

## 24. *SCHOENUS* Linnaeus, Sp. Pl. 1: 42. 1753.

赤箭莎属 *chi jian suo shu*

Liang Songyun (梁松筠 Liang Song-jun); Jeremy J. Bruhl, Karen L. Wilson

Herbs, perennial or rarely annual. Rhizomes short. Culms terete. Leaves basal or cauline; sheath reddish brown; leaf blade flat, 3-angled, or semiterete. Involucral bracts leaflike, sheathing. Inflorescences paniculate, racemose, or rarely headlike. Spikelets usually narrowly ovoid or oblong-ovoid, usually 1–4-flowered, basal 1 or 2 flowers usually bisexual, apical 1 or 2 flowers male. Glumes dark colored with whitish margin, distichous, usually papery, deciduous, 1-veined, keeled, basal 2 or 3 empty. Perianth bristles 6 or absent. Stamens 3. Style slender; stigmas 3. Nutlet ellipsoid or obovoid, usually terete, 3-sided, or rarely biconvex, smooth or with reticulate ornamentation.

More than 120 species: mostly in Australia, a few in E and SE Asia, Pacific islands (New Caledonia, New Zealand), Europe, and America; four species (one endemic) in China.

- 1a. Inflorescences lax; spikelets ca. 2 cm; peduncle 10–15 cm ..... 1. *S. calostachyus*
- 1b. Inflorescences dense; spikelets less than 1 cm; peduncle much shorter or inflorescences sessile.
- 2a. Culms densely tufted; perianth bristles absent ..... 4. *S. nudifructus*
- 2b. Culms laxly tufted; perianth bristles 1–6.
- 3a. Culms 60–100 cm tall; leaf blade 1–5 mm wide; spikelets 7–14 × ca. 2.5 mm ..... 2. *S. falcatus*
- 3b. Culms 20–40 cm tall; leaf blade ca. 0.5 mm wide; spikelets 4–6 × ca. 1 mm ..... 3. *S. apogon*

**1. *Schoenus calostachyus*** (R. Brown) Poiret, Encycl., Suppl. 2: 251. 1811.

长穗赤箭莎 *chang sui chi jian suo*

*Chaetospora calostachya* R. Brown, Prodr. 233. 1810.

Perennials. Rhizomes short. Culms tufted, erect, (30–)70–90 cm tall, obtusely 3-angled to subterete, sulcate, smooth. Leaves basal and cauline; sheath blackish purple; leaf blade linear, 30–75 cm × 1–2 mm, rigid, 3-veined on abaxial surface, margin scaberulose, apex acute. Involucral bracts leaflike; sheaths black purplish red to reddish black, 1.5–2.5 cm, terete; mouth pale, oblique, membranous. Inflorescences racemose, to 50 cm, very lax, with 2 or 3 very distant fascicles of branches; peduncle 10–15 cm, glabrous; branches solitary or 2(or 3) together, erect, ca. 12.5 cm, unequal, compressed, scaberulose on angles, each bearing 1(–3) spikelets. Spikelets chestnut-brown, oblong to narrowly ovoid, 3–5-flowered, apex acute to acuminate. Glumes distichous, narrowly lanceolate, basal 5 and apical 1 or 2 empty; fertile glumes to 1.5 cm; sterile glumes ca. 0.4 cm, leathery, densely ciliate especially toward apex, keel green. Perianth bristles 4–7, white, ca. 1/2 as long as nutlet, antrorsely scabrous on apical part, easily caducous. Stamens 3; anthers linear, caducous. Style slender, apical half ciliate; stigmas 3, papillate. Nutlet grayish brown, obovoid, 3-sided, reticulately wrinkled, glabrous, base attenuate, apex obscurely beaked. Fl. and fr. Jul–Sep.

Slopes, hilltops; ca. 600 m. Guangdong, S Guangxi, Hainan (Wenchang) [Indonesia, Japan (Ryukyu Islands), Malaysia, Papua New Guinea, Thailand, Vietnam; Australia, Pacific islands].

**2. *Schoenus falcatus*** R. Brown, Prodr. 232. 1810.

赤箭莎 *chi jian suo*

*Schoenus sinensis* Handel-Mazzetti.

Perennials. Rhizomes short. Culms tufted, 60–100 cm tall, 2–5 mm thick, subterete, smooth. Leaves basal and cauline.

Basal leaves with sheath dark purple to dark reddish purple, 3–4 cm; leaf blade linear, 1–5 mm wide, margin scabrous. Cauline leaves 1–3, remote, rather short; sheath reddish brown, mouth oblique. Involucral bracts leaflike; sheaths brown to reddish brown; basalmost bract with a blade subequalling inflorescence. Inflorescence a narrow lax panicle; branches 2–4-nate, occasionally single. Spikelets brown, narrowly ovoid, 7–14 × ca. 2.5 mm, erect, slightly flattened, shortly pedunculate, 3–8-flowered. Glumes brown with a pale margin, distichous, ovate-lanceolate to ovate, 5–7 mm, papery, glabrous except for scabrous keel, keel yellowish green, apex acute; basal 2 or 3 glumes sterile and smaller. Perianth bristles (0 or)1–3, ferruginous, antrorsely scabrous. Stamens 3; filaments slender; anthers linear, ca. 3 mm, caducous; connective apex appendage white, to 0.5 mm. Style 3–4 mm; stigmas 3, much shorter than style. Nutlet rusty brown, obovoid, 1–1.5 mm, 3-sided, reticulate, apex hirsute with white appressed hairs. Fl. and fr. May–Jul.

Swamps, wet places; ca. 400 m. Guangdong, Guangxi, Guizhou, Taiwan [Indonesia, Japan (Ryukyu Islands), Malaysia, Papua New Guinea, Thailand, Vietnam; N Australia, Pacific islands].

**3. *Schoenus apogon*** Roemer & Schultes, Syst. Veg. 2: 77. 1817.

矮赤箭莎 *ai chi jian suo*

Annuals or short-lived perennials, slender. Roots fibrous. Culms tufted, 20–40 cm tall, 0.5–1 mm thick, mostly 2-nodose, smooth. Leaves basal and cauline. Cauline leaves 2, shorter than culm; sheath reddish purple, 1–2 cm; leaf blade capillary, ca. 0.5 mm wide. Involucral bracts surpassing inflorescence; sheath reddish purple, 0.5–1 cm. Inflorescences consisting of 2–5 distant corymbiform partial panicles, each bearing several sessile and shortly pedunculate spikelets; partial panicles 0.8–1.5 cm and as broad. Spikelets reddish brown, narrowly ovoid, 4–6 mm, flattened, 1- or 2(or 3)-flowered. Glumes sanguineous

with pale margin, lanceolate to ovate-lanceolate, 3–4 mm, papery, apex obtuse; basal 2 or 3 glumes empty, rather short. Perianth bristles 6, ca. 2 mm, antrorsely scabrous. Stamens 3. Style ca. 1.5 mm, base glabrous; stigmas 3, as long as style. Nutlet whitish, globose-obovoid, ca. 1 mm, obtusely 3-sided, sides convex, shiny, and minutely reticulate. Fl. and fr. May.

Moist coastal grasslands; near sea level. W Taiwan (Taizhong) [Japan, Vietnam; Australia].

This is a very rare species in Taiwan with only one collection at the TAI herbarium, collected in May 1906 and obtained from the MAK herbarium.

**4. *Schoenus nudifructus*** C. Chen in Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 230. 1961.

无刚毛赤箭莎 wu gang mao chi jian suo

?Perennials, tightly clumped. Roots slender fibrous. Culms tufted, erect, 55–100 cm tall, 0.8–1.1 mm thick, terete, smooth. Leaves basal, rarely also cauline. Basal leaf sheaths 1.5–2.5 cm, reddish black at base; leaf blade linear, 1–2 mm wide, papery, veins 7 and abaxially prominent. Cauline leaf sheaths brown, cylindric, 1.7–3 cm, glabrous, ligule absent. Involucral bracts leaflike; sheath brown; blade gradually shorter apically. Inflorescences paniculate, lax, branches 6 or 7 or more. Spikelets erect, narrowly ovoid, 7–9 mm, compressed, usually 2 or 3 or more clustered, ± pedunculate, 3- or 4-flowered. Glumes brownish red, lanceolate to ovate, keel abaxially yellowish green, margin pale, apex mucronate in basal glume and obtuse in apical glumes; basal 2 or 3 glumes empty, apical ones with 3 or 4 bisexual flowers. Perianth bristles absent. Stamens 3; anthers linear, deciduous. Style slender; stigmas 3, pubescent. Nutlet brownish, broadly ovoid to ovoid-oblong, 1–1.3 mm, 3-sided, reticulate, apex sparsely pubescent or glabrous. Fl. and fr. Jul.

- 1800–1900 m. C Yunnan (Kunming).

