bracts. Pedicel 3–10 mm, short pubescent. Calyx lobes linear, ca. 2 mm, short appressed pubescent outside, with few hairs inside. Corolla blue or blue-purple, campanulate-rotate; tube ca. 1.5 mm; appendages low trapeziform or nearly square, ca. 0.5 mm, frequently papillate; limb 4–6 mm wide; lobes obovate to suborbicular, ca. 2.5 mm. Stamens inserted on middle of corolla tube; anthers ovate, ca. 0.5 mm. Style ca. 1 mm. Nutlets dorsiventrally compressed, sparsely pubescent, 2.5–3 × ca. 1.2 mm excluding glochids, adaxially protruding, abaxially slightly convex; marginal glochids to 1.9 mm, apex anchorlike; attachment scar below middle adaxially. Fl. and fr. Jul-Aug.

- Slopes, forests, thickets; 3600–3800 m. Qinghai.

12. *Eritrichium sessilifructum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 42. 1980.

无梗齿缘草 wu geng chi yuan cao

Herbs annual, 15–20 cm tall. Stems ascending, short appressed pubescent. Petiole of lower leaves 3–5 mm; upper leaves ± sessile. Leaf blade oblong to linear-oblancoate, 0.5–2 cm × 2–3 mm, appressed pubescent, base attenuate, apex rounded. Inflorescences axillary or extra-axillary, 1-flowered. Pedicel ca. 1 mm, appressed pubescent. Flowers and fruits sessile or nearly so. Calyx lobes erect at anthesis, divaricate in fruit, lanceolate, ca. as long as to slightly longer than tube, ca. 0.7 mm, to 1 mm in fruit. Corolla campanulate-tubular, 1–1.2 mm; appendages obscure; lobes suborbicular, ca. 0.5 mm wide. Nutlets turbinate; abaxially triangular-ovate, ca. 1.5 × 1 mm, sparsely pubescent; marginal glochids stiff, ca. 1.2 mm, free at base; attachment scar at middle adaxially, narrowly ovate.

- Grasslands, rocky river banks; ca. 2000 m. Xinjiang (Hotan Xian).

13. *Eritrichium longifolium* Decaisne in Jacquemont, Voy. Inde 124. 1844.

阿克陶齿缘草 a ke tao chi yuan cao

Eritrichium aktonense Lian & J. Q. Wang.

Herbs perennial, 5–40 cm tall. Stems erect to ascending, appressed white pubescent. Basal leaves petiolate; stem leaves ± sessile; leaf blade oblanceolate to linear-oblong, 1–1.5 cm × 2–3 mm, appressed pubescent, base attenuate, apex rounded. Inflorescences terminal on branches, elongated, becoming racemose, to 10 cm in fruit; bracts leaflike. Pedicel 3–5 mm at anthesis, to 1 cm in fruit, oblique or recurved upward, appressed pubescent. Calyx lobes appressed, oblanceolate, 1.5–2.5 mm. Corolla light blue, campanulate-rotate; tube ca. 1.5 mm; appendages papillate, ca. 0.5 mm wide; limb ca. 6 mm wide; lobes obovate, ca. 2.5 mm. Anthers elliptic, ca. 0.5 mm. Nutlets dorsiventrally compressed, ca. 2.5 × 1.5 mm excluding marginal rib; adaxially keeled, glabrous or sparsely pubescent; abaxially ovate, convex, with many short hairs; marginal glochids ovate-triangular, ca. 0.3 mm, confluent into wings; attachment scar at middle adaxially, broadly ovate to ovate, ca. 0.5 mm, with aperture at center. Fl. Jun.

- Rocky slopes; ca. 3500 m. Xinjiang.

14. *Eritrichium subjacquemontii* Popov in Komarov, Fl. URSS 19: 709. 1953.

新疆齿缘草 xin jiang chi yuan cao

Herbs perennial. Stems several, caespitose, prostrate to ascending, not branched, 5–15 cm tall. Basal leaves linear-spatulate, 1.5–3 cm × 2–3 mm including petiole, densely short sericeous, long petiolate, base attenuate into a petiole, apex rounded; stem leaves short petiolate or sessile, linear-oblong,

1–1.5 cm × 1–4 mm, base attenuate, apex rounded. Inflorescences terminal, widely spaced. Pedicel sparsely pubescent, 1–1.5 cm in fruit, recurved. Calyx lobes oblong-linear, 1–2 mm, sericeous, apex acute. Corolla light blue; tube ca. as long as calyx, ca. 1 mm; appendages ovate to nearly trapeziform, ca. 0.3–0.5 mm, papillose; limb 4–5 mm wide; lobes obovate. Stamens inserted at middle of corolla tube; anthers ovate to ovate-triangular. Developed nutlets usually 1 or 2, dorsiventrally compressed, sparsely pubescent, 2–2.5 × ca. 1 mm; adaxially sparsely pubescent, keeled above; abaxially ovate-triangular, flat or slightly convex; marginal glochids 3–8 on each side, extremely short, straight, free at base; attachment scar nearly at middle adaxially, prominent, becoming carpophorelike. Fl. and fr. Jun-Jul.

Gravelly slopes, sandy marshes, rocky crevices; 2700–3900 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

15. *Eritrichium kangdingense* W. T. Wang, Bull. Bot. Res., Harbin 6(3): 92. 1986.

康定齿缘草 kang ding chi yuan cao

Herbs perennial, caespitose. Stems 8–11 cm tall, strigose, branched at apex, with 5–9 leaves. Basal leaves densely rosulate, linear, 5–6 cm × 3–4 mm, leathery when dry, densely grayish strigose, base tapering into indistinct petiole, apex subobtusate; leaf blade of stems similar, 0.8–1.6 cm × 1.5–2.2 mm. Cymes often branched, 2–3 cm, axis and pedicel strigose; bracts basal, lanceolate to narrowly elliptic, 3–9 mm. Pedicel 3–5 mm in fruit. Calyx lobes broadly linear, ca. 0.4 mm, strigose on both sides. Corolla blue, glabrous; tube ca. 1.3 mm, faucal appendages low trapeziform, ca. 0.4 mm; limb ca. 4 mm wide; lobes suborbicular. Anthers elliptic, ca. 0.4 mm. Nutlets 4, dorsiventrally compressed, adaxially sparsely puberulent; abaxially plane, ovate, ca. 1.5 × 1 mm, sparsely puberulent, apex with 5–8 minutely barbed, triangular-linear glochids, 0.5–1 mm; marginal glochids on each side; attachment scar at middle adaxially. Fl. and fr. Jul.

- In gravelly glacial valleys; 3600–4000 m. Sichuan.

16. *Eritrichium laxum* I. M. Johnston, J. Arnold Arbor. 33: 66. 1952.

疏花齿缘草 shu hua chi yuan cao

Herbs perennial, 5–15 cm tall. Stems caespitose, erect to decumbent, sparsely appressed pubescent. Petiole of basal leaves 1–4 cm; leaf blade ovate-lanceolate; stem leaves ± sessile, oblanceolate, 1–3 cm × 4–8 mm, short appressed pubescent, base cuneate, apex acute. Inflorescences axillary below 1–2 cm, racemose above. Pedicel of axillary flowers to 2.5 cm, sparsely pubescent. Calyx lobes linear to oblanceolate, 1.5–2 mm, slightly elongated in fruit, strigose outside, sparsely appressed pubescent inside. Corolla white or light blue, campanulate-rotate; tube 1.3–1.7 mm; appendages lunate; limb 5–6 mm wide; lobes suborbicular, 2.2–2.5 mm. Stamens inserted on middle of corolla tube; anthers oblong. Gynobase to 1 mm in fruit. Nutlets dorsiventrally compressed, sparsely pubescent, 1.5–1.7 × ca. 1 mm excluding marginal glochids; adaxially protruding, sparsely pubescent; abaxially flat or somewhat convex, ovate-

triangular, with few hairs; marginal glochids 0.2–0.4(–0.6) mm, free at base; attachment scar at upper 3/8 adaxially, smaller, orbicular, convex. Fl. and fr. Jun–Aug.

• Meadows, rocky ridges; 4000–5000 m. S Qinghai (Nangqên Xian), S Xizang, NW Yunnan.

17. *Eritrichium sinomicrocarpum* W. T. Wang, Fl. Reipubl. Popularis Sin. 64(2): 133. 1989.

小果齿缘草 xiao guo chi yuan cao

Eritrichium microcarpum W. T. Wang (1980), not de Candolle (1846).

Herbs perennial, cushionlike, 3–5 cm tall. Stems cespitose, much branched at base, with many withered leaves and persistent bases. Leaf blade spatulate, 1–2 cm × 2–4 mm, with many white hairs, base attenuate becoming petiolate, margin ciliate, apex obtuse to acute. Inflorescences terminal, racemose, 1–1.5 cm, 3–5-flowered. Pedicel 2–6 mm, erect to ascending. Calyx lobes erect at anthesis, lanceolate, linear, to ovate-lanceolate, 1.5–2 mm, pubescent outside and inside above middle. Corolla light blue, campanulate-rotate; tube 1.5–1.8 mm; appendages lunate, with a small papillate emergence; limb ca. 5 mm wide; lobes ovate to suborbicular, 2–2.5 mm. Anthers ovate to elliptic, ca. 0.5 mm. Style ca. 0.6 mm, not surpassing nutlets. Nutlets dorsiventrally compressed, sparsely pubescent, 1.5–1.7 × ca. 1 mm excluding marginal glochids, adaxially protruding, abaxially somewhat convex; marginal glochids fewer, free or nearly so at base; attachment scar below middle adaxially. Fl. and fr. Jul–Aug.

• Rocky slopes; 4500–4600 m. Xizang.

18. *Eritrichium deqinense* W. T. Wang, Bull. Bot. Res., Harbin 6(3): 94. 1986.

德钦齿缘草 de qin chi yuan cao

Herbs perennial, cushionlike, small, 5–8 cm in diam., 2.5–3.5 cm tall. Rhizomes much branched. Stems numerous, 2–3 cm, densely strigose. Basal leaves densely rosulate, ca. as long as to longer than marginally long ciliate petiole, with sheath, oblong to broadly linear, 7–10 × 2.2–2.8 mm, papery, adaxially strigose, stiff short bristly, tuberculate, base tapering toward petiole, apex obtuse; midvein prominent abaxially, lateral veins indistinct. Cymes ca. 1 cm, usually 3-flowered, axis strigose; bracts oblanceolate to linear, 3–5 mm. Pedicel strigose, 6–8 mm. Calyx lobes linear, ca. 2 mm, strigose, united at base. Corolla white, ca. 5 mm wide, glabrous; tube ca. 1.5 mm, faucal appendages lunate; lobes 5, suborbicular. Anthers broadly ovoid, ca. 0.3 mm. Pistil ca. 1 mm. Nutlets 4, white pubescent, dorsiventrally compressed; adaxially convex, pubescent, keeled above attachment scar; abaxially broadly ovate, nearly flat, ca. 1.8 × 1.1 mm; marginal glochids 6 or 7 on each side, nearly free at base, white, narrowly triangular, 0.3–0.9 mm, margin sparsely ciliate; attachment scar above middle adaxially. Fl. and fr. Jul.

• On rocks of mountain slopes; ca. 4000 m. Yunnan.

19. *Eritrichium pectinatociliatum* Y. S. Lian & J. Q. Wang

in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 518. 1980.

篦毛齿缘草 bi mao chi yuan cao

Herbs perennial, cushionlike, 3–7 cm tall. Stems cespitose, not branched, densely appressed pubescent, frequently with persistent withered basal leaves and leaf bases. Basal leaves long petiolate; leaf blade spatulate, (6–)10–15 × 3–4 mm, appressed white pubescent, base attenuate, apex rounded. Lower inflorescences axillary or extra-axillary, 1-flowered; upper inflorescences 3- to several flowered. Pedicel sparsely pubescent, 2–5 mm; pedicel of single flowers to 1.2 cm. Calyx lobes erect at anthesis, ascending to divaricate, lanceolate to elliptic-lanceolate, ca. 1.5 mm, densely appressed pubescent outside, glabrous or nearly so inside. Corolla purple or light blue, campanulate-rotate; tube ca. 1.2 mm; appendages transversely oblong, papillose; limb ca. 5 mm wide; lobes suborbicular, ca. 2 mm wide. Anthers suborbicular, 0.3–0.4 mm. Gynobase flat, slightly raised in fruit becoming low fastigiate. Style ca. 0.5 mm. Nutlets dorsiventrally compressed, ca. 1 mm; adaxially protruding, glabrous; abaxially ovate, sparsely pubescent, margin hispid, with pectinate bristles or occasionally glochids; attachment scar at middle or slightly above middle adaxially. Fl. and fr. Jun–Aug.

• Slopes; 4100–4900 m. Qinghai (Zhidoi Xian), Xizang (Amdo Xian).

20. *Eritrichium angustifolium* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 516. 1980.

狭叶齿缘草 xia ye chi yuan cao

Herbs perennial, cushionlike, 6–10 mm tall. Stems cespitose, pilose, with persistent withered leaves and leaf bases. Petiole of basal leaves 1–2.5 cm; leaf blade narrowly elliptic, 5–15 × 3–5 cm, spreading white pilose, apex short acuminate; stem leaves sessile. Inflorescences axillary or extra-axillary, 1-flowered; upper inflorescences 3–5-flowered. Pedicel 3–5 mm. Calyx lobes erect to ascending, linear to narrowly elliptic, 2–2.5 × ca. 1 mm, with appressed and numerous long ciliate hairs along margin. Corolla blue, campanulate-rotate; tube ca. 2 mm; appendages cordate; limb ca. 6 mm wide; lobes elliptic, ca. 2.5 mm. Stamens inserted below middle in corolla tube; anthers suborbicular, ca. 0.5 mm. Nutlets dorsiventrally compressed, ca. 2 × 1 mm excluding marginal prickles, adaxially keeled; abaxially ovate, sparsely pubescent, marginal rib narrowly winged, wings with unequal prickles along margin, prickles not barbed; attachment scar at middle adaxially. Fl. and fr. Jun–Aug.

• Ridges, on rocks. Xizang.

21. *Eritrichium humillimum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 44. 1980.

矮齿缘草 ai chi yuan cao

Herbs perennial, cushionlike, 2–4 cm tall. Stems usually

surpassing cushion, sparsely short appressed pubescent. Petiole of basal leaves 1–2 cm; leaf blade oblong to long elliptic, 3–12 × 2–4 mm, abaxially glabrous or nearly so, adaxially sparsely appressed pubescent; stem leaves 1 or 2. Inflorescences racemose, 1–1.5 cm, 2–5-flowered. Pedicel 3–7 mm, short appressed pubescent. Calyx lobes lanceolate-linear, 1.5–2 mm, appressed pubescent outside, subglabrous inside. Corolla light purple, campanulate-rotate; tube ca. 1.2 mm; appendages transversely oblong, 0.5–0.7 mm, surpassing throat; limb ca. 5 mm wide; lobes obovate to suborbicular, ca. 2 mm. Anthers elliptic, ca. 0.5 mm. Nutlets dorsiventrally compressed, ca. 2 × 1 mm excluding marginal prickles, adaxially keeled, glabrous; abaxially slightly convex, ovate-triangular, sparsely pubescent or glabrous, margin with a glabrous or sparsely pubescent, erose, membranous wing; attachment scar at middle or slightly above adaxially. Fl. and fr. Jul-Aug.

• Sand, rock piles, sunny foothills; 3400–4900 m. Gansu (Tianzhu Xian), Qinghai (Zhidoi Xian).

22. *Eritrichium lasiocarpum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Acta Phytotax. Sin.* 18: 517. 1980.

毛果齿缘草 *mao guo chi yuan cao*

Herbs perennial, 5–10 cm tall. Stems erect, ascending or prostrate, appressed pubescent. Petiole of basal leaves 1–2.5 cm; leaf blade oblanceolate, 0.7–1.5 cm × 2–5 mm, appressed white pubescent, base attenuate, apex obtuse to acute; stem leaves short petiolate or sessile, smaller. Inflorescences extra-axillary, racemose, 2–4 cm, 3–10-flowered; bracts resembling leaves, sharply reduced upward to absent. Pedicel thin, weak, appressed pubescent. Calyx lobes lanceolate to narrowly oblong, 1–1.5 mm, appressed pubescent outside, glabrous or sparsely pubescent inside. Corolla light blue, campanulate-tubular; tube 1–1.2 mm; appendages fleshy, 2-cleft; lobes orbicular or nearly so, 0.5–1.3 mm. Stamens inserted below middle of corolla tube; anthers suborbicular. Nutlets dorsiventrally compressed, 1–1.2 × ca. 1 mm excluding marginal glochids, adaxially sparsely short pubescent; abaxially triangular-ovate, slightly convex, densely and minutely hispid, marginal glochids ca. 0.4 mm, triangular below middle, free or confluent into a narrow wing; attachment scar above middle adaxially. Fl. and fr. Jul-Aug.

• Rocky slopes and crevices; 4600–4900 m. Xizang.

23. *Eritrichium qofengense* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Acta Phytotax. Sin.* 18: 518. 1980.

珠峰齿缘草 *zhu feng chi yuan cao*

Herbs perennial, cushionlike, 2–5 cm tall. Stems slightly surpassing leaf cluster, pilose. Leaves basal; petiole 1–1.5 cm; leaf blade oblong to broadly elliptic or obovate, 3–6 × 2–4 mm, spreading pilose, base broadly cuneate, apex obtuse to acute. Inflorescences terminal, 1–4-flowered; bracts leaflike. Pedicel 3–5 mm, pilose. Calyx lobes reflexed, lanceolate, ca. 2 mm in fruit, densely appressed pubescent outside, sparsely short appressed pubescent inside. Corolla

blue-purple, campanulate-tubular; tube ca. 1.2 mm; lobes obovate to short oblong, ca. 0.8 mm, with a partly sunken basal area outside, inside slightly convex becoming triangular to cordate. Stamens inserted on middle of corolla tube; anthers suborbicular, ca. 0.2 mm in diam. Gynobase nearly semiglobose, ca. 0.5 mm. Style shorter. Nutlets dorsiventrally compressed, ovate, 1.8–2 × ca. 1 mm excluding marginal glochids; adaxially protuberant, keeled; abaxially slightly convex, sparsely white hispid; marginal glochids shorter, confluent below middle into a broad wing, hispid; attachment scar above middle adaxially. Fl. and fr. Jun-Jul.

• Alpine meadows, rock crevices; 5400–5500 m. Xizang.

24. *Eritrichium heterocarpum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Bull. Bot. Lab. N. E. Forest. Inst., Harbin* 9: 45. 1980.

异果齿缘草 *yi guo chi yuan cao*

Herbs annual or biennial, 15–40 cm tall. Stems erect, branched from base, densely white strigose. Leaf blade linear-oblong, 1–2.5 cm × 3–7 mm, appressed pubescent, base broadly cuneate, apex obtuse. Inflorescences terminal, to 10 cm after anthesis, widely spaced, 10–20-flowered; bracts leaflike. Pedicel 2–5 mm, with ascending or slightly recurved short hairs. Calyx lobes erect at anthesis, divaricate in fruit, ovate to ovate-lanceolate, ca. 1.5 mm, appressed pubescent. Corolla blue, campanulate-rotate; tube 1.1–1.3 mm; appendages nearly semiorbicular, slightly surpassing throat, ca. 0.2 mm, with a papillate emergence below; lobes oblong to obovate, 1.1–1.3 mm. Stamens on lower part in corolla tube; anthers ovate-orbicular. Nutlets heteromorphic, dorsiventrally compressed, ca. 2 × 1–1.2 mm excluding marginal glochids; marginal glochids confluent into wings; attachment scar at middle adaxially. Broadly winged nutlets larger, glabrous or only sparsely pubescent; narrowly winged nutlets smaller, densely hispid, marginal glochids present. Fl. and fr. Jul-Aug.

• Slopes, hillside thickets; ca. 3200 m. Qinghai (Tongren Xian), Yunnan (Zhongdian Xian).

25. *Eritrichium echinocaryum* (I. M. Johnston) Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Bull. Bot. Lab. N. E. Forest. Inst., Harbin* 9: 46. 1980.

云南齿缘草 *yun nan chi yuan cao*

Hackelia echinocarya I. M. Johnston, *J. Arnold Arbor.* 21: 54. 1940.

Herbs annual, 30–40 cm tall. Stems erect or ascending, much branched, long strigose. Leaves short petiolate or ± sessile, oblanceolate to linear-oblong, 2–4 cm × 3–6 mm, short strigose, base broadly cuneate to cuneate, apex obtuse to acute; midvein marked. Inflorescences terminal, widely spaced, to 10–15 cm in fruit, becoming racemelike; lower flowers with leaflike bracts. Pedicel 1–7 mm, sparsely pubescent, erect to ascending, recurved to arcuate in fruit. Calyx lobes erect at anthesis, divaricate in fruit, oblong-linear, 2–2.5 mm, appressed pubescent outside, subglabrous inside.

Corolla yellow-green, campanulate-tubular, 1.5–2 mm; appendages low trapeziform, sparsely pubescent; lobes suborbicular, ca. 1 mm wide. Anthers suborbicular. Style ca. 0.5 mm. Nutlets dorsiventrally compressed, 2.2–1.5 × 1.5–1.8 mm excluding marginal glochids; adaxially protruding, ribbed; abaxially ovate, flat, with center line rib, with many fine tubercles and bristles; marginal glochids lanceolate, 1–1.5 mm, base slightly confluent, margin ciliate; attachment scar slightly above middle adaxially, ovate. Fl. and fr. Jun-Jul.

- Open slopes; ca. 2700 m. Yunnan (Dêqên Xian).

26. *Eritrichium thymifolium* (A. de Candolle) Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 46. 1980.

假鹤虱齿缘草 jia he shi chi yuan cao

Herbs annual, 10–35 cm tall. Stems much branched, appressed pubescent. Basal leaves becoming withered, spatulate to oblanceolate, 1–3 cm × 3–4 mm; stem leaves short petiolate or sessile, linear, 1–3 cm × 2–3 mm, appressed pubescent, base cuneate, apex obtuse. Inflorescences terminal, frequently extra-axillary, several to many flowered, becoming racemelike. Pedicel 2–5 mm, sparsely pubescent, erect to ascending at anthesis, recurved in fruit. Calyx lobes erect at anthesis, divaricate or reflexed in fruit, linear-lanceolate to lanceolate-oblong, ca. 2 mm, appressed pubescent outside, glabrous or sparsely appressed pubescent inside. Corolla blue or light blue, campanulate-tubular, ca. 1.3 mm; appendages smaller, papillate; lobes oblong, ca. 0.7 mm. Anthers ovate-triangular, ca. 0.3 mm. Nutlets dorsiventrally compressed, glabrous or sparsely pubescent, 1.5–2.5 × ca. 1 mm excluding marginal glochids, adaxially keeled, abaxially slightly convex; marginal glochids ca. 1 mm, triangular below, free or confluent into a wing; attachment scar at middle or slightly below adaxially, ovate. Fl. and fr. Jun-Aug.

Sunny slopes, gravelly areas, terraces; 1800–4800 m. Gansu, Heilongjiang, Nei Mongol, Ningxia, Xinjiang, Xizang [India, Japan, Kazakhstan, Mongolia, Russia].

- 1a. Plants 10–35 cm; nutlets ca. 1.5 mm excluding marginal glochids, marginal glochids free 26a. subsp. *thymifolium*
- 1b. Plants less than 20 cm; nutlets ca. 2.5 mm excluding marginal glochids, marginal glochids confluent into a broad wing 26b. subsp. *latialatum*

26a. *Eritrichium thymifolium* subsp. *thymifolium*

假鹤虱齿缘草(原变种) jia he shi chi yuan cao (yuan bian zhong)

Echinosperrum thymifolium A. de Candolle, Prodr. 10: 136. 1846; *E. deflexum* Lehmann var. *pumilum* Ledebour; *Hackelia thymifolia* (A. de Candolle) I. M. Johnston; *Lappula thymifolia* (A. de Candolle) Gürke.

Plants 10–35 cm tall. Nutlets ca. 1.5 mm excluding marginal glochids, marginal glochids free.

Sunny slopes, gravelly areas; ca. 1800 m. Gansu, Heilongjiang, Nei Mongol, Ningxia, Xinjiang [N India, Japan, Kazakhstan,

Mongolia, Russia].

26b. *Eritrichium thymifolium* subsp. *latialatum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 519. 1980.

宽翅齿缘草 kuan chi chi yuan cao

Plants less than 20 cm tall. Nutlets ca. 2.5 mm excluding marginal glochids, marginal glochids confluent into a broad wing.

- Gravelly slopes and terraces; ca. 4800 m. Xizang.

27. *Eritrichium acicularum* Y. S. Lian & J. Q. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Bull. Bot. Lab. N. E. Forest. Inst., Harbin 9: 46. 1980.

针刺齿缘草 zhen ci chi yuan cao

Herbs annual or biennial, 15–30 cm tall. Stems erect, much branched, with spreading short hairs. Basal leaves becoming withered, petiolate, spatulate to oblanceolate; stem leaves sessile, oblanceolate-linear to linear, 1–3.5 cm × 2–4 mm, finely appressed pubescent, base cuneate, apex obtuse. Inflorescences racemose; bracts leaflike. Pedicel 3–10 mm, sparsely pubescent, erect at anthesis, ascending to slightly curved in fruit. Flowers widely spaced. Calyx lobes erect at anthesis, mostly divaricate in fruit, ovate to ovate-oblong, 1–2.5 mm, appressed pubescent outside, sparsely short pubescent inside. Corolla blue, campanulate-tubular; tube 1–1.2 mm; appendages lunate; lobes ovate to suborbicular, 1–1.2 mm. Anthers ovate. Gynobase low fastigiate, 0.5–0.7 mm. Nutlets dorsiventrally compressed, sparsely pubescent, 2–2.5 × ca. 1 mm excluding marginal glochids, adaxially protruding; abaxially slightly convex, finely tuberculate; marginal glochids needlelike, with separate bases; attachment scar at middle adaxially.

- Ravines, slopes, marshes; 2200–2400 m. Gansu, Qinghai (Huangyuan Xian).

28. *Eritrichium tangkulaense* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 519. 1980.

唐古拉齿缘草 tang gu la chi yuan cao

Herbs annual or biennial, 5–15 cm tall. Stems several, cespitose, often branched from base, short appressed pubescent. Basal leaves frequently withered after anthesis, oblanceolate-spatulate, 1–2 cm × 2–8 mm, short appressed pubescent, base attenuate into petiole, apex obtuse; stem leaves sessile, ovate-oblong, 0.8–1.2 cm × 2–4 mm. Inflorescences racemelike, 5–10-flowered; bracts 1–3 below, leaflike, sharply reduced to absent above. Pedicel erect at anthesis, mostly ascending in fruit, 3–5 mm, short appressed pubescent. Calyx lobes erect at anthesis, divaricate in fruit, linear-oblong to oblong, 1–2 mm, densely appressed pubescent outside, sparsely appressed pubescent inside at apex. Corolla light blue, light purple, or white, campanulate-tubular; tube ca. 2 × as long as lobes; appendages obscure; lobes suborbicular, 0.5–0.7 mm. Anthers ovate, 0.2–0.3 mm. Gynobase ca. 0.5 mm. Nutlets dorsiventrally compressed, sparsely pubescent or subglabrous, 1–1.2 × ca. 0.8 mm excluding marginal glochids; adaxially keeled on center line,

becoming winged above attachment scar; disc flat or slightly convex; marginal glochids lanceolate-triangular, confluent into a broad wing; attachment scar below middle adaxially, ovate. Fl. and fr. Jul-Sep.

• Hillsides, roadsides, sandy and gravelly areas, rivers, rocky crevices; 3500–4900 m. Gansu (Jiuquan Xian), Xinjiang, Xizang (Amdo Xian).

29. *Eritrichium axillare* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Acta Phytotax. Sin.* 18: 519. 1980.

腋花齿缘草 *ye hua chi yuan cao*

Herbs annual, diffuse. Stems prostrate, 5–13 cm tall, ca. 1 mm in diam., densely appressed pubescent. Leaves ± sessile, lanceolate-oblong to ovate-oblong, 0.6–1.5 cm × 3–5 mm, appressed pubescent, base broadly cuneate to suborbicular, apex obtuse to acute. Inflorescences axillary or extra-axillary. Pedicel 2–4 mm, appressed pubescent. Calyx lobes ovate to obovate-lanceolate, 2–3 mm, appressed pubescent outside, glabrous or only apex slightly appressed pubescent inside. Corolla white, campanulate-tubular; tube ca. 1 mm; appendages transverse linear; lobes short oblong, ca. 0.7 mm. Stamens inserted on middle of corolla tube; anthers oblong, ca. 0.3 mm. Gynobase low fastigiate, ca. 0.8 mm, with 2 or 3 semiorbicular ears. Nutlets dorsiventrally compressed, sparse-ly pubescent, 2.4–2.8 × 1.5–1.8 mm excluding marginal glochids, adaxially protruding; abaxially triangular-ovate, flat or slightly convex; marginal glochids lanceolate, 1–1.8 mm, sparsely pubescent, bases nearly free or slightly confluent into a narrow wing; attachment scar at middle or slightly below adaxially. Fl. and fr. Aug-Sep.

• Slopes; 4500–4800 m. Xizang (Biru Xian).

30. *Eritrichium spathulatum* (Benth) C. B. Clarke in J. D. Hooker, *Fl. Brit. India* 4: 164. 1883.

匙叶齿缘草 *chi ye chi yuan cao*

Echinosperrum spathulatum Benth in Royle, *Ill. Bot. Himal. Mts.* 306. 1836; *Eritrichium jacquemontii* Decaisne; *E. rupestre* (Pallas) Bunge var. *pectinatum* (Pallas) Brand subvar. *spathulatum* (Benth) Brand.

Herbs perennial, 15–25 cm tall. Stems cespitose, often decumbent, short branched above or not, sparsely short appressed pubescent. Petiole of basal leaves 1–2 cm; leaf blade spatulate, 2–3 cm × 3–7 mm, abaxially densely short appressed pubescent, adaxially glabrous or pilose, base attenuate, apex obtuse; stem leaves sessile, spatulate to oblanceolate. Inflorescences terminal, several flowered, branches 2–3 cm, bracteate. Pedicel to 6 mm, sparsely pubescent. Calyx lobes oblong to ovate, ca. 1.5 mm, appressed pubescent outside, subglabrous inside. Corolla blue, campanulate-rotate; tube ca. as long as calyx lobes; appendages papillate; limb ca. 7 mm wide; lobes suborbicular, 2–2.5 mm wide. Gynobase fastigiate, 4-angled. Nutlets subturbinate, glabrous or somewhat pubescent, 2–3.5 × 1.3–2.5 mm excluding marginal glochids; marginal glochids ca. 0.6 mm, free; attachment scar small. Fl. and fr. Jun-Aug.

Hillside meadows; 3600–3700 m. SE and W Xizang [N India, Pakistan].

31. *Eritrichium fruticosum* Klotzsch, *Bot. Ergebn. Reise Waldemar* 96. 1862.

小灌齿缘草 *xiao guan chi yuan cao*

Eritrichium strictum Decaisne var. *fruticosum* (Klotzsch) C. B. Clarke.

Herbs perennial, 10–30 cm tall. Stems cespitose, erect to decumbent, short branched above or not, sparsely appressed white pubescent. Petiole of basal leaves 1–2 cm; leaf blade ovate-lanceolate, ca. 2.5 cm × 5 mm, appressed pubescent, base attenuate, apex obtuse; stem leaves ± sessile or short petiolate. Inflorescences terminal, forked, 10–15-flowered, becoming racemose, bracteate. Pedicel ± curved in fruit, to 6 mm, pubescent. Calyx lobes erect at anthesis, spreading or slightly reflexed, lanceolate to linear, 1–1.5 mm, to 2.5 mm, pubescent. Corolla light blue, campanulate-rotate; tube ca. as long as calyx; appendages trapeziform, ca. 1 mm, with a papillate emergence inside; lobes suborbicular, 1.5–2.5 mm wide. Anthers oblong, ca. 1 mm. Nutlets subturbinate, minutely hispid, 1.7–2 × 0.8–1 mm excluding marginal glochids; abaxially slightly convex, base rounded, apex acute; marginal glochids ca. 0.5 mm, free. Fl. and fr. Jun-Aug.

Sandy river banks; ca. 4200 m. Xizang (Nyalam Xian) [N India, Pakistan].

32. *Eritrichium canum* (Benth) Kitamura, *Acta Phytotax. Geobot.* 19: 103. 1963.

灰毛齿缘草 *hui mao chi yuan cao*

Echinosperrum canum Benth in Royle, *Ill. Bot. Himal. Mts.* 1: 306. 1836; *Eritrichium strictum* Decaisne; *E. strictum* var. *thomsonii* C. B. Clarke.

Herbs perennial, 15–40 cm tall. Stems erect or decumbent, frequently woody at base, not branched or short branched above, densely appressed white sericeous. Petiole of basal leaves to 5 cm, pubescent; leaf blade narrowly lanceolate, to 8 cm × 6 mm, densely white sericeous, base broadly cuneate, apex acute to acuminate; stem leaves 1 to several below inflorescences, sessile, lanceolate to ovate-lanceolate, reduced upward. Inflorescences 2 or 3, forked, many flowered, corymbose at anthesis, becoming racemelike, to 15 cm after anthesis; bracts linear. Pedicel erect, 1–1.5 cm in fruit, short pubescent. Calyx lobes ovate, 1–2 mm, appressed pubescent, apex obtuse. Corolla light blue, campanulate-rotate; tube shorter; throat yellow or orange; appendages trapeziform or low trapeziform; lobes suborbicular, ca. 3 mm wide. Nutlets subturbinate, ca. 2 × 1.5 mm excluding marginal glochids; marginal glochids ca. 1 mm, confluent at base adaxially, glabrous or short pubescent or tuberculate; abaxially flat or slightly convex, sparsely pubescent; attachment scar at base adaxially. Fl. and fr. Jun-Jul. $2n = 24$.

Gravelly slopes, sandy river banks and marshes; 2700–5600 m. Xinjiang (Yecheng Xian), Xizang [Afghanistan, N India, Kashmir, Nepal, Pakistan].

33. *Eritrichium gracile* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, *Acta Phytotax. Sin.* 18: 520. 1980.

条叶齿缘草 *tiao ye chi yuan cao*

Herbs perennial, 15–25 cm tall. Stems cespitose, erect, not branched, 1–1.5 mm in diam., densely appressed pubescent, frequently woody below, with persistent withered branches and leaves at base. Basal leaves petiolate, linear, ca. 2 cm × 2–4 mm, densely appressed pubescent; stem leaves sessile, linear, 2–4 cm. Inflorescences 2 or 3, forked or not, terminal, elongated, many flowered, becoming racemose in fruit. Pedicel 3–5 mm, sparsely pubescent, erect at anthesis, ascending or slightly curved. Flowers crowded. Calyx lobes erect or spreading, lanceolate-linear, 1.5–2 mm, densely appressed white pubescent outside, glabrous, or sparsely appressed pubescent. Corolla light blue, campanulate-rotate; tube 1.5–2 mm; appendages low trapeziform, papillose; lobes subobovate, ca. 2 × 1.5 mm. Nutlets turbinate, ca. 1 mm; disc flat or slightly convex, glabrous or finely tuberculate on lateral surfaces; marginal bristles curved toward center, lanceolate-triangular, free or nearly so at base, barbed; attachment scar at base adaxially. Fl. and fr. Jun-Jul.

- Gravelly areas; ca. 4600 m. Xizang (Zanda Xian).

34. *Eritrichium incanum* (Turczaninow) A. de Candolle, Prodr. 10: 127. 1846.

钝叶齿缘草 *dun ye chi yuan cao*

Myosotis incana Turczaninow, Mém. Soc. Imp. Naturalistes Moscou 11: 97. 1838.

Herbs perennial or biennial, 20–40 cm tall. Stems erect, several and cespitose, 1–3 with dense leaf clusters forming rosettes at base. Basal leaves spatulate to spatulate-lanceolate, 2–7 × 0.2–2 cm, gray-white spreading strigose and sericeous, hairs discoid at base, base attenuate, margin ciliate, apex acute to obtuse; stem leaves linear to narrowly oblanceolate. Inflorescences terminal, several to many flowered, becoming racemelike, to 6–15 cm after anthesis; bracts leaflike. Pedicel 1–2 cm, erect, pubescent. Flowers widely spaced. Calyx lobes linear to linear-lanceolate, 2–3 mm, sericeous, spreading hispid outside, short appressed pubescent. Corolla blue, campanulate-rotate; tube 2.5–3 mm; appendages lunate to low trapeziform, surpassing throat, with a papillate emergence below; lobes divaricate, suborbicular, 2.5–3 mm. Anthers narrowly ovate, ca. 1 mm. Gynobase 0.5–0.8 mm. Nutlets turbinate, smooth, shiny, ca. 2 × 1–1.2 mm excluding marginal prickles, abaxially flat or slightly convex, marginal rib irregularly finely prickled; prickles not barbed at apex; attachment scar at base. Fl. and fr. Jul-Aug.

Hillsides, gravelly places. Heilongjiang (Da Hinggan Ling), Nei Mongol (Humeng Xian) [Korea, E Russia].

35. *Eritrichium borealisinense* Kitagawa, J. Jap. Bot. 38: 301. 1963.

北齿缘草 *bei chi yuan cao*

Eritrichium jeholense Baranov & Skvortzov.

Herbs perennial, 15–40 cm tall. Roots to 1 cm in diam. Stems several, cespitose, frequently forming a dense cluster. Basal leaves oblanceolate, 3–8 cm × 3–8 mm, with 2 different-sized strigose hairs, base cuneate, apex acute; stem leaves oblanceolate to lanceolate, 1.5–3 cm × 3–8 mm.

Inflorescences extra-axillary, with 2–4 branches, 1–2 cm, to 2–10 cm in fruit, each branch several to many flowered; bracts linear-lanceolate, 3–5 mm. Pedicel 2–7 cm, erect to slightly ascending, with appressed white hairs. Calyx lobes erect at anthesis, mostly spreading in fruit, oblong-lanceolate to oblong-linear, 3.5–4 × 1–1.5 mm, strigose, apex acuminate to acute. Corolla blue, campanulate-rotate; tube 1.2–1.5 mm; appendages lunate to low trapeziform, surpassing throat; lobes obovate to orbicular, 3–3.5 mm. Anthers oblong. Nutlets turbinate, ca. 2.5 × 1 mm excluding marginal glochids; adaxially sca-brous, keeled; abaxially ovate to broadly ovate, slightly convex, with many fine tubercles and bristles, center line ribbed; marginal glochids triangular, confluent or nearly free, sparsely pubescent; attachment scar at middle or below adaxially, triangular. Fl. and fr. Jul-Sep.

- Hillside meadows, rocky crevices, thickets, rocky slopes. Hebei, Liaoning, Nei Mongol (Humeng Xian), Shanxi.

36. *Eritrichium pauciflorum* (Ledebour) de Candolle in A. de Candolle, Prodr. 10: 127. 1846.

少花齿缘草 *shao hua chi yuan cao*

Myosotis pauciflora Ledebour, Mém. Acad. Imp. Sci. Saint Pétersbourg Hist. Acad. 5: 517. 1812; *Eritrichium altaicum* Popov; *E. pulviniforme* Popov; *E. rupestre* (Pallas ex Georgi) Bunge; *E. subrupestre* Popov; *M. rupestris* Pallas ex Georgi.

Herbs perennial, 10–30 cm tall, densely gray sericeous. Stems several, base short branched with basally persistent withered leaves, frequently forming a dense cluster. Basal leaves spatulate to spatulate-oblanceolate, 3–6 cm × 2–5 mm, base attenuate becoming stipelike, apex acute to obtuse; stem leaves narrowly oblanceolate to linear, 1–2 cm × 2–4 mm. Inflorescences terminal and extra-axillary, 1–2 cm, to 6 cm after anthesis, with 2–4 branches, each branch several to numerous flowered; bracts linear-lanceolate, 3–9 mm. Pedicel erect to slightly ascending, 3–5 mm, short appressed pubescent. Calyx lobes erect at anthesis, spreading in fruit, linear to oblanceolate, ca. 3.5 mm, apex acute to obtuse. Corolla blue, campanulate-rotate; tube ca. 2 mm; appendages lunate to low trapeziform, short pilose, surpassing throat, with a papillate emergence below; limb 6.5–8 mm wide; lobes elliptic to orbicular, ca. 4 mm. Anthers elliptic. Nutlets turbinate, ca. 2 × 1 mm, tuberculate and pubescent, abaxially flat or slightly convex; marginal glochids triangular, sometimes not barbed; attachment scar at base, broadly ovate. Fl. and fr. Jul-Aug.

Rocky slopes, gravelly areas, roadsides; 1400–2000 m. Gansu, Hebei, Nei Mongol, Ningxia, Shanxi [Kazakhstan, Mongolia, Russia].

37. *Eritrichium mandshuricum* Popov in Komarov, Fl. URSS 19: 711. 1953.

东北齿缘草 *dong bei chi yuan cao*

Herbs perennial, 15–30 cm tall. Stems branched from base and becoming cespitose, erect to subdecumbent. Leaf

blade linear to subfiliform, 3–6 × ca. 1 cm, with many appressed white hairs. Inflorescences terminal, to 10 cm, racemelike, many flowered; bracts numerous, leaflike. Pedicel erect to slightly ascending, 5–10 mm, short appressed pubescent. Calyx lobes erect or slightly spreading, linear-oblongate, 2–2.5 mm, slightly elongated in fruit, short appressed pubescent. Corolla light blue, campanulate-rotate; tube 1.5–2.5 mm; appendages lunate to low trapeziform, short pilose, slightly surpassing throat, with a papillate emergence; lobes suborbicular, 2.5–3.5 × 2.5–3 mm. Anthers oblong, ca. 0.8 mm. Nutlets dorsiventrally compressed, ca. 2 × 1 mm; adaxially keeled, slightly convex, glabrous, finely tuberculate, with a center line rib, marginal rib without prickles or glochids, rarely with a few fine teeth; attachment scar at lower part or base adaxially, oblong.

Hillside meadows, gravelly slopes, arid areas at high elevations. NE Hebei, Heilongjiang, Nei Mongol [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

38. *Eritrichium villosum* (Ledebour) Bunge, Verz. Altai Pfl. 14. 1836.

长毛齿缘草 chang mao chi yuan cao

Myosotis villosa Ledebour, Mém. Acad. Imp. Sci. Saint Pétersbourg Hist. Acad. 5: 516. 1815; *Echinosperrum sericeum* Benth; *Eritrichium basifixum* C. B. Clarke; *E. nanum* (Villars) Schrader subsp. *villosum* (Ledebour) Brand; *E. nanum* subsp. *villosum* (Ledebour) Brand var. *euvillosum* Brand; *E. sericeum* (Benth) A. de Candolle.

Herbs perennial, 5–18 cm tall. Stems single or several and cespitose, pilose. Basal leaves forming a rosette, sessile, oblong to broadly lanceolate or oblanceolate. Inflorescences terminal, several to many flowered, becoming racemelike in fruit, 3–4 cm; bracts leaflike. Pedicel 1.5–3 mm, pilose. Calyx lobes erect or spreading, lanceolate to linear, ca. as long as pedicel, pilose outside, glabrous inside or nearly so. Corolla blue, light purple, rarely yellow, campanulate-rotate; tube 1.2–2 mm; appendages oblong, somewhat exserted from throat, with a papillate emergence below; lobes oblong, 1.8–2.5 mm. Stamens inserted on middle of corolla tube. Gynobase ca. 0.5 mm. Nutlets subturbinate, ca. 2 × 1.2–1.6 mm; abaxially slightly convex, somewhat pubescent, with a conspicuous center line rib; marginal bristles ca. 0.2–0.5 mm, pubescent and dentate, confluent into a narrow wing, not barbed; attachment scar at base, suborbicular. Fl. and fr. Jul-Aug. $2n = 24$.

Hillside meadows; 2500–3000 m. Heilongjiang, N Xinjiang, Xizang [Afghanistan, N India, Kashmir, Kazakhstan, Mongolia, Pakistan, Russia; N Europe].

39. *Eritrichium hemisphaericum* W. T. Wang in W. T. Wang, Y. S. Lian, & J. Q. Wang, Acta Phytotax. Sin. 18: 519. 1980.

半球齿缘草 ban qiu chi yuan cao

Herbs perennial, cushionlike, 1–3 cm tall. Stems numerous, in crowded fascicles. Petiole 1–1.5 cm, base inflated becoming sheathlike; leaf blade spatulate to obovate-oblong, abaxially sparsely short pubescent only near apex,

adaxially white pilose, base attenuate forming into a petiole, margin ciliate, apex obtuse. Inflorescences terminal, 1- or 2-flowered. Pedicel somewhat pubescent, 1–1.5 cm in fruit, mostly erect. Calyx lobes erect at anthesis, divaricate in fruit, rarely reflexed, ovate to broadly ovate, 0.7–1 mm, with many white hairs outside, glabrous inside and with many ciliate hairs along margin. Corolla blue, campanulate-tubular, ca. 2 mm; tube usually ca. 2 × as long as lobes; appendages obscure or papillate; lobes orbicular or nearly so, ca. 0.7 mm. Stamens inserted at middle of corolla tube; anthers elliptic. Gynobase semiglobose, ca. 0.5 mm. Style ca. 0.5 mm. Nutlets dorsiventrally compressed, 1.2–1.5 × 0.8–1 mm excluding marginal glochids; adaxially keeled, glabrous; abaxially ovate, with a center line rib, with many hairs; marginal glochids curved toward center, confluent into a broad wing, margin irregularly bristly, tips not anchorlike; attachment scar at middle adaxially. Fl. and fr. Jul-Aug.

• Gravelly slopes, volcanic rock piles; 4900–5700 m. Qinghai (Zhidoi Xian), Xizang.

Flora of China 16: 378–390. 1995.