

20. CUSCUTA Linnaeus, Sp. Pl. 1: 124. 1753.

菟丝子属 tu si zi shu

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Herbs parasitic, yellow or reddish, glabrous. Stems twining, filiform, obtaining nourishment from hosts by haustoria. Leaves reduced to minute scales. Flowers sessile or short pedicellate, mostly in globular, spicate, racemose, or cymose clusters, 4- or 5-merous; bracts minute or absent. Calyx gamosepalous, ± deeply lobed, or sepals free. Corolla white, pinkish, or cream colored, urceolate, tubular, globose or campanulate, inside with fimbriate or crenulate, membranous, infrastaminal scales at base of tube. Stamens as many as corolla lobes, inserted on corolla above scales, alternating with corolla lobes. Pollen smooth. Ovary 2-loculed; ovules 2 per locule. Styles 1 or 2; stigmas 2, subglobose or elongated, sometimes united. Capsule ovoid or globose, dry or sometimes fleshy, circumscissile or opening irregularly. Seeds 1–4, glabrous; embryo acotyledonous, filiform spiral-curved.

About 170 species: mainly in North and South America, several in Asia and Europe; 11 species in China.

Cuscuta is placed by some in a separate family, Cuscutaceae Dumortier.

- 1a. Styles 2, distinctly elongated; inflorescences compact cymose umbellules or glomerules; stems filiform; often parasitic on herbs.
 - 2a. Stigmas clavate, ± elongated.
 - 3a. Flowers short pedicellate; sepals not thickened abaxially; style and stigmas much shorter than ovary 10. *C. europaea*
 - 3b. Flowers sessile; sepals thickened and fleshy abaxially; style and stigmas ca. as long as or longer than ovary 11. *C. approximata*
 - 2b. Stigmas globose or capitate, not elongated.
 - 4a. Capsule entirely enclosed by withered corolla, circumscissile; corolla lobes keeled 3. *C. chinensis*
 - 4b. Capsule subtended by withered corolla, irregularly dehiscent; corolla lobes flat.
 - 5a. Corolla lobes ovate or oblong, apex obtuse to rounded, often erect; corolla scales less than 1/2 as long as tube, deeply 2-cleft 1. *C. australis*
 - 5b. Corolla lobes broadly triangular, apex acute or obtuse, often reflexed; corolla scales ca. as long as corolla tube, reaching throat, deeply fimbriate 2. *C. campestris*
- 1b. Style 1, or very short to absent; inflorescences racemose or spicate; stems stringy; often parasitic on shrubs.
 - 6a. Style distinctly longer than stamens; stigma 2-lobed.
 - 7a. Stigma lobes elongated or ± square 4. *C. japonica*
 - 7b. Stigma oval, slightly lobed, lobes ovate 5. *C. lupuliformis*
 - 6b. Style very short or obsolete; stigma capitate or ligulate.
 - 8a. Corolla scales nearly reaching throat 9. *C. macrolepis*
 - 8b. Corolla scales reaching middle of tube.
 - 9a. Stigma capitate, shallowly cleft 6. *C. monogyna*
 - 9b. Stigma ligulate.
 - 10a. Corolla tube more than 2 × as long as calyx 7. *C. reflexa*
 - 10b. Corolla tube to 2 × as long as calyx 8. *C. gigantea*

1. *Cuscuta australis* R. Brown, Prodr. 491. 1810.

南方菟丝子 nan fang tu si zi

Cuscuta hygrophilae Pearson; *C. kawakamii* Hayata; *C. millettii* Hooker & Arnott; *C. obtusiflora* Kunth var. *australis* Engelm.

Stems golden, thin, ca. 1 mm in diam. Inflorescences lateral, compact cymose glomerules, few to many flowered, subsessile; bracts scaly. Pedicel 1–2.5 mm. Calyx cupular, ca. as long as corolla tube; sepals 3–5, oblong or circular, often unequal, 0.8–1.8 mm, apex rotund. Corolla white or creamy white, cupular, ca. 2 mm; lobes persistent, erect, ovate or ob-

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long. Stamens inserted at sinus, shorter than lobes; scales shorter than tube, deeply 2-cleft, fimbriate. Ovary depressed

globose. Styles 2, equal or unequal in length; stigmas globose. Capsule enclosed by persistent corolla, depressed-globose, 3–4 mm in diam., irregularly opening, not circumscissile. Seeds 4, brownish, ovoid, ca. 1.5 mm, scabrous.

Often on herbaceous or shrubby plants such as Fabaceae, Asteraceae (*Artemisia*), Verbenaceae (*Vitex*); 100–2000 m. Widespread in China: Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Asia, Australia, Europe].

The whole plant and the seeds have a number of medicinal uses.

According to Kamelin (in litt.), the specimens identified as *Cuscuta australis* require further study. Possibly two or three species are combined in this description, one of them, probably *C. cesatiana* Berthol, which perhaps represents the material from Xinjiang.

2. *Cuscuta campestris* Yuncker, Mem. Torrey Bot. Club 18: 138. 1932.

原野菟丝子 *yuan ye tu si zi*

Cuscuta arvensis Beyrich ex Engelmann; *C. arvensis* var. *calycina* Engelm.; *C. pentagona* Engelm. var. *calycina* Engelm.; *C. pentagona* var. *subulata* Yuncker.

Stems yellowish green to yellow or orange, 0.5–0.8 mm in diam., smooth. Inflorescences lateral, usually compact globular clusters, 4–18-flowered, subsessile. Pedicel ca. 1 mm. Calyx cupular, enclosing corolla tube, ca. 1.5 mm; sepals 5, oval or circular, sometimes wider than long. Corolla white, short campanulate, ca. 2.5 mm, 4- or 5-lobed; lobes broadly triangular, apex acute or obtuse, often reflexed. Stamens shorter to longer than corolla lobes; anthers ovate, shorter than filaments; scales distinct, ovate, ca. as long as corolla tube, fimbriate. Ovary globose. Styles 2; stigma globose. Capsule depressed globose, ca. 3 mm in diam., ca. 2 mm high, with withered corolla at base, irregularly opening. Seeds 1–4, often 3 or 4, dull yellow, ovoid. $2n = 56$.

On *Allium fistulosum* Linnaeus. Fujian (Fuzhou Shi), Xinjiang [Africa, Asia, Australia, Europe, North America, Pacific Islands, South America].

3. *Cuscuta chinensis* Lamarck, Encycl. 2: 229. 1786.

菟丝子 *tu si zi*

Stems yellow, thin, ca. 1 mm in diam. Inflorescences lateral, compact cymose glomerules, few to many flowered, subsessile; bracts and bracteoles scalelike. Pedicel ca. 1 mm. Calyx cupular; sepals triangular, ca. 1.5 mm, apex obtuse, partly thickened. Corolla white, urceolate, ca. 3 mm; lobes persistent triangular-ovate, apex acute or obtuse, reflexed. Stamens inserted at throat; scales oblong, reaching stamens, long fimbriate. Ovary subglobose. Styles 2, equal or unequal in length; stigma globose. Capsule enclosed by withered corolla, globose, ca. 3 mm in diam., circumscissile. Seeds 2–4, pale brown, ovoid, ca. 1 mm, scabrous. $2n = 28, 56$.

Fields, open mountain slopes, thickets, sandy beaches, often on plants of Fabaceae, Asteraceae, and Zygophyllaceae; 200–3000 m.

Widespread in China [Afghanistan, Indonesia, Japan, Kazakhstan, Korea, Mongolia, Russia, Sri Lanka; Africa, SW Asia, Australia].

4. *Cuscuta japonica* Choisy, Zoll. Syst. Verz. Ind. Archip. Pflanz. 2: 130, 134. 1854.

金灯藤 *jin deng teng*

Stems yellow or often with purplish spots, slightly stout, 1–2 mm in diam., many branched. Inflorescences spicate, ca. 3 cm; bracts and bracteoles scalelike, broadly ovate, ca. 2 mm. Flowers subsessile. Calyx cupular, ca. 2 mm, deeply divided; sepals ovate to circular, equal or unequal, purplish tuberculate abaxially, apex acute. Corolla pink or greenish white, campanulate to tubular, 3–7 mm, shallowly 5-lobed; lobes erect or reflexed, ovate-triangular, much shorter than tube, apex obtuse. Stamens inserted at throat; anthers yellow, ovate-circular; filaments very short or absent; scales oblong, fimbriate, reaching middle of tube. Ovary globose, smooth. Style 1, longer than or as long as ovary; stigma elongated. Capsule ovoid, ca. 5 mm, circumscissile near base. Seeds 1–3, brown, 2–2.5 mm, smooth. Fl. Aug, fr. Sep.

On herbs and shrubs. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Japan, Korea, Russia, Vietnam].

The seeds are used medicinally.

According to Kamelin (in litt.), Chinese material identified as *Cuscuta japonica* requires further study. Possibly two species are combined in this description; one of them may be *C. engelmannii* Krock, which perhaps represents the material from Xinjiang.

Although *Cuscuta japonica* var. *fissistyla* Engelm. (= *C. upcraftii* Pearson) was recognized by Fang & Huang (1979), no material of this taxon was examined by the authors, and the variety is here excluded.

- 1a. Corolla 3–5 mm; lobes of stigma tongue-shaped 4a. var. *japonica*
- 1b. Corolla 4–7 mm; lobes of stigma ± square 4b. var. *formosana*

4a. *Cuscuta japonica* var. *japonica*

金灯藤 (原变种) *jin deng teng* (*yuan bian zhong*)

Cuscuta colorans Maximowicz; *C. japonica* var. *paniculata* Engelm.; *C. japonica* var. *thyrsoidea* Engelm.; *C. reflexa* Roxburgh var. *densiflora* Benth.

Corolla 3–5 mm. Stigma lobes tongue-shaped.

On herbs and shrubs. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Japan, Korea, Russia, Vietnam].

4b. *Cuscuta japonica* var. *formosana* (Hayata) Yuncker, Mem. Torrey Bot. Club 18: 253. 1932.

台湾菟丝子 *tai wan tu si zi*

Cuscuta formosana Hayata, Icon. Pl. Formosan. 2: 124. 1912.

Corolla 4–7 mm. Stigma lobes quadrangular.

- Low elevations. Taiwan.

5. *Cuscuta lupuliformis* Krockner, Fl. Siles. 1: 261, t. 36. 1787.

啤酒花菟丝子 pi jiu hua tu si zi

Cuscuta flava Sievers ex Ledebour.

Stems rust colored to reddish, stout, ca. 3 mm in diam., tuberculate. Inflorescences racemose-spicate; bracts oval or ovate. Flowers 3–5 mm, sessile or short pedicellate. Calyx greenish, brown in dry specimens, cupular; sepals ovate to broadly ovate, apex obtuse. Corolla pink to whitish, tubular, longer than calyx; lobes erect or ± reflexed, oblong-ovate, shorter than tube, minutely dentate. Stamens inserted just below throat, tops reaching sinus; filaments very short or absent; anthers oblong-ovate; scales at lower parts of tube, not reaching middle of tube, oval or ovate, entire or 2-cleft, short fimbriate, sometimes degenerate. Ovary subglobose or broadly ovoid. Style 1; stigma oval, 2-cleft. Capsule capped by withered corolla, ovoid or conical, 7–9 mm, circumscissile near base. Seeds pale to dark brown, ovoid, 2–3 mm; hilum linear. Fl. Jul, fr. Aug. $2n = 28$.

On trees, shrubs, perennial herbs. Gansu, Hebei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Mongolia; Asia, Europe].

6. *Cuscuta monogyna* Vahl, Symb. Bot. 2: 32. 1791.

单柱菟丝子 dan zhu tu si zi

Cuscuta astyla Engelm.

Stems pinkish, deep purple tuberculate, stout, 1–2 mm in diam. Inflorescences loosely or densely spicate-paniculate; bracts ovate-circular or ovate-triangular, 1–2 mm, fleshy, apex acute. Flowers subsessile or pedicellate. Calyx cupular; sepals ovate-circular, equal, apex acute. Corolla rose to white, or purple late in anthesis, urceolate to tubular, or campanulate, 3–3.5 mm; lobes 5, ovate-circular, 1/2 length of tube, margin entire or minutely dentate, apex obtuse. Stamens inserted at throat; filaments ca. as long as anthers; anthers oval or oval-cordate; scales oblong, reaching middle of tube, ± 2-cleft, fimbriate. Ovary subglobose. Style 1, ca. 0.5 mm; stigma capitate, ca. as long as style, shallowly cleft. Capsule ovoid-globose, ca. 4 mm, circumscissile. Seeds 1 or 2, dark brown, subcordate, 3–3.5 mm, smooth. $2n = 28$.

On trees, shrubs, perennial herbs. Xinjiang [Mongolia, Russia; SW Asia].

7. *Cuscuta reflexa* Roxburgh, Pl. Coromandel 2: 3, t. 104. 1798.

大花菟丝子 da hua tu si zi

Stems yellow or yellowish green, stout, 2–3 mm in diam., with brown spots. Inflorescences lateral, few to many flowered, in racemes or panicles 1.5–3 cm, branched; bracts and bractoles scalelike. Pedicel 2–4 mm, together with

peduncle, brown spotted or tuberculate. Calyx cupular; sepals 5, broadly ovate, equal, 2–2.5 mm, with a few tubercles abaxially, apex rotund. Corolla white or creamy, fragrant, tubular, 5–9 mm; lobes early deciduous, often reflexed, sometimes erect, triangular-ovate, shorter than tube. Stamens inserted at throat; filaments shorter than anthers or absent; anthers elliptic-ovate; scales oblong, reaching middle of tube, short and densely fimbriate. Ovary ovate-conical. Style 1, very short or absent; stigma divergent or erect, elongated, ligulate, longer than style. Capsule conical-globose, subquadrate when mature, 5–10 mm in diam., circumscissile. Seeds 1–4, dark brown, oblong, ca. 4 mm. $2n = 28, 32, 36, 42$.

On shrubs; 900–2800 m. Hunan, Sichuan, Xizang, Yunnan [Afghanistan, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Sikkim, Sri Lanka, Thailand].

- 1a. Flowers 5–9 mm; corolla tube ca. $2 \times$ as long as lobes; stamens with very short filaments; style very short 7a. var. *reflexa*
- 1b. Flowers ca. 6 mm; corolla tube $1-2 \times$ as long as lobes; stamens sessile at sinuses; stigma conical, almost sessile 7b. var. *anguina*

7a. *Cuscuta reflexa* var. *reflexa*

大花菟丝子 (原变种) da hua tu si zi (yuan bian zhong)

Cuscuta macrantha G. Don; *C. reflexa* var. *grandiflora* Engelm.

Flowers 5–9 mm. Corolla tube ca. $2 \times$ as long as lobes. Stamens with very short filaments. Style very short.

On shrubs; 900–2800 m. Hunan, Sichuan, Xizang, Yunnan [Afghanistan, India, Indonesia, Malaysia, Nepal, Pakistan, Sikkim, Sri Lanka, Thailand].

7b. *Cuscuta reflexa* var. *anguina* (Edgeworth) C. B. Clarke in J. D. Hooker, Fl. Brit. India 4: 226. 1883.

短柱头菟丝子 duan zhu tou tu si zi

Cuscuta anguina Edgeworth, Trans. Linn. Soc. London 20: 87. 1851; *C. reflexa* var. *anguina* (Edgeworth) Yuncker; *C. reflexa* var. *brachystigma* Engelm.

Flowers ca. 6 mm. Corolla tube $1-2 \times$ as long as lobes. Stamens sessile at sinuses. Stigma ± erect, conical, short, almost sessile.

Yunnan (Dali Xian) [India, Myanmar, Sikkim].

Some specimens are intermediate between this variety and *Cuscuta reflexa* var. *reflexa*.

8. *Cuscuta gigantea* Griffith, Not. Pl. Asiat. 1: 243. 1847.

高大菟丝子 gao da tu si zi

Stems thin or stout. Inflorescences racemose, compact. Flowers 5–7 mm, short pedicellate. Calyx reaching middle of corolla; sepals circular-ovate. Corolla lobes reflexed, elliptic-ovate, shorter than corolla tube. Stamens inserted below sinus, subsessile; scales ovate, reaching middle of tube, 2-cleft, fimbriate. Ovary globose. Style 1, subulate; stigma ca. as long as or shorter than style, ligulate. Capsule subquadrate,

circumscissile.

On *Tamarix*; ca. 3400 m. Xizang [Afghanistan, Tajikistan].

Chinese specimens were not seen.

9. *Cuscuta macrolepis* R. C. Fang & S. H. Huang, Fl. Xizang. 4: 33. 1985.

大鳞菟丝子 da lin tu si zi

Stems green, tinged with pale purple, 1–2 mm in diam., brown spotted. Inflorescences lateral, racemose, 1–2 cm, few flowered; bracts and bracteoles scalelike, ovate-circular. Pedicel 1.5–3 mm. Calyx cupular, 1.5–2.5 mm; sepals 5, triangular-ovate, unequal, ca. as long as tube, with a few dark brown tubercles abaxially. Corolla white, tinged with pale purple, tubular, 2.5–3.5 mm; lobes reflexed, triangular, shorter than tube. Stamens inserted below sinus, less than 1 mm; filaments shorter than anthers; anthers oblong; scales reaching base of filaments, short and densely fimbriate. Ovary conical. Style 1, very short; stigma short ligulate, crispate, together with style much shorter than ovary. Fruit unknown. Fl. Aug.

- In forests; 2600–2700 m. Xizang (Cona Xian).

According to Kamelin (in litt.), the specimens identified as *Cuscuta macrolepis* require further study because the taxon is very similar to *C. ruschanica* Junuss.

10. *Cuscuta europaea* Linnaeus, Sp. Pl. 1: 124. 1753.

欧洲菟丝子 ou zhou tu si zi

Cuscuta europaea var. *indica* Engelm.; *C. major* Bauhin.

Stems yellowish or reddish, filiform. Inflorescences lateral, compact glomerules, few to many flowered. Pedicel to 1.5 mm. Calyx cupular; sepals 4 or 5, triangular-ovate, sometimes unequal, ca. 1.5 mm. Corolla pink, urceolate, 2.5–3 mm; lobes 4 or sometimes 5, persistent, often reflexed, triangular-ovate. Stamens inserted below sinus; filaments longer than anthers; anthers ovate-circular; scales very thin, obovate, 2-cleft or sometimes entire, sparingly fimbriate.

Ovary subglobose. Styles 2; stigmas divergent or curved, filiform, ca. as long as or shorter than styles. Capsule capped by withered corolla, subglobose, ca. 3 mm in diam., circumscissile. Seeds often 4, pale brown, elliptic, ca. 1 mm, scabrous. $2n = 14$.

Open grassy localities, streamsides, hilly areas on Asteraceae, Fabaceae, Chenopodiaceae, and other herbaceous plants; 800–3100 m. Gansu, Heilongjiang, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Japan, Kashmir; N Africa, W Asia, Europe, occasionally in North and South America].

11. *Cuscuta approximata* Babington, Ann. Mag. Nat. Hist. 13: 253. 1844.

杯花菟丝子 bei hua tu si zi

Cuscuta approximata var. *urceolata* (Kuntze) Yuncker; *C. planiflora* Tenore var. *approximata* (Babington) Engelm.; *C. urceolata* Kuntze.

Stems filiform, less than 1 mm in diam. Inflorescences lateral, compact glomerules, few to many flowered. Flowers sessile. Calyx cupular, 2–2.5 mm; sepals overlapping, broadly rhomboid, thickened abaxially. Corolla white to pink, campanulate, 2–2.5 mm; lobes triangular-ovate, shorter than tube. Stamens inserted at throat, shorter than corolla lobes; anthers ovate-circular, ca. as long as or shorter than filaments; scales oblong, not reaching base of filaments or ca. as long as corolla tube, apex obtuse or 2-cleft, fimbriate. Ovary subglobose. Style ca. as long as or shorter than filiform stigmas. Capsule enclosed by withered corolla, subglobose, circumscissile. Seeds ovoid, ca. 1 mm. $2n = 14, 28$.

Wasteland, mountain slopes, on *Medicago*, and other plants including *Artemisia*. Xinjiang [N Africa, SW Asia, S Europe].

According to Kamelin (in litt.), the specimens identified as *Cuscuta approximata* require further study. Possibly two or three species are combined in this description, one of them probably *C. cupulata* Engelm. *Cuscuta approximata* is known to be strictly parasitic on *Medicago*.