

### 33. ANABASIS Linnaeus, Sp. Pl. 1: 223. 1753.

假木贼属 *jia mu zei shu*

Subshrubs. Woody stem much branched, or reduced to an enlarged, tuberculate caudex; annual branches green, jointed, glabrous or with papillate processes. Leaves opposite, semiterete and fleshy, subulate, scale-like, or obscure, bases united, apex obtuse or acute, sometimes with an acicular awn; leaf axil usually cottony. Flowers solitary in leaf axils, rarely clustered, bisexual; bractlets 2, navicular, usually shorter than perianth. Perianth segments 5, membranous; outer 3 segments broadly elliptic or suborbicular; inner 2 segments ovate; outer 3 or all 5 segments with a winglike appendage abaxially, rarely without such an appendage. Disk cupular, 5-lobed; lobes interstaminal, semiorbicular or linear, adaxially ± granulose glandular. Stamens 5, inserted on disk; filaments subulate, slightly compressed; anthers oblong-ovate, apex obtuse or mucronate. Ovary ovoid, glabrous or papillate; style short; stigmas 2, erect or recurved. Utricle subglobose to broadly ellipsoid, compressed; pericarp fleshy. Seed vertical; embryo spiral; perisperm absent.

About 30 species: from the Mediterranean region to China, Mongolia, and Russia (Siberia); eight species in China.

- 1a. Woody stems much branched.
  - 2a. Perianth segments without a winglike appendage in fruit ..... 4. *A. salsa*
  - 2b. Perianth segments with a winglike appendage in fruit (at early anthesis slightly thickened abaxially).
    - 3a. Leaves obscure, slightly scale-like, broadly angular, apex awnless ..... 3. *A. aphylla*
    - 3b. Leaves distinct, subulate or semiterete, apex with an acicular awn.
      - 4a. Disk lobes linear, apex pectinate; leaves appressed to branch or slightly spreading, usually subulate ..... 1. *A. elatior*
      - 4b. Disk lobes semiorbicular, apex entire; leaves spreading, semiterete or subclavate ..... 2. *A. brevifolia*
- 1b. Woody stems reduced to an enlarged, tuberculate caudex.
  - 5a. Leaves linear, semiterete, densely covered with papillate processes ..... 5. *A. pelliotii*
  - 5b. Leaves scale-like to subulate, smooth.
    - 6a. Perianth segments without a winglike appendage in fruit; disk lobes semiorbicular; leaves subulate, apex with an acicular awn ..... 8. *A. eriopoda*
    - 6b. Perianth segments with a winglike appendage in fruit (at early anthesis slightly thickened abaxially); disk lobes linear; leaves scale-like, apex awnless.
      - 7a. Annual branches simple, with 5–8 internodes ..... 6. *A. cretacea*
      - 7b. Annual branches branched, with 8–12 internodes ..... 7. *A. truncata*

**1. *Anabasis elatior*** (C. A. Meyer) Schischkin in Krylov, Fl. Sibir. Occid. 4: 961. 1930.

高枝假木贼 *gao zhi jia mu zei*

*Brachylepis elatior* C. A. Meyer, Bull. Sci. Acad. Imp. Sci. Saint-Petersbourg 8: 341. 1840; *Anabasis korovinii* Iljin; *A. phyllophora* Karelin & Kirilov.

Subshrubs 15–30 cm tall. Woody stem much branched, gray-brown to gray-white; annual branches erect or slightly obliquely spreading, with 10–20 internodes, with short, obliquely spreading branches above; internodes terete or upper ones slightly compressed, usually 1–1.5 cm × 1.5–3 mm. Leaf apex subobtusate, with a short, pellucid, acicular awn; lower and middle leaves spreading or recurved, subulate, ca. 3 mm; upper leaves appressed against branch, scale-like, ca. 2 mm. Flowers axillary, solitary on upper part of branches and forming a short spike; bractlet apex subacute, without an acicular awn. Perianth segments membranous, proximally slightly thickened; outer 3 segments broadly ovate, abaxially with a developed, transverse wing; inner 2 segments narrower, without a wing or sometimes with a narrow wing in fruit; wing usually erect, yellow-white or pink, reniform. Disk lobes linear, apex pectinate. Ovary ovoid, glabrous; stigmas recurved, adaxially finely papillate. Utricle ovoid to broadly so, 2–3 mm; pericarp yellow-brown or pink, fleshy. Fl. and fr. Jul–Oct.

Gobi desert, saline soils in deserts, sunny slopes. N Xinjiang

[Kazakhstan, Mongolia, Russia (W Siberia)].

**2. *Anabasis brevifolia*** C. A. Meyer in Ledebour, Icon. Pl. 1: 10. 1829.

短叶假木贼 *duan ye jia mu zei*

*Anabasis abolinii* Iljin; *A. affinis* Fischer & C. A. Meyer.

Subshrubs 5–20 cm tall. Root black-brown, stout. Woody stem extremely branched, gray-brown; branchlets gray-white, usually fissured annular; annual branches mostly terminal on branchlets, simple or upper ones few branched, yellow-green, usually with 4–8 internodes; internodes smooth or papillate, lower ones subterete, to 2.5 cm, upper ones shorter, ribbed. Leaves spreading and arcuate recurved, linear, semiterete, 3–8 mm, apex obtuse or acute, with a semitransverse, acicular awn; lower leaves appressed to branch, triangular, usually shorter. Flowers axillary, solitary; bractlets ovate, adaxially concave, margin membranous, apex slightly fleshy. Perianth segments ovate, ca. 2.5 mm, abaxially winged in fruit, apex subobtusate; wing erect or slightly spreading, yellow-apricot or purple-red, occasionally dark brown, membranous; wing of outer 3 perianth segments reniform or suborbicular; wing of inner 2 segments orbicular or obovate. Disk lobes orange-yellow, semiorbicular, slightly fleshy. Anthers 0.6–0.9 mm, apex acute. Ovary usually papillate; stigmas erect or slightly recurved, black-brown, adaxially papillate. Utricle ovoid to broadly so, ca. 2

mm; pericarp yellow-brown. Seed dark brown, suborbicular, ca. 1.5 mm in diam. Fl. Jul–Aug, fr. Sep–Oct.

Gobi desert, arid slopes, alluvial fans. W Gansu, W Nei Mongol, Ningxia, Xinjiang [Kazakhstan, Mongolia, Russia (SW Siberia)].

**3. *Anabasis aphylla*** Linnaeus, Sp. Pl. 1: 223. 1753.

无叶假木贼 wu ye jia mu ze

*Anabasis tatarica* Pallas.

Subshrubs 20–50 cm tall. Woody stem much branched; branchlets gray-white, usually fissured annular; annual branches erect or obliquely spreading, simple or branched, fresh green; internodes numerous, terete, 0.5–1.5 cm. Leaves obscure or slightly scale-like, broadly triangular, apex obtuse or acute. Flowers 1–3 in leaf axils, forming spikes on upper part of branches; bractlets shorter than perianth, margin membranous. Outer 3 perianth segments suborbicular, proximally with a transverse wing abaxially; wing erect, light yellow or pink, flabellate, orbicular, or reniform, membranous; inner 2 perianth segments elliptic, wingless or small winged. Disk lobes linear, apex pectinate. Utricle vertical, subglobose, 1.5–2 mm in diam.; pericarp dark red, fleshy, smooth. Fl. Aug–Sep, fr. Oct.

Gobi desert, inter-dunes, gravelly alluvial fans, sometimes on arid slopes. W Gansu, Xinjiang [Russia (SW Siberia); C Asia, Europe].

This species is used medicinally and for stabilizing dunes. The annual branches contain the alkaloid anabasin ( $C_{10}H_{14}N_2$ ), a botanical insecticide.

**4. *Anabasis salsa*** (C. A. Meyer) Benth. ex Volkens in Engler & Prantl, Nat. Pflanzenfam. 3(1a): 87. 1893.

盐生假木贼 yan sheng jia mu ze

*Brachylepis salsa* C. A. Meyer in Ledebour, Fl. Altaic. 1: 372. 1829; *Anabasis ramosissima* Minkwitz; *Microlepis salsa* (C. A. Meyer) Eichwald.

Subshrubs 10–20 cm tall. Woody stem much branched, gray-brown to gray-white; annual branches numerous, erect or obliquely spreading, upper ones with 5–10 internodes; internodes usually 0.6–2 cm, terete or slightly ribbed, smooth. Lower and middle leaves spreading and recurved, linear, semiterete, 2–5 mm, apex with a pellucid, acicular, caducous awn; upper leaves scale-like, triangular, apex subobtuse, awnless. Flowers solitary in leaf axils, forming short spikes on upper part of branches; bractlets abaxially fleshy, margin membranous. Perianth segments 1.5–2 mm, unchanging in fruit, without abaxial wing; outer 3 segments suborbicular; inner 2 segments broadly ovate, apex obtuse. Disk lobes obscure or slightly semi-orbicular. Ovary ovoid, smooth; stigmas black-brown. Utricle broadly ovoid, apex protruding from perianth; pericarp yellow-brown or slightly reddish, fleshy.

Gobi desert, saline-alkaline deserts. N Xinjiang [Kazakhstan, Mongolia, Russia (Lower Volga region, SW Siberia); SW Asia (E Caucasus)].

Camels eat this plant in winter.

**5. *Anabasis pelliottii*** Danguy in Lecomte, Notul. Syst. (Paris) 2(6): 146. 1912.

粗糙假木贼 cu cao jia mu ze

Herbs perennial. Caudex densely pilose; annual branches numerous, growing from caudex, diffuse or obliquely ascending, branched, usually with 4–8 internodes, papillate; internodes slightly 4-angled, usually 1–3 cm, brittle. Leaves slightly recurved, linear, semiterete, 0.6–1.2 cm × 1–2 mm, adaxially plane or slightly sulcate, apex somewhat swollen, with a short, acicular awn. Flowers usually 1–3 in leaf axils; bractlets shorter than perianth. Perianth segments broadly elliptic, ca. 2.5 mm, enlarged in fruit, proximally with a crescent-shaped, winglike process abaxially, margin entire or erose. Disk lobes semi-orbicular, ovoid, or conic, papillate. Stamens 5; filaments narrowly fusiform, slightly compressed; anthers oblong, apex mucous. Style obscure; stigmas black-brown, subulate. Fl. and fr. Aug–Oct.

Arid slopes. SW Xinjiang [Tajikistan, Uzbekistan].

**6. *Anabasis cretacea*** Pallas, Reise Russ. Reich. 1: 493. 1771.

白垩假木贼 bai e jia mu ze

*Anabasis tianschanica* Botschantzev.

Herbs perennial, 5–15 cm tall. Root stout, to 3 cm in diam. Caudex brown to dark brown, densely tomentose; annual branches numerous, borne on caudex, erect, simple, yellow-green, usually with 5–8 internodes; internodes subterete, 2–3 mm in diam., smooth, sometimes with leaf scars. Leaves scale-like, terete, 1–2 mm, margin membranous, apex obtuse, awnless. Flowers solitary in leaf axils; bractlets ovate-oblong, apex slightly obtuse. Outer 3 perianth segments broadly elliptic, usually only these segments winged in fruit; inner 2 segments narrower; wing pink, reniform or suborbicular, membranous. Disk lobes linear, apex pectinate. Ovary smooth; stigmas usually recurved. Utricle dark red or orange-yellow, 2–2.5 mm. Fl. and fr. Aug–Oct.

Gobi desert, saline-alkaline deserts, arid slopes. N Xinjiang [Russia (SE European part, W Siberia); C Asia].

The general distribution of this species needs clarification, as well as its occurrence in China. Grubov (Rast. Tsentral. Azii 2: 107. 1966) considered C Asian records to belong to *A. truncata*.

**7. *Anabasis truncata*** (Schrenk) Bunge, Mém. Acad. Imp. Sci. Saint Pétersbourg, Sér. 7, 4(11): 38. 1862.

展枝假木贼 zhan zhi jia mu ze

*Brachylepis truncata* Schrenk, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg 2: 193. 1844.

Herbs perennial, 10–20 cm tall. Root stout, terete, to 3 cm in diam. Caudex brown to dark brown, densely tomentose; annual branches numerous, borne on caudex, erect, branched above, with 8–12 internodes; branches opposite, horizontal or apically recurved, 2–3 cm; internodes terete, 2–3 mm in diam., smooth, sometimes with leaf scars. Leaves scale-like, semiorbicular, 1–2 mm, margin submembranous, apex obtuse or acute, awnless. Flowers solitary in leaf axils, arranged into short spikes on upper branches and branchlets; bractlets with membranous margin. Outer 3 perianth segments broadly elliptic to oblong, winged in fruit; wing slightly spreading, elliptic to suborbicular; inner 2 perianth segments narrower, wingless or with a short, winglike process. Disk lobes linear, apex subtruncate. Ovary broadly ellipsoid, smooth; styles erect, black, short. Utricle of same shape as ovary; pericarp yellow-brown, 2.5–3 mm in diam., fleshy. Fl. and fr. Aug–Oct.

Gobi desert, arid slopes. Xinjiang [Russia (SW Siberia); C Asia].

**8. *Anabasis eriopoda*** (Schrenk) Bentham ex Volkens in Engler & Prantl, *Nat. Pflanzenfam.* 3(1a): 87. 1893.

毛足假木賊 mao zu jia mu zei

*Brachylepis eriopoda* Schrenk, *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Pétersbourg* 1: 360. 1843.

Herbs perennial, usually appearing hemispheric, 15–30 cm tall. Caudex densely white villous; annual branches numerous, borne on caudex, erect or decumbent, with obliquely spreading branches above, blue-green, slightly white-glaucous, with 10–15 internodes, smooth; internodes 4-angled, basal ones slightly terete, 0.5–3 cm. Leaves horizontal or slightly recurved, subulate or triangular, 2–5 mm, apex with a straight or recurved, aristate awn 2–5 mm. Flowers solitary in leaf axils, bisexual; bractlets green, shorter than perianth, abaxially fleshy, margin membranous, apex with an aristate awn. Perianth segments 2–3 mm, without winglike appendages in fruit, apex obtuse or acute; outer 3 segments broadly elliptic; inner 2 segments narrowly ovate. Disk lobes semiorbicular, slightly fleshy. Stigmas yellow-green. Utricle broadly ovoid to subglobose, compressed, 3–4 mm, protruding from perianth in fruit; pericarp yellow or orange-yellow, fleshy. Fl. and fr. Jun–Aug.

Gobi desert, deserts, arid slopes. N Xinjiang [Afghanistan, Mongolia; C Asia, SW Asia (Iran)].

