

## 15. TULIPA Linnaeus, Sp. Pl. 1: 305. 1753.

郁金香属 *yu jin xiang shu*

Chen Xinqi (陈心启 *Chen Sing-chi*); Helen V. Mordak<sup>1</sup>

*Amana* Honda; *Orithyia* D. Don.

Herbs perennial, bulbiferous. Bulbs truncate basally, sometimes elongate and tapering apically, covered with a tunic; tunic usually hairy inside. Stem simple or occasionally branched, proximal part usually underground. Leaves basal and cauline, spaced or  $\pm$  crowded, rarely opposite, sessile and clasping at base, linear to narrowly ovate. Inflorescence usually 1-flowered; bracts absent or sometimes present. Flowers bisexual, erect, campanulate to saucer-shaped. Tepals 6, free, often colored, outer and inner ones different in shape, apex usually with a minute tuft of white hairs. Stamens 6, equal or 3 longer; filaments sometimes hairy; anthers basifixed. Ovary 3-loculed; ovules many per locule. Style columnar or very short; stigma 3-lobed. Fruit a loculicidal capsule. Seeds flat, usually subdeltoid.

About 150 species: temperate regions of N Africa, Asia, and Europe, mainly in C Asia and the Mediterranean region; 13 species (one endemic) in China.

- 1a. Bracts 2–4, much smaller than leaves.
  - 2a. Leaves conspicuously overtopping flower, 10–25  $\times$  0.5–0.9(–1.2) cm; bracts usually 2, opposite, very rarely 3 and whorled ..... 1. *T. edulis*
  - 2b. Leaves slightly or scarcely overtopping flower, 7–15  $\times$  (0.5–)0.9–2.2 cm; bracts usually 3 or 4, whorled, very rarely 2 and opposite ..... 2. *T. erythronioides*
- 1b. Bracts absent.
  - 3a. Filaments hairy at least toward base.
    - 4a. Tunic woolly-pubescent inside distally; capsule subglobose ..... 10. *T. biflora*
    - 4b. Tunic appressed hairy inside distally or glabrous; capsule oblong.
      - 5a. Tepals yellow at base; filaments hairy at base ..... 9. *T. patens*
      - 5b. Tepals not yellow at base; filaments wholly hairy, rarely so only at base ..... 11. *T. dasystemon*
  - 3b. Filaments glabrous.
    - 6a. Leaves 2, opposite; tunic glabrous inside ..... 12. *T. heterophylla*
    - 6b. Leaves 2–4 or more, spaced or  $\pm$  crowded but never opposite; tunic usually hairy inside.
      - 7a. Style 1.5–4 mm; stem glabrous.
        - 8a. Stamens equal; style 1.5–2 mm ..... 8. *T. sinkiangensis*
        - 8b. Stamens unequal, inner ones longer than outer; style to 4 mm ..... 13. *T. uniflora*
      - 7b. Style less than 1 mm.
        - 9a. Outer tepals yellow, not tinged with other color abaxially ..... 4. *T. iliensis*
        - 9b. Outer tepals yellow, tinged with violet, red, purplish, green or other deep color abaxially.
          - 10a. Tunic with appressed hairs inside basally and distally ..... 7. *T. altaica*
          - 10b. Tunic with appressed hairs inside only distally.
            - 11a. Stem usually densely or sparsely pubescent; filaments slightly dilated at middle and gradually narrowed at both ends ..... 4. *T. iliensis*
            - 11b. Stem glabrous; filaments dilated in basal or distal part.
              - 12a. Filaments gradually attenuate from base; leaves spaced ..... 3. *T. kolpakovskiana*
              - 12b. Filaments dilated in distal part; leaves  $\pm$  crowded.
                - 13a. Leaves 3, 5–10 mm wide; flower solitary, tepals 1.5–2.5 cm ..... 5. *T. thianschanica*
                - 13b. Leaves (3–)5 or 6(or 7), 10–15 mm wide; flowers 1–4, tepals 3–4 cm ..... 6. *T. tetraphylla*

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**1. *Tulipa edulis*** (Miquel) Baker, J. Linn. Soc., Bot. 14: 295. 1874.

老鸦瓣 *lao ya ban*

*Orithya edulis* Miquel, Ann. Mus. Bot. Lugduno-Batavi 3: 158. 1867; *Amana edulis* (Miquel) Honda; *A. graminifolia* (Baker ex S. Moore) A. D. Hall; *Gagea argyi* H. Léveillé; *G. coreana* H. Léveillé (1910), not Nakai (1932); *G. hypoxioides* H. Léveillé; *Tulipa graminifolia* Baker ex S. Moore.

Bulb ovoid, 1.5–4 cm in diam.; tunic brownish, papery, densely villous-woolly inside. Stem usually simple, 10–25 cm, slender, glabrous. Leaves usually 2, glaucous, linear, (10–)15–25 cm × (2–)5–9(–12) mm, relatively thick, glabrous. Bracts usually 2, opposite, very rarely 3 and whorled, narrowly linear, 1.5–3 cm × 1–2 mm. Flower solitary; pedicel 2–4 cm. Tepals white, streaked with purple-red, narrowly elliptic-lanceolate or lanceolate, 2–3 cm × 4–7 mm. Inner stamens slightly longer than outer; filaments glabrous, slightly dilated near middle or base. Style ca. 4 mm. Capsule subglobose, 5–7 mm in diam., apex long beaked. Fl. Mar–Apr, fr. Apr–May.  $2n = 48^*$

Grassy slopes, hillsides; near sea level to 1700 m. Anhui, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Zhejiang [Japan, Korea].

Wu Zhengyi (editor's note) believes that this and the following species would be better treated under the segregate genus *Amana* on the basis of morphology and geographic distribution.

**2. *Tulipa erythronioides*** Baker, J. Bot. 13: 292. 1875.

阔叶老鸦瓣 *kuo ye lao ya ban*

*Amana latifolia* (Makino) Honda; *Tulipa edulis* (Miquel) Baker var. *latifolia* Makino; *T. latifolia* (Makino) Makino.

Bulb ovoid, 2–4 cm in diam.; tunic brownish, papery, densely villous-woolly inside. Stem 11–20 cm, glabrous. Leaves usually 2, glaucous, linear to narrowly oblong, 7–15 × (0.5–)0.9–2.2 cm, glabrous. Bracts usually 3 or 4, whorled, very rarely 2 and opposite, narrowly linear, 1.5–2 cm × 1–2 mm. Pedicel 1–4 cm. Tepals broadly lanceolate, 1.5–1.8 cm × 2.5–3 mm. Outer stamens 5–6 mm; inner ones longer, ca. 7.5 mm; filaments dilated proximally, glabrous. Style ca. 3 mm. Fl. Apr.

Anhui, Zhejiang [Japan].

**3. *Tulipa kolpakovskiana*** Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 266. 1877.

迟花郁金香 *chi hua yu jin xiang*

*Tulipa aristata* Regel.

Bulb ovoid, 1.5–2 cm in diam.; tunic black, leathery, appressed hairy inside distally. Stem usually glabrous. Leaves 3, spaced, linear-lanceolate, varying in size, usually overtopping flower, 0.5–1.5 cm wide, glabrous, margin crisped. Bracts absent. Flowers solitary or paired, nodding in bud. Tepals yellow, rarely orange-red, ± tinged with violet, oblong to rhomboidal-oblong, 3–6 × 0.5–2 cm. Stamens equal, 1–2 cm; filaments glabrous, gradually attenuate from base. Style very short. Fl. May.  $2n = 24$ .

Semideserts. NW Xinjiang [Kazakstan, Kyrgyzstan].

**4. *Tulipa iliensis*** Regel, Gartenflora 28: 162. 1879.

伊犁郁金香 *yi li yu jin xiang*

Bulb ovoid, 1–2 cm in diam.; tunic blackish brown, thinly leathery, appressed hairy inside basally and distally. Stem 10–20(–30) cm, densely or sparsely pubescent distally, very rarely glabrous. Leaves 3 or 4, spaced or ± crowded, linear or linear-lanceolate, usually not overtopping flower, 0.5–1.5 cm wide. Bracts absent. Flower solitary. Tepals yellow, sometimes turning dark red or pale red when dry, oblong to elliptic-rhomboidal, 2.5–3.5 × 0.4–2 cm; outer ones abaxially tinged with greenish red to greenish purple. Stamens equal; filaments slightly dilated at middle and gradually narrowed at both ends, glabrous. Style very short. Capsule ellipsoid, 1.8–2.2 × 1.2–1.5 cm. Fl. and fr. Mar–May.  $2n = 24$ .

Grassy or gravelly slopes, semideserts; 400–1400 m. Xinjiang [Kazakstan].

Reports of *Tulipa gesneriana* Linnaeus and *T. schrenkii* Regel from China (e.g., in FRPS) are based on misidentified plants of *T. iliensis*.

**5. *Tulipa thianschanica*** Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 508. 1880.

天山郁金香 *tian shan yu jin xiang*

Bulb ovoid, 1.5–2 cm in diam.; tunic blackish brown, thinly leathery, appressed hairy inside distally. Stem 10–15 cm, glabrous. Leaves 3, ± crowded, spreading and slightly recurved apically, linear or linear-lanceolate, usually overtopping flower, 5–10 mm wide, margin usually crisped. Bracts absent. Flower solitary. Tepals yellow, suboblong, 1.5–2.5 × 0.5–1.5 cm; inner ones sometimes tinged with red. Stamens 1.2–1.7 cm, equal; filaments glabrous, abruptly dilated from middle to apex. Style very short. Fl. May–Jun.

Steppes; 1000–1800 m. NW Xinjiang [Kazakstan].

**6. *Tulipa tetraphylla*** Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 296. 1875.

四叶郁金香 *si ye yu jin xiang*

Bulb ovoid, 1.5–2 cm in diam.; tunic blackish, appressed hairy inside distally. Stem glabrous. Leaves (3–)5 or 6(or 7), crowded, subulate, overtopping flower, 1–1.5 cm wide, margin crisped. Flowers 1–4. Tepals yellow, oblong to oblong-rhomboidal, 3–4 cm × 6–7 mm; outer ones tinged with violet and abaxially greenish; inner ones abaxially dingy green. Stamens 1–1.3 cm, equal; filaments glabrous, dilated distally, gradually narrowed toward base. Style short. Fl. May  $2n = 24, 48$ .

Gravelly places, dry slopes. NW Xinjiang [Kazakstan, Kyrgyzstan].

**7. *Tulipa altaica*** Pallas ex Sprengel, Syst. Veg. 2: 63. 1825.

阿尔泰郁金香 *a er tai yu jin xiang*

Bulb ovoid, slightly elongate apically, 2–3.5 cm in diam.; tunic brown, papery, appressed hairy inside or glabrous at middle. Stem 10–30(–35) cm, distally pubescent. Leaves usually 3 or 4, grayish green, ovate to lanceolate, varying in size, not overtopping flower, 0.6–3(–5) cm wide, glabrous or ± pubescent, margin sometimes crisped. Flower solitary. Tepals yellow,

abaxially tinged with greenish purple-red or pink, oblong to oblong-rhomboidal, 2–3.5 × 0.5–2 cm. Stamens glabrous, attenuate from base. Style very short. Capsule broadly ellipsoid, 2.5–4 × 1.5–2 cm. Fl. May, fr. Jun–Jul.  $2n = 24$ .

Thickets, sunny slopes; 1300–2600 m. NW Xinjiang [Kazakstan, Russia (W Siberia)].

**8. *Tulipa sinkiangensis*** Z. M. Mao in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 282. 1980.

新疆郁金香 xin jiang yu jin xiang

Bulb ovoid, elongate apically, 1–1.5(–2.2) cm in diam.; tunic papery, densely appressed hairy inside except at middle. Stem simple or rarely branched, (6–)9–15 cm, glabrous or occasionally minutely pubescent distally. Leaves 3, crowded, narrowly ovate-oblong to linear, 4–6 × 0.2–1.6 cm, sometimes apically recurved or cirrose, distal one much smaller than others. Flower solitary. Tepals yellow, dark red, or reddish yellow, oblong, narrowly obovate, or subspatulate, 1–2 cm × 4–10 mm; outer ones abaxially tinged with purple, green, dark purple, or yellowish green; inner ones streaked with dark color. Stamens equal, 7–10 mm; filaments glabrous, gradually dilated from base. Style 1.5–2 mm. Fl. Apr–May.

• Gravelly and sandy places; 1000–1300 m. Xinjiang (N Tian Shan).

**9. *Tulipa patens*** C. Agardh ex Schultes & J. H. Schultes in Roemer & Schultes, Syst. Veg. 7: 384. 1829.

垂蕾郁金香 chui lei yu jin xiang

Bulb ovoid, slightly elongate apically, 1–1.5 cm in diam.; tunic brown, papery, ± appressed hairy inside, sometimes glabrous toward base. Stem 10–25 cm, glabrous. Leaves 2 or 3, spaced, linear-lanceolate or lanceolate, scarcely or slightly overtopping flower, 0.4–2 cm wide. Flower solitary, nodding in bud or when withered. Tepals white, yellow at base, oblong to lanceolate, 1.5–3 cm × 4–10 mm; outer ones abaxially tinged with purplish green or pale green; inner ones longitudinally streaked with purplish green or pale green at center, ca. 2 × as wide as outer, clawed and pubescent at base. Inner stamens longer than outer ones; filaments hairy and dilated at base. Style 1–2 mm. Capsule oblong, 2–2.5 × ca. 1.5 cm, Fl. and fr. Apr–May.  $2n = 24$ .

Thickets, shady slopes; 1400–2000 m. NW Xinjiang [Kazakstan, Russia].

**10. *Tulipa biflora*** Pallas, Reise Russ. Reich. 3: 727. 1776.

柔毛郁金香 rou mao yu jin xiang

*Tulipa buhseana* Boissier.

Bulb ovoid, slightly elongate apically, 1–1.5 cm in diam.; tunic brown, woolly-pubescent inside distally. Stem 10–15 cm, usually glabrous. Leaves 2, spaced, linear, not overtopping flower, 5–10 mm wide, margin crisped. Flowers solitary or paired, very rarely more. Tepals milky white, bright yellow at base, oblong to lanceolate, 2–2.5 cm × 6–12 mm; outer ones abaxially tinged with purplish green or yellowish green; inner ones longitudinally streaked with purplish green or yellowish green

at center, hairy at base. Inner stamens slightly longer than outer ones; filaments dilated proximally, hairy at base. Style ca. 1 mm. Capsule subglobose, ca. 1.5 cm in diam. Fl. and fr. Apr–Jun.  $2n = 24$ .

Grassy slopes, *Artemisia* deserts. N and W Xinjiang [Afghanistan, Kazakstan, Pakistan, Russia, Turkmenistan, Uzbekistan; NE Africa (Egypt), SW Asia, SE Europe].

**11. *Tulipa dasystemon*** (Regel) Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 507. 1880.

毛蕊郁金香 mao rui yu jin xiang

*Orithya dasystemon* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 261. 1877.

Bulb ovoid, 1–1.2(–1.5) cm in diam.; tunic papery, ± appressed hairy inside distally, rarely glabrous. Stem 10–15 cm, glabrous. Leaves 2, spaced, linear, 0.5–1.5 cm wide. Flower solitary. Tepals milky white or pale yellow, lanceolate to oblong-ovate, 2–2.2 cm × 5–10 mm; outer ones abaxially tinged with purplish green; inner ones abaxially longitudinally streaked with purplish green at center, clawed and hairy at base. Inner stamens slightly longer than outer ones; filaments wholly hairy, rarely so only at base. Style ca. 2 mm. Fl. Apr.  $2n = 24$ , 48.

Sunny slopes; 1800–3200 m. W Xinjiang [Kazakstan, Kyrgyzstan, Tajikistan, Uzbekistan].

**12. *Tulipa heterophylla*** (Regel) Baker, J. Linn. Soc., Bot. 14: 295. 1874.

异叶郁金香 yi ye yu jin xiang

*Orithya heterophylla* Regel in Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 41(1): 440. 1868.

Bulb ovoid, slightly elongate apically, 1–1.4 cm in diam.; tunic brown or blackish brown, papery, glabrous inside. Stem 9–15 cm, glabrous. Leaves 2, opposite, linear or linear-lanceolate, not overtopping flower, 4.5–5.5 cm × 2–4 mm, glabrous. Bracts absent. Flower solitary. Tepals yellow, lanceolate, 2–3 cm × 4–8 mm; outer ones abaxially tinged with purplish green; inner ones abaxially broadly streaked with purplish green at center. Stamens equal; filaments glabrous. Style 4–6 mm. Capsule narrowly ellipsoid, 2.5–3 cm × 6–8 mm, apex long beaked. Fl. Jun, fr. Jul.

Gravelly slopes, sunny places; 2100–3100 m. Xinjiang [Kazakstan, Kyrgyzstan].

**13. *Tulipa uniflora*** (Linnaeus) Besser ex Baker, J. Linn. Soc., Bot. 14: 295. 1874.

单花郁金香 dan hua yu jin xiang

*Ornithogalum uniflorum* Linnaeus, Syst. Nat., ed. 12, 2: 242; Mant. Pl. 1: 62. 1767; *Gagea uniflora* (Linnaeus) Schultes & J. H. Schultes; *Orithya nutans* Trautvetter; *O. uniflora* (Linnaeus) D. Don; *Tulipa nutans* (Trautvetter) B. Fedtschenko.

Bulb ovoid, 1–2 cm in diam.; tunic blackish brown, papery, appressed hairy inside distally. Stem 10–20 cm, glabrous. Leaves 2(or 3), much spaced or ± crowded, narrowly linear-lanceolate or linear, not or slightly overtopping flower, 0.2–1.5

Flora of China 24: 123–126. 2000.

cm wide, glabrous. Flower solitary. Tepals yellow; outer ones abaxially tinged with purplish green or dark violet, oblanceolate to obovate or lanceolate to oblong, 1.5–3 cm × 4–8 mm; inner tepals abaxially longitudinally streaked with purplish green at center, wider than outer ones, clawed at base. Inner stamens slightly longer than outer ones; filaments dilated proximally, gradually attenuate toward apex, glabrous. Style ca. 4 mm. Fl. May–Jun.  $2n = 24$ .

Thickets, sunny gravelly slopes; 1200–2400 m. Nei Mongol, Xinjiang [Kazakstan, Mongolia, Russia].

Reports of *Tulipa heteropetala* Ledebour from China (e.g., in FRPS) are based on misidentified plants of *T. uniflora*.

