

6. AMOMUM Roxburgh, Pl. Coromandel 3: 75. 1820, nom. cons.

豆蔻属 dou kou shu

Meistera Giseke, nom. rej.; *Paludana* Giseke, nom. rej.; *Paramomum* S. Q. Tong; *Wurfbainia* Giseke, nom. rej.

Rhizomes widely creeping. Pseudostems elongate. Leaf sheath long; ligule entire or 2-lobed; leaf blade usually oblong-lanceolate, oblong, or linear. Inflorescence arising from rhizomes, a densely flowered spike or spikelike raceme or panicle; peduncle short or rather long, clothed with imbricate, scalelike sheaths; involucre absent; bracts imbricate, persistent, sometimes soon disintegrating; bracteoles usually tubular. Calyx usually tubular, apex 3-toothed. Corolla tube cylindrical; lobes oblong or linear-oblong, central one erect, usually wider and more convex than lateral ones. Lateral staminodes subulate, small, or absent. Labellum conspicuous, usually yellow or orange at center, with some red veins or marks, often white at margin, usually obovate, broadly concave. Filament well developed; anther locules parallel or diverging; connective appendage extending beyond apex of anther, entire or 3-lobed. Ovary 3-loculed; ovules many per locule, superposed. Style filiform; stigma usually funnelform, small, ciliate. Capsule irregularly dehiscent or indehiscent, smooth, prickly, or winged. Seeds oblong or many angled; aril fleshy or membranous, apex laciniate.

About 150 species: tropical Asia and Australia; 39 species (29 endemic, one introduced) in China.

Amomum krervanh Gagnepain (in FRPS, as “*A. kravanh*”) is locally cultivated in China and is also imported for medicinal use; however, it is not known to be naturalized. It may be conspecific with *A. testaceum* Ridley, in which case the latter name would have priority.

- 1a. Capsule smooth, neither prickly nor winged.
 - 2a. Leaf blade abaxially pubescent.
 - 3a. Leaves subsessile, leaf blade pubescent only along sides of midvein abaxially, ligule 2–4 mm 1. *A. kwangsiense*
 - 3b. Leaves sessile or petiolate (petiole to 12 cm), leaf blade uniformly pubescent abaxially, ligule 5–20 mm.
 - 4a. Ligule ca. 2 cm; petiole 2.5–12 cm; anther connective appendage 3-lobed 2. *A. longipetiolatum*
 - 4b. Ligule 0.5–1.5 cm; petiole absent to 11 cm; anther connective appendage entire.
 - 5a. Leaf blade abaxially silvery pubescent; petiole 4–8(–11) cm 3. *A. sericeum*
 - 5b. Leaf blade abaxially brownish pubescent; petiole absent to 2.5 cm 4. *A. yingjiangense*
 - 2b. Leaf blade glabrous on both surfaces.
 - 6a. Anther connective appendage 3-lobed.
 - 7a. Ligule 2-cleft.
 - 8a. Corolla lobes white, oblong, ca. 0.8 cm; labellum yellowish with orange midvein and purple margin, 1.5–1.8 × 1–1.5 cm 5. *A. compactum*
 - 8b. Corolla lobes rose, elliptic, ca. 3 cm; labellum with yellow midvein and purple stripes on each side, ca. 3.2 × 1.6 cm 6. *A. scarlatinum*
 - 7b. Ligule entire.
 - 9a. Labellum 3.5–4 cm.
 - 10a. Plants 1–1.7 m tall, with odor of coriander (*Coriandrum sativum*); petiole absent; ligule 0.4–1 cm 7. *A. coriandriodorum*
 - 10b. Plants 0.5–1 m tall, without odor of coriander; petiole 2.5–12 cm; ligule ca. 2 cm 8. *A. dolichanthum*
 - 9b. Labellum 1.5–3.2 cm.
 - 11a. Ligule 8–12 mm; corolla orange-red 9. *A. tsaoko*
 - 11b. Ligule 2–5 mm; corolla yellow with purple or white markings.
 - 12a. Petiole to 3 cm; corolla lobes oblong, ca. 3 cm; labellum obovate, 2.8–3.2 × 1.5–1.7 cm, base adnate to filament forming a tube ca. 3 mm 10. *A. tuberculatum*
 - 12b. Petiole absent; corolla lobes narrowly elliptic, ca. 1.4 cm; labellum suborbicular, ca. 1.5 × 1.8 cm, base not adnate to filament 11. *A. quadratolaminare*
 - 6b. Anther connective appendage entire.
 - 13a. Ligule 1–3 cm.
 - 14a. Ligule 1–1.5 cm; labellum yellow, with 2 red stripes from center to base, obovate, distal margin fimbriate 12. *A. thysanochilium*
 - 14b. Ligule 2.5–3 cm; labellum white, densely red dotted at center, with radiate, red veins at margin, narrowly elliptic 13. *A. paratsaoko*
 - 13b. Ligule 2–6 mm.
 - 15a. Petiole absent.
 - 16a. Ligule entire; leaf blade with lateral veins prominent adaxially 14. *A. capsiciforme*
 - 16b. Ligule emarginate at apex; leaf blade with lateral veins not prominent adaxially 15. *A. menglaense*
 - 15b. Petiole 0.5–5 cm.
 - 17a. Ligule entire, 2–4 mm; labellum ca. 3.2 × 1.5 cm, base adnate to filament forming a tube ca. 3 mm, margin crisped 16. *A. jingxiense*

- 17b. Ligule 2-cleft, 3–6 mm; labellum 1–1.3 × 0.6–0.9 cm, base not adnate to filament, apex 2-cleft.
 18a. Plants ca. 0.5 m tall; leaves 1–3; peduncle 4–16 cm; bracts 1.2–1.5 cm 17. *A. austrosinense*
 18b. Plants 1–3 m tall; leaves more than 3; peduncle 30–35 cm; bracts 2–2.7 cm 18. *A. koenigii*
- 1b. Capsule prickly or winged.
 19a. Capsule prickly.
 20a. Leaf blade hairy at least abaxially.
 21a. Leaf blade abaxially hairy 19. *A. verrucosum*
 21b. Leaf blade hairy on both surfaces.
 22a. Ligule entire, rarely emarginate at apex, 4–10 mm; bracts brown, ovate to lanceolate, ca. 3 cm; lateral staminodes 5–6 mm, apex entire 20. *A. microcarpum*
 22b. Ligule 2-cleft, 6–7 mm; bracts purple, oblong, ca. 1.2 cm; lateral staminodes ca. 1 cm, apex emarginate 21. *A. neoaurantiacum*
- 20b. Leaf blade glabrous.
 23a. Anther connective appendage 3-lobed.
 24a. Ligule lanceolate, 2–2.2 cm 22. *A. longiligulare*
 24b. Ligule semiorbicular, 0.3–0.5 cm 23. *A. villosum*
 23b. Anther connective appendage entire.
 25a. Petiole 4–5 mm; peduncle 13–32 cm.
 26a. Flowers white; calyx 1.5–2 cm; labellum broadly orbicular; lateral staminodes absent 24. *A. yunnanense*
 26b. Flowers yellow; calyx ca. 1 cm; labellum fan-shaped-spatulate; lateral staminodes toothlike, ca. 1 mm 25. *A. gagnepainii*
 25b. Petiole 5–10 mm; peduncle 0.5–1 cm.
 27a. Corolla white, lobes ca. 1.5 cm; labellum deltoid-ovate, ca. 1.5 cm; ligule ca. 3 mm 26. *A. chinense*
 27b. Corolla yellow, lobes 2–3 cm; labellum obovate, 2.5–3 cm; ligule 7–9 mm 27. *A. muricarpum*
- 19b. Capsule winged.
 28a. Leaf blade abaxially hairy.
 29a. Petiole absent to 8 cm.
 30a. Leaf blade abaxially white pubescent; capsule ovoid, pedicel 0.7–1 cm 28. *A. maximum*
 30b. Leaf blade abaxially brownish villous; capsule ellipsoid, pedicel 1–2 cm 29. *A. dealbatum*
 29b. Petiole 12–35 cm.
 31a. Inflorescences paniculate; fruiting peduncle 3–4 cm 30. *A. mengtzensis*
 31b. Inflorescences subcapitate; fruiting peduncle 5–12 cm 31. *A. subcapitatum*
- 28b. Leaf blade glabrous.
 32a. Filament broad, anther attached to middle of filament; lateral staminodes absent 32. *A. petaloideum*
 32b. Filament slender, anther attached to apex of filament; lateral staminodes present.
 33a. Ligule entire, 3–5 cm.
 34a. Spikes narrowly ellipsoid, 7–8 × 2.8–3.2 cm; peduncle 2.5–10 cm; bracts elliptic; corolla lobes and labellum entire at apex 33. *A. fragile*
 34b. Spikes capitate, 5.5–7 × 6–8 cm; peduncle 2–3 cm; bracts ovate-orbicular or broadly ovate; central lobe of corolla mucronate at apex; labellum 2-cleft at apex 34. *A. purpureorubrum*
 33b. Ligule entire or 2-cleft, 0.3–3 cm.
 35a. Ligule 3–4 mm; central lobe of corolla apiculate at apex.
 36a. Bract with horny cusp at apex; anther connective appendage entire 35. *A. subulatum*
 36b. Bract without horny cusp at apex; anther connective appendage 3-lobed 36. *A. glabrum*
 35b. Ligule 0.7–3 cm; central lobe of corolla not apiculate at apex.
 37a. Petiole absent; ligule 1.5–3 cm; bracteoles absent 37. *A. odontocarpum*
 37b. Petiole 5–26 cm; ligule 0.7–1.5 cm; bracteoles present.
 38a. Flowers yellow; labellum cuneate; peduncle 12–32 cm 38. *A. putrescens*
 38b. Flowers white; labellum slightly 3-lobed; peduncle ca. 7 cm 39. *A. repoeense*

1. *Amomum kwangsiense* D. Fang & X. X. Chen in D. Fang, Acta Phytotax. Sin. 16(3): 48. 1978.

广西豆蔻 *guang xi dou kou*

Plants ca. 1 m tall. Leaves sessile; ligule 2–4 mm; leaf blade lanceolate, 11–75 × 1.5–8.5 cm, abaxially densely appressed pubescent along sides of midvein, base usually cuneate, margin bristly, apex long acuminate. Spikes with peduncle embedded in ground, 1.5–33 cm; bracts white, lanceolate, 3.5–6 × 0.5–1.5 cm; bracteoles deltoid-lanceolate, not tubular, 0.5–3.5 cm. Calyx 3.3–4.5 cm, apex 3-toothed; teeth ca. 8 mm. Corolla

white, 3–4.5 cm, adaxially hairy; lobes lanceolate, hoodlike, 3.5–4 × 0.8–1.2 cm, central one apiculate at apex. Lateral staminodes subulate, ca. 4 mm. Labellum purple at claw, yellowish at apex, fan-shaped or spatulate, 3.5–4 × 2.5–3 cm, base adnate to filament forming a tube 0.7–1.3 cm. Filament ca. 7 mm; anther 1.1–1.4 cm; connective appendage entire, ca. 5 mm. Ovary pubescent. Capsule pale purple, subglobose, 1–2 cm, with 12 sometimes obscure lines. Fl. May–Jun, fr. Aug–Sep. $2n = 48^*$.

- Forests; 600–700 m. Guangxi, Guizhou.

Medicinal.

2. *Amomum longipetiolatum* Merrill, Lingnan Sci. J. 11: 40. 1932.

长柄豆蔻 chang bing dou kou

Elettariopsis longipetiolata (Merrill) D. Fang.

Plants 50–100 cm tall. Ligule orbicular, ca. 2 cm; petiole 2.5–12 cm; leaf blade adaxially green when fresh, becoming blue gray, abaxially pale green, oblong-lanceolate, 35–75 × 7–11 cm, adaxially glabrous, abaxially yellowish sericeous, base acute, apex acuminate. Spikes ellipsoid; peduncle short or absent; bracts 2–3 cm, submembranous. Flowers ca. 9 cm. Calyx ca. 3.5 cm, pubescent, apex 3-toothed; teeth oblong, ca. 3 mm. Corolla tube ca. 5.5 cm; lobes linear, ca. 2.5 cm × 4 mm, punctate. Lateral staminodes linear, 4–6 mm. Labellum white with yellowish middle and purple base, obovate, ca. 3.5 cm. Anther linear, 1.2–1.5 cm; connective appendage 3-lobed, lobes 3–4 × ca. 1 mm, central one erect, lateral ones falcate, expanding. Ovary oblong-ellipsoid, 3–4 mm, densely appressed pubescent. Capsule subglobose, ca. 2 cm in diam., brown pubescent; pedicel 1.5–2 cm. Fl. Apr–May. $2n = 48^*$.

• Forests; 400–600 m. Guangxi, Hainan.

3. *Amomum sericeum* Roxburgh, Fl. Ind. 1: 45. 1820.

银叶砂仁 yin ye sha ren

Amomum dealbatum Roxburgh var. *sericeum* (Roxburgh) Baker.

Plants 1–3 m tall. Ligule entire or slightly 2-cleft, 0.5–1.5 cm, membranous, pubescent, apex acute; petiole 4–8(–11) cm; leaf blade lanceolate, 50–65 × 7–15 cm, abaxially silvery pubescent, base cuneate, apex acuminate. Spikes subglobose, 3.5–5 cm in diam.; peduncle 2.5–4 cm, scalelike sheaths ovate, subleathery, apex emarginate; bracts oblong, ca. 3.5 cm, membranous, early deciduous; bracteoles absent. Calyx white, clavate, 2.2–3 cm, villous, apex 3-toothed. Corolla tube white; lobes 2.5–3 cm × 8–10 mm. Lateral staminodes subulate, ca. 5 mm. Labellum with yellow midvein striped red, oblong, 2–3 cm, white pubescent. Filament ca. 4 mm; anther ca. 9 mm; connective appendage semiorbicular, rarely obscurely 3-lobed. Capsule pale brown, obovoid-globose or obconical, ca. 2.5 × 1.5–2 cm, 3–5-angled, glabrous, apex with persistent calyx; pedicel ca. 3 mm. Seeds not fragrant. Fl. May–Jun, fr. Jul–Sep. $2n = 48^*$.

Wet places in dense forests; 600–1200 m. S Yunnan [India, Myanmar, ?Nepal, ?Sikkim].

4. *Amomum yingjiangense* S. Q. Tong & Y. M. Xia, Acta Bot. Yunnan. 10: 210. 1988.

盈江砂仁 ying jiang sha ren

Plants 1–1.2 m tall. Leaf sheath green, longitudinally striate, glabrous; ligule entire, 5–7 mm, densely brownish pubescent; petiole absent to 2.5 cm, densely brownish pubescent; leaf blade adaxially dark green, abaxially green, ovate-lanceolate, elliptic, or narrowly elliptic, 33–50 × 7–11 cm, abaxially densely brownish pubescent, adaxially glabrous except pubescent

along veins, base obliquely cuneate or attenuate, apex caudate. Flowers unknown. Fruiting spikes subcapitate, ca. 4 × 5.5 cm; peduncle 3–4 cm, scalelike sheaths densely pubescent. Capsule subglobose, ca. 2.1 cm in diam., with 3 longitudinal grooves, densely pubescent, apex with persistent calyx; pedicel 8–11 mm. Seeds conical, ca. 4 mm, 3-angled; aril white. Fr. Aug.

• Forests, ca. 1700 m. W Yunnan (Yingjiang Xian).

5. *Amomum compactum* Solander ex Maton, Trans. Linn. Soc. London 10: 251. 1811.

爪哇白豆蔻 zhao wa bai dou kou

Amomum kepulaga Sprague & Burkill.

Plants 1–1.5 m tall. Leaves sessile; ligule orbicular, 2-cleft, 5–7 mm, initially pubescent, later ciliate at margin; leaf blade lanceolate, 25–50 × 4–9 cm, glabrous except ciliate at margin, apex caudate, with tip 2.5–3 cm. Spikes cylindrical, ca. 5 × 2.5 cm, elongate after anthesis; peduncle to 8 cm; bracts yellow, ovate-oblong, 2–2.5 cm × 7–10 mm, longitudinally striate, persistent, margin ciliate; bracteoles tubular. Calyx 1–1.2 cm, pubescent, apex 3-toothed. Corolla white or yellowish; tube 1–1.2 cm; lobes oblong, ca. 8 mm. Lateral staminodes absent. Labellum yellowish with orange midvein and purple margin, elliptic, 1.5–1.8 × 1–1.5 cm, slightly concave, pubescent. Filament hairy at base; anther elliptic, ca. 2 mm; connective appendage 3-lobed, ca. 4 mm. Ovary pilose. Capsule yellowish, obovate, 1–1.5 cm in diam., slightly 9-grooved when dry, pilose. Seeds irregularly polyhedral, ca. 4 mm in diam. Fl. Feb–May, fr. Jun–Aug. $2n = 48^*$.

Cultivated. Hainan, S Yunnan [native to Indonesia (Java)].

Medicinal.

6. *Amomum scarlatinum* H. T. Tsai & P. S. Chen, Acta Phytotax. Sin. 17(4): 90. 1979.

红花砂仁 hong hua sha ren

Rhizomes strongly aromatic. Plants 1.5–3 m tall. Leaves sessile or subsessile; ligule 2-cleft, 5–8 mm, membranous, glabrous, lobes obtuse at apex; leaf blade narrowly elliptic, 35–40 × 4–11 cm, glabrous, base cuneate, apex acuminate. Spikes ellipsoid, ca. 4 cm in diam.; peduncle ca. 2.5 cm, scalelike sheaths dense, leathery; bracts purple, lanceolate, mostly acuminate, lacerate when dry; bracteoles rose with pale brown apex, tubular, ca. 4 cm × 8 mm, split nearly to base on 1 side. Calyx rose with pale brown apex, 2.7–3.2 cm × ca. 5 mm, pubescent, apex truncate or obscurely 3-lobed. Corolla tube white, equaling or slightly longer than calyx; lobes rose, narrowly elliptic, ca. 3 cm × 6–9 mm. Labellum with yellow midvein and purple stripes on each side, pale at apex, elliptic, ca. 3.2 × 1.6 cm, base white villous, margin crisped, apex toothed. Anther 1–1.5 cm; connective appendage pale brown, 3-lobed, lateral lobes linear, 5–7 mm. Ovary white pubescent. Fr. May.

• Wet places, roadsides; ca. 900 m. Yunnan.

7. *Amomum coriandriodorum* S. Q. Tong & Y. M. Xia, Acta Bot. Yunnan. 10: 208. 1988.

萎味砂仁 sui wei sha ren

Plants 1–1.7 m tall. Rhizomes, leaves, and capsules with

odor of coriander (*Coriandrum sativum* Linnaeus). Leaves sessile; ligule brownish, entire, 4–10 mm, glabrous; leaf blade elliptic or narrowly so, 20–40 × 5–12 cm, glabrous, base cuneate or attenuate, apex acuminate or caudate. Spikes subobovoid, ca. 7 × 4.5 cm, subcapitate and 5–5.5 × 7.5–8 cm in fruit; peduncle 2–3 cm; bracts red, ca. 4 × 1 cm; bracteoles red, tubular, ca. 2.8 cm. Calyx red, ca. 2 cm, apex obtusely 3-toothed. Corolla tube pale yellowish green, ca. 2 cm; lobes red, central one ca. 2.4 cm × 8 mm, lateral ones narrower. Lateral staminodes absent. Labellum ca. 4 × 2.5 cm, margin crisped; central lobe pale orange, broadly ovate; lateral lobes yellowish, auriculate, small. Filament ca. 7 mm; anther ca. 1 cm; connective appendage 3-lobed, ca. 3 × 11 mm, margin yellowish brown. Ovary sub-ellipsoid, ca. 7 × 4 mm. Capsule purplish red, ellipsoid, 3.8–4.2 × 2.3–2.5 cm. Seeds brown, ca. 6 × 4 mm, 3-angled. Fl. May, fr. Jul.

- Forests; 1300–1500 m. S Yunnan.

8. *Amomum dolichanthum* D. Fang, Acta Phytotax. Sin. 16 (3): 48. 1978.

长花豆蔻 chang hua dou kou

Plants 50–100 cm tall. Leaf sheath pubescent distally; ligule orbicular, ca. 2 cm, pubescent; petiole absent or rarely to 1.5 cm; leaf blade obovate or elliptic, 20–50 × 7–15 cm, glabrous, base acute, apex acuminate. Spikes ellipsoid; peduncle short or absent; bracts submembranous, 2–3 cm. Flowers ca. 9 cm. Corolla tube ca. 5.5 cm; lobes linear, ca. 2.5 cm × 4 mm, punctate. Lateral staminodes linear, 4–6 mm. Labellum white, yellowish at middle, purple at base, obovate, ca. 3.5 cm. Anther linear, 1.2–1.5 cm; connective appendage 3-lobed, lobes 3–4 × ca. 1 mm, central one erect, lateral ones falcate, expanded. Ovary oblong-ellipsoid, 3–4 mm, densely appressed pubescent. Capsule subglobose, ca. 2 cm in diam., brown pubescent, 1.5–2 cm. Fl. Apr–May.

- Forests. SW Guangxi (Longzhou Xian).

Medicinal.

9. *Amomum tsaoko* Crevost & Lemarie, Cat. Prod. Indo-Chine 300. 1917.

草果 cao guo

Amomum hongtsaoko C. F. Liang & D. Fang.

Plants to 3 m tall, aromatic. Rhizomes gingerlike. Ligule entire, 0.8–1.2 cm, apex obtuse; petiole absent or short; leaf blade narrowly elliptic or oblong, 40–70 × 10–20 cm, glabrous, base attenuate, margin drying membranous, apex acuminate. Spikes 13–18 × ca. 5 cm, 5–30-flowered; peduncle at least 10 cm, scalelike sheaths dense, brown when dry, oblong or narrowly elliptic, 5.5–7 × 2.3–3.5 cm, leathery, apex rounded; bracts lanceolate, ca. 4 cm × 6 mm, apex acuminate; bracteoles tubular, ca. 3 cm, apex 2- or 3-toothed. Calyx equaling bracteoles, apex obtusely 3-toothed. Corolla orange-red; tube ca. 2.5 cm; lobes oblong, ca. 2 cm × 4 mm. Labellum elliptic, ca. 2.7 × 1.4 cm, apex slightly toothed. Anther ca. 1.3 cm; connective appendage 3-lobed, ca. 4 × 11 mm, central lobe quadrilateral, lateral ones narrower. Capsule red, drying brown and longitudinally striate, oblong or elliptic, 2.5–4.5 × ca. 2 cm, glabrous.

Seeds 4–6 mm in diam., many angled, strongly aromatic. Fl. Apr–Jun, fr. Sep–Dec. $2n = 48^*$.

- Sparse forests; 1100–1800 m. Yunnan.

Both wild and cultivated plants are used for medicine.

10. *Amomum tuberculatum* D. Fang, Acta Phytotax. Sin. 16 (3): 47. 1978.

德保豆蔻 de bao dou kou

Plants 70–80 cm tall. Ligule entire, 2–5 mm; petiole to 3 cm; leaf blade ovate or lanceolate, 5–45 × 2.5–8 cm, glabrous, base rounded or cuneate, apex caudate. Spikes obovoid, ca. 30-flowered; peduncle embedded in ground, 1.5–7.5 cm; bracts red, lanceolate, 3.3–3.9 × 0.8–1.2 cm; bracteoles red with yellowish apex, tubular, ca. 2 cm. Calyx red with yellowish apex, 2.7–3 cm, split on 1 side, apex 2- or 3-toothed. Corolla tube 2.3–2.5 cm; lobes oblong, ca. 3 cm × 6–7 mm, central one yellow with purple markings, 1–1.2 cm wide. Lateral staminodes absent. Labellum red veined each side of midvein, obovate, 2.8–3.2 × 1.5–1.7 cm, densely tuberculate toward throat, base adnate to filament forming a tube ca. 3 mm, distal margin crisped, apex entire. Filament ca. 1.1 cm; connective appendage yellowish, 3-lobed, central lobe 6–7 × 5–7 mm. Capsule subglobose, 1.2–1.7 cm in diam., obscurely 3-angled. Fl. May, fr. Sep.

- Forests; 1500–1600 m. Guangxi.

11. *Amomum quadratolaminare* S. Q. Tong, Acta Phytotax. Sin. 27: 279. 1989.

方片砂仁 fang pian sha ren

Plants 0.8–1.5 m tall. Leaves sessile; leaf sheath green, conspicuously longitudinally striate; ligule entire, 2–3 mm, densely pubescent; leaf blade narrowly lanceolate or narrowly elliptic, 14–35 × 4–4.5 cm, glabrous, base narrowly cuneate, apex caudate-acuminate. Spikes 1–3, capitate or oblong, 1.2–3 cm in diam.; peduncle 0.8–4 cm, scalelike sheaths red, subleathery, margin ciliate; bracts red, ovate or oblong, 1.5–3.1 × 0.8–1.5 cm, subleathery, margin ciliate; bracteoles pale red, ca. 8 mm. Calyx pale red with white base, equaling bracteoles, apex 2-cleft. Corolla tube white, spotted red at apex, equaling calyx, pale white pubescent; lobes narrowly elliptic, ca. 1.4 cm × 4 mm. Lateral staminodes laminar, square, ca. 2 mm. Labellum white with yellow band at center and red spots at base, sub-orbicular, ca. 1.5 × 1.8 cm, glabrous, margin crisped. Filament white, ca. 5 mm; anther elliptic, ca. 6 mm; connective appendage 3-lobed, ca. 4 × 8 mm, central lobe emarginate at apex. Ovary densely brown pubescent. Style white; stigma ciliate. Fl. Mar.

- Forests; ca. 800 m. S Yunnan.

12. *Amomum thysanochilium* S. Q. Tong & Y. M. Xia, Acta Bot. Yunnan. 10: 205. 1988.

梳唇砂仁 shu chun sha ren

Plants 1.5–3 m tall. Leaves sessile; leaf sheath conspicuously striate, red on basal leaf; ligule brownish, entire, 1–1.5 cm, membranous, glabrous; leaf blade oblong-lanceolate, 50–60 × 7–10 cm, glabrous, base cuneate, apex long caudate. Spikes subcapitate, 4.5–5 × 5–6 cm; peduncle 2–7 cm, scalelike sheaths

pale red; bracts ovate-orbicular or ovate, 4.5–5 × 3.5–4 cm; bracteoles purplish red with brownish apex, tubular, ca. 3 cm. Calyx pale purplish red, ca. 3.2 cm, slightly hairy, apex 3-toothed. Corolla tube yellowish, ca. 2.5 cm, glabrous; lobes pale purplish red, linear, 2.5–3 cm. Lateral staminodes absent. Labellum yellow with 2 red stripes from center to base, obovate, 3.8–4.2 × 2–2.1 cm, base attenuate, distal margin fimbriate. Filament ca. 8 mm; anther white, linear, ca. 1.4 cm; connective appendage white, entire. Ovary slightly hairy. Fl. Apr.

- Forests; ca. 800 m. S Yunnan.

13. *Amomum paratsaoko* S. Q. Tong & Y. M. Xia, Acta Bot. Yunnan. 10: 207. 1988.

拟草果 ni cao guo

Plants 1.5–3 m tall. Leaves sessile; leaf sheath green, conspicuously longitudinally striate; ligule brownish, entire, 2.5–3 cm, membranous, glabrous; leaf blade adaxially green, abaxially pale green, narrowly oblong-lanceolate or narrowly elliptic-lanceolate, 40–85 × 13–18 cm, glabrous, base cuneate or attenuate, apex acuminate. Spikes 1 or 2, capitate or ovoid-globose, 4.5–6.5(–10) × 5–6 cm; peduncle 2–4 cm, scalelike sheaths leathery, glabrous; bracts ovate or elliptic, 4.5–6 × 5–5.5 cm, apex rounded; bracteoles white, tubular, 3–3.2 cm, membranous, glabrous, apex 2-toothed. Calyx white, clavate, 4–4.5 cm, membranous, glabrous, apex 3-toothed. Corolla white, glabrous; tube 3–3.5 cm; lobes lanceolate, subequal, central one 2.5–3.3 × 0.9–1.1 cm, apex not mucronate. Lateral staminodes absent. Labellum white, densely red dotted at center, with radiate, red veins at margin, narrowly elliptic, 3.2–4 × 2–2.3 cm, margin crisped. Stamen white; filament ca. 1 cm; anther linear, ca. 1.4 cm; connective appendage entire. Ovary white, glabrous. Style white, linear, pubescent; stigma pale green, ciliate. Capsule subglobose. Fl. May.

- Forests; ca. 1600 m. Guangxi, Guizhou, Yunnan.

14. *Amomum capsiciforme* S. Q. Tong, Acta Phytotax. Sin. 27: 282. 1989.

辣椒砂仁 la jiao sha ren

Plants 1–1.5 m tall. Leaves sessile; leaf sheath conspicuously longitudinally striate; ligule entire, 3–6 mm, subleathery, glabrous; leaf blade elliptic or oblong, 18–35 × 5.5–10 cm, glabrous, lateral veins prominent, base cuneate, apex caudate-acuminate. Flowers unknown. Fruiting spikes 6–7 cm; peduncle 3–5 cm, scalelike sheaths broadly ovate, subleathery. Capsule red, 4.8–5.2 × 1.8–2.2 cm, apex obtuse, with persistent calyx. Seeds subcapitate, ca. 5 × 3 mm, warty, wholly enclosed by white aril. Fr. Aug.

- Forests; ca. 1400 m. W Yunnan (Yingjiang Xian).

15. *Amomum menglaense* S. Q. Tong, Acta Bot. Yunnan. 13: 277. 1991.

勐腊砂仁 meng la sha ren

Plants 1–1.5 m tall. Leaves sessile; ligule ca. 5 mm, membranous, glabrous, apex emarginate; leaf blade elliptic or oblong-lanceolate, 35–40 × 7.5–9.5 cm, glabrous, base cuneate or narrowly so, apex acuminate. Spikes subcapitate, ca. 5 × 3.5 cm;

peduncle 3–12 cm; bracts brown or greenish brown, ovate or narrowly so, 2–3 × 1.2–1.5 cm; bracteoles reddish, tubular, ca. 3.5 cm. Calyx ca. 3 cm, apex 3-toothed, teeth reddish at apex. Corolla tube white, ca. 3.2 cm; central lobe suboblong, ca. 3 × 1.3 cm, apex mucronate; lateral lobes subelliptic, ca. 1.1 cm. Lateral staminodes red, subulate, ca. 4 mm. Labellum red at center, with radiate lines and yellow apex, suboblong, ca. 3.5 × 1.8 cm, margin crisped, apex entire. Stamen white; filament ca. 5 mm; anther linear, ca. 1.5 cm; connective appendage entire, ca. 4 × 8 mm. Ovary yellowish green, ca. 6 mm, glabrous. Fl. May.

- Forests; ca. 1800 m. S Yunnan (Mengla Xian).

16. *Amomum jingxiense* D. Fang & D. H. Qin in D. Fang, Acta Phytotax. Sin. 27: 461. 1989.

狭叶豆蔻 xia ye dou kou

Plants ca. 1.3 m tall. Ligule entire, 2–4 mm; petiole absent on proximal leaves, 5–10 mm on distal ones; leaf blade linear-lanceolate, 13–50 × 1.5–3(–3.5) cm, glabrous, base cuneate, apex long acuminate. Spikes 5–6 × 2.5–4 cm, 10–20-flowered; peduncle 1.5–4.5 cm; bracts elliptic, 2–3.5 × 1–1.5 cm, apex obtuse; bracteoles purple, tubular, ca. 2.5 cm, split on 1 side, apex 2-lobed. Flowers yellow. Calyx purplish red, ca. 3 cm, apex 3-toothed. Corolla tube ca. 1.7 cm; lobes oblong, ca. 3 cm × 8 mm, central one hoodlike, wider than lateral ones. Lateral staminodes ca. 1 mm. Labellum purple lined, obovate, ca. 3.2 × 1.5 cm, papillose toward throat, base adnate to filament forming a tube ca. 3 mm, margin crisped. Filament ca. 5 mm; anther ca. 1.3 cm; connective appendage ca. 5 × 8 mm, margin crenulate. Ovary glabrous. Capsule ellipsoid, 1.7–1.9 × 1.1–1.2 cm, striate. Fl. Apr, fr. Sep–Oct.

- Forests; ca. 1300 m. W Guangxi (Jingxi Xian).

17. *Amomum austrosinense* D. Fang, Guihaia 2: 136. 1982.

三叶豆蔻 san ye dou kou

Plants ca. 50 cm tall. Leaves 1–3, usually 2; leaf sheath striate; ligule 2-lobed, 3–6 mm, puberulent; petiole 0.5–5 cm, puberulent; leaf blade narrowly elliptic or oblong, rarely ovate to oblanceolate, 10–40 × 3.5–11 cm, glabrous except puberulent along midvein, base cuneate to broadly so, sometimes oblique, margin densely ciliate, apex acuminate. Spikes 3–6 cm; peduncle 4–6 cm; bracts obovate or oblong, 1.2–1.5 cm × 5–8 mm, 1- or 2-flowered; bracteoles absent. Calyx white basally, purple distally, ca. 1.6 cm, puberulent, apex 3- or 4-toothed. Corolla tube ca. 1.8 cm, puberulent; lobes white tinged reddish, oblong, ca. 1.5 cm × 5 mm. Lateral staminodes red, linear, 5–6 mm. Labellum white with red lines, obovate, ca. 1.3 cm × 9 mm, margin coarsely serrate, apex 2-lobed. Anther red, 8–9 mm; connective appendage 2-lobed, small. Ovary densely pubescent. Capsule globose, 0.8–1.4 cm in diam., red pubescent, apex with persistent calyx. Fl. Jun. $2n = 48^*$.

- Forests; 700–1000 m. Guangdong, Guangxi.

Medicinal.

18. *Amomum koenigii* J. F. Gmelin, Syst. Nat. 2: 6. 1791.

野草果 ye cao guo

Plants 1–3 m tall. Ligule 2-cleft, ca. 6 mm, papery, lobes rounded at apex; petiole 5–10 mm; leaf blade lanceolate or linear-lanceolate, 30–45 × 4–11 cm, glabrous, base cuneate, apex caudate. Spikes narrowly ellipsoid, 4–5 cm; peduncle 30–35 cm in fruit; bracts oblong, 2–2.7 cm × 6–8 mm; bracteoles tubular, 1.1–1.3 cm, pubescent, apex 2-cleft. Calyx ca. 1.4 cm, base white villous, apex 2- or 3-lobed. Corolla tube equaling calyx, base white pilose; lobes oblong-lanceolate, 1–1.3 cm. Labellum subrhombic, ca. 1 cm × 6–8 mm, apex 2-cleft; claw white pubescent. Anther linear-oblong, ca. 3 cm; connective appendage semiorbicular. Ovary densely brownish pubescent. Capsule ovoid, rarely oblong-ellipsoid, 2–2.5 × 1–1.5 cm, longitudinally striate when dry. Fl. May–Jul, fr. Sep–Nov.

Forests; 200–1500 m. Guangxi, Yunnan [India, Thailand].

19. *Amomum verrucosum* S. Q. Tong, Acta Phytotax. Sin. 27: 280. 1989.

疣子砂仁 you zi sha ren

Plants 3–3.5 m tall. Leaf sheath striate; ligule 1–1.5 cm, densely brown villous, apex truncate; petiole 1–1.5 cm; leaf blade narrowly elliptic or narrowly lanceolate, 40–50 × 9–12 cm, abaxially sparsely hairy except densely white pubescent along midvein, base cuneate, margin densely ciliate, apex acuminate or caudate-acuminate. Spikes capitate or ovoid, ca. 9.5 × 8.5 cm; peduncle densely brown villous, elongate after anthesis; bracts subelliptic, 3.5–4 × 2.3–2.5 cm; bracteoles tubular, 1.7–2.5 cm, pubescent. Calyx whitish, 2.5–3 cm, pubescent, apex 3-toothed. Corolla tube 2–2.2 cm, apex orange with red veins; lobes yellowish, central one red veined, suborbicular, 2.5–2.8 × 2.2–2.5 cm, lateral ones not red veined, narrower than central one. Lateral staminodes yellowish, subulate, ca. 6 mm. Labellum yellow with red spots and veins, semiorbicular, 3–3.5 × 3.5–4 cm. Stamen ca. 2.5 cm; anther linear, ca. 1.5 cm; connective appendage yellow, slightly 3-lobed. Capsule purple-black, globose, ca. 3.5 cm in diam., with branched, soft spines 3–5 mm. Seeds brown-black, broadly ellipsoid, ca. 4 × 3 mm; aril white. Fl. Jun.

• Forests; ca. 800 m. S Yunnan.

20. *Amomum microcarpum* C. F. Liang & D. Fang in D. Fang, Acta Phytotax. Sin. 16(3): 49. 1978.

细砂仁 xi sha ren

Plants ca. 2.5 m tall. Leaves sessile; ligule entire, 4–10 mm, hairy, apex rounded, rarely emarginate; leaf blade oblong-lanceolate, 20–60 × 2.5–9 cm, sparsely pilose, base cuneate, apex with caudate tip 1.5–3 cm. Spikes with densely appressed hairy peduncle and rachis; bracts brown, lanceolate to ovate, ca. 3 cm, subglabrous except hairy at base; bracteoles reddish with brownish apex, ca. 1.7 cm, apex 2- or 3-toothed. Calyx reddish with whitish apex, ca. 1.7 cm, glabrous, apex slightly 3-toothed. Corolla reddish; corolla tube nearly as long as calyx; central lobe oblong-ovate, ca. 1.1 cm × 8 mm, apex cucullate; lateral lobes narrower than central one. Lateral staminodes linear, 5–6 mm, apex entire. Labellum white with yellow midvein and red-dotted base, orbicular, ca. 1.8 × 1.5 cm, base attenuate, pubescent, apex 2-cleft. Anther ca. 5 mm; connective appendage

slightly 3-lobed, 2–3 mm, central lobe wider than lateral ones. Ovary appressed villous. Capsule purplish, ovoid, 1–1.5 × 0.8–1.2 cm, sparsely appressed villous, with soft spines. Seeds black. Fl. Apr–May, fr. Aug–Sep.

• Dense forests; 300–500 m. S Guangxi (Dongxing Xian).

Medicinal.

21. *Amomum neoaurantiacum* T. L. Wu et al., Novon 10: 90. 2000.

红壳砂仁 hong ke sha ren

Amomum aurantiacum H. T. Tsai & S. W. Zhao in H. T. Tsai & P. S. Chen, Acta Phytotax. Sin. 17(4): 91. 1979, not Ridley (1920).

Plants 2–2.5 m tall. Pseudostems brown pubescent. Ligule 2-cleft, 6–7 mm, densely yellow villous; petiole very short; leaf blade abaxially light green, narrowly lanceolate, ca. 30 × 5–6.5 cm, adaxially sparsely and shortly appressed brown hairy, abaxially densely villous, base cuneate, apex caudate. Spikes oblong; peduncle ca. 3 cm, villous, scalelike sheaths purple, deltoid, villous; bracts purple, oblong, ca. 1.2 cm × 5 mm. Calyx ca. 1.5 cm, apex 3-toothed. Corolla tube yellow-red, ca. 1 cm. Lateral staminodes linear, ca. 1 cm, apex emarginate. Labellum white, yellow with purple spots at center, orbicular, ca. 1.8 cm in diam., apex acute, 2-cleft. Filament ca. 1 cm; anther oblong, ca. 8 mm; connective appendage 3-lobed, central lobe semi-orbicular, lateral ones linear. Capsule orange, subglobose or ovoid, 1.3–1.8 × 0.7–1.1 cm, appressed rusty hairy, with sparse, fleshy spines. Seeds red-brown, 4- to many angled. Fl. May–Jun, fr. Aug–Sep.

• Forests; ca. 600 m. Yunnan.

Medicinal.

22. *Amomum longiligulare* T. L. Wu, Fl. Hainan. 4: 533. 1977.

海南砂仁 hai nan sha ren

Plants 1–1.5 m tall. Ligule lanceolate, 2–4.5 cm, membranous, glabrous; petiole ca. 5 mm; leaf blade linear-lanceolate or linear, 20–30 × 2.5–3 cm, glabrous, base attenuate, apex caudate-apiculate. Spikes with 1–3 cm long peduncle; bracts brown, lanceolate, 2–2.5 cm; bracteoles tubular, ca. 2 cm. Calyx white, 2–2.2 cm, apex 3-toothed. Corolla slightly longer than calyx; lobes oblong, ca. 1.5 cm. Labellum white with purple midvein and yellow apex, orbicular-spatulate, ca. 2 × 2 cm, midvein convex, apex with 2-lobed point. Stamen ca. 1 cm; connective appendage 3-lobed, central lobe orbicular, lateral ones suborbicular. Capsule ovoid, 1.5–2.2 × 0.8–1.2 cm, obtusely 3-angled, with branched, soft, flaky spines to 1 mm. Seeds purple-brown, enclosed in a brown, membranous aril. Fl. Apr–May, fr. Jun–Sep.

• Forests. Hainan.

Cultivated for medicine.

23. *Amomum villosum* Loureiro, Fl. Cochinch. 1: 4. 1790.

砂仁 sha ren

Plants (1–)1.5–3 m tall. Rhizomes procumbent above

ground, clothed with brown, scalelike sheaths. Leaves sessile or subsessile; leaf sheath with netlike, depressed squares; ligule semiorbicular, 3–5 mm; leaf blade lanceolate to linear, 25–35 × 3–7 cm, glabrous, base subrounded, apex caudate. Spikes ellipsoid; peduncle 4–8 cm, scalelike sheaths brown or green, elliptic; bracts lanceolate, ca. 1.8 cm × 5 mm; bracteoles tubular, ca. 1 cm. Calyx white, ca. 1.7 cm, slightly pubescent, apex 3-toothed. Corolla tube ca. 1.8 cm; lobes white, obovate-oblong, 1.6–2 cm × 5–7 mm. Labellum white with yellow, purple-tinged midvein, 2 purple spots at base, and yellow apex, orbicular-spatulate, 1.6–2 cm wide, midvein convex, base contracted into claw, apex reflexed, 2-cleft. Filament 5–6 mm; anther ca. 6 mm; connective appendage 3-lobed, central lobe semiorbicular, ca. 3 × 4 mm, lateral ones auriculate. Ovary white pubescent. Capsule purple, green, or brownish when mature and fresh, brown when dry, ellipsoid, 1.5–2 × 1.2–2 cm, with branched or simple, soft spines. Seeds many angled, strongly aromatic. Fl. May–Jun, fr. Aug–Sep.

Forests, cultivated in wet and shady places in sparse forests; 100–800 m. Fujian, Guangdong, Guangxi, Yunnan [Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

- 1a. Capsule purple when mature and fresh 23a. var. *villosum*
- 1b. Capsule green or brownish when mature and fresh 23b. var. *xanthioides*

23a. Amomum villosum var. **villosum**

砂仁(原变种) sha ren (yuan bian zhong)

Capsule purple when mature and fresh. Fl. May–Jun, fr. Aug–Sep. $2n = 48^*$.

• Cultivated in wet and shady places in sparse forests; 100–600 m. Fujian, Guangdong, Guangxi, Yunnan.

23b. Amomum villosum var. **xanthioides** (Wallich ex Baker) T. L. Wu & S. J. Chen, Acta Phytotax. Sin. 16(3): 38. 1978.

缩砂仁 suo sha ren

Amomum xanthioides Wallich ex Baker in J. D. Hooker, Fl. Brit. India 6: 239. 1892; *A. villosum* var. *nanum* H. T. Tsai & S. W. Zhao.

Capsule green or brownish when mature and fresh. Fl. May–Jun. $2n = 48^*$.

Forests; 600–800 m. Guangxi, Yunnan [Cambodia, India, Laos, Myanmar, Thailand, Vietnam].

24. Amomum yunnanense S. Q. Tong, Acta Bot. Yunnan. 12: 151. 1990.

云南砂仁 yun nan sha ren

Plants 1–1.5 m tall, base with light red sheaths. Leaf sheath green, longitudinally striate, glabrous; ligule green, entire, ca. 4 mm, leathery, margin ciliate; petiole ca. 4 mm; leaf blade obovate-oblong or elliptic-lanceolate, 18–30 × 6–9 cm, glabrous, base rounded, apex acuminate or caudate. Spikes suboblong, ca. 8 × 3.5 cm; peduncle 13–15 cm, scalelike sheaths light red, white pubescent; outer bracts decayed at anthesis, inner bracts narrowly oblanceolate, 3.5–4.5 cm × 7–8

mm; bracteoles light red, tubular, ca. 1 cm, glabrous, apex emarginate. Flowers white. Calyx 1.5–2 cm, apex obtusely 3-toothed; teeth red, ciliate. Corolla tube equaling calyx, glabrous; central lobe elliptic, lateral lobes oblong, 1.4–1.6 cm × 6–9 mm. Lateral staminodes absent. Labellum broadly orbicular, 1.4–1.6 cm, base contracted into claw, apex emarginate. Filament ca. 5 mm; anther ca. 8 mm; connective appendage entire. Ovary densely white pubescent. Capsule (immature) red, globose, ca. 1.2 cm in diam., with soft spines 1–2 mm. Fr. Jul.

• Forests; ca. 1200 m. W Yunnan (Yingjiang Xian).

25. Amomum gagnepainii T. L. Wu et al., Novon 10: 90. 2000.

长序砂仁 chang xu sha ren

Amomum thyrsoideum Gagnepain, Bull. Soc. Bot. France 49: 256. 1903, not Ruiz & Pavón (1798).

Roots tuberous. Leaf sheath striate, glabrous; ligule orbicular, 4–5 mm; petiole ca. 5 mm; leaf blade oblong-lanceolate, 20–25 × ca. 6 cm, glabrous, midvein becoming obscure toward apex, base rounded, apex acuminate. Spikes cylindrical, 8–13 cm; peduncle ca. 30 cm, scalelike sheaths ovate-lanceolate, ca. 3 cm; bracts imbricate, purple, lanceolate, 2–2.3 cm; bracteoles tubular, 0.9–1.2 cm, split on 1 side, apex 2-cleft. Calyx subcylindrical, ca. 1 cm, abaxially villous, apex 3-toothed. Corolla tube equaling calyx, villous; lobes yellow, ca. 1.4 cm × 6 mm, central one ca. 9 mm wide. Lateral staminodes toothlike, ca. 1 mm. Labellum yellow at midvein with purple veins, spatulate-fan-shaped, ca. 1.5 × 1.2 cm, base attenuate, apex 2-cleft. Stamen ca. 1.1 cm; filament ca. 5 mm; connective appendage semiorbicular, ca. 1.5 mm. Ovary hirsute. Capsule subglobose or ovoid, ca. 2.5 × 1.2–1.8 cm, with dense, curved spines. Seeds 3–4 mm in diam., angled. Fl. May, fr. Jul. $2n = 48^*$.

Dense forests. Guangxi [Vietnam].

26. Amomum chinense Chun, Fl. Hainan. 4: 533. 1977.

海南假砂仁 hai nan jia sha ren

Plants 1–1.5 m tall. Leaf sheath conspicuously concave veined; ligule purple, 2-cleft, ca. 3 mm; petiole 5–10 mm; leaf blade oblong or elliptic, 16–30 × 4–8 cm, glabrous, base acute, apex caudate-acuminate. Spikes turbinate, ca. 3 cm in diam., ca. 20-flowered; peduncle 5–10 cm; bracts purple, ovate, 1–2 cm; bracteoles tubular, ca. 2 cm. Calyx tinged red at base, ca. 1.7 cm, base villous, apex 3-toothed. Corolla tube slightly longer than calyx; lobes oblanceolate, ca. 1.5 cm, apex concave. Labellum white with purple midvein and veins, deltoid-ovate, ca. 1.5 × 1 cm; claw 5–6 mm. Anther ca. 6 mm; connective appendage semiorbicular, ca. 8 × 4 mm, margin shallowly crenate. Ovary yellow villous. Capsule ellipsoid, with branched, soft spines 2–3 mm. Fl. Apr–May, fr. Jun–Aug. $2n = 48^*$.

• Forests. Hainan.

27. Amomum muricarpum Elmer, Leaf. Philipp. Bot. 8: 2896. 1915.

疣果豆蔻 you guo dou kou

Plants 2–3 m tall. Rhizomes robust. Ligule 7–9 mm; petiole 5–10 mm; leaf blade lanceolate or oblong-lanceolate, 25–

35 × 6–8 cm, glabrous, base cuneate, apex caudate-acuminate. Spikes ovoid, 6–8 cm; peduncle 5–7 cm, scalelike sheaths imbricate, proximal ones smaller than distal ones; rachis yellow tomentose; bracteoles brown, tubular, 2–2.5 cm, split nearly to base on 1 side. Calyx red, ca. 2.5 cm, apex 2-cleft. Corolla tube equaling calyx; lobes apricot yellow, conspicuously red veined, 2–3 cm. Lateral staminodes subulate. Labellum apricot yellow with purple veins and spots, obovate, 2.5–3 cm, margin cristate, apex 2-cleft. Connective appendage semiorbicular, spreading laterally, ca. 5 mm × 1 cm. Capsule red, globose or ellipsoid, ca. 2.5 cm in diam., yellow tomentose, with branched, fleshy spines 3–6 mm. Fl. May–Sep, fr. Jun–Dec. $2n = 48^*$.

Dense forests; 300–1000 m. Guangdong, Guangxi [Philippines].

Medicinal.

28. *Amomum maximum* Roxburgh, Fl. Ind. 1: 41. 1820.

九翅豆蔻 jiu chi dou kou

Plants 2–3 m tall. Ligule pale yellow-green, oblong, 2-cleft, 1.2–2 cm, sparsely white pubescent; petiole absent to 8 cm; leaf blade oblong or long elliptic, 30–90 × 10–20 cm, adaxially glabrous, abaxially white villous, base attenuate, decurrent, apex caudate. Spikes subglobose, ca. 5 cm in diam.; bracts brownish, 2–2.5 cm, pubescent, deciduous. Calyx pale purple spotted adaxially, ca. 2.3 cm, apex 3-toothed; teeth lanceolate, ca. 5 mm. Corolla tube slightly longer than calyx; lobes white, oblong. Labellum white, yellow on each side of midvein, red striate at base, ovate, ca. 3.5 cm, apex slightly revolute, entire. Filament short; anther linear, 1–1.2 cm; connective appendage yellowish, crescent-shaped, apex slightly revolute. Capsule purple-green, ovoid, 2.5–3 × 1.8–2.4 cm, 9-winged, white pubescent; pedicel 7–10 mm. Fl. May–Jun, fr. Jun–Aug. $2n = 48^*$.

Forests; 400–800 m. Guangdong, Guangxi, S Xizang, Yunnan [Indonesia].

Medicinal.

29. *Amomum dealbatum* Roxburgh, Fl. Ind. 1: 42. 1820.

长果砂仁 chang guo sha ren

Plants 1–3.5 m tall. Ligule orbicular, 2-cleft, 0.4–1.6 cm, rusty villous; petiole 0.5–3 cm; leaf blade adaxially bright green, abaxially whitish, oblong-lanceolate, 50–70 × 5.5–14 cm, adaxially glabrous, abaxially brownish pubescent, base cuneate, apex acuminate. Spikes subglobose, 3–5 cm in diam.; peduncle 2–8 cm; bracts reddish, ovate, ca. 2.5 cm. Calyx 3-lobed at apex; lobes 2-lobed. Corolla tube white, ca. 2.5 cm; lobes white, lanceolate, equaling tube. Lateral staminodes subulate, ca. 2 mm. Labellum white with yellow line along center and radiate, red veins, elliptic, ca. 2.5 cm, apex emarginate. Filament ca. 5 mm; anther ca. 2 mm; connective appendage elliptic, ca. 3 mm. Capsule purple-green, ellipsoid, 2.5–3 × 1–1.2 cm, with 9 crenulate-winged ribs, indehiscent; pedicel 1–2 cm. Fl. May–Jun, fr. Jun–Sep.

Shady forests, hill slopes; 600–800 m. Yunnan [Bangladesh, India, ?Nepal, Sikkim, Thailand].

30. *Amomum mengtense* H. T. Tsai & P. S. Chen, Acta Phytotax. Sin. 17(4): 91. 1979.

蒙自砂仁 meng zi sha ren

Ligule 2-cleft, ca. 1.1 cm, membranous, glabrous, lobes rounded at apex; petiole ca. 16 cm; leaf blade adaxially green, abaxially pale green, oblong, 70–100 × 12–15 cm, adaxially glabrous, abaxially densely pubescent, lateral veins white when dry, base cuneate, apex acuminate. Flowers unknown. Infructescence paniculate; peduncle 30–40 cm, scalelike sheaths oblong, ca. 2.7 × 1 cm, apex mucronate. Capsule ellipsoid, 2.5–3.2 × 1.5–1.7 cm, 9-winged, sparsely villous, apex with persistent calyx; pedicel ca. 5 mm. Fr. May.

• S Yunnan.

31. *Amomum subcapitatum* Y. M. Xia, Acta Phytotax. Sin. 35: 259. 1997.

头花砂仁 tou hua sha ren

Plants 1.5–2 m tall. Leaf sheath green, glabrous; ligule 2-lobed, 1–1.4 cm, leathery, pubescent; petiole 12–35 cm, glabrous; leaf blade lanceolate, 60–100 × 16–18 cm, adaxially glabrous, abaxially densely silvery sericeous, base attenuate, apex shortly acuminate. Spikes 1 or 2, subcapitate, 5.5–7 × 4–6 cm; peduncle 5–12 cm, scalelike sheaths glabrous; bracts 2- or 3-flowered, early deciduous together with bracteoles. Calyx red, ca. 2.4 cm × 5 mm, pubescent, apex 3-toothed. Corolla tube red, ca. 2.2 cm × 3–4 mm, glabrous; lobes striped with purple-red, lanceolate, central one ca. 3.2 cm × 7 mm, apex corniculate, lateral ones obtuse at apex. Lateral staminodes yellow, linear, 4–6 mm. Labellum yellow with purple-red stripes at center, elliptic, 4–4.4 × 2.2–2.5 cm, margin crisped. Filament yellow, ca. 1.5 cm; anther light red, ca. 1.2 cm; connective appendage light red, 2-lobed, ca. 2 × 7 mm. Ovary ca. 6 mm, densely pubescent. Capsule purple-red, ellipsoid, 2.5–2.8 × 1.5–1.8 cm, 9-winged, apex with persistent calyx; wings crisped. Fr. Oct.

• Forests; ca. 900 m. W Yunnan (Yingjiang Xian).

32. *Amomum petaloideum* (S. Q. Tong) T. L. Wu, Novon 7: 441. 1997.

宽丝豆蔻 kuan si dou kou

Paramomum petaloideum S. Q. Tong, Acta Bot. Yunnan. 7: 310. 1985.

Plants 1–1.5 m tall, base with red sheaths. Leaf sheath longitudinally striate; ligule oblong, ca. 1 cm, apex emarginate; petiole 2–9 cm; leaf blade abaxially green, adaxially purple-red or light green, elliptic or lanceolate, 40–60 × 9–14 cm, glabrous, base cuneate or narrowly so, apex acuminate or shortly so. Spikes with 5–6 cm long peduncle, scalelike sheaths red with yellow-green margin; bracts ovate-orbicular, 3.4–3.6 × 3–3.2 cm; bracteoles red, tubular, ca. 2.2 cm, apex 3-toothed. Corolla tube equaling calyx, densely white pubescent; lobes narrowly elliptic, 1.4–1.5 cm × 4–8 mm. Lateral staminodes absent. Labellum yellow at apex, obovate, margin crisped. Filament red at base, bright red at middle, orange distally, broad, apex acuminate; anther attached to middle of filament. Ovary pale red, 3-loculed. Style white, linear. Stylodes clavate. Capsule red, hemispheric, 1.9–2 cm in diam., apex prolonged into wings, with persistent calyx. Seeds black, arillate. Fl. May–Jun.

• Forests; 500–600 m. S Yunnan (Mengla Xian).

33. *Amomum fragile* S. Q. Tong, Acta Phytotax. Sin. 27: 277. 1989.

脆舌砂仁 cui she sha ren

Plants ca. 2 m tall. Leaves sessile; leaf sheath purple-red; ligule light purple, entire, ca. 4 cm, fragile; leaf blade lanceolate or narrowly so, 55–80 × 5–9 cm, glabrous, base cuneate or narrowly so, apex acuminate or caudate-acuminate. Spikes narrowly ellipsoid, 7–8 × 2.8–3.2 cm; peduncle 2.5–10 cm; bracts elliptic, 3.5–5 × 2–3 cm; bracteoles narrowly lanceolate, ca. 4.5 cm × 7 mm, plicate. Calyx purple-red spotted, ca. 3 cm, pubescent, apex 3-toothed. Corolla tube white, ca. 2.5 cm; lobes narrowly elliptic, ca. 3 cm. Lateral staminodes ca. 2 mm. Labellum ovate, ca. 3.5 × 2.3 cm, margin crisped, apex entire. Filament ca. 5 mm; anther linear, ca. 1.2 cm; connective appendage entire, ca. 4 mm × 1 cm. Ovary brownish, densely white pubescent. Capsule narrowly oblong, winged, densely pubescent. Fl. Jun.

• Forests. SW Yunnan (Menghai Xian).

34. *Amomum purpureorubrum* S. Q. Tong & Y. M. Xia, Acta Bot. Yunnan. 10: 207. 1988.

紫红砂仁 zi hong sha ren

Plants 1–2 m tall. Leaves sessile; leaf sheath purple-red, glabrous; ligule entire, 3–5 cm, membranous, glabrous; leaf blade abaxially pale green, adaxially green, lanceolate or narrowly so, 30–60 × 7–10 cm, glabrous, base cuneate or attenuate, apex acuminate or caudate. Spikes 1 or 2, capitate, 5.5–7 × 6–8 cm; peduncle 2–3 cm, scalelike sheaths red, glabrous; bracts dark red, ovate-orbicular or broadly ovate, 3–3.5 × 2.3–2.7 cm, glabrous, apex mucronate; bracteoles dark red, narrowly lanceolate, 4.3–5 cm × 8–11 mm, glabrous. Flowers white. Calyx red spotted, 2.5–3 cm, minutely pubescent, apex 3-toothed; teeth with red line from apex to calyx base. Corolla tube 1.8–2.2 cm; lobes narrowly elliptic, subequal, central one white with minute, red dots, 2.3–2.6 × 1.1–1.2 cm, apex mucronate, lateral lobes narrower than central one. Lateral staminodes subulate, ca. 3 mm. Labellum white with yellow center and radiate, red veins to margin, ovate-orbicular, 3.2–3.4 × 2.1–2.3 cm, base attenuate, margin crisped, apex 2-cleft. Stamen white; filament ca. 4 mm; anther ca. 1.1 cm; connective appendage entire, glabrous. Ovary yellow-green, densely white pubescent. Capsule purple-red, subovoid, ca. 2.8 × 2 cm, crisped winged. Fl. Apr.

• Forests; 1600–1700 m. SW Yunnan (Menghai Xian).

35. *Amomum subulatum* Roxburgh, Pl. Coromandel 3: 75. 1820.

香豆蔻 xiang dou kou

Plants 1–2 m tall. Ligule 3–4 mm, membranous, apex rounded, emarginate; petiole absent or nearly so on proximal leaves, 1–3 cm on distal ones; leaf blade oblong-lanceolate, 25–60 × 3.5–11 cm, glabrous, base rounded or cuneate, apex long cuspidate. Spikes subturbinate, ca. 5 cm in diam.; peduncle 0.5–4.5 cm, scalelike sheaths brown; bracts pale red, ovate, ca. 3 cm, apex obtuse with horny cusp; bracteoles tubular, ca. 3 cm, apex acute, emarginate. Calyx glabrous, 3-cleft to middle; lobes

subulate. Corolla tube equaling calyx; lobes yellow, central one subulate at apex. Lateral staminodes red, subulate, ca. 2 mm. Labellum with yellow midvein, oblong, ca. 3 cm, white pubescent, veins conspicuous, apex involute. Filament ca. 5 mm; anther ca. 1 cm; connective appendage elliptic, entire, ca. 4 mm. Capsule purple or red-brown, globose, 2–2.5 cm in diam., with 10 undulate wings, apex with persistent calyx. Fl. May–Jun, fr. Jun–Sep. $2n = 48$.

Dense forests; 300–1300 m. Guangxi, Xizang, Yunnan [Bangladesh, Bhutan, N India, Myanmar, Nepal, Sikkim].

Tong (Bull. Bot. Res., Harbin 18: 140. 1998) referred the plants treated in FRPS as *Amomum subulatum* to *A. glabrum*. However, one of us (Wu) notes that the species was correctly identified in FRPS, except for the illustration (pl. 46, f. 1–7), which depicts *A. glabrum*.

36. *Amomum glabrum* S. Q. Tong, Acta Phytotax. Sin. 27: 282. 1989.

无毛砂仁 wu mao sha ren

Plants 0.8–1.5 m tall. Leaf sheath green, longitudinally striate; ligule 2-cleft, 3–4 mm, membranous; petiole absent on proximal leaves, 1–3 cm on distal ones; leaf blade narrowly elliptic-lanceolate, 25–55 × 4–5 cm, glabrous, base cuneate, apex acuminate or caudate. Spikes subovoid, ca. 4.5 × 3 cm; bracts reddish, subovate, ca. 3.5 × 2 cm, apex obtuse; bracteoles white, tubular, ca. 3 cm, apex entire. Calyx ca. 3.5 cm, split to middle on 1 side, apex 3-toothed. Corolla tube ca. 3 cm; lobes lanceolate, central one ca. 3.3 × 1.1 cm, apex apiculate, lateral ones narrower. Lateral staminodes red at base, white distally, subulate. Labellum broadly ovate, ca. 3.5 × 2.8 cm, margin crisped. Filament ca. 1 cm; anther ca. 1.5 cm; connective appendage 3-lobed, ca. 3 mm × 1.2 cm. Ovary greenish, glabrous. Capsule globose, 1.5–2 cm in diam., crisped winged. Fl. May.

• Forests; ca. 700 m. S Yunnan (Mengla Xian).

37. *Amomum odontocarpum* D. Fang, Acta Phytotax. Sin. 18: 224. 1980.

波翅豆蔻 bo chi dou kou

Plants 50–120 m tall. Leaves sessile; ligule 2-cleft, 1.5–3 cm; leaf blade lanceolate, 40–60 × 7–12 cm, glabrous except shortly hispid at margin, base cuneate, apex acuminate. Spikes subovoid, ca. 4 cm, 15–20-flowered; peduncle 2–4.5 cm; bracts purple, oblong to linear, 3.3–4 cm × 5–7 mm, margin and apex ciliate; bracteoles absent. Calyx purple, 2.5–3 cm, slightly split on 1 side, pubescent abaxially, apex 3-toothed. Corolla white; tube slightly shorter than calyx, distally sparsely pubescent; lobes oblong, ca. 2.4 cm × 8 mm. Lateral staminodes ca. 1 mm, fleshy. Labellum white with orange midvein, obovate, ca. 3 × 1.5–2 cm, pubescent toward throat, base adnate to filament forming a tube 2–4 mm. Stamen ca. 1.4 cm; anther ca. 1.2 cm; connective appendage entire, ca. 4 mm. Ovary 9-angled, densely pubescent. Capsule purplish, ovoid-globose, ca. 3 × 2.5–2.7 cm, glabrescent, with 9 sparsely toothed wings, apex with persistent calyx; pedicel 1–1.5 cm, Fl. May, fr. Aug–Sep.

• Sparse forests; ca. 1500 m. Guangxi.

38. *Amomum putrescens* D. Fang, Acta Phytotax. Sin. 16(3): 51. 1978.

腐花豆蔻 fu hua dou kou

Plants 70–120 cm tall. Leaves 5 or 6; ligule entire, 0.7–1.5 cm; petiole 5–23 cm, adaxially grooved; leaf blade ovate on proximal leaves, oblong to lanceolate on distal ones, 25–100 × 10–20 cm, glabrous, base obliquely cuneate, apex acute. Spikes ovoid, 50–60-flowered; peduncle 12–32 cm, scalelike sheaths ovate-deltoid or ovate-oblong, 0.5–8 cm; bracts ovate-deltoid, ca. 5 × 3.5 cm, 3- or 4-flowered, soon decaying, apex mucronate; bracteoles 2.5–3 cm, split to base, soon decaying. Flowers yellow. Calyx ca. 2 cm, slightly split on 1 side, apex 3-toothed. Corolla tube ca. 1.6 cm; lobes oblong, 1.7–2 cm. Lateral staminodes red, toothlike, ca. 3 mm. Labellum cuneate, ca. 2.8 × 2.2 cm, apex emarginate, mucronate. Anther ca. 1.7 cm; connective appendage slightly 3-lobed, 4–5 mm × ca. 1.5 cm, apex toothed. Ovary glabrous. Capsule oblong-ovoid, ca. 2.9 × 2.5 cm, glabrous, 9-winged, apex with persistent calyx. Seeds ca. 3 mm, enclosed by white aril. $2n = 48^*$.

- Forests; ca. 300 m. S Guangxi (Dongxing Xian).

39. *Amomum repoeense* Pierre ex Gagnepain, Bull. Soc. Bot. France 53: 144. 1906.

云南豆蔻 yun nan dou kou

Plants ca. 1 m tall. Leaves 2 or 3; leaf sheath glabrous, roughly striate and reticulate; ligule 2-lobed, ca. 1.2 cm, fragile; petiole 7–25 cm; leaf blade oblong or lanceolate, 20–40 × 7–15 cm, glabrous, base attenuate, apex acuminate. Spikes ca. 3 cm in diam.; peduncle ca. 7 cm, scalelike sheaths imbricate, ca. 1.2 cm; bracts lanceolate, ca. 1.4 cm × 5–7 mm, whitish pubescent, 2-flowered; bracteoles enclosing calyx, tubular, pubescent. Flowers white. Calyx 3-toothed at apex. Corolla tube glabrous; lobes lanceolate. Lateral staminodes conical, very small. Labellum slightly 3-lobed, 2.5–3 × 1.7–2.5 cm, base contracted into claw, middle lobe emarginate at apex. Anther 7–8 mm; connective appendage entire or equally 3-lobed. Ovary cylindrical, villous, 9-ribbed. Capsule globose, ca. 1.3 mm in diam., 9-ribbed. Fr. May. $2n = 48^*$.

- S Yunnan [Cambodia, Thailand].

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