
天蓝苜蓿  tian lan mu xu

Annual or perennial herbs, rarely shrubs. Leaves pinnately 3-foliate; stipules adnate to petiole at base; leaflets denticulate, lateral veins running out into teeth. Racemes axillary, flowers crowded into heads; bracts small and caducous. Calyx 5-toothed, subequal. Petals free from staminal tube; standard oblong to obovate, usually reflexed; wings and keel with hooked appendages involved in explosive tripping mechanism for pollination. Stamens diadelphous; filaments not dilated, apical portion of staminal column arched; anthers uniform. Ovary sessile or shortly stipitate; ovules numerous; style subulate; stigma subcapitate, oblique. Legume compressed, coiled, curved, or straight, surface reticulate, sometimes armed with spines. Seed small, reniform, smooth or rough.

About 85 species: Africa, C and SW Asia, Europe, Mediterranean region; 15 species (one endemic, six introduced) in China.

1a. Legume spirally coiled.
2a. Perennial herbs or shrubs; legume spineless.

3a. Shrubs ........................................................................................................................................................................... 9. M. arborea

3b. Herbs.

4a. Legume tightly coiled in 2–4(–6) spirals, center solid or nearly so; corolla variable in color, white, deep blue, to dark purple ........................................................................................................................................... 7. M. sativa

4b. Legume loosely coiled in 1–1.5 spirals, center hollow; corolla yellow to brownish purple ........................................................................................................................................... 8. M. ×varia

2b. Annual or biennial herbs; legume with spines or tubercles.

5a. Leaflets obviously hairy; legume globose, less than 4.5 mm in diam.

6a. Petiole shorter than peduncle, stipule entire or obscurely serrate, leaflets densely hairy; inflorescence 2–10-flowered ........................................................................................................................................... 10. M. minima

6b. Petiole longer than peduncle, stipule small, incised, leaflets sparsely pilose; inflorescence 1- or 2-flowered ........................................................................................................................................... 11. M. praecox

5b. Leaflets glabrous or glabrescent; legume discoid, 4–10 mm in diam.

7a. Petiole not more than 2 × as long as peduncle, stipule laciniate or lacerate, leaflets without dark blotch ........................................................................................................................................... 12. M. polymorpha

7b. Petiole 2–5 × as long as peduncle, stipule triangular, incised to laciniate, leaflets with a dark central blotch ........................................................................................................................................... 13. M. arabica

1b. Legume not spirally coiled.

8a. Legume less than 3 mm ........................................................................................................................................... 1. M. lupulina

8b. Legume more than 8 mm.

9a. Legume falcate or linear, straight or curved to arcuate, less than 3 mm wide.

10a. Plants perennial; flowers in crowded pedunculate racemes ........................................................................................................................................... 6. M. falcata

10b. Plants annual; flowers solitary to few in sessile to shortly stalked clusters.

11a. Flowers 1 or 2(or 3), 6–8 mm, sessile; legume more than 40 mm ........................................................................................................................................... 14. M. monantha

11b. Flowers 2–5, 4–5 mm, shortly pedunculate; legume less than 30 mm ........................................................................................................................................... 15. M. orthoceras

9b. Legume oblong to semioblong, more than 4 mm wide.

12a. Plants densely pubescent; flowers yellow, ca. 5 mm ........................................................................................................................................... 5. M. edgeworthii

12b. Plants glabrous or slightly puberulent; flowers yellow with scarlet spot, more than 6 mm.

13a. Legume 5–9 mm wide; stems glabrous; leaflets rather larger ........................................................................................................................................... 2. M. platycarpos

13b. Legume less than 6 mm wide; stems ± puberulent; leaflets rather smaller.

14a. Flowers 4 or 5 in a scattered thyrs; leaflets ovate to orbicular; stipules hastate ........................................................................................................................................... 3. M. archiducis-nicolai

14b. Flowers (4–)6–9(–15) in dense fascicles; leaflets cuneate-linear to oblanceolate; stipules lanceolate ........................................................................................................................................... 4. M. rutenhica


天蓝苜蓿  tian lan mu xu

Annual or short-lived perennial herbs, 15–60 cm, glabrescent to pubescent, sometimes glandular. Stems decumbent, prostrate or ascending, much branched. Stipules ovate-lanceolate, to 10 mm, entire or toothed, base rounded or hastate, apex acuminate; petiole 1–2 cm; leaflets elliptic, ovate, or obovate, 5–20 × 4–6 mm, papery, pubescent, lateral veins to 10 pairs, base cuneate, margin distally obscurely serrate, apex truncate or retuse, apiculate. Flowers 10–20 in small heads; peduncles slender, straight, longer than subtending leaves, glabrate to densely appressed pubescent; bracts bristlelike, minute; pedicel less than 1 mm. Calyx ca. 2 mm, glabrate to densely hairy. Corolla yellow, 2–2.2 mm; standard suborbicular, apex retuse, longer than wings and keel. Ovary broadly ovate; ovule 1. Legume reniform, ca. 3 × 2 mm, sculptured with concentric arcuate veins, sparsely hairy, black when ripe. Seed 1, brown, ovoid, smooth. Fl. Apr.–Sep., fr. Jun.–Oct.

Stream banks, roadsides, waste fields, woodland margins. Throughout China [Asia, Europe].

**花苜蓿 hua mu xu**

*Trigonella ruthenica* Linnaeus, Sp. Pl. 2: 776. 1753; *Medicago liaoisiensis* (P. Y. Fu & Y. A. Chen) X. Y. Zhu & Y. F. Du; *M. ruthenica var. inschanica* (H. C. Fu & Y. Q. Jiang) X. Y. Zhu; *Melilotoides ruthenica* (Linnaeus) Sojak; *M. ruthenica var. inschanica* (H. C. Fu & Y. Q. Jiang) H. C. Fu & Y. Q. Jiang; *M. ruthenica var. liaoisiensis* (P. Y. Fu & Y. A. Chen) Yakovlev; *M. ruthenicus* (Linnaeus) Peschkova; *M. ruthenicus var. inschanicus* (H. C. Fu & Y. Q. Jiang) H. C. Fu & Y. Q. Jiang; *Pocockia liaoisiensis* P. Y. Fu & Y. A. Chen; *P. ruthenica* (Linnaeus) Boissier; *P. ruthenica var. inschanica* H. C. Fu & Y. Q. Jiang.

Perennial herbs, 20–70(–100) cm. Stems erect or ascending, branched at base, quadrangular. Stipules lanceolate, cuspitate, veins obvious, base rounded, auriculate, with 1–3 shallow denticles, apex slightly curved; petiole 2–7(–12) mm; leaflets varied in shape with different habitats, oblong, oblanceolate, cuneate, linear, and oblance-obovate, (6–)10–15(–25) × (1.5–)3–7(–12) mm, terminal largest, lateral veins 8–18 pairs, prominent on both surfaces, base cuneate, broadly cuneate, to rounded, margin entire below, slightly to irregularly serrulate in upper 3/4, apex truncate, obtuse, or retuse. Flowers (4–)6–9–15 in umbels, sometimes to 2 cm; peduncles straight, usually longer than subtending leaf; bracts 1–2 mm; pedicels 1.5–4 mm. Corolla yellow-brown, with scarlet to purple stripes in center, (5–)6–9 mm; standard oblong-obovate, obcordate, or spatulate; wings oblong; keel shortest, ovate. Ovary linear; ovules 4–8. Legume oblong-obovate, 8–15(–20) × 3.5–5(–7) mm, flat, veins inclined transversely, black when ripe, base tapering and slightly curved, stipitate, apex obtuse, apiculate. Seeds 2–6, brown, elliptic-ovoid, ca. 2 × 1.5 mm, smooth. Fl. Jun–Sep, fr. Aug–Oct.

Sandy soil of stream banks, slopes, grasslands. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan [Mongolia, Russia (Far East, Siberia)].


**毛荚苜蓿 mao jia mu xu**


Perennial herbs, 30–40 cm. Stems erect or ascending, branched at base, terete, densely hairy. Stipules ovate-lanceolate, 5–8(–10) mm, base rounded to hastate, margin entire, apex acuminate; petiole 2–6 mm; leaflets obovate to long obovate, (6–)10(–15) × (4–)7(–10) mm, scattered pubescent on both surfaces, especially dense on midrib abaxially, lateral veins 8–13 pairs, straightly running to teeth, base broadly cuneate, margin serrulate in upper 1/2, apex rounded, abruptly shortly acuminate. Flowers (1 or)2 or 3(–6) scattered in axillary heads; pedicels slightly longer than leaves; bracts ca. 1.5 mm; pedicels less than 2 mm. Corolla yellow, ca. 5 mm. Ovary oblong,

野苜蓿 ye mu xu

Perennial herbs, (20–)40–100(–120) cm. Stems erect or ascending, terete, branchy. Stipules lanceolate to linear-lanceolate, base hastate, apex acuminate; leaflets obovate to linear, (5–)8–15(–20) × (1–)2–5(–10) mm, pubescent abaxially, glabrous or appressed puberulent adaxially, margin serrulate in apical 1/4 or margin 2- or 3-serrate, lateral veins 5–15 pairs, base cuneate, apex rounded, obtuse, or acute, mucronate. Racemes 10–20(–40) mm, with 6–20(–25) flowers, crowded; peduncles axillary, very long, equal to or slightly longer than leaves; bracts ca. 1 mm; pedicels 2–3 mm. Corolla yellow, 6–9(–11) mm; standard obovate to linear-oblanceolate, appressed puberulent abaxially, glabrous or puberulent, veins oblique and thin. Seeds 2–4, brown, ovate-elliptic, ca. 2 × 1 mm. Fl. Jun–Aug, fr. Jul–Sep.

Grassy places, slopes, ravines, dry sandy fields. Gansu, Hebei, Jilin, Nei Mongol, Ningxia, Shaanxi, Shanxi, Xinjiang, Xizang [Asia, Europe].

Medicago romanica Prodan, Fl. Român. 1: 617. 1923; M. falcata var. romanaica (Prodan) Hayek.

Stems erect, densely yellow tomentose. Leaflets linear, densely tomentose abaxially, sparsely appressed pubescent adaxially, lateral veins 5–7 pairs, margins 2- or 3-serrate. Legume straight.

Dry grasslands, slopes. Xinjiang [Russia (W Siberia); C Asia, E Europe].

Medicago afghanica Vassilczenko; M. alaschanica Vassilczenko; M. asiatica Sinskaya subsp. sinensis Sinskaya; M. beipinensis Vassilczenko; M. pekinensis Vassilczenko; M. rilaris Vassilczenko; M. roborovskii Vassilczenko; M. sativa var. tibetana Alefeld; M. tibetana (Alefeld) Vassilczenko.

Perennial herbs, 30–100 cm. Stems erect, ascending, rarely prostrate, quadrangular, glabrous or puberulent, much branched. Stipules ovate-lanceolate, base entire or with 1 or 2 denticles, apex acute; leaflets long ovate, obovate, to linear-ovate, (5–)10–25(–40) × 3–10 mm, papery, appressed pubescent abaxially, glabrous adaxially, lateral veins 8–10 pairs, base tapering, margin serrulate in upper 1/3, apex rounded, mucronate with a denticle from midrib. Heads or racemes with 5–30 flowers, 1–2.5 cm; peduncles straight, longer than leaves; bracts equal to pedicels, ca. 2 mm. Corolla variable in color, white, deep blue, to dark purple; standard oblong, retuse. Ovary linear; ovules numerous. Legume tightly coiled in 2–4(–6) spirals, 5–9 mm in diam., center solid or nearly so, brown when ripe, veins thin and inconspicuous. Seeds 10–20, yellow or brown, ovoid, 1–2.5 mm, smooth. Fl. May–Jul, fr. Jun–Oct.

Cultivated throughout China, often escaped to roadsides, fields, grasslands, and stream banks [native to N and SW Asia, probably also S Europe; now cosmopolitan].


杂交苜蓿 za jiao mu xu

Medicago sativa Linnaeus subsp. varia (Martyn) Arcangeli.

Perennial herbs, 60–80(–120) cm. Stems erect, prostrate, or ascending, quadrangular, much branched. Stipules lanceolate, base obscurely dentate, apex acuminate; leaflets oblanceolate, obovate to elliptic, 10–20(–25) × (3–)5–10 mm, papery, sparsely appressed puberulent abaxially, glabrous adaxially, lateral veins 8 pairs, base rounded or broadly cuneate, margin shallowly serrate in upper 1/2. Flowers 8–15 in capitate racemes, crowded, becoming more widely spaced after anthesis; peduncles straight, longer than leaves; bracts shorter than pedicels. Corolla yellow, yellow-brown, to brownish purple, 9–10(–11) mm; standard oblong-ovate, usually with darker stripes, retuse. Ovules 6–8. Legume loosely coiled in (0.5–)1–1.5(–2) spirals, (4–)7–9(–12) mm in diam., center hollow, veins inconspicuous. Seeds 3–6, brown, ovoid. Fl. Jun–Aug, fr. Aug–Oct.

Cultivated throughout China, escaping to fields and roadsides [widely cultivated elsewhere].


紫苜蓿 zi mu xu

Medicago sativa Linnaeus subsp. sativa (Martyn) Arcangeli.

木本苜蓿 木本牧草

*Rhodasia arborea* (Linnaeus) Vassilczenko.

Shrubs, 1–2–(–4) m, pale yellow sericeous; bark split longitudinally. Stems erect, terete. Stipules narrowly triangular, 5–8 mm, acute, entire; petioles 2–4 cm; leaflets ovate to obcordate, 10–18 × 8–14 mm, sericeous abaxially, glabrous axadially, lateral veins 5–7 pairs, base broadly cuneate, margin entire, apex obtuse or retuse. Flowers 6–10 scattered in racemes, 2–2.5 cm; peduncles axillary, 3–5 cm, densely silky; bracts ca. 2 mm; pedicels ca. 5 mm. Corolla orange, 12–15 mm. Ovary stipitate; ovules 12–15. Legume loosely coiled in 0.5–1.5 spirals, 12–15 mm in diam., center hollow, appressed pubescent, veins radially reticulate, netted in external circle. Seed reniform, ca. 4 mm. Fl. May.

Cultivated as an ornamental. Hebei, Jiangsu [native to the Mediterranean region].


小苜蓿 小牧草


Annual herbs, 5–30 cm, spreading hairy, sometimes with glandular hairs. Stems diffuse, prostrate or ascending, branched at base. Stipules ovate, base rounded, margin entire or obscurely shallowly serrate, apex acute; petioles slender, 5–10(–20) mm; leaflets obovate, 5–8(–12) × 3–7 mm, papery, villos on both surfaces, base cuneate, margin serrulate in apical 1/3, apex rounded or retuse, apiculate. Flowers 2–10 in capitulate racemes; peduncles slender and straight; pedicels short or sessile. Corolla pale yellow, 3–4 mm; standard broadly ovate, emarginate. Legume ash-green to greenish brown, discoid, 4–6(–10) mm, tightly coiled in 1.5–2.5(–6) spirals, turning clockwise, radial veins connected near edge on coil face, spines or tubercles 15 in each row. Seed brown, reniform, ca. 2.5 × 1.25 mm, smooth. Fl. Mar.–May, fr. May–Oct.

Cultivated or escaped to fields, hillsides, and roadsides. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [native to at least N Africa, SW Asia, and S Europe; widely introduced elsewhere].


南苜蓿 南牧草

Annual or biennial herbs, 20–90 cm. Stems prostrate or ascending, branched at base, subquadrangular, glabrescent. Stipules ovate-oblong, 4–7 mm, base auriculate, margin irregularly laciniate or deeply incised, apex acuminate; petioles long and thin, 1–5 cm; leaflets obovate or triangular-obovate, 7–20 × 5–15 mm, papery, sparsely hairy abaxially, glabrous axadially, base broadly cuneate, margin shallowly serrate in apical 1/3, apex obtuse, truncate, or emarginate, apiculate. Flowers (1 or)2–10 in axillary racemes; peduncles slender, 3–15 mm, usually longer than leaves; pedicel less than 1 mm. Corolla yellow, 3–4 mm; standard ovate, emarginate. Legume ash-green to greenish brown, discoid, 4–6(–10) mm, tightly coiled in 1.5–2.5(–6) spirals, turning clockwise, radial veins connected near edge on coil face, spines or tubercles 15 in each row. Seed brown, reniform, ca. 2.5 × 1.25 mm, smooth. Fl. Mar.–May, fr. May–Oct.

Cultivated or escaped to fields, hillsides, and roadsides. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [native to the Mediterranean region].


早花苜蓿 早花牧草

Annual herbs, (5–)10–20(–50) cm. Stems prostrate or ascending, quadrangular, branched at base, sparsely hairy. Stipules ovate, incised or lacerate; leaflets obovate or obcordate, 2(–)4–8(–12) × (2–)3.5–9(–13) mm, papery, sparsely hairy abaxially, glabrous axadially, base broadly cuneate, margin only obscurely serrate apically, apex truncate or emarginate. Flowers 1 or 2 in axillary umbel; peduncles shorter than petiole, bracts ca. 1.5 mm; pedicels less than 1 mm. Corolla yellow, 3–4 mm; standard broadly orbicular. Ovary linear. Legume usually only 1 per umbel, scarlet to dark brown, discoid, 3–4 mm, loosely coiled in 2–4(or 5) spirals, coil edge wide, deeply grooved, spines 10 in each row. Seed brown, reniform, 2–2.8 × 1–1.3 mm. Fl. Mar–Apr, fr. May–Jul.

Introduced and cultivated. Anhui, Fujian, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Sichuan [native to the Mediterranean region].


南苜蓿 南牧草

Annual or biennial herbs, 20–90 cm. Stems prostrate or ascending, branched at base, subquadrangular, glabrescent. Stipules ovate-oblong, 4–7 mm, base auriculate, margin irregularly laciniate or deeply incised, apex acuminate; petioles long and thin, 1–5 cm; leaflets obovate or triangular-obovate, 7–20 × 5–15 mm, papery, sparsely hairy abaxially, glabrous axadially, base broadly cuneate, margin shallowly serrate in apical 1/3, apex obtuse, truncate, or emarginate, apiculate. Flowers (1 or)2–10 in axillary racemes; peduncles slender, 3–15 mm, usually longer than leaves; pedicel less than 1 mm. Corolla yellow, 3–4 mm; standard ovate, emarginate. Legume ash-green to greenish brown, discoid, 4–6(–10) mm, tightly coiled in 1.5–2.5(–6) spirals, turning clockwise, radial veins connected near edge on coil face, spines or tubercles 15 in each row. Seed brown, reniform, ca. 2.5 × 1.25 mm, smooth. Fl. Mar–May, fr. May–Oct.

Cultivated or escaped to fields, hillsides, and roadsides. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [native to the Mediterranean region].


褐斑苜蓿 褐斑牧草


Annual herbs, 40–65 cm. Stems decumbent or spreading, longitudinally ridged, sparsely hairy, hairs simple and multicellular-glandular. Stipules ovate-lanceolate, 5–12 mm, incised, with 6–8 deep lobes; petioles slender, 2–8(–12) cm, 2–5 × as long as peduncle; leaflets usually with a dark colored patch at center, obcordate to broadly obovate, 7–25(–30) × 14–32 mm, sparsely hairy abaxially, glabrous axadially, base broadly cuneate, margin subentire or shallowly serrate, apex rounded or emarginate. Flowers (1 or)2–5(–6) in axillary racemes; peduncles with a terminal cusp; bracts ca. 1 mm; pedicels longer than or equal to bracts. Corolla yellow, 5–6.5 mm; standard broadly obovate, retuse. Legume cylindric to globose, 5–7 mm, tightly coiled in 3–7 spirals, turning counterclockwise, 5–8 radial veins on coil face, spines 13–15 in each row. Seed yellowish brown, oblone-elliptic, 2.5–3.5 × 1.2–1.5 mm, smooth. Fl. Mar–May, fr. May–Aug.

Cultivated, rather moist stream banks, grasslands. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangsu [native to the Mediterranean region].


Annual herbs, 20–40 cm. Stems prostrate or ascending, branched at base, ridged, pilose. Leaves 3-foliolate; stipules lanceolate-hastate, 5–7 mm; petioles 1–2.5 cm; leaflets oblong-obovate to obtangular, (3–)5–12 × (3–)4–8 mm, pilose at least on midrib abaxially, subglabrous adaxially, lateral veins 5–8 pairs, base cuneate, margin denticulate in apical 2/3, apex truncate. Flower axillary, solitary at basal portion of stem, 2(or 3) in apical portion, sessile or peduncles developed, 6–8 mm, with straight dense hairs. Corolla yellow, 6–8 mm; standard evidently longer than wings and keel. Ovary linear; ovules 18–24; style short and flat. Legume straight, cylindric, 40–50(–80) × 1–2 mm, appressed pubescent, veins reticulate, forming a pattern of squares or pentagons, apex hooked. Seeds numerous, brown, oblong-elliptic, ca. 2 mm. Fl. May–Jul, fr. Jun–Aug.

Clay soils in deserts, wilderness tracts, or roadides. Xinjiang [Afghanistan, Mongolia, Pakistan; C and SW Asia].


Annual herbs, 15–25(–40) cm. Stems prostrate or ascending, subquadrangular, sparsely pilose. Leaves 3-foliolate; stipules subhastate, 5–6 mm; leaflets obovate to obovate-triangular, 6–15 × 3–8 mm, pilose at least on midrib abaxially, glabrous adaxially, lateral veins 6–9 pairs, base cuneate, margin denticulate in upper 2/3, apex truncate. Flowers 2–5 in subumbellate heads; peduncles undeveloped, but sometimes to 3–5 mm. Corolla yellow, 4–5 mm; standard longer than wings and keel. Ovary linear; ovules numerous; style short and flat. Legume cylindric, 20–30 × 1–1.5 mm, appressed pubescent, veins reticulate. Seeds numerous, brown, oblong to ovoid, ca. 2 × 1 mm, warty. Fl. Apr–Jun, fr. May–Jul.

Sandy slopes, grasslands; 1200–1900 m. W Xinjiang [Pakistan, Russia (W Siberia); C and SW Asia].