

12. FIMBRISTYLIS Vahl, Enum. Pl. 2: 285. 1805, nom. cons.

飘拂草属 piao fu cao shu

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Abildgaardia Vahl; *Cyperus* subg. *Iria* Richard; *Iria* (Richard) R. Hedwig.

Herbs, annual or perennial, medium sized, often rhizomatous. Culms usually tufted, slender, 3- or 5-angled or flattened. Leaves basal, sometimes reduced to a bladeless sheath; ligule if present membranous or a fringe of hairs; leaf blade linear, filiform, or rarely ensiform, usually dorsiventrally compressed and canaliculate, often adaxially cellular-reticulate. Inflorescences terminal, a simple, compound, or decompound anthela, rarely capitate or reduced to 1 terminal spikelet. Spikelets solitary or fascicled, ovoid, ellipsoid, or subglobose, terete or flattened, with several to many flowers. Glumes spirally imbricate, distichous, or only basal ones distichous and apical ones spirally imbricate, often with 1 or more veins forming an abaxial keel and sometimes extending into an apical mucro or arista. Flowers bisexual. Perianth bristles absent. Stamens 1–3. Style not persistent on nutlet, basally enlarged. Nutlet sometimes stipitate, biconvex, 3-sided, or almost terete, either reticulate, verruculose, or both.

Over 200 species: worldwide but mostly subtropical and tropical with center of distribution in SE Asia; 53 species (ten endemic) in China.

Although J. Kern reported *Fimbristylis merrillii* J. Kern from S China (Blumea 8: 135. 1955), no specimen from China has been seen by the present authors, and we doubt that it actually occurs in China.

- 1a. Spikelets ± compressed; glumes distichous at least on basal part of spikelet.
 - 2a. Inflorescences reduced to a single spikelet; involucre bracts glumelike.
 - 3a. Nutlet obovoid, verruculose, stipes less than 0.5 mm; leaf blade 0.5–1 mm wide 52. *F. ovata*
 - 3b. Nutlet globose, with few verrucae, stipes more than 1 mm; leaf blade ca. 0.5 mm wide 53. *F. longistipitata*
 - 2b. Inflorescences with 2 to several spikelets; involucre bracts leaflike, setaceous, or very rarely glumelike.
 - 4a. Glumes glabrous, not gland-dotted.
 - 5a. Nutlet 1–1.2 mm; spikelets often paired or fascicled, rarely solitary at apex of inflorescence rays 44. *F. nigrobrunnea*
 - 5b. Nutlet 0.7–0.9 mm; spikelets solitary.
 - 6a. Glumes yellowish brown; spikelets 6–10 mm; basalmost involucre bract less than 2 × as long as spikelet; rhizome short 45. *F. eragrostis*
 - 6b. Glumes reddish brown; spikelets 3–6 mm; basalmost involucre bract more than 3 × as long as spikelet; rhizome absent 46. *F. disticha*
 - 4b. Glumes hairy or gland-dotted.
 - 7a. Glumes densely gland-dotted, glabrous; spikelets with 2 or 3 flowers; rays and raylets very slender, glabrous.
 - 8a. Leaf blade ca. 1 mm wide, hairy on both surfaces; ligule absent; involucre bracts surpassing inflorescence 47. *F. nanningensis*
 - 8b. Leaf blade 3–6 mm wide, glabrous; ligule a fringe of short white hairs; involucre bracts shorter than inflorescence 48. *F. cinnamometorum*
 - 7b. Glumes not gland-dotted, hairy; spikelets with more than 3 flowers; rays and raylets thicker, hairy.
 - 9a. Glumes awned, awns excurved; stigmas 2 49. *F. kwantungensis*
 - 9b. Glumes shortly tipped, tips not excurved; stigmas 3.
 - 10a. Perennials; culms 20–40 cm tall; inflorescence a compound anthela; glumes 4–5 mm; nutlet attenuate to base, subsessile; style 4–5 mm 50. *F. fusca*
 - 10b. Annuals; culms 5–13 cm tall; inflorescence a simple or rarely compound anthela; glumes 2.5–3 mm; nutlet truncate at base, shortly stipitate; style ca. 2 mm 51. *F. fimbristylodes*
 - 1b. Spikelets terete; glumes spirally imbricate.
 - 11a. Spikelet solitary; involucre bracts glumelike; leaves with only a bladeless sheath.
 - 12a. Nutlet narrowly oblong, base with a ca. 0.7 mm stipe; culms 4-angled 40. *F. tetragona*
 - 12b. Nutlet broadly obovoid, subsessile; culms flatly cylindrical, subcylindrical, or slightly compressed.
 - 13a. Stigmas 3; spikelets narrowly oblong to clavate-oblong, 3.5–4.5 × 1–1.5 mm; glumes pale with short rust-colored lines, oblong to oblong-ovate, apex not mucronate; nutlet white, with sparse verrucae and subhexagonal reticulation 41. *F. pauciflora*
 - 13b. Stigmas 2; spikelets ovoid, narrowly ovoid, ellipsoid, or oblong-ovoid, 5–15 × 2–5 mm; glumes brown with short rust-colored lines or greenish white and sometimes laterally with brown specks, apex mucronate; nutlet yellowish white, with transverse wavy reticulation.

- 14a. Spikelets slightly nodding; involucre bracts 2–4.5 mm; glumes brown with short rust-colored lines; stamens 3; nutlet margin verruculose 42. *F. nutans*
- 14b. Spikelets erect; involucre bract absent; glumes greenish white and sometimes laterally with brown specks; stamens 2; nutlet margin not verruculose 43. *F. acuminata*
- 11b. Spikelets (1 or)2 to many; involucre bracts not glumelike; leaves with a blade.
- 15a. Stigmas 2; style compressed, apically ciliate.
- 16a. Spikelets angular because of keeled glumes, 7 mm or less (but to 12 mm in *F. gracilentia*).
- 17a. Style base with sparse long hairs covering nutlet apex 35. *F. squarrosa*
- 17b. Style base glabrous.
- 18a. Glumes brown; nutlet 0.6–0.8 mm.
- 19a. Nutlet broadly obovoid, with transverse oblong reticulation; leaf sheath greenish yellow or with rust-colored flecks; leaf blade 0.7–1.5 mm wide .. 36. *F. bisumbellata*
- 19b. Nutlet obovoid, almost smooth but sometimes with very indistinct hexagonal reticulation; leaf sheath brown; leaf blade 0.5–1 mm wide 37. *F. aestivalis*
- 18b. Glumes pale brown; nutlet ca. 1 mm.
- 20a. Leaf blade ca. 1 mm wide; spikelet oblong, lanceolate, or linear-lanceolate, 1.5–2 mm wide; rhizomes absent 38. *F. gracilentia*
- 20b. Leaf blade 1.5–3 mm wide; spikelet ovate or narrowly ovate, 2–4 mm wide; rhizomes short 39. *F. simaoensis*
- 16b. Spikelets terete, at least some to 10 mm or more (but only to 8 mm in *F. polytrichoides*).
- 21a. Spikelets 1–3(–6).
- 22a. Nutlet grayish black, with an extremely short stipe, obovoid, with transversely oblong reticulation and verrucae; growing in sandy places; glumes pale white with short brown lines medially, sometimes slightly yellowish brown apically 34. *F. polytrichoides*
- 22b. Nutlet yellowish white or brown, with a distinct stipe, broadly obovoid, with hexagonal reticulation; not growing in sandy places; glumes yellowish white with short brown lines or brown with short rust-colored lines.
- 23a. Glumes yellowish white, ca. 3 mm; nutlet yellowish white, with a short yellowish white stipe 31. *F. schoenoides*
- 23b. Glumes brown, 5–7 mm; nutlet brown or yellowish brown, with a short brown stipe.
- 24a. Spikelets 1 or 2; bract 1 or absent, longer than inflorescence; rhizomes absent; leaf blade ca. 1 mm wide 32. *F. subbispicata*
- 24b. Spikelets 3–6; bract 1, shorter than inflorescence; rhizomes short; leaf blade 1.2–2 mm wide 33. *F. tristachya*
- 21b. Spikelets several to many (in *F. sieboldii* sometimes with only 1–3 spikelets, but glumes only 1-veined, and culm base with leafless sheaths).
- 25a. Spikelets very narrowly ovoid to linear; nutlet with linear-oblong reticulation; rhizome absent 30. *F. hookeriana*
- 25b. Spikelets ovoid, ellipsoid, oblong, oblong-ovoid, narrowly oblong, ovoid-ellipsoid, or narrowly oblong-ovoid; nutlet with subtransverse, oblong, hexagonal, or oblong-hexagonal reticulation or subsmooth; rhizome absent or present.
- 26a. Plants stoloniferous; nutlet with horizontally oblong reticulation, vertical ribs not obvious 28. *F. stolonifera*
- 26b. Plants not stoloniferous; nutlet with hexagonal reticulation (*F. dichotoma* with oblong reticulation, but vertical ribs obvious; in *F. sieboldii* reticulation not obvious).
- 27a. Culm bases with leafless sheaths; glumes 1-veined, apical part abaxially pubescent; leaf blade ca. 1 mm wide; nutlet almost smooth 29. *F. sieboldii*
- 27b. Culm bases without leafless sheaths; glumes with 3 or more veins, abaxially glabrous; leaf blade more than 1 mm wide; nutlet with evident reticulation.
- 28a. Inflorescences inclined to nodding 27. *F. subinclinata*
- 28b. Inflorescences erect.
- 29a. Rhizomes woody, horizontally elongated 26. *F. rigidula*
- 29b. Rhizomes not prominent.

- 30a. Nutlet with hexagonal reticulation, without obvious vertical ribs, not stipitate 25. *F. longispica*
- 30b. Nutlet with transversely oblong reticulation, vertical ribs obvious or not, with a short brown stipe at base.
 - 31a. Nutlet obovoid, with obvious vertical ribs, not verruculose; inflorescences 5–9 cm 23. *F. dichotoma*
 - 31b. Nutlet ovoid, without vertical ribs, sparsely verruculose; inflorescences 3–4 cm 24. *F. shimadana*
- 15b. Stigmas (2 or)3; style not compressed or rarely slightly compressed, apically not ciliate.
 - 32a. Basal part of culms with 1–3 leafless sheaths.
 - 33a. Leaf blade bilaterally compressed, ensiform; leaf sheaths compressed; spikelets spherical or subspherical; glumes 1–1.3 mm 16. *F. littoralis*
 - 33b. Leaf blade (if present) dorsiventrally flattened but canaliculate, linear; leaf sheaths tubular; spikelets more elongated (but sometimes globose-ellipsoid in *F. umbellaris*); glumes 1.5–2.7 mm.
 - 34a. Leaves reduced to a bladeless sheath 18. *F. salbundia*
 - 34b. Leaves with a blade.
 - 35a. Culms 3-angled to subterete 22. *F. umbellaris*
 - 35b. Culms 4- or 5-angled to subterete.
 - 36a. Anthelae simple or subcompound (rarely reduced to 1 spikelet); glumes without any dark brown lines 21. *F. diphylloides*
 - 36b. Anthelae usually compound; glumes each with 1 or 2 dark brown lines.
 - 37a. Glume apices obtuse to rounded and not mucronate or apiculate; nutlet 0.6–0.8 mm; spikelets 2.7–7 mm 17. *F. aphylla*
 - 37b. Glume apices mucronate or apiculate or at least acute; nutlet ca. 0.8 mm (or sometimes longer in *F. quinquangularis*); spikelets 2–5 mm.
 - 38a. Ligule absent; involucre bracts 4, setaceous; rays 4; nutlet obovoid; stamens 1 or 2 19. *F. quinquangularis*
 - 38b. Ligule a fringe of pubescence; involucre bracts 5–7, leaflike; rays 5–7; nutlet broadly obovoid; stamens 3 20. *F. chingmaiensis*
 - 32b. Culm leaves all with a leaf blade.
 - 39a. Culms tufted; rhizomes absent.
 - 40a. Nutlet oblong; glumes white, straw-yellow, or rust-colored.
 - 41a. Glumes white to pale straw-yellow; nutlet papillate laterally but papillae later deciduous; leaf blade 0.2–0.5 mm wide 1. *F. dipsacea*
 - 41b. Glumes rust-colored; nutlet not papillate; leaf blade 1–2.5 mm wide 2. *F. stauntonii*
 - 40b. Nutlet obovoid, broadly obovoid, or ellipsoid-obovoid; glumes usually yellowish green.
 - 42a. Stigmas 2; involucre bracts longer or shorter than inflorescence 5. *F. henryi*
 - 42b. Stigmas 3; involucre bracts shorter than inflorescence.
 - 43a. Spikelets 3–6 × 1–1.5 mm; glumes 2–2.5 mm; nutlet broadly obovoid, 0.7–1 mm 3. *F. autumnalis*
 - 43b. Spikelets 2–3 × 1–1.2 mm; glumes 1–1.2 mm; nutlet obovoid, 0.4–0.5 mm 4. *F. microcarya*
 - 39b. Culms not tufted; rhizomes short or plants stoloniferous.
 - 44a. Nutlet purplish black, grayish black, or blackish purple (not seen for *F. psammocola*); stigmas 2 or 3.
 - 45a. Whole plant covered with dense white silky hairs; rhizomes elongated, branched 12. *F. sericea*
 - 45b. Plant glabrous; rhizomes short, not branched.
 - 46a. Spikelets 10–20 mm; style 3-sided; stigmas 3 13. *F. insignis*
 - 46b. Spikelets 3–10 mm; style slightly flat or flat; stigmas 2 or 3.
 - 47a. Glumes 1.2–2 mm, apex obtuse; spikelets 3–6 × 1.5–2.5 mm 11. *F. cymosa*
 - 47b. Glumes 4–5 mm, apex acute; spikelets 6–10 × 2.5–4 mm 15. *F. psammocola*
 - 44b. Nutlet white, yellowish white, cream-colored, yellow, or brown; stigmas 3.
 - 48a. Glumes densely gland-dotted, margin fimbriate-ciliate, apex often emarginate 14. *F. leptoclada*
 - 48b. Glumes not gland-dotted, margin not fimbriate-ciliate, apex not emarginate.

- 49a. Plants stoloniferous; involucre bracts subulate or glumelike 10. *F. pierottii*
 49b. Plants not stoloniferous; involucre bracts leaflike.
 50a. Leaf sheaths not compressed; glumes 5–7-veined forming an abaxial obtusely angled keel; nutlet ca. 2 mm 6. *F. thomsonii*
 50b. Leaf sheaths compressed; glumes 1–3-veined; nutlet 0.7–1.5 mm.
 51a. Ligule absent; involucre bracts longer than inflorescence 9. *F. dura*
 51b. Ligule ciliate; involucre bracts shorter than inflorescence
 52a. Glumes 3–3.5 mm, herbaceous, 1-veined; nutlet 1–1.5 mm 7. *F. complanata*
 52b. Glumes 2–2.5 mm, membranous, 3-veined; nutlet 0.7–0.8 mm 8. *F. tainanensis*

1. *Fimbristylis dipsacea* (Rottbøll) Bentham, Gen. Pl. 3: 1049. 1883.

起绒飘拂草 *qi rong piao fu cao*

Annuals. Rhizomes absent. Culms tufted, 2.5–15 cm tall, slender, smooth. Leaves as long as or shorter than culm; sheath rust-colored, thinly membranous, glabrous, mouth obliquely split; leaf blade capillary, 2.5–15 cm × 0.2–0.5 mm, involute to nearly flat. Involucre bracts 3–10, setaceous, basal 1 or 2 sometimes surpassing inflorescence. Inflorescence a simple or subcompound anthela, with fewer to numerous spikelets; rays 3–10, slender, unequal, spreading. Spikelets solitary, rarely 2 clustered, oblong, oblong-ovoid, or subglobose, 3–6 × 2–6 mm, many flowered. Glumes white or pale straw-yellow, oblong, oblong-ovate, or elliptic, ca. 1 mm (excluding awn), thinly membranous, 1-veined forming an abaxial green keel, apex blunt and awned. Stamens 1 or 2; anthers narrowly ovoid to oblong. Style basally slightly thickened; stigmas 2. Nutlet brown, oblong, shiny, with transversely hexagonal reticulation or sublinear horizontal lines, each edge bearing 5–9 caducous clavate glandular cells. Fl. and fr. Mar–Nov.

Field margins, wet grassy places by rivers, swampy places, pond margins; below 100 m. Anhui, Guangdong, Guangxi, Hainan, Heilongjiang, Hunan, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Laos, Myanmar, Papua New Guinea, Philippines, Russia, Sri Lanka, Thailand, Vietnam; Africa, N Australia, South America].

- 1a. Glume apices with a long excurved awn 1a. var. *dipsacea*
 1b. Glume apices with a short straight awn 1b. var. *verrucifera*

1a. *Fimbristylis dipsacea* var. *dipsacea*

起绒飘拂草(原变种) *qi rong piao fu cao (yuan bian zhong)*

Scirpus dipsaceus Rottbøll, Descr. Icon. Rar. Pl. 56. 1773.

Leaves often as long as or shorter than culm. Glumes white, elliptic, apex with a long excurved awn. Stamens 1 or 2. Fl. and fr. Mar–Nov. *2n* = 10.

Field margins, wet grassy places by rivers, swampy places, pond margins; below 100 m. Guangdong, Guangxi, Hainan, Yunnan [India, Indonesia, Laos, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, South America].

1b. *Fimbristylis dipsacea* var. *verrucifera* (Maximowicz) T. Koyama, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 8: 118. 1961.

疣果飘拂草 *you guo piao fu cao*

Isolepis verrucifera Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9 [Prim. Fl. Amur.]: 300. 1859; *Fimbristylis verrucifera* (Maximowicz) Makino.

Leaves shorter than culm. Glumes white to pale straw-yellow, oblong to oblong-ovate, apex with a short straight awn. Stamen 1. Fl. and fr. Aug–Nov.

Field margins, wet places, water margins. Anhui, Heilongjiang, Hunan, Zhejiang [Japan, Korea, Russia (Far East)].

2. *Fimbristylis stauntonii* Debeaux & Franchet, Actes Soc. Linn. Bordeaux 31: 31. 1877.

烟台飘拂草 *yan tai piao fu cao*

Annuals. Rhizomes absent. Culms tufted, 4–40 cm tall, erect or rarely curved, flatly 3-angled, striate, glabrous, with fewer leaves at base. Leaves shorter than culm; sheath pale brown, 0.5–7 cm, adaxially membranous, mouth obliquely split; ligule very short, ciliate, apex truncate; leaf blade 1–2.5 mm wide but apically attenuate, flat, glabrous, apex acute. Involucre bracts 2 or 3, leaflike, slightly longer to shorter than inflorescence; bractlets subulate or glumelike, base dilated, apex awned. Inflorescence a simple or compound anthela, 1–7 × 1.5–7 cm; rays few, 1–7 cm, slender, ± spreading. Spikelets solitary, broadly ovoid to oblong, 3–7 × 1.5–2.5 mm, many flowered, base cuneate, apex acute, obtuse, or rounded. Glumes rust-colored, oblong-lanceolate, membranous, 1-veined forming an abaxial green keel, apex with a straight mucro. Stamen 1; anther ca. 0.4 mm, apex apiculate. Style subcylindric, glabrous, basally slightly inflated to spherical; stigmas 2 or 3. Nutlet yellowish white, oblong, ca. 1 mm, subterete, with transverse oblong reticulation. Fl. and fr. Jul–Oct.

Cultivated fields, wet sandy places, among grasses; near sea level to 700 m. Anhui, S Gansu, Hebei, Henan, Hubei, Hunan, Jiangsu, Liaoning, Shaanxi, Shandong, Sichuan, Zhejiang [Japan, Korea].

3. *Fimbristylis autumnalis* (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 97. 1817.

秋飘拂草 *qiu piao fu cao*

Scirpus autumnalis Linnaeus, Mant. Pl. Alt. 180. 1771; *Fimbristylis wukungshanensis* Tang & F. T. Wang.

Annuals. Rhizomes absent. Culms tufted, 6–20 cm tall, 1.5–2 mm wide, 3-angled, striate, glabrous, with 1 or 2 leaves at base. Leaves shorter than culm; sheath membranous, tinged rusty brown on ventral side, mouth obliquely truncate; ligule truncate, ciliate; leaf blade 1–2.5 mm wide, glabrous, gradually

narrowed to an acute apex. Involucral bracts subulate, shorter than inflorescence. Inflorescence a simple to decompound anthela, 2–7 cm, lax; rays 3–6, 0.6–4 cm, spreading. Spikelets solitary, narrowly ovoid to oblong-ovoid, 3–6 × 1–1.5 mm, 7–16-flowered. Glumes pale brownish to yellowish, lanceolate-ovate, 2–2.5 mm, margin broadly hyaline, strongly folded by a 3-veined keel with veins projecting into a mucro. Stamen 1. Stigmas 3. Nutlet broadly obovoid, 0.7–1 × ca. 0.5 mm, 3-sided, finely cancellate with transversely oblong epidermal cells, sparsely verruculose; persistent style base conic. Fl. and fr. Sep.

Cultivated ground, grasslands; below 600 m. Jiangxi (Wugong Shan), Liaoning, Taiwan [Japan; Central, North, and South America].

4. *Fimbristylis microcarya* F. Mueller, *Fragm.* 1: 200. 1859.

台北飘拂草 tai bei piao fu cao

Fimbristylis autumnalis (Linnaeus) Roemer & Schultes subsp. *taiwanica* (Ohwi) T. Koyama; *F. taiwanica* Ohwi.

Annuals. Culms densely tufted, 10–30 cm tall, 0.7–1.3 mm thick, flatly 3-angled, smooth. Leaves basal, few; sheath light straw-colored to pale brown; ligule ciliate; leaf blade linear, to 18 cm × 1.5–5 mm, flat, apical margin scabrid. Involucral bracts 3 or 4, basalmost leaflike and to 4 cm. Inflorescence a decompound anthela, 3–6 × 3–6 cm, lax; primary rays 2–5, 1–5 cm, unequal, apically scabrous. Spikelets numerous per inflorescence, solitary, rust-colored, narrowly ovoid, 2–3 × 1–1.2 mm, slightly angular, subaxly 5–10-flowered, apex acute. Glumes numerous, spirally imbricate, light rust-colored with pale brownish margins, ovate, 1–2 mm, membranous, 3-veined forming an abaxial keel, apex mucronate. Stamens 1 or 2; anthers 0.2–0.3 mm. Style 3-sided, glabrous, basally dilated; stigmas 3. Nutlet sessile, light straw-colored, obovoid, 0.4–0.5 × 0.3–0.4 mm, ± smooth or with scattered verrucae and slightly cancellate with transversely oblong cells.

Open wet places. Taiwan [India, Indonesia, Kashmir, Papua New Guinea, Philippines, Vietnam; Africa, Australia].

5. *Fimbristylis henryi* C. B. Clarke, *J. Linn. Soc., Bot.* 36: 237. 1903.

宜昌飘拂草 yi chang piao fu cao

Fimbristylis unicolor Ohwi & T. Koyama.

Annuals. Rhizomes absent. Culms tufted, 3–20 cm tall, 3-angled, striate, glabrous, with ca. 2 leaves at base. Leaves longer than culm; sheath rust-colored, 1–3.5 cm, adaxially membranous, mouth obliquely split; ligule ciliate, apex truncate; leaf blade 1–3 mm wide but apically attenuate, flat, glabrous, apex acute. Involucral bracts 2 or 3 (or 4), leaflike, longer to shorter than inflorescence; bractlets subulate, broad at basal part, margin membranous. Inflorescence a simple, compound, or decompound anthela, 1–5 cm in diam.; rays 2–4, 0.5–3 cm. Spikelets solitary, narrowly oblong, narrowly ellipsoid, or rarely ovoid, 3–8 × 1–1.5 mm, with 8–10 or more flowers, apex obtuse to subacute. Glumes yellowish green to pale brown, ovate to ovate-lanceolate, ca. 2 mm (including mucro), 3-veined forming an abaxial green keel, margin broadly hyaline. Stamen 1; anther oblong, ca. 0.5 mm, 1/5–1/4 as long as filament, apex apiculate.

Style basally inflated to conic; stigmas 2, ca. 1/2 as long as style. Nutlet pale yellow, ellipsoid-obovoid, obovoid, or ellipsoid, less than 1 mm, flat-convex, with transversely oblong reticulation but not verruculose. Fl. and fr. Aug–Nov.

• Cultivated fields, on rocks, marshes, riversides; 100–2000 m. Anhui, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, SE Yunnan, Zhejiang.

6. *Fimbristylis thomsonii* Boeckeler, *Linnaea* 37: 37. 1871.

西南飘拂草 xi nan piao fu cao

Perennials. Rhizomes short. Culms tufted, (11–)25–70 cm tall, flatly and obtusely 3-angled, striate, with many leaves at base. Leaves slightly shorter than culms to 1/4–1/2 as long as culm; sheaths brown, abaxially membranous and rust-colored, apex truncate; leaf blade 2–4.5 mm wide, flat, stiff, margin finely toothed, apex acute. Involucral bracts 2 or 3, leaflike, much shorter than inflorescence; bractlets subulate, broader at base. Inflorescence a compound or decompound anthela; rays 2–4, 0.7–3.5 cm, slightly compressed. Spikelets solitary, oblong-ovoid to ellipsoid, 5–10 × 2–3 mm, 7–10-flowered or more, apex acute. Glumes chestnut-brown, ovate, 2.2–3.5 mm, 5–7-veined forming an abaxial obtuse keel, midvein green and excurrent into a mucro, margin membranous, apex acute. Stamens 3; anthers narrowly oblong, ca. 2 mm, ca. 2 × as long as filaments. Ovary oblong, nearly 3-sided, base slightly narrowed; style 3-sided, not ciliate, basally inflated to oblong-conic; stigmas 3, slightly longer than style. Nutlet yellowish white to yellow, obovoid, ca. 2 mm, obtusely 3-sided, with transversely oblong reticulation and verrucae. Fl. and fr. May–Jun.

Grassy slopes; 100–3100 m. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

7. *Fimbristylis complanata* (Retzius) Link, *Hort. Berol.* 1: 292. 1827.

扁鞘飘拂草 bian qiao piao fu cao

Perennials. Rhizomes long, short, or almost absent. Culms tufted, (10–)20–70 cm tall, flatly 3- or 4-angled, striate, sometimes apically winged, with many leaves at base. Leaves shorter than culm; sheath bilaterally compressed, abaxially membranous and rust-colored, adaxially keeled, mouth obliquely split and ciliate; ligule very short, ciliate; leaf blade 1–5 mm wide, flat, thickly papery, margin apically finely serrulate, apex acute. Involucral bracts 2–4, suberect, much shorter than inflorescence; bractlets setaceous, broader at base. Inflorescence a simple, compound, or decompound anthela, 7.5–10.5 × 4–7 cm; rays 3 or 4, 1–7 cm, compressed, scabrid. Spikelets many per inflorescence, solitary, oblong, ovoid, or narrowly ovoid, 5–9 × 1.2–2 mm, 5–13-flowered, apex acute. Glumes brown, ovate, ca. 3 mm, 1-veined forming an abaxial yellowish green keel excurrent into a mucro, apex acute. Stamens 3; anthers oblong, 1 mm or longer, ca. 1/4 as long as filament, apex acute. Ovary oblong, 3-sided; style 3-sided, glabrous, basally inflated to conic; stigmas 3, ± as long as style. Nutlet white or yellowish white, obovoid to broadly obovoid, ca. 1.5 mm, obtusely 3-sided, with transverse oblong reticulation. Fl. and fr. Jun–Oct.

Wet places in valleys, grasslands, streamsides, open fields, slopes,

ditches, swampy places, along ravines; 100–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, SW Asia (Yemen), N Australia, Central and South America, Indian Ocean islands, Pacific islands].

- 1a. Culms 50–70 cm tall, robust; rhizomes long to short; leaf blade 3–5 mm wide; inflorescence a decompound anthela 7a. var. *complanata*
- 1b. Culms (10–)20–50 cm tall, slender; rhizomes short to almost absent; leaf blade 1–2.5 mm wide; inflorescence a simple or compound anthela 7b. var. *exaltata*

7a. *Fimbristylis complanata* var. *complanata*

扁鞘飘拂草(原变种) *bian qiao piao fu cao* (yuan bian zhong)

Scirpus complanatus Retzius, *Observ. Bot.* 5: 14. 1788.

Rhizomes long or short, sometimes nearly diageotropic. Culms 50–70 cm tall, robust. Leaf blade 3–5 mm wide. Inflorescence a decompound anthela. Fl. and fr. Jul–Oct.

Wet places in valleys, grasslands, streamsides; 500–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, SW Asia (Yemen), N Australia, Central and South America, Indian Ocean islands, Pacific islands].

7b. *Fimbristylis complanata* var. *exaltata* (T. Koyama) Y. C. Tang ex S. R. Zhang & T. Koyama, *stat. nov.*

矮扁鞘飘拂草 *ai bian qiao piao fu cao*

Basionym: *Fimbristylis complanata* f. *exaltata* T. Koyama, *Bull. Arts Sci. Div. Ryukyuu Univ.* 3: 70. 1959.

Rhizomes short to almost absent, slender. Culms (10–)20–50 cm tall, slender. Leaf blade 1–2.5 mm wide. Inflorescence a nearly simple or compound anthela. Fl. and fr. Jun–Sep.

Streamsides, water margins, open fields, slopes, ditches, swampy places, along ravines; 100–800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Taiwan, Zhejiang [Japan, Korea].

The name *Fimbristylis complanata* var. *kraussiana* (Hochstetter ex Steudel) C. B. Clarke was used by Tang and F. T. Wang (*Fl. Reipubl. Popularis Sin.* 11: 81. 1961), but the type of the basionym, *F. kraussiana* Hochstetter ex Steudel, belongs to *F. consanguinea* Kunth, which does not occur in China. T. Koyama proposed the new name *F. complanata* f. *exaltata* based on a different type. Because of the morphological differences and the more northern distribution, we are raising this form to a variety.

8. *Fimbristylis tainanensis* Ohwi, *J. Jap. Bot.* 14: 547. 1938.

台南飘拂草 *tai nan piao fu cao*

Fimbristylis autumnalis (Linnaeus) Roemer & Schultes subsp. *tainanensis* (Ohwi) T. Koyama; *F. microcarya* F. Mueller var. *tainanensis* (Ohwi) H. Y. Liu.

Perennials. Rhizomes short, ascending. Culms laxly tufted, 40–60 cm tall, compressed 3-sided or apically ± 2-angled, basally leaved. Leaf sheath ± 2-ranked, pale or tinged brown, mouth obliquely truncate and with a fringe of short pubescence; ligule short, ciliate; leaf blade 3–5 mm wide, ± flat, subrigid, scabrous toward subabruptly acute apex. Involucral bracts 2–4, basal one linear and equaling inflorescence. Inflorescence a compound or in part decompound anthela, 3–4 cm, with many dense spikelets; rays many, 1–2 cm, compressed. Spikelets solitary or in groups of 2 or 3, chestnut-brown to light brown, oblong to narrowly ovoid, 4–6 × 1.5–2 mm, 5–10-flowered, apex subacute. Glumes pale brown with chestnut-brown striae on both surfaces, oblong to oblong-ovate, 2–2.5 × 1–1.2 mm, 3-veined, apex with an acute costa. Stamens 3. Nutlet pale yellow, obovoid to broadly ovoid, 0.7–0.8 × ca. 0.7 mm, 3-sided, indistinctly cancellate, verruculose; persistent style ca. 2 mm, base conically thickened.

- Lowland marshes, paddy fields. Taiwan.

9. *Fimbristylis dura* (Zollinger & Moritz) Merrill, *Philipp. J. Sci., C*, 11: 53. 1916.

类扁鞘飘拂草 *lei bian qiao piao fu cao*

Isolepis dura Zollinger & Moritz in Moritz, *Syst. Verz.* 97. 1846.

Perennials. Rhizomes short. Culms solitary or tufted, 45–75 cm, 2–4 mm wide, compressed, striate, apically scabrous. Leaves shorter than or as long as culm, subdistichous; sheath slightly bilaterally compressed, abaxially membranous and brown, mouth obliquely split; ligule absent; leaf blade linear, 3–8 mm wide, flat, margin apically scabrous, apex acute. Involucral bracts 3 or 4, linear, basal 1 or 2 longer than inflorescence. Inflorescence a compound anthela, to 20 × 10 cm, lax; rays many, to 10 cm, slightly compressed. Spikelets solitary, oblong to oblong-ovoid, 4–10 × 1–1.5 mm. Glumes brown, ovate to oblong-ovate, 1.5–2 mm, 3-veined forming an abaxial yellowish green keel excurrent into a mucro, apex acute; apical glumes often abnormal, to 4 × 1.5 mm. Stamens (2 or)3; anthers oblong. Style 0.5–1 mm, 3-sided, glabrous or apically slightly ciliate, basally inflated; stigmas 3. Nutlet yellowish white to grayish brown, ellipsoid to oblong-obovoid, ca. 1 × 0.5 mm, obtusely 3-sided, with distinct transverse oblong reticulation, sparsely verruculose. Fl. and fr. autumn.

Riversides, shady moist places in woods. Hainan [India, Indonesia, Malaysia, Thailand, Vietnam].

10. *Fimbristylis pierotii* Miquel, *Ann. Mus. Bot. Lugduno-Batavi* 2: 145. 1865.

东南飘拂草 *dong nan piao fu cao*

Perennials. Rhizomes to 2 mm in diam., creeping, covered with ovate scales. Culms solitary, 13–35 cm tall, flatly 3-angled, apical part scabrid, with 4–6 leaves and 2 nearly leafless sheaths at base. Leaves shorter than to nearly as long as culm; sheath rust-colored, adaxially membranous, not ciliate, mouth obliquely split; ligule absent; leaf blade 1.2–2 mm wide, margin flat to incurved and finely serrulate, apex acute. Involucral bracts 1–3, subulate or glumelike, shorter than inflorescence,

apex with a long awns. Inflorescence a simple anthela, 1.5–2.5 cm, with 2–7 spikelets. Spikelets oblong, ellipsoid, or ovoid, 6–10 × 2.5–4 mm, 9-flowered, apex acute. Glumes chestnut-brown, broadly ovate, ca. 4 mm, 3-veined forming an abaxial green keel, margin membranous and white, apex obtuse to subacute; basal 2 glumes with an apical short hard mucro. Stamens 3; anthers linear-oblong, ca. 2 mm, ca. 1/4 as long as filaments. Ovary oblong, 3-sided, basally slightly narrower; style 3-sided, not ciliate, basally conic; stigmas 3, nearly as long as style. Nutlet brown, broadly obovoid, ca. 1 mm or more, flat to convex, finely verruculose. Fl. and fr. May–Sep.

Roadsides, coniferous forests, sunny dry places on mountain summits; near sea level to 3000 m. Anhui, Fujian, SE Henan, Jiangsu, Shandong, Yunnan, Zhejiang [Japan, Kashmir, Korea, Nepal, Philippines].

11. *Fimbristylis cymosa* R. Brown, Prodr. 228. 1810.

黑果飘拂草 *hei guo piao fu cao*

Perennials. Rhizomes short. Culms tufted, 10–60 cm tall, flatly and obtusely 3-angled, sometimes thick at base, with many leaves. Leaf blade 1–4 mm wide, thick, flat, extremely rigid, margin finely serrulate, apex acute. Involucral bracts 1–3, shorter than inflorescence. Inflorescence a simple or compound anthela, headlike with a few short rays or open with several elongated rays. Spikelets numerous, solitary or clustered, oblong to ovoid, 3–6 × 1.5–2.5 mm, densely many flowered, apex obtuse. Glumes brown, ovate to broadly ovate, 1.2–2 mm, membranous, abaxially 3-veined, margin broadly hyaline, apex obtuse. Stamens 3; anthers linear. Style slender, not ciliate, basally slightly thickened; stigmas 2 or 3. Nutlet purplish black when mature, obovoid to broadly obovoid, 0.7–1 mm, 3-sided or biconvex, indistinctly verruculose and with square or transversely oblong reticulation but sometimes smooth. Fl. and fr. Jun–Oct.

Dry sandy places along roads, coastal rocky places, gravelly places along rivers, sandy seashores; near sea level to 400 m. Fujian, Guangdong, Guangxi, Hainan, Nansha Qundao, Taiwan, Zhejiang [India, Indonesia, Japan, Laos, Malaysia, Sri Lanka, Thailand, Vietnam; Africa, Australia].

- 1a. Nutlet 3-sided; stigmas 3; anthelae headlike with a few short rays; spikelets many congested together 11a. var. *cymosa*
- 1b. Nutlet biconvex or rarely 3-sided; stigmas 2(or 3); anthelae open with several elongated rays; spikelets solitary or a few fascicled 11b. var. *spathacea*

11a. *Fimbristylis cymosa* var. *cymosa*

黑果飘拂草(原变种) *hei guo piao fu cao* (yuan bian zhong)

Culms flatly and obtusely 3-angled, thick at base. Leaves extremely rigid, 1.5–4 mm wide. Anthelae congested to a head with a few short rays. Spikelets clustered. Stigmas 3. Nutlet broadly obovoid, 3-sided. Fl. and fr. Jun–Sep. $2n = 10$.

Dry sandy places along roads, coastal rocky places; near sea level. Nansha Qundao, Taiwan [Indonesia, Japan; Australia].

11b. *Fimbristylis cymosa* var. *spathacea* (Roth) T. Koyama, J.

Jap. Bot. 46(3): 66. 1971.

佛焰苞飘拂草 *fo yan bao piao fu cao*

Fimbristylis spathacea Roth, Nov. Pl. Sp. 24. 1821; *F. formosensis* C. B. Clarke; *F. kankaoensis* Hayata; *F. wightiana* Nees.

Culms obtusely 3-angled, not thick at base. Leaves rigid, 1–3 mm wide. Anthelae open with several elongated rays. Spikelet solitary or 2 or 3 clustered. Stigmas 2(or 3). Nutlet obovoid to broadly obovoid, biconvex or rarely 3-sided. Fl. and fr. Jul–Oct. $2n = 32$.

Gravelly places along rivers, sandy seashores; near sea level to 400 m. Fujian, Guangdong, Guangxi, Hainan, Nansha Qundao, Taiwan, Zhejiang [India, Japan, Laos, Malaysia, Sri Lanka, Thailand, Vietnam; Africa].

12. *Fimbristylis sericea* R. Brown, Prodr. 228. 1810.

绢毛飘拂草 *juan mao piao fu cao*

Fimbristylis decora Nees & Meyen.

Perennials. Rhizomes obliquely to horizontally elongated, branched, covered with often blackish brown fibers from old leaf sheaths. Culms widely spaced, 15–30 cm tall, obtusely 3-angled, with white silky hairs, bearing leaves at base. Leaf sheath adaxially membranous and rust-colored, mouth obliquely split; ligule absent; leaf blade 1.5–3.2 mm wide, curved, flat, both surfaces with dense white silky hairs, apex acute. Involucral bracts 2 or 3, leaflike, shorter than inflorescence, both surfaces with white silky hairs. Inflorescence a simple anthela; rays 2–4, 0.7–2.5 mm, sometimes extremely short, compressed, with white silky hairs. Spikelets 3–15 in capitate heads, oblong-ovoid to oblong, 6–10 × 2–3.5 mm, apex acute. Glumes ovate, ca. 3 mm, both surfaces with reddish purplish lines, midvein white pilose, margin broad and white, apex obtuse with a hard mucro. Stamens 3; anthers narrowly oblong, ca. 3 mm. Ovary oblong, biconvex; style slightly compressed, basally slightly inflated and hairy, apically slightly pubescent; stigmas 2, slightly shorter than style. Nutlet yellowish white to brown when young but blackish purple when mature, ellipsoid-obovoid to obovoid, ca. 1.5 mm, biconvex. Fl. and fr. Aug–Oct.

Sandy places, sand dunes along seashores; near sea level to 400 m. Fujian, Guangdong, S Guangxi, Hainan, Jiangsu, Taiwan, Zhejiang [India, Indonesia, Japan, Korea, Malaysia, Thailand, Vietnam; Africa, Australia].

13. *Fimbristylis insignis* Thwaites, Enum. Pl. Zeyl. 349. 1864.

硬穗飘拂草 *ying sui piao fu cao*

Perennials. Rhizomes short. Culms 20–40 cm tall, ± stiff, cylindric but sometimes slightly compressed on apical part, deeply striate, smooth, glabrous, basal sheaths bladed. Leaves 1/3–1/2 as long as culm; sheath less than 5 cm, leathery; ligule absent; leaf blade 1–2.5 mm wide, flat, subleathery, margin finely serrulate, apex acute to slightly obtuse. Involucral bracts 2 or 3, erect, leaflike, shorter than inflorescence, base slightly dilated. Inflorescence a simple or compound anthela, with 3–5 rays and 10 or more spikelets; rays flatly cylindric, 2–4 cm, slightly rigid. Spikelets solitary, narrowly oblong-ovoid, 10–20

× ca. 4 mm, subterete, with basal 2 or 3 glumes empty, apex acute. Glumes densely spirally imbricate, oblong, ca. 6 mm, midvein distinct and forming an abaxial keel, apex mucronate. Stamens 3; anthers linear-oblong, ca. 2 mm. Style 4–5 mm, 3-sided, basally inflated, apically ciliate; stigmas 3. Nutlet grayish black when mature, broadly obcordate, ca. 1.5 mm, 3-sided, verruculose with hexagonal reticulation. Fl. and fr. Jun.

Dry slopes, poor soil. Guangdong, Hainan [Indonesia, Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

14. *Fimbristylis leptoclada* Bentham, Fl. Hongk. 393. 1861.

细茎飘拂草 xi jing piao fu cao

Perennials, rhizomatous. Culms tufted, 15–60 cm tall, 0.2–1.5 mm thick, 3-angled, smooth to scabrid. Leaves basal, few; sheath pale hyaline to light brown, 1.5–4 cm, apex oblique; ligule absent; leaf blade filiform, 10–30 cm × 0.3–0.5 mm, margin ± incurved, apex obtuse. Involucral bracts 1–3, glumelike or setaceous, basalmost 0.5–2 cm. Inflorescence a simple anthela or capitate, 5–20 × 5–8 mm; rays (when present) to 2 cm. Spikelets 3–12 per inflorescence, in clusters of 2–8, ellipsoid, 2.2–3.5 × 1.5–2 mm. Glumes 10–15 per spikelet, spirally imbricate, brown, broadly ovate, 1–1.5 × 0.7–1.3 mm, densely gland-dotted, apically fimbriate ciliate, 3-veined forming an abaxial obtusely angled pale brown keel, margin membranous with a pale hyaline edge, apex rounded-truncate to shallowly emarginate and mucronulate. Stamens 1 or 2; anthers ca. 0.5 mm. Stigmas 3. Nutlet cream-colored, obovoid, 0.7–0.9 × 0.5–0.7 mm, 3-sided, verruculose. Fl. and fr. Jul–Oct.

Dry sandy places, grasslands along roads; near sea level. Fujian, Guangdong [Indonesia, Japan (Ryukyu Islands), Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam].

15. *Fimbristylis psammocola* Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 227. 1961.

砂生飘拂草 sha sheng piao fu cao

Perennials. Rhizomes short, woody. Culms solitary, 5–16 cm tall, obtusely 3-angled to subterete, striate, basally leaved, base covered with blackish brown often fibrous old leaf sheaths. Leaves slightly shorter than to equaling culm; sheath adaxially membranous and brown, mouth obliquely split; ligule absent; leaf blade 1–2.5 mm wide, stiff, slightly scabrid, margin slightly involute, apex acute. Involucral bracts 2–4, subulate, shorter to slightly longer than inflorescence. Inflorescence a simple or compound anthela, 2–4 × 1.2–2.5 cm, with 1–14 spikelets; rays 3–5, subcylindric, 0.6–2.5 mm. Spikelets solitary, narrowly ellipsoid, 6–10 × 2.5–4 mm, densely many flowered, apex acute. Glumes grayish green, triangular-ovate, 4–5 mm, abaxially slightly pubescent at middle, 3-veined forming an abaxial keel and excurrent into a hard mucro, midvein green, lateral veins brown, margin broadly hyaline, apex acute. Stamens 3; anthers linear, ca. 2.5 mm, ca. 1/2 as long as filaments, apex acute. Style ca. 2 mm, compressed, not ciliate, basally slightly inflated; stigmas ± as long as style. Nutlet not seen. Fl. May.

• Sandy places along rivers; 500–600 m. S Yunnan (Xishuangbanna).

16. *Fimbristylis littoralis* Gaudichaud, Voy. Uranie 10: 413. 1829.

水虱草 shui shi cao

Annuals or short-lived perennials. Rhizomes absent. Culms tufted, (1.5–)10–60 cm tall, flatly 4-angled, striate, bearing 1–3 bladeless sheaths at base. Basal leaf sheaths (1.5–)3.5–9 cm, sometimes setaceous, compressed bilaterally, attenuate apically, mouth obliquely split. Leaves shorter to longer than culm; sheath bilaterally compressed, abaxially with a membranous and rust-colored margin, adaxially keeled, mouth obliquely split; ligule absent; leaf blade ensiform, (1–)1.5–2 mm wide, bilaterally compressed, margin sparsely and finely serrulate, apically attenuate into a setaceous tip. Involucral bracts 2–4, setaceous, base dilated, margin rust-colored and membranous. Inflorescence a compound, decompound, or rarely simple anthela, subdense, with many spikelets; rays 3–6, 0.8–5 cm, slender, scabrid. Spikelets solitary, globose to subglobose, 1.5–5 × 1.5–3 mm, apex rounded. Glumes chestnut-brown or dark brown, ovate, 1–1.3 or 3.5–6 mm, membranous, 3-veined forming an abaxial keel, midvein green, lateral veins brown, apex obtuse. Stamens 2; anthers oblong, ca. 0.7 mm, ca. 1/2 as long as filaments, apex obtuse. Style 3-sided, not ciliate, basally slightly inflated; stigmas 3, ca. 1/2 as long as style. Nutlet straw-yellow, obovoid to broadly obovoid, ca. 1 mm, obtusely 3-sided, verruculose with transversely oblong reticulation. Fl. and fr. May–Oct.

Field margins, open slopes, muddy places near water, grasslands, paddy fields, paddy field margins; 100–2000 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, SE Qinghai, S Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

- 1a. Glumes chestnut-brown, 1–1.3 mm 16a. var. *littoralis*
1b. Glumes dark brown, 3.5–6 mm 16b. var. *koidzumiana*

16a. *Fimbristylis littoralis* var. *littoralis*

水虱草(原变种) shui shi cao (yuan bian zhong)

Fimbristylis miliacea (Linnaeus) Vahl, nom. rej.; *Scirpus miliaceus* Linnaeus, nom. rej.

Glumes chestnut-brown, 1–1.3 mm. Fl. and fr. May–Oct.

Field margins, open slopes, muddy places near water, grasslands, paddy field margins; 100–2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, SE Qinghai, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

16b. *Fimbristylis littoralis* var. *koidzumiana* (Ohwi) T. Koyama, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 8: 108. 1961.

小泉氏飘拂草 xiao quan shi piao fu cao

Fimbristylis koidzumiana Ohwi, Acta Phytotax. Geobot. 1:

78. 1932; *F. miliacea* subsp. *koidzumiana* (Ohwi) T. Koyama.

Culms apically scabrous. Glumes dark brown, 3.5–6 mm.

Paddy fields. Taiwan [Japan, Vietnam; Pacific islands].

17. *Fimbristylis aphylla* Steudel, Syn. Pl. Glumac. 2: 114. 1855.

无叶飘拂草 wu ye piao fu cao

Fimbristylis aphylla var. *gracilis* Tang & F. T. Wang; *F. globulosa* (Retzius) Kunth var. *aphylla* (Steudel) Miquel.

Perennials. Rhizomes short, woody. Culms densely tufted, 30–100 cm tall, slender, 5-angled, smooth, bearing a few bladeless sheaths at base. Basal leaf sheaths cylindrical, margin brown and membranous, apically attenuate, mouth obliquely truncate. Leaves on vegetative shoots often with only blades; leaf blade linear, margins involute. Involucral bracts 3–5, needlelike, 0.6–2.5 cm, much shorter than inflorescence, margin scabrid. Inflorescence a decompound anthela, spreading; rays 5–8, to 7 cm, slender. Spikelets solitary, oblong to ellipsoid, 2.5–7 × 1.2–3 mm. Glumes densely spirally imbricate, rust-colored to yellowish brown, broadly ovate to subelliptic, ca. 2.5 mm, membranous, prominently 3-veined forming an abaxial keel, veins yellow to greenish yellow and often dark brown between lateral veins, margin paler, apex obtuse to rounded and apiculate. Stamens 3; anthers linear. Style short and flat, not ciliate, basally slightly inflated; stigmas 3, longer than style, densely ciliate. Nutlet pale brown, shortly stipitate, obovoid, 0.6–0.8 mm, 3-sided, transversely wavy verruculose. Fl. Jul, fr. Dec.

Swamps, wet places along streams or in valleys; 400–2400 m. Yunnan [India, Indonesia, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa].

18. *Fimbristylis salbundia* (Nees) Kunth, Enum. Pl. 2: 230. 1837.

芒苞飘拂草 mang bao piao fu cao

Trichelostylis salbundia Nees in Wight, Contr. Bot. India, 105. 1834; *Fimbristylis haspaniformis* T. Koyama.

Perennials, rhizomatous. Culms crowded along rhizome, 30–80 cm tall, 1–3 mm thick, acutely 4- or 5-angled, smooth. Leaves bladeless; sheath dusky or cinnamon brown, 1–17 cm, apex lanceolate; ligule absent. Involucral bracts 2–5, setaceous with lanceolate base, longest to 1.5 cm. Inflorescence a compound or decompound anthela, 2–6 × 2–6 cm, open; primary rays 6–8, to 5 cm. Spikelets ovoid to ovoid-ellipsoid, 3–5 × ca. 2 mm. Glumes many, spirally imbricate, light brown, ovate, 2–2.3 × ca. 1.5 mm, membranous, margin hyaline, 1-veined forming an abaxial pale brown obtuse keel, apex obtuse. Stamens (2 or) 3; anthers 0.7–1 mm. Stigmas 3. Nutlet whitish to yellowish brown, broadly obovoid, 0.8–1 × 0.6–0.8 mm, 3-sided, smooth to sparsely verruculose, with 9–14 longitudinal rows of epidermal cells on each side. Fl. and fr. Sep.

Swampy places; 1700–1800 m. Yunnan [India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, N Thailand, Vietnam].

19. *Fimbristylis quinquangularis* (Vahl) Kunth, Enum. Pl. 2:

229. 1837.

五棱秆飘拂草 wu leng gan piao fu cao

Scirpus quinquangularis Vahl, Enum. Pl. 2: 279. 1805; *Fimbristylis fauriei* Ohwi; *F. quinquangularis* var. *bistaminifera* Tang & F. T. Wang; *F. quinquangularis* var. *elata* Tang & F. T. Wang.

Annuals or short-lived perennials. Rhizomes absent or very short. Culms tufted, 14–120 cm tall, 5-angled, bearing 0–3 bladeless sheaths. Basal leaf sheaths 3–17 cm, cylindrical, mouth oblique. Leaves on vegetative shoots with only blades, shorter than to subequaling culm; leaf blade 2–3 mm wide, flat. Involucral bracts 4, setaceous, much shorter than inflorescence, margin finely serrulate. Inflorescence a decompound anthela, 5–9 × 3–6 cm; rays 4, 1–4 cm, scabrid. Spikelets solitary, ovoid, 2–5 × 1.2–1.5 mm, apex acute to subobtuse. Glumes chestnut-brown, ovate, ca. 2 mm, 3-veined forming an abaxial keel, lateral 2 veins dark brown, margin paler, apex obtuse and apiculate. Stamens 1 or 2; anthers oblong, ca. 0.5 mm, ca. 1/3 as long as filament. Style 3-sided, basally slightly inflated, apically slightly pubescent; stigmas 3, slightly longer than style. Nutlet obovoid, 0.8 mm or longer, 3-sided, verruculose and with transverse linear reticulation. Fl. and fr. Aug–Oct. 2n = 10.

Swamps; 800–2100 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Afghanistan, India, Indonesia, Kazakhstan, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Indian Ocean islands, Madagascar].

20. *Fimbristylis chingmaiensis* S. M. Huang, Fl. Hainan. 4: 536. 1977.

澄迈飘拂草 cheng mai piao fu cao

Annuals. Rhizomes absent. Culms tufted, 30–60 cm tall, 1–1.2 mm thick, slender, 5-angled, smooth, glabrous, bearing 1–3 bladeless sheaths at base. Leaves basal, shorter than culm; sheath pale brown, to 13 cm, margins membranous; ligule shortly ciliate; leaf blade linear, ca. 2 mm wide, midvein distinct, margins involute, apex acute. Involucral bracts 5–7, leaf-like, ca. 3 cm, apex acuminate. Inflorescence a compound anthela, 3–5 cm; rays 5–7, to 3.5 cm, slender, unequal, 5-angled. Spikelets solitary, ovoid to oblong-ovoid, 2–2.5 × 1–1.2 mm, 7–9-flowered, apex acute. Glumes 7–11, spirally imbricate, overall pale chestnut-brown, ovate to broadly ovate, ca. 1.5 × 1–1.2 mm, membranous, abaxially keeled, midvein distinct and yellowish green, each side of midvein dark brown, margin apically hyaline, apex acute or mucronate. Stamens 3; anthers oblong, ca. 0.5 mm. Style 3-sided, not ciliate, basally inflated; stigmas 3. Nutlet white or pale brown, shortly stipitate, broadly obovoid, ca. 0.8 mm, obtusely 3-sided, with indistinct transverse oblong reticulation. Fl. autumn.

• Deserted paddy fields. Fujian, Hainan (Chengmai).

21. *Fimbristylis diphyloides* Makino in Makino & Nemoto, Fl. Jap. 1389. 1925.

拟二叶飘拂草 ni er ye piao fu cao

Annuals or short-lived perennials. Rhizomes absent or very

short. Culms tufted, 15–50 cm tall, thin, flatly 4-angled, striate, bearing 1 or 2 bladeless sheaths at base. Basal leaf sheaths 2.5–6.5 cm, cylindric, covered with fibers from old sheaths, mouth obliquely truncate, apex acute. Leaves shorter than to subequaling culm; sheath adaxially membranous and rust-colored, mouth obliquely split; ligule absent; leaf blade 1.2–2.2 mm wide, flat, margin finely toothed, apex acute. Involucral bracts 4–6, setaceous, much shorter than inflorescence, base dilated, margin finely serrulate. Inflorescence a simple or subcompound anthela, 1.5–6 × 2–6 cm; rays 4–8, 0.6–4 cm, scabrid. Spikelets solitary, obovoid to oblong-obovoid, 2.5–7.5 × 1.5–2.5(–3) mm, densely many flowered, apex obtuse to subacute. Glumes reddish brown or straw-yellow, broadly ovate or oblong-ovate, ca. 2 mm or slightly longer, membranous, 3-veined forming a slight abaxial keel, veins green, margin hyaline, apex extremely obtuse. Stamens 2; anthers oblong, ca. 0.8 mm, ca. 1/2 as long as filaments, apex obtuse. Style not ciliate, basally slightly inflated; stigmas 2 or 3, subequaling to slightly longer than style. Nutlet brown, broadly obovoid, ca. 1 mm, 3-sided or biconvex, with sparsely verruculose and with transversely oblong reticulation. Fl. and fr. Jun–Sep.

Paddy fields, streamsides, wet places in valleys, ponds; 100–2100 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Zhejiang [Japan, Korea].

- 1a. Glumes brown to reddish brown, broadly ovate, ca. 2 mm 21a. var. *diphyloides*
- 1b. Glumes straw-yellow, oblong-ovate, longer than 2 mm 21b. var. *straminea*

21a. *Fimbristylis diphyloides* var. *diphyloides*

拟二叶飘拂草(原变种) ni er ye piao fu cao (yuan bian zhong)

Fimbristylis brevicollis Kükenthal.

Glumes brown to reddish brown, broadly ovate, ca. 2 mm. Fl. and fr. Jun–Sep.

Paddy fields, streamsides, wet places in valleys, ponds; 100–2100 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang [Japan, Korea].

21b. *Fimbristylis diphyloides* var. *straminea* Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 227. 1961.

黄鳞二叶飘拂草 huang lin er ye piao fu cao

Glumes straw-yellow, oblong-ovate, longer than 2 mm. Fl. and fr. Sep.

- Jiangxi (Lushan).

One of us (Simpson) questions whether these varieties should be recognized.

22. *Fimbristylis umbellaris* (Lamarck) Vahl, Enum. Pl. 2: 291. 1805.

伞形飘拂草 san xing piao fu cao

Scirpus umbellaris Lamarck, Tabl. Encycl. 1: 141. 1791; *Fimbristylis globulosa* (Retzius) Kunth; *F. globulosa* var. *austrojaponica* Ohwi; *F. globulosa* var. *torresiana* (Gaudichaud) C. B. Clarke; *F. torresiana* Gaudichaud; *Scirpus globu-*

losus Retzius.

Perennials. Rhizomes short, horizontal, covered with brownish scales. Culms densely tufted, 17–90 cm tall, 1–5 mm thick, obtusely 3-angled, smooth or striate, glabrous, with 2 or 3 bladeless sheaths at base. Leaves of vegetative shoot usually shortly bladed; sheaths cylindric, 2–19 cm, mouth obliquely truncate; ligule reduced to a circle of hairs or absent; blade linear, 7–25 cm × 1–2 mm. Involucral bracts 2 or 3, narrowly lanceolate to lanceolate, longest 5–11 mm, margin scabrid. Inflorescence a simple or compound anthela, 1.5–10 × 1.3–7 cm; primary rays 2–10, 0.7–5 cm, unequal. Spikelets 3–40 per inflorescence, solitary, ovoid, broadly ovoid, broadly ellipsoid, or globose-ellipsoid, 3–8 × 3–4 mm, terete, densely many flowered, apex obtuse. Glumes numerous, spirally imbricate, yellowish rust-colored, or brown, ovate to ovate-elliptic, 1.8–2.7 × 1–1.5 mm, membranous, 3-veined but abaxially scarcely keeled, apex obtuse to mucronate. Stamens 2 or 3; anthers ca. 0.5 mm. Style 3-sided or 3-cleft, glabrous, basally dilated; stigmas (2 or)3. Nutlet yellowish, shortly stipitate or sessile, obovoid to obovoid-globose, 0.8–1 × 0.5–0.7 mm, 3-sided to sometimes slightly compressed, obscurely cancellate with transversely oblong cells or rarely sparsely verruculose. Fl. and fr. Aug–Oct. *2n* = 6.

Marshy places, paddy fields, wet grasslands; 100–800 m. Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan [India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Pacific islands].

23. *Fimbristylis dichotoma* (Linnaeus) Vahl, Enum. Pl. 2: 287. 1805.

两歧飘拂草 liang qi piao fu cao

Annuals or short-lived perennials. Culms tufted, 5–50(–100) cm tall, glabrous or sparsely pubescent. Leaves slightly shorter to longer than culm; sheaths leathery, margin pale brown, broad, and membranous, apex subtruncate; leaf blade linear to setaceous, pubescent or glabrescent, apex acute to obtuse. Involucral bracts 3 or 4, leaflike, usually 1 or 2 longer than inflorescence, glabrous or hairy. Inflorescence a compound or rarely simple anthela, 5–9 × 3–6 cm, lax or compact. Spikelets solitary, ovoid, ellipsoid, or oblong, 4.5–14 × ca. 2.5 mm, many flowered. Glumes brown, ovate, oblong-ovate, or oblong, 2.2–4.2 mm for fertile ones, shiny, 3–5-veined, midvein excurrent into a mucro. Stamens 1 or 2; filament short. Style longer than stamen, compressed, apically ciliate; stigmas 2. Nutlet with brown stipe, obovoid to broadly so, globose, or ± obdeltoid, 0.6–1.3 mm, biconvex, with 7–9 obvious vertical ribs, reticulation nearly transversely oblong. Fl. and fr. Jul–Oct.

Paddy fields, open grasslands, shallow water in marshes, farmlands, open wastelands; near sea level to 2100 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xisha Qundao, SE Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Kyrgyzstan, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

Fimbristylis depauperata R. Brown (*F. dichotoma* f. *depauperata* (R. Brown) Ohwi; *F. dichotoma* subsp. *depauperata* (R. Brown) J. Kern) has been mistakenly treated as a form or subspecies of *F. dichotoma* (Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 90. 1961; J. Kern, Fl. Males. 7: 576. 1974), but it is a distinct species that occurs in N Australia, W Indonesia, and Papua New Guinea.

- 1a. Spikelets 4.5–8.5 mm; fertile glumes 2.2–3 mm; nutlet obovoid to broadly so, 0.6–1.2 mm, with 5–11 vertical rows of transversely oblong epidermal cells, apex rounded to obtuse 23a. subsp. *dichotoma*
- 1b. Spikelets (8–)9–14 mm; fertile glumes 3.8–4.2 mm; nutlet obovoid, globose, or ± obdeltoid, 1.2–1.3 mm, with 15–24 vertical rows of transversely oblong-rectangular epidermal cells, apex obtuse to subtruncate 23b. subsp. *podocarpa*

23a. *Fimbristylis dichotoma* subsp. *dichotoma*

两歧飘拂草(原亚种) liang qi piao fu cao (yuan ya zhong)

Scirpus dichotomus Linnaeus, Sp. Pl. 1. 50. 1753; *Fimbristylis annua* (Allioni) Roemer & Schultes; *F. dichotoma* f. *annua* (Allioni) Ohwi; *F. dichotoma* var. *tikushiensis* (Hayata) T. Koyama; *F. dichotoma* f. *tomentosa* (Vahl) Ohwi; *F. diphylla* (Retzius) Vahl; *F. diphylla* var. *annua* (Allioni) C. B. Clarke; *F. tikushiensis* Hayata; *F. tomentosa* Vahl; *S. annuus* Allioni; *S. diphyllus* Retzius.

Culms (5–)15–50 cm. Leaves slightly shorter to sometimes slightly longer than culm; leaf blade linear, 1–2.5 mm wide. Inflorescence a compound or rarely simple anthela. Spikelets 4.5–8.5 mm. Fertile glumes 2.2–3 mm. Nutlet obovoid to broadly so, 0.6–1.2 mm, with 5–11 vertical rows of transversely oblong epidermal cells, apex rounded to obtuse. Fl. and fr. Jul–Oct. $2n = 10, 20$.

Paddy fields, open grasslands, shallow water in marshes; near sea level to 2100 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, E Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xisha Qundao, SE Xizang, Yunnan, Zhejiang [Afghanistan, India, Japan, Korea, Kyrgyzstan, Nepal, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

Within *Fimbristylis dichotoma* subsp. *dichotoma* two varieties could be recognized in China, i.e., *F. dichotoma* var. *dichotoma* and *F. dichotoma* var. *tikushiensis*. The latter can be separated by its mostly single spikelets that are 7.5–8.5 mm in contrast to var. *dichotoma* with spikelets clustered and 5.5–8 mm. In var. *tikushiensis* styles of the fruiting state are elongated exposing them beyond the glume apex, but in var. *dichotoma* styles at the fruiting state are still enclosed by the subtending glume. In typical subsp. *dichotoma* plants tend to be biennials or short-lived perennials often with a very short rhizome, whereas in var. *tikushiensis* plants are typically annual without a rhizome.

In NE China, Korea, and Japan another annual phase of *Fimbristylis dichotoma* subsp. *dichotoma* occurs, in which spikelets are as a rule solitary and stems and leaves tend to be hairy and softer. This annual plant has been named *F. dichotoma* var. *tentsuki* T. Koyama and if

recognized as a variety has often been misidentified as *F. annua* (e.g., by Nakai, Bot. Mag. (Tokyo) 36: 20. 1922; Kükenthal, Acta Horti Gothob. 5: 109. 1930) and also misidentified as *F. depauperata* as mentioned above. It is quite possible that this annual plant does not constitute a real taxon but may possibly be a fruiting plant of a first-year seedling of var. *dichotoma*. It appears in the northern part of the geographical area of subsp. *dichotoma*, where it cannot survive through the winter and only occurs as an annual. In southern areas it may become biennial or a short-lived perennial developing a short rhizome and is treated as subsp. *dichotoma* (*F. dichotoma* var. *floribunda* Miquel). For more exhaustive treatment of the nomenclature, as well as misapplication of the various names in Asia, see T. Koyama (J. Jap. Bot 63: 86–95, t. I–III. 1988).

23b. *Fimbristylis dichotoma* subsp. *podocarpa* (Nees) T. Koyama, Micronesica 1: 87. 1964.

绒毛飘拂草 rong mao piao fu cao

Fimbristylis podocarpa Nees in Wight, Contr. Bot. India, 98. 1834; *F. dichotomoides* Tang & F. T. Wang; *F. diphylla* var. *podocarpa* (Nees) Kükenthal.

Culms 5–100 cm tall, often densely pubescent. Leaves shorter than culm; leaf blade narrowly linear, 0.5–2 mm wide, both surfaces often pilose. Spikelets (0.8–)0.9–1.4 cm. Fertile glumes 3.8–4.2 mm. Nutlet obovoid, globose, or ± obdeltoid, 1.2–1.3 mm, cancellate with 15–24 vertical rows of transversely oblong-rectangular epidermal cells, apex obtuse to subtruncate. Fl. and fr. Jul. $2n = 30$.

Farmlands, shallow water, open wastelands, grasslands on slopes; 100–2100 m. Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [Bhutan, India, Indonesia, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Pacific islands].

24. *Fimbristylis shimadana* Ohwi, Acta Phytotax. Geobot. 5: 184. 1936.

白穗飘拂草 bai sui piao fu cao

Annuals or short-lived perennials, without a conspicuous rhizome. Culms tufted, 20–40 cm tall, angular, smooth but basally scabrid. Leaves equaling to slightly shorter than culm; sheath 2–5 cm, ventral side dark straw-colored and membranous, mouth obliquely truncate; ligule a fringe of short hairs; leaf blade linear, ± flat but margin slightly incurved, herbaceous, smooth except for scabrid apical margins, glabrous to sparsely pilose. Involucral bracts 3 or 4, basalmost leaflike and ± as long as inflorescence. Inflorescence a simple or compound anthela, 3–4 × 2.5–3 cm, lax; primary rays 1–3, 2–4 cm, flattened. Spikelets many per inflorescence, light rust-colored, ovoid to oblong-ovoid, 5–10 × 2.2–2.5 mm, terete, slightly shiny, densely many flowered, apex acute. Glumes many per spikelet, pale and tinged rust-colored, broadly ovate, ca. 2 mm, membranous, 3-veined with lateral pair not reaching apex, apex obtuse. Anthers ca. 0.3 mm. Style flat, basally slightly dilated, apical margin ciliate; stigmas 2. Nutlet brownish, shortly stipitate, broadly ovoid, ca. 1 mm, biconvex, sparsely verruculose and finely cancellate with several rows of transversely oblong cells. Fl. and fr. Mar–Nov.

- Grassy vegetation at margin of evergreen broad-leaved forests,

wet areas; below 100–200 m. Taiwan.

25. *Fimbristylis longispica* Steudel, Syn. Pl. Glumac. 2: 118. 1855.

长穗飘拂草 chang sui piao fu cao

Fimbristylis didrichsenii Boeckeler.

Perennials. Rhizomes short. Culms tufted, 25–60 cm tall. Leaves shorter than culm; leaf blade 1.5–2.5 mm wide, nearly glabrous, margins often involute, apex obtuse. Involucral bracts 2 or 3, leaflike, basalmost usually longer than inflorescence, apex obtuse. Inflorescence a compound, decompound, or simple anthela; rays 3–6. Spikelets solitary, narrowly oblong, oblong, oblong-ovoid, or ovoid, 0.6–2 cm, apex acute to obtuse. Glumes broadly ovate and boat-shaped, ca. 3 mm, glabrous, with 3–5 brown to pale brown veins, apex mucronate. Stamens 3. Style slightly longer than nutlet, basally slightly broader, apically ciliate; stigmas 2. Nutlet pale brown to brown, sessile, globose-obovoid, 1.2–1.5 mm, biconvex, with hexagonal reticulation. Fl. and fr. Aug–Sep.

Wet places on seashores, base of hills; near sea level to 600 m. Fujian, Guangdong, Guangxi, Jiangsu, Liaoning, Shaanxi, Shandong, Yunnan, Zhejiang [Japan, Korea, Myanmar].

26. *Fimbristylis rigidula* Nees in Wight, Contr. Bot. India, 99. 1834.

结壮飘拂草 jie zhuang piao fu cao

Perennials. Rhizomes short, thick, woody, diageotropic. Culms sparsely tufted, 15–50 cm tall, flatly cylindrical, striate, thicker at base, often covered with old sheaths. Leaves shorter than culm; leaf blade grayish green, 2–3 mm wide, flat, both surfaces sparsely pubescent. Involucral bracts 3–5, leaflike, shorter than or rarely equaling inflorescence. Inflorescence a compound or rarely simple anthela; rays 3–6, longest to 3 cm, unequal. Spikelets solitary, ovoid to ellipsoid, 5–10 × 3–4 mm, many flowered, apex acute to obtuse. Glumes densely arranged, reddish brown, ovate to broadly ovate, ca. 4 mm, adaxially with several veins, apex obtuse and mucronate; basal 2 glumes empty, smaller than fertile glumes and with a slightly longer mucro. Stamens 3; anthers linear, ca. 1.5 mm. Style long and compressed, basally slightly broader, apically ciliate; stigmas 2. Nutlet broadly obovoid to subellipsoid, 1.2–1.5 mm, with fine hexagonal reticulation. Fl. and fr. Apr–Jun.

Slopes, roadsides, grasslands, forests; 300–2600 m. Anhui, N Guangdong, Guangxi, S Guizhou, Henan, Hubei, Hunan, S Jiangsu, N Jiangxi, S Sichuan, Yunnan, Zhejiang [Bangladesh, N India, Kashmir, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam].

27. *Fimbristylis subinclinata* T. Koyama, Bot. Mag. (Tokyo) 80: 353. 1967.

知本飘拂草 zhi ben piao fu cao

Perennials. Rhizomes short, sometimes subglobose. Culms tufted. Leaves clustered at base of culm; sheath brownish, mouth ciliate; ligule a fringe of short hairs; leaf blade linear, 5–15 cm × 1–2.5 mm, glaucous, apex mucronate. Involucral bracts 1 or 2, basalmost 1.5–4 cm, much shorter than inflorescence. Inflorescence a compound anthela, 3–7 cm, inclined to nodding,

with 4–23 spikelets; primary rays 3–6, 1.5–5 cm. Spikelets yellowish brown, ovoid to ovoid-ellipsoid, 8–12 × 3–4 mm, terete. Glumes yellowish brown and brown striate, ovate to broadly elliptic, 2–3.2 × 1.7–2 mm, thinly papery, 1-veined or obscurely 3-veined, margin hyaline, apex acute and mucronate. Anthers ca. 1.3 mm. Style liguliform, flat, apical margin densely fimbriate; stigmas 2. Nutlet brownish when mature, globose-obovoid, ca. 3 × 3 mm, biconvex, slightly cancellate with ca. 20 rows of transversely oblong-hexagonal epidermal cells, apex rounded to subtruncate. Fl. and fr. Aug–Oct.

• Dry sandy grasslands along rivers; near sea level. E Taiwan.

28. *Fimbristylis stolonifera* C. B. Clarke in J. D. Hooker, Fl. Brit. India 6: 637. 1893.

匍匐茎飘拂草 pu fu jing piao fu cao

Perennials, stoloniferous. Culms 30–70 cm tall. Leaves ca. 1/3 as long as culm; leaf blade linear, 1.5–2 mm wide, flat, both surfaces hairy, midvein abaxially prominent, apex acute. Involucral bracts 2 or 3, leaflike, usually shorter than or rarely equaling inflorescence, apex acute. Inflorescence a simple or subcompound anthela; rays 3–6. Spikelets solitary, ovoid to oblong-ovoid, 7–13 × 3–4 mm, with basal 1 or 2 glumes empty. Fertile glumes chestnut-brown, oblong-ovate, 3–4 mm, shiny, abaxially with 5–7 veins, midvein excurrent into a mucro. Stamens 3. Style compressed, ciliate, basally slightly inflated; stigmas 3. Nutlet white or pale brown, obovoid, ca. 1.3 mm, biconvex, with transversely oblong reticulation, inconspicuous vertical ribs, and sometimes verruculose. Fl. and fr. Aug–Sep.

Ditch sides on slopes; ca. 1000 m. Chongqing, Guangdong, Guangxi, Guizhou, Hebei, Yunnan, Zhejiang [Bhutan, N India, Nepal].

29. *Fimbristylis sieboldii* Miquel ex Franchet & Savatier, Enum. Pl. Jap. 2: 118. 1877 [*“sieboldii”*].

锈鳞飘拂草 xiu lin piao fu cao

Perennials. Rhizomes short or well developed and horizontally creeping, woody. Culms grayish green, tufted, 10–65 cm tall, slender, flatly 3-angled, smooth, base thicker, with few leaves. Basal leaves with sheaths only and grayish brown. Leaves apically on culm with a blade, 1/3 or less as long as culm; leaf blade often linear, ca. 1 mm wide, folded. Involucral bracts 2 or 3, shorter to slightly longer than inflorescence, suberect, base slightly broader. Inflorescence a simple or rarely subcompound anthela; rays less than 10 mm. Spikelets solitary, oblong-ovoid, oblong, or narrowly oblong-ovoid, 10–17 × 3–4 mm, terete, densely many flowered, apex acute to rarely obtuse. Glumes grayish brown with dark brown lines at middle, ovate to elliptic, 3–4 mm, submembranous, apically with grayish white hairs, abaxially prominently keeled, margin ciliate, apex obtuse and apiculate. Stamens 3; anthers linear. Style long and flat, basally broader; stigmas 2. Nutlet brown to blackish brown when mature, shortly stipitate, obovoid to broadly obovoid, 1.2–1.5 mm, flatly biconvex, subsmooth. Fl. and fr. Jun–Aug.

Seashores and sunny wet places at seashores, salty marshes; near sea level. Anhui, Fujian, Guangdong, Hainan, Jiangsu, Shandong, Taiwan, Xisha Qundao, Zhejiang [Japan, Korea].

Fimbristylis sieboldii has often been misidentified as *F. ferruginea*

(Linnaeus) Vahl (e.g., D. A. Simpson & T. Koyama, Fl. Thailand 6(4): 317. 1998) or treated as a variety of *F. ferruginea* (e.g., Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 93. 1961). *Fimbristylis ferruginea*, originally described from Jamaica, differs from *F. sieboldii* by having ovoid spikelets, broader nutlets, and distribution in the tropics.

- 1a. Leaves with a blade 29a. var. *sieboldii*
1b. Leaves mostly reduced to a bladeless sheath 29b. var. *anpinensis*

29a. *Fimbristylis sieboldii* var. *sieboldii*

锈鳞飘拂草(原变种) xiu lin piao fu cao (yuan bian zhong)

Fimbristylis aginkotensis Hayata; *F. ferruginea* (Linnaeus) Vahl var. *sieboldii* (Miquel ex Franchet & Savatier) Ohwi.

Rhizomes short. Culms 20–65 cm tall, thin, stiff. Leaves with a blade. Fl. and fr. Jun–Aug.

Seashores, salty marshes; near sea level. Anhui, Fujian, Guangdong, Hainan, Jiangsu, Shandong, Taiwan, Xisha Qundao, Zhejiang [Japan, Korea].

29b. *Fimbristylis sieboldii* var. *anpinensis* (Hayata) T. Koyama, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 8: 115. 1961.

安平飘拂草 an ping piao fu cao

Fimbristylis anpinensis Hayata, Icon. Pl. Formosan. 6: 108. 1916; *F. ferruginea* var. *anpinensis* (Hayata) H. Y. Liu; *F. sieboldii* subsp. *anpinensis* (Hayata) T. Koyama.

Rhizomes well developed, horizontally creeping. Culms ca. 60 cm tall, 1–1.5 mm thick, densely tufted or closely arranged in a row along a ± horizontal knotty rhizome. Leaves mostly reduced to a bladeless sheath but apicalmost sheaths with a setaceous short blade.

Sunny wet places at seashores; near sea level. Taiwan [Japan (Bonin Islands, Ryukyu Islands)].

30. *Fimbristylis hookeriana* Boeckeler, Linnaea 37: 22. 1871.

金色飘拂草 jin se piao fu cao

Fimbristylis chalarocephala Ohwi & T. Koyama; *F. fordii* C. B. Clarke.

Annuals or short-lived perennials. Rhizomes absent. Culms tufted, 5–40 cm tall. Leaves slightly shorter than to equaling culm; leaf blade 1–2.5 mm wide, glabrous, midvein abaxially prominent or not, apex acuminate. Involucral bracts 2–5, leaf-like, usually longer than inflorescence, ca. 1 mm wide, apex acuminate to acute. Inflorescence a simple or compound anthela. Spikelets digitately clustered or solitary, very narrowly ovoid to linear, 7–17 × ca. 2 mm. Glumes straw-yellow to greenish yellow, oblong-ovate, 2.5–5 mm, sometimes hairy, abaxially with 3 or more veins, margin hyaline, apex obtuse and mucronate or awned. Stamens usually 2 or 3. Style very long, compressed, basally slightly inflated, apically ciliate; stigmas 2. Nutlet white, very shortly stipitate, obovoid, 1–1.2 mm, biconvex, verruculose with transversely oblong reticulation. Fl. and fr. Aug–Oct.

Among rocks along streams, slopes, grassy areas; ca. 1000 m. Fujian, Guangdong, Hunan, Jiangsu, Jiangxi, Zhejiang [N India, Laos,

Philippines, Thailand, Vietnam].

31. *Fimbristylis schoenoides* (Retzius) Vahl, Enum. Pl. 2: 286. 1805.

少穗飘拂草 shao sui piao fu cao

Scirpus schoenoides Retzius, Observ. Bot. 5: 14. 1788; *Fimbristylis kagiensis* Hayata.

Perennials. Rhizomes very short. Culms tufted, 5–40 cm tall, slender, slightly compressed, smooth, striate, with leaves at base. Leaves shorter than culm; leaf blade 0.5–1 mm wide, glabrous, margins often involute and apical part ciliate. Involucral bracts absent or 1 or 2, linear, to 2.5 cm. Inflorescence a reduced anthela, with only 1 or 2(or 3) spikelets. Spikelets sessile or stipitate, broadly ovoid, ovoid, or oblong-ovoid, 5–12(–16) × 3–4 mm, many flowered. Glumes densely arranged, yellowish white with short brown lines, broadly ovate, membranous, abaxially with many veins but not keeled, apex rounded and not mucronate or sometimes midvein excurrent into a ca. 3 mm mucro. Stamens 3; anthers linear. Style long, compressed, basally inflated, apical half ciliate; stigmas 2. Nutlet yellowish white, globose-obovoid to subglobose, ca. 1.5 mm (including short stipe), biconvex, with hexagonal reticulation. Fl. Aug–Sep, fr. Oct–Nov.

Wet places along streams, ditches, roads, paddy fields; 300–800 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, S Yunnan, S Zhejiang [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, N Australia].

32. *Fimbristylis subbispicata* Nees & Meyen, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19(Suppl. 1): 75. 1843.

双穗飘拂草 shuang sui piao fu cao

Fimbristylis crassipes Palla (1909), not Boeckeler (1858); *F. gynophora* C. B. Clarke.

Annuals. Culms grayish green, tufted, 7–60 cm tall, slender, flatly 3-angled, smooth, striate, with few leaves at base. Leaves shorter than culm; leaf blade ca. 1 mm wide, flat but sometimes involute, slightly stiff, margin apically ciliate. Involucral bracts absent or only 1, linear, 0.7–10 cm, erect, longer than inflorescence. Inflorescences reduced to 1(or 2) terminal spikelet. Spikelet ovoid, oblong-ovoid, or narrowly oblong-ovoid, 8–30 × 4–8 mm, terete, many flowered. Glumes spirally imbricate, brown with short rust-colored lines, ovate, broadly ovate, or subelliptic, 5–7 mm, membranous, abaxially with many veins, not keeled, apex obtuse and mucronate. Stamens 3; anthers linear, 2–2.5 mm. Style long, compressed, ciliate, basally slightly inflated; stigmas 2. Nutlet brown, stipitate, globose-obovoid, 1.5–1.7 mm, flatly biconvex, slightly shiny and with hexagonal reticulation. Fl. Jun–Aug, fr. Sep–Oct. *2n* = 10.

Slopes, valleys, marshes, streamsides, watersides, seashores, salt marshes; near sea level to 1200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, W Hunan, Jiangsu, Liaoning, Shaanxi, Shandong, Shanxi, Taiwan, Xisha Qundao, Zhejiang [Japan, Korea, Vietnam].

33. *Fimbristylis tristachya* R. Brown, Prodr. 266. 1810.

三穗飘拂草 san sui piao fu cao

Perennials. Rhizomes short. Culms densely tufted, 20–90 cm tall, 1–1.5 mm wide, flatly 3-angled, smooth, striate, with few leaves at base. Leaves shorter than culm; leaf blade 1.5–2 mm wide, stiff, involute, margin apically ciliate. Involucral bract 1, leaflike, much shorter than inflorescence, erect, margin ciliate. Inflorescence a simple anthela, with 3–6 spikelets. Spikelets ovoid to oblong-ovoid, 8–22 × 4–6 mm, terete, many flowered. Glumes spirally imbricate, brown with short rust-colored lines, ovate to broadly ovate, 5–6 × 4–4.5 mm, subleathery, with many veins, abaxial midvein slightly keeled, apex obtuse and mucronate. Stamens 3; anthers linear, 2–2.5 mm. Style ca. 3.5 mm, compressed, ciliate, basally slightly inflated; stigmas 2. Nutlet yellowish brown, stipitate, obovoid, ca. 2 mm, flatly biconvex, slightly shiny and with hexagonal reticulation. Fl. and fr. Jun–Oct.

Slopes, valleys, streamsides, fields, salt marine marshes. Guangdong, Hainan [Bangladesh, India, Indonesia, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam; NE Australia, Pacific islands].

34. *Fimbristylis polytrichoides* (Retzius) Vahl, Enum. Pl. 2: 248. 1805.

细叶飘拂草 xi ye piao fu cao

Scirpus polytrichoides Retzius, Observ. Bot. 4: 11. 1786.

Annuals or short-lived perennials. Rhizomes very short or absent, with many remnant fibers from old leaves. Culms densely tufted, 5–25 cm tall, slender, cylindrical, smooth, striate, with fewer leaves at base. Leaves shorter than culm; sheath yellowish brown, short, glabrous; leaf blade nearly *Juncus*-like, ca. 1 mm in diam., smooth. Involucral bract (0 or) 1, 5–12 mm, needlelike, basally broadened, margin membranous. Inflorescences with a single terminal spikelet, ellipsoid to oblong, 5–8 × 3–3.5 mm, 10- to many flowered, apex obtuse to rounded. Glumes densely spirally imbricate, pale white and translucent with short brown lines at middle, sometimes apically slightly yellowish brown laterally, oblong, ca. 3 mm, membranous, 1-veined, not keeled, apex rounded and without or with only a very short hard mucro. Stamens 3; anthers linear, short. Style long, slightly compressed, basally inflated, apical half ciliate; stigmas 2. Nutlet grayish black, obovoid, ca. 1 mm, biconvex, sparsely verruculose and with transversely oblong reticulation. Fl. and fr. Mar–Sep. $2n = 10$.

Wet salty places by sea, paddy fields; near sea level. Fujian, Guangdong, Hainan, Taiwan [Bangladesh, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, Australia, Madagascar].

35. *Fimbristylis squarrosa* Vahl, Enum. Pl. 2: 289. 1805.

畦畔飘拂草 qi pan piao fu cao

Annuals. Culms densely tufted, 6–25 cm tall, slender, compressed, with few leaves at base. Leaves shorter than culm; sheath pale brown, densely pilose; leaf blade less than 1 mm wide, flat, both surfaces pubescent. Involucral bracts 3–7, leaf-like, shorter to slightly longer than inflorescence. Inflorescence

a simple, compound, or decompound anthela; rays few to many, to 3 cm. Spikelets solitary, ovoid, narrowly ovoid, or oblong, 3–7 × 1.2–3 mm, many flowered, squarrose or not. Glumes spirally imbricate, yellowish brown, oblong to oblong-ovate, 1.5–2 mm (including awn), membranous, 3-veined forming an abaxial green keel, apex obtuse and awned, awn either long and recurved or short and straight or slightly recurved. Stamen 1; anther oblong, apex apiculate. Style long and compressed, basally inflated with long filiform pendent hairs covering top of nutlet, apically ciliate; stigmas 2. Nutlet yellowish white, shortly stipitate, obovoid, 0.5–1 mm, biconvex, almost smooth or with very indistinct hexagonal reticulation. Fl. Sep.

Watersides, wet places; 100–2200 m. Anhui, Fujian, Guangdong, S Guangxi, NW Guizhou, Hainan, Hebei, Heilongjiang, Henan, Jiangsu, Shandong, Taiwan, SE Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Laos, Myanmar, Nepal, Philippines, Thailand, Vietnam; Africa, SW Asia, Australia, S Europe, Pacific islands (New Zealand)].

Fimbristylis squarrosa was treated as a synonym of *F. aestivialis* by D. A. Simpson and T. Koyama (Fl. Thailand 6(4): 333–334. 1998).

- 1a. Glume midvein often excurrent into a recurved 1–1.8 mm awn, ca. 1/2 as long as glume; spikelets squarrose 35a. var. *squarrosa*
- 1b. Glume midvein ending in a short and straight or slightly recurved awn, ca. 1/5 as long as glume; spikelets not squarrose 35b. var. *esquarrosa*

35a. *Fimbristylis squarrosa* var. *squarrosa*

畦畔飘拂草(原变种) qi pan piao fu cao (yuan bian zhong)

Culms 6–20 cm tall. Anthelae simple or compound. Spikelets squarrose, 3–6 × 2–3 mm. Glume midvein often excurrent into a recurved 1–1.8 mm awn, ca. 1/2 as long as glume. Nutlet ca. 1 mm, almost smooth. Fl. Sep. $2n = 20$.

Watersides, wet places; 100–2200 m. Anhui, Fujian, Guangdong, S Guangxi, NW Guizhou, Hebei, Heilongjiang, Henan, Jiangsu, Shandong, Taiwan, SE Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Myanmar, Nepal, Philippines; Africa, SW Asia, Australia, S Europe, Pacific islands].

35b. *Fimbristylis squarrosa* var. *esquarrosa* Makino, Bot. Mag. (Tokyo) 17: 47. 1903.

短尖飘拂草 duan jian piao fu cao

Fimbristylis makinoana Ohwi; *F. velata* R. Brown.

Culms 10–25 cm tall. Anthelae compound or decompound, spreading. Spikelets 3–7 × 1.2–2 mm. Glume midvein ending in a short and straight or slightly recurved awn, ca. 1/5 as long as glume. Nutlet ca. 0.5 mm, almost smooth or with very indistinct hexagonal reticulation. Fl. Sep.

Watersides, wet places. Fujian, Hainan, Hebei, Heilongjiang, Jiangsu, Shandong, Taiwan, Yunnan [Indonesia, Japan, Korea, Laos, Philippines, Thailand, Vietnam; Australia, Pacific islands (New Zealand)].

36. *Fimbristylis bisumbellata* (Forsskål) Bubani, Dodecanthea, 30. 1850.

复序飘拂草 fu xu piao fu cao

Scirpus bisumbellatus Forsskål, Fl. Aegypt.-Arab. 15. 1775.

Annuals. Culms densely tufted, 4–20 cm tall, slender, flatly 3-angled, smooth, with few leaves at base. Leaves shorter than culm; sheath yellowish green with rust-colored flecks, short, white pilose; leaf blade 0.7–1.5 mm wide, flat, margin apically ciliate, abaxially sometimes sparsely hairy. Involucral bracts 2–5, leaflike, suberect, basal 1 or 2 equaling or longer than inflorescence. Inflorescence a compound or decompound anthela, lax; rays 4–10, to 4 cm, slender. Spikelets solitary, oblong-ovoid, ovoid, or oblong, 2–7 × 1–1.8 mm, 10–20-flowered, apex acute. Glumes spirally imbricate, brown, broadly ovate, 1.2–2 mm, membranous, 3-veined forming an abaxial green keel. Stamens 1 or 2; anthers narrowly oblong-ovoid. Style long and compressed, ciliate, basally inflated; stigmas 2. Nutlet yellowish white, very shortly stipitate, broadly obovoid, ca. 0.8 mm, biconvex, with transversely oblong reticulation. Fl. and fr. Jul–Sep(–Nov). $2n = 10, 16, 20$.

Along rivers, streams, sandy or marshy places, wet places on slopes; 100–1500 m. Anhui, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, India, Indonesia, Japan, Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Turkmenistan, Vietnam; Africa, SW Asia, Australia, Europe, Indian Ocean islands].

37. *Fimbristylis aestivalis* (Retzius) Vahl, Enum. Pl. 2: 288. 1805.

夏飘拂草 xia piao fu cao

Scirpus aestivalis Retzius, Observ. Bot. 4: 12. 1786.

Annuals. Rhizomes absent. Culms densely tufted, 3–25 cm tall, slender, flatly 3-angled, smooth, with few leaves at base. Leaves shorter than culm; leaf blade filiform, 0.5–1 mm wide, flat, both surfaces sparsely pubescent, margin slightly involute; sheath brown, short, white pilose. Involucral bracts 3–5, filiform, shorter to longer than inflorescence, sparsely hairy. Inflorescence a compound anthela, lax; rays 3–7, to 3 cm, slender. Spikelets solitary, ovoid, oblong-ovoid, or narrowly ovoid, 2.5–6 × 1–1.5 mm, many flowered. Glumes spirally imbricate, reddish brown, ovate to oblong, ca. 1 mm, membranous, 3-veined forming an abaxial green keel, apex mucronate. Stamen 1; anther narrowly ovoid. Style long and compressed, basally inflated, apically ciliate; stigmas 2, short. Nutlet yellow, subsessile, obovoid, ca. 0.6 mm, biconvex, almost smooth or sometimes with very indistinct hexagonal reticulation. Fl. May–Aug.

Grasslands, marshy places, paddy fields; 400–2200 m. Anhui, S Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Heilongjiang, Hubei, Hunan, Jiangxi, S Shaanxi, Sichuan, Taiwan, S Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Laos, Nepal, Papua New Guinea, Philippines, Russia (Far East), Sri Lanka, Thailand, Vietnam; Australia, Pacific islands].

38. *Fimbristylis gracilentia* Hance, J. Bot. 6: 89. 1868.

纤细飘拂草 xian xi piao fu cao

Annuals. Culms tufted, 3–25 cm tall, slender, flatly 3-angled, striate, glabrous, with few leaves at base. Leaves shorter than culm; sheath brown, densely pubescent; leaf blade ca. 1 mm wide, flat, both surfaces sparsely pubescent, margin some-

times slightly involute. Involucral bracts 5 or 6, needlelike, shorter than inflorescence, pubescent. Inflorescence a simple or occasionally compound anthela; rays 5–8, to 5 cm, slender, densely pubescent. Spikelet solitary, oblong, narrowly ovoid, or narrowly linear-ovoid, 4–12 × 1.5–2 mm, with several to 10 or more flowers. Glumes spirally imbricate, pale brown, ovate-lanceolate, ca. 2 mm, membranous, 3-veined forming an abaxial keel, midvein excurrent into a mucro. Stamens 2; anthers dark red, linear-oblong. Style long and compressed, basally inflated, apically ciliate; stigmas 2, short, with papillae. Nutlet brown, shortly stipitate, obovoid, ca. 1 mm, biconvex, almost smooth with indistinct hexagonal reticulation. Fl. Jun–Jul.

Open places. Guangdong [Indonesia (N Sumatra), Thailand, Vietnam].

39. *Fimbristylis simaoensis* Y. Y. Qian, Bull. Bot. Res., Harbin 17: 128. 1997.

思茅飘拂草 si mao piao fu cao

Rhizomes short. Culms tufted, 30–60 cm tall, slender, flatly 3-angled, striate, glabrous, with few leaves at base. Leaves shorter than culm; sheath pale yellow, glabrous; leaf blade 1.5–3 mm wide, flat, adaxially sparsely hairy, margin involute. Involucral bracts 3–6, leaflike, longer than inflorescence, margin ciliate. Inflorescence a compound anthela; rays 2–7, 0.5–7 cm, glabrous. Spikelets solitary, ovoid to narrowly ovoid, 4–10 × 2–4 mm, with 6–20 flowers. Glumes spirally imbricate, brown, elliptic, 2.2–2.4 mm, membranous, 3-veined forming an abaxial keel, midvein excurrent into a mucro. Stamen 1; anther yellow, oblong. Style long and compressed, basally inflated, apically ciliate; stigmas 2. Nutlet dark brown, shortly stipitate, broadly obovoid, 1–1.2 mm, biconvex, with hexagonal reticulation. Fl. Aug–Sep.

• Moist grasslands; ca. 1300 m. S Yunnan (Simao Diqu).

40. *Fimbristylis tetragona* R. Brown, Prodr. 226. 1810.

四棱飘拂草 si leng piao fu cao

Fimbristylis cylindrocarpa Kunth.

Annuals or short-lived perennials. Rhizomes poorly developed. Culms densely tufted, (8–)18–50(–60) cm tall, 4-angled, smooth, with few leaf sheaths at base. Leaves bladeless; sheath margin brown membranous, mouth obliquely truncate. Involucral bracts absent. Inflorescences reduced to a single terminal spikelet, ovoid to ellipsoid, 5–10 × 3–6 mm, many flowered, apex obtuse to rounded. Glumes densely spirally imbricate, pale brownish yellow, oblong, 3.5–5 mm, membranous, many veined, middle 3 veins thicker but abaxially not forming a keel, base sometimes narrower, apex not mucronate. Stamens 3; anthers linear, 1.2–1.5 mm. Style long and compressed, sparsely ciliate, basally gradually broader and nearly as wide as nutlet; stigmas 2 or 3. Nutlet pale brown, shiny with a ca. 0.7 mm stipe, narrowly oblong, ca. 2.5 mm, biconvex, shiny and with obvious hexagonal reticulation. Fl. and fr. Sep–Oct.

Marshes; below 100–200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [India, Indonesia, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

41. *Fimbristylis pauciflora* R. Brown, Prodr. 225. 1810.

海南飘拂草 hai nan piao fu cao

Fimbristylis hainanensis Tang & F. T. Wang.

Perennials. Rhizomes hardly developed. Culms densely tufted, 5–18 cm tall, slender, short, flatly cylindrical, smooth, glabrous, with few leaf sheaths at base. Leaves bladeless; sheath brown, cylindrical, apically attenuate, margin membranous, mouth obliquely truncate. Involucral bracts absent. Inflorescences reduced to a single terminal spikelet, narrowly oblong to clavate-oblong, 3.5–4.5 × 1–1.5 mm, few flowered, with basalmost glume empty. Glumes pale with rust-colored short lines, oblong to oblong-ovate, 3–3.2 mm, 7–9-veined, midvein abaxially green, apex obtuse and not mucronate. Stamens 3; anthers linear. Style long and compressed, sparsely ciliate, basally slightly broader; stigmas 3, with sparse papillae. Nutlet white, obovoid, ca. 0.8 mm, nearly 3-sided, with sparse verruculose and subhexagonal reticulation. Fl. and fr. Aug–Sep.

Wet places by ponds; low elevations. Hainan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Thailand, Vietnam; Australia, Pacific islands].

42. *Fimbristylis nutans* (Retzius) Vahl, Enum. Pl. 2: 285. 1805.

垂穗飘拂草 chui sui piao fu cao

Scirpus nutans Retzius, Observ. Bot. 4: 12. 1786.

Annuals or short-lived perennials. Rhizomes extremely short or absent. Culms densely tufted, 15–85 cm tall, subcylindrical, stiff, striate, smooth, glabrous, with leaf sheaths at base. Leaves bladeless; leaf sheath brown, basal ones glumelike and apical ones cylindrical, margins membranous, apex obliquely truncate. Involucral bract 1, glumelike, ovate, 2–4.5 mm, apex mucronate. Inflorescences reduced to a single terminal spikelet, ovoid, ellipsoid, or oblong-ovoid, 5–15 × 2–5 mm, slightly nodding, 10- to many flowered. Glumes rather densely spirally imbricate, brown with short rust-colored lines, broadly ovate to subelliptic, 3–5 mm, papery, veins many but abaxially faint, apex rounded and mucronate. Stamens 3; anthers linear. Style long and compressed, basally slightly inflated, apically sparsely ciliate; stigmas 2, short. Nutlet white with a very short brown stipe, obovoid, 1.2–1.5 mm, flatly biconvex to sometimes nearly flat-convex, with transverse wavy reticulation and verruculose margins. Fl. and fr. Jul–Aug.

Wet places. S Fujian, Guangdong, Guangxi, Hainan, S Hunan, Taiwan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia].

43. *Fimbristylis acuminata* Vahl, Enum. Pl. 2: 285. 1805.

披针穗飘拂草 pi zhen sui piao fu cao

Annuals or short-lived perennials. Rhizomes absent. Culms sparsely tufted, 6–35 cm tall, thin, slightly compressed, striate, smooth, glabrous. Leaves bladeless; basal sheaths glumelike; apical sheaths cylindrical, apex obliquely truncate. Involucral bracts absent. Inflorescences reduced to a single terminal spikelet, ovoid to narrowly ovoid, 5–10 × 2–3 mm, with several to 10 or more flowers. Glumes laxly spirally

imbricate, greenish white and sometimes laterally with brown specks, broadly ovate to elliptic, 2.8–4 mm, thickly papery, with several faint veins forming an abaxial green keel, apex obtuse and mucronate. Stamens 2; anthers linear. Style long and compressed, sparsely ciliate, basally inflated; stigmas 2, straight. Nutlet with a short brown stipe, globose-obovoid, ca. 1.5 mm, biconvex, with transverse wavy reticulation. Fl. and fr. Jul–Aug.

Open wet places, sandy soil grasslands, watersides, grasslands by water; low elevations. Fujian, Guangdong, Hainan [India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

44. *Fimbristylis nigrobrunnea* Thwaites, Enum. Pl. Zeyl. 434. 1864.

褐鳞飘拂草 he lin piao fu cao

Fimbristylis eragrostis (Nees & Meyen) Hance var. *nigrobrunnea* (Thwaites) S. S. Hooper; *F. pycnostachya* Hance.

Perennials. Rhizomes short. Culms tufted, 10–45 cm tall, slightly scabrid, with radical leaves at base. Leaves 1/4–1/3 as long as culm; sheath leathery, obliquely split at apex, mouth membranous and pale brown; leaf blade linear, 1–2.5 mm wide, apex acute and apiculate or not. Involucral bracts 2–4, leaflike, 2–13 mm, apically attenuate. Inflorescence a simple or rarely compound anthela or sometimes reduced to a single terminal spikelet; rays few, 0.5–3 cm, slender. Spikelets solitary, oblong to ovoid, 6–8 × ca. 2.5 mm, many flowered, sometimes with basal glumes ± distichous. Glumes brown without brown spots, broadly ovate and boat-shaped, 2–3 mm, papery, 1-veined, margin hyaline, apex mucronate. Stamens 3; anthers linear-oblong, 1–1.5 mm. Ovary narrowly oblong; style 3-sided, glabrous, basally inflated; stigmas 3. Nutlet white, obovoid, 1–1.2 mm, flatly 3-sided, verruculose with subhexagonal reticulation. Fl. and fr. Apr–Jul.

Marshes, along rivers, among rocks in valleys; 100–2500 m. Guangdong, Guangxi, Hainan, Yunnan [Cambodia, India, Sri Lanka].

45. *Fimbristylis eragrostis* (Nees & Meyen) Hance, J. Linn. Soc., Bot. 13: 132. 1873.

知风飘拂草 zhi feng piao fu cao

Abildgaardia eragrostis Nees & Meyen in Wight, Contr. Bot. India, 95. 1834.

Perennials. Rhizomes short. Culms tufted, 20–50 cm tall, with fewer radical leaves at base. Leaf sheath leathery, apex obliquely split, mouth margins membranous and pale brown; leaf blade slightly falcate, 10–20 cm × 1–2.5 mm, glabrous, apex acute and apiculate. Involucral bracts 2–4, nearly leaflike, 3–15 mm, apically attenuate; bractlets pale brown, 2–3 mm. Inflorescence a compound anthela; rays 2 to many. Spikelets solitary, oblong, oblong-ovoid, or ovoid, 6–10 × 2–3 mm, many flowered, with basal 1 or 2 glumes empty. Fertile glumes yellowish brown, broadly ovate to subtriangular, 2.5–3.5 mm, shiny, 1-veined forming an abaxial keel, apex mucronate. Stamens 3. Ovary white, cylindrical, striate; style brown, 3-sided, basally inflated; stigmas 3. Nutlet white or slightly brownish, broadly obovoid, 0.7–0.8 mm, 3-sided, verruculose. Fl. and fr.

Jun–Sep.

Grasslands; near sea level to 1100 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Nansha Qundao, Taiwan [India, Indonesia, Laos, Malaysia, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia].

46. *Fimbristylis disticha* Boeckeler, *Linnaea* 38: 393. 1874.

红鳞飘拂草 hong lin piao fu cao

Fimbristylis rufoglumosa Tang & F. T. Wang.

Annuals. Culms tufted, 10–30 cm tall. Leaf 1/4–1/3 as long as culm; sheath apex obliquely split, mouth margins membranous and pale brown; leaf blade linear, 1–2.5 mm wide, slightly curved, both surfaces scabrous with appressed short pubescence or glabrescent, apex acute. Involucral bracts 3 or 4, leaflike, to 2.8 cm, basalmost ca. 3 × as long as glumes, apically attenuate. Inflorescence a compound anthela; rays many. Spikelets solitary, ovoid to oblong-ovoid, 3–6 × 1.5–2.5 mm, slightly compressed, with basal 1 or 2 glumes empty. Glumes reddish brown, broadly ovate, ca. 2.5 mm, not shiny, glabrous, 1-veined forming an abaxial keel, apex mucronate. Stamens 3. Style 3-sided, not ciliate, basally inflated; stigmas 3. Nutlet white, obovoid, ca. 0.7 mm, 3-sided, verruculose. Fl. and fr. Aug–Sep.

Grasslands, slopes. Fujian, Guangdong, Guangxi [Cambodia, Indonesia, Laos, Myanmar, Thailand, Vietnam; Indian Ocean islands].

47. *Fimbristylis nanningensis* Tang & F. T. Wang, *Fl. Reipubl. Popularis Sin.* 11: 229. 1961.

南宁飘拂草 nan ning piao fu cao

?Annuals. Culms tufted, 18–55 cm tall, slender, with many radical leaves. Leaves usually shorter than or rarely as long as culm; leaf blade narrowly linear, ca. 1 mm wide, both surfaces scabrous with appressed short pubescence, apically attenuate. Involucral bracts leaflike, much longer than inflorescence, less than 1 mm wide, scabrous with appressed pubescence, apex acuminate. Inflorescence a compound anthela, slightly lax, with many rays and spikelets; rays slender, glabrous. Spikelets solitary, narrowly ovoid, ca. 5 × 1 mm, slightly compressed, with only 2 or 3 flowers. Glumes ovate-lanceolate to lanceolate, ca. 3 mm, membranous, densely gland-dotted, 2- or 3-veined, mid-vein abaxially forming a slight keel, apex acuminate. Stamens 3. Ovary white, cylindrical, slightly 3-sided; style very long, 6–8 × as long as ovary, basally slightly inflated; stigmas 3, often curly. Fl. and fr. Jul.

• Grasslands, slopes. Guangxi.

48. *Fimbristylis cinnamometorum* (Vahl) Kunth, *Enum. Pl.* 2: 229. 1837.

腺鳞飘拂草 xian lin piao fu cao

Scirpus cinnamometorum Vahl, *Enum. Pl.* 2: 278. 1805; *Fimbristylis cyperoides* R. Brown.

Perennials or rarely annuals. Rhizomes ± creeping. Culms moderately tufted to lax, (10–)20–50 cm tall, 0.5–1 mm thick, 3-angled, smooth. Leaves basal, 2-ranked; sheath 1.5–5 cm, apex obliquely truncate and ciliate; ligule a fringe of short white hairs; leaf blade filiform, 4–22 cm × 0.3–0.6 mm, can-

aliculate, margin involute, apex subacute. Involucral bracts 2 or 3, leaflike, longest 1–5 cm, shorter than inflorescence. Inflorescence a compound or decomposed anthela of 10–90 spikelets, 2–7 × 2–7 cm, open; primary rays 3–6, 0.8–5 cm. Spikelets solitary, light brown to deep reddish brown, ± narrowly ovoid, 4–8 × 1.2–1.5 mm, flattened. Glumes densely gland-dotted, 1–3-veined forming an acute abaxial keel, margin membranous, apex acuminate. Stamens 3; anthers 1.5–2 mm. Stigmas 3. Nutlet narrowly obovoid to obovoid-oblong, 0.8–1 × 0.3–0.5 mm, 3-sided to nearly subterete, transversely ridged and cancellate with 4 or 5 rows of linear epidermal cells. Fl. Jul, fr. Sep.

Swampy grasslands, wet savannah forests; below 1300 m. Hainan [India, Indonesia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

49. *Fimbristylis kwantungensis* C. B. Clarke, *J. Linn. Soc., Bot.* 36: 238. 1903.

广东飘拂草 guang dong piao fu cao

Perennials. Rhizomes very short. Culms tufted, 30–50 cm tall, 0.5–1 mm wide. Leaf blade linear, 1/4–1/2 as long as culm, 2–3 mm wide, often falcately curved, both surfaces hairy, apex acute. Involucral bracts 2–4, leaflike, 5–15 mm wide, hairy, apically attenuate. Inflorescence a compound anthela; rays 3–5, slender, slightly hairy or glabrous. Spikelets solitary, brown, narrowly ovoid, 6–10 × ca. 3 mm, 8–10-flowered, with basal 2 glumes empty. Glumes brown, ovate-lanceolate to lanceolate, 3.5–4 × ca. 2 mm, hairy, 1-veined forming an abaxial keel, margin sometimes hyaline, apex with an excurved awn. Stamens 2. Style ca. 3 mm, slender; stigmas 2. Nutlet grayish yellow or white, ellipsoid, ca. 1 × 0.6 mm, 3-sided, verruculose. Fl. summer.

• Grasslands along rivers. Guangdong (Lianzhou).

50. *Fimbristylis fusca* (Nees) C. B. Clarke in J. D. Hooker, *Fl. Brit. India* 6: 649. 1893.

暗褐飘拂草 an he piao fu cao

Abildgaardia fusca Nees in Wight, *Contr. Bot. India*, 95. 1834; *Fimbristylis fusca* var. *cantoniensis* C. B. Clarke.

Perennials, rhizomatous. Culms tufted, 20–40 cm tall, with radical leaves. Leaf blade linear, 5–35 cm × 1–3 mm, both surfaces hairy, apex acute. Involucral bracts 2–4, leaflike, 0.8–1.5 cm, hairy, base much broader, apex attenuate and apiculate. Inflorescence a compound anthela; rays many, hairy. Spikelets solitary, narrowly ovoid to narrowly oblong-ovoid, 6–10 mm, apex attenuate, with basal 2 or 3 glumes empty. Fertile glumes brown to nearly blackish brown, ovate-lanceolate, 4–5 mm, thickly papery, hairy, 1-veined forming an abaxial keel, margin sometimes hyaline, apex apiculate. Stamens 3. Style 4–5 mm, basally inflated; stigmas 3. Nutlet pale brown or white, almost sessile, obovoid, ca. 0.9 mm, 3-sided, verruculose. Fl. and fr. Jun–Sep.

Mountain summits, grassy slopes, grasslands, cultivated fields; 100–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Taiwan, Yunnan, Zhejiang [India, Japan, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam; N Australia].

51. *Fimbristylis fimbristylodes* (F. Mueller) Druce, Rep. Bot. Soc. Exch. Club Brit. Isles 4: 623. 1917.

矮飘拂草 ai piao fu cao

Abildgaardia fimbristylodes F. Mueller, Fragm. 8: 273. 1874; *Fimbristylis nanofusca* Tang & F. T. Wang.

Annuals. Culms tufted, 5–13 cm tall, with radical leaves. Leaves slightly more than 1/2 as long as culm; leaf blade linear, 1–1.5 mm wide, slightly curved, margin ciliate, apex acute. Involucral bracts 2 or more, leaflike, 0.5–1.8 cm, less than 1 mm wide, hispid, apex acuminate. Inflorescence a simple or rarely subcompound anthela; rays 1–3 cm, hairy. Spikelets solitary, ovoid to broadly ovoid, 4–5 × ca. 1.5 mm, slightly compressed, with basal 1–3 glumes empty. Glumes brown, ovate, 2.5–3 mm, membranous, not densely gland-dotted, hairy, midvein abaxially forming a slight keel and excurrent into a mucro; empty glumes shorter than fertile ones, with longer awns. Stamens 3. Ovary white, cylindrical, 3-sided; style pale brown, ca. 2 mm, basally inflated; stigmas 3. Nutlet pale yellow to nearly white, very shortly stipitate, obovoid, 3-sided, verruculose, base truncate. Fl. and fr. Aug.

Slopes. Guangdong, Guangxi, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan (Ryukyu Islands), Korea, Malaysia, Myanmar, Nepal, Papua New Guinea, Thailand, Vietnam; N Australia].

52. *Fimbristylis ovata* (N. L. Burman) J. Kern, Blumea 15: 126. 1967.

独穗飘拂草 du sui piao fu cao

Carex ovata N. L. Burman, Fl. Indica, 194. 1768; *Abildgaardia monostachyos* (Linnaeus) Vahl; *A. ovata* (N. L. Burman) Kral; *Cyperus monostachyos* Linnaeus; *Fimbristylis monostachyos* (Linnaeus) Haaskarl; *Iria monostachyos* (Linnaeus) Kuntze.

Perennials. Rhizomes short. Culms tufted, 15–35 cm tall, slender. Leaves 1/2–2/3 as long as culm; leaf blade 0.5–1 mm wide, apex acute. Involucral bracts 1–3, glumelike but basal-most sometimes leaflike, 0.5–1.8 cm, apex with a 2–3 mm awn. Inflorescences reduced to a single terminal spikelet, ovoid, ellipsoid, or oblong-ovoid, 7–13 × ca. 5 mm, slightly compressed, with basal glumes distichous and apical ones spirally imbricate. Glumes yellowish green, broadly ovate to ovate, 3–6 mm, leathery, shiny, abaxially 3-veined, midvein prominent and excurrent into a mucro. Stamens 3. Style 3-sided, basally inflated; stigmas 3. Nutlet shortly stipitate, obovoid, ca. 2 mm, 3-sided, prominently verruculose. Fl. and fr. Jun–Sep. $2n = 10$.

Grasslands, roadsides, waste fields, open moist hillsides, stream-sides, sunny dry slopes, grassy slopes; 100–1400 m. Fujian, Guangdong, Guangxi, S Guizhou, Hainan, S Hunan, NE Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Laos, Malaysia, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, SW Asia (Yemen), Central and South America, Pacific islands].

53. *Fimbristylis longistipitata* Tang & F. T. Wang, Fl. Reipubl. Popularis Sin. 11: 229. 1961.

长柄果飘拂草 chang bing guo piao fu cao

Perennials, rhizomatous. Culms tufted, 15–30 cm tall, slender. Leaves ca. 1/2 as long as to equaling culm; leaf blade narrowly linear, ca. 0.5 mm wide, apex acuminate. Involucral bracts 2 or 3, glumelike, 0.5–1.8 cm, apex with a longer hairy awn. Inflorescences reduced to a single terminal spikelet, ovoid to oblong-ovoid, 8–13 × ca. 4 mm. Glumes yellowish green with fine brown spots, broadly ovate to oblong-ovate, ca. 4 mm, shiny, 3-veined forming an abaxial slight keel, midvein prominent, apex mucronate. Stamens 3. Style 3-sided, ciliate, basally inflated; stigmas 3. Nutlet with a ca. 0.8 mm stipe, flatly globose, ca. 1.5 mm, 3-sided, very sparsely verruculose. Fl. and fr. Jun–Oct.

• Streamsides, open woods, field margins, scrub by seashores; near sea level to 600 m. Guangdong, Hainan.

