

SAURURACEAE

三白草科 san bai cao ke

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Herbs perennial, aromatic. Stems erect, ascending, or prostrate, obviously jointed. Leaves alternate, simple; stipules interpetiolately connate or adnate to petiole, forming a sheath. Inflorescence a dense spike or raceme, sometimes resembling a single flower when large involucrel petaloid bracts are present at base; bracts evident or inconspicuous. Flowers bisexual; perianth absent. Stamens usually 3, 6, or 8, free or adnate to ovary base; anthers 2-loculed, longitudinally dehiscent. Pistils (2 or)3- or 4-carpelled; carpels distinct or connate, if distinct: each carpel with 2–4 ovules, if connate: ovary 1-loculed, placentation parietal, each placenta with 6–13 ovules; styles free. Fruit a schizocarp or apically dehiscent capsule. Seed 1 or many; endosperm scanty; perisperm abundant; embryo minute.

Four genera and ca. six species: E and S Asia, North America; three genera and four species (one endemic) in China.

Tseng Yung-chien. 1982. Saururaceae. In: Tseng Yung-chien, ed., Fl. Reipubl. Popularis Sin. 20(1): 4–11.

Saururaceae taxa have been extensively compared in studies of floral vasculature (H. X. Liang & S. C. Tucker, Amer. J. Bot. 77: 607–623. 1990), organogenesis (H. X. Liang, Acta Phytotax. Sin. 32: 425–432. 1994), pollen morphology (H. X. Liang, Acta Bot. Yunnan. 14: 401–404. 1992), and stem anatomy (S. Carlquist & al., I. A. W. A. Bull. n.s., 16(2): 133–150. 1995). Phylogenetic relationships of Saururaceae and its sister clade Piperaceae have been discussed by S. C. Tucker, (Syst. Bot. 18: 614–641. 1993).

1a. Herbs prostrate, ± stoloniferous; stamens shorter than styles; petioles nearly as long as or longer than leaf blades

..... 3. *Gymnotheca*

1b. Herbs erect or ascending, rhizomatous; stamens longer than styles; petioles shorter than leaf blades.

2a. Inflorescence a raceme, without involucrel petal-like bracts; stamens 6 or 8, rarely 3, filaments ca. as long as or slightly longer than anthers; fruit a schizocarp; leaf blade ovate to ovate-lanceolate 1. *Saururus*

2b. Inflorescence a dense spike, with 4 rarely 6 or 8, involucrel petal-like bracts at base; stamens 3, rarely 4, filaments ca. 3 × as long as anthers; fruit a dehiscent capsule; leaf blade broadly ovate or ovate-cordate 2. *Houttuynia*

1. SAURURUS Linnaeus, Sp. Pl. 1: 341. 1753.

三白草属 san bai cao shu

Sauruopsis Turczaninow.

Herbs erect or ascending, rhizomatous. Stems longitudinally ridged and sulcate. Leaves entire; stipules membranous; petioles shorter than leaf blades. Inflorescence a raceme, opposite leaves or terminal. Flowers white when mature, small. Stamens usually 6, sometimes 8, rarely 3, longer than styles; filaments ca. as long as or slightly longer than anthers; anthers oblong. Pistils 4, 3- or 4-carpelled, with carpels distinct or connate at base; ovary superior; ovules 2–4 per carpel; styles 4, recurved. Fruit a schizocarp; mericarps 3 or 4, indehiscent. Seed 1 per mericarp.

Two species: E Asia, North America; one species in China.

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1. *Saururus chinensis* (Loureiro) Baillon, *Adansonia* 10(2): 71. 1871.

三白草 *san bai cao*

Spathium chinense Loureiro, *Fl. Cochinch.* 217. 1790; *Saururopsis chinensis* (Loureiro) Turczaninow; *S. cumingii* C. de Candolle; *Saururus cernuus* Thunberg (1784), not Linnaeus (1753); *S. loureiri* Decaisne.

Herbs to more than 1 m high; rhizomes creeping, white, thick. Stems strong, basal part creeping and usually whitish, apical part erect and green. Stipular sheath 2–10 mm, ca. as long as petiole, slightly clasping; petiole 1–3 cm, glabrous; leaf blade ovate to ovate-lanceolate, (4–)10–20 × (2–)5–10 cm, papery, densely glandular, glabrous, base cordate or oblique-cordate, apex acute or acuminate; veins 5–7, basal, if 7-veined, outermost pair slender, ascending and then arched and combined; reticulate veins conspicuous. Apical leaves smaller, 2 or

2. *HOUTTUYNIA* Thunberg, *Kongl. Vetensk. Acad. Nya Handl.* 4: 149. 1783, nom. cons.
蕺菜属 *ji cai shu*

Polypara Loureiro.

Herbs erect or ascending, rhizomatous. Stems longitudinally ridged and sulcate. Leaves entire; stipules membranous; petioles shorter than leaf blades. Inflorescence a terminal or leaf-opposed spike, with 4, rarely 6 or 8, white, petal-like involucre bracts at base. Flowers white when mature, small. Stamens 3, rarely 4, longer than styles; filaments ca. 3 × as long as anthers, basal part connate to ovary; anthers oblong. Pistils 3, 3-carpelled; carpels partly connate; ovary semi-inferior (flowers perigynous), 1-loculed; placentae 3, each with 6–9 ovules; styles 3, recurved. Capsule subglobose, dehiscent at apex.

One species: E and S Asia.

1. *Houttuynia cordata* Thunberg, *Kongl. Vetensk. Acad. Nya Handl.* 4: 149, 151. 1783.

蕺菜 *ji cai*

Polypara cochinchinensis Loureiro; *P. cordata* Kuntze. Herbs (5–)30–60 cm high; rhizomes creeping, thin. Basal part of stems creeping, rooted in whorls at nodes, apical part erect, glabrous or pubescent on nodes, sometimes purplish red. Stipular sheath (0.5–)1–2.5 cm, 1/4–1/2 as long as petiole, usually ciliate, base enlarged and slightly clasping; petiole (0.7–)1–3.5(–4) cm, glabrous; leaf blade broadly ovate or ovate-cordate, (1.5–)4–10 × (1.8–)2.5–6 cm, thinly papery, densely glandular, usually glabrous, sometimes pubescent at vein axils, usually purplish abaxially, base cordate, apex shortly acuminate; veins 5–7, basal or innermost pair arising ca. 5 mm above base, if 7-veined, then

3 at stem apex, usually petal-like, white at anthesis. Inflorescence an elongated, axillary or terminal raceme, (3–)12–20 (–22) cm; peduncles 0.5–4.5 cm, glabrous; rachis densely pubescent. Bract beneath each flower spatulate, basal part linear and pilose, apical part orbicular and glabrous or sparsely ciliate, small, apex rounded to acute. Filaments slightly longer than anthers. Fruit subglobose, ca. 3 mm in diam., tuberculate. Fl. Apr–Jun, fr. Jun–Jul. $2n = 22^*$.

Wet places, ditches, meadows, riverbanks, streamsides, forests, thickets, roadsides, field margins; near sea level to 1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan (including Ryukyu Islands), Korea, Philippines, Vietnam].

Type from Guangzhou, Guangdong.

Rhizomes and flowers used medicinally.

outermost pair very slender or inconspicuous; reticulate veins ± conspicuous. Inflorescences (0.4–)1.5–2.5(–2.7) cm × (2–)5–6 mm; peduncles 1.5–3 cm, subglabrous; involucre bracts oblong or obovate, (5–)10–15 × (3–)5–7 mm, apex rounded. Bract beneath each flower linear, terete, inconspicuous. Stamens longer than ovary. Capsule 2–3 mm, with persistent styles. Fl. Apr–Sep, fr. Jun–Oct. $2n = 24^*$, 96.

Ravines, streamsides, forests, wet meadows, slopes, thicket and field margins, trailsides, roadsides, ditch banks; near sea level to 2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia (?Java), Japan (including Ryukyu Islands), Korea, Myanmar, Nepal, Sikkim, Thailand].

Leaves used medicinally; shoots eaten as a vegetable.

3. *GYMNOTHECA* Decaisne, *Ann. Sci. Nat., Bot., sér.* 3, 3: 100. 1845.

裸蒴属 *luo shuo shu*

Herbs prostrate, ± stoloniferous. Stems longitudinally ridged and sulcate. Leaves: stipules membranous, base enlarged and clasping, slender; petioles nearly as long as or longer than leaf blades, papery, subglabrous, ± glandular, margin entire or inconspicuously crenulate; veins 5–7, basal. Inflorescence a terminal spike, with large, white, leafy involucre bracts at base or not; rachis compressed, both sides broadly ridged or nearly winged, subglabrous. Flowers white, small. Stamens (5 or)6(or 7), nearly on apex of ovary, shorter than styles; filaments ca. as long as to slightly longer than anthers; anthers oblong. Pistils 4, (2–)4-carpelled; carpels connate; ovary semi-inferior, 1-loculed; placentae 4, each with 9–13 ovules; styles 4, recurved. Capsule fusiform, dehiscent at apex.

Two species: C and SW China, N Vietnam; two species (one endemic) in China.

- 1a. Inflorescences without leafy involucre bracts at base 1. *G. chinensis*
 1b. Inflorescences with 3 or 4, large, white, leafy involucre bracts at base 2. *G. involucrata*

1. *Gymnotheca chinensis* Decaisne, Ann. Sci. Nat., Bot., sér. 3, 3: 100. 1845.

裸蒴 *luo shuo*

Saururus cavaleriei H. Léveillé.

Herbs glabrous. Stems usually 30–65 cm long, rooted at nodes. Stipular sheath 1.5–2 cm, ca. 1/3 as long as petiole; petiole 1.5–7 cm; leaf blade reniform-cordate, (1.5–)3–6.5 × (3–)4–7.5 cm, base auriculate, apex broadly acute or rounded; sometimes outermost pair of veins slender or inconspicuous; reticulate veins ± conspicuous. Inflorescence 2–7.5 cm; peduncle ca. as long as or slightly shorter than inflorescence, 3–6 cm. Bract beneath each flower oblanceolate, ca. 3 mm, apex acute, sometimes basal bracts slightly larger and nearly ligulate. Filaments nearly as long as or slightly longer than anthers. Ovary long obovoid. Fl. Apr–Nov. $2n = 18^*$.

Streamsides, valleys; (100–)600–2000 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan [N Vietnam].

Used medicinally.

2. *Gymnotheca involucrata* S. J. Pei, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot., 9: 111. 1934.

白苞裸蒴 *bai bao luo shuo*

Herbs glabrous. Stems usually 30–70 cm long. Stipular sheath 1.5–2 cm, 1/4–1/3 as long as petiole; petiole 1.5–8.5 cm; leaf blade cordate or reniform-cordate, 4–18 × 6–10 cm, base deeply auriculate, apex broadly acute; reticulate veins conspicuous. Inflorescence ca. 5 cm, usually leaf-opposed at middle of stems; peduncles 4–7 cm, slightly longer than or nearly as long as inflorescences; involucre bracts 3 or 4, white, leafy, very large, 1.2–1.8 × 0.8–1.2 cm, obovate-oblong. Bract beneath each flower obovate-oblong or oblanceolate, ca. 3 mm, apex acute. Filaments slightly longer than anthers. Ovary obconical. Fl. Feb–Jun. $2n = 18^*$.

• Roadsides, wet places in forests; 700–1000 m. S Sichuan.

Type from Mabian, Sichuan.

