

MARANTACEAE

竹筴科 zhu yu ke

Wu Delin (吴德邻 Wu Te-lin)¹; Helen Kennedy²

Herbs perennial, rhizomatous. Aerial stems present or absent. Leaves distichous, usually large; petiole sheathing at base, apex with a swollen pulvinus; leaf blade pinnately veined, lateral veins parallel, slightly S-shaped. Inflorescences terminal or axillary, borne on leafy shoots or occasionally on separate, leafless shoots from rhizomes, compound, headlike, spicate, or diffuse and much branched, bracteate; bracts each subtending a pair of flowers or a cincinnus of paired flowers. Flowers bisexual, asymmetric, paired or rarely borne singly. Sepals 3, free. Corolla lobes 3, often slightly unequal, basally connate into a tube. Stamines and stamen in 2 whorls: outer whorl with 1 or 2 petaloid stamines, rarely absent; inner whorl with 1 hooded (cucullate) stamine enclosing terminal portion of pistil at anthesis and bearing a lateral appendage (trigger), 1 thickened and fleshy (callose) stamine, and 1 fertile stamen narrowly petaloid laterally; anther 1-loculed. Ovary inferior, 3-loculed, 1–3 locules fertile; ovules 1 per locule. Style cylindrical, adnate to inside of corolla and stamine tube, free portion curved after explosive forward movement (tripping) when released. Seeds 1–3, hard, usually arillate. from hooded stamine; stigma scoop-shaped or blunted and 3-cleft. Fruit a capsule, loculicidal, rarely indehiscent or berrylike.

Thirty-one genera and ca. 525 species: pantropical but ca. 80% in America, absent from Australia; four genera (one introduced) and eight species (two endemic, one introduced) in China.

Additional genera, e.g., *Calathea* G. Meyer, are cultivated in S China as ornamentals.

Wu Te-lin & Chen Sen-jen. 1981. Marantaceae. In: Wu Te-lin, ed., Fl. Reipubl. Popularis Sin. 16(2): 158–169.

- 1a. Stems simple; cauline leaf 1 or absent; inflorescences capitate or spikelike; flower pairs subsessile; sepals and ovary not visible (covered by bracts); corolla tube proximally \pm solid, not obviously hollow.
 - 2a. Bracts numerous, spirally arranged, tan, red-purple, or green, leathery; cauline leaf 1, rarely absent; sepals slightly shorter than or longer than corolla tube 1. *Phrynium*
 - 2b. Bracts 6–8, distichous, green, herbaceous; cauline leaves absent, all leaves basal; sepals less than 1/3 as long as corolla tube 2. *Stachyphrynium*
- 1b. Stems branched to much branched; cauline leaves (1 or) 2 to numerous; inflorescences terminal on leafy shoots, racemose or paniculate; flower pairs exerted; sepals and ovary clearly visible; corolla tube obviously hollow throughout.
 - 3a. Bracts numerous, deciduous; bracteoles present; sepals white, 2.5–4 mm; fruit globose, white to pale cream, indehiscent; plants 1.5–5 m tall, much branched above a basal, bamboolike cane; basal leaves absent 3. *Donax*
 - 3b. Bracts 1–3, persistent; bracteoles absent; sepals green, 7–17 mm; fruit ellipsoid, green or tinged reddish brown, dehiscent; plants 0.4–1.3 m tall, once to moderately branched; basal leaves several, always present 4. *Maranta*

1. PHRYNIUM Willdenow, Sp. Pl. 1: 1, 17. 1797, nom. cons.

叶属 zhong ye shu

Phyllodes Loureiro, nom. rej.

Rhizomes creeping. Basal leaves 1 or more; cauline leaf 1 or absent; leaf sheath and petiole long. Inflorescences borne basally or above an elongate internode on leafy shoots, subtended by a cauline leaf or a reduced, bladeless sheath, compound, capitate, often with additional spikes borne in axils of basal bracts of initially produced spike and later additional ones in basal bracts of secondary spikes, often in a very compact, congested group of few to many small spikes; bracts spirally arranged, often shredding into fibers after anthesis, at least at apex. Flower pairs 2 to many per bract. Sepals usually longer than corolla tube, membranous. Corolla tube proximally \pm solid, distally hollow; lobes 3, oblong, subequal. Outer stamines 2, obovate, stamine tube longer than corolla tube; callose stamine wholly callose, not petaloid at apex. Style curved after tripping; stigma enlarged, blunted. Fruit globose to ellipsoid, dehiscent, often late dehiscent; pericarp hard. Seeds 1–3; aril membranous.

About 20 species: tropical Asia; five species (one endemic) in China.

- 1a. Bracts with a spinescent acumen at apex 1. *P. placentarium*
- 1b. Bracts without a spinescent acumen at apex.
 - 2a. Bracts 3.5–5 cm, apex soon withering; flowers yellowish 2. *P. oliganthum*

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- 2b. Bracts 2–3 cm, apex not withering; flowers white, yellow-orange, or purple.
- 3a. Bracts wholly shredding into fibers after anthesis; flowers white 3. *P. hainanense*
- 3b. Bracts apically shredding into fibers after anthesis; flowers not white.
- 4a. Leaf blade oblong-ovate to oblong, 25–50 × 10–12 cm; inflorescence heads ca. 5 cm in diam. 4. *P. rheedei*
- 4b. Leaf blade narrowly ovate, 35–45 × 6–8 cm; inflorescence heads ca. 3 cm in diam. 5. *P. tonkinense*

1. Phrynium placentarium (Loureiro) Merrill, Philipp. J. Sci. 15: 230. 1919.

尖苞 叶 jian bao zhong ye

Phyllodes placentaria Loureiro, Fl. Cochinch. 1: 13. 1790; *Phrynium parviflorum* Roxburgh; *P. sinicum* Miquel.

Plants 1–2 m tall. Basal leaf 1(or 2); leaf sheath 3–50 cm. Cauline leaf 1; leaf sheath 3–5 cm; petiole 7.5–60 cm, pulvinus 2–7 cm; leaf blade ovate to elliptic, 25–55 × (5.5–)8–20 cm, thinly leathery, glabrous, base rounded with an acute center, apex acuminate. Inflorescence sessile, composed of 4 or 5 or more spikelets, globose, 3–8 cm in diam.; bracts crowded, oblong, 2–2.5 cm, apex with a spinescent acumen. Flowers 2 per bract, white to yellowish white. Sepals linear, ca. 5 mm. Corolla tube ca. 8 mm; lobes elliptic, ca. 5 × 2 mm. Outer staminodes obovate, ca. 5 mm. Ovary glabrous or apically puberulent. Fruit oblong, ca. 1.2 cm; exocarp thin. Seed 1, ellipsoid, ca. 1 cm; aril red. Fl. (Feb–)May–Aug, fr. Aug–Nov.

Wet shaded places in forests, often in valleys along streams; near sea level to 1500 m. Guangdong, Guangxi, Guizhou, Hainan, SE Xizang (Mêdog Xian), S Yunnan [Bhutan, India, Indonesia, Myanmar, Philippines, Thailand, Vietnam].

2. Phrynium oliganthum Merrill, Philipp. J. Sci. 23: 239. 1923.

少花 叶 shao hua zhong ye

Phrynium dispernum Gagnepain.

Plants 1–1.6 m tall. Basal leaves 4 or 5; leaf sheath 30–55 cm. Cauline leaf 1; leaf sheath 5–10 cm; petiole yellow-green, 20–50 cm, pulvinus 3–9 cm; leaf blade elliptic to ovate-elliptic, 25–55 × 10–25 cm, glabrous, base rounded to obtuse and shortly and abruptly attenuate, apex obtuse with an acumen. Inflorescence sessile, composed of 2–6 readily distinguishable spikes, capitate, obovoid, 8–12 × 6–7 cm; bracts olive green, elliptic, 3.5–5 × ca. 3 cm, glabrous or basally pilose, apex spreading, obtuse, soon withered and turning brown. Flowers yellowish. Sepals lanceolate, ca. 1.5 cm. Corolla tube white, ca. 1.3 cm; lobes strongly reflexed, reddish purple, oblong, ca. 1 cm. Outer staminodes yellow, obovate, ca. 4 mm, unequal, shorter than corolla lobes, wider one emarginate at apex; cucullate and callose staminodes yellow at apex. Fertile stamen ca. 3 mm, with a yellow, petaloid appendage. Ovary ca. 4 mm, light brown sericeous. Fruit ellipsoid to obovoid-ellipsoid, 1.3–1.5 × 0.7–0.9 cm; pericarp brown, shiny, dry and brittle. Seeds 2(or 3), ellipsoid, 7–9 mm. Fl. Apr–Aug.

Moist shady areas in forests; 500–600 m. Fujian, Guangdong, Hainan [Vietnam].

3. Phrynium hainanense T. L. Wu & S. J. Chen in T. L. Wu, Fl. Reipubl. Popularis Sin. 16(2): 176. 1981.

海南 叶 hai nan zhong ye

Plants ca. 1 m tall. Basal leaves several; cauline leaf 1; leaf

sheath strigose; petiole pulvinus 3–4 cm; leaf blade oblong, 25–45 × 8–14 cm, glabrous, base rounded to subrounded and shortly and abruptly attenuate, apex acuminate to caudate. Inflorescence pedunculate, composed of several clustered spikes, capitate, 7–8 cm in diam.; peduncle 2.5–6 cm; bracts oblong-ovate, 2–3 cm, glabrous, wholly shredding into fibers after anthesis. Flowers white; pedicel ca. 5 mm. Sepals ovate, 1.1–1.3 cm. Corolla tube ca. 7 mm; lobes obovate-oblong, ca. 7 mm. Outer staminodes equaling corolla tube. Ovary ca. 2.5 mm, angled, densely golden yellow villous. Fruit white, trigonous obpyramidal, 0.8–1 × 1–1.2 cm, villous. Seeds 3. Fl and fr. Jul–Oct.

• Valleys; ca. 1600 m. Guangdong, Hainan.

4. Phrynium rheedei Suresh & Nicolson, Taxon 35: 355. 1986.

叶 zhong ye

Pontederia ovata Linnaeus, Sp. Pl. 1: 288. 1753; *Phrynium capitatum* Willdenow (1797), nom. illeg. (included *Pontederia ovata*); *Phrynium ovatum* (Linnaeus) Druce (1914), not Nees & Martius (1823).

Plants ca. 1 m tall. Rhizomes tuberous. Basal leaves several; cauline leaf 1; petiole to 60 cm, pulvinus 3–7 cm, glabrous; leaf blade ovate-oblong to oblong, 25–50 × 10–12 cm, glabrous, base acute, apex shortly acuminate. Inflorescence sessile, capitate, ca. 5 cm in diam.; bracts purple-red, oblong-lanceolate, 2–3 cm, apex initially acute, shredding into fibers after anthesis. Flower pairs 3 per bract, sessile. Sepals linear, ca. 1 cm, sericeous. Corolla tube violet, shorter than calyx; lobes dark red, oblong-obovate. Outer staminodes light red, obovate, slightly corrugated; cucullate and callose staminodes yellowish, shorter than outer staminodes. Ovary sericeous. Fruit dark red, shiny, pyriform, ca. 1 cm, slightly 3-angled; exocarp hard. Seeds 2 or 3, shallowly grooved. Fl. May–Jul.

Wet shaded places in dense forests; 100–1400 m. Fujian, Guangdong, Guangxi, S Yunnan [India, Vietnam].

5. Phrynium tonkinense Gagnepain, Bull. Soc. Bot. France 51. 179. 1904.

云南 叶 yun nan zhong ye

Plants ca. 1 m tall. Basal leaves 1 to several; cauline leaf 1; leaf sheath to 27 cm; petiole 3–25 cm, pulvinus 1–2 cm, puberulent; leaf blade lanceolate, 35–45 × 6–8 cm; adaxially glabrous, abaxially velvety along midvein, base attenuate, apex long acuminate. Inflorescence composed of 4 or 5 crowded spikes, capitate, ca. 3 cm in diam.; bracts dark green, ovate, ca. 1.5 × 1 cm, apex obtuse, densely pilose, soon shredding into fibers. Flowers yellow-orange or purple; pedicel ca. 5 mm, velvety. Sepals linear, ca. 7 mm, membranous, apex hirsute. Corolla lobes reflexed, elliptic, 4–5 mm. Staminodes ca. 3 mm. Ovary hirsute. Fruit brown, trigonous, 0.6–0.7 × ca. 1.2 cm, velvety, both ends compressed. Seeds 3, ca. 5 × 5 mm, 3- or 4-angled,

truncate; aril small. Fl. Apr–Aug, fr. Aug–Oct.

Forests. SE Yunnan (Pingbian Miao Zu Zizhixian) [Vietnam].

2. STACHYPHRYNIUM K. Schumann in Engler, Pflanzenr. 11(IV. 48): 45. 1902.

穗花 叶属 sui hua zhong ye shu

Rhizomes creeping. Basal leaves 1 or more; cauline leaves absent. Inflorescences borne terminally on leafy shoots or on separate, leafless shoots arising directly from rhizomes, spikelike, ellipsoid or spindle-shaped to subcylindric, usually laterally compressed; bracts distichous, usually herbaceous. Flower pairs 1–5 per bract. Sepals less than 1/2 as long as corolla tube, usually much shorter, membranous. Corolla proximally ± solid, distally hollow; lobes 3, oblong, subequal. Outer staminodes 2, obovate; callose staminode wholly callose, not petaloid at apex. Ovary often 2-loculed by abortion. Style cylindric, curved after tripping; stigma enlarged, blunted. Fruit ellipsoid, dehiscent. Seeds usually 2; aril reflexed, 2-lobed.

Ten to sixteen species: tropical Asia; one species (endemic) in China.

1. *Stachyphrynium sinense* H. Li, Acta Phytotax. Sin. 23: 146. 1985.

穗花 叶 sui hua zhong ye

Herbs 40–80 cm tall. Basal leaves 3–5; leaf sheath 9–25 cm; petiole 10–35 cm, pulvinus 1–2 cm, adaxially tomentose in a line, otherwise glabrous; leaf blade ovate to elliptic, 17–30 × 7–9 cm, glabrous, base rounded to obtuse and abruptly

attenuate, apex acuminate. Inflorescence fusiform, laterally flattened, 5–7 × 1.2–1.6 cm; peduncle 3–20 cm; bracts 6–8, distichous, green, ovate-triangular, 2.5–3.5(–5.5) × 1–1.3 cm, herbaceous, apex acute and apiculate. Flower pairs 1 or 2 per bract, white. Sepals ca. 3 mm. Corolla tube ca. 2.8 cm. Outer staminodes obovate, ca. 9 mm; cucullate staminode ca. 3 mm. Ovary glabrous, ca. 2 mm. Fl. Jun–Sep.

• Open forests, thickets; 700–1100 m. S Yunnan (Mengla Xian).

3. DONAX Loureiro, Fl. Cochinch. 1: 1, 11. 1790.

竹叶蕉属 zhu ye jiao shu

Herbs shrublike, rhizomatous. Stems much branched above a basal, canelike internode. Leaves all cauline; petiole short, base elongate, sheathing. Inflorescences terminal on leafy branches, branched, sparsely paniculate; bracts distichous, green, herbaceous, deciduous. Common pedicel shorter or scarcely longer than bracts, pedicel thickened in fruit; bracteoles 2 per flower pair, glandular. Sepals free. Corolla tube shorter or longer than sepals; lobes narrowly elliptic to linear. Staminode tube short, subequaling corolla tube; outer staminodes 2, white, petaloid, apex emarginate; callose staminode creamy yellow, petaloid, basal, callose portion white, bearing a lateral, fleshy projection, apex strongly recurved; cucullate staminode light yellow at apex, with a subterminal, lateral, flap-like appendage. Fruit globose to ellipsoid, indehiscent; pulp ± spongy. Seeds 1–3, globose or complanate, grooved, irregularly warty; aril absent.

Three species: S and SE Asia, SW Pacific Islands; one species in China.

1. *Donax canniformis* (G. Forster) K. Schumann, Bot. Jahrb. Syst. 15: 440. 1893.

竹叶蕉 zhu ye jiao

Thalia canniformis G. Forster, Fl. Ins. Austr. 1. 1780; *Actoplantes canniformis* (G. Forster) K. Schumann; *Donax arundastrum* Loureiro.

Herbs 1.5–4(–5) m tall. Stems with basal, canelike internode 1–2.5 m. Leaf sheath to 15 cm; petiole 8–20 cm, thickened into a cylindric pulvinus; leaf blade broadly ovate to elliptic, 10–25 × 10–45 cm, abaxially villous along midvein, base rounded to obtuse, apex acuminate. Inflorescences often branched at base, to 20 cm, slender; bracts 9–11, green, obovate

to lanceolate, 2.5–3.5 cm, deciduous after anthesis. Pedicel thickened in fruit. Sepals white, triangular-ovate, 3–3.5 mm, glabrous. Corolla tube 8–10 mm; lobes linear, 1–1.4 cm × 2–3 mm. Outer staminodes white, obovate, 1.2–1.4 cm × 5–6 mm; callose staminode yellowish, ca. 1.5 cm, apex usually emarginate; cucullate staminode light yellow at apex. Fertile stamen ca. 8 mm, with a narrowly triangular appendage. Ovary sericeous. Fruit white to pale cream, 1–1.5 cm in diam., dry, indehiscent. Seeds 1 or 2, brown, globose to complanate. Fl. Jun.

Rather wet places in secondary forests and dry bamboo scrub. Taiwan (Lan Yu opposite SE coast) [Cambodia, India, Indonesia, Malaysia, Philippines, Thailand, Vietnam].

4. MARANTA Linnaeus, Sp. Pl. 1: 2. 1753.

竹芋属 zhu yu shu

Herbs caulescent, erect or prostrate, sometimes much branched, occasionally with tuberous, swollen rhizomes. Leaves both basal and cauline or all cauline; petiole sheathing at base. Inflorescences 2 to several per leafy shoot, each a dichotomous panicle or raceme; bracts few, each subtending 2–6 pedicellate flower pairs, herbaceous, late deciduous or persistent. Sepals green, herbaceous. Corolla white; tube 4–14 mm, base often inflated; lobes subequal. Staminode tube usually short; staminodes white, occasionally tinged or marked with purple; outer staminodes 2, petaloid, obovate, exceeding corolla lobes; cucullate staminode with median or subterminal appendage; callose staminode obovate, apex petaloid. Ovary 1-loculed by abortion. Style thick. Fruit a capsule, obovoid to ellipsoid, dehiscent. Seed 1.

About 32 species: tropical America; one species (introduced) in China.

Additional species, e.g., *Maranta bicolor* Ker Gawler, are cultivated in S China as ornamentals. One of us (Kennedy) notes that the plant illustrated in FRPS (pl. 56, f. 4) as *M. bicolor* is in fact *M. leuconeura* E. Morren var. *kerchoveana* (E. Morren) Petersen.

1. *Maranta arundinacea* Linnaeus, Sp. Pl. 1. 2. 1753.

竹芋 zhu yu

Maranta sylvatica Roscoe ex Smith; *Phrynium variegatum* N. E. Brown.

Herbs 30–130 cm tall. Rhizomes sympodial, cylindrical, fleshy, starchy. Stems erect, often apically branched, slender. Basal leaves 4–8; cauline leaves 1–8; petiole 3.5–20 cm in basal leaves, often absent in cauline leaves, pulvinus 0.2–1.8 cm, glabrous except adaxially tomentose; leaf blade ovate-oblong, 3.5–35 × 3–11 cm, adaxially sparsely pilose, abaxially glabrous or sparsely pilose, base rounded to truncate, apex acuminate. Inflorescences several per leafy shoot; bracts 1 or 2(or 3), each

subtending 2 or 3 flower pairs, distichous, green, 2.4–6 cm. Flowers mostly self-pollinating; common pedicel 2.3–5.5 cm. Sepals green, narrowly ovate, 1.2–1.7 cm. Corolla white; tube curved, 1.2–1.4 cm, base inflated; lobes 8–10 mm. Staminodes white; outer staminodes 2, obovate, ca. 1 cm. Ovary densely pubescent, rarely glabrous or subglabrous. Capsule green or tinged reddish brown, ellipsoid, 7–8 × 4–5 mm, dehiscent. Seeds brown, rugose; aril basal, white, 2-lobed. Fl. Jun–Aug. $2n = 18, 48$.

Cultivated. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [native to tropical America; cultivated pantropically].

Grown as a source of starch.

