
岩黄耆属 yan huang qi shu

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

Stracheya Bentham.

Herbs, rarely shrublets or shrubs. Stipules 2, opposite petiole, scariosus, connate or free, marcescent or deciduous. Leaves imparipinnate; leaflet blades opposite, margin entire. Racemes axillary, lax to capitatus; bracts marcescent or caducaus. Bracteoles 2, at base of calyx. Calyx campanulae obliqui or campanulate; teeth 5, ± 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 × 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. Calyx wings 2/5 as long as standard .............................................. 30. H. brachypterus

5b. Calyx wings 1/2–3/4 as long as standard.

6a. Stems 15–20 cm tall; corolla 1.5–2 cm .......................... 31. H. petrovii

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 × 0.3–0.5 cm .......................... 32. H. songaricum

7b. Leaflet blades oblong-ovate, 3–3.5 × 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 × 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 × 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. splendidens

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 ± as long as to shorter than tube; legume surfaces without prickles or ribs; leaflet blades membranous, lateral veins inconspicuous.

15a. Loments with a ca. 1 mm dentate margin ............................................. 2. H. dentataolatum

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 ± equal.

19a. Leaves 9–15-foliolate; leaflet blades 1–2 cm wide.

20a. Racemes distinctly longer than leaves; lomentum margins entire ........................................... 6. H. flavescens

20b. Racemes ± as long as leaves; lomentum margins dentate ........................................... 7. H. semenovii

19b. Leaves 13–33-foliolate; leaflet blades 0.4–0.7 cm wide.
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 pubescent. Legume divided into 2 or 3 loments; loments subglobose to ovoid, 5–6 × 3–4 mm, compressed, pubescent, margin narrow and dentate. Fr. Jun.–Aug., fr. Aug.–Sep.

Herbs, perennial, 60–80 cm tall. Stems caespitose, erect. Stipules narrowly lanceolate, 1.5–2 cm, connate farther than middle. Leaves 4–7 cm, 11–15-foliolate; leaflet blades oblong-ovate to obovate-lanceolate, 2.5–5 × 1–1.7 cm, abaxially pubescent, 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 ovoid, 5–6 × 3–4 mm, compressed, pubescent, margin narrow and dentate. Fl. Jul.–Aug, fr. Aug.–Sep.

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

Herbs, perennial, 75 cm tall. Stems caespitose, erect. Stipules narrowly lanceolate, 1.5–2 cm, connate farther than middle. Leaves 8–10 cm, 7–10-foliolate; leaflet blades oblanceolate to obovate-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 ovoid, 5–6 × 3–4 mm, compressed, pubescent, margin narrow and dentate. Fl. Jul.–Aug., fr. Aug.–Sep.


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, 1–1.7 × 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, meadows; 3200–4000 m. Qinghai, SW Sichuan, E Xizang, NW Yunnan.


乌恰岩黄耆 wu qia yan huang qi

Herbs, perennial, 30–40 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 loments; loments subglobose, 3–4 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.
Hedysarum polybotrys

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, 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, 1.4–1.6 × 0.7–1.5 mm, densely pubescent; other 4 teeth triangular and 1/4–1/3 as long as tube. Ovary glabrous. Legume divided into 2–4 loments; loments ellipsoid-obovoid, subglobose, or rhomboid, ca. 2 × 1.5 mm, compressed, glabrous, 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.

8a. var. polybotrys

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-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, ± equal, pubescent. Corolla yellow; standard long obovate, 1.4–1.6 × 0.7–1.5 mm; 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 ellipsoid-obovoid, subglobose, or rhomboid, ca. 2 × 1.5 mm, compressed, glabrous, margin entire or inconspicuous. Fl. Jul–Aug, fr. Aug–Sep.

Gravelly or stony slopes; 1200–3000 m. E and S Gansu, W Hebei, S Nei Mongol, Ningxia, N Shanxi. One of us (Choi) has seen no specimens of this variety.

8b. Hedysarum polybotrys var. alaschanicum (B. Fedtschenko) Y. Z. Zhao, R. Sha & R. Cao.

Herbs, perennial, 40–60–120 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 to 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.


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 × 0.5–0.7 cm, abaxially appressed sparsely pilose to pubescent, adaxially glabrous. Racemes dense, with many flowers; bracts subulate-lanceolate, ± as long as pedicel; peduncle as long as to longer than leaves. Pedicel 2–4 mm. Calyx campanulate, 3–5 mm, pubescent to pilose; pedicel longer than tube, adaxial and lateral teeth ca. 1/5 as long as tube. Corolla purple; standard long obovate, 1.4–1.5 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 ovoid, 4–8 × 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 Neimongol, S Shaanxi, Shanxi, Sichuan [Kashmir, N Korea, N Mongolia, Pakistan, Russia; E and N Europe, North America].

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, slightly longer than standard; keel ± as long as standard. Ovary glabrous. 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].


Herbs, perennial, 45–60 cm tall. Stems erect, solid. Stipules connate. Leaves 15–20 cm, (11–)15–21(–27)-foliolute; 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.


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].

紫云英岩黄耆  zì yún yìng yān huáng qí

_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 divided into 3 or 5 loments; loments globose to ellipsoid, 6–7 × 4–5 mm, compressed, coniescent, margin narrow and entire. Fl. Jul–Aug, fr. Aug–Sep.

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


块茎岩黄耆  kuài jīng yān huáng qí

_Hedysarum algidum_ var. speciosum (Handel-Mazzetti) Yakovlev.

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 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 = 16x.

- Alpine meadows, alpine gravelly areas; 3300–4200 m. S Gansu, E Qinghai, Yunnan [N Nepal].

This species is a good fodder plant.


唐古特岩黄耆  táng gǔ tè yān huáng qí


美丽岩黄耆  měi lì yān huáng qí


块茎岩黄耆 (原变种)  kuài jīng yān huáng qí (yuán biàn zhòng)

_Hedysarum algidum_ var. thyrsum Y. H. Wu; _H. tuberosum_ B. Fedtschenko (1900), not Roxburgh ex Wildenow (1825).

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


美丽岩黄耆  měi lì yān huáng qí

_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.

23. Hedysarum sikkimense Bentham ex Baker var. megalanthum H. Ohashi & Tateishi; _H. tongolense_ Ulbrich.

锡金岩黄耆  xī jīn yān huáng qí

_Hedysarum sikkimense_ Bentham ex Baker var. megalanthum H. Ohashi & Tateishi; _H. tongolense_ Ulbrich.

Herbs, perennial, 15–30 cm tall. Stems several, ascending to erect; sometimes 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 broadly lanceolate-ovate, ± as long as pedicel; peduncle longer

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


Herbs, perennial, 40–120 cm tall. Stems numerous, erect. Stipules long 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 equal, slightly longer than tube. Corolla dark purple; standard ± as long as to slightly longer than tube, most abaxial tooth slightly longer than others. 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 elliptoid to obovoid, 1.3–1.8 × 0.7–0.8 cm, compressed, pubescent, margin irregularly dentate, apex acute. Fl. Jun–Jul.

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

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


Herbs, perennial, 40–80 cm tall. Stems several, slender, erect. Stipules obovate, 8–10 mm, connate farther than middle. Leaves 8–12 cm, 11- or 13-foliolate; leaflet blades obovate-oblong, 1–1.5 × 0.8 cm, abaxially sparsely pilose, adaxially glabrous. Racemes lax, with many flowers; bracts lanceolate, ± as long as pedicel; peduncle 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.


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 obovate to oblance-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.


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.


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 obovate or ovate, 20–24 × 7–9 mm, abaxially and adaxially densely pubescent. Racemes dense, with 10–20 flowers; bracts narrowly lanceolate, 7–11 × 0.7–1 mm; peduncle as long 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.


华北岩黃耆  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, 11–13 foliolar; leaflet blades long ovate, ovate-oblong, or ovate-elliptic, 8–20 × 4–6 mm, abaxially pressed pubescent, adaxially glabrous. Racemes dense, ovoid to ovoid-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 lanceolate-subulate, 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.

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


准噶尔岩黄耆  zuan ga er yan huang qi

*Hedysarum songaricum* var. *songaricum*

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 foliolar; 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-obovate, 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*


乌鲁木齐岩黄耆  wu lu mu qi yan huang qi

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

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

*库茂恩岩黄耆*  ku mao en yan huang qi

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

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 pubescent, adaxially glabrous or sparsely pubescent. 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 pubescent; 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].


*伊犁岩黄耆*  yi li yan huang qi

Herbs, perennial, ca. 10 cm tall. Stems abbreviated, inconspicuous. Stipules basally on stems obovate, completely connate; stipules apically on stems lanceolate, basally connate. Leaves 3–5 cm, 3–7-foliolate; leaflet blades obovate, 12–14 × 5–8 mm, abaxially densely pubescent, adaxially sparsely pressed 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 tetomose, with inconspicuous tubercles. Fl. May–Jul.

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

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

*光滑岩黄耆*  guang hua yan huang qi

*Hedysarum splendidens* 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 subglobose, 4–5 mm in diam., inflated, with hyaline scales, usually papillate prickly, margin thickened. Fl. Jun–Jul, fr. Jul–Aug.

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


**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, 1.2–1.5 cm; wings ca. 1/4 as long as standard; keel slightly shorter than standard. Ovary subglabrous. Legume divided into 2 or 3 loments; loments globose, 3–4 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.


**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 capitulate, 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 broadly 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].

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].


**河滩岩黄耆** he tan yan huang qi


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

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


**敏姜岩黄耆** min jiang yan huang qi


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

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


**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-

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