

## AMARYLLIDACEAE

石蒜科 shi suan ke

Ji Zhanhe (吉占和 Tsi Zhan-huo)<sup>1</sup>; Alan W. Meerow<sup>2</sup>

Herbs perennial, rarely shrubby or treelike, often with bulbs, corms, rhizomes, or tubers. Leaves basal or cauline, often narrow, margin entire or spiny. Inflorescence a terminal spike, umbel, raceme, panicle, or flowers solitary. Flowers bisexual, actinomorphic or zygomorphic, usually subtended by 1 to several spatheous involucre. Perianth segments 6, in 2 whorls, free or connate to form a short tube, with or without a corona. Stamens 6, inserted at perianth throat or at base of segments; filaments sometimes basally connate; anther dorsifixed or basifixed, mostly introrse. Ovary inferior, 3-loculed; ovules few to many per locule; placentation axile. Style slender; stigma capitate or 3-lobed. Fruit a capsule, usually loculicidal, sometimes dehiscent irregularly, rarely a berry. Seeds with endosperm.

More than 100 genera and 1200 species: tropical, subtropical, and temperate regions worldwide; ten genera and 34 species (14 endemic, four introduced) in China.

The circumscription adopted here for Amaryllidaceae *sensu lato* follows FRPS and is not supported by current phylogenetic analysis of the group. The genus order has been slightly adjusted to reflect the more recent classification of Kubitzki (Fam. Gen. Vasc. Pl. 3, 1998), who placed the genera in segregate families as follows: Acanthochlamydeae: *Acanthochlamys*; Agavaceae: *Agave*; Amaryllidaceae: *Crinum*, *Lycoris*, *Narcissus*, *Pancreatium*, *Zephyranthes*; Hypoxidaceae: *Curculigo*, *Hypoxis*; Ixioliriaceae: *Ixiolirion*.

Many members of this family, including garden plants, are cultivated in China as ornamentals, including *Clivia* Lindley, *Haemanthus* Linnaeus, *Hippeastrum* Herbert, *Hymenocallis* Salisbury, *Leucojum* Linnaeus, *Polianthes* Linnaeus, and *Sprekelia* Heister; however, not all are described in this account. Some species are used medicinally or for fibers.

Qian Xiao-hu, Chen Sing-chi, Hsu Yin, Hu Zhi-bi, Huang Xiu-lan & Fan Quan-jin. 1985. Amaryllidaceae. In: Pei Chien & Ting Chih-tsun, eds., Fl. Reipubl. Popularis Sin. 16(1): 1–42.

- 1a. Leaves grooved ..... 10. *Acanthochlamys*
- 1b. Leaves not grooved.
  - 2a. Leaves fleshy and thick, with a spinelike apex and often with sharp, marginal teeth; perianth tube present; ovary beakless ..... 7. *Agave*
  - 2b. Leaves neither fleshy nor thick, never spiny; perianth tube absent or very short; ovary sometimes narrowly beaked.
    - 3a. Plants with corms, rhizomes, tubers, or fleshy, fibrous roots; flowering stem leafy or bracteate.
      - 4a. Rootstock a bulblike corm covered with a tunic; perianth white or pale blue ..... 6. *Ixiolirion*
      - 4b. Rootstock a tuberous rhizome or corm covered with fibers; perianth yellow (color not recorded for *Curculigo sinensis*).
        - 5a. Fruit a berry; inflorescences usually many flowered ..... 8. *Curculigo*
        - 5b. Fruit a capsule; inflorescences 1- or 2-flowered ..... 9. *Hypoxis*
    - 3b. Plants with bulbs or a bulblike base formed by persistent leaf bases; flowering stem scapose, leafless except for involucre enclosing strictly terminal umbel, sometimes 1-flowered.
      - 6a. Corona present ..... 5. *Narcissus*
      - 6b. Corona absent.
        - 7a. Filaments basally connate into a cup or with free scales among them.
          - 8a. Filaments basally connate into a cup ..... 3. *Pancreatium*
          - 8b. Filaments with free scales among them ..... 4. *Lycoris*
        - 7b. Filaments free, without scales among them.
          - 9a. Fibers not visible in broken bulbs and leaves; flowers solitary ..... 1. *Zephyranthes*
          - 9b. Fibers visible in broken bulbs and leaves; flowers several to many ..... 2. *Crinum*

### 1. ZEPHYRANTHES Herbert, Appendix, 36. 1821, nom. cons.

葱莲属 cong lian shu

*Atamosco* Adanson, nom. rej.

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Herbs perennial, bulbiferous. Bulbs covered with a tunic. Leaves several, fascicled, linear. Flowering stem slender, hollow. Involucre 1, basally tubular, apically 2-notched. Flower solitary, terminal, erect. Perianth funnelform; tube short or long; lobes 6, subequal. Stamens 6, 3 long alternating with 3 short, inserted at throat or in tube of perianth; filament erect to slightly declinate; anther dorsifixed. Ovary with many ovules. Stigma 3-lobed or 3-notched. Fruit a capsule, subglobose, 3-valved, loculicidal. Seeds black, slightly flattened.

About 40 species: warmer regions of the W hemisphere; two species (introduced) in China.

- 1a. Perianth white; tube very short or indistinct; leaves 2–4 mm wide ..... 1. *Z. candida*  
1b. Perianth rose red to pink; tube 1–2.5 cm; leaves 6–8 mm wide ..... 2. *Z. carinata*

**1. *Zephyranthes candida*** (Lindley) Herbert, Bot. Mag. 53: t. 2607. 1826.

1825.

韭莲 jiu lian

葱莲 cong lian

*Amaryllis candida* Lindley, Bot. Reg. 9: t. 724. 1823;  
*Argyropsis candida* (Lindley) M. Roemer.

Bulbs globose, 2–3 cm in diam. Leaves several, fascicled, linear, flattened, 15–30 cm × 6–8 mm. Involucres purplish, 4–5 cm. Flower solitary, terminal; pedicel 2–3 cm. Perianth rose red to pink; tube 1–2.5 cm; lobes obovate, 3–6 cm, apex subacute. Stamens 2/3–4/5 as long as perianth; anther versatile. Style slender; stigma strongly 3-lobed. Capsule subglobose. Fl. summer to autumn.

Bulbs ovoid, ca. 2.5 cm in diam., neck 2.5–5 cm. Leaves bright green, terete-linear, 20–30 cm × 2–4 mm, fleshy. Involucres red-brown. Flowers solitary, terminal; pedicel ca. 1 cm. Perianth white, often tinged with rose abaxially; lobes ± free, 3–5 × ca. 1 cm, usually with tiny scales near throat, apex obtuse to shortly acute. Stamens ca. 1/2 as long as perianth. Style slender; stigma 3-notched. Capsule subglobose, ca. 1.2 cm in diam. Fl. autumn.

Widely cultivated as an ornamental. Becoming naturalized in S China [native to Mexico].

When the name *Zephyranthes grandiflora* Lindley was published for this species earlier in 1825 than *Z. carinata*, the still earlier name *Amaryllis minuta* Kunth (not now considered to be the same species) was cited in synonymy. Therefore, *Zephyranthes grandiflora* is nomenclaturally superfluous and an illegitimate name.

Widely cultivated as an ornamental. Becoming naturalized in S China [native to South America].

**2. *Zephyranthes carinata*** Herbert, Bot. Mag. 52: t. 2594.

## 2. CRINUM Linnaeus, Sp. Pl. 1: 291. 1753.

文殊兰属 wen shu lan shu

Herbs perennial, bulbiferous. Leaves basal, ligulate or ensiform, often large, with extensible fibers visible when torn. Flowering stem solid. Inflorescences umbellate, rarely flower solitary; involucre large and broad. Flowers pedicellate or sessile. Perianth actinomorphic or slightly zygomorphic, salverform or subsalverform; lobes oblong, lanceolate, or linear, straight or curved upward. Stamens inserted at throat of perianth tube; filament suberect to declinate, filiform; anther versatile, linear. Ovary 3-loculed; ovules 2 to many per locule. Style slightly decumbent, slender; stigma capitate, small. Fruit a capsule, subglobose, dehiscent irregularly. Seeds orbicular or angular, large.

Between 65 and over 100 species: tropical and subtropical regions of both hemispheres, mainly in Africa; two species in China.

According to the literature, *Crinum asiaticum* Linnaeus var. *anomalum* Herbert, *C. asiaticum* var. *declinatum* Herbert, and *C. loureiroi* M. Roemer also occur in China, but no specimens of these taxa have been seen by the present authors.

- 1a. Perianth lobes linear, usually less than 1 cm wide, apex acuminate; perianth tube straight ..... 1. *C. asiaticum*  
1b. Perianth lobes lanceolate to oblong-lanceolate, more than 1 cm wide, apex usually abruptly contracted to shortly acuminate; perianth tube often slightly curved ..... 2. *C. latifolium*

**1. *Crinum asiaticum*** Linnaeus var. **sinicum** (Roxburgh ex Herbert) Baker, Handb. Amaryll. 75. 1888.

linear, 4.5–9 × 0.6–0.9 cm, apex acuminate. Stamens reddish; filament 4–5 cm; anther linear, more than 1.5 cm, apex acuminate. Ovary fusiform, less than 2 cm. Capsule subglobose, 3–5 cm in diam. Seed often 1. Fl. summer.

文殊兰 wen shu lan

• Seashores, sandy places near river banks. Fujian, Guangdong, Guangxi, Taiwan.

*Crinum sinicum* Roxburgh ex Herbert, Bot. Mag. 47: 7 sub t. 2121. 1820.

*Crinum asiaticum* var. *asiaticum* occurs in tropical Asia but not in China.

Herbs perennial, stout. Bulbs narrowly cylindrical. Leaves 20–30, dark green, linear-lanceolate, ca. 100 × 7–12 cm, margin undulate, apex acuminate, sharply pointed. Flowering stem erect, nearly as long as leaves. Umbel 10–24-flowered; bracts linear, 3–7 mm; involucre 2, lanceolate, 6–10 cm, membranous. Flowers fragrant; pedicel 0.5–2.5 cm. Perianth salverform; tube greenish white, straight, 7–10 cm × ca. 2 mm; lobes white,

The Chinese plant is widely cultivated as an ornamental and is used medicinally.

**2. *Crinum latifolium*** Linnaeus, Sp. Pl. 1: 291. 1753.

西南文殊兰 xi nan wen shu lan

*Crinum esquirolii* H. Léveillé; *C. ornatum* Herbert var. *latifolium* (Linnaeus) Herbert.

Herbs perennial, fairly stout. Leaves ligulate, usually ca. 70 × 3.5–6 cm or more. Umbel several flowered; bracts linear; involucre 2, lanceolate, ca. 9 cm. Pedicel very short. Perianth subsalverform; tube slightly curved, ca. 9 cm; lobes white, often

tinged with red, lanceolate to oblong-lanceolate, ca. 7.5 × 1.5 cm, apex shortly acuminate. Filaments shorter than perianth; anthers linear, 1.2–1.8 cm. Fl. Jun–Aug.

Dry riverbeds, sandy soil. Guangxi, Guizhou, Yunnan [India, Laos, Myanmar, Sri Lanka, Thailand, Vietnam].

### 3. PANCRATIUM Linnaeus, Sp. Pl. 1: 290. 1753.

全能花属 *quan neng hua shu*

Herbs perennial, bulbiferous. Leaves basal, sessile, linear or ligulate. Flowering stem solid. Inflorescences umbellate, 1- to many flowered; involucre 2. Pedicel often short. Perianth subfunneliform; lobes 6, spreading, lanceolate or linear. Stamens inserted at throat of perianth tube; filaments connate into a cup for most of their length but apically free; anthers versatile, linear. Ovary with many ovules. Style filiform; stigma capitate, sometimes somewhat 3-lobed to -branched, small. Fruit a capsule, 3-valved, loculicidal. Seeds black, angular.

About 15 species: Mediterranean region to tropical Africa and Asia; one species in China.

**1. *Pancratium biflorum*** Roxburgh, Fl. Ind., ed. 1832, 2: 125. 1832.

全能花 *quan neng hua*

Leaves several, ensiform, 30–45 × 2.5–5 cm. Flowering

stem shorter than leaves. Inflorescences 2- or 3-flowered; involucre lanceolate. Perianth tube green, slender, 10–12 cm; lobes white, linear, subequaling tube. Staminal cup ca. 1/3 as long as perianth tube and equal to free part of filament. Fl. Jul–Aug.

Hong Kong [India].

### 4. LYCORIS Herbert, Bot. Mag. 47: 5 sub t. 2113. 1819.

石蒜属 *shi suan shu*

Herbs perennial, bulbiferous. Bulbs subglobose to ovoid; tunic brown to black-brown. Leaves appearing before or after anthesis, ligulate. Flowering stem erect, simple, solid. Umbel terminal, 4–8-flowered; involucre 2, membranous. Perianth white, creamy, gold, pink, or bright red, funneliform; lobes oblanceolate to narrowly elliptic, margin sometimes undulate; ring of 6 perianth scales or fimbriae sometimes present at throat of tube. Stamens inserted at throat of perianth tube; filament filiform; anther versatile. Ovary with few ovules. Style slender; stigma capitate, very small. Fruit a capsule, 3-valved, usually 3-angled, loculicidal. Seeds black, subglobose.

About 20 species: China, India, Japan, Korea, Laos, Myanmar, Pakistan, Thailand, Vietnam; 15 species (ten endemic) in China.

1a. Flowers actinomorphic; perianth lobes apically slightly recurved, margin basally minutely undulate or not undulate.

2a. Margin of perianth lobes not undulate.

3a. Perianth pale purple but apically blue, tube 1–1.5 cm; leaves ca. 1 cm wide ..... 14. *L. sprengeri*

3b. Perianth white or yellow, tube 4–6 cm; leaves 1.5–2 cm wide ..... 15. *L. longituba*

2b. Margin of perianth lobes basally minutely undulate.

4a. Leaves first appearing in autumn and then reappearing in spring; perianth purple ..... 11. *L. squamigera*

4b. Leaves appearing in spring; perianth yellow or white.

5a. Perianth yellow, tube 2.5–3.5 cm; leaves ca. 2 cm wide ..... 12. *L. anhuiensis*

5b. Perianth white, gradually changing to yellowish pink, tube ca. 1 cm; leaves ca. 1.2 cm wide ..... 13. *L. incarnata*

1b. Flowers zygomorphic; perianth lobes recurved, margin undulate.

6a. Leaves appearing in autumn; stamens obviously longer than perianth.

7a. Perianth yellow or light rose red.

8a. Perianth yellow; leaves ensiform, ca. 60 × 2 cm, apex acuminate ..... 4. *L. aurea*

8b. Perianth light rose red; leaves ligulate, ca. 20 × 1 cm, apex rounded ..... 5. *L. rosea*

7b. Perianth bright red, white, or ochereous.

9a. Perianth bright red; leaves narrowly ligulate, ca. 0.5 cm wide ..... 1. *L. radiata*

9b. Perianth white or ochereous; leaves ligulate, 1.2–1.5 cm wide.

10a. Perianth ochereous; leaves green ..... 2. *L. straminea*

10b. Perianth white; leaves dark green ..... 3. *L. houdyshellii*

6b. Leaves appearing in spring; stamens shorter to slightly longer than perianth.

11a. Stamens shorter than perianth; leaf midvein not distinctly pale.

12a. Perianth pink in bud, becoming creamy at anthesis, then gradually fading to white, lobes without pink stripes ..... 9. *L. caldwellii*

12b. Perianth white with red stripes in bud, fading to white at anthesis, lobes abaxially with scattered, pink stripes ..... 10. *L. shaanxiensis*

11b. Stamens nearly as long as to slightly longer than perianth; leaf midvein distinctly pale (except

in *L. albiflora*).

- 13a. Perianth pink in bud, becoming creamy as buds develop, then gradually fading to white, lobes adaxially with scattered, pink stripes, abaxially with pink midvein ..... 8. *L. albiflora*
- 13b. Perianth yellow, lobes with or without stripes or spots.
- 14a. Perianth lobes without red stripes; leaves green, ligulate, ca. 3.5 × 2 cm ..... 6. *L. chinensis*
- 14b. Perianth lobes abaxially with red stripes or brushlike spots; leaves dark green, narrowly ligulate, 24–29 × 1–1.2 cm ..... 7. *L. guangxiensis*

**1. *Lycoris radiata*** (L'Héritier) Herbert, Bot. Mag. 47: 5 sub t. 2113. 1819.

石蒜 shi suan

*Amaryllis radiata* L'Héritier, Sert. Angl. 16. 1788.

Bulbs subglobose, 1–3 cm in diam. Leaves appearing in autumn, dark green, narrowly ligulate, ca. 15 × 0.5 cm, midvein pale, apex obtuse. Flowering stem ca. 30 cm. Umbel 4–7-flowered; involucre 2, lanceolate, ca. 3.5 × 0.5 cm. Perianth bright red; tube green, ca. 0.5 cm; lobes strongly recurved, narrowly oblanceolate, ca. 3 × 0.5 cm, margin strongly undulate. Stamens conspicuously exserted. Fl. Aug–Sep. fr. Oct.  $2n = 22, 32, 33$ .

Shady and moist places on slopes, rocky places along stream banks; near sea level to 1000(–2500) m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Shaanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, Nepal].

The fertile, diploid populations are *Lycoris radiata* var. *pumila* Grey (Hardy Bulbs 2: 58. 1938) according to Hsu et al. (Sida 16: 325. 1994), while the morphologically essentially identical, triploid populations are *L. radiata* var. *radiata*.

**2. *Lycoris straminea*** Lindley, J. Hort. Soc. London 3: 76. 1848.

稻草石蒜 dao cao shi suan

Bulbs subglobose, ca. 3 cm in diam. Leaves appearing in autumn, green, midvein pale. Flowering stem ca. 35 cm. Umbel 5–7-flowered; involucre 2, lanceolate, ca. 3 × 0.5 cm. Perianth ochreous; tube ca. 1 cm; lobes strongly recurved, adaxially with scattered, pink stripes or spots which disappear at anthesis, oblanceolate, ca. 4 × 0.6 cm, margin strongly undulate. Stamens conspicuously exserted, 5–6 cm. Ovary subglobose, ca. 0.6 cm in diam. Fl. Aug.

- Shady and moist slopes; ca. 100 m. Jiangsu, Zhejiang.

**3. *Lycoris houdyshelii*** Traub, Herbertia 13: 45. 1957.

江苏石蒜 jiang su shi suan

Bulbs subglobose, ca. 3 cm in diam. Leaves appearing in autumn, dark green, ligulate, ca. 30 × 1.2 cm, midvein pale, apex obtuse. Flowering stem ca. 30 cm. Umbel 4–7-flowered; involucre 2, oblanceolate, ca. 2 × 0.8 cm. Perianth white; tube ca. 0.8 cm; lobes strongly recurved, abaxially with green midvein, oblanceolate, ca. 4 × 0.8 cm, margin strongly undulate. Stamens conspicuously exserted, 5–6 cm; filament white. Style pink at apex. Fl. Sep.  $2n = 30^*$ .

- Shady and moist slopes. Jiangsu, Zhejiang.

This triploid species is widely cultivated in S China. Further study is required to show whether it really occurs in the wild or only as cultivated plants, as was suggested by Hsu et al. (Sida 16: 321. 1994).

**4. *Lycoris aurea*** (L'Héritier) Herbert, Bot. Mag. 47: 5 sub t.

2113. 1819.

忽地笑 hu di xiao

*Amaryllis aurea* L'Héritier, Sert. Angl. 14. 1788.

Bulbs ovoid, ca. 5 cm in diam. Leaves appearing in autumn, ensiform, ca. 60 × 1.7–2.5 cm, midvein pale, base and apex gradually tapering. Flowering stem ca. 60 cm. Involucres 2, lanceolate, ca. 3.5 × 0.8 cm. Perianth yellow; tube 1.2–1.5 cm; lobes strongly recurved, abaxially with pale green midvein, oblanceolate, ca. 6 × 0.4–1 cm, margin strongly undulate. Stamens slightly or long exserted, 7–12 cm; filament yellow. Style rose red at apex. Capsule 3-angled, loculicidal. Seeds few, black, subglobose, ca. 0.7 cm in diam. Fl. Aug–Sep.  $2n = 12–16$ .

Shady and moist places on slopes, rock crevices; (100–)500–2300 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Laos, Myanmar, Pakistan, Thailand, Vietnam].

*Lycoris traubii* W. Hayward (Pl. Life 13: 40. 1957) has been named for plants from Taiwan and S Japan that are closely related to *L. aurea*. The status of this species and its relationship to *L. aurea* needs further study. *Lycoris aurea* var. *angustitepala* P. S. Hsu et al. (Sida 16: 318. 1994) has been named for plants from S Gansu (Kang Xian) and SW Shaanxi (Feng Xian) that are characterized by narrow perianth lobes (0.4–0.8 cm wide) and long exserted stamens (1.5–2 × as long as perianth).

*Lycoris aurea* is cultivated as an ornamental in S China.

**5. *Lycoris rosea*** Traub & Moldenke, Amaryllidaceae: Tribe Amaryllieae, 178. 1949.

玫瑰石蒜 mei gui shi suan

Bulbs subglobose, ca. 2.5 cm in diam. Leaves appearing in autumn, pale green, ligulate, ca. 20 × 0.8 cm, midvein pale. Flowering stem pale rose red, ca. 30 cm. Umbel ca. 5-flowered; involucre 2, lanceolate, ca. 3.5 × 0.5 cm. Perianth light rose red; tube ca. 1 cm; lobes recurved, oblanceolate, ca. 4 × 0.8 cm, margin undulate. Stamens exserted, 4.5–5 cm. Fl. Sep.  $2n = 22^*$ .

- Shady slopes, rocky places. Jiangsu, Zhejiang.

According to Hsu et al. (Sida 16: 326–327. 1994), this species is believed to be a hybrid between *Lycoris radiata* var. *pumila* Grey and *L. sprengeri*.

**6. *Lycoris chinensis*** Traub, Herbertia 14: 44. 1958.

中国石蒜 zhong guo shi suan

Bulbs ovoid, ca. 4 cm in diam. Leaves appearing in spring, green, midvein distinctly pale, apex rounded. Flowering stem ca. 60 cm. Umbel 5- or 6-flowered; involucre 2, oblanceolate, ca. 2.5 × 0.8 cm. Perianth yellow; tube 1.7–2.5 cm; lobes strongly recurved, abaxially with pale yellow midvein, oblanceolate,

ca. 6 × 1 cm, margin strongly undulate. Stamens nearly as long as or somewhat longer than perianth; filament yellow. Style rose red at apex. Fl. Jul–Aug.  $2n = 16$ .

Mixed forests, shady and moist slopes. Henan, Jiangsu, Shaanxi, Sichuan, Zhejiang [S Korea].

This species is related to *Lycoris aurea*, but the leaves appear in spring.

**7. *Lycoris guangxiensis*** Y. Xu & G. J. Fan in Y. Xu et al., *Acta Phytotax. Sin.* 20: 196. 1982.

广西石蒜 *guang xi shi suan*

Bulbs ovoid, ca. 3 cm in diam. Leaves appearing in early spring, dark green, narrowly ligulate, 24–30 × 1–1.2 cm, midvein distinctly pale, apex obtuse. Flowering stem ca. 50 cm. Umbel 3–6-flowered; involucre 2, pale brown, ovate-lanceolate to lanceolate, ca. 4 × 1(–1.5) cm. Perianth yellow with red stripes in bud; tube 1.5–2 cm; lobes adaxially with red, brush-like stripes, obovate-ob lanceolate to oblanceolate, ca. 7 × 1.5 cm, base clawed, ca. 0.5 cm wide, margin minutely undulate, apex acute. Stamens nearly as long as perianth. Style longer than perianth. Fl. Jul–Aug.

• Mixed forests, shady and moist places on slopes. Guangxi.

**8. *Lycoris albiflora*** Koidzumi, *Bot. Mag. (Tokyo)* 38: 100. 1924.

乳白石蒜 *ru bai shi suan*

Bulbs ovoid, ca. 4 cm in diam. Leaves appearing in spring, green, ligulate, ca. 35 × 1.5 cm, midvein not distinctly pale, apex obtuse. Flowering stem ca. 60 cm. Umbel 6–8-flowered; involucre 2, oblanceolate, ca. 3.5 × 1.2 cm. Perianth pink in bud, usually creamy at anthesis, later white; tube ca. 2 cm; lobes recurved, adaxially with a few scattered, pink stripes, abaxially with red midvein, oblanceolate, ca. 6 × 1.2 cm, margin undulate. Stamens nearly as long as or slightly longer than perianth; filament pale red at apex. Style slightly longer than perianth; stigma rose red. Fl. Aug–Sep.  $2n = 16, 17, 18$ .

Mountain slopes. Jiangsu [Japan, Korea].

**9. *Lycoris caldwellii*** Traub, *Herbertia* 13: 46. 1957.

短蕊石蒜 *duan rui shi suan*

Bulbs subglobose, ca. 4 cm in diam. Leaves appearing in early spring, green, ligulate, ca. 30 × 1.5 cm, midvein not distinctly pale, apex obtuse. Umbel 6- or 7-flowered. Perianth pink to creamy in bud, gradually fading to white at anthesis; tube ca. 2 cm; lobes oblanceolate, ca. 7 × 1.2 cm, margin minutely undulate. Stamens shorter than perianth; filament white. Style nearly as long as perianth, apex pale rose. Fl. Sep.  $2n = 27^*$ .

• Shady and wet places on slopes. Jiangsu, Jiangxi, Zhejiang.

**10. *Lycoris shaanxiensis*** Y. Xu & Z. B. Hu in Y. Xu et al., *Acta Phytotax. Sin.* 20: 196. 1982.

陕西石蒜 *shan xi shi suan*

Bulbs subglobose, ca. 5 cm in diam. Leaves appearing in early spring, ligulate, ca. 50 × 1.8 cm, midvein not distinctly

pale, apex obtuse. Flowering stem ca. 50 cm. Umbel 5–8-flowered; involucre 2, pale pink, lanceolate to broadly so, 5–7 × ca. 1.2 cm. Perianth white; tube ca. 2 cm; lobes recurved, adaxially with a few scattered, pale red stripes, abaxially with red midvein, margin minutely undulate. Stamens shorter than perianth; filament pale purple. Style slightly longer than perianth, apex purple. Fl. Aug–Sep.

• Shady slopes. Shaanxi, Sichuan.

**11. *Lycoris squamigera*** Maximowicz, *Bot. Jahrb. Syst.* 6: 79. 1885.

鹿葱 *lu cong*

Bulbs ovoid, ca. 5 cm in diam. Leaves first appearing in autumn and a second time in early spring, green, ligulate, ca. 8 × 2 cm, apex obtuse. Flowering stem ca. 60 cm. Umbel 4- or 5-flowered; involucre 2, lanceolate, ca. 6 × 1.3 cm. Perianth pale purple; tube ca. 2 cm; lobes oblanceolate, ca. 7 × 1.8 cm, margin basally slightly undulate. Stamens nearly as long as perianth. Style slightly longer than perianth. Fl. Aug.  $2n = 27$ .

Shady and moist often disturbed places, along valleys, beside streams; near sea level to 1200 m. Jiangsu, Shandong, Zhejiang [Japan, Korea].

**12. *Lycoris anhuiensis*** Y. Xu & G. J. Fan in Y. Xu et al., *Acta Phytotax. Sin.* 20: 197. 1982.

安徽石蒜 *an hui shi suan*

Bulbs ovoid to ovoid-ellipsoid, 3–4.5 cm in diam. Leaves appearing in early spring, ligulate but gradually tapering toward apex, ca. 35 × 1.5–2 cm, midvein pale, apex obtuse. Flowering stem ca. 60 cm. Umbel 4–6-flowered; involucre 2, narrowly ovate to lanceolate, 3–3.5 × ca. 1.2 cm. Perianth yellow, ca. 7.5 cm in diam.; tube 2.5–3.5 cm; lobes strongly recurved and widely spreading, obovate-ob lanceolate, ca. 6 × 1.5 cm, margin basally minutely undulate. Stamens nearly as long as perianth. Style slightly longer than perianth. Fl. Aug.  $2n = 16^*$ .

• Rock crevices on slopes. Anhui, Jiangsu.

**13. *Lycoris incarnata*** Comes ex Sprenger, *Gartenwelt* 10: 490. 1906.

香石蒜 *xiang shi suan*

Bulbs ovoid, ca. 3 cm in diam. Leaves appearing in early spring, green, ligulate but gradually tapering toward apex, ca. 50 × 1.2 cm, midvein inconspicuously pale, apex obtuse. Perianth white with red midvein in bud, gradually changing to yellowish pink; tube ca. 1 cm; lobes adaxially with scattered, red stripes, abaxially with purple midvein, oblanceolate, ca. 5 × 1.2 cm, margin minutely undulate. Stamens nearly as long as perianth; filament purple. Style purple, darker at apex, slightly longer than perianth. Fl. Sep.  $2n = 30^*$ .

• Mountain slopes. Hubei, Yunnan.

**14. *Lycoris sprengeri*** Comes ex Baker, *Gard. Chron.*, ser. 3, 32: 469. 1902.

换锦花 *huan jin hua*

Bulbs ovoid, ca. 3.5 cm in diam. Leaves appearing in early spring, green, ligulate, ca. 30 × 1 cm, apex obtuse. Flowering

stem ca. 60 cm. Umbel 4–6-flowered; involucre 2, ca. 3.5 × 1.2 cm. Perianth pale purple; tube 1–1.5 cm; lobes often bluish at apex, oblanceolate, ca. 4.5 × 1 cm, margin not undulate. Stamens nearly as long as perianth. Style slightly longer than perianth. Capsule 3-angled, loculicidal. Seeds black, subglobose, ca. 0.5 cm in diam. Fl. Aug–Sep.  $2n = 22^*$ .

• Sparse forests, bamboo forests, shady and wet places on slopes; ca. 100 m. Anhui, Hubei, Jiangsu, Zhejiang.

**15. *Lycoris longituba*** Y. Xu & G. J. Fan, Acta Phytotax. Sin. 12: 299. 1974.

长筒石蒜 chang tong shi suan

Bulbs ovoid, ca. 4 cm in diam. Leaves appearing in early spring, lanceolate, gradually tapering toward apex, ca. 40 × 1.5–2.5 cm, midvein pale, apex rounded. Flowering stem 60–80 cm. Umbel 5–7-flowered; involucre 2, lanceolate, ca. 5 cm, apex acuminate. Perianth white or yellow, ca. 5 cm in diam.; tube 4–6 cm; lobes adaxially with pale red stripes (if perianth white), narrowly elliptic, 6–8 × ca. 1.5 cm, margin not undulate, apex slightly recurved. Stamens slightly shorter than perianth. Style

longer than perianth. Fl. Jul–Aug.  $2n = 16^*$ .

• Mountain slopes, shady and moist areas on slopes; low elevations. Jiangsu.

- 1a. Perianth white, lobes adaxially with pale red stripes ..... 15a. var. *longituba*  
1b. Perianth yellow ..... 15b. var. *flava*

**15a. *Lycoris longituba* var. *longituba***

长筒石蒜(原变种) chang tong shi suan (yuan bian zhong)

Perianth white; lobes adaxially with pale red stripes. Fl. Jul–Aug.

• Mountain slopes; low elevations. Jiangsu.

**15b. *Lycoris longituba* var. *flava*** Y. Xu & X. L. Huang in Y. Xu et al., Acta Phytotax. Sin. 20: 198. 1982.

黄长筒石蒜 huang chang tong shi suan

Perianth yellow. Fl. Aug.

• Shady and moist areas on slopes; low elevations. Jiangsu.

## 5. NARCISSUS Linnaeus, Sp. Pl. 1: 289. 1753.

水仙属 shui xian shu

Herbs perennial, bulbiferous. Bulbs with a membranous tunic. Leaves basal, linear or terete. Flowering stem solid. Inflorescence a several-flowered umbel or sometimes a solitary flower; involucre membranous, basally tubular. Flowers erect or pendulous. Perianth tube cylindric or funnellform, short; lobes 6, erect or recurved, subequal; corona narrowly tubular, corollalike or shallowly cupular. Stamens inserted in perianth tube; anther basifixed. Ovary with many ovules. Style filiform; stigma 3-lobed, small. Fruit a loculicidal capsule. Seeds subglobose.

About 60 species: mainly in C Europe and the Mediterranean region; one species in China.

Additional species of *Narcissus*, e.g., *N. jonquilla* Linnaeus and *N. pseudonarcissus* Linnaeus, are cultivated as garden plants in China but are not described in this account.

**1. *Narcissus tazetta*** Linnaeus var. ***chinensis*** M. Roemer, Fam. Nat. Syn. Monogr. 4: 223. 1847.

水仙 shui xian

Bulbs ovoid. Leaves broadly linear, flat, 20–40 × 0.8–1.5 cm, margin entire, apex obtuse. Flowering stems usually equaling leaves. Umbels 4–8-flowered; involucre membranous. Flowers fragrant; pedicels unequal, perianth tube glaucous, ca. 2 cm, slender, nearly 3-angled; lobes widely spreading, white, broadly elliptic to ovate, apex shortly acute; corona pale yellow, shallowly cupular, less than 1/2 as long as perianth, margin not undulate. Stamens ca. 4 mm, not exerted. Fl. Feb–Mar.  $2n = 30^*$ .

• Sandy places, wastelands; near sea level to 100 m. SE Fujian, E

Zhejiang.

*Narcissus tazetta* has a large number of forms occurring in S Europe, is very common in cultivation, and extends in a wild or naturalized state from S Europe through SW Asia to E Asia. It seems impossible to define clearly the delimitation of these forms by any important characters or definite manner. Although it is difficult to find differences between the Chinese entity and the original description of *N. tazetta*, this varietal name has been widely used in horticultural circles and we suggest maintaining it.

*Narcissus tazetta* var. *chinensis* is widely cultivated as an ornamental in China. It was reported to be introduced 1300–1400 years ago, and has become naturalized in coastal areas and offshore islands of Fujian and Zhejiang.

## 6. IXIOLIRION Fischer ex Herbert, Appendix, 37. 1821.

鸢尾蒜属 yuan wei suan shu

Herbs perennial, cormous. Corms covered with a tunic. Leaves basal, linear. Flowering stem with a few leaves at base. Inflorescences terminal, umbellate, racemose, or sometimes paniculate, 2- to several flowered, often with 1–3 additional flowers in basal leaf axil of flowering stem. Flowers pedicellate. Perianth segments free, sometimes proximally with a pseudotube formed by laxly connivent segments, or connate proximally into a true tube. Stamens in 2 whorls, inserted at base of perianth; filament linear to sub-filiform; anther basifixed or dorsifixed, erect. Ovary subclavate, with many ovules. Style filiform; stigma 3-lobed. Fruit a capsule, oblong-clavate, 3-valved. Seeds black, ovoid-oblong, small.

About three species: C and SW Asia, NE Africa (Egypt); two species (one endemic) in China.

- 1a. Perianth segments spreading, free, sometimes laxly connivent proximally into a pseudotube; filament purple, anther basifixed ..... 1. *I. tataricum*  
1b. Perianth segments recurved, connate proximally into a true tube; filament white, anther dorsifixed ..... 2. *I. songaricum*

**1. *Ixiolirion tataricum*** (Pallas) Herbert, Appendix 37. 1821.

鸢尾蒜 yuan wei suan

Corms ovoid, 1.5–2.5 × 2(–2.5) cm; tunic brown, longitudinally striate. Basal leaves usually 3–8, linear. Flowering stem 10–40 cm, base with 1–3 smaller leaves; bracts smaller than involucre, membranous. Inflorescence an umbel or short raceme, 3–6-flowered, sometimes basal leaf axil of flowering stem with 1–3 additional flowers; involucre 2 or 3, white or green, lanceolate, to 3.5 cm, membranous, apex acuminate and aristate. Pedicels unequal. Perianth azure to dark violet or light blue; segments spreading, free, sometimes laxly connivent proximally into a ca. 1 cm long pseudotube, oblanceolate to narrowly so, 2–3.5 cm × 1–7 mm, veins 3–5 at middle, apex subacute. Stamens unequal, outer ones longer than inner; filament purple, subfiliform, glabrous; anther basifixed, straight. Fl. Apr–Jun.

Valleys, stony slopes, sandy places, waste grasslands. N Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Pakistan, Russia, Turkmenistan].

- 1a. Perianth azure to dark violet, segments not connivent proximally into a pseudotube ..... 1a. var. *tataricum*  
1b. Perianth light blue, segments laxly connivent proximally into a ca. 1 cm long pseudotube ..... 1b. var. *ixiolirioides*

**1a. *Ixiolirion tataricum* var. *tataricum***

鸢尾蒜(原变种) yuan wei suan (yuan bian zhong)

*Amaryllis tatarica* Pallas, Reise Russ. Reich. 3: 727. 1776.

Perianth azure to dark violet, segments 1–7 mm wide, not connivent proximally into a pseudotube. Fl. Apr–Jun.

Valleys, sandy places, waste grasslands. N Xinjiang [Afghanistan, Kazakstan, Pakistan, Russia, Turkmenistan].

**1b. *Ixiolirion tataricum* var. *ixiolirioides*** (Regel) X. H. Qian, Bull. Bot. Res., Harbin 4(2): 158. 1984.

假管鸢尾蒜 jia guan yuan wei suan

*Kolpakowskia ixiolirioides* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 635. 1878; *Ixiolirion ixiolirioides* (Regel) Dandy; *I. kolpakowskianum* Regel.

Perianth light blue, segments 1–3 mm wide, laxly connivent proximally into a ca. 1 cm long pseudotube. Fl. Apr–May.

Stony slopes. N Xinjiang [Kazakstan, Kyrgyzstan].

Rudolf Kamelin (pers. comm.) notes that this taxon differs from var. *tataricum* in other characters and would be better recognized at the rank of species.

**2. *Ixiolirion songaricum*** P. Yan in N. R. Cui, Fl. Xinjiang. 6: 605. 1996.

准噶尔鸢尾蒜 zhun ga er yuan wei suan

Corms subovoid, 1.5–3 × 0.8–2.2 cm; tunic brown, longitudinally striate. Basal leaves linear, 1.5–3 × 0.2–0.5(–0.7) cm. Inflorescence an umbel, 3–6-flowered, sometimes middle leaf axil of flowering stem with 1 or 2 additional flowers. Pedicels unequal, 1–3 cm. Perianth azure or pale purple, 1.8–3 cm; segments recurved, connate proximally into a true tube 9–11 mm, linear or linear-lanceolate, outer segments 1.5–2.5 mm wide, apex with an angular appendix with tufted hairs inside, inner segments 2.5–3.5 mm wide, apex acute. Stamens unequal; filament white, 3 outer ones filiform, 1.1–1.4 cm, 3 inner ones linear-oblanceolate, 1.6–2.1 cm; anther dorsifixed. Stigma blue-purple, 1.3–1.8 cm. Capsule 10–16 × 4–7 mm. Fl. Apr–May, fr. May–Jun.

• Dry slopes and fields; 400–1600 m. Xinjiang (N slopes of Tian Shan).

**7. AGAVE Linnaeus, Sp. Pl. 1: 323. 1753.**

龙舌兰属 long she lan shu

Plants perennial or monocarpic. Stems very short or indistinct. Leaves in a basal rosette, large, stout, leathery-fleshy or somewhat woody, containing many fibers, margin usually spiny, rarely entire, apex tipped with a spine. Flowering stems branched or simple, tall, stout. Inflorescence terminal, a spike or panicle, mostly very large. Perianth tube short; lobes narrow, subequal. Stamens inserted at throat or in tube of perianth; filament filiform, usually longer than perianth; anther versatile. Ovary with many ovules. Style slender; stigma 3-lobed. Fruit a capsule, oblong, 3-valved, loculicidal. Seeds numerous, black, thin, flattened.

About 200 species: arid and semiarid regions of the W hemisphere; two species (introduced) in China.

*Agave* is often placed in a distinct family, the Agavaceae. Recent molecular research suggests that *Hosta* Trattinnick is quite closely related.

Additional species of *Agave*, e.g., *A. angustifolia* Haworth and *A. cantala* Roxburgh, are cultivated as garden plants in China but are not described in this account.

- 1a. Leaves usually 200–250, apex straight ..... 1. *A. sisalana*  
1b. Leaves usually 30–40, apex recurved ..... 2. *A. americana*

1. *Agave sisalana* Perrine ex Engelmann, Trans. Acad. Sci. St. Louis 3: 314. 1875.

剑麻 jian ma

Stems short, thick. Leaves usually 200–250, in a basal rosette before inflorescence develops, glaucous when young, later dark blue-green, ensiform, straight, usually 1–1.5 m × 10–15 cm, fleshy, adaxially concave, abaxially convex, margin not spiny or rarely spiny, apex straight and tipped with a red-brown spine 2–3 cm. Panicle to 6 m, stout, usually bearing bulblets after anthesis. Flowers with a strong smell; pedicel 5–10 mm. Perianth yellowish green; tube 1.5–2.5 cm; lobes obovate-oblong, 1.2–2 × 0.6–0.8 cm. Stamens inserted at base of perianth lobes; filament yellow, 6–8 cm; anther ca. 2.5 cm. Ovary oblong, ca. 3 cm. Style slender, 6–7 cm; stigma slightly capitate. Capsule oblong, ca. 6 × 2–2.5 cm.

Widely cultivated. S China [native to Mexico].

The leaves are used as a source of fiber.

2. *Agave americana* Linnaeus, Sp. Pl. 1: 323. 1753.

龙舌兰 long she lan

Stems indistinct. Leaves usually 30–40 or more, in a massive basal rosette, oblanceolate, 1–2 m × 15–20 cm, fleshy, margin spiny, apex recurved and tipped with a dark brown spine 1.5–2.5 cm. Panicle many branched, 6–12 m, usually bearing few bulblets after anthesis. Perianth greenish yellow; tube ca. 1.2 cm; lobes 2.5–3 cm. Stamens ca. 2 × as long as perianth. Capsule oblong, ca. 5 cm.

Widely cultivated. Naturalized in S China [native to tropical America].

The leaves are used medicinally and as a source of fiber.

## 8. CURCULIGO Gaertner, Fruct. Sem. Pl. 1: 63. 1788.

仙茅属 xian mao shu

*Molineria* Colla.

Herbs perennial, often with tuberous rhizomes. Leaves several, basal, sessile or petiolate; leaf blade usually lanceolate, plicate, leathery or papery. Flowering stems axillary, erect or apically bent downward, long or short. Inflorescences racemose, spicate, or subcapitate. Flowers bisexual or unisexual. Perianth often yellow; segments spreading, subequal, sometimes basally connate into a tube. Stamens inserted at base of perianth segments; anther nearly basifixed or dorsifixed; filament very short, sometimes subequaling anther. Ovary usually hairy; ovules 2 to many. Style columnar, slender; stigma 3-lobed. Fruit a berry, indehiscent, apex sometimes beaked; beak (when present) formed by persistent perianth tube. Seeds small, often striped; hilum conspicuous.

About 20 species: tropical and subtropical regions worldwide; seven species (two endemic) in China.

Wu Zhengyi (editor's note) believes that species nos. 1–4 would be better treated in the genus *Molineria*, which has recently been treated as separate from *Curculigo*, e.g., by Nordal (in Kubitzki, Fam. Gen. Vasc. Pl. 3: 294. 1998).

1a. Berry with a slender beak 2.5–7 mm.

2a. Leaves 0.5–2.5 cm wide; berry beak ca. 2.5 mm ..... 6. *C. orchioides*

2b. Leaves 3–8 cm wide; berry beak 6–7 mm ..... 7. *C. glabrescens*

1b. Berry beakless or very shortly beaked.

3a. Leaves abaxially white tomentose ..... 5. *C. crassifolia*

3b. Leaves abaxially glabrous or laxly hairy but never tomentose.

4a. Racemes 2.5–5 cm, densely flowered; berry beakless.

5a. Flowering stems (10–)15–30 cm; filaments inconspicuous; berry subglobose, 4–5 mm in diam. .... 1. *C. capitulata*

5b. Flowering stems ca. 5 cm; filaments 3–3.5 mm; berry ovoid-ellipsoid, ca. 9 mm in diam. .... 2. *C. breviscapa*

4b. Racemes 6–9 cm, laxly or densely flowered; berry very shortly beaked.

6a. Leaves slightly plicate, papery; inflorescences suberect, 10–12-flowered ..... 3. *C. gracilis*

6b. Leaves strongly plicate, leathery; inflorescences nodding, densely 40- or more flowered ..... 4. *C. sinensis*

1. *Curculigo capitulata* (Loureiro) Kuntze, Revis. Gen. Pl. 2: 703. 1891.

大叶仙茅 da ye xian mao

*Leucojum capitulatum* Loureiro, Fl. Cochinch. 1: 199. 1790; *Curculigo fuziwarae* Yamamoto; *C. recurvata* W. T. Aiton; *C. strobiliformis* D. Fang & D. H. Qin; *Molineria capitulata* (Loureiro) Herbert; *Tupistra esquirolii* H. Léveillé & Vaniot; *Veratrum mairei* H. Léveillé.

Herbs to 1 m tall, stout. Rhizomes tuberous, thick, with creeping, slender stolons. Leaves often 4–7; petiole 30–80 cm; leaf blade oblong-lanceolate to suboblong, 40–90 × 5–14 cm, plicate, papery, sometimes pubescent, margin entire, apex acu-

minate. Flowering stems (10–)15–30 cm, brown villous. Racemes nodding, capitate to subovoid, 2.5–5 cm, densely many flowered; bracts ovate-lanceolate to lanceolate, 1.5–2.5 cm, hairy. Pedicel ca. 7 mm. Perianth yellow; segments ovate-oblong, ca. 8 × 3.5–4 mm, apex obtuse, outer segments adaxially hairy, inner ones adaxially hairy on midvein or at base of midvein. Stamens 5–6 mm; filament less than 1 mm; anther linear, ca. 5 mm. Ovary subglobose to oblong, hairy. Style longer than stamens, slender; stigma subcapitate. Berry white, subglobose, 4–5 mm in diam., beakless. Seeds black with irregular stripes. Fl. May–Jun, fr. Aug–Sep.

Forests, shady and moist places; (300–)800–2200 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Xizang, Yunnan [Bangladesh, Bhutan, India, Indonesia, Japan, Laos, Malaysia,

Myanmar, Nepal, Papua New Guinea, Philippines, Sikkim, Sri Lanka, Thailand, Vietnam].

**2. *Curculigo breviscapa*** S. C. Chen, Acta Phytotax. Sin. 11: 132. 1966.

短葶仙茅 duan ting xian mao

Rhizomes short, slightly thick. Leaves often 5 or 6; petiole ca. 60 cm × 3–4 mm, usually tomentose, base with a black, membranous margin; leaf blade green, lanceolate, 70–75 × ca. 10.5 cm, plicate, papery, adaxially glabrous, abaxially laxly strigose on conspicuous veins, base obliquely cuneate, apex acuminate. Flowering stems ca. 5 cm, brown tomentose. Inflorescences nodding, capitate, subglobose, 3–3.5 cm in diam.; bracts oblong-lanceolate, basal ones 0.8–2.5 cm, abaxially tomentose. Pedicel 2–10 mm. Perianth yellow; segments suboblong to ovate-oblong, 10–12 × ca. 4 mm, outer segments abaxially hairy, inner ones abaxially hairy on midvein. Stamens shorter than perianth segments; filament 3–3.5 mm; anther ca. 5 mm. Ovary oblong, ca. 1/2 as long as pedicel. Style columnar, 1–1.2 cm, slightly angled; stigma subcapitate. Berry ovoid-ellipsoid, ca. 1.3 × 0.9 cm, pubescent, beakless. Seeds black, subglobose, Fl. Apr–May. fr. Jun.

• Dense forests along valleys or streams; near sea level to 600 m. Guangdong, Guangxi.

**3. *Curculigo gracilis*** (Kurz) J. D. Hooker, Fl. Brit. India 6: 278. 1892.

疏花仙茅 shu hua xian mao

*Molineria gracilis* Kurz in Miquel, Ann. Mus. Lugduno-Batavi 4: 177. 1869.

Rhizomes very short, with creeping, slender stolons. Leaves 5–9; petiole 7–13 cm; leaf blade lanceolate to suboblong-lanceolate, 20–50 × 3–5 cm, papery to thickly so, adaxially glabrous, abaxially slightly pilose on veins, base acuminate, apex acuminate to subcaudate. Flowering stems decumbent to suberect, 13–20 cm, brown hairy. Racemes 6–9 cm, usually laxly 10–12-flowered; bracts linear-lanceolate, basal ones longer than flowers, margin and apex hairy, apex caudate. Pedicel 3–5 mm. Perianth yellow; segments suboblong, ca. 11 × 4.5 mm, apex obtuse, outer segments abaxially hairy on midvein. Stamens ca. 2/3 as long as perianth segments; filament very short; anther sublinear, 6–7 mm. Ovary suboblong, ca. 1 cm, brown tomentose. Style ca. 1 cm; stigma capitate, 1.5–2 mm in diam. Berry bottle-like, ca. 2 cm, slightly hairy, very shortly beaked. Seeds black, striped. Fl. May.

Shady and moist forests; ca. 1000 m. Guangxi, Guizhou, Sichuan [Cambodia, Nepal, Thailand, Vietnam].

**4. *Curculigo sinensis*** S. C. Chen, Acta Phytotax. Sin. 11: 133. 1966.

中华仙茅 zhong hua xian mao

Rhizomes short, thick. Petiole ca. 40 cm; leaf blade oblong-lanceolate to linear-lanceolate, ca. 85 × 4 cm, strongly plicate, leathery, adaxially subglabrous, abaxially villous, particularly on veins, base tapering, apex narrowly acuminate. Flower-

ing stems nodding, ca. 15 cm, tomentose. Racemes ca. 9 cm, densely 40- or more flowered; bracts linear-lanceolate to subulate, 3–3.5 × 0.2–0.3 cm, base and margin hairy. Pedicel hairy, 2–3 mm. Perianth ca. 1 cm in diam.; segments suboblong, 5–6 × 2.5–4 mm, apex acute, outer segments abaxially strigose on midvein, inner ones glabrous. Stamens ca. 1/2 as long as perianth segments; filament very short; anther oblong-lanceolate, ca. 3 mm. Ovary fusiform, ca. 8 mm, tomentose. Style columnar, longer than stamens, slightly angled; stigma subcapitate. Berry ca. 1.6 cm, tomentose, very shortly beaked. Fl. Apr–May.

• Grassy slopes; ca. 1800 m. SE Yunnan.

**5. *Curculigo crassifolia*** (Baker) J. D. Hooker, Fl. Brit. India 6: 279. 1892.

绒叶仙茅 rong ye xian mao

*Molineria crassifolia* Baker, J. Linn. Soc., Bot. 17: 121. 1878.

Rhizomes tuberous, short, thick. Petiole ca. 40 cm; leaf blade oblong-lanceolate to linear-lanceolate, to 1 m or more, strongly plicate, abaxially white tomentose, apex narrowly acuminate. Flowering stems usually erect, 12–30 cm, tomentose, apex slightly pendent. Racemes to 7 × 5 cm, densely many flowered. Bracts lanceolate, 2–3 cm, margin and apex often hairy. Pedicel very short. Perianth yellow; segments suboblong, 10–12 × 4–6 mm, abaxially hairy on midvein, apex obtuse. Stamens ca. 1/2 as long as perianth segments; filament very short. Ovary oblong, ca. 1 cm, brown tomentose. Style slightly longer than stamens; stigma capitate. Berry oblong-ovoid, ca. 1 × 1 cm. Seeds longitudinally striped. Fl. May–Oct.

Forests, grassy slopes; 1500–2500 m. Yunnan [Bhutan, NE India, Nepal, Sikkim].

**6. *Curculigo orchioides*** Gaertner, Fruct. Sem. Pl. 1: 63. 1788.

仙茅 xian mao

*Curculigo orchioides* var. *minor* Benth.

Rhizomes erect, subcylindric, ca. 10 × 1 cm. Leaves sessile or shortly petiolate; leaf blade lanceolate to linear, usually 10–45(–90) × 0.5–2.5 cm, laxly pilose or glabrous, base tapering, apex narrowly acuminate. Flowering stems nearly enclosed in base of sheathing petiole, 6–7 cm, pilose; bracts lanceolate, 2.5–5 cm, margin ciliate. Inflorescences umbel-like racemes, 4–6-flowered. Pedicel ca. 2 mm. Perianth yellow; segments oblong-lanceolate, 8–12 × 2.5–3 mm, outer ones sometimes abaxially laxly pilose. Stamens ca. 1/2 as long as perianth segments; filament 1.5–2.5 mm; anther 2–4 mm. Ovary narrowly oblong, to 7.5 mm, pilose. Stigma lobes longer than style. Berry subfusiform, 1.2–1.5 × ca. 0.6 cm; beak ca. 2.5 mm. Fl. and fr. Apr–Sep.

Forests, open grassy slopes; near sea level to 1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang [Cambodia, India, Indonesia, Japan, Laos, Myanmar, Pakistan, Papua New Guinea, Philippines, Thailand, Vietnam].

The rhizomes are used medicinally.

**7. *Curculigo glabrescens*** (Ridley) Merrill, J. Straits Branch

Roy. Asiat. Soc. 85: 163. 1922.

光叶仙茅 *guang ye xian mao*

*Curculigo latifolia* Dryander var. *glabrescens* Ridley, Mat. Fl. Malay. Penins. 2: 66. 1907; *C. senporeiensis* Yamamoto.

Rhizomes short, with creeping stolons and thick, fibrous roots. Petiole 5–10 cm; leaf blade lanceolate to oblong-lanceolate, 18–40 × 3–8 cm, usually glabrous, both ends tapering. Flowering stems suberect, usually 2–4 cm, slightly hairy. Racemes 1.5–3 cm, usually densely several flowered; bracts lanceolate, to 2.5 cm, slightly hairy. Flowers erect; pedicel short.

Perianth yellow; segments suboblong, ca. 10 × 3.5 mm, margin involute, outer segments abaxially pilose on midvein. Stamens slightly shorter than perianth segments; filament ca. 4 mm; anther slightly shorter than or subequaling filament. Ovary cylindrical, ca. 1.5 cm. Style slender, subequaling stamens; stigma subcapitate. Berry ovoid to oblong-ovoid, ca. 2.5 cm, slightly hairy; beak 6–7 mm. Seeds verruculose. Fl. and fr. Apr–Sep.

Forests, wet areas beside streams; near sea level to 1000 m. Guangdong, Hainan [Indonesia, Malaysia].

## 9. HYPOXIS Linnaeus, Syst. Nat., ed. 10, 2: 972, 986, 1366. 1759.

小金梅草属 *xiao jin mei cao shu*

Herbs perennial. Rhizomes subglobose or tuberous. Leaves 3–20, basal, sessile. Flowering stems shorter than leaves, slender, usually pilose. Inflorescences terminal, umbellate or racemose, few flowered or flower solitary. Perianth segments free, persistent. Stamens inserted at base of perianth segments; filament short; anther nearly basifixed. Style short; stigma 3-lobed. Fruit a capsule.

Between 50 and 100 species: widely distributed in both hemispheres (absent from Europe); one species in China.

### 1. *Hypoxis aurea* Loureiro, Fl. Cochinch. 1: 200. 1790.

小金梅草 *xiao jin mei cao*

Plants small. Rhizomes globose to cylindrical, fleshy, covered with fibers. Leaves 4–12, linear, 7–30 cm × 2–6 mm, yellow pilose, base membranous, apex narrowly acute, yellowish brown pilose. Flowering stems 2.5–10 cm or more, slender, 1- or 2-flowered, pale brown pilose; bracts 2, setaceous, small. Perianth yellow; segments oblong, 6–8 mm, brown pilose, per-

sistent. Filaments short. Ovary 3–6 mm, pilose. Style short; stigma erect, 3-lobed. Capsule clavate, 6–12 mm, 3-valved. Seeds numerous, subglobose, tuberculate.

Forest margins, moist grassy slopes; near sea level to 2600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Korea, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Thailand, Vietnam].

## 10. ACANTHOCHLAMYS P. C. Kao, Phytotax. Res. 1: 1. 1980.

芒苞草属 *mang bao cao shu*

Rhizomes short, with tufted roots. Leaves basal, subterete, grooved, base sheathing. Flowering stems erect, simple, slightly shorter than leaves. Inflorescence an abbreviated cyme, capitate, (1 or) 2–5-flowered; bracts 8–18 per flower, sheathing stem, leaflike. Flowers bisexual, actinomorphic; pedicel very short. Perianth corollalike; segments basally connate into a tube, inner ones slightly smaller than outer. Stamens inserted opposite perianth segments, outer ones slightly larger than inner and attached near middle of perianth tube; inner ones attached at base of inner perianth segments and with short filaments; anthers nearly dorsifixed, locules 2, parallel; connective slightly exerted. Ovary inferior; ovules many. Style columnar; stigma (2 or) 3-lobed. Fruiting a capsule, obliquely lanceolate, slightly 3-angled, beaked. Seeds numerous, ellipsoid.

- One species: China.

*Acanthochlamys* has also been treated as belonging to the Velloziaceae (Wu, J. Jap. Bot. 63: 297–311. 1988) or placed in its own family, the Acanthochlamyaceae (Kao, Acta Bot. Sichuan. 1–14. 1989).

### 1. *Acanthochlamys bracteata* P. C. Kao, Phytotax. Res. 1: 2. 1980.

芒苞草 *mang bao cao*

*Didymocolpus nanus* S. C. Chen.

Plants tufted, 1.5–5 cm tall. Rhizomes hard, 1–2 mm thick. Leaves suberect, 2.5–7 cm × ca. 0.3 mm, grooved on both surfaces. Flowering stems 2–5.5 cm. Cymes broomlike, 8–10 × 5–8 mm; 2 bracts at base of inflorescence 8–10 mm, persistent. Perianth red to purple, 3.5–6.5 mm; segments ovate, 3-veined, apex obtuse to acute, outer segments 1.5–3 mm, larger than inner ones. Anthers oblong, outer ones 0.8–1 mm, shorter than

inner ones. Ovary oblong, 1.3–2 × ca. 1 mm. Style 2–3 mm, usually slightly dilated below middle; stigma lobes ca. 0.3 mm. Capsule ca. 7 × 3 mm, spongy, apex white with a beak ca. 1 mm. Seeds ca. 0.8 × 0.5 mm, both ends obtuse. Fl. Jun, fr. Aug.

- Open scrub, grassy slopes; 2700–3500 m. W Sichuan, E Xizang.

