

150. HEDYSARUM Linnaeus, Sp. Pl. 2: 745. 1753, nom. cons.

岩黄耆属 *yan huang qi shu*

Xu Langran (徐朗然 Xu Lang-rang); Byoung-Hee Choi

Stracheya Benth.

Herbs, rarely shrublets or shrubs. Stipules 2, opposite petiole, scarious, connate or free, marcescent or deciduous. Leaves imparipinnate; leaflet blades opposite, margin entire. Racemes axillary, lax to capitate; bracts marcescent or caducous. Bracteoles 2, at base of calyx. Calyx campanulate to obliquely campanulate; teeth 5, \pm equal or unequal. Corolla purple, pink, yellow, or white; standard usually longer than wings, shorter or rarely as long as or longer than keel, turned backward at anthesis; keel with claw half or less than half as long as lamina. Stamens diadelphous (9+1). Ovary sessile to stipitate, with a few ovules. Legume articulate, usually divided into several loments, indehiscent, sutures connate or winged; loments compressed to biconvex, with veins, ribs, bristles, or spines, margin usually distinct.

About 160 species: N Africa, Asia, Europe, North America; 41 species (17 endemic) in China.

- 1a. Adaxial calyx teeth 1.5–4 \times as long as tube; legume usually prickly or ribbed (but unknown for some species); leaflet blades leathery, lateral veins obscure.
 - 2a. Legume loments without conspicuous septa, with triangular and irregular prickles along margins; stipules apically connate 1. *H. tibeticum*
 - 2b. Legume loments with conspicuous septa, without prickles or with linear and regular prickles along margins; stipules mostly apically distinct.
 - 3a. Stems longer than 15 cm.
 - 4a. Corolla pale yellow 29. *H. dahuricum*
 - 4b. Corolla purple or pinkish purple.
 - 5a. Corolla wings ca. 2/5 as long as standard 30. *H. brachypterum*
 - 5b. Corolla wings 1/2–3/4 as long as standard.
 - 6a. Stems ascending, 15–20 cm tall; corolla 1.5–1.7 cm 31. *H. gmelinii*
 - 6b. Stems erect to ascending at base, 30–90 cm tall; corolla 1–1.4 cm.
 - 7a. Leaflet blades narrowly elliptic to lanceolate, 1–1.2 \times 0.3–0.5 cm 32. *H. songaricum*
 - 7b. Leaflet blades oblong-ovate, 3–3.5 \times 0.6–0.7 cm 33. *H. shanense*
 - 3b. Stems 4 cm or less.
 - 8a. Leaflet blades adaxially glabrous, subglabrous, or with scattered trichomes.
 - 9a. Calyx teeth 2–3 \times as long as tube; corolla wings 1/4–1/3 as long as standard; leaflets 4–9 mm 34. *H. petrovii*
 - 9b. Calyx teeth 1.5–2 \times as long as tube; corolla wings ca. 1/5 as long as standard; leaflets 12–16 mm 35. *H. setigerum*
 - 8b. Leaflet blades adaxially sparsely pilose, sparsely pubescent, or pubescent.
 - 10a. Leaves 13–24-foliolate 36. *H. kumaonense*
 - 10b. Leaves 3–13-foliolate.
 - 11a. Leaflet blades ovate or broadly ovate; legume tomentose or pubescent.
 - 12a. Leaves 3–7-foliolate 37. *H. iliense*
 - 12b. Leaves 7- or 9-foliolate 38. *H. splendens*
 - 11b. Leaflet blades narrowly ovate-lanceolate, lanceolate-elliptic, ovate-oblong, narrowly elliptic, ovate, or ovate-elliptic; legume with dense hyaline scalelike trichomes (unknown for *H. setosum*).
 - 13a. Stems 1–2 cm; leaflet blades narrowly ovate-lanceolate to lanceolate-elliptic, 1.2–1.5 cm 39. *H. krylovii*
 - 13b. Stems inconspicuous; leaflet blades ovate-oblong, narrowly elliptic, ovate, or ovate-elliptic, 0.6–0.9 cm.
 - 14a. Corolla 1.2–1.4 cm; calyx 7–8 mm; plants 5–15 cm tall 40. *H. ferganense*
 - 14b. Corolla 1.7–2 cm; calyx 8–10 mm; plants 15–20 cm tall 41. *H. setosum*
 - 1b. Adaxial calyx teeth \pm as long as to shorter than tube; legume surfaces without prickles or ribs; leaflet blades membranous, lateral veins conspicuous.
 - 15a. Loments with a ca. 1 mm dentate margin 2. *H. dentatoalatum*
 - 15b. Loments with a 0.5 mm or less dentate or entire margin (unknown for *H. xizangense*).
 - 16a. Loments pyramidal 3. *H. trigonomerum*
 - 16b. Loments ovoid, globose, subglobose, ellipsoid, or rhomboid (unknown for *H. xizangense*).
 - 17a. Corolla yellow.
 - 18a. Calyx teeth \pm equal.
 - 19a. Leaves 9–15-foliolate; leaflet blades 1–2 cm wide.
 - 20a. Racemes distinctly longer than leaves; loment margins entire 6. *H. flavescens*
 - 20b. Racemes \pm as long as leaves; loment margins dentate 7. *H. semenovii*
 - 19b. Leaves 13–33-foliolate; leaflet blades 0.4–0.7 cm wide.

- 21a. Leaves 13–27-foliolate; leaflet blades long ovate to ovate-lanceolate, abaxially dark brownish and adaxially greenish 4. *H. limitaneum*
- 21b. Leaves 27–33-foliolate; leaflet blades ovate-oblong, abaxially and adaxially greenish 5. *H. thiochroum*
- 18b. Most abaxial calyx tooth 2–3 × as long as others.
- 22a. Bracts marcescent, 1/4–2/3 as long as pedicels 8. *H. polybotrys*
- 22b. Bracts caducous, ca. 2/3 as long as to longer than pedicels.
- 23a. Loment wings inconspicuous, entire; calyx densely pubescent 9. *H. citrinum*
- 23b. Loment wings conspicuous, dentate; calyx sparsely pubescent.
- 24a. Adaxial most calyx tooth 0.7–1.5 × as long as tube, others less than 1/2 as long as tube; pedicel 5–6 mm 10. *H. ussuriense*
- 24b. Adaxial most calyx tooth 1.5–2 × as long as tube, others 1/2 to as long as tube; pedicel 3–4 mm 11. *H. taipeicum*
- 17b. Corolla pinkish purple to dark purple (red but apically dark purple in *H. kirghisorum*, unknown for *H. longigynophorum*).
- 25a. Auricle of corolla wing less than 1/2 as long of claw; calyx teeth subulate, apex long cuspidate 18. *H. falconeri*
- 25b. Auricle of corolla wing as long as claw; calyx teeth triangular, triangular-subulate, or lanceolate, apex not long cuspidate.
- 26a. Leaflet blades adaxially pubescent, sericeous, or tomentose.
- 27a. Corolla wings equal to or longer than keel; calyx with adaxial 2 teeth connate 19. *H. campylocarpon*
- 27b. Corolla wings shorter than keel; calyx teeth not connate.
- 28a. Leaflet blades narrowly ovate to ovate, 20–24 × 7–9 mm; bracteoles shorter, 0.4–0.7 mm; lateral veins conspicuous 28. *H. taoriparium*
- 28b. Leaflet blades broadly ovate to suborbicular, 6–10 × 5–10 mm; bracteoles longer, 3.5–5 mm; lateral veins sometimes inconspicuous 20. *H. pseudastragalus*
- 26b. Leaflet blades adaxially glabrous.
- 29a. Corolla keel shorter than standard and wing, wings not curved upward at apex; legume often inconspicuously constricted between lomenta at abaxial suture 12. *H. inundatum*
- 29b. Corolla keel longer than standard or wing, wings curved upward at apex; legume conspicuously constricted between lomenta.
- 30a. Bracts obovate to obtuse, apex usually dentate; rhizomes often with tubercle; leaflet blades obovate, elliptic, or suborbicular 21. *H. algidum*
- 30b. Bracts ovate or obovate, apex acute or acuminate; rhizomes without tubercle; leaflet blades ovate, elliptic, or oblong.
- 31a. Pedicel 1.5–2.5 cm 25. *H. jinchuanense*
- 31b. Pedicel 0.2–0.6 cm.
- 32a. Lomenta 1 or 2, rhomboid 24. *H. longigynophorum*
- 32b. Lomenta (1 or)2–5, ovate, obovate, or elliptic.
- 33a. Adaxial calyx teeth 1/5–1/3 as long as tube.
- 34a. Bract marcescent; racemes densely flowered 13. *H. alpinum*
- 34b. Bract caducous; racemes laxly flowered 14. *H. laxiflorum*
- 33b. Adaxial calyx teeth ca. 1/2 as long as to equal to tube.
- 35a. Lomenta acute at apex; stem and leaves sericeous.
- 36a. Corolla wings longer than standard; leaflet blades 2–4 cm; legume pubescent 26. *H. fistulosum*
- 36b. Corolla wings shorter than standard; leaflet blades 1–1.5 cm; legume glabrous 15. *H. nagarzense*
- 35b. Lomenta obtuse at apex; stem and leaves tomentose.
- 37a. Corolla 2.1–2.5 cm 22. *H. tanguticum*
- 37b. Corolla 1.2–2 cm.
- 38a. Leaflet blades 1.9–3 × 0.6–1.4 cm.
- 39a. Corolla red, with dark purple at apex; bracts slightly longer than pedicel; plants 15–30 cm tall 16. *H. kirghisorum*
- 39b. Corolla purple, not dark purple at apex; bracts ca. 2 × as long as pedicel, subequal to calyx teeth; plants 30–60(–90) cm tall 17. *H. neglectum*
- 38b. Leaflet blades 1–1.6 × 0.5–0.9 cm.
- 40a. Racemes dense; pedicel 2–3 mm; calyx teeth narrowly lanceolate; corolla standard long obovate, 1.2–1.4 cm, keel 1–2 mm longer than standard 23. *H. sikkimense*
- 40b. Racemes lax; pedicel 3–4 mm; calyx teeth triangular-lanceolate; corolla standard obovate, 1.4–1.5 cm, keel 2–3 mm longer than standard 27. *H. xizangense*

1. *Hedysarum tibeticum* (Benth) B. H. Choi & H. Ohashi, 藏豆 zang dou

Taxon 52: 574. 2003.

Stracheya tibetica Benth, Hooker's J. Bot. Kew Gard.

Misc. 5: 307. 1853; *Astragalus toktjenensis* Ulbrich.

Herbs, perennial, 4–5 cm tall. Stems abbreviated, inconspicuous. Stipules brown, ovate, 7–10 mm, membranous, apically connate. Leaves 4–7 cm, 11–15-foliolate; leaflet blades long ovate to elliptic, 8–10 × 3–5 mm, abaxially appressed pubescent, adaxially glabrous. Racemes corymbose, with 3–6 flowers; bracts ovate, ca. 2 × as long as pedicel; peduncle as long as to shorter than leaves. Pedicel 1–2 mm; bracteoles 2, small. Calyx obliquely campanulate, 7–8 mm, pilose; teeth lanceolate, as long as to slightly longer than tube. Corolla reddish; standard obovate, 1.5–1.8 cm; wings slightly shorter than standard; keel ± as long as standard. Ovary glabrous, sessile; ovules 2–5. Legume long obovoid, inconspicuously septate into 2–5 segments, 1.5–2.5 cm, slightly inflated, banded, pubescent, with 1–1.5 mm prickles along margin and lateral midline. Fl. Jul–Aug, fr. Aug–Sep.

Alpine meadows; 4000–4600 m. SW Qinghai, Xizang [India (Sikkim), Kashmir, Nepal, N Pakistan].

2. *Hedysarum dentatoalatum* K. T. Fu, Fl. Tsinling. 1(3): 448. 1981.

齿翅岩黄耆 chi chi yan huang qi

Herbs, perennial, 60–80 cm tall. Stems caespitose, erect. Stipules triangular-lanceolate, 5–6 mm, basally connate. Leaves 12–20 cm, 11–21-foliolate; leaflet blades oblong-ovate to ovate-lanceolate, 2–2.5(–5) × 1–1.7 cm, abaxially sparsely pubescent, adaxially glabrous. Racemes lax, with many flowers; bracts ± as long as pedicel; peduncle longer than to ± as long as leaves. Pedicel 3–4 mm. Calyx campanulate, 5–6(–11) mm; teeth linear-lanceolate, 1.5–2 × as long as tube. Corolla unknown. Legume divided into 2 or 3(or 4) loments; loments subglobose to ellipsoid, 8–12 × 7–10(–12) mm, compressed, pilose, margin 1(–3) mm and deeply dentate. Fr. Jun.

• Shrublands; ca. 1200 m. Shaanxi (E Qin Ling).

This species is a good fodder plant.

One of us (Choi) has seen no specimens of this species.

3. *Hedysarum trigonmerum* Handel-Mazzetti, Symb. Sin. 7: 562. 1933.

三角莱岩黄耆 san jiao jia yan huang qi

Herbs, perennial, 50–70 cm tall. Stems erect. Stipules small. Leaves 8–13 cm, 7–13-foliolate; leaflet blades elliptic to ovate-oblong, 1.2–2.5 × 0.4–0.8 cm. Racemes lax, with many flowers; peduncle ± as long as leaves. Pedicel 5–8 mm. Calyx obliquely campanulate; teeth unequal, most abaxial tooth linear and ca. 2 × as long as others, other 4 teeth triangular. Legume divided into 4 loments; loments pyramidal, ca. 7 × 5–6 mm.

• Meadows, shrublands. S Gansu (Zhugqu).

No specimens of this species have been seen by the authors.

4. *Hedysarum limitaneum* Handel-Mazzetti, Symb. Sin. 7: 564. 1933.

滇岩黄耆 dian yan huang qi

Herbs, perennial, 20–40 cm tall. Stems caespitose, erect. Stipules broadly lanceolate, 1.5–2 cm, connate farther than

middle. Leaves 8–14 cm, 13–27-foliolate; leaflet blades long ovate to ovate-lanceolate, 1.5–2 × 0.5–0.7 cm, abaxially dark brownish and pilose along veins, adaxially glabrous. Racemes lax, with many flowers; bracts subulate-lanceolate, slightly longer than pedicel; peduncle longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 8–10 mm, pubescent; teeth lanceolate-triangular, ± as long as tube, most abaxial tooth slightly longer than others. Corolla yellow; standard long obovate, 1.4–1.6 cm; wings ± as long as standard; keel 1–2 mm longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments ellipsoid to long ovoid, 5–6 × 3–4 mm, compressed, pubescent, margin narrow and dentate. Fl. Jun–Aug, fr. Aug–Sep.

• Forests, meadows; 3200–4000 m. Qinghai, SW Sichuan, E Xizang, NW Yunnan.

5. *Hedysarum thiochrom* Handel-Mazzetti, Symb. Sin. 7: 563. 1933.

中甸岩黄耆 zhong dian yan huang qi

Herbs, perennial, ca. 75 cm tall. Stems caespitose, erect. Stipules triangular-lanceolate, 1–1.5 cm, connate farther than middle. Leaves 8–12 cm, 27–33-foliolate; leaflet blades ovate-oblong, 1.4–1.7 × 0.4–0.5 cm, abaxially usually pubescent along veins, adaxially glabrous. Racemes lax, with many flowers; bracts subulate-lanceolate, ca. 1.5 × as long as pedicel; peduncle longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 5–6 mm, pubescent; teeth lanceolate-triangular, ca. 1/2 as long as tube, most abaxial tooth slightly longer than others. Corolla yellow; standard long obovate, ca. 1.2 cm; wings slightly longer than standard; keel 2–3 mm longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments subglobose, 3–4 mm in diam., compressed, pubescent, margin narrow and entire. Fl. Jul–Aug, fr. Aug–Sep.

• Forests; ca. 3200 m. SW Sichuan, NW Yunnan.

6. *Hedysarum flavescens* Regel & Schmalhaus, Izv. Imp. Obsc. Ljubit. Estestv. Moskovsk. Univ. 34(2): 21. 1882.

乌恰岩黄耆 wu qia yan huang qi

Herbs, perennial, 30–40[–150] cm tall. Stems erect. Stipules lanceolate, 1–1.2 cm, basally connate. Leaves 10–15 cm, 9–13-foliolate; leaflet blades ovate-elliptic to ovate-orbicular, 1.2–1.5[–3.5] × 1–1.3[–2] cm, abaxially with appressed trichomes, adaxially glabrous. Racemes lax, with many flowers, distinctly longer than leaves; bracts lanceolate, slightly shorter than pedicel; peduncle longer than leaves. Pedicel 3–4 mm. Calyx shortly campanulate, 4–5 mm, pubescent; teeth subulate to triangular at base, slightly shorter than tube. Corolla yellow; standard long elliptic, 1.4–1.5 cm; wings ± as long as standard; keel ca. 2 mm longer than standard. Ovary pubescent. Legume divided into 2 or 3(or 4) loments; loments globose-ellipsoid, 5–6 mm in diam., compressed, pubescent, margin narrow and entire. Fl. Jul–Aug, fr. Aug–Sep.

Gravelly areas along rivers; 2900–3100 m. SW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

B. Fedtschenko (in Komarov, Fl. URSS 13: 278. 1948) reported this species to be 1.5 m tall, with leaflet blades 2–3.5 × 1.7–2 cm and the most abaxial calyx tooth longer than the calyx tube.

This species is a good fodder plant.

7. *Hedysarum semenovii* Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 39(2): 39. 1866.

天山岩黄耆 tian shan yan huang qi

Hedysarum junatovii Yakovlev.

Herbs, perennial, 40–60[–120] cm tall. Stems caespitose, erect. Stipules lanceolate, 1–1.5 cm, connate less than to middle. Leaves 10–15 cm, 9–15-foliolate; leaflet blades ovate to elliptic, 2.5–3.5 × 1.5–2.2 cm, abaxially with appressed trichomes, adaxially glabrous. Racemes ± dense, ± as long as leaves, with many flowers; bracts narrowly lanceolate, slightly shorter than leaves; peduncle ± as long as leaves. Pedicel 4–5 mm. Calyx campanulate, ca. 5 mm, glabrous or pubescent at base; teeth subulate, ± equal, pubescent. Corolla yellow; standard long obovate, 1.2–1.4 cm; wings ± as long as standard; keel ca. 2 mm longer than standard. Ovary appressed pubescent. Legume divided into 3 or 4 loments; loments globose, ellipsoid, or obovoid, 6–7 mm in diam., compressed, pubescent to subglabrous, margin irregularly dentate. Fl. Jul–Aug, fr. Aug–Sep.

Gravelly or stony slopes; 1400–1900 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

B. Fedtschenko (in Komarov, Fl. URSS 13: 278. 1948) reported this species to be 50–120 cm tall and (in fig. 47-9) the most abaxial calyx tooth to be only slightly longer than the calyx tube.

8. *Hedysarum polybotrys* Handel-Mazzetti, Symb. Sin. 7: 563. 1933.

多序岩黄耆 duo xu yan huang qi

Herbs, perennial, 7–12 cm tall. Stems caespitose, erect. Stipules lanceolate, 5–7 mm, connate less than to middle. Leaves 5–9 cm, 11–19-foliolate; leaflet blades ovate, ovate-lanceolate, or ovate-oblong, 1.5–3 × 0.4–1.5 cm, abaxially with appressed trichomes, adaxially glabrous. Racemes dense, with many flowers; bracts subulate-lanceolate, marcescent, 1/4–2/3 as long as pedicels; peduncle ± as long as to longer than leaves. Pedicel 3–4 mm. Calyx obliquely campanulate, 4–5 mm, pubescent; teeth triangular-subulate, unequal, most abaxial tooth ca. 2 mm and ca. 2 × as long as others. Corolla yellow; standard long obovate, 1.1–1.2 cm; wings as long as to slightly longer than standard; keel 2–3 mm longer than standard. Ovary pubescent. Legume divided into 2–4 loments; loments subglobose to broadly ovoid, (3–)4–5(–6) mm in diam., compressed, pubescent, margin narrow and entire. Fl. Jul–Aug, fr. Aug–Sep.

• Gravelly and stony slopes, forest margins; 1200–3200 m. E and S Gansu, W Hebei, S Nei Mongol, Ningxia, N Shanxi, NW Sichuan.

The roots are used medicinally.

1a. Leaflet blades ovate-lanceolate to ovate-oblong, 1.5–2.4 × 0.4–0.6 cm 8a. var. *polybotrys*

1b. Leaflet blades ovate, 1.5–3 × 0.6–1.5 cm 8b. var. *alaschanicum*

8a. *Hedysarum polybotrys* var. *polybotrys*

多序岩黄耆(原变种) duo xu yan huang qi (yuan bian zhong)

Leaflet blades ovate-lanceolate to ovate-oblong, 1.5–2.4 × 0.4–0.6 cm. Peduncle ± as long as leaves. Legume divided into 2–4 loments; loments 3–4 mm in diam., sparsely pubescent.

• Gravelly and stony slopes. E and S Gansu, NW Sichuan.

8b. *Hedysarum polybotrys* var. *alaschanicum* (B. Fedtschenko) H. C. Fu & Z. Y. Chu, Fl. Intramongol., ed. 2, 3: 341. 1989.

宽叶岩黄耆 kuan ye yan huang qi

Hedysarum semenovii Regel & Herder var. *alaschanicum* B. Fedtschenko, Trudy Imp. S.-Peterburgsk. Bot. Sada 19: 250. 1902; *H. polybotrys* var. *latifolium* L. Z. Shue; *H. przewalskii* Yakovlev; *H. vicioides* Turczaninow var. *alaschanicum* (B. Fedtschenko) Y. Z. Zhao, R. Sha & R. Cao.

Branchlets pubescent. Leaflet blades ovate, 1.5–3 × 0.6–1.5 cm.

• Forest margins, stony slopes. S Gansu, W Hebei, S Nei Mongol, Ningxia, N Shanxi.

One of us (Choi) has seen no specimens of this variety.

9. *Hedysarum citrinum* E. G. Baker, J. Bot. 73: 296. 1935.

黄花岩黄耆 huang hua yan huang qi

Herbs, perennial, 30–80 cm tall. Stems caespitose, erect. Stipules narrowly lanceolate, 1–1.3 cm, connate farther than middle. Leaves 8–16 cm, 15–19-foliolate; leaflet blades long ovate to ovate-oblong, 1.5–3 × 0.5–1 cm, abaxially sparsely pubescent, adaxially glabrous. Racemes lax, with many flowers; bracts lanceolate, 3–5 mm; peduncle as long as to longer than leaves. Pedicel 5–6 mm. Calyx obliquely campanulate, 5–6 mm, densely pubescent; teeth unequal, most abaxial tooth subulate-lanceolate and ± as long as tube, other 4 teeth lanceolate and ca. 1/2 as long as tube. Corolla yellow; standard long obovate, 1–1.2 cm; wings ± as long as standard; keel ca. 2 mm longer than standard. Ovary glabrous or pubescent. Legume divided into 2–4 loments; loments ellipsoid-obovoid, subglobose, or rhomboid, ca. 2 × 1.5 mm, compressed, glabrous, margin entire or inconspicuous. Fl. Jul–Aug, fr. Aug–Sep. $2n = 14^*$.

• Forests, scrub, stony slopes; 3200–4200 m. W Sichuan, E Xizang.

This is one of the most variable species, particularly in size and shape of parts, which differ between habitats or localities. Even in an individual plant, the loments are usually variable. In the original description, the corolla standard was reported as 1.4–1.5 cm and the loments ca. 6 × 5 mm.

10. *Hedysarum ussuriense* Schischkin & Komarov, Bot. Mater. Gerb. Glavn. Bot. Sada S.S.S.R. 6: 11. 1926.

拟蚕豆岩黄耆 ni can dou yan huang qi

Herbs, perennial, 30–50 cm tall. Stems caespitose, erect. Stipules broadly lanceolate, 1–1.2 cm, connate farther than middle. Leaves 7–15 cm, 11–19-foliolate; leaflet blades long ovate, 1–2.3 × 0.6–1.1 cm, abaxially pubescent along veins, adaxially glabrous. Racemes dense, with many flowers; bracts lanceolate, slightly shorter than pedicel, caducous; peduncle slightly longer than leaves. Pedicel 5–6 mm. Calyx obliquely campanulate, 5–6 mm, sparsely pubescent; teeth unequal, most abaxial tooth 0.7–1.5 × as long as tube, other 4 teeth triangular and 1/4–1/3 as long as tube. Corolla yellow; standard long obovate, 1.4–1.6

cm; wings \pm as long as standard; keel ca. 2 mm longer than standard. Ovary glabrous or pubescent. Legume divided into 2 or 4 loments; loments subglobose to ovoid, $6-7 \times 4-5$ mm, compressed, glabrous or pubescent, margin narrow and irregularly dentate. Fl. Jul–Aug, fr. Aug–Sep.

Forests, subalpine meadows; 2500–3200 m. Hebei, E Jilin, NE Liaoning, Sichuan [N Korea, Russia (Far East)].

Plants treated as *Hedysarum vicioides* Turczaninow in FRPS (42(2): 190. 1998) belong here.

11. *Hedysarum taibeicum* (Handel-Mazzetti) K. T. Fu, Fl. Tsinling. 1(3): 72. 1981.

太白岩黄耆 tai bai yan huang qi

Hedysarum esculentum Ledebour var. *taibeicum* Handel-Mazzetti, Symb. Sin. 7: 562. 1933; *H. vicioides* Turczaninow var. *taibeicum* (Handel-Mazzetti) Liu ex B. H. Choi & H. Ohashi.

Herbs, perennial, 30–40 cm tall. Stems caespitose, erect. Stipules lanceolate, 1–1.2 cm, connate farther than middle. Leaves 10–13 cm, 15–27-foliolate; leaflet blades long ovate, oblong, or elliptic, $1.2-2 \times 0.6-0.9$ cm, abaxially pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts narrowly lanceolate, \pm as long as pedicel, caducous; peduncle as long as to longer than leaves. Pedicel 3–4 mm. Calyx campanulate, 6–8 mm, candescent; teeth lanceolate, unequal, most abaxial tooth $1.5-2 \times$ as long as tube, lateral 2 teeth \pm as long as tube, adaxial 2 teeth ca. $1/2$ as long as tube. Corolla yellow; standard long obovate, 1.2–1.4 cm; wings as long as to slightly longer than standard; keel ca. 2 mm longer than standard. Ovary glabrous. Legume divided into 2–5 loments; loments obovoid to globose, $4-5 \times 3-4$ mm, compressed, glabrous, margin narrow and irregularly dentate. Fl. Jul–Aug, fr. Aug–Sep.

• Stony slopes, meadows; 1500–3300 m. NW Hubei, Shaanxi (Qin Ling).

12. *Hedysarum inundatum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 11: 366. 1838.

湿地岩黄耆 shi di yan huang qi

Hedysarum connatum (B. Fedtschenko) B. Fedtschenko; *H. obscurum* Linnaeus var. *connatum* B. Fedtschenko; *H. obscurum* var. *inundatum* (Turczaninow) B. Fedtschenko.

Herbs, perennial, 10–15[–40] cm tall. Stems ascending to erect. Stipules lanceolate, 1–1.5 cm, connate farther than middle. Leaves 7–12 cm, 11–17-foliolate; leaflet blades ovate to oblong, $1.2-1.7 \times 0.6-0.9$ cm, abaxially sparsely pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts lanceolate, slightly longer than pedicel; peduncle slightly longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 4–5 mm, pubescent; teeth triangular, \pm equal, ca. $1/2$ as long as tube. Corolla purple; standard long obovate, 1.4–1.6(–1.8) cm; wings slightly shorter than standard, straight or slightly curved downward at apex; keel shorter than standard and wings. Ovary glabrous. Legume divided into 3 or 4 loments, inconspicuously constricted between loments at abaxial suture; loments ellipsoid, $5-6 \times 4-5$ mm, compressed, glabrous, margin entire. Fl. Jun–Jul, fr. Jul–Aug. $2n = 8$.

Subalpine meadows; 2500–3000 m. Hebei (Xiaowutai Shan), N Shanxi [Russia (E Siberia)].

B. Fedtschenko (in Komarov, Fl. URSS 13: 270. 1948) reported this species to be 20–40 cm tall.

13. *Hedysarum alpinum* Linnaeus, Sp. Pl. 2: 750. 1753.

山岩黄耆 shan yan huang qi

Hedysarum alpinum var. *chinense* B. Fedtschenko; *H. chinense* (B. Fedtschenko) Handel-Mazzetti; *H. polybotrys* Handel-Mazzetti var. *robustum* K. T. Fu; *H. smithianum* Handel-Mazzetti.

Herbs, perennial, 50–100 cm tall. Stems numerous, erect. Stipules triangular-lanceolate, 0.8–1.4 cm, connate farther than middle. Leaves 8–12 cm, 9–21-foliolate; leaflet blades ovate-oblong, narrowly elliptic, or oblong-lanceolate, $1.5-3 \times 0.5-0.7$ cm, abaxially appressed sparsely pilose to pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts subulate-lanceolate, \pm as long as pedicel; peduncle as long as to longer than leaves. Pedicel 2–4 mm. Calyx campanulate, 3–5 mm, pubescent to pilose; teeth triangular-lanceolate, unequal, most abaxial tooth ca. $2/3$ as long as tube, adaxial 2 teeth ca. $1/2$ as long as most abaxial one. Corolla purple; standard long obovate, 0.9–1.2 cm; wings as long as to slightly longer than standard; keel 2–3 mm longer than standard. Ovary glabrous or appressed pubescent. Legume divided into 2 or 3(–5) loments; loments ellipsoid to obovoid, $4-8 \times 3-5$ mm, compressed, glabrous, margin inconspicuous. Fl. Jun–Aug, fr. Jul–Sep. $2n = 14$.

Swampy meadows, taiga forests, stony slopes, scrub. S Gansu, Hebei, Heilongjiang, S Henan, Jilin, NE Nei Mongol, S Shaanxi, Shanxi, Sichuan [Kashmir, N Korea, N Mongolia, Pakistan, Russia; E and N Europe, North America].

14. *Hedysarum laxiflorum* Benthham ex Baker in J. D. Hooker, Fl. Brit. India 2: 146. 1876.

疏花岩黄耆 shu hua yan huang qi

Hedysarum alpinum Linnaeus subsp. *laxiflorum* (Benthham ex Baker) H. Ohashi & Tateishi.

Herbs, perennial, 30–120 cm tall. Stems numerous, erect. Stipules lanceolate, ca. 7 mm, connate. Leaves 10–15 cm, 17–33-foliolate; leaflet blades elliptic to oblong-elliptic, $1.5-2.5 \times 0.6-1$ cm, abaxially pubescent along veins, adaxially glabrous. Racemes lax, with many flowers; bracts ovate, ca. $1/2$ as long as pedicel, caducous; peduncle longer than leaves. Pedicel 4–6 mm. Calyx campanulate, 4–6 mm, glabrous or calyx teeth pubescent; teeth lanceolate, unequal, most abaxial tooth longer than others, adaxial and lateral teeth ca. $1/5$ as long as tube. Corolla purple; standard obovate, 1.4–1.5 cm; wings as long as to slightly longer than standard; keel 2–3 mm longer than standard. Ovary glabrous. Legume divided into 3 or 4 loments; loments broadly ellipsoid, $5-6 \times 4-5$ mm, compressed, glabrous. Fl. Jul–Aug, fr. Aug–Sep.

W Xizang? [Kashmir, NW Pakistan].

No specimens of this species from China have been seen by the authors. It is likely that the lectotype of *Hedysarum laxiflorum* (*Fal-*

coner 440), cited as being from near “West Tibet” by Baker (Fl. Brit. India 2: 146. 1846) and by H. Ohashi and Tateishi (Fl. E. Himalaya, 3rd. Rep. 368. 1975), was actually from the Karakoram mountains in NW Pakistan.

15. *Hedysarum nagarzense* C. C. Ni, Acta Phytotax. Sin. 18: 372. 1980.

浪卡子岩黄耆 lang ka zi yan huang qi

Herbs, perennial, 30–45 cm tall. Stems numerous, erect. Stipules lanceolate, 5–7 mm, connate. Leaves 8–11 cm, 17–23-foliolate; leaflet blades oblong to ovate-elliptic, 10–15 × 6–8 mm, abaxially pubescent along veins, adaxially glabrous. Racemes somewhat dense, with many flowers; bracts ca. 4 mm; peduncle longer than leaves. Pedicel 5–6 mm. Calyx campanulate, 7–9 mm, pilose; teeth lanceolate, unequal, most abaxial tooth ca. 5 mm and ± as long as tube, adaxial 2 teeth ca. 4 mm. Corolla purple; standard obovate, 1.6–1.8 cm; wings shorter than standard; keel ± as long as standard. Ovary glabrous. Legume with 1 or 2 loments; loments obliquely obovoid, 1.5–2 × 0.8–1 cm, compressed, glabrous, margin entire, apex acute. Fl. Jul–Aug, fr. Aug–Sep.

- Gravelly alpine areas; ca. 4500 m. Xizang (Nagarzê).

16. *Hedysarum kirghisorum* B. Fedtschenko, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 11: 114. 1949.

吉尔吉斯岩黄耆 ji er ji si yan huang qi

Herbs, perennial, 15–30 cm tall. Stems numerous to caespitose, erect. Stipules ovate-lanceolate, 0.8–1.2 cm, connate farther than middle. Leaves 8–12 cm, 9–15-foliolate; leaflet blades broadly lanceolate to oblong-lanceolate, 1.9–2.5 × 0.6–0.8 cm, abaxially pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts lanceolate, slightly longer than pedicel; peduncle longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 6–8 mm, pubescent; teeth narrowly lanceolate, slightly longer to 1.5[–2.5] × as long as tube, most abaxial tooth slightly longer than others. Corolla pale red but dark purple at apex; standard obovate, 1.4–1.5 cm; wings ± as long as to slightly longer than standard; keel ca. 2 mm longer than standard. Ovary pubescent. Legume divided into 2–4 loments; loments globose, compressed, appressed pubescent, margin narrow and dentate. Fl. Jun–Jul, fr. Jul–Aug.

Gravelly areas, meadows, glacial till in alpine areas; 2500–3300 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

B. Fedtschenko (in Komarov, Fl. URSS 13: 274. 1948) reported the calyx teeth to be 2–2.5 × as long as the calyx tube.

This species is a good fodder plant.

17. *Hedysarum neglectum* Ledebour, Fl. Altaic. 3: 341. 1831.

疏忽岩黄耆 shu hu yan huang qi

Hedysarum obscurum Linnaeus var. *lasiocarpum* B. Fedtschenko; *H. obscurum* var. *neglectum* (Ledebour) Krylov.

Herbs, perennial, 30–60(–90) cm tall. Stems several, erect. Stipules lanceolate, 1.5–9 mm, connate farther than middle. Leaves 8–12 cm, 11–15-foliolate; leaflet blades long ovate to

ovate-oblong, 2–3 × 0.8–1.4 cm, abaxially sparsely pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts ca. 2 × as long as pedicel, subequal to calyx teeth; peduncle longer than leaves. Pedicel ca. 2 mm. Calyx campanulate, 5–6 mm, pubescent; teeth triangular-lanceolate, ± as long as tube. Corolla purple; standard obovate, 1.3–1.4 × 0.6–0.8 cm; wings as long as to slightly shorter than standard; keel ca. 2 mm longer than standard. Ovary pubescent. Legume divided into 3 or 4 loments; loments globose to ovoid, 5–6 × 4–5 mm, compressed, appressed pubescent, margin ca. 1 mm and entire. Fl. Jul–Aug, fr. Aug–Sep.

Alpine meadows, scrub, forests; 1200–2600 m. Xinjiang (Altay Shan, W Tian Shan) [Kazakhstan, W Mongolia, E Russia].

18. *Hedysarum falconeri* Baker in J. D. Hooker, Fl. Brit. India 2: 146. 1876.

藏西岩黄耆 zang xi yan huang qi

Herbs, perennial, 45–60 cm tall. Stems erect, solid. Stipules connate. Leaves 15–20 cm, (11–)15–21(–27)-foliolate; leaflet blades elliptic, ovate, or oblong-elliptic, 1.5–3 × 0.6–1.5 cm, abaxially pubescent, adaxially glabrous or sparsely pubescent. Racemes with many flowers; bracts lanceolate, (1–)3–10 mm; peduncle longer than leaves. Pedicel 3–5 mm. Calyx campanulate, 7–9 mm, pilose; teeth subulate, most abaxial tooth slightly longer than others. Corolla purple; standard obovate, 1.7–2 cm; wings shorter than standard, with auricle less than 1/2 as long as claw; keel ± as long as standard. Ovary pubescent. Legume divided into 1–3 loments; loments ellipsoid, compressed, pubescent, margin irregularly dentate.

Alpine areas. W Xizang? [N Afghanistan, Kashmir, NW Pakistan].

No specimens of this species from China have been seen by the authors. It is likely that all the specimens, including the lectotype of *Hedysarum falconeri* (*Falconer 441*), that were cited as being from “West Tibet” by Baker (Fl. Brit. India 2: 146. 1846) and by H. Ohashi and Tateishi (Fl. E. Himalaya, 3rd. Rep. 377. 1975) are actually from the Karakoram mountains in NW Pakistan.

19. *Hedysarum campylocarpon* H. Ohashi, J. Jap. Bot. 49: 164. 1974.

曲果岩黄耆 qu guo yan huang qi

Herbs, perennial, 50–80 cm tall. Stems numerous, erect. Stipules long ovate, 1–1.5 cm, connate less than to middle. Leaves 10–15 cm, 15–19-foliolate; leaflet blades ovate to long ovate, 2–2.5 × 1.2–1.4 cm, both surfaces sparsely to densely pubescent. Racemes somewhat dense, with many flowers; bracts ± as long as pedicel; peduncle slightly longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 5–6 mm, pubescent; teeth triangular, unequal, slightly longer than tube, adaxial teeth connate and slightly shorter than others. Corolla dark purple; standard obovate-oblong, 1.4–1.6 cm; wings slightly longer than standard; keel as long as to slightly longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments ellipsoid, 5–7 × 4–5 mm, compressed, appressed pubescent, margin irregularly dentate or entire. Fl. Jul–Aug, fr. Aug–Sep.

Meadows, forests; 3300–4100 m. Xizang (Gyirong) [Nepal].

20. *Hedysarum pseudastragalus* Ulbrich, Repert. Spec. Nov. Regni Veg. Beih. 12: 427. 1922.

紫云英岩黄耆 *zi yun ying yan huang qi*

Hedysarum blepharopterum Handel-Mazzetti.

Herbs, perennial, 3–15 cm tall. Stems ascending to erect but almost acaulescent. Stipules oblong, 0.9–1.5 cm, connate farther than middle. Leaves 4–6 cm, 11–17-foliolate; leaflet blades broadly ovate to suborbicular, 6–10 × 5–10 mm, both surfaces usually sericeous, lateral veins sometimes inconspicuous. Racemes lax, with 5–8 flowers; bracts narrowly elliptic, 4–5 × as long as pedicel; peduncle ca. 2 × as long as leaves. Pedicel 1–2 mm; bracteoles 3.5–5 mm. Calyx campanulate, 0.8–1.4 cm, pilose; teeth narrowly lanceolate, equal, 2–3 × as long as tube. Corolla purple; standard broadly obovate, 1.7–2.1 cm; wings 1–2 mm longer than standard; keel 3–4 mm longer than standard. Ovary pubescent. Legume with 2–4 loments; loments obovoid to ellipsoid, 6–7 × 4–5 mm, compressed, canescent, margin narrow and entire. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine meadows; 4300–5000 m. W Sichuan, SE Xizang, NW Yunnan.

21. *Hedysarum algidum* L. Z. Shue in W. T. Wang et al., Vasc. Pl. Hengduan Mts. 1: 974. 1993.

块茎岩黄耆 *kuai jing yan huang qi*

Herbs, perennial, 5–20 cm tall. Rhizome inflated torose. Stems several, ascending. Stipules lanceolate, 6–10 mm, connate farther than middle. Leaves 4–8 cm, 5–13-foliolate; leaflet blades obovate, elliptic, or suborbicular, 8–10 × 4–7 mm, abaxially appressed pubescent, adaxially glabrous. Racemes lax, with 6–12 flowers; bracts obovate, slightly longer than pedicel, apex obtuse and usually dentate; peduncle conspicuously longer than leaves. Pedicel 3–4 mm. Calyx campanulate, 5–6 mm, pilose; teeth triangular-lanceolate, ± as long to 1.5 × as long as tube, most abaxial tooth slightly longer than others. Corolla purple; standard obovate, 1.3–2.4 cm; wings ± as long as standard; keel slightly longer than standard. Ovary pubescent. Legume divided into 2–4 loments; loments ovoid to ellipsoid, 5–6 × 4–5 mm, compressed, pubescent, margin narrow and denticulate. Fl. Jul–Aug, fr. Aug–Sep.

• Alpine meadows, alpine gravelly areas; 3000–4500 m. SW Gansu, Qinghai, Sichuan, E Xizang, Yunnan.

- 1a. Corolla standard 1.3–1.6 cm; calyx teeth ± as long as tube; leaflet blades obovate to elliptic 21a. var. *algidum*
1b. Corolla standard (1.8–)2–2.4 cm; calyx teeth 1.2–1.5 × as long as tube; leaflet blades suborbicular 21b. var. *speciosum*

21a. *Hedysarum algidum* var. *algidum*

块茎岩黄耆(原变种) *kuai jing yan huang qi (yuan bian zhong)*

Hedysarum algidum var. *thyrsum* Y. H. Wu; *H. tuberosum* B. Fedtschenko (1900), not Roxburgh ex Willdenow (1825).

Leaflet blades obovate to elliptic. Corolla standard 1.3–1.6 cm. Calyx teeth ± as long as tube.

• Alpine meadows, alpine gravelly areas; 3000–4200 m. SW Gansu, Qinghai, Sichuan.

21b. *Hedysarum algidum* var. *speciosum* (Handel-Mazzetti) Y. H. Wu, Fl. Qinghai. 2: 264. 1999.

美丽岩黄耆 *mei li yan huang qi*

Hedysarum tuberosum Roxburgh ex Willdenow var. *speciosum* Handel-Mazzetti, Symb. Sin. 7: 567. 1933; *H. speciosum* (Handel-Mazzetti) Yakovlev.

Leaflet blades suborbicular. Corolla standard (1.8–)2–2.4 cm. Calyx teeth 1.2–1.5 × as long as tube.

• Alpine meadows; 3900–4500 m. SW Gansu, SE Qinghai, Sichuan, E Xizang, Yunnan.

22. *Hedysarum tanguticum* B. Fedtschenko, Bot. Centralbl. 84: 274. 1900.

唐古特岩黄耆 *tang gu te yan huang qi*

Hedysarum sikkimense Bentham ex Baker var. *megalanthum* H. Ohashi & Tateishi; *H. tongolense* Ulbrich.

Herbs, perennial, 15–30 cm tall. Stems several, erect to ascending from base. Stipules lanceolate, 0.8–1.2 cm, connate farther than middle. Leaves 8–15 cm, 15–25-foliolate; leaflet blades ovate-oblong, narrowly elliptic, or elliptic, 8–15 × 4–6 mm, abaxially villous, adaxially glabrous. Racemes dense, with many flowers; bracts broadly lanceolate, ca. 2 × as long as pedicel; peduncle conspicuously longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 6–8 mm, villous; teeth lanceolate, ± as long as to slightly longer than tube. Corolla pinkish purple; standard broadly obovate, 2.1–2.5 cm; wings as long as standard; keel 3–4(–5) mm longer than standard. Ovary villous. Legume divided into 3 or 5 loments; loments globose to ellipsoid, 4–5 × 3–4 mm, inflated, villous, margin inconspicuous. Fl. Jul–Aug, fr. Aug–Sep. $2n = 16^*$.

Alpine meadows, alpine scrub; 3300–4200 m. S Gansu, E Qinghai, Sichuan, E Xizang, N Yunnan [N Nepal].

This species is a good fodder plant.

23. *Hedysarum sikkimense* Bentham ex Baker in J. D. Hooker, Fl. Brit. India 2: 145. 1876.

锡金岩黄耆 *xi jin yan huang qi*

Hedysarum limprichtii Ulbrich; *H. sikkimense* var. *rigidum* Handel-Mazzetti; *H. sikkimense* var. *xiangchengense* L. Z. Shue.

Herbs, perennial, 5–100 cm tall. Stems several to caespitose, ascending to erect. Stipules broadly lanceolate, 6–8(–12) mm, connate farther than middle. Leaves 5–7(–15) cm, (13–)17–23-foliolate; leaflet blades ovate-oblong, (0.7–)1.3–1.6 × (0.3–)0.9 cm, abaxially pilose along veins and margin, adaxially glabrous. Racemes secund, dense, with many flowers; bracts lanceolate-ovate, ± as long as pedicel; peduncle longer

than leaves. Pedicel 2–3 mm. Calyx campanulate, 4–6(–8) mm, pilose; teeth narrowly lanceolate, ± as long as to slightly longer than tube, most abaxial tooth slightly longer than others. Corolla purple to violet; standard long obovate, 1.2–1.4 cm; wings ± as long as standard; keel 1–3 mm longer than standard. Ovary densely pubescent. Legume with 1 or 2 loments; loments obovoid, 8–9 × 6–7 mm, compressed, pubescent, margin irregularly dentate. Fl. Jul–Aug, fr. Aug–Sep. $2n = 14^*$.

Alpine gravelly areas, alpine meadows, forests; 3100–4500 m. S Gansu, S Qinghai, W Sichuan, E Xizang, NW Yunnan [Bhutan, India (Sikkim), E Nepal].

24. *Hedysarum longigynophorum* C. C. Ni, Acta Phytotax. Sin. 18: 373. 1980.

长柄岩黄耆 chang bing yan huang qi

Herbs, perennial, 40–80 cm tall. Stems caespitose, erect. Stipules ovate, 8–10 mm, connate farther than middle. Leaves 8–10 cm, 15–21-foliolate; leaflet blades ovate-oblong, 1.7–2.1 × 0.4–0.6 cm, abaxially sparsely pilose, adaxially glabrous. Racemes lax, with many flowers; bracts lanceolate, ± as long as pedicel; peduncle conspicuously longer than leaves. Pedicel 3–4 mm. Calyx campanulate, 4–5 mm, pilose; teeth lanceolate, ± equal, slightly longer than tube. Corolla unknown. Legume divided into 2 or 3 loments, stipe 8–10 mm; loments basally obovoid and apically rhomboid, 12–15 × 5–7 mm, compressed, pilose, margin irregularly dentate. Fl. Jul–Aug, fr. Aug–Sep.

• Subalpine stony slopes and forests; 3800–4300 m. E Xizang (Gongbo'gyamda).

One of us (Choi) has seen no specimens of this species.

25. *Hedysarum jinchuanense* L. Z. Shue, Bull. Bot. Res., Harbin 5(3): 134. 1985.

金川岩黄耆 jin chuan yan huang qi

Herbs, perennial, 40–80 cm tall. Stems numerous, erect. Stipules long ovate, 8–10 mm, connate farther than middle. Leaves 8–12 cm, 11- or 13-foliolate; leaflet blades broadly ovate, 1.5–1.9 × ca. 0.8 cm, abaxially sparsely pilose, adaxially glabrous. Racemes dense, with many flowers; bracts lanceolate, ± as long as pedicel; peduncle as long as to slightly longer than leaves. Pedicel 1.5–2.5 mm. Calyx campanulate, 6–8 mm, pubescent; teeth lanceolate, ± as long as tube, most abaxial tooth slightly longer than others. Corolla purple; standard long obovate, 1.5–1.7 cm; wings ± as long as standard; keel 1–3 mm longer than standard. Ovary appressed pubescent. Legume divided into 3 or 4 loments; loments subglobose to ellipsoid, 5–6 × 4–5 mm, compressed, pubescent, margin inconspicuous. Fl. Jul–Aug, fr. Aug–Sep.

• Stony slopes, scrub, forest margins; ca. 3000 m. NW Sichuan.

One of us (Choi) has seen no specimens of this species.

26. *Hedysarum fistulosum* Handel-Mazzetti, Symb. Sin. 7: 564. 1933.

空茎岩黄耆 kong jing yan huang qi

Herbs, perennial, 40–120 cm tall. Stems numerous, erect

to caespitose. Stipules ovate-lanceolate, 1–2.5 cm, connate farther than middle. Leaves 9–16 cm, 15–21-foliolate; leaflet blades long ovate to oblong-ovate, 2–4 × 0.6–1 cm, abaxially densely pubescent, adaxially glabrous. Racemes lax, with many flowers; bracts ± as long as pedicel; peduncle longer than leaves. Pedicel 4–5 mm. Calyx campanulate, 6–7 mm, appressed pubescent; teeth lanceolate, ± equal, as long as or slightly longer than tube. Corolla dark purple; standard obovate, 1.3–1.5 cm; wings 2–3 mm longer than standard; keel ± as long as wings. Ovary pubescent. Legume divided into 1–3 loments; loments ellipsoid to obovoid, 1.3–1.8 × 0.7–0.8 cm, compressed, pubescent, margin irregularly dentate, apex acute. Fl. Jun–Jul.

• Cliffs; ca. 3300 m. NW Yunnan.

27. *Hedysarum xizangense* C. C. Ni, Acta Phytotax. Sin. 18: 373. 1980 [*“xizangensis”*].

西藏岩黄耆 xi zang yan huang qi

Herbs, perennial, 30–40 cm tall. Stems numerous, erect. Stipules triangular, 6–10 mm, connate farther than middle. Leaves 6–10 cm, 9–17-foliolate; leaflet blades oblong to ovate-elliptic, 10–15 × 5–7 mm, abaxially pilose, adaxially glabrous. Racemes lax, with many flowers; bracts ± as long as pedicel; peduncle conspicuously longer than leaves. Pedicel 3–4 mm. Calyx campanulate, 6–8 mm, pilose; teeth triangular-lanceolate, ± as long as to slightly longer than tube, most abaxial tooth slightly longer than others. Corolla dark purple; standard obovate, 1.4–1.5 cm; wings ± as long as standard; keel 2–3 mm longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments (juvenile) densely appressed pubescent. Fl. Jul–Aug, fr. Aug–Sep.

• Scrub; ca. 3100 m. Xizang (Nangxian).

One of us (Choi) has seen no specimens of this species.

28. *Hedysarum taoriparium* B. H. Choi & H. Ohashi, Notes Roy. Bot. Gard. Edinburgh 45: 107. 1988.

洮河岩黄耆 tao he yan huang qi

Herbs, perennial, ca. 40 cm tall. Stems several, slender, erect, pubescent. Stipules lanceolate, 1.5–2 cm, connate farther than middle. Leaves 12–16 cm, 17–19-foliolate; leaflet blades narrowly ovate or ovate, 20–24 × 7–9 mm, abaxially and adaxially tomentose. Racemes dense, with 10–20 flowers; bracts narrowly lanceolate, 7–11 × 0.7–1 mm; peduncle as long as or longer than leaves. Pedicel 2–3.5 mm; bracteoles 0.4–0.7 mm. Calyx campanulate, 8–10 mm, pilose; teeth lanceolate, adaxial teeth slightly shorter than tube, abaxial teeth slightly longer than tube. Corolla dark purple; standard obovate, 1.8–2 cm; wings as long as standard; keel ca. 8 mm longer than standard. Ovary appressed pubescent; ovules 3 or 4. Legume unknown. Fl. Jun–Jul.

• Riverbanks; ca. 3000 m. SW Gansu.

This species was treated by X. Y. Zhu et al. (Legumes China, 416. 2007) as a synonym of *Hedysarum tanguticum*.

29. *Hedysarum dahuricum* Turczaninow ex B. Fedtschenko in Komarov, Fl. URSS 13: 290. 1948.

刺岩黄耆 ci yan huang qi

Herbs, perennial, 20–25 cm tall. Stems numerous, ascending to decumbent. Stipules ovate-lanceolate, 6–8 mm, connate farther than middle. Leaves 8–15 cm, 9–17-foliolate; leaflet blades oblong to lanceolate-ovate, 1.2–2.2 × 0.4–0.6 cm, abaxially densely appressed pubescent, adaxially glabrous. Racemes dense, capitate to ovoid, with many flowers; bracts lanceolate, slightly longer than pedicel; peduncle longer than leaves. Pedicel ca. 1 mm. Calyx campanulate, 5–6 mm, pubescent; teeth lanceolate-subulate, 2–3 × as long as tube. Corolla pale yellow; standard obovate, 1.2–1.3 cm; wings ca. 4/5 as long as standard; keel ca. 1 mm longer than standard. Ovary pubescent. Legume divided into 3–7 loments; loments subglobose, inflated, pubescent, prickly, margin inconspicuous. Fl. Jul–Aug, fr. Aug–Sep.

Gravelly areas in steppes; ca. 1000 m. E Nei Mongol [N Mongolia, E Russia].

This species is a good fodder plant.

30. Hedysarum brachypterum Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 92. 1835.

短翼岩黄耆 duan yi yan huang qi

Herbs, perennial, 15–25 cm tall. Stems caespitose, decumbent. Stipules lanceolate, 3–4 mm, connate farther than middle. Leaves 3–5 cm, 11–19-foliolate; leaflet blades ovate, elliptic, or oblong, 4–6(–10) × 2–3 mm, abaxially appressed pubescent, adaxially glabrous. Racemes dense, ovoid, with many flowers; bracts subulate-lanceolate, ± as long as pedicel; peduncle longer than leaves. Pedicel ca. 1 mm. Calyx campanulate, 5–6 mm, pubescent; teeth lanceolate-subulate, ca. 2 × as long as tube. Corolla purple; standard broadly obovate, 7–9 mm; wings ca. 2/5 as long as standard; keel 2–3 mm longer than standard. Ovary subglabrous. Legume divided into 2–4 loments; loments globose to ellipsoid, inflated, densely pubescent, prickly, margin inconspicuous. Fl. May–Aug, fr. Jul–Sep.

• Steppes; 600–800 m. NW Hebei, C Nei Mongol, Ningxia.

31. Hedysarum gmelinii Ledebour, Mém. Acad. Imp. Sci. St. Pétersbourg Hist. Acad. 5: 551. 1812.

华北岩黄耆 hua bei yan huang qi

Hedysarum gmelinii var. *lineiforme* H. C. Fu.

Herbs, perennial, 15–20 cm tall. Stems numerous, decumbent to ascending. Stipules lanceolate, 7–9 mm, connate farther than middle. Leaves 6–10 cm, 11- or 13-foliolate; leaflet blades long ovate, ovate-oblong, or ovate-elliptic, 8–20 × 4–6 mm, abaxially appressed pubescent, adaxially glabrous. Racemes dense, ovoid to oblong, with many flowers; bracts ca. 2 × as long as pedicel; peduncle longer than leaves. Pedicel ca. 1 mm. Calyx campanulate, 7–10 mm, pubescent; teeth subulate-lanceolate, 1.5–2.5 × as long as tube. Corolla pinkish purple; standard obovate, 1.5–1.7 cm; wings 2/3–3/4 as long as standard; keel slightly longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments globose to broadly ovoid, inflated, pubescent, usually prickly, margin inconspicuous. Fl.

May–Aug, fr. Jul–Sep.

Gravelly areas in steppes; 800–1800 m. C Gansu, N Hebei, Henan, Nei Mongol, Ningxia, Shanxi, N Xinjiang [Kazakhstan, Mongolia, E Russia].

Hedysarum gmelinii var. *tongtianhense* Y. H. Wu (Bull. Bot. Res., Harbin 19: 8. 1999), described from Qinghai, is unlikely to belong to this species and may not even be a *Hedysarum*.

32. Hedysarum songaricum Bongard, Mém. Acad. Imp. Sci. Saint-Petersbourg, Sér. 6, Sci. Math., Seconde Pt. Sci. Nat. 4: 30. 1841.

准噶尔岩黄耆 zhun ga er yan huang qi

Herbs, perennial, (20–)30–70 cm tall. Stems caespitose, ascending to erect. Stipules triangular-lanceolate, 0.8–1.2 cm, connate less than to middle. Leaves 7–12 cm, 9–17-foliolate; leaflet blades narrowly elliptic to lanceolate, 1–2.5 × 0.3–0.5 cm, abaxially sparsely pilose, adaxially glabrous. Racemes dense, oblong, with many flowers; bracts lanceolate, 1–2 × as long as pedicel; peduncle longer than leaves. Flowers ascending to erect, rarely nodding. Pedicel ca. 2 mm. Calyx campanulate, 6–7 mm, pubescent; teeth lanceolate-subulate or triangular-subulate, 2–3 × as long as tube. Corolla pinkish purple; standard obovate, 1–1.2 cm; wings ca. 1/2 as long as standard; keel slightly shorter than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments globose-ovoid, 4–5 × 3–4 mm, inflated, pubescent, prickly, margin inconspicuous. Fl. Jun–Jul, fr. Jul–Aug.

Steppes, gravelly areas; 700–1200 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].

This species is a good fodder plant.

- 1a. Stems ascending, 30–70 cm tall; flowers ascending to erect; calyx teeth lanceolate-subulate 32a. var. *songaricum*
- 1b. Stems erect, 20–30 cm tall; flowers nodding; calyx teeth triangular-subulate 32b. var. *urumqiense*

32a. Hedysarum songaricum var. *songaricum*

准噶尔岩黄耆(原变种) zhun ga er yan huang qi (yuan bian zhong)

Stems ascending, 30–70 cm tall. Flowers ascending to erect. Calyx teeth lanceolate-subulate.

Steppes; 700–1200 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].

32b. Hedysarum songaricum var. *urumqiense* L. Z. Shue, Bull. Bot. Res., Harbin 5(3): 135. 1985.

乌鲁木齐岩黄耆 wu lu mu qi yan huang qi

Stems erect, 20–30 cm tall. Flowers nodding. Calyx teeth triangular-subulate.

• Gravelly areas in steppes; 800–1000 m. N Xinjiang (Ürümqi).

33. Hedysarum shanense L. R. Xu & B. H. Choi, **nom. nov.**

山地岩黄耆 shan di yan huang qi

Replaced synonym: *Hedysarum songaricum* Bongard var. *montanum* B. Fedtschenko, Trudy Imp. S.-Peterburgsk. Bot. Sada 19: 281. 1902; *Hedysarum montanum* (B. Fedtschenko) B. Fedtschenko in Komarov, Fl. URSS 13: 292. 1948, not *Hedysarum montanum* (Candolle) Persoon, Syn. Pl. 2: 324. 1807 [*Onobrychis montana* Candolle in Lamarck & Candolle, Fl. Franç., ed. 3, 4: 611. 1805].

Herbs, perennial, 50–90 cm tall. Stems numerous, erect. Stipules triangular-lanceolate, 0.8–1.2 cm, connate less than to middle. Leaves 8–12 cm, 11–17-foliolate; leaflet blades oblong-ovate, 3–3.5 × 0.6–0.7 cm, abaxially sparsely pilose, adaxially glabrous. Racemes dense, oblong, with many flowers; bracts lanceolate, slightly longer than pedicel; peduncle conspicuously longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 6–7 mm, pubescent; teeth lanceolate-subulate, ca. 2 × as long as tube. Corolla pinkish purple; standard 1.5–1.7 cm; wings ca. 1/2 as long as standard; keel ± as long as standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments ellipsoid to globose, 4–5 × 3–4 mm, inflated, pubescent, prickly, margin thickened. Fl. Jun–Jul, fr. Jul–Aug.

Steppes, scrub; 1100–1700 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].

This species is a good fodder plant.

34. *Hedysarum petrovii* Yakovlev, Novosti Sist. Vyssh. Rast. 19: 116. 1982.

贺兰山岩黄耆 he lan shan yan huang qi

Hedysarum alaschanicum Y. Z. Zhao; *H. liupanshanicum* L. Z. Shue.

Herbs, perennial, 8–15 cm tall. Stems abbreviated, inconspicuous. Stipules triangular-lanceolate, 3–5 mm, connate farther than middle. Leaves 4–8 cm, 7–11-foliolate; leaflet blades long ovate to elliptic, 4–7(–9) × 3–5 mm, abaxially densely appressed pilose, adaxially subglabrous to scattered pilose. Racemes dense, ovoid to oblong, with many flowers; bracts lanceolate, 2–3 mm; peduncle longer than leaves. Pedicel less than 1 mm. Calyx campanulate, 0.8–1.2 cm, sericeous; teeth lanceolate-subulate, 2–3 × as long as tube. Corolla pinkish purple; standard obovate, 1.2–1.4 mm; wings 1/4–1/3 as long as standard; keel as long as to slightly longer than standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments ovoid-globose, ca. 3 mm in diam., inflated, densely pubescent, prickly, margin inconspicuously thickened. Fl. Jun–Jul, fr. Jul–Aug.

• Steppes; 1100–1600 m. C Gansu, SW Nei Mongol (Helan Shan), Ningxia, N Shaanxi.

35. *Hedysarum setigerum* Turczaninow ex Fischer & C. A. Meyer, Index Sem. Hort. Petrop. 1: 29. 1835.

短茎岩黄耆 duan jing yan huang qi

Herbs, perennial, 10–15 cm tall. Stems abbreviated, inconspicuous. Stipules lanceolate. Leaves 8–15 cm, 9–13-foliolate; leaflet blades ovate to elliptic, 1.2–1.6 × 0.5–0.7 cm, abaxially with dense silvery appressed trichomes, adaxially glabrous. Racemes dense, ovoid, with many flowers; bracts ovate-lanceo-

late, ca. 2 × as long as pedicel; peduncle longer than leaves. Pedicel less than 1 mm. Calyx campanulate, 5–6 mm, pubescent; teeth lanceolate-subulate, 1.5–2 × as long as tube. Corolla pinkish purple; standard obovate, 1–1.2 cm; wings ca. 4/5 as long as standard; keel slightly shorter than standard. Ovary pubescent. Legume divided into 3–5 loments; loments pubescent, prickly. Fl. Jul–Aug, fr. Aug–Sep.

Sandy steppes; ca. 1100 m. E Nei Mongol [Mongolia, Russia].

No specimens have been seen by the authors.

36. *Hedysarum kumaonense* Benthham ex Baker in J. D. Hooker, Fl. Brit. India 2: 145. 1876.

库茂恩岩黄耆 ku mao en yan huang qi

Herbs, perennial, 7–12 cm tall. Stems abbreviated, inconspicuous. Stipules lanceolate-ovate, 0.7–1.5 cm, connate farther than middle. Leaves [5–]7–10[–32] cm, 13–25-foliolate; leaflet blades obovate to elliptic-ovate, 7–10 × 5–7 mm, abaxially densely pilose, adaxially glabrous or sparsely pilose. Racemes dense, long ovoid, with many flowers; bracts 1.5–2 × as long as pedicel; peduncle conspicuously longer than leaves. Pedicel 2–3 mm. Calyx campanulate, 6–8 mm, grayish pilose; teeth lanceolate-subulate, ca. 2 × as long as tube. Corolla pinkish purple; standard obovate, 1.2–1.4[–1.6] cm; wings slightly shorter than standard; keel 1–2 mm longer than standard. Ovary pubescent. Legume divided into 1 or 2 loments; loments elliptic, sparsely pubescent, reticulately veined on both surfaces. Fl. Jun–Jul, fr. Jul–Sep.

Alpine steppes; 3500–3600 m. Xizang (Gyirong) [NW India, Nepal].

37. *Hedysarum iliense* B. Fedtschenko, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk S.S.S.R. 7: 14. 1937.

伊犁岩黄耆 yi li yan huang qi

Herbs, perennial, ca. 10 cm tall. Stems abbreviated, inconspicuous. Stipules basally on stems ovate, completely connate; stipules apically on stems lanceolate, basally connate. Leaves 3–5 cm, 3–7-foliolate; leaflet blades ovate, 12–14 × 5–8 mm, abaxially densely appressed pubescent, adaxially sparsely appressed pubescent. Racemes dense, long ovoid to oblong, with many flowers; bracts lanceolate; peduncle conspicuously longer than leaves. Pedicel ca. 1 mm. Calyx campanulate, 1.4–1.5 cm, pubescent; teeth linear-subulate, 2–2.5 × as long as tube. Corolla pinkish purple; standard obovate, 1.4–1.5 cm; wings ca. 1/4 as long as standard; keel as long as to slightly longer than standard. Ovary pubescent. Legume divided into 3–5 loments; loments orbicular-elliptic, shortly tomentose, with inconspicuous tubercles. Fl. May–Jul.

Steppes; ca. 600 m. NW Xinjiang [Kazakhstan].

38. *Hedysarum splendens* Fischer ex Candolle, Prodr. 2: 340. 1825.

光滑岩黄耆 guang hua yan huang qi

Hedysarum qinggilense Chang Y. Yang & N. Li.

Herbs, perennial, 15–40 cm tall. Stems abbreviated, inconspicuous. Stipules broadly lanceolate, 0.8–1.2 cm, connate to middle. Leaves 0.6–1.6 cm, 7- or 9-foliolate; leaflet blades

broadly ovate, 1.5–2 × 1–1.6 cm, both surfaces densely silvery pubescent. Racemes lax, with many flowers; bracts lanceolate, ca. 2 × as long as pedicel; peduncle inconspicuously longer than leaves. Pedicel ca. 2 mm. Calyx campanulate, 7–9 mm, pubescent; teeth lanceolate-subulate, 3–4 × as long as tube. Corolla pinkish purple; standard broadly obovate, 1.2–1.5 cm; wings ca. 1/3 as long as standard; keel ± as long as standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments globose, 5–6 mm in diam., inflated, pubescent, with curved prickles, margin thickened. Fl. Jun–Jul, fr. Jul–Aug.

Stony slopes to gravelly areas; 600–800 m. Xinjiang (Altay Shan) [Kazakhstan].

39. *Hedysarum krylovii* Sumnevicz, Sist. Zametki Mater. Gerb. Krylova Tomsk. Gosud. Univ. Kuybysheva 1931(4): 2. 1931.

克氏岩黄耆 ke shi yan huang qi

Herbs, perennial, 10–20 cm tall. Stems 1–2 cm, ascending. Stipules ovate, 6–8 mm, connate farther than middle. Leaves 1–1.8 cm, 11–15-foliolate; leaflet blades narrowly ovate-lanceolate to lanceolate-elliptic, 12–15 × 4–7 mm, both surfaces densely silvery pubescent. Racemes lax, with many flowers; bracts narrowly lanceolate, ca. 2 × as long as pedicel; peduncle conspicuously longer than leaves. Pedicel 1.5–2 mm. Calyx campanulate, 7–10 mm, pilose; teeth lanceolate-subulate, 3–4 × as long as tube. Corolla pinkish purple; standard obovate, 1.4–1.5 cm; wings ca. 1/2 as long as standard; keel slightly shorter than standard. Ovary subglabrous. Legume divided into 2 or 3 loments; loments subglobose, 4–5 mm in diam., inflated, with densely hyaline scales, margin thickened. Fl. Jun–Jul, fr. Jul–Aug.

Stony slopes, gravelly areas; ca. 1300 m. Xinjiang (W Altay Shan) [Kazakhstan].

This species is a good fodder plant.

40. *Hedysarum ferganense* Korshinsky, Zap. Imp. Akad. Nauk Fiz.-Mat. Otd. 4: 93. 1896.

费尔干岩黄耆 fei er gan yan huang qi

Shrublets or perennial herbs, 5–15 cm tall. Stems abbreviated, inconspicuous, sometimes ligneous at base. Stipules triangular-lanceolate, 4–6 mm, connate farther than middle. Leaves 3–10 cm, 7–11 (or 13)-foliolate; leaflet blades ovate-oblong to narrowly elliptic, 6–8 × 2–4 mm, abaxially densely appressed pilose, adaxially sparsely pilose. Racemes dense, oblong or capitate, with many flowers; bracts 2–3 × as long as pedicel; peduncle conspicuously longer than leaves. Pedicel ca. 1 mm. Calyx shortly campanulate, 7–8 mm, sparsely pilose; teeth lanceolate-subulate, 2–3 × as long as tube. Corolla pinkish purple; standard obovate, 1.2–1.4 cm; wings ca. 1/4 as long as standard; keel ± as long as standard. Ovary pubescent. Legume divided into 2 or 3 loments; loments subglobose, 3–4 mm in diam., inflated, with hyaline scales, usually papillate prickly, margin inconspicuously thickened. Fl. Jun–Jul, fr. Jul–Aug.

Steppes, gravelly areas; 800–4500 m. Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, N Pakistan, Tajikistan, Turkmenistan, Uzbekistan].

Hedysarum jaxartucirdes Y. Liu ex R. Sha (Ann. Bot. Fenn. 44:

157. 2007) was described from Xinjiang (Qinghe, ca. 2400 m) as a species related to *H. ferganense*. The authors have not seen any material of this species and cannot confirm whether or not the species should be recognized.

- 1a. Racemes oblong; plants 10–15 cm tall; leaves 8–10 cm 40a. var. *ferganense*
- 1b. Racemes capitate; plants 5–12 cm tall; leaves 3–8 cm.
 - 2a. Herbs, perennial 40b. var. *poncinsii*
 - 2b. Shrublets 40c. var. *minjanense*

40a. *Hedysarum ferganense* var. *ferganense*

费尔干岩黄耆(原变种) fei er gan yan huang qi (yuan bian zhong)

Hedysarum polymorphum Ledebour var. *pumilum* Ledebour.

Herbs, perennial, 10–15 cm tall. Stems numerous. Leaves 8–10 cm. Racemes oblong.

Steppes; 800–1700 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].

40b. *Hedysarum ferganense* var. *poncinsii* (Franchet) L. Z. Shue, Fl. Reipubl. Popularis Sin. 42(2): 215. 1998.

河滩岩黄耆 he tan yan huang qi

Hedysarum poncinsii Franchet, Bull. Mus. Hist. Nat. (Paris) 2: 344. 1896.

Herbs, perennial, 8–12 cm tall. Stems caespitose. Leaves 6–8 cm. Racemes capitate.

Steppes; 2800–3200 m. SW Xinjiang (S Tian Shan) [Tajikistan].

40c. *Hedysarum ferganense* var. *minjanense* (K. H. Rechinger) L. Z. Shue, Fl. Reipubl. Popularis Sin. 42(2): 217. 1998.

敏姜岩黄耆 min jiang yan huang qi

Hedysarum minjanense K. H. Rechinger, Biol. Skr. 9: 185. 1958.

Shrublets, 5–6 cm tall. Stems densely caespitose, strongly ligneous at base. Leaves 3–5 cm. Racemes capitate.

Gravelly areas; ca. 4500 m. W Xinjiang (Pamir Shan) [Afghanistan, Kashmir, N Pakistan, Tajikistan].

41. *Hedysarum setosum* Vvedensky, Bot. Mater. Gerb. Inst. Bot. Akad. Nauk Uzbeksk. S.S.R. 13: 24. 1952.

刚毛岩黄耆 gang mao yan huang qi

Herbs, perennial, 15–20 cm tall. Stems numerous, abbreviated, inconspicuous. Stipules triangular, 8–10 mm, connate farther than middle. Leaves 6–10 cm, 9–13-foliolate; leaflet blades ovate to ovate-elliptic, 6–9 × 3–5 mm, abaxially densely appressed pilose, adaxially sparsely pilose. Racemes dense, broadly ovoid, with many flowers; bracts lanceolate, 6–8 mm; peduncle conspicuously longer than leaves. Pedicel ca. 1 mm. Calyx campanulate, 8–10 mm, sericeous; teeth subulate-lanceolate, 2–2.5 × as long as tube. Corolla pinkish purple; standard broadly obovate, 1.7–2 cm; wings ca. 1/4 as long as stan-

dard; keel dark purple at apex, slightly shorter than standard.
Ovary pilose. Legume not seen. Fl. Jul–Aug, fr. Aug–Sep.

Alpine steppes; 3200–3800 m. Xinjiang (S Tian Shan) [Kyrgyzstan].

