

CHLORANTHACEAE

金粟兰科 jin su lan ke

Xia Nianhe (夏念和)¹; Joël Jérémié²

Shrubs, small trees, or perennial herbs. Leaves simple; stipules small; petioles usually connate at base; leaf blade pinnately veined, margin serrate or crenate. Flowers small, bisexual or unisexual, arranged in spikes, capitula, or panicles; perianth present in female flowers or absent. Bisexual flowers: stamens 1 or 3, inserted on 1 side of ovary; filaments inconspicuous; connectives conspicuous, if stamens 3, connectives connate at base or free; anthers 1- or 2-loculed, longitudinally dehiscent; pistil 1, 1-carpelled; ovary inferior, 1-loculed; ovule 1, pendulous, orthotropous; style short or absent. Unisexual flowers: male flowers many, stamen 1; female flowers few; perianth 3-toothed, calyxlike, connate to ovary. Drupes ovoid or globose; exocarp ± fleshy; endocarp hard. Seeds containing rich endosperm and tiny embryo.

Five genera and ca. 70 species: tropical and subtropical regions; three genera and 15 species (nine endemic) in China.

Wu Kuo-fang. 1982. Chloranthaceae. In: Tseng Yung-chien, ed., Fl. Reipubl. Popularis Sin. 20(1): 77–97.

The origin and distribution of the family have been discussed by Z. K. Zhou (Acta Bot. Yunnan. 15: 321–331. 1993).

1a. Flowers unisexual, female flowers with a 3-toothed, cupular perianth connate to ovary; male flowers with 1

stamen 3. *Hedyosmum*

1b. Flowers bisexual, perianth absent; stamens 1 or 3, inserted on 1 side of ovary.

2a. Stamen 1, baculate or ovoid, anthers 2-, rarely 3-loculed; subshrubs 1. *Sarcandra*

2b. Stamens (1 or)3, base ± connate, central anther 2-loculed, lateral anthers 1-loculed; perennial herbs

or

subshrubs 2. *Chloranthus*

1. *SARCANDRA* Gardner, Calcutta J. Nat. Hist. 6: 348. 1845.

草珊瑚属 cao shan hu shu

Subshrubs glabrous; wood without vessels. Leaves opposite, usually in many pairs; stipules small; petioles short, connate at base, forming a short sheath; leaf blade elliptic, ovate-elliptic, or elliptic-lanceolate, margin serrate, with 1 gland at serrate tip. Spikes terminal, usually branched, ± in panicles; flowers bisexual, perianth and pedicel absent; bract 1, triangular, persistent. Stamen 1, fleshy, baculate to depressed; anther 2(or 3)-loculed, thecae lateral to introrse. Ovary globose or ovoid; style absent; stigma subcapitate or minutely spotted. Drupes globose or ovoid.

Three species: SE Asia to India; one species in China.

¹ Herbarium, Department of Taxonomy, South China Institute of Botany, Chinese Academy of Sciences, Wushan, Guangzhou, Guangdong 510650, People's Republic of China.

² Muséum National d'Histoire Naturelle, Laboratoire de Phanérogamie, 16 rue Buffon, F-75005 Paris, France.

1. *Sarcandra glabra* (Thunberg) Nakai, Fl. Sylv. Kor. 18: 17. 1930.

草珊瑚 *cao shan hu*

Bladhia glabra Thunberg, Trans. Linn. Soc. London 2: 331. 1794; *Ardisia glabra* (Thunberg) de Candolle; *Chloranthus glaber* (Thunberg) Makino.

Subshrubs, evergreen, 50–150 cm tall. Stems cylindrical, erect, glabrous, nodes swollen. Stipules subulate; petioles 0.5–2 cm; leaf blade elliptic or ovate to ovate-lanceolate, or broadly elliptic to oblong, 6–20 × 2–8 cm, leathery or papery, glandular mucronate on marginal teeth, glabrous, base acute, cuneate, or broadly cuneate, margin sharply coarsely-serrate or dully serrate except basally, apex acute to acuminate; lateral veins 5–7, slightly prominent on both surfaces. Inflorescences terminal, usually branched, ± in spikes, 1.5–4 cm with peduncles; bracts triangular or ovate. Flowers yellowish green. Stamen 1, fleshy, baculate to terete or ovoid; anther 2-loculed, thecae lateral or sometimes introrse, on both sides of apical part of connective or nearly as long as connective. Ovary globose or ovoid; style absent; stigma subcapitate or minutely spotted. Drupes green when young, shiny red or yellowish red at maturity, globose (3–4 mm in diam.) or ovoid (ca. 4 mm). $2n = 30^*$.

Forests, thickets, valleys, ravines, slopes, roadsides, trailsides, grasslands, swamps, streamsides, sandy soil; near sea level to 2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Japan (including Ryukyu Islands), Korea, Laos, Malaysia, Philippines, Sri Lanka, N Thailand, Vietnam].

Used medicinally and for tea.

- 1a. Stamen overall more than 2 × as long as thecae 1a. subsp. *glabra*
 1b. Stamen only slightly longer than thecae 1b. subsp. *brachystachys*

1a. *Sarcandra glabra* subsp. *glabra*

草珊瑚(原亚种) *cao shan hu* (*yuan ya zhong*)

Chloranthus dentalatus Cordemoy; *C. esquirolii* H. Léveillé.

Leaf blade elliptic or ovate-lanceolate, 6–17 × 2–6 cm, leathery, margin sharply coarsely-serrate. Stamen baculate to terete; thecae shorter than connective. Stigma subcapitate. Fruit globose, 3–4 mm in diam. Fl. Jun, fr. Aug–Dec.

Forests, thickets, valleys, ravines, slopes, roadsides, trailsides, grasslands, swamps, streamsides, sandy soil; near sea level to 2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Japan (including Ryukyu Islands), Korea, Malaysia, Philippines, Sri Lanka, Vietnam].

Sarcandra chloranthoides Gardner, treated as a synonym of this taxon in FRPS, is a distinctive species restricted to India and Sri Lanka (B. Verdcourt, Kew Bull. 39: 66. 1984).

Used medicinally and for tea.

1b. *Sarcandra glabra* subsp. *brachystachys* (Blume) Verdcourt, Kew Bull. 40: 216. 1985.

海南草珊瑚 *hai nan cao shan hu*

Chloranthus brachystachys Blume, Fl. Jav., Chloranthaceae: 13: t. 2. 1829; *Ascarina serrata* Blume; *Chloranthus hainanensis* Pei; *Sarcandra hainanensis* (Pei) Swamy & I. W. Bailey.

Leaf blade elliptic or broadly elliptic to oblong, 8–20 × 3–8 cm, papery, margin dully serrate except basally. Stamen ovoid; thecae much shorter than connective. Stigma minutely spotted. Fruit orange-red at maturity, ovoid, ca. 4 mm. Fl. Oct–May, fr. Mar–Aug.

Wet places on slopes, ravines, roadsides; 400–1600 m. Guangdong, Guangxi, Hainan, Yunnan [Laos, N Thailand, Vietnam].
 Used medicinally.

2. **CHLORANTHUS** Swartz, Philos. Trans. 77: 359. 1787.

金粟兰属 *jin su lan shu*

Nigrina Thunberg; *Tricercandra* A. Gray.

Subshrubs or perennial herbs. Leaves opposite or whorled, serrate; stipules tiny; petioles connected by a transverse ridge on stem. Inflorescences in spikes or branched, arranged in panicles, terminal or axillary. Flowers small, bisexual; perianth absent. Stamens usually 3, rarely 1, on 1 side of apical part of ovary; basal part of connective confluent, or free and connected or overlapped at base, ovoid or lanceolate, sometimes elongated to linear; anthers 1- or 2-loculed; if stamens 3, central anther 2-loculed or occasionally absent, lateral anthers 1-loculed, if stamen 1, anther 2-loculed. Ovary 1-loculed; ovule 1, pendulous, orthotropous; style usually absent, rarely present; stigma truncate or parted. Drupes globose, obovoid, or pyriform.

About 17 species: temperate to tropical Asia; 13 species (nine endemic) in China.

Further study is required on *Chloranthus pernyanus* Solms in A. de Candolle (Prodr. 16(1): 474. 1868), described from China but not treated here.

- 1a. Subshrubs; stems branched; leaves usually in many pairs, not clustered at stem apex; connectives confluent and ovate, 3- or 5-lobed.
 2a. Flowers yellowish green; leaves 5–11 × 2.5–5.5 cm, apex acute or obtuse, margin crenate-serrate; central connective 3-toothed 1. *C. spicatus*

- 2b. Flowers white; leaves 10–20 × 4–8 cm, apex gradually narrowed to caudate, margin glandular serrate; central lobe of connective entire 2. *C. erectus*
- 1b. Perennial herbs; stems usually not branched; leaves usually 4 (rarely 6–10), clustered near stem apex, often false-whorled, with nodes toward base of stem with scalelike leaves only; connectives linear to oblong-lanceolate or very reduced.
- 3a. Style conspicuous 3. *C. oldhamii*
- 3b. Style absent.
- 4a. Leaves sessile 13. *C. sessilifolius*
- 4b. Leaves petiolate.
- 5a. Connectives conspicuous, linear, more than 5 × as long as thecae.
- 6a. Leaves 8–10, lanceolate to narrowly elliptic, apex acuminate 4. *C. angustifolius*
- 6b. Leaves usually 4, broadly elliptic or obovate, apex acute or acuminate.
- 7a. Central stamen without anther; leaf margin sharply serrate 5. *C. japonicus*
- 7b. Central stamen 2-loculed; leaf margin serrate or crenate.
- 8a. Connective 1–1.9 cm; bracts 2- or 3-toothed; spike 1 6. *C. fortunei*
- 8b. Connective less than 1 cm; bracts entire; spikes 1–5 7. *C. holostegius*
- 5b. Connectives short, 1–3 × as long as thecae.
- 9a. Leaves pubescent along veins abaxially.
- 10a. Spikes many (sometimes 1), axillary and terminal; stamens 1–3, connectives small, ca. as long as thecae or slightly longer 11. *C. multistachys*
- 10b. Spike 1, terminal, dichotomously or racemosely branched; stamens 3, connectives 2–4 × as long as thecae.
- 11a. Leaves broadly elliptic, ovate-elliptic, or obovate, serrate; peduncle 10–16 cm; central connective ca. 3 mm; thecae at base of connectives 12. *C. henryi*
- 11b. Leaves suborbicular or broadly elliptic, dully serrate; peduncles 1.2–2.3 cm; central connective ca. 2 mm; thecae at middle of connectives 10. *C. serratus*
- 9b. Leaves glabrous abaxially.
- 12a. Stamen 1, connective very reduced, not projecting beyond thecae 8. *C. anhuiensis*
- 12b. Stamens 3, connective longer than thecae.
- 13a. Pistil with a gynophore 4–7 mm 9. *C. tianmushanensis*
- 13b. Pistil without a gynophore.
- 14a. Leaves obovate or suborbicular, coarsely crenate; 3 connectives obliquely ascending, central connective erect, longer than lateral connectives; thecae at base of connectives 12. *C. henryi*
- 14b. Leaves elliptic, obovate, or ovate-lanceolate, sharply and densely serrate; 3 connectives connivent, central connective incurved, nearly as long as lateral connectives; thecae at middle or apical part of connectives ... 10. *C. serratus*

1. *Chloranthus spicatus* (Thunberg) Makino, Bot. Mag. (Tokyo) 16: 180. 1902.

金粟兰 jin su lan

Nigrina spicata Thunberg, Nov. Gen. Pl. 59. 1783;
Chloranthus inconspicuus Swartz.

Subshrubs erect or slightly prostrate, 30–60 cm tall. Stems terete, glabrous. Leaves opposite; petioles 0.8–1.8 cm, base ± connate; leaf blade elliptic or obovate-elliptic, 5–11 × 2.5–5.5 cm, thickly papery, glandular mucronate, pale yellowish green abaxially, deep green and shiny adaxially, base cuneate, margin crenate-serrate, apex acute or obtuse; lateral veins 6–8 pairs, slightly prominent on both surfaces. Spikes arranged in

panicles, usually terminal, rarely axillary; bracts triangular. Flowers yellowish green, small, very fragrant. Stamens 3; connectives confluent and ovate, apical part irregularly 3-lobed; central lobe larger, sometimes apex shallowly 3-lobed again, with 2-loculed anther sacs; lateral lobes smaller, each with a 1-loculed anther. Ovary obovoid. Fl. Apr–Jul, fr. Aug–Sep. $2n = 30$.

Forests; 200–1000 m. Fujian, Guangdong, Guizhou, ?Hebei, Sichuan, Yunnan [Japan, Thailand, widely cultivated throughout SE Asia]. Used for ornamental, aromatic, and medicinal purposes.

2. *Chloranthus erectus* (Buchanan-Hamilton) Verdcourt, Kew Bull. 40: 217. 1985.

鱼子兰 yu zi lan

Cryphaea erecta Buchanan-Hamilton, Edinburgh J. Sci. 2: 11. 1825; *Chloranthus officinalis* Blume.

Subshrubs to 2 m tall. Stems terete, glabrous. Leaves opposite; petiole 5–13 mm; leaf blade broadly elliptic or obovate to long obovate or oblanceolate, 10–20 × 4–8 cm, rigidly papery, glandular, glabrous, base cuneate, margin serrate, apex gradually narrowed to caudate; lateral veins 5–9 pairs. Spikes terminal, dichotomously or racemosely branched, rearranged in panicles, long pedunculate; bracts triangular or ovate. Flowers white, small. Stamens 3; connectives confluent and ovoid, not elongate, apical part 3-lobed; central lobe larger, with a 2-loculed anther; lateral lobes smaller, with a 1-loculed anther each; thecae at central or apical parts of connective. Ovary ovoid. Fruit green when young, white at maturity, obovoid, ca. 5 mm. Fl. Apr–Jun, fr. Jul–Sep.

Valleys, ravines; 100–2000 m. Guangxi, Guizhou, Sichuan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sikkim, Thailand, Vietnam].

The authors have followed B. Verdcourt (Kew Bull. 40: 217. 1985), who rejected the name *Chloranthus elatior* R. Brown ex Sims as a nomen nudum, and *C. elatior* Link as too poorly known to be usable; the latter was based on a sterile cultivated plant and the type was destroyed in Berlin.

3. *Chloranthus oldhamii* Solms-Laubach in A. de Candolle, Prodr. 16: 476. 1869.

台湾金粟兰 tai wan jin su lan

Herbs perennial, 25–40 cm high, smooth, glabrous. Stems erect; basal nodes with 1 pair of scalelike leaves. Leaves opposite, 4-clustered on stem apex and false-whorled; petiole 6–9 mm; leaf blade broadly elliptic, orbicular, or broadly ovate, 10–13 × 6–9 cm, papery, glandular mucronate, base broadly cuneate to rounded, margin serrulate or sharply serrate, apex acuminate to long acuminate; lateral veins 5–7. Spikes arising from stem apex, racemosely branched; branches usually opposite, 9–15 cm with peduncles; peduncles 3.5–7 cm; bracts ovate or broadly triangular, ca. 1.2 mm, margin irregularly small dentate, with a few small, pale yellow dots. Flowers white. Stamens 3; connectives oblong or long elliptic, connate at base, on outside of apical part of ovary; central connective ca. 3 mm, with a 2-loculed anther; lateral connectives ca. 2 mm, with a 1-loculed anther each; thecae ca. 0.7 mm, at base of connective. Ovary obovoid, ca. 1.6 mm, with style ca. 0.7 mm; stigma several lobed. Drupes brown, obovoid or pyriform, 2–3 mm; stalk ca. 2.5 mm. Fl. Apr, fr. May. $2n = 30^*$.

• Forests, roadsides; 200–1000 m. Taiwan.

The name *Chloranthus serratus* (Thunberg) Roemer & Schultes was misapplied to this species by Matsumura & Hayata (Enum. Pl. Formosan. 348. 1906).

4. *Chloranthus angustifolius* Oliver, Hooker's Icon. Pl. 16: t. 1580. 1887.

狭叶金粟兰 xia ye jin su lan

Herbs perennial, 15–43 cm high. Rhizomes deep yellow, with many yellow, fibrous roots. Stems erect, glabrous, 1 or several in a fascicle, basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, triangular, membranous. Leaves opposite, 8–10; stipules lacinate and subulate; petiole 7–10 mm; leaf blade lanceolate to narrowly elliptic, 5–11 × 1.5–3 cm, papery, glandular mucronate, basal 1/4 entire, glabrous, base cuneate, margin sharply serrate, apex acuminate; lateral veins 4–6 pairs. Spike solitary, terminal, 5–8 cm with peduncle ca. 1 cm; bracts ovate or nearly semiorbicular, margin entire, rarely 2-lobed. Flowers white. Stamens 3; connectives elongated, becoming linear, 4–6 mm, horizontally spreading or ascending, connate at base, on outside of apical part of ovary; central connective with a 2-loculed anther; lateral connectives with a 1-loculed anther each; thecae at base of connectives. Ovary green, obovoid; style absent. Drupes obovoid or subglobose, ca. 2.5 mm, subsessile. Fl. Apr, fr. May.

• Forests, wet places; 700–1200 m. Hubei, Sichuan.

5. *Chloranthus japonicus* Siebold, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 14: 681. 1829.

银线草 yin xian cao

Chloranthus mandshuricus Ruprecht; *Tricercandra japonica* (Siebold) Nakai; *T. quadrifolia* A. Gray.

Herbs perennial, 20–49 cm high. Rhizomes many noded, procumbent, branched, with many slender, long, fibrous roots, aromatic. Stems erect, 1 or several in a fascicle, not branched, basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, triangular or ovate, 4–5 mm, membranous. Leaves opposite, usually 4 clustered on stem apex and false-whorled; petiole 0.8–1.8 cm; leaf blade broadly elliptic or obovate, 8–14 × 5–8 cm, papery, glandular mucronate, basal 1/4 entire, shiny adaxially, glabrous, base broadly cuneate, margin sharply serrate, apex acute; lateral veins 6–8 pairs; reticulate veins conspicuous. Spike solitary, terminal, 3–5 cm with peduncle; bracts triangular or nearly semiorbicular. Flowers white. Stamens 3; connectives elongated, linear, ca. 5 mm, horizontally spreading or curved upward, connate at base, on outside of apical part of ovary; central connective without anther; lateral connectives with a 1-loculed anther each; thecae at base of connectives. Ovary ovoid; style absent; stigma truncate. Drupes green, subglobose or obovoid, 2.5–3 mm; stalk 1–1.5 mm. Fl. Apr–May, fr. May–Jul. $2n = 30$.

Forests, shaded, wet places, streamsides; 100–2300 m. Gansu, Hebei, Jilin, Liaoning, ?Nei Mongol, Shaanxi, Shandong, Shanxi [Japan, Korea, Russia (Far East)].

Used for medicinal and aromatic purposes.

6. *Chloranthus fortunei* (A. Gray) Solms-Laubach in A. de Candolle, Prodr. 16: 476. 1869.

水晶花 shui jing hua

Tricercandra fortunei A. Gray, Mem. Amer. Acad. Arts, n.s., 6: 405. 1858.

Herbs perennial, 15–40 cm high, glabrous. Rhizomes thick, short, with many slender, long, fibrous roots. Stems erect, 1 or several in a fascicle, basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, triangular. Leaves opposite, usually 4 in apical part of stem; stipules lacinate becoming subulate; petiole 1–1.5 cm; leaf blade broadly elliptic, long elliptic, or obovate, 5–11 × 3–7 cm, papery, glandular mucronate, sub-basal part entire, densely finely glandular abaxially when young, glands inconspicuous when old, base broadly cuneate, margin crenate-serrate or coarsely serrate, apex acute; lateral veins 4–6 pairs; reticulate veins conspicuous. Spike solitary, arising from stem apex, 4–6 cm with peduncle; bracts obovate, usually 2- or 3-toothed. Flowers white, fragrant. Stamens 3; connectives elongated, linear, erect or ascending, 1–1.9 cm, connate at base, on outside of apical part of ovary; central connective with a 2-loculed anther; lateral connectives with a 1-loculed anther each; thecae at base of connectives. Ovary obovoid; style absent. Drupes pale yellowish green, globose, striate, ca. 3 mm, subsessile. Fl. Apr–May, fr. May–Jun. $2n = 30, 60^*$.

• Thickets, slopes, wet places, meadows, roadsides; 200–300 m. Anhui, Guangdong, Guangxi, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang.

Used medicinally.

7. *Chloranthus holostegius* (Handel-Mazzetti) Pei & Shan, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot., 10: 210. 1938.

全缘金粟兰 *quan yuan jin su lan*

Herbs perennial, 25–55 cm high. Rhizomes with many fibrous roots. Stems erect, usually not branched, basal nodes with 1 pair of scalelike leaves. Scalelike leaves ovate or rectangular. Leaves opposite, usually 4 at stem apex and whorled; petiole 0.5–1.5 cm; leaf blade broadly elliptic or obovate, 8–15(–19) × 4–10(–13) cm, rigidly papery, glandular, glabrous or pubescent along veins abaxially, base broadly cuneate, margin serrate or dentate-serrate, apex acute or acuminate; lateral veins 6–8 pairs. Spikes terminal and axillary, usually 1–5 in a fascicle, 5–12 cm with peduncle; bracts ovate or nearly semiorbicular, not lobed. Flowers white. Stamens 3; connectives elongated, linear, 5–8 mm, connate at base, on outside of stigma; central connective with a 2-loculed anther; lateral connectives with a 1-loculed anther each. Ovary ovoid. Drupes green, subglobose or obovoid, 3–4 mm. Fl. May–Jun, fr. Jul–Aug.

• Thickets, forests; 700–2800 m. Guangxi, Guizhou, Sichuan, Yunnan.

B. Verdcourt (in Fl. Thailand) included this species within *Chloranthus nervosus* Collett & Hemsley.

Used medicinally.

- 1a. Leaves densely scurfy pubescent along veins abaxially 7c. var. *trichoneurus*
1b. Leaves glabrous.

- 2a. Leaves 8–15 × 4–10 cm, apex acuminate 7a. var. *holostegius*
2b. Leaves 12–19 × 8–13 cm, apex acute 7b. var. *shimianensis*

7a. *Chloranthus holostegius* var. *holostegius*

全缘金粟兰(原变种) *quan yuan jin su lan* (*yuan bian zhong*)

Chloranthus fortunei (A. Gray) Solms-Laubach var. *holostegius* Handel-Mazzetti, Symb. Sin. 7: 156. 1929. Leaf blade broadly elliptic or obovate, 8–15 × 4–10 cm, glabrous, margin serrate, apex acuminate.

• Thickets, forests; 700–2800 m. Guangxi, Guizhou, Sichuan, Yunnan.

7b. *Chloranthus holostegius* var. *shimianensis* K. F. Wu, Acta Phytotax. Sin. 18: 222. 1980.

石棉金粟兰 *shi mian jin su lan*

Leaf blade broadly obovate, 12–19 × 8–13 cm, base broadly cuneate, margin dentate-serrate except in basal 1/4, apex acute. Fl. Jun.

• Forests; ca. 1100 m. Sichuan.

7c. *Chloranthus holostegius* var. *trichoneurus* K. F. Wu, Acta Phytotax. Sin. 18: 223. 1980.

毛脉金粟兰 *mao mai jin su lan*

Leaf blade with dense hairs abaxially.

• Thickets, forests; 1100–1600 m. Guizhou, Yunnan.

8. *Chloranthus anhuiensis* K. F. Wu, Acta Phytotax. Sin. 18: 222. 1980.

安徽金粟兰 *an hui jin su lan*

Herbs perennial, 32–50 cm high. Rhizomes with many slender, long, fibrous roots, fragrant. Stems erect, 1 or several in a fascicle, with 5–7 conspicuous nodes; internodes 0.7–2.5 cm, basal nodes with 1 pair of scalelike leaves. Scalelike leaves triangular, membranous. Leaves opposite, 4, sometimes 6, on stem apex; petiole 0.7–2.5 cm; leaf blade elliptic to broadly elliptic, 10–13 × 4–7 cm, papery, glandular mucronate, glabrous abaxially, base broadly cuneate, margin densely and sharply serrulate, apex gradually angustate and caudate; lateral veins 6 or 7 pairs. Spikes several, axillary and terminal, slender, 1.5–5.5 cm with peduncle; bracts obovate. Flowers sparsely arranged, white, small. Stamen 1, on outside of apical part of ovary; connective oblong, ca. 0.7 mm, apex not projected, nearly as long as thecae; anther 2-loculed. Ovary ovoid, ca. 1 mm; style absent; stigma subcapitate. Drupes obovoid; stalk short. Fl. Jun–Jul, fr. Aug.

• Slopes, wet places; 500–700 m. Anhui.

9. *Chloranthus tianmushanensis* K. F. Wu, Acta Phytotax. Sin. 18: 221. 1980.

天目金粟兰 *tian mu jin su lan*

Herbs perennial, 20–26 cm high, glabrous. Rhizomes with many pale yellow, fibrous roots. Stems erect, 1 or several in a fascicle, with 6 or 7 conspicuous nodes;

internodes 0.6–3.5 cm, basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, ovate, membranous, late deciduous. Leaves opposite, 6 on apical part of stems; stipules subulate; petiole 1–2 cm; leaf blade oblong or broadly elliptic, 5–8 × 3–5.5 cm, papery, glandular mucronate, base broadly cuneate to obtuse, margin serrate, apex acute; lateral veins 5–7 pairs. Spikes at stem apex, dichotomously branched or unbranched, 2.8–4 cm with peduncles; bracts ovate. Flowers white. Stamens 3, basal 3/4 connate, on outside of apical part of ovary; connectives oblong; central connective ca. 2 mm, nearly as long as lateral connectives or slightly longer, with a 2-loculed anther; lateral connectives with a 1(or 2)-loculed anther each; thecae at middle of connectives. Pistil with gynophore 4–7 mm; ovary ovoid; style absent; stigma capitate. Fruit unknown. Fl. May–Jun.

• Wet places in forests; ca. 1100 m. Zhejiang.

10. *Chloranthus serratus* (Thunberg) Roemer & Schultes, Syst. Veg. 3: 461. 1818.

及己 *ji ji*

Herbs perennial, 15–50 cm high. Rhizomes procumbent, thick, short, ca. 3 mm in diam., with many yellowish brown, fibrous roots. Stems erect, 1 or several in a fascicle, evidently noded, glabrous, basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, triangular, membranous. Leaves opposite, 4–6 on stem apex; petiole 0.8–2.5 cm; leaf blade elliptic, obovate, ovate-lanceolate, suborbicular, or broadly elliptic, sometimes ovate-elliptic or oblong, 7–15 × 3–6 cm, papery, glandular mucronate, glabrous or pubescent along veins abaxially, base cuneate, margin serrate, apex gradually angustate and caudate; lateral veins 6–8 pairs. Spikes terminal, sometimes axillary, 1–3-branched; peduncle 1–3.5 cm; bracts triangular or nearly semiorbicular, usually several toothed at apex. Flowers white. Stamens 3; connectives oblong, connate-connate at basal part, on outside of apical part of ovary; central connective introrse, 2–3 mm, nearly as long as or slightly longer than lateral connectives, with a 2-loculed anther; lateral connectives with 1-loculed anther each; thecae at middle or apical part of connectives. Ovary ovoid; style absent; stigma thick, short. Drupes green, globose or pyriform. Fl. Apr–May (–Jul), fr. Jun–Aug. *2n* = 28, 30.

Wet places in forests, valleys, ravine thickets, swamps, streamsides; 100–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan [Japan, Russia (S Kurile Islands)].
Used medicinally.

1a. Leaves sharply serrate, glabrous . 10a. var. *serratus*

1b. Leaves dully serrate, pubescent along veins abaxially 10b. var. *taiwanensis*

10a. *Chloranthus serratus* var. *serratus*

及己(原变种) *ji ji* (*yuan bian zhong*)

Nigrina serrata Thunberg, Nova Acta Regiae Soc. Sci. Upsal., ser. 2, 7: 142. 1815.

Leaf blade elliptic, obovate, or ovate-lanceolate, sometimes ovate-elliptic or oblong, glabrous, margin densely sharply serrate. Fl. Apr–May.

Wet places in forests, valleys, ravine thickets, swamps, streamsides; 100–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan [Japan, Russia (S Kurile Islands)].

10b. *Chloranthus serratus* var. *taiwanensis* K. F. Wu, Acta Phytotax. Sin. 18: 222. 1980.

台湾及己 *tai wan ji ji*

Leaf blade suborbicular or broadly elliptic, pubescent along veins abaxially, densely evidently orange-yellow spotted adaxially and abaxially, margin bluntly serrate. Fl. Jul.

• Taiwan.

11. *Chloranthus multistachys* Pei, Sinensia 6: 681. 1935.

多穗金粟兰 *duo sui jin su lan*

Herbs perennial, 16–50 cm high. Rhizomes strong, with many slender, long, fibrous roots. Stems erect, 1; basal nodes with 1 pair of scalelike leaves. Leaves opposite, usually 4; petioles 0.8–2 cm; leaf blade elliptic to broadly elliptic, ovate-elliptic, or ovate, 10–20 × 6–11 cm, rigidly papery, glandular mucronate, scurfy pubescent along veins abaxially, shiny green adaxially, sometimes small glandular punctate, base broadly cuneate to rounded, margin coarsely serrate or crenate-serrate, apex acuminate; lateral veins 6–8; reticulate veins conspicuous. Spikes several (sometimes 1), branched, strong, terminal and axillary, 4–11 cm with peduncle; bracts ovate or nearly semiorbicular. Flowers sparsely arranged, white, small. Stamens 1–3, on outside of apical part of ovary; if 1, anther ovoid, 2-loculed; if 3(or 2), central anther 2-loculed, lateral anthers 1-loculed, much smaller than central anther; connectives ca. as long as thecae or slightly longer, rarely shorter than thecae. Ovary ovoid; style absent; stigma truncate. Drupes green, globose, 2.5–3 mm, minutely glandular punctate; stalk 1–2 mm. Fl. May–Jul, fr. Aug–Oct.

• Wet places, steep slopes, shaded places; 400–1700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan.

Used medicinally.

12. *Chloranthus henryi* Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 367. 1891.

宽叶金粟兰 *kuan ye jin su lan*

Herbs perennial, 40–65 cm high. Rhizomes strong, blackish brown, with many slender, long, brown, fibrous roots. Stems erect, 1 or several in a fascicle, evidently 6- or 7-noded; internodes 0.5–3 cm, basal nodes with 1 pair of scalelike leaves. Scalelike leaves ovate-triangular, membranous. Leaves opposite, usually 4 on apical part of stem; stipules subulate; petiole 5–12

mm; leaf blade broadly elliptic, ovate-elliptic, obovate, or suborbicular, 9–18 × 5–9 cm, papery, glandular mucronate, base cuneate to broadly cuneate, margin serrate or crenate, apex acuminate; lateral veins 6–8 pairs. Spikes terminal or terminal and axillary, usually dichotomously or racemosely branched; peduncle (2.5–)10–16 cm; bracts usually ovate-triangular or nearly semiorbicular. Flowers white. Stamens 3, base nearly free, only insides connected; central connective ca. 3 mm, with a 2-loculed anther; lateral connectives slightly shorter, each with a 1-loculed anther; thecae at base of connectives. Ovary ovoid; style absent; stigma subcapitate. Drupes globose, ca. 3 mm; stalk short. Fl. Apr–Jun, fr. Jul–Aug.

• Wet places, thickets, forests; 800–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Shaanxi, Sichuan, Zhejiang.
Used medicinally.

1a. Leaf margin serrate; peduncle

10–16 cm 12a. var. *henryi*

1b. Leaf margin coarsely crenate; peduncle

2.5–5 cm 12b. var. *hupehensis*

12a. *Chloranthus henryi* var. *henryi*

宽叶金粟兰(原变种) *kuan ye jin su lan* (*yuan bian zhong*)

Leaf blade broadly elliptic, ovate-elliptic, or obovate, scurfy pubescent along midvein and lateral veins abaxially, margin serrate. Spikes terminal; peduncle 10–16 cm. Fl. Apr–Jun.

• Wet places, thickets; 800–1900 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Shaanxi, Sichuan, Zhejiang.

12b. *Chloranthus henryi* var. *hupehensis* (Pampanini) K. F. Wu, *Acta Phytotax. Sin.* 18: 223. 1980.

湖北金粟兰 *hu bei jin su lan*

Chloranthus hupehensis Pampanini, *Nuovo Giorn. Bot. Ital.*, n.s., 22: 272. 1915.

Leaf blade obovate or suborbicular, glabrous, margin coarsely crenate. Spikes terminal and axillary; peduncle shorter, 2.5–5 cm. Fl. May–Jun.

• Forests; 800–2000 m. Gansu, Hubei, Shaanxi.

Used medicinally.

13. *Chloranthus sessilifolius* K. F. Wu, *Acta Phytotax. Sin.* 18: 220. 1980.

四川金粟兰 *si chuan jin su lan*

Herbs perennial, 35–70 cm high. Rhizomes strong, 5–7 mm in diam., with many slightly thick, fibrous roots. Stems erect, rather strong, 1 or several in a fascicle, evidently 4- or 5-noded; basal nodes with 1 pair of scalelike leaves. Scalelike leaves opposite, triangular, 0.7–1.3 cm, membranous. Leaves sessile, opposite, 4 on stem apex becoming whorled, obovate, rhombic, or

elliptic, 12–20 × 7–12 cm, papery, glandular mucronate, pale green abaxially, sometimes reddish purple or only veins pale reddish, base cuneate, margin crenate or serrate, apex gradually angustate forming a tip ca. 2 cm; midvein and lateral veins densely scurfy pubescent; lateral veins 6–8 pairs; reticulate veins slightly prominent on both surfaces, conspicuous. Spikes terminal, with 2–4 pendulous branches; peduncle (4–)10–15 cm; bracts triangular or flabellate, ca. 1.5 mm, margin irregularly denticulate. Flowers white. Stamens 3, base free or nearly free, connate, or slightly overlapping, on outside of apical part of ovary; connectives oblong, 2–2.5(–4) mm, subequal; central connective with a 2-loculed anther, thecae at base of connective; lateral connectives with a 1-loculed anther each, thecae at rim of connective base. Ovary ovoid, ca. 2 mm; style absent; stigma truncate, margin dentate. Drupes brown, subglobose, ca. 2.5 cm; stalk ca. 1.8 mm. Fl. Mar–Apr, fr. May–Jul.

• Wet places in forests, thickets; 600–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Sichuan.

Used medicinally.

1a. Leaf blade obovate or rhombic; peduncle

10–15 cm; bracts triangular; stamens ± free

at base, connectives 2–2.5 mm 13a. var. *sessilifolius*

1b. Leaf blade elliptic; peduncle 4–9 cm; bracts

flabellate; stamens connate at base,

connectives ca. 4 mm 13b. var. *austrosinensis*

13a. *Chloranthus sessilifolius* var. *sessilifolius*

四川金粟兰(原变种) *si chuan jin su lan* (*yuan bian zhong*)

Leaf blade obovate or rhombic, margin crenate or serrate. Peduncle 10–15 cm; bracts triangular. Stamens free or nearly free at base; connectives 2–2.5 mm. Fr. Jun–Jul.

• Wet places in forests; 1000–1200 m. Sichuan.

13b. *Chloranthus sessilifolius* var. *austrosinensis* K. F. Wu, *Acta Phytotax. Sin.* 18: 221. 1980.

华南金粟兰 *hua nan jin su lan*

Leaf blade elliptic, margin sharply serrate. Peduncle 4–9 cm; bracts usually flabellate, with tip projecting at middle. Stamens evidently connate at base; connectives ca. 4 mm. Fr. May–Jul.

• Forests, thickets; 600–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi.

The name *Chloranthus oldhamii* Solms-Laubach was misapplied to this taxon by Pei (*Sinensia* 6: 681. 1935, as “*oldhamii*”).

3. HEDYOSMUM Swartz, Prodr. 5, 84. 1788.

雪香兰属 xue xiang lan shu

Trees or erect subshrubs, monoecious or dioecious; branches jointed. Leaves opposite, usually serrate; petiole connate, forming a sheath at base. Inflorescences axillary or subterminal. Flowers unisexual, fragrant. Male flowers clustered in spikes; stamen 1; filaments nearly absent; anther 2-loculed, linear or oblong, transversely arranged; connective with a short appendage at apex. Female flowers in various capitula or panicles; tube of perianth 3-toothed, calyxlike, adnate to ovary; style very short or absent. Drupes globose or ovoid, sometimes trigonous, small; exocarp thin, fleshy; endocarp usually hard.

About 41 species: tropical America, SE Asia; one species in China.

1. *Hedyosmum orientale* Merrill & Chun, Sunyatsenia 5: 36. 1940.

雪香兰 xue xiang lan

Herbs or subshrubs to 2 m tall, dioecious. Stems erect, glabrous. Petiole 0.5–2 cm, basal sheath cupular or tubular, membranous, 8–10 mm, apex truncate; leaf blade narrowly lanceolate, 10–23 × 1.5–4 cm, membranous or papery, glandular mucronate, pale yellow abaxially when dry, olive green adaxially when dry, base cuneate, margin densely serrulate, apex gradually angustate becoming caudate; midvein prominent abaxially, curved adaxially; lateral veins 15–22 pairs. Male spikes 3–5, clustered at apex of branches, pedunculate, 1.5–3.5 cm excluding peduncle at anthesis; bracts 0.8–1.2 cm; stamen 1; filament absent; anther oblong, ca. 2 mm, connective with a projected, acute appendage at apex, 0.7–1 mm. Female inflorescences terminal or axillary, branches few, 1.5–5 cm, ca. 2 cm wide; bracts large, 0.8–1.2 cm, with many small, orange-yellow spots. Drupes green, subellipsoid-trigonous, ca. 4 mm; apical part of bracts tightly adnate to fruit, elongated into a long beak. Fl. Dec–Mar, fr. Feb–Jun.

Forests, thickets, forested ravines; ca. 500 m. Guangdong, Hainan [Indonesia, S Vietnam].

The name *Hedyosmum nutans* Swartz was misapplied to this species by E. D. Merrill (Lingnan Sci. J. 5: 59. 1927).

