**CYPERACEAE**

莎草科 suō cáo ke

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Herbs, annual or perennial, rhizomatous to stoloniferous. Culms (stems) simple, often 3-sided. Leaves basal and/or cauline, often 3-ranked, comprising a blade and sheath but sometimes only sheath present; sheath open or closed; ligule often present, sometimes on opposite side to leaf blade; leaf blade usually linear, grasslike, sometimes basally broader and constricted into a pseudopetiole. Involucral bracts 1 to several, leaflike or glumelike. Inflorescences unbranched and spicate or capitate, to branched and anathelate (umbel-like) or paniculate, comprising 1 to many ultimate inflorescence units, these either indeterminate and called spikelets or in a few genera determinate and called pseudospikelets (see explanation below). Spikelets with 1 to many glumes, sometimes reduced to a single flower and aggregated into unisexual spikes; glumes membranous to leathery, spirally arranged or 2-ranked, each subtending a single flower. Pseudospikelets comprising 2–12 membranous scalelike floral bracts on a much reduced axis; lowest 2 bracts opposite, keeled, pseudospikelet subtended and usually hidden by a glumelike bract; bracts spirally arranged and aggregated into spikeletlike spikes. Flowers bisexual or unisexual with plants monoecious or rarely dioecious. Perianth absent or reduced to bristles or scales. Stamens 1–3; anthers basifixed. Ovary 2- or 3-carpellate, unilocular, with a single ovule; style divided or rarely undivided, base sometimes persistent and variously shaped in fruit; stigmas 2 or 3. Fruit usually a hard 2- or 3-sided nutlet, rarely with a succulent or corky exocarp, surface smooth or variously minutely patterned, sometimes partially or completely enclosed by an enlarged basal prophyll (utricle).

One hundred and six genera and ca. 5,400 species: worldwide except Antarctica; 33 genera and 865 species (326 endemic, five introduced) in China.

Recent phylogenetic studies (e.g., D. A. Simpson et al., Aliso 23: 72–83. 2007; A. M. Muasya et al., Bot. Rev. (Lancaster) 75: 52–66. 2009) suggest that tribal and generic delimitation in Cyperaceae is likely to be modified in the future.

The closest relatives to Cyperaceae are Juncaceae and Thurniaceae (D. A. Simpson in P. Rudall, P. J. Cribb, D. F. Cutler & C. J. Humphries, eds., Monocot. Syst. Evol. 2: 497–509. 1995) in the order Poales. Poaceae, which shares some characteristics of Cyperaceae, such as wind pollination and reduced floral structure, has often been placed near to Cyperaceae but is now shown to be more distantly related (H. P. Linder & E. A. Kellogg in P. Rudall et al., loc. cit.: 473–496; D. A. Simpson in P. Rudall et al., loc. cit.: 497–509).

Inflorescence structure in Cyperaceae is notoriously difficult to interpret due to its highly reduced nature. Consequently, the terminology used in describing parts of the inflorescence can be confusing with several terms often being applied to the same structure. In addition, several terms are also used in the Poaceae, but they do not always relate to the same structure in both families. A laudable attempt to standardize terminology in Cyperaceae was made by I. Kuikonen (Ann. Bot. Fenn. 31: 37–43. 1994). In our treatment we have attempted to keep terminology as simple as possible.

Inflorescences are generally either unbranched or very shortly branched and spicate or capitate in appearance to prominently branched and paniculate or anathelate (umbel-like), with variations around these. The basic unit of the inflorescence in most Cyperaceae is the spikelet. This comprises a very short to elongated axis, which subtends one to many scalelike bracts, referred to here as glumes. Each glume subtends and partially hides a single very small, bisexual or unisexual flower, which may or may not have a perianth. The perianth, when present, is reduced to bristles or scales. There may be 1–3 stamens and a pistil comprising an ovary, style, and 2 or 3 stigmas. The ovary gives rise to a hard, 1-seeded nutlet (sometimes referred to as an achene). Spikelets tend to be aggregated into larger structures known as spikes. In the tribe Cariceae this basic structure is modified such that the spikelet is reduced to a single flower that is enclosed by a sac-like structure known as an utricle, the latter being a modified prophyll at the base of the spikelet. The utricle is subtended by a glumelike bract, and the whole structure is again aggregated with others into spikes. Some confusion arises with caricoid spikes especially as the spikelets comprise only one flower and are subtended by a glumelike bract. This has meant that spikes are sometimes referred to as spikelets and the glumelike bracts as true glumes.

The spikelet is indeterminate, i.e., having no terminal flower. However, in Hypolytrum, Lepironia, and Mapania, the basic inflorescence unit has an apparently terminal female flower. To distinguish this type of unit, the term pseudospikelet is used here; some authors refer to it as a spicoid. Its structure is rather different to that of the spikelet, comprising 2–12 scalelike floral bracts on a very much reduced axis. The two lowest bracts are opposite, keeled, and often enclose the upper bracts (when the latter are present). The lower bracts subtend a male flower comprising a single stamen, the upper bracts usually empty. The terminal flower, which is not subtended by a floral bract, is female. There are no perianth bristles or scales, and the whole structure is subtended and partially to fully hidden by a glumelike bract. These are again aggregated into spikes, but there is further

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confusion in terminology with the spikes sometimes being referred to as spikelets. The above interpretation of the pseudospikelet is widely accepted, although some workers have interpreted it as a single flower.

One of us (Dai) believes that if *Kyllinga* and *Pycrus* are treated as separate genera from *Cyperus*, as they are in this treatment, then *Juncellus* and *Mariscus* should also be separated from *Cyperus* on account of their distinct morphological characters.


**Glossary**

Within the definitions, *italics* indicate terms that are defined in this glossary.

- **Amphicarpous** – applied to a small secondary inflorescence occurring at the base of the **culm** in certain genera, particularly *Schoenoplectus*.
- **Androgy nous** – having male and female flowers in the same structure such as a **spike** in *Carex*.
- **Anthela** (plural *anthelae*, adjective *anthelate*) – an umbel-like inflorescence in which the primary branches ± arise from the same point, the inflorescence being subtended by 1 to several **involutral bracts**.
- **Beak** – short extension at the apex of a **utricule** or **nutlet**.
- **Biconvex** – 2-sided, the sides convex.
- **Cancellate** – having the appearance of a lattice.
- **Capitate** – headlike inflorescence, without any apparent branching.
- **Cladoprophyll** – a sterile **utricule** found at the base of a *Carex* **spike**.
- **Compound** – applied to an inflorescence or partial inflorescence where there are 2 orders of branching, i.e., primary and secondary.
- **Compressed trigonous** – 3-sided, but distinctly flattened and thus appearing to be 2-sided.
- **Conic** – cone-shaped, being wider at the base than the apex; here it is used as the 3-dimensional equivalent of lanceolate.
- **Contraligule** – membranous, ligule-like structure at the apex of the leaf sheath on the side of the **culm** facing away from the leaf blade.
- **Culm** – stem supporting the inflorescence.
- **Decompound** – applied to an inflorescence or partial inflorescence where there are 3 or more orders of branching, i.e., primary, secondary, and tertiary.
- **Determinate** – applied to an inflorescence with terminal flowers and therefore not capable of indefinite growth.
- **Disk** – 3-lobed structure occurring at the base of the **nutlet** in *Scleria* and *Diplacrum*. In some species it may be indistinct, whereas in *Scleria sumatrensis* it is developed into a cuplike structure ± covering the **nutlet**.
- **Distichous** (of **glumes** and **spikelets**) – arranged in 2 opposite rows down the **rachilla** or **rachis**.
- **Glume** – membranous to leathery scalelike structure subtending individual flowers.
- **Gynophore** – short stalk at the base of a **nutlet**.
- **Indeterminate** – inflorescence which, in theory, is capable of indefinite growth.
- **Involucral bract** – bract or bracts occurring at the point where the inflorescence arises from the **culm**. Vary from being leaflike to glumelike or setaceous.
- **Isodiamicetric** – of equal size both horizontally and vertically.
- **Keel** – used here for the midrib of a **glume** or scalelike bract.
- **Lageniform** – urn-shaped with a constriction in the middle.
- **Ligule** – membranous tissue or fringe of hairs occurring at the apex of the leaf sheath on the inner side at the point where it joins the leaf blade.
- **Nutlet** – hardened, usually minute, 1-seeded fruit, the surface of which may be smooth to variously patterned and a diagnostic character for many species. Often called an achene in literature on Cyperaceae.
- **Paniculate** – inflorescence comprising partial inflorescences arising at intervals along the main inflorescence axis.
- **Partial inflorescence** – primary branches of an inflorescence.
- **Perianth bristles** – small bristlelike or scalelike structures at the base of the **nutlet**. Presumed to be the remnants of a fully developed perianth.
- **Prophyll** – 2-keeled structure at the base of a branch within an inflorescence. It may be glumelike or tubular or, in *Kobresia* and *Carex*, developed into a **utricule**.
- **Pseudospikelet** – the ultimate inflorescence unit in *Hypolytrum*, *Lepironia*, and *Mapania*. Has a much reduced axis and appears flowerlike. Comprises 2–12 scalelike bracts each subtending a male flower. The whole structure is terminated by a female flower, thus making it determinate.
- **Rachis** – the axis of a **spike**.
- **Rachilla** – the axis of a **spikelet**.
- **Ray** – branches of an **anthela**.
- **Rhizome** – underground stem, which may be short, often giving the plant a tufted habit, or long creeping.
- **Scale-like bract** – membranous scalelike structure in a **pseudospikelet** each of which subtends a male flower comprising a single stamen only. The lowest 2 floral bracts usually have a keel and are opposite.
- **Scrobiculate** – having numerous minute pits or depressions.
- **Septate** – partitioned. In some species, particularly in *Eleocharis*, the **culm** has a series of horizontal septa, which are best seen in dried material.
- **Simple** – applied to an inflorescence or partial inflorescence where there is only one order of branching, i.e., primary branching.
- **Spike** – an aggregation of **spikelets** or **pseudospikelets**; sometimes the whole structure is similar in appearance to a **spikelet** (in *Ascolepis* Nees ex Steudel, *Carex*, *Hypolytrum*, *Kobresia*, *Lepironia*, *Lipocarpha*, and *Mapania*). Has an elongated or reduced axis with 1 to many **glumes**, each **glume** subtending a bisexual or unisexual flower.
- **Squarrose** – with tips spreading outward. In Cyperaceae usually applied to the apex of the **glumes**.
- **Stipe** – short, narrowed extension to the base of the **nutlet**.
- **Stolon** – in Cyperaceae this term is applied to a thin underground branch arising from the **rhizome** or base of the **culm**. Each stolon terminates in an aerial shoot.
- **Style base** – a variously shaped portion at the base of the style which is persistent on the mature **nutlet** in some genera.
- **Trabeculate** – having the appearance of minute girders.
- **Trigone** – 3-sided, with the margins blunt and rounded. Applied here to the **culm** and **nutlet**.
- **Triquetrous** – 3-sided with the margins acute. Applied here to the **culm** and **nutlet**.
- **Utricle** – a prophyll which has developed into a characteristic bottlelike structure and partially to completely surrounds the **nutlet** in *Kobresia* and *Carex*.
Systematic list of subfamilies, tribes, and genera

Cyperaceae is the third largest family in the Monocotyledons (after Orchidaceae and Poaceae). The largest genera in China are Carex (527 spp.), Cyperus (62 spp.), Fimbristylis (53 spp.), Eleocharis (35 spp.), and Scleria (24 spp.). In the present treatment we follow D. A. Simpson (Amer. J. Bot. 90: 1071–1087. 2003) for subfamily delimitation and Goetghebeur (in K. Kubitzki, Fam. Gen. Vasc. Pl. 4: 141–190. 1998) for tribal and generic delimitation and sequence. Two subfamilies and eight tribes of Cyperaceae occur in China with generic allocation as follows:

1. MAPANIOIDEAE
   1. Hypolytreae
      1. Hypolytrum (p. 168)
      2. Mapania (p. 169)
      3. Lepironia (p. 170)
   2. Cyperoideae
      2. Scirpeae
         4. Scirpus (p. 171)
         5. Eriophorum (p. 174)
         6. Trichophorum (p. 176)
         7. Fuzirena (p. 178)
      8. Bolboschoenus (p. 179)
      9. Actinocirrus (p. 181)
     10. Schoenoplectus (p. 181)
   3. Abildgaardieae
      11. Eleocharis (p. 188)
   4. Cyperae
      12. Fimbristylis (p. 200)
      13. Bulbosystis (p. 218)
   5. Dulichiaceae
      14. Isolepis (p. 219)
      15. Cyperus (p. 219)
      16. Courtoisina (p. 241)
      17. Remirea (p. 241)
      18. Pycreus (p. 242)
      19. Kyllinga (p. 246)
      20. Lipocarpha (p. 249)
   6. Schoeneae
      21. Blysmus (p. 251)

Key to genera

For accurate identification of Cyperaceae good fruiting material should be used wherever possible. Indeed this is essential in certain genera, such as Fimbristylis and Scleria. It is also important to have underground parts as these may be diagnostic for some species. Care is needed when counting the number of stigmas as these are easily broken off. Several should be observed from the same specimen. Care is also needed when counting the stamens. Anthers break off easily leaving the filaments partially hidden within the glumes. Always check that filaments are present. Also, care should be taken to distinguish perianth bristles from filaments as the number of perianth bristles may be useful in separating taxa. The bristles will usually have antrorse or retrorse hairs on them.

1a. Inflorescence comprising small units (pseudospikelets) with 2 opposite, keeled, scalelike bracts at base often enclosing a further 2–10 scalelike bracts, each unit subtended and usually hidden by a glume-like bract.
2a. Leaves without blades; culms with transverse septa .......................................................... 3. Lepironia
2b. Leaves with blades fully developed; culms without septa.
   3a. Pseudospikelets with 5 or 6 scalelike bracts; stamens 3 per pseudospikelet ........................................ 2. Mapania
   3b. Pseudospikelets with 2 scalelike bracts; stamens 2 per pseudospikelet ............................................. 1. Hypolytrum
1b. Inflorescence not as above.
4a. All flowers unisexual.
   5a. Female flowers and nutlets not hidden by a utricle.
      6a. Inflorescence made up of capitate clusters of spikelets arising along whole length of culm; nutlets tightly enclosed by 2 subtending glumes and shed with them .......................................................... 31. Diplacrum
      6b. Inflorescence paniculate or ± capitulate, arising on upper part of culm; nutlets not tightly enclosed by 2 glumes ...................................................................................................................................................... 30. Scleria
   5b. Female flowers and nutlets hidden by a utricle.
      7a. Utricle ± open on one side; at least some spikelets bisexual with male flowers above female flower ...... 32. Kobresia
      7b. Utricle completely closed except at apex; spikelets all unisexual with either 1 male or 1 female flower ...... 33. Carex
4b. At least some flowers bisexual.
   8a. Spikelets much reduced, with 0–2 glumes subtended by a glume-like spikelet bract, spikelets densely clustered into spikes or in a capitulate inflorescence.
      9a. Perennial with long-creeping rhizome; sandy beaches near sea only .................................................. 17. Remirea
      9b. Annual or perennial, without long-creeping rhizome; inland ......................................................... 20. Lipocarpha
   8b. Spikelets not as above, elongated, with spirally or distichously arranged glumes.
      10a. Spikelets usually with bisexual and male flowers.
         11a. Nutlets biconvex, with persistent style base; stigmas 2 or style undivided ...................................... 23. Rhynchospora
         11b. Nutlets trigonous or obtuse trigonous-cylindric, without persistent style base; stigmas 3.
            12a. Glumes distichous, middle glumes with flowers, lowest empty .................................................... 24. Schoenus
            12b. Glumes spiral or rarely distichous, usually apex or near apex with flowers.
               13a. Leaves flat, midrib conspicuous or inconspicuous; inflorescence paniculate spreading and loose or small capitulate; perianth bristles present or absent; nutlets beaked.
14a. Glumes spirally arranged; leaves dorsiventral .......................................................... 26. Cladium
14b. Glumes ± distichous; leaves unifacial .................................................................. 27. Machaerina

13b. Leaf midrib inconspicuous or terete; inflorescence densely narrowly paniculate, long and large and spreading, loose; perianth bristles present or absent; nutlets beakless.
15a. Leaves linear or terete, involute on margins; perianth bristles absent ............... 25. Gahnia
15b. Leaves terete or flat; perianth bristles present.
16a. Leaves terete; perianth connate at base, glabrous; nutlets smooth .... 28. Lepidosperma
16b. Leaves flat; perianth separate, pubescent; nutlets with reticulate wrinkles ................................................................. 29. Tricostularia

10b. Spikelets usually with bisexual flowers only.
17a. Glumes increasing in length toward apex of spikelet ........................................... 22. Actinoschoenus
17b. Glumes ± equal in length (with 1–3 smaller glumes often at base of spikelet).
18a. Style jointed with ovary and clearly demarcated from it.
19a. Leaf blades absent; perianth bristles present .......................................................... 11. Eleocharis
19b. Leaf blades usually present, if absent then style base not persistent on nutlet; perianth bristles absent.
20a. Leaf sheath without long silky hairs at apex; nutlets without persistent style base ........................................................................................................ 12. Fimbristylis
20b. Leaf sheath with long silky hairs at apex; nutlets with persistent style base .......................................................................................................................... 13. Bulbostylis

18b. Style continuous with ovary and not demarcated from it.
21a. Inflorescence spicate with few to many apparently distichous spikelets ............... 21. Blysmus
21b. Inflorescence not as above.
22a. Glumes distichous.
23a. Stigmas 3, rarely 2; nutlets trigonous, rarely biconvex with 1 side facing spikelet axis.
24a. Annual or perennial; glumes not winged ......................................................... 15. Cyperus
24b. Annual; glumes prominently winged ................................................................. 16. Courtoisina
23b. Stigmas 2; nutlets 2-sided with 1 margin facing spikelet axis.
25a. Spikelets with more than 2 glumes; spikelet axis and glumes persistent ................................................................. 18. Pycreus
25b. Spikelets with 1 or 2 glumes; spikelet axis deciduous, spikelets falling whole ................................................................. 19. Kyllinga
22b. Glumes spirally arranged.
26a. Perianth bristles present, 3 inner ones squamellate ......................................... 7. Fuirena
26b. Perianth bristles present but not as above, or absent.
27a. Perianth bristles 10–30, elongating extremely after anthesis, smooth, silky ................................................................. 5. Eriophorum
27b. Perianth bristles up to 6, elongating or not after anthesis, or absent.
28a. Inflorescence paniculate.
29a. Culms not nodose; leaves basal only ............................................. 9. Actinoscirpus
29b. Culms nodose; leaves basal and up to 8 cauline ............................ 4. Scirpus
28b. Inflorescence a single spikelet, up to 3 spikelets, or capitate, if paniculate then longest inflorescence bract culmlike and apparently continuous with culm, inflorescence appearing to be lateral.
30a. Inflorescence bract glumelike, shorter than inflorescence ........................................ 6. Trichophorum
30b. Inflorescence bracts leaflike or culmlike, longest exceeding inflorescence.
31a. Spikelets up to 4 mm; perianth bristles absent; nutlet up to 0.9 mm (mostly ca. 0.5 mm) ............ 14. Isolepis
31b. Spikelets 4 mm or more; perianth bristles usually present; nutlet 1 mm or more.
32a. At least 2 involucral bracts over 1.5 cm, longest involucral bract leaflike, erect to spreading ................................................................. 8. Bolboschoenus

**Schoenus nemorum** Vahl, Symb. Bot. 3: 8. 1794; *Hypolytrum formosanum* Ohwi; *H. latifolium* Persoon.

Roots few, hard, fibrous. Rhizomes short, slightly thick, woody, with dense reddish scales. Culms central, 30–90 cm tall, 3–4 mm thick, 3-angled, stiff. Leaves basal and 1 or 2 cauline, longer than culm; basal leaf sheath brownish, 5–15 cm, margin thickly membranous, basal few bladeless; leaf blade 35–120 × 0.8–2.6 cm or longer, flat, stiff, subleathery, base folded, margin scabrous near apex. Involucre bracts 3–5, leaflike, at base of inflorescence and branches, basalmost much longer than inflorescence, not sheathing. Involucres paniculate, ovoid-globose to subglobose, 3–7 × 4.5–6 cm, with many spikes; racis and rachilla angles scabrous. Spikes obovoid, becoming globose when mature, 3–7 × 3–6 mm, with many glumelike bracts. Glumelike bracts brown, spirally and imbricately arranged, obovate, ca. 2 mm, mid-veined, each subtending a pseudospikelet, apex rounded and mucronate. Pseudospikelets ca. 1.5 mm, with 2 glumes, 2 male flowers, and 1 female flower; glumes brown, lateral and opposite, cymbiform, ca. 1.2 mm, membranous, keeled, connate on adaxial side, spinulose on keel, each with a male flower. Filaments slender; anthers narrowly oblong. Stigmas 2. Nutlet dark grayish brown, subglobose, 2–2.5 mm (including rostrum), compressed, longitudinally rugose, apex conically rostrate. Fl. and fr. Apr–Aug.

Wet places in forests or scrub, valleys; 100–1200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and America, NE Australia, Indian Ocean islands, Pacific islands].

1a. Culms central; inflorescences paniculate with many spikes; basalmost involucral bract 15–30 × 0.7–1.7 cm, much longer than inflorescence ................................................................. 1. *H. nemorum*

1b. Culms lateral; inflorescences capitate, with 1 to many spikes; basalmost involucral bract 1.5–5 × ca. 5 cm, shorter to slightly longer than inflorescence.

2a. Culms 30–45 cm; leaf blade 2–6 mm wide; spike 1(or 2) ................................................................. 4. *H. shurenii*

2b. Culms 5–40 cm; leaf blade 1–2 mm wide; spikes few to many.

3a. Culms 5–10 cm tall; spikes few; nutlet olivaceous, subglobose, ca. 2 mm, apex mucronate .... 2. *H. paucistrobiliferum*

3b. Culms 30–40 cm tall; spikes many; nutlet brown, obovoid to ovoid, ca. 3 mm, apex conically rostrate .................................................................................................. 3. *H. hainanense*


Roots fibrous. Rhizomes stout, woody. Culms lateral, 30–40 cm tall, 3-angled, basally with several scales and bladeless sheaths. Basal scales broadly ovate. Bladeless sheaths dark grayish brown, densely spirally arranged. Leaves basal, tufted; leaf sheath reddish, to 14 cm, not closed, slightly folded, smooth, margin thickly membranous; leaf blade flat, ca. 1 m × 1–1.8 cm, apically gradually narrowed, papery, glabrous, margin and abaxial midvein serrulate. Inflorescence 2 or 3, leaf-like, 1.5–5 cm, slightly longer than inflorescence; basalmost bract sheathing. Inflorescence a corymbose panicle congested into a head, 1.3–2 × 1.5–2.5 cm, with many spikes. Spikes narrowly ellipsoid, becoming globose in fruit, 5–6 mm in diam., with many glumelike bracts and pseudospikelets. Glumelike bracts yellowish brown, spirally and imbricately arranged, oblong-ovate, 2.5–3 mm, leathery, punctate, keeled, each subtending a pseudospikelet. Pseudospikelets ca. 2 mm, with 2 glumes, 2 male flowers, and 1 female flower; glumes dark grayish brown, lateral and opposite, narrowly elliptic and cymbiform, ca. 2.5 mm, keeled, membranous, connate on adaxial side, spinulose on keel, each with a male flower. Anther narrowly oblong; connective apex not prominent beyond anther. Stigmas 2. Nutlet dark grayish brown, broadly obovoid to ovoid, ca. 3 mm, biconvex, irregularly longitudinally rugose, apex with a conic beak. Fl. and fr. May–Aug.

Forests, dry places on mountain slopes; 100–300 m. Hainan, Hong Kong [Vietnam].


*树仁割鸡芒* shu ren ge ji mang

Type: China. Hainan: Changjiang, 10 Dec 1933, Liang Xiangri 66046 (holotype, MO!).

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*擂鼓苈属* lei gu li shu

*Dai Lunkai* (戴伦凯); David A. Simpson, Gordon C. Tucker

Herbs, perennial, robust. Roots coarse. Rhizomes woody. Culms central or lateral (arising from basal leaf axils or below leaves), if lateral then with cataphylls at base. Leaves 3-ranked, basal or rarely cauline; basal leaf sheath folded, open adaxially; cauline leaf sheath tubular; ligule absent; leaf blade linear to oblong, leathery or subleathery. Inflorescences corymbose or capitellate, each subtending a bisexual spikeletlike unit with a much reduced axis (pseudospikelet). Pseudospikelets comprising an apparently terminal female flower and 5 or 6 scalelike glumes; basal 2 pseudospikelet glumes opposite and keeled; basal 3 pseudospikelet glumes subtending a male flower comprising 1 stamen, remaining glumes empty. Perianth bristles absent. Styles slender; stigmas [2 or]3. Nutlet with a hard or succulent outer surface, smooth or sculptured, lateral costae or furrows 0 or 2–4.

About 85 species: pantropical and extending into warm temperate regions; three species in China.

1a. Inflorescences corymbose paniculate; nutlet with 2–4 longitudinal furrows ........................................... 1. *M. sumatrana*

1b. Inflorescences capitellate or with only a single spikelet; nutlet without longitudinal furrows.

2a. Inflorescences capitellate with up to 4 spikes, broadly ovoid, 1.8–2.5 × 1.5–1.8 cm ................................. 2. *M. silhetensis*

2b. Inflorescence a single spike, ellipsoid to subobovoid, ca. 3 × 1.6–2 cm ....................................................... 3. *M. wallichii*

露兜树叶野长蒲  

Rhizomes short or stolonlike. Culms central, ca. 1 m tall, 2–10 mm thick, straight, 3-angled, glabrous. Leaves basal and cauline, glabrous, basal leaves stipitate, cauline leaves sheathing; leaf sheath greenish to reddish brown, 7–24 cm; leaf blade to 2 m × 2.5–3 cm or longer, 3-angled, inverse W-shaped in cross section, 3-veined, margins scabrous or serrulate, apex flagelliform-acuminate. Involucral bracts brown, subulate, cylindric, erect. Inflorescence a single spike, pseudolateral, with many spirally arranged imbricate glumelike bracts. Glumelike bracts densely spirally and imbricately arranged, narrowly oblong, ca. 1 cm, papery, apex obtuse. Pseudospikelets with 6 glumes, 3 male flowers, and 1 female flower; basal 2 glumes opposite, cymbiform, membranous, keeled, spinulose on apical part of keel, each subtending 1 male flower; remaining 4 bracts narrowly oblong, outermost one subtending a male flower. Filaments to 1.6 cm; anthers linear, 7–8 mm. Style ca. 6.5 mm; stigmas 3. Nutlet brown, obovoid, 4.4–5.5 mm, obtusely 3-sided, outer surface succulent, apex conically rostrate. Fl. and fr. Oct.

Forests; 600–700 m. Guangdong, Guangxi [Bangladesh, India, Vietnam].


单穗擂鼓荔  

Rhizomes thick, woody. Culms lateral, 20–70 cm tall, 2–4 mm thick, with several cataphylls toward base. Leaves basal, ± distichous; leaf sheath dark green, open, folded, overlapping each other, 7–12 cm, leathery; leaf blade ca. 1.2 m × 2–3.5 cm or longer, subleathery, margin and abaxial midvein serrulate, apically gradually narrowed into an acutely trigonous and flagelliform apex. Involucral bracts yellowish green, glumelike, ovate-lanceolate, 1.5–2.5 cm, slightly shorter to nearly as long as inflorescence, leathery, midvein abaxially elevated, margin brown and thickly membranous. Inflorescence a single terminal spike, ellipsoid to subobovoid, 3–3.5 × 1.5–2 cm, with many glumelike bracts and pseudospikelets. Glumelike bracts yellowish, spirally and imbricately arranged, ovate-oblong, 1.2–1.5 cm, papery. Pseudospikelets with 6 glumes, 3 male flowers, and 1 female flower; basal 2 glumes opposite, cymbiform, membranous, keeled, spinulose on apical part of keel, each subtending 1 male flower; remaining 4 bracts narrowly oblong, outermost one subtending a male flower. Filaments to 1.5 cm; anthers linear, ca. 8 mm. Style ca. 9 mm; stigmas 3. Nutlet brown, shortly stipitate, subobovoid to ellipsoid, ca. 7.5 mm, obtusely 3-sided, outer surface succulent, apex conically rostrate. Fl. and fr. Oct.–Nov.

River margins, dense forests, ditch margins in valleys; ca. 500 m. Fujian, Guangdong, Guangxi, Hainan [Indonesia, Malaysia].

3. **LEPIRONIA** Persoon, Syn. Pl. 1: 70. 1805.

石龙刍属  
Dai Lunkai (戴伦凯); Jeremy J. Bruhl, David A. Simpson


One species: tropical Asia, Australia, Madagascar, Pacific islands.

东方藨草

Scirpus orientalis

Restio articulatus Retzius, Observ. Bot. 4: 14. 1786; Lepironia compressa Boeckeler; L. mucronata Persoon; L. mucronata var. compressa (Boeckeler) E. G. Camus.

Rhizomes creeping, covered by brown ovate scales. Culms 0.7–1.5(-2) m tall, 5–8 mm thick when dried, terete, with 3 or 4 leaf sheaths at base; sheaths open, brown to reddish, 10–30 cm, papery, margin thickly membranous. Involucral bract 3–7 cm. Spike brown to blackish, pseudolateral, ellipsoid to ovoid-ellipsoid, 1–2 × 0.6–1 cm, with many glumelike bracts. Glume-like bracts orange, dark brown, or black, ovate, broadly ovate, or obovate-oblong, 4–5 × 4.5–5 mm, concave, striate, apex rounded. Pseudospikelets with many brown glumes; basal 2 glumes lateral, narrowly spatulate and cymbiform, ca. 5 mm, membranous, keeled, with stout prickle hairs on keel, apex acute; middle glumes linear-lanceolate and cymbiform, slightly shorter, membranous, each with or without a single stamen, apex acuminated; central gynoecium surrounded by empty glumes. Anther linear-oblong; connective apex ca. 0.5 mm, prominent beyond anther. Style white at anthesis, shorter than stigmas. Nutlet yellowish, maturing to dark brown, obvoid, ca. 4 × 3 mm, compressed, with 7–9 dark brown longitudinal striae on both sides, margins distally scaberulous. Fl. and fr. Feb–Jun.

Usually in coastal ponds, marshes, and streams; 100–200 m. Guangdong, Hainan, Taiwan [Cambodia, India, Indonesia, Japan (Ryukyu Islands)], Laos, Malaysia, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia, Madagascar, Pacific islands.

Lepironia articulata is used for making mats and baskets.


Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker

Herbs, perennials. Culms tufted, 3-angled to obtusely 3-angled, rarely terete, few to many nodose. Leaves basal and cauline; leaf blade linear, grasslike, ligulate, base sheathing. Involucral bracts leaflike, spreading. Inflorescence a terminal corymbiform antherela, with many spikelets. Spikelets ovoid to ellipsoid, generally rather small. Glumes spirally arranged, deciduous, each subtending a flower. Flowers bisexual. Perianth bristles 3–6, as long as to much longer than nutlet. Stamens 1–3. Style white at anthesis, shorter than nutlet.

About 35 species: mostly in temperate regions of N Hemisphere, greatest diversity in North America; 12 species (four endemic) in China.

1a. Involucral bracts spathelike .................................................................................................................................. 11. S. maximowiczii

1b. Involucral bracts leaflike.

2a. Prophyll subtending a bisexual flower ........................................................................................................ 12. S. paniculatocorymbosus

2b. Prophyll absent.

3a. Spikelets dark green (to grayish).

4a. Perianth bristles erect, retrorsely scabrous, nearly as long as nutlet ........................................................................ 1. S. orientalis

4b. Perianth bristles prominently flexuose to contorted, retrorsely scabrous only near apex, 2–4 × as long as nutlet ................................................................. 2. S. radicans

3b. Spikelets reddish brown.

5a. Spikelets narrowly ovoid; basal several glumes empty ......................................................................................... 9. S. filipes

5b. Spikelets globose, ovoid, oblong, or ellipsoid; all glumes with a flower.

6a. Perianth bristles basally glabrous and apically densely pubescent with long yellowish brown hairs .................................................................................................................. 10. S. hainanensis

6b. Perianth bristles antrorsely scabrous but not pubescent.

7a. Glumes 1-veined, apex acuminated; perianth bristles flexuose, 1.5–4 × as long as nutlet; nutlet compressed 3-sided; stigmas 3.

8a. Glumes lanceolate to ovate-lanceolate, 2.5–3 mm ......................................................................................... 3. S. karuisawensis

8b. Glumes deltoid-ovate to oblong-ovate, 1.3–2 mm.

9a. Spikelets globose-ellipsoid; glumes 1.3–1.5 mm, apex obtuse ........................................................................... 4. S. hainanensis

9b. Spikelets globose; glumes 1.8–2 mm, apex acute ..................................................................................................... 5. S. wichurae

7b. Glumes 1-, 3-, or 5-veined, apex obtuse; perianth bristles slightly flexuose, less than 1.5 × as long as nutlet; nutlet biconvex; stigmas 2.

10a. Spikelets 2–3 mm; glumes broadly ovate, ca. 1 mm, 3-veined ............................................................................. 8. S. rosthornii

10b. Spikelets 3–6 mm; glumes broadly ovate-elliptic, 1.2–1.5 mm, 1- or 5-veined.

11a. Glumes ca. 1.2 mm, without brown short lines, 1-veined; nutlet 0.7–1 mm .......... 6. S. ternatanus

11b. Glumes ca. 1.5 mm, with brown short lines, 5-veined; nutlet ca. 1.5 mm ............. 7. S. chinianus


东方藨草

Scirpus sylvaticus Linnaeus var. maximowiczii Regel; S. sylvaticus var. subradicans Kükenthal ex Tang

Rhizomes short, stoloniferous. Culms 0.6–1.8 m tall, 7–12
mm thick, obtusely 3-angled, 5–7-nodose. Leaves cauline, as long as or shorter than inflorescence; leaf blade 4–15 mm wide, flat, abaxial midvein and margin usually scabrous. Involutcular bracts 2–4, leaflike, much longer than inflorescence. Inflorescence a terminal large compound anthela; rays many, to 10 cm, apically scabrous. Spikelets usually solitary or in clusters of 2 or 3, dark gray, ovoid to narrowly ovoid to rarely ovoid, 4–6 × ca. 2 mm, many flowered. Glumes dark green, broadly ovate, ca. 1.5 mm, with 3 yellowish green veins, apex acute to subrounded. Perianth bristles 5 or 6, as long as or slightly longer than nutlet, erect, retrorsely scabrous. Stamens 3; anthers linear-oblong, ca. 1 mm; connective apex very short. Style slightly longer than nutlet; stigmas 3. Nutlet pale yellow, oblong to ovoid, compressed 3-sided. Fl. Jun–Jul, fr. Aug. 2

Swampy places in woods, wet places; 400–2700 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang [Japan, Korea, Mongolia, Russia (Far East, Siberia)].


单穗藨草  dan sui biao cao

Nemocaris radicans (Schkuhr) Beurling; Scirpus sylvaticus Linnaeus var. radicans (Schkuhr) Willdenow; Seidlia radians (Schkuhr) Opiz.

Rhzomoses short. Culms slightly tufted, 0.7–1.5 m tall, obtusely 3-angled, 7- or 8-nodose, smooth but slightly scabrous near inflorescence. Leaves cauline, shorter than inflorescence; sheath ± long; leaf blade 7–10 mm wide, abaxial midvein and margin slightly scabrous. Involutular bracts 2 or 3, leaflike, overlapping inflorescence. Inflorescence an terminal large compound anhela, with many rays; first rays to 9 cm, glabrous. Spikelets solitary, oblong-ovoid to narrowly ovoid, 5–8 × ca. 2 mm, many flowered, apex acuminate. Glumes densely arranged, oblong, ca. 2 mm, membranous, both surfaces dark grayish black, midvein pale yellow, base sometimes straw-colored, margin apically ciliate, apex rounded. Perianth bristles 6, usually 2–4 × as long as nutlet, prominently flexuose, retrorsely scabrous only near apex. Anthers ca. 1 mm, linear-oblong. Style slightly short; stigmas 3. Nutlet pale yellow, obovoid, ca. 1 mm, compressed 3-sided. Fl. and fr. Jun–Sep. 2n = 60.

In water, swampy places; 400–900 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Kazakhstan, Korea, Mongolia, Russia; Europe].


华东藨草  hua dong biao cao

Scirpus fuirenoides Maximowicz var. jaluansus Komarov; S. jaluansus (Komarov) Nakai ex Mori.

Rhzomoses short. Culms 0.8–1.5 m tall, stout, rigid, obtusely 3-angled, 5–7-nodose, clothed at base with a few bladeless leaf sheaths. Leaves shorter than culm; sheath reddish brown; leaf blade linear, 4–10 mm wide, stiff. Involutular bracts 1–4, leaflike, overlapping inflorescence. Inflorescences consisting of a terminal and 2–4 lateral lax anthelae; lateral anthelae simple, with 5 or fewer ca. 7 cm rays; terminal decomposed anthela with many rays. Spikelets in spherical clusters of 5–10, oblong to ovoid, 5–9 × 3–4 mm, densely many flowered, apex obtuse. Glumes reddish brown, lanceolate to oblong-ovate, 2.5–3 mm, membranous, 1-veined, apex acute. Perianth bristles 6, white, 3–4 × as long as nutlet, basally flexuose, apically sparsely antrorsely scabrous. Anthers linear. Style of medium length; stigmas 3. Nutlet yellowish, oblong to obovoid, ca. 1 mm, compressed 3-sided, shiny, apex shortly beaked. Fl. and fr. Aug–Sep.

Wet places, swamps; 600–1200 m. Anhui, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Yunnan, Zhejiang [Japan, Korea].


庐山藨草  lu shan biao cao

Scirpus lineatus Michaux var. lushanensis (Ohwi) T. Koyama; S. rongchenensis F. Z. Li; S. wichurae Boeckeler var. lushanensis (Ohwi) T. Koyama.

Rhzomoses short, stout. Culms 1–1.5 m tall, stout, erect, rigid, obtusely 3-angled, 5–8-nodose. Leaves shorter than culm; sheath usually reddish brown, 3–10 cm; leaf blade 0.5–1.5 cm wide, ± stiff. Involutural bracts 2–4, leaflike, usually shorter to rarely longer than inflorescence. Inflorescences terminal and lateral, a large compound or decumbent anthela, with many rays; first ray to 20 cm, slender; rays and peduncles scabrous. Spikelets mostly solitary, sometimes in clusters of 2–8, globose-ellipsoid, 2.5–3.5 mm, densely many flowered, apex rounded. Glumes rust-colored (concolorous), deltoid-ovoid to broadly ovate, 1.3–1.5 × 0.7–0.8 mm, membranous, with 1(–3) brown veins, apex acute. Perianth bristles 6, ca. 1.5 × as long as nutlet, basally flexuose, distally straight, apically antrorsely scabrous. Anthers linear-oblong. Style of medium length; stigmas 3. Nutlet pale yellow, ellipsoid, ca. 1.5 × 0.5 mm, compressed 3-sided, slightly exceeding subtending glume when mature. Fl. Jun–Jul, fr. Aug–Sep.

Moist grasslands, swamps, trail margins on slopes, stream margins; 300–2800 m. Anhui, S Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, SE Sichuan, SE Xizang, Yunnan, Zhejiang [NE India, Indonesia (Sumatra), Japan, Korea, Russia (Far East), Thailand, Vietnam].

5. Scirpus wichurae Boeckeler, Linnaea 36: 729. 1870 ["wichurai"].

球穗藨草  qiu sui biao cao

Scirpus asiaticus Beetle; S. lineatus Michaux subsp. wichurae (Boeckeler) T. Koyama; S. wichurae var. asiaticus (Beetle) T. Koyama ex W. T. Lee.

Culms 60–100 cm tall, stout, 3-angled, several nodose. Leaves shorter than culm; basal sheaths blackish purple, shiny, apex with a distinct tongue; leaf blade usually shorter than culm, 0.5–1.5 m × 1–1.5 cm, flat, stiff, leathery, margin slightly scabrous. Involutural bracts 5 or 6, leaflike, basal 3 or 4 overtopping inflorescence. Inflorescence a large compound or decumbent anthela, turbinate with concave center, 7–10 × 8–15 cm; rays 5 or more, to 9 cm, slender, spreading (often in same direc-
Culms 60–100 cm tall, stout, 3-angled, several nodose. Leaves longer than culm; basal sheaths blackish purple, shiny; leaf blade 1–1.5 cm wide, flat, stiff, leathery, margin slightly scabrous. Involucral bracts 5 or 6, leaflike, basal 3 or 4 overtopping inflorescence. Inflorescence a large compound or decompound anthela; rays 6 or 7, to 12 cm, stout, scabrous. Spikelets sessile, in headlike clusters of 4–10, stout, spreading, smooth. Spikelets sessile, in headlike clusters of 4–10, ovoid, apex subrounded. Stigmas 2. Nutlet yellow, ellipsoid to subspherical, 0.6–0.7 mm, suborbicular. Fl. and fr. May–Jun.

Wet places, hillsides, valleys; 300–1400(–1800) m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Shandong, Sichuan, Taiwan, SE Xizang, Yunnan [Bhutan, India, Indonesia, Japan, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; Pacific islands].


Culms 0.9–1.5 m tall, stout, obtusely 3-angled, acutely 3-angled just basal to inflorescence. Leaves longer than culm; sheath 5–7.5 cm; leaf blade 0.8–1.4 cm wide, flat, stiff, abaxial midvein and margin scabrous. Involucral bracts 7, leaflike, overtopping inflorescence, abaxial midvein and margin scabrous. Inflorescence a large terminal decompound anthela; rays many, scabrous; first rays to 9 cm, stout, 3-angled. Spikelets sessile, in headlike clusters of 3–7, ellipsoid to oblong, 4–6 × 2–3 mm, many flowered, apex obtuse to rounded. Glumes brown with dark brown short lines, deltoid-ovate, ca. 1.5 mm, membranous, 5-veined, apex rounded. Perianth bristles 2 or 3, white, slightly longer than nutlet, erect, apically sparsely antrorsely scabrous. Stamens 2. Stigmas 2. Nutlet yellow, broadly ellipsoid to sub-spherical, ca. 1.5 mm, biconvex, densely minutely verruculose. Fl. and fr. Mar–Apr.

– Forests along valleys; 300–600 m. Guangdong, Guangxi, Hainan (Boating), Hunan.


百穗藨草 bai sui biao cao

Rhizomes short. Culms 70–100 cm tall, stout, 3-angled, stiff, nodose. Leaves overtopping inflorescence; sheath 3–12 cm, with transverse veins; leaf blade 0.6–1.5 cm wide, ± stiff, abaxial midvein and margin scabrous. Involucral bracts 3–5, leaflike, usually overtopping inflorescence. Inflorescence a large terminal decompound anthela; rays 6 or 7, to 12 cm, stout, scabrous. Spikelets sessile, in headlike clusters of 4–15, ovoid to ellipsoid, 2–3 × ca. 1.5 mm, many flowered, apex subrounded. Glumes straw-colored to brown but later becoming blackish brown, broadly ovate, ca. 1 mm, with 3 green veins, apex obtuse. Perianth bristles 2 or 3, longer than nutlet, erect, apical half antrorsely scabrous. Stigmas 2. Nutlet yellow, ellipsoid to subspherical, 0.6–0.7 mm, biconvex. Fl. and fr. May–Sep.

Forests, forest margins, slopes, trail margins, wet places, swamps; 300–2600 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Shandong, Sichuan, Xizang, Yunnan, Zhejiang [China, Nepal].


細枝藨草 xi zhi biao cao

Rhizomes short, woody. Culms 25–100 cm tall, 3-angled, stiff, scabrous, obscurely nodose, clothed at base with several pale brown leaf sheaths. Leaves shorter than culm; sheath very long; leaf blade 5–6 mm wide, stiff, veins and margin scabrous. Involucral bracts 1 or 2, leaflike, overtopping inflorescence, both surfaces and margin scabrous. Inflorescence a terminal simple anthela or pseudolateral head; rays 7–12, to 6 cm, ± slender. Spikelets solitary or in clusters of 2–6, brown, narrowly ovoid, 7–9 × 1.5–2 mm, ca. 10-flowered, basally several glumes empty. Glumes reddish brown, lanceolate-oblong to oblong-ovate, ca. 4 mm, with 1–3 dark yellow veins, apex acute to obtuse. Perianth bristles 6, longer than nutlet, antrorsely scabrous. Stamens 3; anthers linear, ca. 2.5 mm. Stigmas 3. Nutlet yellow, obovoid, less than 1/2 as long as subtending glume, compressed 3-sided. Fl. and fr. May–Jun.

– Forests, forest margins, slopes, trail margins, grassy slopes, wet places, stream margins, swamps, on rocks; 300–2400 m. Fujian, Guangdong, Guangxi.

1a. Culms 70–100 cm tall; inflorescence a terminal simple anthela; spikelets in clusters of 2–6 .................................................. 9a. var. filipes

1b. Culms ca. 25 cm tall; inflorescence a pseudolateral head; spikelets 1 or 2 .................................................. 9b. var. panicpticulatus
9a. Scirpus filipes var. filipes

细枝藨草 (原变种) xi zhi biao cao (yuán biàn zhòng)

Culms 70–100 cm tall. Inflorescence a terminal simple anthela. Spikelets in clusters of 2–6.

- Forests, forest margins, slopes, trail margins, grassy slopes, wet places, stream margins, swamps; 300–2400 m. Fujian, Guangdong, Guangxi.


少花细枝藨草 shào huā xì zhī biao cao

Culms ca. 25 cm tall. Inflorescence a pseudolateral head. Spikelets 1 or 2.

- On rocks. Fujian (Nanping).


海南藨草 hǎi nán bǐáo cao

Rhizomes short or not. Culms tufted, 60–90 cm tall, slender, erect, terete, nodose, glabrous. Leaves basal or 3–5 on culm, shorter than culm; sheath brown, 1.5–3 cm, mouth obliquely truncate; leaf blade linear, 3–5 mm wide, flat, abaxial midvein and margin scabrous, apex acuminate. Involucral bracts leaf-like, usually shorter than inflorescence, sheathing. Inflorescences consisting of a terminal and 3–5 lateral anthelae; rays long, each with 3–12 spikelets. Spikelets solitary, sessile or pedunculate, oblong to ovoid-oblong, 5–7 × 2–3 mm, 10–15-flowered, sometimes spikelets bearing small plants. Glumes yellowish brown to pale yellow, ovate to obovate, 2–2.5 mm, membranous, both surfaces with dark brown short lines, with 1 yellowish green vein, apex acute to very shortly mucronate. Perianth bristles 6, ca. 1 mm, basally glabrous, apically densely yellowish brown long pubescent. Stamens 1; anther oblong, ca. 1 mm; connective apex short. Style ca. 1.5 mm, base slightly thickened; stigmas 3. Nutlet yellowish brown, obovoid to broadly obovoid, ca. 1.5 mm, 3-sided, shiny. Fl. and fr. Aug.–Dec.

- Moist places, forests along valleys. Fujian, Hainan, Hong Kong, Jiangsu.


少花细枝藨草 shào huā xì zhī biao cao

Eriophorum japonicum Maximowicz; E. maximowiczii (C. B. Clarke) Beetle; Scirpus japonicus (Maximowicz) Fernald (1905), not (Miquel) Franchet & Savatier (1877).

Rhizomes oblique, stoloniferous. Culms solitary, 15–30 cm tall, 3-angled, nodose, basally clothed with leaf sheaths eventually disintegrating into fibers, apically slightly scabrous. Basal leaves shorter than culm; leaf blade broadly linear, 3–6 mm wide, flat, apically abruptly narrowed to 3-angled, abaxial midvein and margin slightly scabrous, apex obtuse. Cauline leaves 2 or 3; sheath green, nearly black at apex; leaf blade linear-lanceolate, 3–6 cm × 4–6 mm, flat or slightly plicate. Involucral bracts 1–3, spathelike, suberect, base blackish brown. Inflorescence a terminal anthela; rays unequal in length, to 3 cm, each terminated by (1 or) 2 or 3 (or 4) spikelets, nodding on side, scabrous. Spikelets grayish brown, ellipsoid to ovoid, 5–7 mm, many flowered. Glumes elliptic to oblong, 3–4 × 1.2–1.5 mm, membranous, 1-veined, apex obtuse. Perianth bristles 6, 4–6 mm, flexuose, antorsely scabrous at apex. Stamens 3; anthers 2–2.5 mm. Style slender; stigmas 3. Nutlet narrowly obovoid, 1.8–2 × ca. 1 mm, 3-sided. Fl. and fr. Jul.–Sep. 2n = 64.

Wet places, slopes, alpine frozen soil; 1800–2400 m. S Jilin (Changbai Shan) [Japan, Korea, Russia (Far East, E Siberia)].


高山藨草 gāo shān bǐáo cao

Rhizomes 3–5 cm, slender, creeping. Culms 18–30 cm tall, slender, scattered, glabrous. Leaves shorter than culm; sheath reddish purple; leaf blade 4–5 mm wide, flat, abaxial midvein and margin scabrous. Inflorescence a large panicle, consisting of a terminal and 2 or 3 lateral anthelae; rays 3 or 4, 1.5–4 cm; prophyll subtending a bisexual flower at base, on opposite side of bractlet. Spikelets solitary at ends of rays or raylets (secondary rays), narrowly ovoid, 7–10 × 1.5–2.5 mm, 6–8-flowered. Glumes reddish purple, lanceolate, 5–7 mm (including awn), papery, with 3 green costae excurrent into a scabrous awn. Perianth bristles 6, very short, glabrous. Stamens 3; anthers linear. Style slender; stigmas 3, nearly as long as style. Nutlet narrowly obovoid, ca. 1.5 mm, 3-sided; persistent base blackish purple. Fl. May, fr. Jun.–Jul.

- Stream margins in grasslands; 2000–2800 m. W Sichuan.


羊胡子草属 yáng hu zī cǎo shù

Liang Songyun (梁松筠 Liáng Sōng-jūn); Gordon C. Tucker, David A. Simpson

Erioscirpus Palla.

Herbs, perennial. Rhizomes creeping. Culms tufted or nearly scattered, obtusely 3-angled, clothed at base with bladeless leaf sheaths. Leaves basal and caudinal; leaf blade of basal leaves slender, elongate, flat or 3-angled; caudinal leaves usually reduced to a sheath. Involucral bracts spathelike or glumelike, rarely leaflike. Inflorescence a terminal simple or compound anthela or reduced to a single spikelet. Spikelets with few to many spirally arranged deciduous glumes. Glumes each subtending a bisexual flower. Perianth bristles 10–30, white or brownish red, elongating extremely after anthesis, smooth, silky. Stamens 3. Style base not distinct, not or slightly thickened; stigmas 3. Nutlet obovoid to oblong, 3-sided, smooth, apex beaked.

5a. Eriophorum japonicum Maximowicz; E. maximowiczii (C. B. Clarke) Beetle; Scirpus japonicus (Maximowicz) Fernald (1905), not (Miquel) Franchet & Savatier (1877).

Rhizomes oblique, stoloniferous. Culms solitary, 15–30 cm tall, 3-angled, nodose, basally clothed with leaf sheaths eventually disintegrating into fibers, apically slightly scabrous. Basal leaves shorter than culm; leaf blade broadly linear, 3–6 mm wide, flat, apically abruptly narrowed to 3-angled, abaxial midvein and margin slightly scabrous, apex obtuse. Cauline leaves 2 or 3; sheath green, nearly black at apex; leaf blade linear-lanceolate, 3–6 cm × 4–6 mm, flat or slightly plicate. Involucral bracts 1–3, spathelike, suberect, base blackish brown. Inflorescence a terminal anthela; rays unequal in length, to 3 cm, each terminated by (1 or) 2 or 3 (or 4) spikelets, nodding on side, scabrous. Spikelets grayish brown, ellipsoid to ovoid, 5–7 mm, many flowered. Glumes elliptic to oblong, 3–4 × 1.2–1.5 mm, membranous, 1-veined, apex obtuse. Perianth bristles 6, 4–6 mm, flexuose, antorsely scabrous at apex. Stamens 3; anthers 2–2.5 mm. Style slender; stigmas 3. Nutlet narrowly obovoid, 1.8–2 × ca. 1 mm, 3-sided. Fl. and fr. Jul.–Sep. 2n = 64.

Wet places, slopes, alpine frozen soil; 1800–2400 m. S Jilin (Changbai Shan) [Japan, Korea, Russia (Far East, E Siberia)].
About 25 species: mostly in cool temperate, alpine, and arctic regions of N Hemisphere; seven species (one endemic) in China.

*Eriophorum japonicum*, recognized by Tang and F. T. Wang (Fl. Reipubl. Popularis Sin. 11: 36. 1961), is a synonym of *Scirpus maximowiczii* in this treatment (see p. 174).

1a. Spikelets solitary, terminal; involucral bracts glumelike.

2a. Perianth bristles pale reddish brown to reddish; nutlet spinulate on apical margin ............................... 6. *E. russeolum* 

2b. Perianth bristles white or pure white; nutlet smooth.

3a. Culms tufted; perianth bristles white; nutlet obovoid; anthers ca. 2 mm ............................................. 5. *E. vaginatum* 

3b. Culms scattered; perianth bristles pure white; nutlet oblong; anthers ca. 1 mm ........................................ 7. *E. scheuchzeri* 

1b. Spikelets many, arranged in a compound or single anthela; involucral bracts leaflike or spathelike.

4a. Spikelets arranged in a compound anthela; involucral bracts leaflike.

5a. Spikelets many, densely congested capitellate; glumes reddish brown with red lines, oblong ............................ 1. *E. transiens* 

5b. Spikelets solitary or a cluster of 2 or 3; glumes brown, ovate-lanceolate .............................. 2. *E. comosum*

4b. Spikelets arranged in a simple anthela; involucral bracts spathelike.

6a. Glumes usually 1-veined; culms ± stout; leaf blade 3–5(–7) mm wide, flat but apex 3-angled ............. 3. *E. angustifolium* 

6b. Glumes many veined; culms ± slender; leaf blade ca. 1 mm wide, compressed 3-angled ......................... 4. *E. gracile*


中间羊胡子草  zhong jian yang hu zi cao

Culms tufted, 20–25 cm tall, ca. 1.6 mm thick, rigid, striate, clothed at base with dark reddish brown scabrous leaf sheaths. Basal leaves reddish brown-gray; leaf blade ca. 75 cm × 3–4 mm, leathery, margin scabrous, apex acuminate. Involucral bracts 5 or 6, leaflike, ± ascending, ca. 30 cm, overtopping inflorescence, base cymbiform; bractlets cymbiform, broad, dark reddish brown hyaline with fine red lines, apex acuminate and scabrous. Inflorescence a compound anthela, 3–4 cm; rays unequal, ± rigid; second anthela 6–8 mm, sessile or pedunculate. Spikelets 6–20, densely congested into capitellate spherical clusters, 1–1.2 × 1.2–1.5 cm, many flowered. Glumes reddish brown with fine red lines, oblong, 3–3.5 mm, 1-veined costa excurrent into an erect short mucro. Perianth bristles many, white, flat, surpassing glume at maturity, ca. 7 mm, smooth. Stamens 2; anthers purplish black, narrowly ovoid, apex mucronate. Style shorter than nutlet; stigmas 3. Nutlet narrowly oblong, ca. 2.5 × 0.5 mm (including beak), compressed 3-sided. Fl. and fr. May–Nov. 2n = 52.

Crevices on rock or cliffs, grassland slopes; 500–2800 m. Chongqing, S Gansu, Guangxi,  Guizhi, Hubei, NW Hunan, Sichuan, SE Xizang, Yunnan [Afghanistan, Bangladesh, Bhutan, N India, Indonesia (Java), Kashmir, Myanmar, Nepal, Pakistan, Vietnam; SW Asia].


从毛羊胡子草  cong mao yang hu zi cao

Culms densely tufted, 20–40 cm tall, ca. 1.6 mm thick, rigid, striate, clothed at base with dark reddish brown scabrous leaf sheaths. Basal leaves reddish brown-gray; leaf blade 75 cm × 3–4 mm, leathery, margin scabrous, apex acuminate. Involucral bracts 5 or 6, leaflike, ± ascending, ca. 30 cm, overtopping inflorescence, base cymbiform; bractlets cymbiform, broad, dark reddish brown hyaline with fine red lines, apex acuminate and scabrous. Inflorescence a compound anthela, 3–4 cm; rays unequal, ± rigid; second anthela 6–8 mm, sessile or pedunculate. Spikelets 6–20, densely congested into capitellate spherical clusters, 1–1.2 × 1.2–1.5 cm, many flowered. Glumes reddish brown with fine red lines, oblong, 3–3.5 mm, 1-veined costa excurrent into an erect short mucro. Perianth bristles many, white, flat, surpassing glume at maturity, ca. 7 mm, smooth. Stamens 2; anthers purplish black, narrowly ovoid, apex mucronate. Style shorter than nutlet; stigmas 3. Nutlet narrowly oblong, ca. 2.5 × 0.5 mm (including beak), compressed 3-sided. Fl. and fr. May–Nov. 2n = 52.

Crevices on rock or cliffs, grassland slopes; 500–2800 m. Chongqing, S Gansu, Guangxi, Guizhi, Hubei, NW Hunan, Sichuan, SE Xizang, Yunnan [Afghanistan, Bangladesh, Bhutan, N India, Indonesia (Java), Kashmir, Myanmar, Nepal, Pakistan, Vietnam; SW Asia].


东方羊胡子草  dong fang yang hu zi cao

Culms short; stolons slender, creeping. Culms scattered, 35–114 cm tall, suberect but apically 3-angled, smooth. Basal leaves shorter than culm; leaf blade 2–9 mm wide, flat, leathery, margin scabrous, apex long acuminate and 3-angled. Cauline leaves 1–3; sheath blackish purple, long, slightly inflated; leaf blade 3–5(–7) mm wide, plicate or flat, apex 3-angled. Involucral bracts 2 or 3, dark brown, spathelike, erect, with leaflike blade to 12 cm, apex 3-angled and green. Inflorescence a simple anthela, with (1 or)2–10 spikelets. Spikelets ovoid to elliptoid, 10–15 × 5–7 mm; peduncles unequal, flattened, smooth or scabrous, often dropping. Glumes pale brownish gray, ovate to lanceolate, 5.5 × 18–22 mm, membranous, 1-veined but sometimes obscurely 3-veined at base, apex obtuse. Perianth bristles 10 or more, white, 3–4 mm, soft, unbranched at ends, apex acute. Stamens 3; anthers linear, (2–)3–4(–5) mm. Style slender; stigmas 3. Nutlet black, narrowly ovoid, 2.3–3 × ca. 1 mm, compressed 3-sided, apex beaked. Fl. and fr. Jun–Aug. 2n = 58.

Marshes, wet places; (100–)400–800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, N Sichuan [Japan, Kazakhstan, Korea, Mongolia, Russia; Europe, North America].

In FRPS (11: 37, t. XV. 1961), the name *Eriophorum lattifolium* Hoppe was misapplied to this species, following the usage in Fl. URSS (3: 29. 1935). The name *E. polystachion* Linnaeus, nom. utilizat, re., has often been applied to both species.

细秆羊胡子草  xi gan yang hu zi cao

**Eriophorum asiaticum** V. N. Vassiljev; **E. coreanum** Palla; **Scirpus ardea** T. Koyama; **S. ardea** var. **coreanum** (Palla) T. Koyama.

Rhizomes long creeping, slender. Culms scattered, 25–50 cm tall, slender, ± 3-angled, smooth or sometimes scabrous below inflorescence. Basal leaves narrowly linear, ca. 1 mm wide, compressed 3-angled, channeled only in basal part. Cauline leaves ± short (apicalmost with blade shorter than sheath), 1.5–2.5 cm. Involutral bracts 1 or 2, dark green, sheathlike, ca. 1.5 cm, erect or oblique. Inflorescence a simple anhela with 2–4 spikelets. Spikelets obovoid, 6–10 mm in flower; peduncles unequal, ca. 2 cm, flattened, scabrous, yellow tomentose, partly dropping. Glumes dark black to gray, broadly ovate, 4.5–5 mm, many veined, keeled, margin broadly hyaline, apex obtuse. Perianth bristles 10 or more, whitish, 1.5–1.5 cm. Stamens 3; anthers 2–3 mm. Style slender; stigmas 3. Nutlet yellowish brown, obovoid, ca. 2.5–3.5 × 2.5–3.5 cm in fruit. Glumes obovoid, ca. 2.5 × 0.5 mm, apex obtuse. Perianth bristles linear, 2–2.5 cm. Fl. and fr. Jun–Jul. 2n = 60.

Marshes, meadows; (below 100–)700–2200 m. Heilongjiang, Jilin, N Liaoning; NE Nei Mongol, N Sichuan, N Xinjiang, Yunnan (Tengchong) [Japan, Kazakhstan, Korea, Russia; Europe, North America].


白毛羊胡子草  bai mao yang hu zi cao

**Eriophorum fauriei** E. G. Camus; **E. scabridum** Ohwi; **Scirpus spinum** Fernald; **Scirpus spinum** (E. G. Camus) T. Koyama.

Rhizomes short. Culms densely tufted, 15–80 cm tall, obtusely 3-angled, smooth but sometimes scabrous below inflorescence, clothed at base with brown leaf sheaths disintegrating into fibers. Basal leaves linear, shorter than culm; leaf blade ca. 1 mm wide, 3-angled, scabrous, apically narrowly tapering, apex obtuse to acute. Cauline leaves 1 or 2, often black, reduced to a bladeless sheath, 3–6 cm with apical one inflated, membranous, with finely transverse veins. Involutral bracts grayish black, glumelike, ovate-lanceolate, membranous, apex acuminate. Inflorescences terminal with only 1 spikelet, 1–3 cm, many flowered, with ca. 10 sterile basal glumes. Spikelet erect, grayish brown, obovoid-globose ca. 1.5 cm in flower, subglobose and 2.5–3.5 × 2.5–3.5 cm in fruit. Glumes ovate-lanceolate to deltoid-lanceolate, thinly membranous, 1-veined, margin gray to dark gray with pale hyaline edge, apex acuminate. Perianth bristles 10 or more, white, 1.5–2.5 cm. Stamens 3; anthers linear, 2–2.5 mm. Stigmas 3. Nutlet brown, obovoid, 2–2.5 mm, compressed 3-sided, minutely apiculate, smooth. Fl. and fr. Jun–Sep. 2n = 26, 58, 60, 61, 83.

Marshes, meadows; below 100 m. Heilongjiang, Jilin, N Liaoning; NE Nei Mongol [Japan, Korea, Mongolia, Russia; SW Asia, Europe, North America].


红毛羊胡子草  hong mao yang hu zi cao

**Eriophorum mandshuricum** Meinshausen; **E. russeolum** var. **major** Sommier; **Scirpus russeolus** (Fries) T. Koyama var. **major** (Sommier) T. Koyama.

Rhizomes creeping. Culms erect, 30–60 cm tall, slender, terete. Basal leaves linear, ca. 1 mm wide, subterete, apex obtuse. Cauline leaves 1 or 2, reduced to bladeless leaf sheaths. Leaf sheaths grayish black with reddish fine transverse veins, cylindric, 6.5–7.5 cm, apically slightly inflated, apex obtuse. Involutral bracts grayish black, glumelike, ovate-lanceolate, 3–9-veined, apex acuminate. Inflorescences terminal with only 1 spikelet. Spikelet oblong-cylindric and 1.5–2.5 cm in flower, obovoid, fairly lax, and 2.5–4 cm in fruit. Glumes brownish gray, ovate-lanceolate, ca. 7 mm, thinly membranous, 1-veined, margin broadly whitish hyaline, apex obtuse. Perianth bristles 10 or more, usually pale reddish brown to reddish, ca. 3 mm. Stamens 3; anthers linear, 2–3 mm. Stigmas 3. Nutlet obovogloboid-obovoid to obovoid, ca. 2.5 mm, compressed 3-sided, margin spinulate, apex beaked. Fl. and fr. Jun–Jul. 2n = 58, 60, 62.

Marshes, moist places; below 100 m. Heilongjiang, Jilin, NE Nei Mongol [Japan, Korea, Mongolia, Russia; N Europe, North America].


羊胡子草 yang hu zi cao

Rhizomes long, slender. Culms solitary, scattered, erect, 8–30[–70] cm tall, ± stout, terete. Basal leaves with leaf blade narrowly linear, channeled at base. Apicalmost cauleine leaf with a narrow sheath, slightly inflated in apical part and with a very short blade. Involutral bract glumelike, broadly ovate, larger than glumes, apex subobtuse to shortly acuminate. Inflorescences reduced to a single terminal erect spikelet. Spikelet broadly obovoid to subglobose and 0.8–1.2 cm in flower, compressed globose, very dense, and 2–2.5 cm in fruit. Glumes dark gray to blackish, narrowly lanceolate, margin usually whitish and narrow, apex long acuminate. Perianth bristles 10 or more, pure white, ca. 2 cm. Stamens 3; anthers 0.5–1.5 mm. Style slender; stigmas 3. Nutlet oblong, ca. 2 × 0.5 mm, apex with a subulate beak. Fl. and fr. Jun–Jul. 2n = 58.

Swamps, moist places; 2200–3000 m. Xinjiang [Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Mongolia, Russia; Europe, North America].

No specimen from China has been seen by the present authors.


针蔺属  zhen lin shu

Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker

Herbs, perennial. Culms tufted, naked but clothed at base with a few bladeless ligulate leaf sheaths. Leaf blade much reduced. Involutral bract 1, glumelike, suberect, apex mucronate or awned. Inflorescences reduced to a single terminal spikelet, rarely an anthela or capitate with a few spikelets. Spikelets ellipsoid. Glumes pale brown, spirally arranged, membranous, deciduous, all
bearing a bisexual flower in axil. Flower bisexual or unisexual. Perianth bristles 6, filiform, silky, usually much elongated after anthesis and overtopping subtending glume. Stamens 2 or 3 or 6. Style base not distinct, slightly thickened, ± persistent. Nutlet obovoid, 3-sided or dorsiventrally compressed, smooth, apex slightly beaked.

About ten species: arctic and subarctic regions, alpine areas in temperate and tropical regions; six species (one endemic) in China.

1a. Perianth bristles absent; nutlet broadly obovoid or narrowly obovoid, ca. 0.9 mm wide; involucral bracts not awned.

2a. Flower bisexual; nutlet oblong-obovoid, ca. 1.5 mm, 3-sided; stigmas 3 .................................................. 5. T. pumilum

2b. Flower unisexual; nutlet broadly obovoid, ca. 2 mm, plano-convex; stigmas 2 ........................................... 6. T. distigmaticum

1b. Perianth bristles 6–9; nutlet ovoid or oblong, 0.6–0.7 mm wide; involucral bracts awned.

3a. Inflorescences consisting of 2–4 spikelet clusters (sometimes reduced to a single terminal spikelet in T. mattfeldianum); stolons absent.

4a. Culms 3-sided; stamens 6 ............................................................................................................................. 1. T. mattfeldianum

4b. Culms terete; stamens 3 .................................................................................................................................. 2. T. subcapitatum

3b. Inflorescences reduced to a single terminal spikelet; stolons present.

5a. Glumes 0.9–3.5 mm, apex obtuse and not awned; perianth bristles 4–6, less than 1.5 × as long as nutlet, erect ......................................................................................................................................................... 3. T. alpinum

5b. Glumes 4–4.5 mm, apex with a scabrous awn; perianth bristles 7–9, ca. 3 × as long as nutlet, curved .... 4. T. schansiense


三棱针蔺 san leng zhen lin


Roots slender, fibrous. Rhizomes short, woody. Culms densely tufted, 20–100 cm tall, 3-angled, rigid, smooth, clothed at base with 4–6 pale brown leaf sheaths. Apical leaves with mouth obliquely truncate; leaf blade pale green, setaceous or reduced to a mucro, 3–12 mm but apical one to 20 cm, margin scabrous. Involucral bracts lanceolate to oblong-ovate, glume-like, apex mucronate. Inflorescences consisting of 2–4 cincinni or reduced to a single terminal spikelet. Spikelets ellipsoid to oblong, 6–7 × 2–3 mm, several flowered. Glumes reddish brown to brown, laxly arranged, oblong-ovate, 3–4 mm, membranous, apex acute with a costa excurrent into a short mucro. Perianth bristles 6, longer than nutlet, apically sparsely antrorsely scabrous. Stamens 6; anthers linear, ca. 2 mm. Style slender; stigmas 3. Nutlet brown, oblong to oblong-ovoid, ca. 1.8 mm, 3-sided. Fl. and fr. Apr–May.

Wet places at forest margins; ca. 900 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Shanxi, Zhejiang [Vietnam].


玉山针蔺 yu shan zhen lin

Scirpus subcapitatus Thwaites & Hooker, Enum. Pl. Zeyl. 351. 1864; Baeothryon subcapitatum (Thwaites & Hooker) A. Löve & D. Löve; S. morrisonensis Hayata; S. subcapitatus var. morrisonensis (Hayata) Ohwi.

Rhizomes short. Culms densely tufted, 20–30 cm tall, 3-angled, slightly scabrous, clothed at base with bladeless leaf sheaths. Leaf blade of apical leaf ca. 1 cm × 0.3 mm. Involucral bracts glumelike, basalmost awned. Inflorescences reduced to a single terminal spikelet, oblong, 4.5–5 × ca. 3 mm, few flowered. Glumes yellowish brown, oblong to narrowly ovate, ca. 3.5 × 0.9 mm, 1-veined, apex obtuse. Perianth bristles 4–6, white, to 2 cm in fruit, flattened, smooth, silky, eventually ± crinkled. Stigmas 3. Nutlet dark brown, oblong-obovoid, 1–1.5 mm, apex shortly pointet. Fl. and fr. Jun–Aug.

Wet places, thickets, damp ledges in mountain woods; 600–2300 m. Anhui, Chongqing (Nanchuan), Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangxi, Taiwan, Zhejiang [India, Indonesia, Japan, Malaysia, Papua New Guinea, Philippines, Sri Lanka, N Thailand, Vietnam].


鳞苞针蔺 lin bao zhen lin

Eriophorum alpinum Linnaeus, Sp. Pl. 1: 53. 1753; E. hudsonianum Michaux; Scirpus hudsonianus (Michaux) Fernald; Trichophorum alpinum var. hudsonianum (Michaux) Persoon.

Rhizomes creeping, branched. Culms densely tufted, 20–30 cm tall, 3-angled, slightly scabrous, clothed at base with bladeless leaf sheaths. Leaf blade of apical leaf ca. 1 mm × 0.3 mm. Involucral bracts glumelike, basalmost awned. Inflorescences reduced to a single terminal spikelet, oblong, 4.5–5 × ca. 3 mm, few flowered. Glumes yellowish brown, oblong to narrowly ovate, ca. 3.5 × 0.9 mm, 1-veined, apex obtuse. Perianth bristles 4–6, white, to 2 cm in fruit, flattened, smooth, silky, eventually ± crinkled. Stigmas 3. Nutlet dark brown, oblong-obovoid, 1–1.5 mm, apex shortly pointet. Fl. and fr. Jun–Aug.

Alpine tundra. Jilin [Japan, Korea, Russia; Europe, North America].

太行山针蔺 tai hang shan zhen lin


Rhizomes creeping. Culms tufted, 5–40 cm tall, slender, nearly 4-angled, smooth, clothed at base with 2 or 3 leaf sheaths. Leaf sheaths to 2 cm, with a setaceous blade at apex. Involucral bract glumelike, as long as or shorter than spikelet, apex with a short scabrous awn. Inflorescences reduced to a single terminal spikelet, obvoid to oblong, 4–5 × ca. 2 mm, 5- or 6-flowered. Glumes straw-colored to reddish brown, laxly arranged, oblong, ovate, or oblong-ovate, 4–4.5 mm, apex with 3 costae excurrent into a short scabrous awn. Perianth bristles 7–9, white, ca. 3 × as long as nutlet, curved, smooth, apically antrorsely scabrous. Stamens 2 or 3; anthers linear-oblong; connective apex slightly evident beyond anthers. Style slender; stigmas 3, filiform. Nutlet yellowish green, obvoid, ca. 1 mm, 3-sided, shiny. Fl. and fr. May–Sep.

- Rock crevices in valleys; below 700 m. Beijing (Fangshan), Shanxi (Yangcheng).


矮针蔺 ai zhen lin


Rhzizomes creeping, long, slender. Culms rather densely caespitose, 5–15 cm tall, slender, terete, grooved when dry. Leaves basal, semiterete, only apicalmost bearing a blade; leaf blade setaceous, to 1.8 cm but 2.5 cm, longer than blade; leaf blade setaceous, to 1.8 cm but 2.5 cm, longer than blade. Leaf sheath brown, to 2 cm, shorter than culm, very slender. Involucral bract glumelike, shorter than spikelet, apex mucronate. Inflorescences reduced to a single terminal spikelet, obvoid to ellipsoid, ca. 4.5 × 2.5 mm, few flowered. Glumes ovate to elliptic, ca. 2.5 mm, membranous, both surfaces yellowish brown, with 1 green vein, margin pale hyaline, apex obtuse; basal 2 glumes empty. Perianth bristles absent. Stamens 3; anthers linear-oblong; connective apex slightly evident beyond anthers. Style of medium length; stigmas 3. Nutlet blackish brown, obvoid, ca. 1.5 mm, 3-sided. Fl. and fr. May–Sep.

- Stream margins in grasslands, moist places along valleys; 500–4700 m. Gansu, Hebei, Nei Mongol, Ningxia, NW Sichuan, Xinjiang, Xizang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Uzbekistan; SW Asia, Europe, North America].


双柱头针蔺 shuang zhu tou zhen lin


Plants dioecious. Rhizomes creeping, long, slender. Culms 10–25 cm tall, slender, subtetere, smooth. Leaf sheath brown, to 2.5 cm, longer than blade; leaf blade setaceous, to 1.8 cm but basal 2 or 3 bladeless. Inflorescences reduced to a single terminal spikelet, ovoid, ca. 5 × 2.5–3 mm, few flowered. Glumes straw-colored, ovate, ca. 3.5 mm, thinly membranous, shiny, margin sometimes basally white but apically brown, apex obtuse. Perianth bristles absent. Stamens 3, sterile on female flowers. Style long; stigmas 2. Nutlet black at maturity, broadly obvoid, ca. 2 mm, plano-convex. Fl. and fr. Jul–Sep.

- Alpine grasslands, river margins; 2000–4600 m. Gansu, Ningxia, Qinghai, Shaanxi, Sichuan, NE Xizang, Yunnan [Africa, Australia, Europe].

7. _FUIRENA_ Rottböl, Descr. Icon. Rar. Pl. 70. 1773.

芙兰草属 fu lan cao shu

Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker, Jeremy J. Bruhl

Herbs, perennial or annual, sometimes with a creeping rhizome. Culms tufted or solitary, usually pubescent, nodose. Leaves mostly cauleine, pubescent or glabrous; sheath usually completely surrounding culm; ligule tubular, hyaline; leaf blade usually elongate, linear to lanceolate. Involucral bracts leaflike, sheathing at base. Inflorescences paniculate, with few to many glanduliferous clusters or sessile spikelets at few to several nodes. Spikelets ovoid to ellipsoid, terete, many flowered, usually pubescent. Glumes spirally imbricately arranged, oblong, broadly elliptic, or oblong, each subtending a bisexual flower but basal 1 or 2 empty, apex obtuse and awned. Perianth bristles 3 or 6, 3 outer ones needlelike (sometimes reduced or absent), 3 inner ones squamellate and alterneate with outer whorl. Stamens 3. Style not or hardly dilated at base, continuous with ovary, glabrous; stigmas 3. Nutlet ± stipitate, obvoid to ovoid, 3-sided, ± smooth or tuberculately

- About 30 species: warm regions of the world, most species in tropical Africa and tropical America; three species (one endemic) in China.

1a. Perianth bristles 3, all alike, obovate, subsessile, gradually narrowed at base; culms 60–120 cm tall; anthers 0.5–0.7 mm

1b. Perianth bristles 6, of two types, outer ones needlelike and scaberolesque or smooth, inner ones with a subquadrate or spatulate blade abruptly narrowed to a distinct ca. 0.3 mm stalk; culms 7–68 cm tall; anthers 0.2–0.3 mm.

2a. Annuals; inflorescences glanduliferous clusters each with 3–15 spikelets; spikelets 2.5–3 mm wide; inner whorl of perianth bristles with subquadrate blades

1. _F. umbellata_
2b. Perennials and rhizomatous; inflorescences glomerulate clusters each with 3–5 spikelets; spikelets 3.5–5 mm wide; inner whorl of perianth bristles with spatulate blades ........................................... 3. *F. rhizomatifera*


芙兰草 fu lan cao

Perennials. Rhizomes horizontally creeping. Culms solitary, erect, 60–120 cm tall, acutely 5-angular, glabrous except below inflorescence, basalmost node bulbously thickened. Cau
tine leaves with sheath 1.2–6.5 cm, tightly surrounding culm; ligule rust-colored, hyaline, truncate; leaf blade pale green, lan
cellate to linear-lanceolate, 10–20 × 0.9–1.9 cm, flat, ± rigid, usu
al glabrous but sometimes basally pubescent, 5-veined, apex acumin
tate. Involucral bracts leaflike; bractlets setaceous, sheathless. Inflorescences paniculiform, with 4–20 glomerulate clusters of spikelets; glomerules single or binate, 1.5–2.5 cm wide, bearing 6–15 spikelets; peduncles single or binate, occasion
ally branched, white villous. Spikelets brownish green to dark brownish green at maturity, ovoid to ovoid-ellipsoid, 7–12 × ca. 3 mm, many flowered, wholly covered with woolly hairs. Glumes brown, broadly elliptic to oblong, ca. 2 mm, membra
uous, apical ones abaxially sparsely pilose, apex emarginate and with a 3-veined costa ending in a short recurved puberulent 0.5–0.7 mm a
wn. Perianth bristles brown; outer bristles absent; 3 inner bristles obovate, subsecusse, gradually narrowed to base, margin ciliate, apex emarginate and with 3 prominent veins, with 1 costa usually excurrent into a short curved a
wn. Stamens 3; anthers oblong, 0.5–0.7 mm. Stigmas 3, as long as style. Nutlet brown at maturity, shortly stipitate, obovoid, ca. 1 mm (in

Wet grasslands, river margins, paddy fields; near sea level to 200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, SW Guangxi, Guan
don, Taiwan, S Yunnan [Bangladesh, Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia].


毛芙兰草 mao fu lan cao

*S. ciliaris* Linnaeus, Mant. Pl. Alt. 182. 1771; *Fuirena glomerata* Lamarck; *F. rottboellii* Nees.

Annuals. Rhizomes short. Culms tufted, 7–40 cm tall, 3-
angled, striate-sulcate, pubescent, clothed at base with 1 or 2 bladeless pubescent leaf sheaths. Cauline leaves with sheath 1–3.5 cm; ligule rust-colored to reddish, 1–2 mm, membranous, mouth truncate; leaf blade glabrous, 5–15 × 3–7 mm, flat, soft, 3-
costate, surfaces and margin ± pubescent, apex acuminate. Involucral bracts leaflike, surpassing inflorescence; bractlets set
aceous, sheathless. Inflorescences with 1–3 clusters of spikelets, in
terrupted, glomerulate, 1–3 cm wide, bearing 3–15 spikelets; peduncles single, mostly enclosed in bractlet sheaths. Spikelets ovoid to oblong, 5–8 × 2.5–3 mm, many flowered, covered with woolly hairs. Glumes basally yellowish brown, apically grayish black, obovate, 1.2–2 mm, thinly membranous, abaxi
al pilose, apex obtuse, emarginate, and with a 3-veined costa excurrent into a recurved 1–1.5 mm awn. Perianth bristles 6; 3 outer bristles needlelike, occasionally much reduced, retrorsely scabrous; 3 inner bristles brownish, with subquadrat blades abruptly narrowed at base to a distinct ca. 0.3 mm stalk, apex mucronulate. Stamens 3; anthers oblong, 0.2–0.3 mm. Ovary white, oblong, 3-sided; style brownish, 3–4 × as long as ovary; stigmas 3, 1/3–1/2 as long as style. Nutlet brownish, shortly stipitate, obovoid, ca. 1 mm, 3-sided. Fl. and fr. Jul–Dec. 2n = 38.

Wet places, often in paddy fields, river margins; near sea level to 200 m. Fujian, Guangdong, S Guangxi, Hainan, Hebei, Jiangsu, Shan
don, Taiwan, S Yunnan [Bangladesh, Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia].


黔芙兰草 qian fu lan cao

*Fuirena umbellata* Rottboll var. *angustifolia* Kükenthal.

Perennials. Rhizomes oblique; scales purplish brown, broadly ovate, apex acute. Culms laxly tufted, 35–68 cm tall, slender, subang
tular, striate-sulcate, clothed at base with 2 leaf sheaths. Cauline leaves with sheath 1–3 cm, glabrous; ligule reddish brown, 1–2 mm, membranous, mouth truncate; leaf blade 3–5 mm wide, flat, margin scabrous, apex acuminate. Involucral bracts leaflike, margin and sheath pubescent. Inflorescences with 3 glomerulate clusters of spikelets, each cluster bearing 3–5 spikelets; peduncles compressed, pubescent. Spikelets ovoid to spherical, 5.5–8 × 3.5–5 mm. Glumes brownish green to grayish black, broadly obovate, ca. 3 mm, pubescent, margin ciliate, apex rounded, emarginate, and with a 3-veined costa excurrent into a scabrous ca. 1 mm a
wn. Perianth bristles 6; 3 outer bristles brownish, needlelike, 1/2–2/3 as long as inner ones, squamellate, pubescent; 3 inner bristles with blades abruptly narrowed at base, distinctly stalked, margin ciliate, apex obtuse. Stamens 3; anthers oblong, 0.2–0.3 mm, apex obtuse. Stigmas 3, as long as style. Nutlet obovoid, ca. 1 mm, 3-

● Swamps; ca. 800 m. SW Guangxi, Guizhou.


三棱草属 san leng cao shu

Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker, David A. Simpson

*Scirpus* [unranked] *Bolboschoenus* Ascherson, Fl. Brandenburg 1: 753. 1864.

Herbs, perennial. Rhizomes often forming hard ovoid tubers. Culms many node, base bulbously thickened. Leaves basal and
cauline; sheath tubular; ligule absent; leaf blades linear, flat. Involutional bracts leaflike, surpassing inflorescence, spreading. Inflorescence a terminal anthela or capitate with 1 to many spikelets. Spikelets with many spirally arranged deciduous glumes, each subtending a bisexual flower. Perianth bristles 3–6, shorter to longer than nutlet, deciduous with nutlet. Stamens 3. Style base not distinct, slightly thickened or not, persistent. Nutlet biconvex to 3-sided, smooth, apex beaked.

About eight species: mainly in North America and E Asia; four species in China.

A hybrid, Scirpus × mariqueter Tang & F. T. Wang (Fl. Reipubl. Popularis Sin. 11: 223. 1961), was originally described from Beijing. It was believed to be a hybrid of Bolboschoenus planiculmis and Schoenoplectus triqueter. Specimens have since been collected from Shanxi. Under current generic concepts, it is considered an intergeneric hybrid, × Bolboschoenoplectus mariqueter (Tang & F. T. Wang) Tatanov (Novosti Sist. Vyssh. Rast. 39: 154. 2007).

1a. Nutlet 3-sided; stigmas 3; perianth bristles almost as long as nutlet; inflorescence a simple anthela .......................................................... 1. B. yagara
1b. Nutlet biconvex; stigmas 2; perianth bristles ca. 1/2 as long as nutlet; inflorescences capitate and rarely with short rays or reduced to a single spikelet.

2a. Glumes pale yellow; anthers ca. 1 mm; nutlet 2–2.5 mm ........................................................................................................ 3. B. affinis
2b. Glumes bright orangish brown, brown, or dark brown; anthers 2–4 mm; nutlet 2.5–3.5 mm.

3a. Glumes brown to dark brown; nutlet 3–3.5 mm ......................................................................................... 2. B. planiculmis
3b. Glumes bright orangish brown; nutlet ca. 2.5 mm ................................................................................. 4. B. maritimus


4. B. maritimus

1. Bolboschoenus yagara

2. Bolboschoenus planiculmis

3. Bolboschoenus affinis

4. B. maritimus


Rhizomes long creeping, blackish brown, 3–6 mm thick, terminated by a tuber; tuber glbobos to depressed obovoid, 2–3 × 3–4 cm, woody, covered with blackish to purplish brown membranous broad scales. Culms solitary from a tuber, 0.6–1.5 m tall, sharply 3-angled, smooth. Leaves as long as or overtopping culm; sheath 5–20 cm, front with veins nearly to summit (i.e., lacking veinless area); blade broadly linear, 5–10 mm wide, ± stiff, margin scabrous. Involutional bracts 3 or 4, leaflike, usually longer than inflorescence. Inflorescence a simple anthela; rays 3–8, unequal, to 7 mm, smooth, each terminated by a single spikelet or a cluster of 2 or 3 (or 4) spikelets. Spikelets rust-colored brown, ovoid to oblong-ovoid, 1–2 × 0.5–0.8 (–1) cm, many flowered. Glumes rust-colored brown, densely imbricate, oblong, ca. 7 mm, membranous, abaxially minutely pubescent, 1-veined costa projected beyond apex forming a recurved 2–3 mm scarious awn, apex 2-cleft and lacerate. Perianth bristles 6, almost as long as nutlet, retrorsely scabrous. Stamens 3; anthers linear, ca. 4 mm. Style slender; stigmas 3. Nutlet grayish brown, obovoid, 3-sided, base cuneate-attenuate, apex contracted to a conic short beak. Fl. and fr. May–Jul.

Lake margins, shallow water, marshes, wet places; near sea level to 2000 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Taiwan, Xining, Yunnan, Zhejiang [India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Papua New Guinea, Philippines, Russia, Tajikistan, SW Asia, Europe].

2. Bolboschoenus planiculmis

3. Bolboschoenus affinis

4. B. maritimus

Scirpus affinis Roth in Roemer & Schultes, Syst. Veg. 2: 1817; Bolboschoenus popovii T. V. Egorova; B. strobilinus (Roxburgh) V. I. Kreczetowicz; S. maritimus Linnaeus subsp. affinis (Roth) T. Koyama; S. maritimus var. affinis (Roth) C. B. Clarke; S. strobilinus Roxburgh.

Rhizomes creeping, terminated by a small ovoid tuber. Culms 10–50 cm tall, 3-angled, smooth. Leaf blade linear, 1–4 mm wide, flat, ± stiff, apical ones longer than or as long as culm. Involutional bracts 2 or 3, leaflike, overtopping inflorescence. Inflorescences of 1–10 spikelets, capitulate, rarely with short rays. Spikelets ovoid, 10–16 × 3.5–7 mm, many flowered. Glumes pale yellow, oblong-ovate, 5–6 mm, membranous, abaxially ± pubescent, 1-veined costa excursive into an awn, apex lacerate. Perianth bristles 6, ca. 1/2 as long as nutlet, retrorsely scabrous. Stamens 3; anthers linear-oblong, ca. 1 mm;
connective apex conic, ca. 0.5 mm. Style slender; stigmas 2.
Nutlet yellowish white but becoming dark brown at maturity, broadly obovoid, ca. 2.5 mm, biconvex, shiny. Fl. and fr. Jun–Sep.

Lake margins, swampy places (often alkaline), wood margins; 1000–2900 m. Gansu, W Nei Mongol, Ningxia, Xinjiang [Afghanistan, Cambodia, India, Japan, Kazakhstan, Laos, Mongolia, Pakistan, Russia, Thailand, Turkmenistan, Uzbekistan, Vietnam; SW Asia, Afghanistan, Cambodia, India, Japan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Turkmenistan, Uzbekistan; Africa, SW Asia, Atlantic Ocean islands, Europe, North and South America, Pacific islands].

This taxon is part of an inadequately studied worldwide complex centered around Bolboschoenus maritimus.


8. **Schoenoplectus** (Linnaeus) Lye. 1959, nom. cons.


a sheath or more rarely developing a ligulate blade. Involucral bracts culmlike, erect. Inflorescence a pseudolateral anthela or more frequently capitate with (1 or) few to many spikelets. Spikelets ovoid to ellipsoid. Glumes many, spiral (rarely pseudodistichous), deciduous or rarely persistent, often each subtending a bisexual flower. Perianth bristles 0–6, needlelike, shorter to longer than nutlet, smooth, scabrous, or plumose, deciduous with nutlet. Stamens 1–3. Style base not distinct, not thickened, persistent. Nutlet obvoid, ± 3-sided or biconvex, smooth to rugose, apex beaked or not.

About 77 species: worldwide; 22 species (five endemic) in China.

1a. Perianth bristles plumosely fringed.

2a. Culms terete; perianth bristles longer than nutlet; stigmas 2 ................................................................. 1. *S. subulatus*
2b. Culms 3-angled to obtusely 3-angled just below inflorescence; perianth bristles ± as long as nutlet; stigmas 3 ................................................................................................................................. 2. *S. litoralis*

1b. Perianth bristles retrorsely scabrous.

3a. Glumes emarginate and with a 1-veined costa excurrent into an awn; nutlet smooth; culms scattered; leaves developed.

4a. Involucral bracts much overtopping inflorescence, 1.5–2.5 cm; creeping rhizomes not red .................. 3. *S. ehrenbergii*
4b. Involucral bracts usually shorter than inflorescence, 1.5–5.5 cm; creeping rhizomes red.

5a. Culms sharply 3-angled but sometimes basally terete and only 3-angled apically; creeping rhizomes slender ................................................................................................................................. 4. *S. trigueter*
5b. Culms terete; creeping rhizomes stout.

6a. Spikelets 4–7 (–10) mm; glumes abaxially with reddish resinous spots; stigmas 2; nutlet plano-convex .............................................................. 5. *S. tabernaemontani*
6b. Spikelets 6–15 mm; glumes abaxially smooth; stigmas usually 3; nutlet compressed 3-sided ................................................................. 6. *S. lacustris*

3b. Glumes apex acute to obtuse and without an awn; nutlet mostly rugose; culms tufted (except *S. lineolatus*); leaves absent.

7a. Culms 3-angled (3–5-angled in *S. trapezoideus* and *S. monocephalus*), sometimes winged.

8a. Perianth bristles longer than nutlet, retrorsely scabrous; nutlet compressed 3-sided ................................ 7. *S. mucronatus*
8b. Perianth bristles shorter than nutlet, retrorsely scabrous or not; nutlet 3-sided or biconvex.

9a. Nutlet 3-sided; perianth bristles glabrous .................................................................................................. 8. *S. chuanus*
9b. Nutlet biconvex; perianth bristles retrorsely scabrous ........................................................................ 9. *S. trapezoideus*

7b. Culms terete.

10a. Plants with a creeping rhizome; culms scattered.

11a. Glumes oblong to elliptic, margin not ciliate; perianth bristles as long to 2 × as long as nutlet .................................................................................. 10. *S. lineolatus*
11b. Glumes broadly ovate; margin ciliate; perianth bristles absent or 1–3 and very short ...... 11. *S. monocephalus*

10b. Plants without a creeping rhizome; culms densely tufted.

12a. Culms 56–120 cm tall.

13a. Involucral bracts often deflexed; culms without transverse septa; stigmas 2 ............................... 12. *S. clemensii*
13b. Involucral bracts erect; culms with many transverse septa; stigmas 3 .............................. 13. *S. articulatus*

12b. Culms 15–30 (–40) cm tall.

14a. Nutlet 3-sided, distinctly rugulose; stigmas 3.

15a. Perianth bristles very well developed, slightly longer than nutlet, retrorsely scabrous .............................................................. 20. *S. chen-moui*
15b. Perianth bristles very short and glabrous or absent.

16a. Culms 2.5–3.5 mm thick; involucral bract 10–30 cm; perianth bristles very short, glabrous .............................................................. 21. *S. schoofii*
16b. Culms ca. 1 mm thick; involucral bract 1.5–12 cm; perianth bristles absent .... 22. *S. supinus*

14b. Nutlet biconvex, obscurely rugulose or smooth; stigmas 2.

17a. Glumes oblong, 2–3 mm; nutlet 1–1.5 mm.

18a. Spikelets yellow, 7–20 mm; glume margin apically ciliate; nutlet obscurely rugulose .............................. 18. *S. jingmenensis*
18b. Spikelets brownish green, 4–7 mm; glume margin entire; nutlet subsMOOTH .............................................................. 19. *S. komarovi*

17b. Glumes broadly ovate, oblong-ovate, or elliptic, 3.5–5.5 mm; nutlet 1.6–2.5 mm.

19a. Glumes pale green to brownish green, oblong-ovate, 4–5.5 mm, apex acuminate; nutlet broadly ellipsoid, ca. 2.5 mm; stigmas 2; perianth bristles 4, longer than nutlet ................................. 17. *S. wallichii*

钻苞水葱 zuan bao shui cong


Rhizomes short. Culms 50–120 cm tall, 3–8 mm thick, terete, clothed at base with several bladeless leaf sheaths. Leaf sheaths to 20 cm, subpapery, membranous at mouth, disintegrating into fibers. Involucral bract 1, culmlike, longer to shorter than inflorescence, nearly subulate, stiff, hyaline margins basally ca. 1 mm wide. Inflorescence a pseudolateral simple or compound anthem, 5–8, to 5 mm, compressed 3-angled, scabrous. Spikelets solitary or binate, ovoid to oblong-ovoid, 6–20 mm, many flowered. Glumes pale brown to yellowish brown, ovate-elliptic, 3–4 mm, membranous, 1½ veined, margin white hyaline, apex obtuse to emarginate. Perianth bristles 4 or 5, longer than nutlet, plumosely fringed. Stamens 2; anthers linear; connective apex with a fimbriate appendage. Stigmas 3. Nutlet dark reddish brown to blackish, broadly obovoid, ca. 2 × 1.3 mm, biconvex, smooth. Fl. and fr. Jul.–Sep. 2n = 42, 78, 80, 84.

Water margins, swampy places; ca. 600 m. Gansu, Ningxia, W Qinghai, Shanxi, Sichuan, Xinjiang [Afghanistan, India, Indonesia, Kazakhstan, Kyrgyzstan, W Mongolia, Pakistan, Papua New Guinea, Philippines, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Europe, Indian Ocean islands, Madagascar, Pacific Ocean islands].


羽状刚毛水葱 yu zhuang gang mao shui cong

*Scirpus litoralis* Schrader, Fl. Germ. 1: 142. 1806.

Rhizomes short; stolons long creeping, slender. Culms erect, 50–120 cm tall, 3–10 mm thick, 3-angled to obtusely 3-angled just below inflorescence, glossy. Leaves reduced to a bladeless or a shortly laminate sheath. Involucral bract 1, simulating a continuation of culm, 2–5 (–10) cm, erect, rigid. Inflorescence a pseudolateral simple or compound anthem, 4–6 cm, with few to many spikelets; rays slender, smooth. Spikelets solitary, reddish brown, ovoid to oblong-ovoid, 6–12 × 1.5–3 mm, terete, densely many flowered, apex ± acute. Glumes broadly elliptic, 3.5–4 × ca. 2 mm, membranous, margin broadly white hyaline and apically minutely ciliate, apex obtuse to ± notched and with a prominent green vein excurrent into a short mucro. Perianth bristles (3 or)4 (or 5), rust-colored, ligulate-spatulate, ± as long as nutlet, antrorsely scabrous, apically plumosely fringed. Stamens (2 or)3; anthers 1.5–2 mm; connective apex with a fimbriate appendage. Stigmas 3. Nutlet reddish brown to blackish, broadly obovoid, ca. 2 × 1.3 mm, biconvex, smooth. Fl. and fr. Jul.–Sep. 2n = 42, 78, 80, 84.

Near water margins. Gansu, Hebei, Ningxia, Shandong, Xinjiang [Kazakhstan, Russia; E Europe].


剑苞水葱 jian bao shui cong

*Scirpus ehrenbergii* Boeckeler, Linnaea 36: 712. 1870.

Plants stoloniferous. Culms 1–1.5 m tall, ca. 1 cm thick, sharply 3-angled, angles slightly winged, base clothed with long leaf sheaths. Leaf blade 40–60 × ca. 0.8 cm, abaxially ribbed, basally folded. Involucral bract 1, culmlike, to 25 cm, erect, greatly overtopping inflorescence, obtusely 3-angled. Inflorescence a pseudolateral head, ± dense, with 3–5 spikelets. Spikelets oblong to oblong-ovoid, 8–10 × 2–3 mm, 10-flowered. Glumes brown, broadly ovate to elliptic, ca. 5 mm, membranous, margin white hyaline, apex marginate with a 1-veined costa excurrent into a short awn. Perianth bristles 6, longer than nutlet, retrorsely scabrous. Stamens 3; anthers linear, ca. 2 mm. Style slender; stigmas 3, shorter than style. Nutlet broadly ovoid, ca. 2 mm, plano-convex. Fl. and fr. Aug.–Oct.

Near water margins. Gansu, Hebei, Ningxia, Shandong, Xinjiang [Kazakhstan, Russia; E Europe].


三棱水葱 san leng shui cong


Rhizomes long creeping, reddish brown, slender. Culms solitary, erect, 20–100 cm tall, 2–8 mm thick, 3-angled, subrigid, clothed at base with 2 or 3 leaf sheaths. Leaf sheath pale green, 5–15 cm, membranous, distinctly transversely septate, mouth obliquely truncate: leaf blade flat, 1.3–5.5 (–8) cm × 1.5–2 mm. Involucral bract 1, culmlike, 1.5–7 cm, 3-angled, usually...
shorter than inflorescence, apex subacute. Inflorescence a pseudolateral anthera, 3–6 cm, laxly bearing 3–20 spikelets or sometimes congested in a headlike cluster; rays to 5 cm, ± stout, scabrous. Spikelets oblong to ovoid-oblong, 6–12 × 3–7 mm, densely many flowered, apex obtuse. Glumes yellowish brown, elliptic, oblong, or broadly ovate, 3–4 mm, membranous, margin sparsely ciliate, apex emarginate to rounded with a green costa excurrent into a mucro. Perianth bristles 3–5, almost as long as nutlet, retrorsely scabrous. Style ca. 2 mm; stigmas 3. Nutlet brownish at maturity, obovoid, 2–3 mm, plano-convex, shiny. Fl. and fr. Jun–Oct. 2n = 40, 42.

Wet places at river margins, ditches, pond margins, swamps; 100–2300 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, N Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, E Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, India, Japan, Korea, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Uzbekistan, N Africa, SW Asia, Atlantic Ocean islands, Europe].


水葱 shui cong


Rhizomes brown, horizontally creeping. Culms 1–2[–3] m tall, terete, smooth, clothed at base with 3 or 4 leaf sheaths. Leaf sheaths to 38 cm, membranous, apicalmost sheath with a blade; leaf blade linear, 1.5–11 cm. Involucral bract 1, culmlike, subulate, usually shorter to rarely slightly longer than inflorescence, erect. Inflorценсe a pseudolateral simple or decom posed anthera; rays 4–13 or more, unequal in length, to 5 cm, convex to concave, scabrous. Spikelets solitary or in clusters of 2 or 3, ovoid to oblong, 4–10 × 2–3.5 mm, densely many flowered, apex acute to obtuse. Glumes brown to purplish-coloured, elliptic to broadly ovate, 2.5–3 mm, membranous, abaxially with reddish resinous spots on apical median part, margin broadly white hyaline and ciliate toward apex, apex obtuse to emarginate with a green costa excurrent into a mucro. Perianth bristles (2–)6, reddish brown, shorter than to equaling nutlet, retrorsely scabrous except at base. Stamens 3; anthers linear; connective apex evident beyond anthers. Style ca. 2 mm; stigmas 2(or 3, and 3rd when present shorter than other 2). Nutlet grayish, broadly obovoid to ellipsoid, 2–2.5 mm, subplano-convex, apically contracted into a 0.2–0.4 mm beak. Fl. and fr. Jun–Sep. 2n = 42.

Lake margins, shallow water; (near sea level to) 300–3200 m. Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Afghanistan, India, Japan, Kazakhstan, Korea, Kyrgyzstan, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Tajikistan, Turkmenistan, Uzbekistan, Vietnam; N Africa, SW Asia, Australia, Central, North, and South America, Europe, Pacific islands].


沼生水葱 zhaosheng shui cong


Rhizomes stout, horizontally creeping. Culms erect, green, 1–2.5 m tall, ca. 2(–3) cm thick, terete, smooth. Leaves mostly reduced to a sheath, glabrous; basal sheath brownish; apical 2 sheaths with leaf blades; leaf blade subulate to linear, 1–10 cm. Involucral bract 1, culmlike, subulate, as long as to slightly overtopping inflorescence. Inflorценсe a pseudolateral simple or decom posed anthera; rays 2–8, unequal in length, 5–8 cm. Spikelets reddish brown, oblong to ovoid, 0.6–1.5 cm, apex acute. Glumes ovate, abaxially glabrous, margin ciliate, apex emarginate with a 1-veined costa excurrent into a short awn. Perianth bristles 5 or 6, slightly longer than nutlet, retrorsely scabrous. Stamens 3; anthers linear, 1.5–2 cm; connective apex with a pyramidal-ovoid bearded appendage. Stigmas 3. Nutlet grayish, obovoid, ca. 3 mm, compressed 3-sided (ridge evident on abaxial surface when immature). Fl. and fr. Jun–Aug. 2n = 38, 42, 80.

Swamps, shallow water; ca. 1000 m. Xinjiang (Shawan) [Afghanistan, N India, Kashmir, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan, N and S Africa, SW Asia, Europe].


水毛花 shui maohua

Scirpus mucronatus Linnaeus var. robustus Miquel, Ann. Mus. Bot. Lugduno-Batavi 2: 143. 1865; Schoenoplectus mucronatus var. robustus (Miquel) T. Koyama; S. triangulatus (ROXBURGH) SOJÁK; Scirpus acutus J. Presl & C. Presl (1828), not Muhlenberg ex Bigelow (1814); S. mucronatus subsp. robustus (Miquel) T. Koyama; S. mucronatus var. subleioleptus FRANCHE & SAVATIER; S. preslii A. Dietrich; S. triangulatus ROXBURGH; S. triangulatus var. sanguineus TANG & F. T. WANG; S. triangulatus var. tripteris TANG & F. T. WANG.

Rhizomes short. Culms deep green, slightly densely tufted, 45–130 cm tall, 5–11 mm thick, sharply 3-angled with shallowly concave sides, clothed at base with 2–4 leaf sheaths. Leaf sheaths to 38 cm, membranous to herbaceous, obliquely truncate at mouth. Involucral bract 1, culmlike, upright or obliquely bent, 2–10 cm. Inflorescence a pseudolateral hemispheric head, with (3–)5–20 spikelets. Spikelets brownish green, ovoid, oblong-ovoid, or narrowly ovoid, 10–20 × 4–6 mm, terete, densely many flowered, apex subacute. Glumes pale green and brownish tinged usually with reddish brown, broadly obovate, ovate or broadly ovate, 3.8–5 × 2.5–3 mm, very concave, papyry, margin apically minutely ciliate, apex with a green 1–3-veined costa excurrent into a mucro. Perianth bristles 6, 1.5–2 × as long as nutlet, retrorsely scabrous. Stamens 3; anthers linear, ca. 2.5 mm; connective apex slightly prominent beyond anthers. Style ca. 4 mm; stigmas 3. Nutlet blackish brown at maturity, obovoid to broadly obovoid, 2.25 × 1.5–2 mm,
compressed 3-sided, conspicuously or inconspicuously transversely wrinkled, ± shiny, base contracted to cuneate, apex rounded to mucronate. Fl. and fr. May–Nov. 2n = 44.

Pond and lake margins, swamps, grasslands in streamsides, paddy fields; 100–2700 m. Anhui, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Malaysia, Sri Lanka; Africa, S Europe, Madagascar].

Only specimens of Schoenoplectus mucronatus subsp. robustus, as interpreted here, have been seen from China by the present authors. If recognized at specific rank, this taxon would be correctly named as Schoenoplectus mucronatus var. triangulatus. Schoenoplectus mucronatus subsp. mucronatus occurs in Europe and is naturalized in North America.


曲氏水葱 qu shi shui cong


Rhizomes short, creeping. Culms laxly tufted, 66–76 cm tall, ± stout, 3-angled, distinctly channeled, smooth, clothed at base with 2 or 3 leaf sheaths. Leaf sheaths to 25 cm; basal sheaths dark brown, with prominent transverse veins; apical sheaths green to greenish brown, mouth obliquely truncate with hyaline margin. Involucral bract 1, erect to obliquely spreading, culmlike, 5–9 cm, 3-angled, smooth. Inflorescence a pseudolateral head, with ca. 10 spikelets. Spikelets oblong to ellipsoid, 5–10 × 3–5 mm, densely many flowered. Glumes brown with dark brown short lines, broadly ovate, 2.5–3 mm, concave, papery, many veined, margin hyaline, apex rounded with a yellowish green costa excurrent into a micro. Perianth bristles 6, 1/4–1/3 as long as nutlet, glabras. Stamens 3; anthers narrowly deltoid, apex obtuse; connective apex slightly dilated. Style short; stigmas 3, slender. Nutlet black at maturity, obovoid, 1.5–2 mm, 3-sided, shiny. Fl. and fr. Jul–Aug.

● Shallow water. Jiangsu (Nanjing).


五棱水葱 wu leng shui cong


Rhizomes short. Culms tufted, erect, 40–70 cm tall, ± slender, 3–5-angled, clothed at base with bladeless leaf sheaths. Leaf sheaths pale brown at base, to 12 cm, oblique at mouth. Involucral bract 1, erect, culmlike, 5–15 cm. Inflorescence a pseudolateral head, with 2–9 spikelets. Spikelets sessile, pale rust-colored brown, oblong-ovoid to ovoid, 8–14 × 4–6 mm. Glumes pale rust-colored brown, broadly elliptic, 3–4 mm, thinly leathery, with a green costa excurrent into a micro, apex acute. Perianth bristles 6, ca. 2/3 as long as nutlet, retrorsely scabrous. Stamens 3; anthers 1.2–1.5 mm. Style ca. 3 mm; stigmas (2 or)3. Nutlet blackish brown, broadly obovoid to sub-spherical, ca. 2 mm, biconvex or unequally biconvex, obscurely wrinkled. Fl. and fr. Aug–Oct.

Wet places, swamps by streams; 200–1000 m. Fujian, Guangxi, Hebei, Jilin, Shandong [Japan].


细匍匐茎水葱 xi pu fu jing shui cong


Rhizomes creeping, long, slender. Culms solitary at nodes of rhizome, distantly arranged in a row, dark green, 7–35 cm tall, 0.8–1.2 mm thick, terete, clothed at base with 1 or 2 bladeless short leaf sheaths. Leaf sheaths pale brown, 1–5 cm, hyaline, mouth obliquely truncate. Involucral bract 1, erect, culmlike, apex subulate. Inflorescence generally a single pseudolateral spikelet. Spikelet sessile, greenish straw-colored, oblong to broadly narrowly ovoid, 4–6 × 2–3 mm, densely many flowered. Glumes pale yellow with some brown lines, oblong to elliptic, 4–4.5 × 1.8–2 mm, membranous, keel green, margin white hyaline, apex acute to obtuse. Perianth bristles 4 or 5, as long as 2 × as long as nutlet. Stamens 2 or 3; anthers linear, ca. 2.5 mm. Style 4–5 mm; stigmas 2. Nutlet black, obovoid to ellipsoid, 1.7–2.2 × 1.2–1.8 mm, plano-convex, shiny. Fl. and fr. Jul–Oct. 2n = ca. 60.

Marshy places; near sea level. Guangdong, Taiwan, Zhejiang [Japan, Russia (Far East)].


单穗水葱 dan sui shui cong


Rhizomes creeping, with several fusiform bulblets. Culms scattered, 10–20 cm tall, 0.5–1.5 mm thick, terete, channeled, smooth, clothed at base with 1 or 2 dark brown bladeless leaf sheaths. Leaf sheaths 1–3 cm, hyaline, mouth obliquely truncate. Involucral bract 1, erect, culmlike, 1–2.5 cm, apex subacute. Inflorescence generally a single pseudolateral spikelet. Spikelet sessile, oblong to ovoid, 4–10 × 2–4 mm, densely 6–10-flowered. Glumes pale brown with minute brown spots, broadly ovate to ovate-oblong, 1–3.5 mm, veinless or 1-veined, apex obtuse. Perianth bristles absent or 1–3 unequal short bristles, when present 1/6–4/5 as long as nutlet, glabras. Stamens 3; anthers linear, ca. 1.5 mm. Style slender, ca. 3 mm; stigmas 2, ca. 1 mm. Nutlet brown, broadly ovoid, 1.5–2.5 mm, plano-convex, shiny, glabrous. Fl. and fr. Jun–Sep.

● Trail margins, wet places. Anhui (Fuyang).

12. Schoenoplectus clemensii (Kükenthal) G. C. Tucker, comb. nov.

佛海淀水葱 fo hai shui cong

Rhzomes short, without creeping stolons. Culms 60–120 cm tall, 5–8 mm thick, terete, smooth, clothed at base with 3 or 4 leaf sheaths. Leaf sheaths brown to greenish, mouth obliquely truncate and bladeless or sometimes setaceous. Inflorescence a pseudolateral head with many spikelets. Spikelets sessile, dark brown, ovoid to oblong, 4–5 × ca. 3 mm, many flowered. Glumes pale brown with dark brown lines, obovate to elliptic, 2–2.5 mm, membranous, margin ciliolate, apex acute to obtuse with a costa excurrent into a mucro. Perianth bristles 5 or 6, as long as to slightly longer than nutlet, retrorsely scabrous. Stamens 3; anthers linear; connective apex evident beyond anthers. Style long; stigmas 2. Nutlet black at maturity, broadly obovoid to obovoid, ca. 1.2 mm, plano-convex, shiny. Fl. and fr. May–Jun.

Ponds; ca. 1600 m. Yunnan (Fuhai) [Papua New Guinea, Vietnam].


Roots many, fibrous. Rhizomes elongated, bearing culms in a well-spaced row forming a single rank. Culms not tufted, 15–70 cm tall, 1–4 mm thick, slightly stiff, terete or oblongely several angled, smooth, clothed at base with 2 or 3 bladeless leaf sheaths. Leaf sheaths pale green, 5–15 cm, obliquely truncate at mucronate mouth. Involucral bract 1, pale green, looking like a continuation of culm, 3–15 cm, perpendicular to it. Inflorescence a pseudolateral head with 2–4 spikelets. Spikelets brown to pale brown, ovoid to oblong-ovoid, 7–20 × 3–6 mm, densely many flowered. Glumes pale brown with brown lines, oblong, ca. 2 mm, membranous, veins obscure, with green 1-veined costa excurrent into a mucro. Perianth bristles 4–6, ± as long as nutlet, retrorsely scabrous. Stamens 3; anthers ellipsoid, short. Style long; stigmas 2, slender. Nutlet blackish brown, obovoid, ca. 1 mm, plano-convex, distinctly transversely wrinkled, shiny. Fl. and fr. Aug–Nov.

Damp meadows on mountains; 2000–2700 m. Guizhou, Xizang [Bhutan, Nepal].


*Scirpus wallachii* Nees in Wight, Contr. Bot. India, 112. 1834; *Schoenoplectiella wallachii* (Nees) Lye; *Scirpus erectus* Poiret var. *wallachii* (Nees) Beetle; *S. sasaki* Hayata.

Plants without a distinct rhizome. Culms tufted, 10–40 cm tall, smooth, clothed at base with 2–4 leaf sheaths. Leaf sheaths 2–10 cm, with basal ones straw-colored and apical ones pale green, mouth obliquely truncate and with a subulate ca. 0.8 mm appendage. Involucral bract 1, erect, ciliolate, 4.5–16 cm, base dilated, apex acute. Inflorescence a pseudolateral head, with 1–3 spikelets. Spikelets pale green to pale brownish green, narrowly ovoid to oblong-ovoid, 7–20 × 3–6 mm, densely many flowered, apex acute. Glumes oblong-ovate, 4–5.5 × ca. 2.5 mm, thinly leathery, apex acuminate with a green costa excurrent into a mucro. Perianth bristles 4(5), longer than nutlet, retrorsely scabrous except at base. Stamens 3; anthers slender, connective apex slightly evident beyond anthers. Style 2–2.5 mm; stigmas 2 or 3. Nutlet blackish brown, broadly obovoid, ca. 2.5 mm, plano-convex, ± transversely wrinkled, shiny. Fl. and fr. Aug–Nov.

Wet places, stream margins, river margins, paddy fields; 800–1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [NE India, Japan, Korea, Malaysia, Myanmar, Philippines, Vietnam].


Rhizomes short. Culms tufted, 10–32 cm tall, 2–3 mm thick, terete, smooth, clothed at base with 2 or 3 leaf sheaths. Leaf sheaths 1.5–9 cm, mouth obliquely truncate; apicalmost sheath usually with a slender 1–1.7 cm blade. Involucral bract 1, culmlike, 13–18 cm, sometimes longer than culm, subterete, base dilated, margin hyaline; bractlets pale brown, glumelike, ovate to broadly lanceolate, 4–10 mm. Inflorescence a pseudolateral head, with 5–10 spikelets. Spikelets sessile, oblong to narrowly ovoid, 7–20 × ca. 1 mm, many flowered. Glumes pale brown with brown lines, oblong, ca. 2 mm, membranous, deciduous at nutlet maturity, margin apically ciliate, apex rounded and with a 1–3-veined costa excurrent into a mucro. Perianth bristles 4–6, ± as long as nutlet, retrorsely scabrous. Stamens 1 or 2; anthers ellipsoid, short. Style long; stigmas 2, slender. Nutlet blackish brown, obovoid, ca. 1 mm, plano-convex, distinctly transversely wrinkled, shiny. Fl. Sep.

*•* Hubei (Jingmen).


*吉林水葱* *Scirpus komarovii* Roshevitz in Komarov, Fl. URSS 3: 579. 1935; *S. hondoensis* Ohwi var. *leiocarpus* (Komarov) Ohwi; *S. okuyamae* Ohwi; *S. sasaki* Hayata var. *leiocarpus* (Komarov) Kitagawa; *S. supinus* Linnaeus var. *leiocarpus* Komarov.

Rhizomes very short. Culms tufted, 10–50 cm tall, terete, smooth, clothed at base with 2 or 3 bladeless leaf sheaths. Leaf sheaths green, 1–10 cm, base sometimes pale brown, mouth obliquely truncate. Involucral bract 1, culmlike, 8–18 cm, base slightly dilated. Inflorescence a pseudolateral head, with 2–10 or more spikelets. Spikelets sessile, ovoid to oblong-ovoid, 4–7(10) × 2–3 mm, many flowered. Glumes pale brown with dark brown lines, oblong, ca. 2 mm, membranous, veins obscure, with green 1-veined costa excurrent into a mucro at rounded apex. Perianth bristles 4, ± as long as nutlet, retrorsely scabrous. Stamens 3; anthers narrowly ovoid, short; connective apex slightly evident beyond anthers. Style long; stigmas 2. Nutlet blackish brown, broadly obovoid, 1–1.5 mm, compressed biconvex, obscurely transversely wrinkled, shiny. Fl. and fr. Jun–Oct.

Swamps, wet places, paddy fields; near sea level to 100 m. Heilongjiang, Jilin, Liaoning, NE Nei Mongol [Japan, Korea, Russia (Far East)].


Roots fibrous. Culms 10–30 cm tall, ca. 1.5 mm thick, terete, smooth, clothed at base with 2–4 green to pale brown leaf sheaths. Leaf sheaths 1–10 cm, mouth obliquely truncate and sometimes with a seaceous ca. 1 cm blade. Inflorescence a pseudolateral head, with 2–10 spikelets. Spikelets oblong-ovoid to oblong, 5–10 × ca. 3 mm, many flowered. Glumes yellow with brown lines, obovate to broadly obovate, 3–10, narrowly ovoid, ovoid, or oblong, 4–8 × 2–3 mm, subdensely many flowered, apex subacute. Glumes elliptic and boat-shaped, 1.8–2.5 mm, with a prominent green 3-veined keel, margins membranous, apex obtuse and shortly mucronate. Perianth bristles absent or rarely rudimentary. Style ca. 1.5 mm; stigmas 3. Nutlet black at maturity, broadly obovoid, 1–1.3 mm, 3-sided, obscurely or distinctly transversely wrinkled, both ends suddenly contracted, apex mucronate. Fl. and fr. Jul–Sep or Nov–Jan.

- Paddy fields; ca. 1800 m. W Yunnan (Dali).


**Schoenoplectus schoofii** (Beetle) Soják,

*Culms tufted, 30–60 cm tall, 2.5–3.5 mm thick, compressed terete to terete, smooth, clothed at base with 2 or 3 bladeless pale brown leaf sheaths. Leaf sheaths 2–16 cm, mouth obliquely truncate and with a micro. Inflorescence a pseudolateral head, with 8–20 spikelets. Spikelets ovoid to oblong-ovoid, 3–10 × 2–3 mm, many flowered. Glumes brownish yellowish to brown, elliptic and subobovate, ca. 3 mm, membranous, obscurely many veined, margin ciliolate, apex obtuse and shortly mucronate; leaf blade present or absent. Involucral bracts 3; anthers nearly narrowly ovate, short; connective apex evident beyond anthers. Style of medium length; stigmas 3. Nutlet yellow when young but turning black at maturity, obovoid to broadly obovoid, 1–1.2 mm, 3-sided, transversely wrinkled. Fl. and fr. Aug–Oct.

- Paddy fields; ca. 1800 m. W Yunnan (Dali).


**Schoenoplectus supinus** (Linnaeus) Palla,


- Wet places along lake margins; ca. 2300 m. Jiangsu, Yunnan.

22a. Schoenoplectus supinus subsp. lateriflorus (J. F. Gmelin) T. Koyama.


- Moist meadows along valleys; 600–2300 m. Xinjiang.


**ELEOCHARIS** R. Brown, Prodr. 224. 1810.

*ELEOCHARIS* R. Brown, Prodr. 224. 1810.
apiculate or rarely with a scarious appendage at apex. Inflorescences reduced to a single terminal spikelet, erect, rarely proliferous (bearing plantlets) at base, with few to many bisexual flowers. Glumes spirally imbricate or rarely distichous, oblong, oblong-ovate, lanceolate, or subrounded, firm or membranous, glabrous, usually with a midvein although sometimes indistinct but with lateral veins, margin usually hyaline; basal 1 or 2 glumes usually empty. Perianth bristles (3–6–12) or rarely absent, retrorsely spinulose. Stamens 1–3. Style thin; stigmas 2 or 3. Nutlet obovoid, broadly obovoid, or globose-obovoid, 3-sided, biconvex, or plano-convex, smooth, reticulate, cancellate, or rarely pitted; persistent style base expanded, triangular, conic, or variously shaped, sometimes spongy-thickened.

About 250 species: worldwide; 35 species (nine endemic) in China.

1a. Spikelet usually cylindric or narrowly ellipsoid, as wide as culms; culms usually stout, sometimes transversely separtate with nodes evident on surface (in *E. dulcis*); leaf sheath mouth oblique; glumes firm, subcartilaginous, rarely subpapery or membranous, midvein obscure or indistinct but with 15 or more prominent to obscure close longitudinal veins.

2a. Culms with transverse septa, nodes evident on surface when dry; spikelet with basal 2 glumes empty, rarely 1 with a flower; nutlet surface essentially smooth ................................................................. 1. *E. dulcis*

2b. Culms without transverse septa, nodes not evident on surface when dry; spikelet with only basalmost glume empty; nutlet surface cancellate or reticulate.

3a. Culms terete ........................................................................................................................................... 6. *E. ochrostachys*

3b. Culms 3-angled, rarely acutely 4- or 5-angled.

4a. Culms firm, with pith in center; glumes broadly ovate or subquadrate, as long as wide.

5a. Leaf sheath mouth with setaceous appendage; glumes densely imbricate, subquadrate, apex truncate; nutlet apex not constricted; perianth bristles as long as or shorter than nutlet ......................... 2. *E. spiralis*

5b. Leaf sheath mouth acute but without an appendage; glumes laxly imbricate, broadly ovate, apex rounded; nutlet apex constricted; perianth bristles ca. 2 × as long as nutlet ........................................... 3. *E. trilateralis*

4b. Culms spongy, subhollow; glumes narrowly ovate or broadly lanceolate, ca. 2 × as long as wide.

6a. Culms 3-angled, (1–)3–4 mm thick; spikelet 1.5–4 cm × 3–5 mm; glumes broadly ovate, 3–3.5 mm wide, subleathery, apex rounded; nutlet surface shallowly pitted with 13–15 longitudinal rows of transversely oriented, oblong to linear epidermal cells ........................................... 4. *E. acutangula*

6b. Culms acutely 4- or 5-angled, 1.5–2.5 mm thick; spikelet 2–5 cm × 2.5–3 mm; glumes broadly lanceolate, 1.5–2.5 mm wide, membranous, apex obtuse to slightly acute; nutlet surface deeply pitted with 15–20 longitudinal rows of hexagonal epidermal cells ....................... 5. *E. philippinensis*

1b. Spikelet ovoid to narrowly ovoid, rarely cylindric, usually wider than culms; culms slender, nodes not evident on surface; leaf sheath mouth truncate or slightly oblique, rarely with a scarious appendage; glumes generally membranous, midvein distinct or rarely obscure.

7a. Persistent style base scarcely differentiated from nutlet apex and seemingly a continuation of it.

8a. Annuals, neither stoloniferous or rhizomatous; culms often recurved; persistent style base pyramidal-acuminate; nutlet narrowly winged on angles, reticulate to deeply pitted-reticulate with isodiametric epidermal cells ............................................................................................................. 9. *E. retroflexa*

8b. Perennials, stoloniferous; culms erect to ascending; persistent style base triangular-subulate or subconic; nutlet not winged on angles, essentially smooth.

9a. Culms 1–7 cm tall; spikelets 2–4 mm, 6–10-flowered; persistent style base triangular-subulate; nutlet 0.9–1.5 mm, smooth ........................................................... 7. *E. parvula*

9b. Culms 3–30 cm tall; spikelets 4–7 mm, 2–7-flowered; persistent style base subconic to 3-angled-subulate; nutlet 1.9–2.5 mm, appearing smooth but finely cellular-reticulate ...................... 8. *E. quinqueflora*

7b. Persistent style base differentiated from nutlet apex by a constriction or articulation at junction with it.

10a. Stigmas 3.

11a. Culms short and very slender; spikelet few flowered; glumes subdistichous at base of spikelet; nutlet terete or nearly so, longitudinally ridged with ridges separated by numerous cross-walls (trabeculae) ................................................................................................................................. 10. *E. yokoscensis*

11b. Culms elongate and ± stout; spikelet many flowered; glumes spirally imbricate; nutlet 3-sided to compressed 3-sided, essentially smooth.

12a. Culms acutely (3 or)4–6-angled; spikelet not proliferous at base; nutlet brownish when mature.

13a. Glumes 3–4 × 1–1.5 mm, margin narrow and hyaline; nutlet 1.2–1.5 mm and as wide; perianth bristles laxly to densely retrorsely spinulose; persistent style base deltoid, 1/2–2/3 as long as nutlet .......................................................... 11. *E. tetraquetra*

13b. Glumes 4–6 × 2–2.5 mm, margin broad and hyaline; nutlet 1.5–2 mm and as wide; perianth bristles plumose with spreading hairs; persistent style base narrowly ovoid, as long and as wide as nutlet or nearly so ...................................................... 12. *E. wichurae*
12b. Culms terete; spikelet usually proliferous at base; nutlet olivaceous or yellowish when mature.

14a. Glumes ovate-lanceolate, 3–4 mm, apex acute; persistent style base narrowly 3-angled to conic, attenuate to a short caudal tip, ca. 1/2 as long as nutlet; rhizome decumbent or obliquely ascending ......................... 13. *E. yunnanensis*

14b. Glumes oblong, suboblong, ovate, or elliptic, 1.5–2.5 mm, apex obtuse or rounded; persistent style base 3-angled, pyramidal, deltoid, narrowly ovoid, or subconic, ca. 1/4 as long as nutlet; rhizome absent or present.

15a. Persistent style base depressed, deltoid-pyramidal, as wide as nutlet or nearly so ............................................................. 17. *E. attenuata*

15b. Persistent style base not depressed, deltoid, narrowly ovoid, or subconic, often shortly attenuate to apex, ca. 1/2 as wide as nutlet.

16a. Perianth bristles exceeding tip of style base .................................................. 18. *E. congesta*

16b. Perianth bristles shorter than tip of style base.

17a. Annuals; spikelet narrowly ovoid, oblong-ovoid, cylindric, or rarely globose-ovoid, (3–)5–10 mm, several to many flowered; glumes oblong .............................................. 14. *E. pellucida*

17b. Perennials; spikelet ovoid or ovoid-cylindric, 2.5–6 mm, few flowered; glumes ovate or elliptic.

18a. Perianth bristles 6, slightly shorter than nutlet; nutlet obovoid, ca. 1 mm ........................................................................... 15. *E. maximowiczii*

18b. Perianth bristles 2–5, 1/4–1/2 as long as nutlet; nutlet oblong to obov-obovoid, ca. 1.5 mm ............................................. 16. *E. setulosa*

19b. Stigmas 2.

19a. Annuals; persistent style base not spongy-thickened; stolons absent; spikelet ovoid, subglobose, or oblong-ovoid, (2–)3–5(–8) mm.

20a. Persistent style base dorsiventrally compressed, deltoid; nutlet brownish at maturity ............... 19. *E. ovata*

20b. Persistent style base depressed conic, slightly reflexed basally on both sides ......................... 20. *E. geniculata*

19b. Perennials; persistent style base spongy-thickened but rarely obscurely so; stolons often present; spikelet narrowly ovoid, narrowly oblong-ovoid, or ellipsoid-cylindric, (3–)7–25 mm.

22a. Basalmost glume empty, suborbicular, spathiform, usually completely encircling base of spikelet.

23a. Persistent style base large, mitriform, cellular-spongy, ovoid, more than 2/3 to as long as nutlet .......................................................... 30. *E. kamschatica*

23b. Persistent style base conic, broadly ovoid, deltoid, 3-angled, or depressed, less than 1/2 as long as nutlet.

24a. Persistent style base depressed, subpatelliform (disk-shaped) ........................................... 31. *E. fennica*

24b. Persistent style base shallowly conic-ovoid, obtusely 3-angled, low conic, or shortly 3-angled.

25a. Glumes oblong-ovate to oblong-lanceolate; persistent style base shallowly conic-ovoid, nearly as long as wide, nearly 1/2 as long as nutlet ................................................................. 32. *E. uniglumis*

25b. Glumes ovate; persistent style base obtusely 3-angled or low conic, shorter than or nearly as long as wide, 1/4–1/3 as long as nutlet.

26a. Persistent style base obtusely 3-angled, nearly as long as wide, ca. 1/3 as wide as nutlet; perianth bristles 4, slightly longer than nutlet ................................................................. 33. *E. penchaoi*

26b. Persistent style base low conic or shortly 3-angled, shorter than wide, ca. 1/2 as wide as nutlet; perianth bristles 4–6, slightly shorter to slightly longer than nutlet.

27a. Culms 8–25 cm tall; spikelet 3–4 mm wide; glumes ovate to broadly ovate, ca. 3 mm, apex acute; perianth bristles as long as or slightly longer than nutlet ........................................ 34. *E. erhaiensis*

**Andropogon dulcis** N. L. Burman, Fl. Indica, 219. 1768; *Eleocharis equisetina* J. Presl & C. Presl; *E. plantaginea* (Retzius) Roemer & Schultes; *E. plantagineiformis* Tang & F. T. Wang; *E. tuberosa* Schultes; *Scirpus plantagineus* Retzius; *S. tuberosus* Roxburgh (1819), not Desfontaines (1798).

Perennials. Stolons slender, often terminated by a tuber. Culms erect, grayish green, tufted, 15–60 cm tall, 1.5–3 mm thick, cylindric, smooth, glabrous, surface transverse septa, nodes evident when dry. Leaf sheaths 2 or 3, greenish yellow, purplish red, or brown, 2–20 cm, mouth obliquely truncate, apex acute. Spikelet pale green, cylindric, 1.5–4 cm × 6–7 mm, many flowered. Basal 2 glumes empty, amplicemial for whole spikelet base; fertile glumes grayish green, laxly imbricate, broadly oblong to ovate-oblong, 3.5 × 2.5–3.5(–4) mm, subleathery, pale brown puncticulate and finely striate, margin pale yellow and membranous, apex obtuse. Perianth bristles 7, ca. 1.5 × as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet brown when mature, broadly obovoid, ca. 2.5 × 1.8 mm, biconvex, essentially smooth but faintly and finely cancellate with hexagonal to oblong hexagonal epidermal cells, apex not constricted but with an annular thickening; persistent style base triangular-attenuate, flattened, not spongy, base ca. 1/2 as wide as nutlet. Fl. and fr. May–Oct. 2n = 38, ca. 108.

Field margins, lake margins, commonly cultivated; near sea level to 1500 m. Fujian, Guangdong, Guangxi, Hainan, Hubei, W Hunan, Jiangsu, Taiwan [India, Indonesia, Japan, Korea, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, N Australia, Indian Ocean islands, Madagascar, Pacific islands].

The tuber (water chestnut) is eaten.

Although originating in the Old World tropics, because this species is commonly cultivated for its tubers, the actual distribution is uncertain. As a cultivated plant, it is grown throughout most of China.


**Scirpus spiralis** Rottbøll, Descr. Icon. Rar. Pl. 45. 1773.

Perennials. Stolons slender. Culms erect, pale green, tufted, 50–60 cm tall, 3–4 mm thick, firm, 3-angled, without transverse septa and nodes. Leaf sheaths 3 or 4, 3–21 cm, smooth, slightly shiny; basalmost sheath purplish red to dark brown, ± short; cauline sheaths pale red, elongate, mouth obliquely truncate and parted, apex shortly acuminate with a setaceous appendage. Spikelet pale yellow, cylindric, 1.5–3 cm × 5–6 mm, many flowered, apex acute to obtuse. Basalmost glume empty, broadly triangular, amplicemial for whole spikelet base; fertile glumes densely imbricate, subquadrate, ca. 3 × 3 mm, pale and brownish red puncticulate striate, medially leathery and with a midvein, margin hyaline and minutely brown puncticulate, apex
truncate to subtruncate. Perianth bristles 6, reddish purple, as long as or shorter than nutlet, laxly retrorsely spinulose. Stigmas 3. Nutlet pale yellow turning dark brown when mature, obovoid to broadly obovoid, 1.2–1.5 × ca. 1 mm, compressed biconvex, obscurely cancellate with 17–20 rows of transversely oblong epidermal cells, margin narrow, apex not constricted but with an obscure annular thickening; persistent style base conic, basally gradually narrowed, base ca. 1/2 as wide as nutlet. Fl. and fr. Nov–Jan.

Wet places near seashores; near sea level. Guangdong, Hainan [Bangladesh, Cambodia, China, Indonesia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Madagascar, Pacific islands].


Eleocharis trilateralis

Perennials. Stolons long, slender. Culms erect, grayish yellow, tufted, 30–75 cm tall, ca. 5 mm thick, firm, sharply 3-angled, narrowly wings on angles, smooth, glabrous, without transverse septa. Leaf sheaths 2, 5–18 cm; basalmost sheath dark purple, ± short; cauline sheath pale yellow, ± elongate, tubular, mouth obliquely truncate, apex acute. Spikelet pale brown, cylindric, 2–4 cm × ca. 5 mm, ± few flowers, apex obtuse. Basalmost glume empty, broadly ovate, ampelicual for whole spikelet base, apex subrounded; fertile glumes pale brown, laxy imbricate, broadly ovate, ca. 5 × 5 mm, with many purple longitudinal striae, medially reddish brown punctulate, leathery, and with a single midvein, both sides thinner, margin hyaline, apex obtuse-rounded. Perianth bristles 6, pale brown, nearly 2 × as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet pale yellow, broadly obovoid, ca. 2.5 × 1.5 mm, biconvex, with transverse oblong reticulate striae, apex distinctly constricted into a neck; persistent style base dark brown, attenuate to subdeltoid, compressed, not spongy, base ca. 1/2 as wide as nutlet. 

- Marshes; 1800–3500 m. Yunnan.

4. Eleocharis acutangula (Roxburgh) Schultes, Mant. 2: 91. 1824.

Eleocharis acutangula

Scirpus acutangulus Roxburgh, Fl. Ind. 1: 216. 1820; Eleocharis fistulosa Schultes; S. fistulosus Poiret (1805), not Forsskål (1775).

Perennials. Stolons slender. Culms erect, pale green, tufted, 30–75 cm tall, (1)–3–4 mm thick, sharply 3-angled, smooth, glabrous, without transverse septa. Leaf sheaths 2 or 3; basalmost sheath brown, glumelike; cauline sheaths tubular, 5–15 cm, base dark red to dark purple, mouth obliquely truncate, apex acute. Spikelet pale green, cylindric, 1.5–4 cm × 3–5 mm, many flowered, apex acuminata. Basalmost glume empty, broadly ovate, amplicual for whole spikelet base; fertile glumes laxy imbricate, broadly ovate, ca. 4.5 × 3.5 mm, purplish red punctulate, mediately grayish yellow, subleathery, and with several veins including a conspicuous midvein, margin membranous, apex rounded. Perianth bristles 6, longest ca. 1.5 × as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet pale yellow, broadly obovoid to obovoid, ca. 2 × 1.5 mm, biconvex, shallowly pitted with 13–15 longitudinal rows of transversely oriented oblong to linear epidermal cells, apex slightly constricted and with a conspicuous annular thickening; persistent style base subdeltoid, not spongy, base ca. 3/5 as wide as nutlet. Fl. and fr. Jun–Sep.

Flooded fields, moist areas; 500–1800 m. Fujian, Guangxi, Hainan, Hong Kong, Taiwan [Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, America, and Australia, Madagascar].


Eleocharis philippinensis

Perennials. Stolons slender. Culms erect, brown, tufted, 30–50 cm tall, 1.5–2.5 mm thick, acutely 4- or 5-angled. Leaf sheaths 2 or 3, reddish brown to dark brown, tubular, 2–8 cm, mouth obliquely truncate, apex acute. Spikelet cylindric, 1.5–4 cm × 2.5–3 mm. Basalmost glume empty; fertile glumes brownish green, laxly spiraled and in 4 rows, broadly lanceolate, 4.5 × 1.5–2.5 mm, membranous, abaxially purplish red punctulate mediately, many veined and with a slightly conspicuous midvein, margin hyaline, apex obtuse to slightly acute. Perianth bristles 7, 3 on outer series as long as nutlet, 4 on inner series as long as style base, retrorsely spinulose. Stigmas 2. Nutlet yellowish brown, obovoid, 1.5–2 × 1–1.2 mm, biconvex, deeply pitted with 15–20 longitudinal rows of hexagonal epidermal cells, apex slightly constricted into a short neck and with a slightly annular thickening; persistent style base long pyramidal, apex attenuate. Fl. and fr. Sep–Oct.

Flooded fields, moist areas. Guangdong, Hainan [India, Indonesia, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam; N Australia, Pacific islands (New Caledonia)].


Eleocharis ochrostachys

Eleocharis variegata (Poiret) C. Presl var. laxiflora (Thwaites) Ridley; Scirpus laxiflorus Thwaites.

Perennials. Stolons slender. Culms straw-colored, tufted, 37–75 cm tall, 2–3 mm thick, terete but sometimes apically obscurely 3-angled, without transverse septa, longitudinally canalicate on surface when dry. Leaf sheaths 2 or 3, purplish red, tubular, 6–18 cm, mouth obliquely truncate, apex acute. Spikelet pale, cylindric, 2–4 cm × ca. 4 mm, few flowered, apex rounded to obuscate. Basalmost glume empty, broadly ovate, amplicual for whole spikelet base; fertile glumes straw-colored to pale brown, laxy imbricate, broadly oblong, ca. 5 × 3 mm, subleathery, purple punctulate, many veined with an obscure midvein, margin hyaline, apex rounded to obtuse. Perianth bristles 6 or 7, ca. 2 × as long as nutlet, retrorsely spinulose. Stigmas (2 or)3. Nutlet pale yellow turning brown when mature, broadly obovoid, ca. 2 × 1.5 mm, compressed biconvex, longitudinally striate with 25–32 rows of transversely linear-oblong epidermal cells, apex not constricted but with an annular...
thickening; persistent style base narrowly long pyramidal, base ca. 1/2 as wide as nutlet. Fl. and fr. Sep–Oct.

Paddy fields, pond margins, moist areas. Guangdong, Hainan, Taiwan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; Pacific islands].


Scirpus parvulus Roemer & Schultes, Syst. Veg. 2: 124. 1817.

Perennials, stoloniferous. Rhizomes often terminated by small fusiform tubers. Culms light green, tufted, 1–7 cm tall, capillary. Leaf sheaths 1(or 2), tubular, short, hyaline, inconspicuous, mouth oblique at orifice, apex obtuse. Perianth bristles 1–4, nearly as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet yellowish brown, obovoid, 1.4–2.7 mm, 3-sided with plane to concave faces, smooth, apex not constricted; persistent style base triangular-subulate, 0.1–0.3 mm. Fl. and fr. Jul–Oct.

Wet saline or brackish shores; near sea level. Hainan [Indonesia, Japan, Kazakhstan, W Malesia, Russia, Uzbekistan, Vietnam; N Africa, Central, North, and South America, Europe].


Scirpus quinqueflorus Hartmann, Prim. Lin. Inst. Bot., ed. 2, 85. 1767; *Eleocharis meridionalis* G. Zinserling; *E. pauciflora* (Lightfoot) Link; *S. pauciflorus* Lightfoot.

Perennials. Stolons ca. 1 mm thick. Culms erect, wavy, or rarely recurved, grayish green, tufted, 3–30 cm tall, ca. 0.5 mm thick, obtusely 5-angled. Leaf sheaths 1 or 2, reddish brown to brown, tubular, 1–4 cm, mouth truncate. Spikelet brownish, ovoid to globose, 4–7 mm, 2–7-flowered. Basalmost glume straw-colored to reddish tinged, ovate, 1.4–2.7 mm, membranous, apex subacute to rounded. Perianth bristles 6, nearly as long as nutlet, one on outer series shorter than nutlet, retrorsely spinulose. Stigmas 3. Nutlet straw-colored to reddish, ovate, 1.4–2.7 mm, few flowered, slightly proliferous. Basalmost glume empty, subelliptic, amplexicaul for whole spikelet base; fertile glumes green, broadly ovate, 2.8–3 × 1.8–2 mm, herbaceous, with a median keel, edge membranous, margin hyaline, apex acute to obtuse. Perianth bristles 6, as long as nutlet, one on outer series shorter than nutlet, retrorsely spinulose. Stigmas 3. Nutlet yellowish, broadly ovobovoid, ca. 1.5 × 1 mm, 3-sided, prominently costate, reticulate to deeply pitted-reticulate with isodiametric epidermal cells, apex broadly truncate and not constricted; persistent style base pyramidal-acuminate, base as wide as to slightly narrower than nutlet. Fl. and fr. Jul–Nov.

Moist areas in fields. Fujian, Guangdong, Hainan, Yunnan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, N Thailand, Vietnam; Africa, tropical America, NE Australia, Pacific islands].


Perennials. Stolons slender. Culms densely tufted, 2–12 cm tall, filiform. Leaf sheaths reddish, tubular, 0.5–1.5 cm. Spikelet pale purple, ovoid, ca. 3 × 2 mm, few flowered, apex obtuse. Glumes laxly imbricate, subdistichous at base of spikelet; basalmost glume empty, oblong, ca. 2 × 1 mm, 3-veined, amplexicaul for whole spikelet base, apex obtuse; fertile glumes greenish medially and purple on sides, ovate, ca. 1.8 × 1.2 mm, membranous, margin hyaline, apex acute. Perianth bristles 1–4, ca. 2 × as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet pale yellow, narrowly oblong, ca. 1 × 0.4–0.5 mm, obscurely 3-sided, longitudinally ridged, ridges separated by numerous cross-walls (trabeculae), apex contracted; persistent style base slightly inflated, conic, base ca. 1/3 as wide as nutlet. Fl. and fr. Apr–Nov.

Flooded fields, pond margins, moist and muddy soil; 300–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jinlin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, N Xinjiang, Yunnan, Zhejiang [India, Indonesia (Sumatra), Japan, Korea, Mongolia, Myanmar, Philippines, Russia (Far East), Vietnam].

**Cyperaceae**


贝壳叶荸荠  bei ye bi qi

Scirpus retroflexus Poiret, Encycl. 6(2): 753. 1804; *Eleocharis chaetaria* Roemer & Schultes.

Annuals. Roots fibrous. Rhizomes and stolons absent. Culms often recurved, tufted, 2–16 cm tall or rarely more, filiform, soft, 5- or nearly 4-angled. Leaf sheaths 1 or 2, pale red, tubular, 2–12 mm; basalmost sheath bladeless; cauline sheaths usually with a glumelike blade at apex. Spikelet purplish red, ovoid, ca. 4 × 2 mm, slightly compressed, few flowered, sometimes proliferous. Basalmost glume empty, subelliptic, amplexicaul for whole spikelet base; fertile glumes green, broadly ovate, 2.8–3 × 1.8–2 mm, herbaceous, with a median keel, edge membranous, margin hyaline, apex acute to obtuse. Perianth bristles 6, nearly as long as nutlet, one on outer series shorter than nutlet, retrorsely spinulose. Stigmas 3. Nutlet yellowish, broadly obovoid, ca. 1.5 × 1 mm, 3-sided, prominently costate, reticulate to deeply pitted-reticulate with isodiametric epidermal cells, apex broadly truncate and not constricted; persistent style base pyramidal-acuminate, base as wide as to slightly narrower than nutlet. Fl. and fr. Jul–Nov.

Moist areas in fields. Fujian, Guangdong, Hainan, Yunnan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, N Thailand, Vietnam; Africa, tropical America, NE Australia, Pacific islands].


Perennials. Stolons slender. Culms densely tufted, 2–12 cm tall, filiform. Leaf sheaths reddish, tubular, 0.5–1.5 cm. Spikelet pale purple, ovoid, ca. 3 × 2 mm, few flowered, apex obtuse. Glumes laxly imbricate, subdistichous at base of spikelet; basalmost glume empty, oblong, ca. 2 × 1 mm, 3-veined, amplexicaul for whole spikelet base, apex obtuse; fertile glumes greenish medially and purple on sides, ovate, ca. 1.8 × 1.2 mm, membranous, margin hyaline, apex acute. Perianth bristles 1–4, ca. 2 × as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet pale yellow, narrowly oblong, ca. 1 × 0.4–0.5 mm, obscurely 3-sided, longitudinally ridged, ridges separated by numerous cross-walls (trabeculae), apex contracted; persistent style base slightly inflated, conic, base ca. 1/3 as wide as nutlet. Fl. and fr. Apr–Nov.

Flooded fields, pond margins, moist and muddy soil; 300–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jinlin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, N Xinjiang, Yunnan, Zhejiang [India, Indonesia (Sumatra), Japan, Korea, Mongolia, Myanmar, Philippines, Russia (Far East), Vietnam].

**龙师草 long shi cao**

Perennials. Stolons short or absent. Culms tufted, 25–90(–100) cm tall, ca. 1 mm thick, sharply 4-angled, glabrous. Leaf sheaths 2 or 3, tubular, 7–10 cm, basally purplish red, apically grayish green, mouth truncate, apex shortly triangular and mucronate. Spikelet brownish green, oblong-ovoid, ± narrowly ovoid, or oblong, 7–20 cm × 3–5 mm, slightly oblique, many flowered, apex obtuse to acute. Basal 3 glumes empty; basalmost glume amplexicaul for whole spikelet base; fertile glumes green at middle and pale rust-colored on sides, tightly imbricate, oblong and boat-shaped, 3–4 × 1–1.5 mm, papery, margin narrowly hyaline, apex obtuse. Periang bristles 6, reddish to brownish, as long as nutlet (including style base), surface sometimes mammillate, apex acuminate. Fl. and fr. Sep.–Nov.

Pond and ditch margins, riverbanks; 100–1900 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Liaoning, NE Nei Mongol, S Shaanxi, Shandong, Zhejiang [Japan, Korea, Russia (Far East, Siberia)].


**羽毛荸荠 yu mao bi qi**

*Eleocharis petasata* (Maximowicz) G. Zinserling; *Scirpus petasata* Maximowicz.

Perennials. Stolons short or absent. Culms grayish green, tufted, 30–60 cm tall, slender, sharply 4-angled, smooth. Leaf sheaths 1 or 2, reddish to purplish, mouth very obliquely truncate. Spikelet brownish at first but becoming pale green, ovoid, narrowly ovoid, or oblong, 8–15 × 3–5 mm, slightly oblique, many flowered, apex acute. Basal 2 glumes empty; basalmost glume amplexicaul for whole spikelet base; fertile glumes pale green, mediually and rust-colored striate on both sides, tightly spirally imbricate, oblong to elliptic and boat-shaped, 4–6 × 2–2.5 mm, membranous, midvein thin and obscure, margin broadly hyaline, apex obtuse-rounded. Periang bristles 6, rust-colored, as long as nutlet (including style base), plumose with spreading hairs. Stigmas 3. Nutlet pale olivaceous, turning brownish when mature, shortly stipitate, obovate to broadly obovoid, ca. 1.5 × 2 mm, obtusely 3-sided, slightly compressed, both surfaces smooth, apex not constricted; persistent style base very inflated, narrowly ovoid, as long and as wide as nutlet or nearly so, laterally compressed, densely mammillate, apex acute to obtuse. Fl. and fr. Jul.–Sep.

Shallow water in valleys, grasslands by water, marshy areas; 900–1700 m. Anhui, SE Gansu, W Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, NE Nei Mongol, S Shaanxi, Shandong, Zhejiang [Japan, Korea, Russia (Far East, Siberia)].


**云南荸荠 yun man bi qi**

*Eleocharis pauciflora* (Lightfoot) Link var. *rhizomatosa* Handel-Mazzetti.

Perennials. Rhizomes thick, decumbent to obliquely ascending. Culms laxly to densely tufted, 16–40 cm tall, ca. 1 mm thick, terete, longitudinally sulcate. Leaf sheaths 3, basalmost glume-like; cauline sheaths 2, tubular, 2–8 cm, basally purplish red to purple, apically green, mouth slightly obliquely truncate. Spikelet narrowly oblong to oblong, 6–8 × 2–3 mm, few flowered. Basal 2 glumes opposite, 1/2 or more as long as spikelet; basalmost glume usually proliferous but without a flower and next one both proliferous and with a flower; fertile glumes blood-red, spirally imbricate, ovate-lanceolate, 3–4 × ca. 1.3 mm, midvein conspicuous to obscure, margin pale blood-red and broadly hyaline, apex acute. Periang bristles 6, pale rust-colored, as long as nutlet, densely retrorsely shortly spinulose. Stigmas 3. Nutlet yellowish green, obovoid, 1.2–1.5 × 0.6–0.8 mm, obtusely 3-sided, sides slightly convex, apex constricted, ± narrow, and as wide as base of style; persistent style base pale, narrowly 3-angled to conic, ca. 1/2 as long as nutlet, apex attenuate to a short caudal tip. Fl. and fr. Apr.–Aug.

- River margins in valleys; 1800–3300 m. Yunnan.


**透明鳞荸荠 tou ming lin bi qi**

Annual or short-lived perennials. Rhizomes absent. Culms tufted to densely tufted, 5–30 cm tall or more, 0.5–1 mm thick, soft, longitudinally sulcate. Leaf sheaths 2, basally ± purplish and apically green, tubular, 1.5–4 cm, mouth truncate, apex deltoid dentate. Spikelet narrowly ovoid, oblong-ovoid, cylindrical, or rarely globose-ovoid, (3–)5–10 × 1.5–3 mm, several to many flowered. Basalmost glume empy, amplexicaul for whole spikelet base; fertile glumes pale rust-colored, ± laxly spirally imbricate, oblong or suboblong, ca. 2 × 1 mm, midvein greenish, margin hyaline, apex obtuse to rounded. Periang bristles 6, rust-colored, ca. 1.5 × as long as nutlet or slightly shorter, densely or laxly retrorsely spinulose. Stigmas 3. Nutlet yellowish to olivaceous, obovoid, 0.8–1.2 × 0.5–0.7 mm, 3-sided, sides convex, narrowly costate on angles; persistent style base pyramidal to conic, 1/4–1/2 as long and ca. 1/2 as wide as nutlet, sometimes spongy-thickened, apex acuminate. Fl. and fr. Mar.–Nov.

Pond margins, shallow ponds, paddy fields, shallow water margins, lake banks; 200–1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Jiangsu, Jiangxi, Liaoning,
1a. Spikelet narrowly ovoid, oblong-ovoid, or rarely globose-ovoid, (3–)5–8 mm.

   2a. Perianth bristles ca. 1.5 × as long as nutlet, densely retrorsely spinulose; nutlet ca. 1.2 mm .......................... 14a. var. pellucida

   2b. Perianth bristles shorter than nutlet, laxly retrorsely spinulose; nutlet 0.8–0.9 mm .......................... 14b. var. japonica

1b. Spikelet cylindric or globose-ovoid, 8–10 mm or ca. 3 mm.

   3a. Spikelet cylindric, 8–10 mm; nutlet ca. 0.5 mm wide; persistent style base conic, ca. 1/2 as long as nutlet, not spongy-thickened ......... 14c. var. sanguinolenta

   3b. Spikelet globose-ovoid, ca. 3 mm; nutlet ca. 0.7 mm wide; persistent style base pyramidal, ca. 1/3 as long as nutlet, spongy-thickened .......................... 14d. var. spongiosa

14a. Eleocharis pellucida var. pellucida

透明鳞荸荠(原变种) tou ming lin bi qi (yuan bian zhong)

Eleocharis afflata Steudel; E. shimadae Hayata; Scirpus afflatus (Steudel) Bentham.

Culms 5–30 cm tall, 0.5–1 mm thick. Spikelet narrowly ovoid, oblong-ovoid, or rarely globose, (3–)5–8 mm. Perianth bristles ca. 1.5 × as long as nutlet, densely retrorsely spinulose. Stigmas 3. Nutlet obovoid, ca. 1.2 × 0.7 mm; persistent style base pyramidal, ca. 1/4 as long as nutlet, not spongy-thickened, apex attenuate. Fl. and fr. Apr–Nov.

Rice paddies, pond margins, lake banks; 300–1000 m. Anhui, Fujian, Guangdong,Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Jiangxi, Liaoning, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang (India, Indonesia, Japan, Korea, Malaysia, Myanmar, Philippines, Russia (Far East), Sri Lanka).


稻田荸荠 dao tian bi qi


Culms usually very short, hairlike. Perianth bristles shorter than nutlet, laxly retrorsely spinulose. Nutlet 0.8–0.9 mm; persistent style base usually ± elongate. Fl. and fr. Mar–Oct.

Paddy fields, shallow water margins; 200–1700 m. Anhui, Fujian, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, N Thailand].


血红穗荸荠 xue hong sui bi qi

Spikelet blood-red, cylindric, 8–10 mm. Nutlet ca. 0.5 mm wide; persistent style base conic, ca. 1/2 as long as nutlet.

- Shallow water margins. Guizhou.


海绵基荸荠 hai mian ji bi qi

Spikelet globose-ovoid, ca. 3 mm. Nutlet ca. 0.9 × 0.7 mm; persistent style base pyramidal, ca. 1/3 as long as nutlet, spongy-thickened. Fl. and fr. Sep–Nov.

- Shallow ponds; 200–300 m. Jiangxi (Pingxiang).


细秆荸荠 xi gan bi qi

Eleocharis pellucida J. Presl & C. Presl var. maximowiczii (G. Zinserling) Ohwi.

Perennials. Culms ascending or erect, pale green, densely tufted, 8–25 cm tall, thin, 4-angled, sulate. Leaf sheaths reddish-purple. Spikelet ovoid to ovoid-cylindric, 2.5–6 mm, few flowered, sometimes bearing a second, sterile spikelet in basalmost glume, apex acute to rarely blunt. Basalmost glume empty, amplexicaul for more than 1/2 of spikelet base; fertile glumes green in a broad medial band and dark brown on sides, laxly imbricate, ovate to elliptic, 2 mm, margin broadly hyaline, apex obtuse. Perianth bristles 6, slightly shorter than nutlet, densely retrorsely spinulose. Stigmas 3. Nutlet olivaceous, obovoid, 0.9–1 × ca. 0.5 mm, obtusely 3-sided, smooth; persistent style base deltoid to shortly conic, 1–2 × ca. 3 mm. Fl. and fr. Jun–Jul.

Swamps, wet meadows, damp trail margins, paddy fields. Heilongjiang [Russia (Far East)].


短刚毛针蔺 duan gang mao zhen lin

Perennials. Culms 7–11 cm tall, slender, smooth. Leaf sheaths 2, basally reddish brown and apically yellowish, 0.8–1.8 cm, mouth obliquely truncate, apex acuminate. Spikelet ovoid to ± narrowly ovoid, 3–4 mm, 4–6-flowered. Basalmost glume empty, amplexicaul for 1/2 or more of spikelet base; fertile glumes reddish brown, oblong, 1.9–2.1 mm, membranous, margin white and hyaline, apex obtuse. Perianth bristles 2–5, 1/4–1/2 as long as nutlet, retrorsely spinulose. Stigmas 3. Nutlet straw-colored to green, oblong to obovoid-oblong, ca. 1.5 mm, obtusely 3-sided, with longitudinal rows of oblong epidermal cells; persistent style base straw-colored, deltoid, base ca. 1/2 as wide as nutlet, apex attenuate.

- Alpine meadows; 3100–3200 m. NW Yunnan (Zhongdian).


渐尖穗荸荠 jian jian sui bi qi

Perennials. Rhizomes decumbent or absent. Culms ± laxly
to densely tufted, 20–50 cm tall or short, ca. 1 mm thick, terete, longitudinally sulcate. Leaf sheaths 2, basally blood-red to pale blood-red and apically pale brownish yellow, 2.5–7 cm, mouth truncate, apex shortly aristate to mucronate. Spikelet ovoid, narrowly ovoid, or ellipsoid-ovoid, 6–10 × ca. 3 mm or longer, densely manyflowered, apex acute to obtuse. Basalmost glume empty, amplexicaul for whole spikelet base; fertile glumes pale to slightly rust-colored, tightly imbricate, oblong to oblong-ovoid, 8–11 × 3–4 mm, densely manyflowered, sometimes proliferate at spikelet base, apex obtuse to acute. Basalmost glume empty, amplexicaul for whole spikelet base; fertile glumes blood-red but green medially, tightly imbricate, oblong, ca. 2.2 × 0.9 mm, margin very narrowly hyaline, apex subrounded. Perianth bristles 6, longer than nutlet, slightly densely and shortly retrorsely spinulose. Stigmas 3. Nutlet blood-red but green medially, 2.5–7 cm, terete, longitudinally sulcate. Leaf sheaths 2, basally blood-red to densely tufted, 20–50 cm tall or ± short, ca. 1 mm thick, dark yellow, obovoid, ca. 1.2 × 0.7 mm, 3-sided, sides convex, 1/4–1/3 as long as nutlet, margin basally slightly involute, apex acute. Fl. and fr. May–Sep.

Paddy fields, pond margins, riverbanks, moist soil; 100–600 m. Anhui, Fujian, Guangxi, Henan, Hunan, Jiangsu, Shaanxi, Shandong, Zhejiang [Japan, S Korea, Papua New Guinea, Russia (Far East), Vietnam].

1a. Rhizomes decumbent; culms 20–50 cm tall or more; perianth bristles densely retrorsely spinulose ................................................ 17a. var. attenuata
1b. Rhizomes absent; culms ± short; spikelet ± short; perianth bristles laxly retrorsely spinulose ........................................ 17b. var. erhizomatosa

17a. Eleocharis attenuata var. attenuata

17b. Eleocharis attenuata var. erhizomatosa


密花荸荠 mi hua bi qi

Eleocharis purpurascens Boeckeler.
Annuals. Rhizomes and stolons absent. Culms tufted to densely tufted, 3–45 cm tall, ca. 0.5 mm thick, soft, with a few longitudinal ribs and sulcate. Leaf sheaths 2, basally reddish and apically straw-colored, 1–1.5 cm, mouth obliquely truncate, apex acuminate. Spikelet globose to ovoid, 3–5 × 3–3.5 mm, densely many flowered, apex obtuse. Basal 3 or 4 glumes empty; basal 2 glumes opposite, amplexicaul for ca. 1/2 of spikelet base; fertile glumes pale rust-colored becoming ± pale, broadly elliptic, 1.6–2 × 1–1.2 cm, midvein obscure, margin narrowly hyaline, apex rounded. Perianth bristles 6–8, rust-colored, slightly shorter than nutlet, laxly and shortly retrorsely spinulose. Stigmas 2. Nutlet dark purple, broadly obovoid to globose-ovoid, 0.7–1.1 × ca. 0.6 mm, biconvex, smooth and shiny; persistent style base pale, depressed conic, 1/5–1/4 as long and 1/7–1/4 as wide as nutlet, slightly reflexed basally on both sides. Fl. and fr. Jan–Apr. 2n = 30.

Shallow water margins at trail edges, sandy coastal habitats; near sea level. Fujian, Guangdong, Hainan, Taiwan [Afghanistan, Bangladesh, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand; Africa, SW Asia, Australia, Central, North, and South America, 5 Europe, Madagascar, Pacific islands].


紫果蔺 zi guo lin


Annuals. Rhizomes and stolons absent. Culms greenish, tufted, 2–15 cm tall, hairlike, erect, terete, obtusely longitudinally ribbed. Leaf sheaths 1 or 2, basally purplish red and apically greenish, tubular, 0.5–1.5 cm, mouth obliquely truncate, apex obtuse to acute. Spikelet ovoid, globose, or oblong-ovoid, 2–5.5 × 1.5–2.5 mm, many flowered, apex obtuse. Basal 2 glumes empty; basalmost glume ± pale at middle and blood-red on both sides, laxly imbricate, oblong to elliptic, ca. 1 × 0.5 mm, membranous, midvein obscure, margin narrowly hyaline, apex obtuse to subrounded. Perianth bristles 4–6, colorless to white, slightly longer to shorter than nutlet, laxly retrorsely spinulose. Stigmas 2. Nutlet at first purplish red then becoming white, slightly longer to shorter than nutlet, laxly retrorsely ribbed and sulcate, ± tuberose. Leaf sheaths 1 or 2, basally purplish red and apically straw-colored, 0.5–1.5 cm, mouth obliquely truncate, apex acute. Spikelet ovoid-cylindric to narrowly oblong, 10–18 × 3–4.5 mm, many flowered, apex obtuse to subacute. Basal 2 glumes empty; basalmost glume ± pale at middle and blood-red on both sides, slightly tightly imbricate, oblong-lanceolate, 3.5–4.5 × 1–1.5 mm, midvein greenish, margin narrowly hyaline, apex subacute. Perianth bristles 4, 1.5–2 × as long as nutlet (including style base), densely and greatly retrorsely spinulose. Stigmas 2. Nutlet yellow to yellowish, obovoid, 1–1.3 × 0.7–0.8 mm, biconvex, smooth; persistent style base narrowly conic, ca. 1/2 as long and ca. 1/3 as wide as nutlet, apex attenuate. Fl. and fr. May–Aug.

● Moist grasslands on mountain slopes. Anhui, Jiangsu, Jiangxi, Zhejiang.


刘氏荸荠 liu shi bi qi

Perennials, stoloniferous. Culms tufted, 14–36 cm tall, 1–3 mm thick, few ribbed and longitudinally sulcate. Leaf sheaths 2, basally dark blood-red, tubular, 4–7 cm, mouth truncate. Spikelet oblong, narrowly oblong-ovoid, or sometimes ± narrowly ovoid, 10–20 × 4–5.5 mm, many flowered, apex obtuse at anthesis. Basal 2 glumes empty; basalmost glume amplexical for more than 1/2 of spikelet base; fertile glumes green at middle and dark blood-red on both sides, laxly imbricate, oblong to linear-oblong, ca. 4 × 2 mm or narrower, margin broadly hyaline, apex obtuse to subrounded. Perianth bristles 4(or 5), longer than nutlet, densely and slightly retrorsely spinulose, spinules spreading. Stigmas 2. Nutlet at first yellow then becoming dark brown, usually ellipsoid or sometimes obovoid to subglobose, 1.2–1.5 × 1–1.2 mm, biconvex, apex constricted and not over-lain by style base; persistent style base globose-ovoid to subquadrate, ca. 1/3 as long and ca. 2/3 as wide as nutlet, spongy, base rounded, apex attenuate. Fl. and fr. May–Jul.

● Trail margins; ca. 1900 m. Yunnan.


江南荸荠 jiang nan bi qi

Perennials, stoloniferous. Culms tufted to densely tufted, 20–50 cm tall, 1–2 mm thick, slightly soft, longitudinally ribbed and sulcate, conspicuously transversely septiculate, ± tuberose when dry. Leaf sheaths 2, basally reddish brown to brown and apically green, tubular, 3–10 cm, mouth truncate. Spikelet narrowly oblong-ovoid, 10–18 × 3–4.5 mm, many flowered, apex obtuse to subacute. Basal 2 glumes empty; basalmost glume amplexical for 1/2 or more of spikelet base; fertile glumes ± pale at middle and blood-red on sides, slightly tightly imbricate, oblong-lanceolate, 3.5–4.5 × 1–1.5 mm, midvein greenish, margin narrowly hyaline, apex subacute. Perianth bristles 4, 1.5–2 × as long as nutlet (including style base), densely and slightly retrorsely spinulose. Stigmas 2. Nutlet yellow to yellowish, obovoid, 1–1.3 × 0.7–0.8 mm, biconvex, smooth; persistent style base narrowly conic, ca. 1/2 as long and ca. 1/3 as wide as nutlet, apex attenuate. Fl. and fr. Apr–Aug.

● Moist grasslands on mountain slopes. Anhui, Jiangsu, Jiangxi, Zhejiang.


乌苏里荸荠 wu su li bi qi

Eleocharis mamillata H. Lindberg var. cyclocarpa Kitagawa; E. mamillata subsp. ussuriensis (G. Zinserling) T. V. Egorova.

Perennials, with rhizomes and slender stolons. Culms single or laxly to densely tufted, 7–70 cm tall, 2–4 mm thick, terete, longitudinally ribbed and sulcate, obscurely transversely septiculate between longitudinal ribs. Leaf sheaths 1 or 2, basally purplish red, tubular, 5–10 cm, mouth obliquely to transversely truncate. Spikelet ovoid-cylindric to narrowly cylindric-ovoid, 10–20 × 2–6 mm, many flowered. Basal 2 glumes empty, each amplexicaul for ca. 1/2 of spikelet base; fertile glumes green medially and reddish brown to dark brown on sides, subtightly imbricate, becoming laxly imbricate, oblong-ovate to ovate-lanceolate, 3–4 × 1.3–1.5 mm, apical margin broadly hyaline, apex acute to subacute. Perianth bristles 4
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or 5, longer than nutlet, densely spreading and curved retrorsely spinulose. Style less than 1 mm; stigmas 2. Nutlet yellowish initially then brownish when mature, broadly obovoid to globose-obovoid, 1–1.5 × 1–1.3 mm, biconvex, subsmooth, apex constricted; persistent style base submammiform, shortly conic, or depressed conic, slightly wider than long, ca. 1/4 as long and ca. 1/2 as wide as nutlet, subspiny. Fl. and fr. Jun–Jul.

Moist areas, marshes, meadows; 100–1800 m. Hebei, Heilongjiang, Jilin, Liaoning, NE Nei Mongol, Shanxi [Japan, Korea, Russia (Far East, Siberia)].


短刚毛荸荠 duan gan mao bi qi

Perennials. Rhizomes creeping. Culms grayish green, 30–100 cm tall, 2–5 mm thick, spongy, easily compressed, smooth, finely longitudinally ribbed and sulcate. Leaf sheaths basally purplish to reddish brown and apically yellowish brown to pale brown, tubular, 1–20 cm, scarious, mouth obliquely truncate. Spikelet oblong-obovoid to narrowly oblong-obovoid, 1.5–3 cm × 4–7 mm, many flowered. Glumes laxly imbricate; basal 2 glumes empty; basalmost glume encircling 1/2 or less of spikelet base; apex oblongate; remaining glumes fertile, greenish medi ally and sides brown to reddish brown, lanceolate, 3.5–4.5 × ca. 1.3 mm, margin broadly hyaline, apex subacute. Perianth bristles 4, pale brown, shorter than to equaling nutlet (including style base). Stigmas 2. Nutlet yellow brown, ca. 1.5 × 1.4 mm, biconvex, smooth; persistent style base white basally and dark brown at apex, shortly conic, 1/4–1/3 as long and 1/3–1/2 as wide as nutlet, spongy, apex obtuse to nearly half-oblong. Fl. and fr. Jul–Aug.

● Shallow water at lake margins; ca. 3300 m. Qinghai (Qinghai Hu).


沼泽荸荠 ju gang mao bi qi

Perennials. With a rhizomes and stolons. Culms single or tufted, 6–50 cm tall, 1–3 mm thick, terete, with a few sharp ribs. Leaf sheaths 1 or 2, basally purplish red, tubular, 3–10 cm, mouth truncate. Spikelet oblong-obovoid to narrowly oblong-obovoid, rarely ellipsoid to oblong, 0.7–2 cm × 2.5–3.5 mm, many flowered. Basal 2 glumes empty, amplexicaul for 1/2–2/3 of spikelet base; sterile glumes greenish to pale medially and with a narrow pale blood-red band on sides, ovate to oblong-ovate, ca. 3 × 1.7 mm, margin broadly hyaline, apex obtuse. Perianth bristles 4, distinctly longer than nutlet, slightly curved and not spreading, densely retrorsely spinulose. Stigmas 2. Nutlet yellowish, globose-obovoid, ca. 1 × 1 mm, biconvex, smooth; persistent style base broadly ovoid, ca. 1/3 as long and ca. 1/2 as wide as nutlet, spongy. Fl. and fr. Jun–Aug.

Shallow water, 100–4000 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Zhejiang, Yunnan [Japan, Korea].

Eleocharis valleculosa var. valleculosa occurs in Japan and Korea and differs by lacking perianth bristles.


沼泽荸荠 zao ze bi qi


Perennials. Rhizomes creeping. Culms a few tufted, 10–100 cm tall, 2–3 mm thick, few ribbed and longitudinally sulcate, obscurely tuberculate. Leaf sheaths 1 or 2, basally blood-
red purple, tubular, 3–7 cm, mouth slightly obliquely truncate. Spikelet oblong, narrowly oblong, or ellipsoidal, 0.6–2.5 cm × 3–5 mm, many flowered, apex obtuse-rounded. Basal 2 glumes empty; basalmost glume amplexicaul for 1/2 or more of spikelet base; fertile glumes with a narrow green band medially and dark blood-red on sides, ovate to ovate-lanceolate, 3–4 × 1–1.5 mm, membranous, margin broadly hyaline, apex obtuse. Perianth bristles 4–6, shorter to slightly longer than nutlet, slightly curved, spreading outward, densely retrorsely spinulose. Stigmas 2. Nutlet at first yellowish then becoming brownish, ovoid, broadly obovoid, or globose-obovate, 1.2–1.4 × 0.8–1 mm, unequally biconvex, smooth or rarely slightly prominently reticulate; persistent style base ovoid-oblong to oblong-conic, much longer than wide, 1/2–3/5 as long and ca. 1/2 as wide as nutlet, spongy, apex obtuse to rounded. Fl. and fr. Jun–Jul. 2n = 15, 16.

Shallow water margins in valleys, wet meadows, water of canals; 100–4000 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Afghanistan, Japan, Kazakhstan, Mongolia, Nepal, Russia; N Africa, SW Asia, Atlantic Ocean islands, Europe, North America].

### 30. Eleocharis kantschatica

Perennials. Rhizomes elongate. Culms 20–50 cm tall, 1.5–3 mm thick, terete, conspicuously obtusely ribbed and longitudinally sulcate, surface transversely septic when dry. Leaf sheaths 1 or 2, brownish, tubular, 6–7 cm or more, mouth slightly obliquely truncate, apex triangular mucronate. Spikelet ovoid to narrowly ovoid, 8–20 × 3–5 mm, many flowered, apex obtuse. Basalmost glume empty, amplexicaul for more than 1/2 of spikelet base; fertile glumes dark blood-red to brown, slightly laxly imbricate, ovate, ca. 3 × 1.5 mm, midvein obscure, margin broadly to narrowly hyaline, apex obtuse. Perianth bristles absent or 4 or 5 and longer than nutlet. Stigmas 2. Nutlet brownish yellow, obovoid to rarely globose, ca. 1.4 × 1 mm to nearly as long as wide, biconvex, smooth; persistent style base white, subpatelliform (disk-shaped), ca. 0.2 × 0.5–0.7 mm, depressed, spongy-thickened, apically slightly concave. Fl. and fr. May–Aug.

Perennials. Rhizomes short. Culms green to grayish green, tufted, 10–50 cm tall, ca. 1 mm thick, few ribbed and longitudinally sulcate. Leaf sheaths 2, blood-red, tubular, 5–10 cm, mouth truncate, apex triangular dentate. Spikelet cylindrical to ovoid-cylindric, 7–15 × ca. 3 mm, many flowered. Basalmost glume empty, amplexicaul for whole or nearly whole of spikelet base; fertile glumes dark blood-red to dark brown, slightly laxly imbricate, ovate, ca. 3 × 1.5 mm, midvein obscure, margin broadly to narrowly hyaline, apex obtuse. Perianth bristles absent or 4 or 5 and longer than nutlet. Stigmas 2. Nutlet brownish yellow, obovoid to rarely globose, ca. 1.4 × 1 mm to nearly as long as wide, biconvex, smooth; persistent style base white, subpatelliform (disk-shaped), ca. 0.2 × 0.5–0.7 mm, depressed, spongy-thickened, apically slightly concave. Fl. and fr. May–Aug.

### 31. Eleocharis fennica

大基荸荠 da ji bi qi

**Scirpus kamtschaticus** C. A. Meyer, Mém. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 1: 198. 1831; *Eleocharis kamtschatica* f. reducta Ohwi; *E. komarovii* G. Zinserling; *E. mitrata* Makino; *E. sachalinensis* (Meinshausen) Komarov; *E. savatieri* C. B. Clarke ex H. Léveillé; *S. mitratus* Franchet & Savatier (1878), not Grisebach (1864); *S. sachalinensis* Meinshausen.

Perennials. Rhizomes elongate. Culms 20–50 cm tall, 1.5–3 mm thick, tuberous, distinctly obtusely ribbed and longitudinally sulcate, surface transversely septic when dry. Leaf sheaths 1 or 2, brownish, tubular, 6–7 cm or more, mouth slightly obliquely truncate, apex triangular mucronate. Spikelet ovoid to narrowly ovoid, 8–20 × 3–5 mm, many flowered, apex obtuse. Basalmost glume empty, amplexicaul for more than 1/2 of spikelet base; fertile glumes pale blood-red to straw-colored and ± with pale blood-red lines, tightly imbricate, oblong to ovate-oblong, ca. 4 × 1 mm, midvein obscure, margin broadly to narrowly hyaline, apex obtuse. Perianth bristles 4 or 5 but sometimes rudimentary or absent, slightly shorter than to as long as nutlet, densely retrorsely spinulose. Stigmas 2. Nutlet at first yellow then becoming brownish, obovoid, broadly obovate, or subglobose, 1–1.5 × ca. 1 mm, biconvex, smooth and shiny; persistent style base ovoid to mitriform, large, cellular spongy, 2/3 or more as long and nearly as wide as nutlet. Fl. and fr. Jul.–Oct. 2n = 38–40, 44, 56.

River margins, marshes, wet places, especially in coastal habitats. Hebei, S Liaoning, Sichuan [Japan, Korea, Russia (Far East, E Siberia); North America].

### 31a. Eleocharis fennica var. fennica

【原变种】bian ji bi qi (yuan bian zhong)


Perianth bristles absent.

River margins, streams in valleys, wet places, coastal habitats; shallow water at lakeshores, swamps; near sea level to 3300 m. Heilongjiang, Nei Mongol, Qinghai, Xinjiang [Kazakhstan, Mongolia, Russia; Europe].

#### 31a. var. fennica

1a. Perianth bristles absent ......................... 31a. var. *fennica*
1b. Perianth bristles 4 or 5 and longer than nutlet .................................................................. 31b. var. *sareptana*

### 31b. Eleocharis fennica var. sareptana

具刚毛扁基荸荠 ju gan mao bian ji bi qi


Perianth bristles 4 or 5, longer than nutlet.

Shallow water at lakeshores; ca. 3300 m. Qinghai, Xinjiang [Kazakhstan, Mongolia, Russia; Europe].

### 32. Eleocharis uniglumis
(Links) Schultes, Mant. 2: 88. 1824.

单鳞色荸荠 dan lin bao bi qi


扁基荸荠 bian ji bi qi

Perennials. Rhizomes short. Culms green to grayish green, tufted, 10–50 cm tall, ca. 1 mm thick, few ribbed and longitudinally sulcate. Leaf sheaths 2 or 3, basally blood-red and apically yellowish green, 1–4 cm, mouth truncate to slightly obliquely truncate. Spikelet narrowly ovoid, obovoid, or oblong, 3–8 × 1.5–3 mm, 4–10-flowered. Basalmost glume empty, amplexicaul for whole of spikelet base; fertile glumes at first green then becoming brownish at middle and both edges purplish red, laxly...
imbricate, oblong-ovate to oblong-lanceolate, ca. 4 × 2 mm, margin apically becoming broadly hyaline, apex obtuse. Perianth bristles 4–6, longer than nutlet, slightly curved, outwardly spreading, densely retrorsely spinulose. Stigmas 2. Nutlet at first yellow then becoming brown, obovoid to broadly ovoid, 1.4–1.7 × ca. 1 mm, biconvex, ventral side conspicuously convex and dorsal side slightly convex, sometimes obtusely 3-sided, apex constricted and overlain by style base; persistent style base white, shallowly conic-ovoid, slightly elongate basally, nearly as long as wide, ca. 1/2 as long and ca. 1/2 as wide as nutlet, spongy, apex rounded to obtuse. Fl. and fr. Apr–Aug. 2n = 46, 60–88.

Lake banks, swamps, meadows, shallow water margins; 100–3300 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang, Yunnan [Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Uzbekistan; N Africa, SW Asia, Europe, North America].


本兆荸荠 ben zha bo qi

Perennials. Rhizomes elongate. Culms tufted, erect, 25–35 cm tall, ca. 2 mm thick. Leaf sheaths 1(or 2), grayish brown, tubular, 5–7 cm, smooth, glabrous, mouth truncate. Spikelet oblong, ca. 8 × 3–4 mm, more than 10-flowered. Basalmost glume empty, amplexicaul for more than 1/2 of spikelet base; fertile glumes brown, sublaxly imbricate, ovate to narrowly ovate, ca. 4 × 2 mm, margin ± broadly hyaline, apex acute to obtuse. Perianth bristles 4, slightly longer than nutlet, retrorsely spinulose. Stigmas 2. Nutlet yellowish, obovoid, ca. 1.7 × 1.5 mm, biconvex, smooth, both sides narrowly margined, apex constricted; persistent style base white but dark brown at apex, obtusely 3-angled, nearly as long and ca. 1/3 as wide as nutlet, spongy. Fl. and fr. Jul–Aug.

● Shallow water at lake margins; ca. 3300 m. Qinghai (Qinghai Hu).


青海荸荠 qing hai bo qi

Perennials. Rhizomes elongate; stolons elongate. Culms tufted, erect, grayish green, 25–30 cm tall, ca. 1 mm thick, glabrous. Leaf sheaths 1 or 2, purplish red, 3–4 cm, smooth. Spikelet brown, oblong, 5–7 × 2–3 mm, few flowered. Basalmost glume empty, amplexicaul for whole spikelet base; fertile glumes brown dark brown, ovate to oblong-ovate, ca. 3.5 × 2.5 mm, margin broadly hyaline, apex obtuse. Perianth bristles 5–7, shorter than nutlet, retrorsely spinulose. Stigmas 2. Nutlet greenish yellow, obovoid, ca. 1.7 × 1.5 mm, biconvex, smooth, apex constricted; persistent style base shortly conic, wider than long, ca. 1/3 as long and more than 1/2 as wide as nutlet, spongy, apex obtuse to subrounded. Fl. and fr. Jul–Aug.

● Shallow water at lake margins; ca. 3300 m. Qinghai (Qinghai Hu).


飘拂草属 piao fu cao shu

Zhang Shuren (张树仁), Liang Songyun (梁松苑 Liang Song-jun); Tetsuo Koyama, David A. Simpson

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 capitulate 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 micro or arista. Flowers biserocious. 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 merrilli 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; involucral 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; involucral 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 involucral bract less than 2 × as long as spikelet; rhizome short ................................................................. 45. F. eragrostis

6b. Glumes reddish brown; spikelets 3–6 mm; basalmost involucral 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; involucral bracts surpassing inflorescence .......................................................................... 47. F. nanningensis

8b. Leaf blade 3–6 mm wide, glabrous; ligule a fringe of short white hairs; involucral 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 anthemla; glumes 4–5 mm; nutlet attenuate to base, sub sessile; style 4–5 mm ............................................ 50. F. fusca

10b. Annuals; culms 5–13 cm tall; inflorescence a simple or rarely compound anthemla; glumes 2.5–3 mm; nutlet truncate at base, shortly stipitate; style ca. 2 mm ................. 51. F. simaoensis

1b. Spikelets terete; glumes spirally imbricate.

11a. Spikelet solitary; involucral 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 obvoid, sub sessile; culms flatly cylindric, sub cylindric, 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. pacificlora

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; involucral bracts 2–4.5 mm; glumes brown with short rust-colored lines; stamens 3; nutlet margin verruculose ........................................... 42. F. nutans

14b. Spikelets erect; involucral 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; involucral 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. gracilenta).

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 obvoid, 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 obvoid, 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. gracilenta

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. rigida

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 verrucose; inflorescences 5–9 cm .................. 23. F. dichotoma

31b. Nutlet ovoid, without vertical ribs, sparsely verrucose; 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. diphylooides
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; involucral bracts 4, setaceous; rays 4; nutlet obovoid; stamina 1 or 2 ......................... 19. *F. quinquangularis*
38b. Ligule a fringe of pubescence; involucral bracts 5–7; leaflike; rays 5–7; nutlet broadly obovoid; stamina 3 .... 20. *F. chingnaensis*

32b. Culms 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; involucral bracts longer or shorter than inflorescence ....................... 5. *F. henryi*
   42b. Stigmas 3; involucral 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; involucral bracts subulate or glumelike ....................... 10. *F. pierotii*
49b. Plants not stoloniferous; involucral 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; involucral bracts longer than inflorescence .............. 9. *F. dura*
   51b. Ligule ciliate; involucral 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*


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. Involucral 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. Stamina 1 or 2; anthers narrowly ovoid to oblong. Style basally slightly thickened; stigmas 2. Nutlet brown, ob-
long, shiny, with transversely hexagonal reticulation or sublinear horizontal lines, each edge bearing 5–9 caducous elavate 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) Makino.

疣果飘拂草 you guo piao fu cao


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


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. Involucral bracts 2 or 3, leaflike, slightly longer to shorter than inflorescence; bractlets subulate or glumelike, base dilated, apex awned. Inflorescence a simple or compound anhela, 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 keel, apex with a straight micro. Stamens 1 or 2; anthers 0.2–0.3 mm. Style 3-sided, glabrous, basally dilated; stigmas 3. Nutlet sub 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].


宜昌飘拂草 yi chang piao fu cao


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. Inflorescences solitary, broadly 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 macro. 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 fields, wet sandy places, among grasses; near sea level to 700 m. Anhui, S Gansu, Hebei, Henan, Hunan, Jiangsu, Liaoning, Shanxi, Shandong, Sichuan, Zhejiang [Japan, Korea].


秋飘拂草 qiu piao fu cao


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 compound anhela, 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 × 1–2.2 mm, slightly angular, sublaxly 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 subelliptic, 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.

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


燕秋飘拂草 yan qiu piao fu cao

Scirpus autumnalis (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 97. 1817.

秋飘拂草 qiu piao fu cao

Scirpus autumnalis (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 97. 1817.

秋飘拂草 qiu piao fu cao

Scirpus autumnalis (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 97. 1817.

秋飘拂草 qiu piao fu cao

Scirpus autumnalis (Linnaeus) Roemer & Schultes, Syst. Veg. 2: 97. 1817.
**Fimbristylis unicolor** Ohwi & T. Koyama.

Annuals. Rhizomes absent. Culms tufted, 3–20 cm tall, 3-angled, striate, glabrous, with 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. Involute 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 micro), 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 acute. Nutlet pale yellow, ellipsoid-obovoid, ovobovoid, or ellipsoid, less than 1 mm, flat-convex, with transversely oblong reticulation but not verruculose. Fl. and fr. August–November.

*● Cultivated fields, on rocks, marshes, riversides; 100–2000 m.*

Anhui, Guangdong, Guangxi, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, SE Yunnan, Zhejiang.


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. Involute 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, ovobovoid, ca. 2 mm, obtusely 3-sided, with transversely oblong reticulation and verrucae. Fl. and fr. May–June.

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


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, thinly papery, margin apically finely serrulate, apex acute. Involute 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, ovobovoid to broadly ovobovoid, ca. 1.5 mm, obtusely 3-sided, with transverse oblong reticulation. Fl. and fr. June–October.

*● Cultivated fields, on rocks, marshes, riversides; 100–2000 m.*

Anhui, Fujian, Guangdong, Guangxi, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, SE Yunnan, Zhejiang.

7b. **Fimbristylis complanata** var. **complanata**

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

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

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


Wet places in valleys, grasslands, streamsides, open fields, slopes, ditches, swampy places, along ravines; 100–3000 m. Anhui, Fujian, Guangdong, Guangxi, 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].


矮扁鞘飘拂草　ai bian qiao piao fu cao


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. June–September.

Streamsides, water margins, open fields, slopes, ditches, swampy places, along ravines; 100–800 m. Anhui, Fujian, Guangdong, Guangxi,
Guizhou, 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. Popul. 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.


台南飘拂草 tai nan piao fu cao


Perennials. Rhizomes short, ascending. Culms laxly tufted, 40–60 cm tall, compressed 3-sided or apically ± 2-angled, basally leaved. Leaf sheath short, ciliate; leaf blade 3.5–5 mm wide, ± flat, subrigid, sebaceous when mature, obovoid to broadly obovoid, 0.7–1.5 mm, 3-veined, apex with an acute costa. Stamens 3. Nutlet yellowish white to yellowish brown, broadly obovoid, ca. 1 mm or more, flat to convex, finely verruculose. Fl. and fr. May–Aug.

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, 3.5–6 × 1.5–2.5 mm, densely many flo- wered, apex obtuse. Glumes brown, ovate to broadly ovate, 1.2–2 mm, membranous, axially 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, 0.7–1 mm, 3-sided or biconvex, indistinctly verruculose and with square or transversely oblong reticulation but sometimes subsmooth. 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 (yuán biàn zhòng)


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


佛焰苞飘拂草 fo yan bao piao fu cao


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 obvoid 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].


绢毛飘拂草 juan mao piao fu cao

Fimbristylis decora Nees & Meyen.

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 oblond-oboid, 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].


细茎飘拂草 xi ji 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 capitulate, 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, obvoid, 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].


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. Involutural bracts 2–4, subulate, shorter to slightly longer than inflorescence. Inflorescence a simple or compound anthela, 2.4–12.5 cm, with 1–14 spikelets; rays 3–5, subcyllindric, 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 micro, 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.


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 russet-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, obvoid 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, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, SE Qinghai, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Vietnam; SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

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.


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; SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].


小泉氏飘拂草 xiao quan shi piao fu cao


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

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


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. Inflorescences 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 spiral imbricately, 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 in or in valleys; 400–2400 m. Yunnan [India, Indonesia, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa].


芒苞飘拂草 mang bao piao fu cao


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 com-
pound 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, margined hyaline, 1-veined forming an abaxial pale brown obulate 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].


五棱秆飘拂草 wu leng gan piao fu cao


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. Invovulular bracts 4, 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, ovoid, ovate to broadly 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. 1/3 as long as filaments, apex obtuse to subacute. Grumes red-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. 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 obovulate and with transverse line-articulation. Fl. and fr. Oct–Nov. 2n = 10.

Swamps; 800–2100 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Zhejiang [Japan, Korea].


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. Invovulular 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, obutely 3-sided, with indistinct transverse obovulate reticulation. Fl. autumn.

Deserted paddy fields. Fujian, Hainan (Chengmai).


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, cylindrical, 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. Invovulular 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-ovoid, 2.5–7.5 × 1.5–2.5(–3) mm, densely manyflowered, apex obtuse to subacute. Grumes red-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 obovulate and with transverse line-articulation. 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. diphylloides

1b. Glumes straw-yellow, oblong-ovate, longer than 2 mm ....................... 21b. var. straminea

21a. Fimbristylis diphylloides var. diphylloides

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].


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.
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- Jiangxi (Lushan).

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


两歧飘拂草 san xing piao fu cao

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

Perennials. Rhizomes short, horizontal, covered with brownish scales. Culms densely tufted, 17–90 cm tall, 1–5 mm thick, obliquely or sparsely, glabrous, with 2 or rarely bladeless sheaths at base. Leaves of vegetative shoot usually shortly bladed; sheaths cylindrical, 2–19 cm, mouth obliquely truncate; ligule reduced to a circle of hairs or absent; blade linear, 7–25 cm × 1–2 mm. Inflorescence a simple or compound anthera, 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, ovate obtuse. Glumes numerous, spirally imbricate, yellowish rust-colored, or brown, ovate to ovate-elliptic, 1.8–2.7 × 1–1.5 mm, membranous to abaxially scarly 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, occasionally 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, Taiwan, Yunnan [India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

23. Fimbristylis dichotoma subsp. dichotoma

两歧飘拂草 (原亚种) liang qi piao fu cao (yuán ya zhòng)

Scirpus dichotomus Linnaeus, Sp. Pl. 1. 150. 1753; Fimbristylis annua (Allioni) Roemer & Schultes; F. dichotoma f. annua (Allioni) Ohwi; F. dichotoma var. tikiushiensis (Hayata) T. Koyama; F. dichotoma f. tomentosa (Vahl) Ohwi; F. diphylla (Retzius) Vahl; F. diphylla var. annua (Allioni) C. B. Clarke; F. tikiushiensis Hayata; F. tomentosa Vahl; S. annua Allioni; S. diphylla Retzius.

In N Australia, W Indonesia, and Papua New Guinea.

23a. Fimbristylis dichotoma subsp. podocarpa

两歧飘拂草 (原亚种) liang qi piao fu cao (yuán ya zhòng)

Scirpus dichotomus Linnaeus, Sp. Pl. 1. 150. 1753; Fimbristylis annua (Allioni) Roemer & Schultes; F. dichotoma f. annua (Allioni) Ohwi; F. dichotoma var. tikiushiensis (Hayata) T. Koyama; F. dichotoma f. tomentosa (Vahl) Ohwi; F. diphylla (Retzius) Vahl; F. diphylla var. annua (Allioni) C. B. Clarke; F. tikiushiensis Hayata; F. tomentosa Vahl; S. annua Allioni; S. diphylla 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 anthera. 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


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, Hebei, Hunan, Jiangsu, Jiangxi, Liaoning, E Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xisha Qundao, SE Xizang, Yunnan, Zhejiang [Afghanistan, India, 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].

Within Fimbristylis dichotoma subsp. dichotoma two varieties could be recognized in China, i.e., F. dichotoma var. dichotoma and F. dichotoma var. podocarpa.

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, Hebei, Hunan, Jiangsu, Jiangxi, Liaoning, E 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].
**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. *tenedusi* 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).


绒毛飘拂草 rong mao piao fu cao


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].


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 in inflorescence. Inflorescence a simple or compound anthera, 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, short-lived stipitate, broadly ovoid, ca. 1 mm, biconvex, sparsely verruculose and finely cancellate with several rows of transversely oblong cells. Fl. and fr. Mar–Nov.

- Grass vegetation at margin of evergreen broad-leaved forests, wet areas; below 100–200 m. Taiwan.


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 anthera; 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].


结壮飘拂草 jie zhuang piao fu cao

Perennials. Rhizomes short, thick, woody, diageotropic. Culms sparsely tufted, 15–50 cm tall, flatly cylindric, 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 anthera; 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.


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 anthera, 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 × 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.


匍匐茎飘拂草  pu fu jing piao fu cao

Perennials, stoloniferous. Culms 30–70 cm tall. Leaves ca. 60 cm tall, 1–1.5 mm thick, densely tufted or closely arranged in a row along a ± horizontal knotty rhizome. Leaves with a blade. 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].


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.


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


安平飘拂草  an ping piao fu cao


Rhzomes 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 seetaceous short blade.

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


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 anthera. Spikelets digitately clustered or solitary, very narrowly ovoid to linear, 7–17 × ca. 2 mm. Glumes straw-yellow to white hairs, abaxially prominently keeled, margin ciliate, apex obuse 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 obvovoid, 1.2–1.5 mm, flatly biconvex, subsulmooth. Fl. and fr. Jun–Aug.
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, obvoid, 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, Pala, Philippines, Thailand, Vietnam].


少穗飘拂草 shao sui piao fu cao

Fimbristylis 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. Involutral 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 micro. 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, Sri Lanka, Thailand, Vietnam; tropical Africa, N Australia].


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. Involutral 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-ovoid, 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, obvoid, 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].


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 few leaves at base. Leaves shorter than culm; sheath yellowish brown, short, glabrous; leaf blade nearly Juncus-like, ca. 1 mm in diam., smooth. Involutral 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, obvoid, 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].

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; another oblong, apiculate. Style long and compressed, basally inflated with long filiform pendant 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; 100–2000 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. aestivalis* 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. *squarrosa*

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

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; 100–2000 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, Thailand, Vietnam; Africa, SW Asia, Australia, S Europe, Pacific islands].

35b. *Fimbristylis squarrosa* var. *squarrosa*

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.

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, orobial, orobial, or 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 obvoid, 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, S Lanka, Thailand, Turkmenistan, Vietnam; Africa, SW Asia, Australia, Europe, India, Indian Ocean islands].


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, redish brown, ovate to oblong, ca. 1 mm, membranous, 3-veined forming an abaxial green keel, apex mucronate. Stamen 1; another narrowly ovoid. Style long and compressed, basally inflated, apically ciliate; stigmas 2, short. Nutlet yellow, subes- sessile, obvoid, 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, Hebei, Hunan, Jiangxi, S Shaanxi, Sichuan, Taiwan, S Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Laos, Nepal, Papua New Guinea, Philippines, Russia (Far East), S Lanka, Thailand, Vietnam; Australia, Pacific islands].
38. *Fimbristylis gracilenta* 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 sometimes slightly involute. Involucral bracts 5 or 6, needlelike, shorter than inflorescence, pubescent. Inflorescence a simple or occasionally compound anthera; 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].


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 anthera; 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. Stamens 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).


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–)15–25(–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, 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].


海南飘拂草  hai nan piao fu cao


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].


垂穗飘拂草  chui sui piao fu cao


Annuals or short-lived perennials. Rhizomes extremely short or absent. Culms densely tufted, 15–85 cm tall, subcylindric, stiff, striate, smooth, glabrous, with leaf sheaths at base. Leaves bladeless; sheath brown, basal ones glume-like and apical ones cylindrical, margins membranous, apex obliquely truncate. Involucral bract 1, glume-like, 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].


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 cylindric, apex obliquely truncate. 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 stipule, 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].


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. 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, not ciliate, basally inflated; stigmas 3. Nutlet white, obovoid, ca. 0.7 mm, 3-sided, verruculose. Fl. and fr. Apr–Jul.

Marshes, along rivers, among rocks in valleys; 100–2500 m. Guangdong, Guangxi, Hainan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia].


知风飘拂草 zhi feng piao fu cao


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, cylindric, 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


Annuals. Culms tufted, 10–30 cm tall. Leaf 1/4–1/3 as long as culm; sheath obliquely split, mouth margins membranous and 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].


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, midvein abaxially forming a slight keel, apex acuminate. Stamens 3. Ovary white, cylindric, 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.


腺鳞飘拂草 xian lin piao fu cao

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, canaliculate, margin involute, apex subacute. Involucral bracts 2 or 3, leaflike, longest 1–5 cm, shorter than inflorescence. Inflorescence a compound or decumbent 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. Style 4–5 mm, thickly papery, hairy, 1-veined forming an abaxial keel, margin brown to nearly blackish brown, ovate-lanceolate, 4–5 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].


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 excurrent awn. Stamens 2. Style ca. 3 mm, slender; stigmas 2. Nutlet grayish yellow or white, elliptoid, ca. 1 × 0.6 mm, 3-sided, verruculose. Fl. summer.

● Grasslands along rivers. Guangdong (Lianzhou).


暗褐飘拂草 an he piao fu cao


Perennials, rhizomatous. Culms tufted, 20–40 cm tall, with radical leaves. Leaf blade linear, 5–35 × 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–Sept.

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].


Rose piao fu cao


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 ciliolate, 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, cylindric, 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].


独穗飘拂草 du sui piao fu cao


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 basalmost 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 micro; empty glumes shorter than fertile ones, with longer awns. Stamens 3. Style 3-sided, basally inflated; stigmas 3. Nutlet shortly stipitate, obovoid, ca. 2 mm, 3-sided, prominently verruculose. Fl. and fr. Jun–Sept. 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].

Perennials, rhizomatous. Culms tufted, 15–30 cm tall, slender. Leaves ca. 1/2 as long as equaling culm; leaf blade narrowly linear, ca. 0.5 mm wide, apex acuminate. Inflorescences 2 or 3, glumelike, 0.5–1.8 cm, with an elongated 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-sliided, 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.


球柱草属 qiu zhu cao shu

Liang Songyun 梁松筠; Gordon C. Tucker

Herbs, annual [or perennial]. Culms tufted, very slender. Leaves with a leaf blade or rarely reduced to a bladeless sheath, mouth with lax white hairs; leaf blade filiform to linear, margin often involute. Inflorescences leaflike or setaceous. Inflorescence a terminal simple or compound anthela or capitule, sometimes reduced to a single spikelet. Spikelets ovoid to ellipsoid, many flowered. Glumes spirally arranged or rarely distichous, herbaceous or membranous, deciduous, subtending a flower but basal 1 or 2 empty. Flowers bisexual. Perianth bristles absent. Stamens (1 or)2 (or 3). Style filiform, base thickened, bulbous, and persistent in fruit; stigmas 3. Nutlet obovoid to obpyriform, 3-sided.

About 100 species: tropical to temperate regions worldwide with high concentration of species in tropical Africa and tropical America; three species in China.

1a. Spikelets 2–15, sessile in a capitulate inflorescence; glumes brownish to yellowish green, apex with a recurved short awn ........................................................................................................ 3. B. barbata

1b. Spikelet single, in a simple to compound anthela; glumes brownish to brown, apex mucronate.

2a. Glumes glabrous, apex obtuse; nutlet irregularly puncticate ........................................................................... 1. B. densa

2b. Glumes pubescent, apex acute; nutlet undulate-corrugate ................................................................. 2. B. puberula


丝叶球柱草 si ye qiu zhu cao

Scirpus densus Wallich in Roxburgh, Fl. Ind. 1: 231. 1820; Bulbostylis capillaris (Linnaeus) Kunth ex C. B. Clarke var. trifida (Kunth) C. B. Clarke; Isolepis densa (Wallch) Schultes; I. tenuissima D. Don; I. trifida Kunth.

Rhizomes absent. Culms tufted, 7–35 cm tall, slender. Leaf sheath pale, membranous, mouth long pilose; leaf blade filiform, 5–10(–13) × ca. 0.6 mm, papery, abaxially sparsely pilose, margin entire and slightly revolute, apex acuminate. Inflorescences leaflike or setaceous to glumelike, 0.8–1.5 cm, much shorter than inflorescence, apex acuminate. Inflorescence a simple or subcompound anthela, with 4–7 spikelets; rays 3–5, 2–5 cm. Spikelets solitary or clustered, oblong-oovoid to ovoid, 3–6 × ca. 1.5 mm, 5–18-flowered, base rounded, apex acute. Glumes brown, ovate to broadly ovate, 1.5–2 × 1–1.5 mm, membranous, 1–3-veined, base rounded, margin ciliate, apex obtuse to rarely acute; empty glumes yellowish green, apex sometimes mucronate. Stamens 2; anthers oblong-oovoid to ovoid, base cuneate, apex acute. Style filiform; stigmas 3. Nutlet grayish purple at maturity, obovoid, ca. 0.8 × 0.5–0.6 mm, 3-sided, inconspicuously undulate-corrugate and punctulate, apex contracted with a persistent depressed bulbous style base. Fl. and fr. Apr.–Dec. 2n = 64.


毛鳞球柱草 mao lin qiu zhu cao

Scirpus puberulus Poir. (1805), not Michaux (1803).

Rhizomes absent. Culms tufted, 10–30 cm tall, slender, smooth. Leaf sheath straw-colored to brownish, thinly membranous, pubescent; leaf blade capillary, 4–6 cm × 0.4–0.8 mm, abaxially pubescent, margin entire and slightly revolute, apex acuminate. Inflorescences 2 or 3, setaceous, ca. 8 mm, base membranous, margin ciliate. Inflorescence a simple or compound anthela, with 1–3 or more spikelets, often congested to almost capitulate, sometimes reduced to a single spikelet. Spikelets ovoid-oblong to ovoid, 3–6 × 1–2 mm, 7–21-flowered, base obtuse to rounded, apex acute. Glumes brownish to dark brown, ovate to broadly ovate, 1.5–2 × 1–1.5 mm, keeled, membranous, abaxially pubescent, margin ciliate, apex with a 1–3-veined yellowish green costa excurrent into a recurved mucro. Stamens 1; anther oblong, apex acute. Style filiform, base depressed globose; stigmas 3. Nutlet white to grayish yellow, obovoid, ca. 0.8 × 0.5–0.6 mm, 3-sided, apex contracted with a

**细莞属**  **xi guan shu**

Liang Songyun (梁松筠 Liang Song-jun); A. Muthama Muasya, David A. Simpson

Herbs, annual or rarely perennial. Rhizomes present or absent. Culms tufted, terete. Leaves all basal; sheath green to straw-colored, sometimes nearly reddish; ligule absent; leaf blade often much reduced. Involucral bract leaflike, spreading to erect. Inflorescences capitulate, with few to many spikelets or reduced to a single spikelet, rarely an anther. Spikelets with few to many spirally arranged mostly deciduous glumes. Glumes each subtending a flower but basalmost sometimes empty. Flowers bisexual. Perianth bristles absent. Stamens 1–3. Style linear, persistent, base not or slightly thickened, apex 2- or 3-cleft. Nutlet mostly obovoid, biconvex or 3-sided, papillose or longitudinally ribbed.

About 70 species: worldwide, especially Africa and Australia; one species in China.

1. **Isolepis setacea** (Linnaeus) R. Brown, Prodr. 222. 1810.

**细莞**  **xi guan**

*Scirpus setaceus* Linnaeus, Sp. Pl. 1: 49. 1753; *Schoenoplectus setaceus* (Linnaeus) Palla.

Rhizomes creeping. Culms 3–12 cm tall, ca. 5 mm thick, terete, grooved. Leaves sometimes with only a sheath; leaf blade linear, usually shorter than culm, 0.2–0.5 mm wide, sometimes very short and deltoid or absent. Involucral bract 1(or 2), ovate-lanceolate, 3–10(–12) mm, spreading to erect, both surfaces dark red at base, apex long awned or mucronate. Inflorescence a pseudolateral head with 1–3 spikelets. Spikelets ovoid, 2.5–4 mm, many flowered. Glumes ovate to subelliptic, ca. 1.5 mm, both surfaces dark purple to purple, midvein greenish to straw-colored, apex rounded to obtuse. Perianth bristles absent. Stamens 2; filaments short, thick, with brown minute spots; anthers oblong, 0.3–0.5 mm; connective apex evident beyond anthers. Style short; stigmas (2 or)3, slender. Nutlet pale brown to orangish brown, broadly obovoid to subspherical, ca. 0.5 mm, plano-convex to compressed 3-sided, each surface prominently longitudinally ribbed, with many fine transverse ridges. Fl. and fr. Jun–Aug. 2n = 28.

Stream margins, pond margins, moist grassy slopes, floodplains; 1800–4600 m. Gansu, Jiangxi, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, India (Sikkim), Kashmir, Kazakhstan, Kyrgyzstan, Myanmar, Nepal, Pakistan, Russia, Tajikistan, Thailand, Uzbekistan; Africa, SW Asia, Atlantic Ocean islands, Australia, Europe, North America].

15. **CYPERUS** Linnaeus, Sp. Pl. 1: 44. 1753.

**莎草属**  **suo cao shu**

Dai Lunkai (戴伦凯); Gordon C. Tucker, David A. Simpson

*Cyperus* sect. *Juncellus* Grisebach; *Juncellus* (Grisebach) C. B. Clarke; *Mariscus* Vahl; *Torulinum* Desvaux ex Hamilton.

Herbs, annual or perennial, with rhizomes or stolons. Culms caespitose or solitary, erect, usually 3-angled or acutely triquetrous,
sometimes compressed triquetrous, stout or slender, leafy at basal part or at base. Leaves basal, 3-ranked, rarely without a blade; ligule absent. Involucral bracts leaflike, usually 2–10(–20 or more), at base of inflorescence. Inflorescences terminal, a simple or compound anthela, with several to many rays and usually with raylets (secondary rays); rays and raylets unequal or rarely equal in length or inflorescence capitate. Spikelets few to many in spikes, digitate clusters, or a capitulum at apex of rays, rarely single; rachilla not articulate at base, persistent, usually with narrow wings. Glumes distichous, rarely spirally imbricate; basal 1 or 2 glumes without a flower; remaining glumes each with a bisexual flower. Perianth bristles or scales absent. Stamens (1–3). Style base not swollen; stigmas (2 or)3, deciduous at maturity. Nutlet 3-sided, smooth, puncticulate, tuberculate, or rarely reticulately striate.

About 600 species: temperate, subtropical, and tropical regions worldwide; 62 species (eight endemic, four introduced) in China.

1a. Spikelets digitate or fasciculate on a very short rachis, or inflorescences capitate or globose.

2a. Inflorescences capitulate or anthelate, with very short rays (rarely with 1 or 2 elongated rays).

3a. Spikelets 1–5-flowered, falling from rachis as a single unit while glumes remain attached to winged rachilla; culm base swollen into a bulb shape, enclosed by dark brown or brown leaf sheaths.

4a. Spikelets 1-flowered; glumes inconspicuously veined .......................................................... 58. C. monospermus

4b. Spikelets 2–5-flowered; glumes conspicuously veined.

5a. Spikelets narrowly ovoid, 3–5-flowered; glumes broadly ovate, densely brown puncticulate, 15–17-veined; nutlet obovoid to ellipsoid ............................................................... 56. C. dubius

5b. Spikelets ovoid-ellipsoid, 2–3-flowered; glumes ovate, brownish to straw-colored and laxly reddish puncticulate at base and apex, 9–13-veined; nutlet oblong ........................................ 57. C. hainanensis

3b. Spikelets 3–8-flowered or more, rachilla remaining attached to rachis as glumes and nutlets fall with maturity; culm base not bulbous.

6a. Spikelets 3– or 4-flowered; nutlet with spongy base of style extending downward along angles of nutlet ................................................................................................................................................. 19. C. cephalotes

6b. Spikelets 8-flowered or more; nutlet without enlarged spongy apex.

7a. Culms usually tall; spikelets several to more than 20, laxly fascicled; glumes conspicuously distichous, ca. 4 mm, apex obtuse and muticous.

8a. Leaves usually longer than culm; spikelets 5–8 mm, 6–10-flowered; nutlet oblong......... 17. C. szechuanensis

8b. Leaves usually shorter than culm; spikelets 7–25 mm, 8–48-flowered; nutlet obovoid .......... 18. C. niveus

7b. Culms dwarf; spikelets numerous, very densely arranged; glumes spirally imbricate or obscurely distichous, ca. 2 mm, apex recurved mucronate.

9a. Spikelets ovoid to narrowly ovoid, 3–4 × ca. 1.5 mm; glumes spirally imbricate .......... 20. C. michelianus

9b. Spikelets narrowly oblong-ovoid, oblong, or rarely narrowly ovoid, 3–8 × 1.5–2 mm; glumes distichous but sometimes obscurely so.

10a. Spikelets very numerous, congested into capitulum, 4–5 mm; glumes oblong-lanceolate, apex slightly long mucronate; stigmas 2(or 3); nutlet narrowly oblong to oblong, nearly 3-sided ................................................................. 21. C. pygmaeus

10b. Spikelets many, congested with short or slightly elongate rays, 3–8 mm; glumes ovate or broadly ovate, apex shortly mucronate; stigmas 2; nutlet ellipsoid, plano-convex.

11a. Inflorescences capitulate, sometimes with 1 ray to 2 cm; glumes broadly ovate, white on both surfaces or rusty brown striate; nutlet oblong ......... 22. C. nipponicus

11b. Inflorescence a simple anthela, with 3–6 rays to 6 cm; glumes ovate, pale on both surfaces but medially green; nutlet ellipsoid ...................................................... 23. C. hilgendorfianus

2b. Inflorescences anthelate, with elongate rays, sometimes with secondary (compound) and tertiary (decompound) branching.

12a. Nutlet lenticular, with face toward rachilla.

13a. Annuals; spikelets compressed, usually ca. 1.5 mm wide; glumes 1–2 mm; stamens 1 or 2, anthers ellipsoid ................................................................. 61. C. limosus

13b. Perennials; spikelets slightly turgid, (2.5–)3–5 mm wide; glumes 2.5–3 mm; stamens 3, anthers linear.

14a. Culms 35–100 cm tall; leaf blade 3–10 mm wide; inflorescence a simple or compound anthela, usually with long rays and 5–17 spikelets arranged into spikes .............. 59. C. serotinus

14b. Culms 4–20 cm tall; leaf blade ca. 1 cm wide; inflorescences capitulate, usually with 1–8 spikelets ................................................................. 60. C. pannonicus

12b. Nutlet 3-sided (sometimes dorsiventrally compressed).

15a. Perennial herbs; glumes ca. 2 mm; nutlet 0.7–1.5 mm.

16a. Spikelets slightly turgid; glumes 7-veined or more.

17a. Culms 1.5–5 cm tall; anthela rays much longer than culm .................................................. 6. C. radians

17b. Culms 35–70 cm tall; anthela rays much shorter than culm.
18a. Culms 3-angled but not winged; involucral bracts 6–12; inflorescence rays 6–16 cm ........................................ 4. C. diffusus

18b. Culms 3-angled and winged; involucral bracts 3–5; inflorescence rays 2.5–5.5 cm ................................... 5. C. trialatus

16b. Spikelets compressed; glumes 3–5-veined.

19a. Culms and rays with retrorse prickles ....................................................... 7. C. surinamensis

19b. Culms and rays smooth or with spreading or ascending prickles.

20a. Culms compressed triquetrous, with leaves at basal part; leafy involucral bracts 5–12, unequal in length.

21a. Culms scabrid on angles; raylets present; stamens 3 per flower; nutlet compressed ........................................ 3. C. platystylis

21b. Culms smooth; raylets absent; stamen 1 per flower; nutlet not compressed ........................................ 24. C. eragrostis

20b. Culms obtusely 3-angled to subterete, with bladeless sheaths basally; leafy involucral bracts 15–20, nearly equal in length.

22a. Involucral bracts flexuose, drooping; apex of glumes acute; nutlet not stipitate ........................................ 1. C. involucratus

22b. Involucral bracts rigid; apex of glumes acuminate; nutlet stipitate ........ 2. C. alternifolius

15b. Annual or perennial herbs; glumes ca. 1(–1.5) mm; nutlet 0.2–0.3 mm.

23a. Leaves very narrow, adaxially canaliculate, margin involute; glumes papery, apex truncate and with a recurved awn; nutlet oblong-obovoid.

24a. Glumes with a (0.5–)0.6–1 mm awn; nutlets 0.5–0.6 mm ............................................. 15. C. cuspidatus

24b. Glumes with a 0.2–0.5 mm awn; nutlets 0.7–0.9 mm .................................... 16. C. castaneus

23b. Leaves flat; glumes membranous, apex obtuse and mucronate or muticous; nutlet obvoid or ellipsoid.

25a. Perennials or rarely annuals; culms with few leaves or with bladeless sheaths only; stamens (1–)3; nutlet less than 1/2 as long as subtending glume.

26a. Leafy involucral bracts usually longer than inflorescence; glumes laxly imbricate, with recurved apex; anther apices not white setose; nutlet 0.2–0.3 mm wide ...................................................... 13. C. tenispica

26b. Leafy involucral bracts usually shorter than inflorescence; glumes densely imbricate, apex straight; anther apices white setose; nutlet 0.4–0.5 mm wide ................ 14. C. haspan

25b. Annuals without stolons (except C. duclouxii); culms usually leafy; stamens 1 or 2 (or 3); nutlet 1/2 or more as long as subtending glume.

27a. Perennials, with stolons; culms scattered; spikelets 3–10, digitately arranged .......... 8. C. duclouxii

27b. Annuals, with fibrous roots; culms tufted; spikelets many, congested into a capitulum or capitate heads.

28a. Spikelets numerous, densely congested into a dense capitulum ................ 12. C. difformis

28b. Spikelets (isolated) several to more than 10, congested into a lax capitulum.

29a. Glumes lax, orbicular-ovate to suborbicular, spreading when mature, apex mucronate ..................................................... 9. C. nigrofuscus

29b. Glumes slightly dense, broadly ovate or compressed orbicular, not spreading at maturity, apex muticous.

30a. Spikelets ca. 1.5 mm wide; glumes broadly ovate, purplish brown to brown and yellowish green between both lateral veins .................................................. 10. C. fuscus

30b. Spikelets ca. 1.8 mm wide; glumes ovate-lanceolate, blackish purple .................................................. 11. C. nanellus

1b. Spikelets in spikes terminating rays (rachis (0.5–)1–6 cm, usually visible, sometimes covered by bases of spikelets in pressed specimens).

31a. Rachilla not winged or only with very narrow white hyaline margins; style short.

32a. Perennials, with long stolons; spikelets slightly turgid; glumes abaxially not keeled or rarely keeled, margin involute, apex obtuse or rounded and usually muticous or rarely mucronate.

33a. Culms with long sheaths at basal part, sheaths with short blade or nearly bladeless; rachis of spikes glabrous; spikelets linear; glumes elliptic to oblong ........................................................................ 42. C. malaccensis

33b. Culms with long blades; rachis of spikes hispidulous, rarely glabrous; spikelets narrowly ovoid; glumes ovate or broadly ovate.

34a. Rachis of spikelets laxly hispidulous, sometimes glabrous; spikelets ca. 3 mm wide; glumes obtuse and muticous at apex .......................................................... 44. C. procerus
34b. Rachis of spikes slightly densely hispidulous; spikelets 1.5–2.5 mm wide; glumes mucronate or muticous at apex.

35a. Inflorescence a compound anthela; glumes with inconspicuous keel and not spinulose ................................................................. 43. C. pilosus

35b. Inflorescence a simple anthela; glumes with conspicuous keel and spinulose ................................. 45. C. babakan

32b. Annuals, without rhizomes or stolons, with fibrous roots only; spikelets ± compressed; glumes abaxially keeled, margin not involute, apex mucronate to cuspidate.

36a. Dried plants with odor like curry; stamen 1; glumes 7–9-veined, apex cuspidate .............................. 53. C. squarrosus

36b. Dried plants odorless; stamens 3; glumes 3–7-veined, apex obtuse, mucronulate, or cuspidate.

37a. Rachis of spikes short; spikelets densely arranged, subcapitate; glumes densely imbricate; nutlet ca. 1/2 as long as subtending glume ....................................................... 50. C. compressus

37b. Rachis of spikes long; spikelets laxly arranged; glumes laxly imbricate; nutlet nearly as long as subtending glume.

38a. Inflorescence a compound anthela; spikelets erect or obliquely spreading.

39a. Rachilla not winged; glumes retuse and very shortly mucronate at apex; successive glumes 0.7–0.9 mm apart on same side of rachilla ..................................... 46. C. iria

39b. Rachilla wings white hyaline and narrow; glumes orbicular and slightly long mucronate at apex; successive glumes 1–1.5 mm apart on same side of rachilla ................................................................................................ 47. C. microiria

38b. Inflorescence a simple anthela; spikelets subspreading.

40a. Rachis glabrous; style usually long or medium, rarely short.

41a. Mature spikelets disarticulating at base of each glume, with each nutlet clasped by rachilla wings; rachilla wings yellowish spongy .............................................. 62. C. odoratus

41b. Mature spikelets either falling as a unit or rachilla remaining attached to rachis and glumes falling; rachilla wings hyaline and not spongy.

42a. Spikes ± cylindric, with numerous spikelets.

43a. Rachilla winged; style usually long or medium, rarely short.

44a. Spikelets linear, terete or subterete; rachilla broadly winged, wings lanceolate and ± deciduous.

45a. Spikes broadly cylindric, 1.5–2 cm wide; spikelets spreading; anther connective minute ........................................................................................................ 25. C. digitatus

45b. Spikes narrowly cylindric, 0.8–1.2 cm wide; spikelets ascending; anther connective prominent and subulate .............................................................. 26. C. elatus

44b. Spikelets narrowly oblong-ovoid, compressed; rachilla narrowly winged, wings linear and persistent.

46a. Spikes ± pedunculate; spikelets ± distichous, laxly arranged; anthers linear .... 27. C. exaltatus

46b. Spikes not pedunculate; spikelets in several rows, densely arranged; anthers oblong.

47a. Involucral bracts 8–15; anthela with 12–15 rays; spikes 1.5–11 cm; glumes oblong-ovate, 2.2–2.5 mm, apex straight mucronate; nutlet oblong to obovoid-oblong ...................................................... 28. C. simaoensis

47b. Involucral bracts 3–5; anthela with 6–10 rays; spikes 1.5–4 cm; glumes broadly ovate, ca. 1.5 mm, apex curved mucronate; nutlet obvoid to ellipsoid ......................................................... 29. C. imbricatus

43b. Mature spikelets deciduous and falling from rachis with glumes and nutlets attached.

48a. Spikelets 1–3(or 4)-flowered; glumes tightly included around nutlet.

49a. Spikes cylindric, (1–)2–3.5 × 0.6–1 cm, with parallel sides; anthers (0.6–)0.8–1 mm; nutlet ca. 0.5 mm wide; leaf blade margin smooth ......... 54. C. cyperoides

49b. Spikes shortly cylindric, oblong, or ovoid, 1.2–1.8 × 0.8–1.0 × 1.5 cm, with sides narrowed toward base; anthers 1–1.5 mm; nutlet 0.6–0.9 mm wide; leaf blade margin scabrous ........................................... 55. C. cyperinus

48b. Spikelets 4–10-flowered; glumes not tightly included around nutlet.

50a. Annuals; glumes with a recurved mucro at apex; stamens 1 ............................. 53. C. squarrosus

50b. Perennials; glumes without mucro at apex; stamens 3.

51a. Spikelets subulate, 5–18 mm, slightly less than 1 mm wide, arranged into a globose to half-globose spike; culms and anthela rays not papillose; nutlet linear-oblong; leaf sheath purplish red .................................. 51. C. compactus
51b. Spikelets narrowly oblong-ovoid, 4.5–7 × 1.8–2.5 mm, arranged into a cylindric spike; culms and anthela rays papillose; nutlet broadly elliptoid to ovoid-ellipsoid; leaf sheath blackish brown ......... 52. *C. javanicus*

42b. Spikes broadly ovoid, turbinate, ellipsoid, oblong, orbicular, or rarely cylindric, with up to 10 spikelets (rarely more in *C. glomeratus* and *C. eleusinoides*).

52a. Rhizomes short or surculose, without stolons or tubers; glumes laxly spreading.

52a. Rhizomes short or surculose, without stolons or tubers; glumes laxly spreading.

53a. Culms slender; spikes broadly ovoid; spikelets subquadranular, obliquely spreading to spreading at maturity; glumes ca. 4 mm ................................. 37. *C. tenuiculmis*

53a. Culms slender; spikes broadly ovoid; spikelets subquadranular, obliquely spreading to spreading at maturity; glumes ca. 4 mm ................................. 37. *C. tenuiculmis*

53b. Culms stout; spikes oblong, cylindric, ellipsoid, globose, or rarely broadly ovoid; spikelets slightly compressed, suberect or rarely spreading; glumes ca. 2 mm.

54a. Spikelets laxly arranged, spreading after anthesis, 0.8–4 cm × ca. 1 mm; glumes dark blood-red ................................................................. 38. *C. distans*

54b. Spikelets densely or very densely arranged, suberect, not spreading after anthesis, 0.4–1.1 cm × 1.5–2 mm; glumes reddish brown or yellowish brown.

55a. Annuals, without rhizomes but with fibrous roots; glumes muticous at apex ..................................................................................................... 41. *C. glomeratus*

55b. Perennials; rhizomes short; glumes mucronate at apex.

56a. Anthela raylets radially spreading; spikes 6 cm or more; spikelets 1–1.5 mm wide ............................................................... 39. *C. nutans*

56b. Anthela raylets suberect; spikes less than 6 cm; spikelets ca. 2 mm wide ................................................................. 40. *C. eleusinoides*

52b. Rhizomes creeping or with stolons and tubers; glumes ± densely imbricate.

57a. Culms stout; sheaths bladeless or apicalmost with short blade only; glumes oblong, concave, margin involute; spikelets slightly compressed, rachilla with reddish brown wings ............................................................................................. 30. *C. pangorei*

57b. Culms slightly slender; sheaths with blade; glumes ovate, broadly ovate, or ovate-elliptic, margin not involute.

58a. Spikes ovoid; glumes laxly imbricate, spreading at maturity ........................... 36. *C. esculentus*

58b. Spikes broadly ovoid, obdeltoid, or obovoid; glumes densely imbricate, not spreading at maturity (laxly imbricate and spreading at maturity in *C. mitis* but spikes obovoid).

59a. Rachilla narrowly winged; glumes laxly imbricate, spreading at maturity; involucral bracts subulate, shorter than inflorescence ................................................. 35. *C. mitis*

59b. Rachilla broadly winged; glumes densely imbricate, not spreading at maturity; involucral bracts leaflike, usually longer than inflorescence.

60a. Leaves and involucral bracts slightly narrow, usually plicate; anthela rays erect or suberect, less than 2 cm.

60a. Leaves and involucral bracts slightly narrow, usually plicate; anthela rays erect or suberect, less than 2 cm.

61a. Stolons short; culms laxly tufted; rays of anthela erect; spikelets laxly arranged into spikes, linear, ca. 1 mm wide; anthers ellipsoid; nutlet oblong ............................ 31. *C. linearispiculatus*

61b. Stolons long; culms scattered; rays of anthela slightly obliquely spreading; spikelets nearly digitately arranged at apex of ray, oblong-lanceolate to lanceolate, 2–3 mm wide, slightly turgid; anthers linear; nutlet obovoid to ellipsoid .......................................................... 32. *C. stoloniferus*

60b. Leaves and involucral bracts slightly broad, usually flat; anthela rays obliquely spreading, slender, mostly to 12 cm.

62a. Glumes dark blood-red, ovate to oblong-ovate ............................... 33. *C. rotundus*

62b. Glumes straw-colored to brownish yellow, broadly ovate to elliptic ........................................................................ 34. *C. tuberosus*


风车草  feng che cao

*Cyperus alternifolius* Linnaeus subsp. *flabelliformis* Kükenthal; *C. flabelliformis* Rottbøll, nom. illeg. superfl.
as long as inflorescence, subequal in length, to 30 cm, 0.5–17 mm wide, margin scabridulous, basally ± horizontal, apically flexuose and ± drooping. Inflorescence a compound anthem; rays numerous, 3–10 cm, each with 4–10 raylets; raylets 1–1.5 cm, each with 3–9 spikelets. Spikelets clustered at apex of raylets, narrowly ovoid or oblong, 3–12 × 1.5–3 mm, flattened, radially spreading, 8–36-flowered; rachilla straight, wingless. Glumes densely imbricate, ovate, ca. 2 mm, membranous, rusty brown punctate, 3–5-veined, apex acute. Stamens 3; anthers linear, ca. 1 mm, apex setose. Style ca. 1 mm; stigmas 3, ca. 1 mm. Nutlet brown at maturity, not stipitate, broadly ellipsoid, 0.5–0.6 mm, 1/4–1/3 as long as subtending glume, 3-sided, apex not apiculate. Fl. and fr. May–Dec. 2n = 32.

Cultivated as an ornamental in China, sometimes escaped and naturalized along streams and in wet thickets and disturbed areas; below 400 m. Guangdong, Hunan, Taiwan [native to E Africa and SW Asia (Arabian Peninsula)].

*Cyperus involucratus* is widely cultivated as an ornamental and sometimes naturalized in tropical and subtropical areas worldwide.


野生风车草 ye sheng feng che cao

Perennials. Roots ± thick, fibrous. Rhizomes short, thick. Culms 0.5–1.5(–3) m tall, slightly stout, obtusely 3-angled to subterete, base with bladeless sheaths, apically scabrid. Basal leaf sheaths yellowish brown; apical leaf sheaths pale green and mostly to 20 cm. Involutral bracts 11–18, leaflike, ca. 2 × as long as inflorescence, subequal in length, 1–14 mm wide, ± horizontal, stiff, margin scabrous. Inflorescence a decom-pound anthem; rays 8–18, 3–10 cm, each with 1–4 raylets; raylets 1–1.5 cm, each with 3–9 spikelets. Spikelets clustered at apex of raylets, linear to narrowly linear-ovoid, 5–20 × 1–1.5 mm, flattened, 10–40-flowered; rachilla straight, wingless. Glumes pale green, densely imbricate, ovate, ca. 2 mm, membranous, 3-veined, apex acuminate. Stamens 3; anthers linear, ca. 1 mm, apex setose. Style ca. 1 mm; stigmas 3, ca. 1 mm. Nutlet brown at maturity, not stipitate, ellipsoid to ovoid, ca. 0.8 mm, 1/3–1/2 as long as subtending glume, compressed 3-sided, apex apiculate. 2n = 32.

Naturalized in wetlands along rivers; below 100–300 m. Taiwan [native to Madagascar].

*Cyperus alternifolius* is naturalized in many tropical areas worldwide.


宽柱莎草 kuan zhu suo cao

Perennials. Roots ± thick. Rhizomes very short. Culms 1(–3 and tufted), 30–90 cm tall, stout, triquetrous, scabrid on apical angles, leaved at basal part. Leaves equaling culm; sheath brownish, basal ones bladeless; leaf blade 5–12 mm wide, ± stiff, ± flat plicate, margin scabrous. Involutral bracts 5–12, longer than inflorescence, basal few to 60 cm, spreading to deflexed after anthesis. Inflorescence a compound or decompound anthem; rays many (to 17), 2–8 cm, ± slender, each with 4–16 raylets; raylets 1–4 cm, each with 3–7 spikelets. Spikelets digitately arranged at apex of raylets, narrowly oblong-ovoid, 5–8 × ca. 2.5 mm, oblique or spreading, densely 15–35-flowered; rachilla straight, wingless. Glumes broadly ovate, 2–2.5 mm, thickly membranous, inconspicuously 3-veined, keel abaxially greenish, apex acute to obtuse and mucronate. Stamens 3, short. Style long, flattened, margin pilose; stigmas 3, short. Nutlet brownish glaucous, ellipsoid to ovoid-ellipsoid, compressed 3-sided, with concave sides, shiny, angles pale brown and markedly spongy-thickened.

Ponds, lakes; below 500 m. Taiwan, SE Xizang [Bangladesh, India, Indonesia, Malaysia, Myanmar, Nepal, Papua New Guinea, Sri Lanka, Thailand, Vietnam; Australia].


多脉莎草 duo mai suo cao

Perennials. Rhizomes short, hardened. Culms 25–80 cm tall, slightly thick, triquetrous, smooth, several leaved at basal part. Leaves equaling or shorter than culm; sheath pale green and eventually reddish brown; leaf blade 0.3–2 cm wide, flat, margin scabrous. Involutral bracts 6–12, leaflike, longer than inflorescence, 0.6–1.6(–1.9) cm wide. Inflorescence a decom-pound anthem; rays many, mostly 12–16 cm, each with 2–8 raylets. Spikelets 1–5, sessile, sometimes more than 3 at apex of raylets or tertiary raylets, oblong to linear-oblong, 3–(7(–14) × 1.5–2 mm, slightly turged, 6–12(–22)-flowered; rachilla narrowly winged. Glumes reddish brown or rusty brown on both surfaces but middle abaxially green or grayish green, lax, broadly ovate to orbicular-ovate, ca. 2 mm, 7–11-veined, keel prominent, apex rounded and with recurved mucro. Stamens 3; anthers linear, apex with white setae. Style very short; stigmas 3. Nutlet dark brown, ellipsoid, ca. 3/4 as long as subtending glume, 3-sided. Fl. and fr. Jun–Sep.

Forests in valleys, grasslands on mountain slopes, wet places by rivers, along trails, paddy fields; 100–1700 m. Guangdong, Guangxi, Hainan, Taiwan, SE Xizang, S Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; NE Australia, Indian Ocean islands, Pacific islands].

This was referred to as *Cyperus laxus* Lamarck by D. A. Simpson and T. Koyama (Fl. Thailand 6(4): 366. 1998), but G. C. Tucker (Syst. Bot. Mongr. 43: 44. 1994) noted a distinction between neotropical and paleotropical material, with the latter being recognized as *C. diffusus*, which we accept here.

1a. Leaves 0.3–1.2 cm wide; involucral bracts 0.6–1.2 cm wide; spikelets (1 or)2 or 3 digitately arranged at raylets or tertiary raylets, 3–6 mm, 6–12-flowered; glumes reddish brown on both surfaces, middle abaxially green ................................. 4a. var. *diffusus*

1b. Leaves 0.8–2 cm wide; involucral bracts 1–1.6(–1.9) cm wide; spikelets (1 or)2–5 digitately arranged at raylets or tertiary raylets, 7–14 mm, 10–22-flowered; glumes rusty brown on both surfaces, middle abaxially grayish green .......... 4b. var. *latifolius*

4a. *Cyperus diffusus* var. *diffusus*

多脉莎草(原变种) duo mai suo cao (yuan bian zhong)

*Cyperus bancanus* Miquel; *C. diffusus* subsp. bancanus (Miquel) Kükenthal; *C. diffusus* var. *multispicatus* S. M. Huang.
Leaves 0.3–1.2 cm wide. Involutrular bracts 0.6–1.2 cm wide. Spikelets (1 or)2 or 3 digitately arranged at raylets or tertiary raylets, 3–6 mm, 6–12-flowered. Glumes reddish brown on both surfaces, middle abaxially green. Fl. and fr. Jun–Sep.

Forests in valleys, grasslands on mountain slopes, wet places by rivers, along trails, paddy fields; 100–1700 m. Guangdong, Guangxi, Hainan, Taiwan, SE Xizang, S Yunnan [China, Japan, Russia, Korea].


宽叶多脉莎草

Leaves 0.8–2 cm wide. Involutrular bracts 1–1.6(–1.9) cm wide. Spikelets (1 or)2–5 digitately arranged at raylets or tertiary raylets, 7–14 mm, 10–22-flowered. Glumes rusty brown on both surfaces, middle abaxially grayish green. Fl. and fr. Aug–Sep.

Cyperus diffusus var. latifolius appears to be well differentiated from other variants of this widespread paleotropical species.


三翅秆葫芦


Perennials. Rhizomes short. Culms tufted, (10–)35–80 cm tall, 3-angled, scaberulose with retrorse prickles. Leaves shorter than culm, flat or V-shaped; leaf blade 0.8–1.2 cm wide, flat, smooth. Involutrular bracts 3–5, leaffike, basal 2 or 3 longer than inflorescence, subspreading. Inflorescence a compound or sometimes simple anthela; rays 4–8, mostly 15–18 cm, sometimes with raylets; raylets usually less than 1 cm or mostly 2–3 cm. Capitulum of 8–30 spikelets congested at apex of rays or raylets, globose, 0.8–2.5 cm in diam. Spikelets ovoid, narrowly ovoid, or narrowly obleng-ovoid, 5–12 × 2–5 mm, 4–20-flowered; rachilla wingless. Glumes pale and purplish striate or purplish red on both surfaces, densely imbricate, broadly ovate, 3.5–4 mm, papery, 11–13-veined, keel abaxially green, apex recurved mucronate. Stamens 3; anthers broadly linear. Style long; stigmas 3. Nutlet blackish brown, broadly elliptoid, ca. 1/2 as long as subtending glume, triquetrous, slightly concave on 3 sides, with dense punctate processes. Fl. and fr. Jul–Oct.

Sands at seashores, wastelands by seashores; near sea level to below 100 m. Fujian, Guangdong, Hainan, Shandong, Taiwan, Zhejiang [China, Japan, Japan, Malaysia, Sri Lanka, Thailand, Vietnam].


苏里南莎草

Annuals (7or short-lived perennials). Rhizomes absent. Culms tufted, (10–)35–80 cm tall, 3-angled, scaberulose with retrorse prickles. Leaves shorter than culm, flat or V-shaped; leaf blade 5–8(–12) mm wide. Involutrular bracts 3–8, horizontal at ascending at ca. 30°, 3–30(–50) cm × 1.5–8(–12) mm, flat or sometimes V-shaped. Inflorescences globose heads, 1–2 cm in diam.; rays 4–12, 1–6(–9) cm, scaberulose with retrorse prickles; raylets often present. Spikelets (6–)15–40(–65), linear to linear-oblong, 4–12 × 1.5–2.5 mm, compressed. Glumes 10–50, pale yellow, light brown, or reddish brown, lanceolate, 1–1.5 mm, medially 3-veined, laterally veinless but distinctly reticulate, basally 2-keeled, apically often scaberulose, apex mucronulate. Stamens 1; anthers ca. 0.5 mm. Nutlets slightly stipitate, brown to reddish brown, narrowly elliptoid, 0.7–0.9 mm, 3-sided, papillate or obscurely reticulate to rugulose, apex apiculate. Fl. and fr. Mar–Sep.

Pond shores, roadsides; below 200 m. Naturalized in N Taiwan [native to Caribbean and Central, North, and South America].

Cyperus surinamensis is also naturalized in Indonesia (Borneo).


云南莎草

Perennials. Rhizomes and stolons ± long, soft, scaly. Culms scattered, 15–65 cm tall, 3-angled, smooth, basally few leaved. Leaves usually shorter than culm but sometimes apical leaves longer than culm; sheath reddish brown; leaf blade 0.5–1.5 cm wide, flat. Involutrular bracts (2 or)3–5, leaffike, longer than inflorescence, 0.6–1.6 cm wide, margin scabrous. Inflorescence a compound anthela; rays 4–8, mostly to 3.5 cm, some with ray-
lets. Spikelets 3–6(−10), digitately arranged at apex of rays or raylets, ovoid to narrowly ovoid, 4–6 × 1.5–2 mm, compressed, 6–14-flowered; rachilla wingless. Glumes dark purple on both surfaces but middle yellowish green, densely imbricate, orbicular-ovate to suborbicular, ca. 1.5 mm, membranous, 3-veined, abaxially slightly keeled, margin apically white hyaline, apex rounded and sometimes mucronulate. Stamens 2; anthers oblong, ca. 0.3 mm; connective not prolonged. Style 0.2–0.3 mm; stigmas 3, 0.3–0.5 mm. Nutlet yellowish, oblong to ellipsoid, ca. 2/3 as long as subtending glume, 3-sided, apex mucronate. Fl. and fr. Jun–Nov.

- Wet grasslands on mountain slopes, water margins; (1100–) 1800–2600 m. E Guizhou, Sichuan, Yunnan.


黑穗莎草 *hei sui suo cao*

Annuals. Roots fibrous. Culms tufted, 2–12 cm tall, slightly soft, compressed triquetrous, winged at angles, smooth, base with leaves. Leaves shorter to longer than culm; sheath brownish, short; leaf blade 2–4 mm wide, flat, midvein abaxially slightly wing-shaped, margin smooth or sometimes spinulose. Involucral bracts 2–4, leaflike, longer than inflorescence. Inflorescence a simple or compound anthela; rays 4–7, mostly to 1.5 cm, sometimes short, each with 7–15 densely arranged spikelets. Spikelets at apex of rays, digitately arranged, linear-oblong to linear, 4–10 × ca. 1.8 mm, 12–30-flowered; rachilla straight, wingless, with successive glumes 0.5–0.7 mm apart. Glumes dark purple to blackish brown on both surfaces but middle yellowish green, lax, orbicular-ovate to suborbicular, ca. 1 mm but extended after anthesis, membranous, prominently longitudinally striate, 3-veined, apex rounded and mucronate. Stamens 2; anthers oblong; connective prominent beyond anthers. Style of medium length; stigmas 3. Nutlet at first yellowish but blackish brown when mature, ellipsoid to obovoid-ellipsoid, nearly as long as subtending glume, 3-sided, smooth, apex long mucronate. Fl. and fr. Sep–Oct.

- Wet places, shallow water; 1500–3000 m. N Sichuan, Yunnan.

Collections from Yunnan have a compound anthela inflorescence, have nearly all spikelets solitary, and come from higher elevations than those from Sichuan. Further specimens might show that they merit taxonomic recognition.


褐穗莎草 *he sui suo cao*

*Cyperus fuscus* f. *pallescens* Husnott; *C. fuscus* f. *virescens* (Hoffmann) Vahl; *C. virescens* Hoffmann.

Annuals. Roots fibrous. Culms tufted, 6–30 cm tall, slender, compressed triquetrous, soft, smooth, basally few leaved. Leaves shorter than to sometimes subequalling culm; leaf blade 2–4 mm wide, flat, sometimes folded, margin not scabrous. Involucral bracts 2 or 3, leaflike, longer than inflorescence. Inflorescence a compound or sometimes simple anthela; rays 3–9, mostly to 3(–5) cm, unequal in length, each with many spikelets at apex densely arranged. Spikelets very narrowly ovoid to linear, 3–10 × ca. 1.5 mm, slightly compressed, 8–24-flowered; rachilla wingless. Glumes purplish brown, brownish, brown, or pale yellowish on both surfaces but middle yellowish green, slightly laxly imbricate, broadly ovate, ca. 1 mm, obscurely 3-veined, apex obtuse. Stamens 2; anthers ellipsoid; connective not prominent beyond anthers. Style short; stigmas 3. Nutlet ellipsoid, ca. 2/3 as long as subtending glume, 3-sided, base barely stipitate to cuneate, apex apiculate. Fl. and fr. Jun–Oct. 2n = 36.

Swamps, water margins, ditch margins, river margins, shaded places in valleys, along trails, wet places, paddy fields; 100–2000 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan [Afghanistan, India, Kashmir, Kazakhstan, Kyrgyzstan, Laos, Mongolia, Pakistan, Russia, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; N Africa, SW Asia, Atlantic Ocean islands, Europe].

*Cyperus fuscus* is naturalized in North America.


汾河莎草 *fen he suo cao*

Annuals. Roots fibrous. Rhizomes absent. Culms 1–3 cm tall, half-terete, basally usually with 1 or 2 bladeless or bladed sheaths. Leaves shorter than culm; sheath brownish, short, scarios at 1 side; leaf blade ca. 2 mm wide, flat or folded, margin not scabrous. Involucral bracts 2, leaflike, shorter to slightly longer than inflorescence, adaxially ± blackish purple, base ± wide. Inflorescence a simple anthela to almost capitulate; rays few, very short, each with a few spikelets densely arranged at apex. Spikelets oblong to linear-oblong, 3–7 × 1.2–1.8 mm, compressed, 8–22-flowered; rachilla wingless, with successive glumes ca. 0.7 mm apart. Glumes blackish purple but adaxially paler yellowish or green at middle, slightly densely imbricate, ovate-lanceolate, ca. 1 mm, membranous, conspicuously longitudinally striate, obscurely 3-veined, margin apically white hyaline and usually involute, apex muticous. Stamens 2; anthers oblong, apex rounded to truncate, muticous, and mucronate. Style short; stigmas 3, longer than style. Nutlet yellowish, ellipsoid, ca. 1 × 0.5 mm, as long as subtending glume, stipitate, apiculate, 3-sided, smooth. Fl. and fr. Oct.

- Sandy stream margins; 800–1500 m. Shanxi.


异型莎草 *yi xing suo cao*

Annuals. Roots fibrous. Culms tufted, 2–65 cm tall, slightly thick or flaccid, compressed triquetrous, smooth, few leaved at basal part. Leaves shorter than culm; sheath brownish, slightly long; leaf blade 2–6 mm wide, flat or folded. Involucral bracts 2 or 3, leaflike, longer than inflorescence. Inflorescence a simple or rarely compound anthela; rays 3–9, mostly to 3(–5) cm, unequal in length, each with many spikelets at apex densely aggregated into a capitulum. Capitulum of spikelets globose, 0.5–1.5 cm in diam. Spikelets narrowly ovoid to linear, 2–8 × 1–1.2 mm, compressed orbicular, 8–28-flowered; rachilla wingless. Glumes dark reddish purple to dark grayish brown on both surfaces but middle yellowish, less than 1 mm, slightly spreading, obscurely 3-veined, margin white hyaline, apex rounded. Stamens (1 or) 2; anthers ellipsoid; connective not

Grasslands at mountain slopes, shallow water, water margins, lake margins, wet places in grasslands, along trails, paddy fields; below 100–2000 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Europe, Indian Ocean islands, Madagascar, Pacific islands].

*Cyperus differens* is naturalized in Central, North, and South America.


窄穗莎草 *zhai sui suo cao*

Annuals. Roots fibrous. Culms tufted, 3–30 cm tall, flaccid, compressed triquetrous, smooth, base clothed with a few bladeless sheaths, apical sheaths with short blade. Leaves shorter than culm, 2–3 mm wide; flat; sheath reddish brown to purplish brown, 2–6 cm. Involucral bracts usually 2 or 3, leaflike, usually basalmost equaling or longer than inflorescence. Inflorescence a compound or sometimes simple anhela; rays 4–10, mostly to 7 cm, unequal in length, each with 2–9 raylets. Spikelets 3–12, digitately arranged at apex of raylets or rays, linear, 3–12 × ca. 1 mm, 10–40-flowered; rachilla wingless. Glumes dark brown on both surfaces but middle abaxially yellowish green, lax, elliptic to suboblong, 0.8–1 mm, membranous, slightly spreading after anthesis, veins inconspicuous, apex obtuse to truncate, slightly excurved, and muticous. Stamens 1 or 2; anthers not setose at apex. Style long; stigmas 3. Nutlet yellowish, obvoid, ca. 0.3 mm, tuberculate. Fl. and fr. Sep–Nov. $2n = 16$.

Sparse forests, along trails, wet places, paddy fields; below 100–500 m. Anhui, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, SE Xizang, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, tropical America, SW Asia, Australia, Indian Ocean islands, Madagascar, North America, Pacific islands].

*Cyperus tenuispica* is naturalized in Central and South America.


畦畔莎草 *qi pan suo cao*

*Cyperus haspan* var. *flaccidissimus* Kükenthal; *C. haspan* var. *juncoides* Kükenthal.

Perennials or annuals. Roots fibrous when annual. Rhizomes short to slightly long. Culms tufted or scattered, 10–60 cm tall, slender, compressed triquetrous, smooth. Leaves shorter than culm, sometimes sheathed only and bladeless; sheath pale green, base purplish brown to reddish purple, 2–10 cm; leaf blade 2–3 mm wide. Involucral bracts usually 2, leaflike, shorter to rarely longer than inflorescence. Inflorescence a simple, compound, or decompound anhela; rays 8–12, mostly 17–30 cm, unequal in length, each with several raylets; raylets less than 2 cm, usually with 1–6(–14) spikelets at apex. Spikelets digitately arranged or sometimes solitary, linear to narrowly linear-ovoid, 5–12 × 1–1.5 mm, 6–28-flowered; rachilla wingless. Glumes purplish brown, pale brown, or straw-colored but middle pale brownish to pale green, densely imbricate, oblong-ovate to subelliptic, ca. 1.5 mm, membranous, 3-veined, abaxially keeled, apex rounded to subtruncate and mucronate. Stamens 1–3; anthers narrowly oblong, apex white setose. Style of medium length; stigmas 3. Nutlet yellowish, whitish, or reddish brown, broadly obvoid, 0.5–0.6(–0.7) mm, ca. 1/3 as long as subtending glume, 3-sided, tuberculate. Fl. and fr. over a long period, different in each region. $2n = 26$.

Sparse forests, grasslands on mountain slopes, sand by river margins, swamps, ditch margins in valleys, wastelands, wet places, along trails, dry fields, paddy fields; near sea level to 1600 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Henan, Hunan, Jiangsu, Jiangxi, Taiwan, SE Xizang, S Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, tropical America, SW Asia, Australia, Indian Ocean islands, Madagascar, North America, Pacific islands].


长尖莎草 *chang jian suo cao*

Annuals. Roots fibrous. Culms tufted, 3–15 cm tall, flaccid, 3-angled, smooth, base with few leaves (often withered by flowering time). Leaves shorter than culm; leaf blade 1–2 mm wide, usually folded. Involucral bracts 2 or 3, linear, longer than inflorescence. Inflorescence a simple anhela; rays 2–6, mostly to 2 cm. Spikelets 5 to many, digitately arranged at apex of ray, linear, 4–12 × ca. 1.5 mm, 8–26-flowered; rachilla wingless. Glumes purplish red to brown on both surfaces, ± laxly imbricate, oblong, 1–1.5 mm, 3-veined, apex truncate and with a recurved (0.5–)0.6–1 mm awn. Stamens 3; anthers ellipsoid, ca. 0.1(–0.2) mm. Style (0.2–)0.4–0.6 mm; stigmas 3, 0.3–0.5 mm. Nutlet dark brown, oblong-obovoid to oblong, 0.5–0.6 mm, ca. 1/2 as long as subtending glume, 3-sided, with many tubercles. Fl. and fr. Jun–Sep (–Oct).

Sand at river margins, grasslands at water margins, seashores, along trails, wastelands, mountain slopes, forests, fields; near sea level to 2000 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Kashmir, Laos, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Central, North, and South America, Indian Ocean islands, Madagascar].


长板栗莎草 *chang ban li suo cao*

Annuals. Roots fibrous. Culms tufted, 3–15 cm tall, flaccid, 3-angled, smooth, base with few leaves (often withered by flowering time). Leaves shorter than culm; leaf blade 0.4–1 mm wide, folded. Involucral bracts 2–5, linear, longer than inflorescence. Inflorescence a simple anhela; rays 1–4, to 3 cm. Spikelets 5–30, digitately or stellately arranged at apex of ray, linear, 5–20 × 1–1.8 mm, 8–26-flowered; rachilla wingless. Glumes purplish red, ± laxly imbricate, oblong to oblong-lanceolate,
1.2–1.7 mm, 3-veined, apex subobtuse to emarginate and with a recurved 0.2–0.5 mm awn. Stamens 2 or 3; anthers ellipsoid, 0.1(–0.2) mm. Nutlets brown, narrowly oblong, 0.7–0.9 mm, 3-sided, surface minutely punctate. Fl. and fr. Jun–Sep.

Sand at river margins, roadsides, fields; below 300 m. Guangdong, Guangxi, Guizhou, Hunan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; S Africa, N Australia].


四川莎草 si chuan suo cao

Perennials. Roots long, fibrous. Rhizomes short. Culms densely tufted, 16–26 cm tall, 3-angled, smooth, base swollen into a bulb shape and with several leaves. Leaves usually longer than culm; sheath dark brown, long; leaf blade 2.5–4 mm wide, flat. Involucral bracts 3, leaflike, longer than inflorescence. Inflorescence a simple anthela, contracted into a capitulum, globose, 1.2–1.6 cm in diam., with many spikelets. Spikelets ovoid to ellipsoid, 5–8 × ca. 3 mm, compressed, 6–10-flowered; rachilla wingless. Glumes yellowish white, adaxially pale rusty brown and shortly striate, densely arranged, ovate, ca. 4 mm, membranous, veins several, prominently keeled, margin white hyaline, apex mucronate. Stamens 3; anthers linear, slightly long; connective dark red, prominent beyond anthers. Style short; stigmas 3, long. Nutlet oblong, 3-sided (not mature).

● Wet places. Sichuan.


南莎草 nan suo cao

Perennials. Rhizomes short, thickened. Culms tufted, 10–70 cm tall, 3-angled, smooth, base slightly swollen into a bulb shape. Leaves shorter than or sometimes as long as culm; leaf blade 2–3 mm wide, usually folded but sometimes flat. Involucral bracts 2 or 3, leaflike, longer than inflorescence. Inflorescences capitulate, 2–3 cm in diam., with 6 to more than 20 spikelets. Spikelets narrowly oblong-ovoid to narrowly ovoid, 0.7–2(–2.5) cm × 3–5 mm, compressed, 8–48-flowered; rachilla wingless. Glumes yellowish white to pale straw-colored on both surfaces but adaxially usually pale rusty brown and with short striae, densely imbricate, ovate-lanceolate, 4–4.5 × ca. 2 mm, papery, conspicuously many veined, midvein green, apex subobtuse. Stamens 3; anthers linear; connective not prominent beyond anthers. Style long; stigmas 3, shorter than style. Nutlet broadly obvoid, ca. 1/3 as long as subtending glume, triquetrous. Fl. and fr. Sep–Oct. 2n = 64, 68, 74.

Sand at stream margins, mountain slopes, wet places; 500–2100 m. Sichuan, SE Xizang, Yunnan [Afghanistan, Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; S Africa, N Australia].


少花穀穀 cao shao hua sui suo cao

Perennials, stoloniferous. Culms single or laxly tufted, 10–50 cm tall, apically 3-angled to triquetrous, smooth. Leaves shorter than to equaling culm; leaf blade 0.5–4 mm wide, basally folded, apically becoming flat. Involucral bracts 3–5, leaflike, longer than inflorescence, spreading or longest erect. Inflorescences capitulate, conic to globose, 5–10 mm in diam., with 5–30 spikelets. Spikelets ovoid to narrowly ovoid, 4–10 × 3–4 mm, slightly compressed, 3- or 4-flowered; rachilla wingless. Glumes yellowish brown tinged with dark brown, densely imbricate, ovate, 3–4 × ca. 2 mm, leathery, 3–5-veined and green, midvein scabrid, margin pale, apex acute and mucronate. Stamens 3; anthers linear, 1–1.5 mm; connective apex not prolonged beyond anthers. Style 3–4 mm, gradually widened to a 3-angled or winged base; stigmas 3, much shorter than style. Nutlet ovoid, ca. 1.5 mm, 1/3–1/2 as long as subtending glume, 3-sided, dorsiventrally flattened, scabrid angled, with spongy base of style extending downward along angles of nutlet, apex acute and beaklike. Fl. and fr. ?summer.

Lakes and rivers, rooted on floating mats of Pistia, Salvinia, and decayed water plants; near sea level. Fujian (Xiamen) [India, Indonesia, Myanmar, Papua New Guinea, Sri Lanka, Thailand, Vietnam; NE Australia, Indian Ocean islands].


旋鳞莎草 xuan lin suo cao

Scirpus michelianus Linnaeus, Sp. Pl. 1: 52. 1753.

Annuals. Roots many, fibrous. Culms densely tufted, 2–25 cm tall, compressed 3-angled, smooth, few leaved, base not swollen. Leaves shorter to slightly longer than culm; sheath purplish red, short; leaf blade 1–2.5 mm wide, flat or folded. Involucral bracts 3–6, leaflike, much longer than inflorescence, base broad. Inflorescences capitulate, pyramidal-ovoid, ovoid, or subglobose, 0.5–1.5 cm in diam., with numerous spikelets. Spikelets densely aggregated at apex of short rays, ovoid to narrowly oblong-ovoid, 3–4 × ca. 1.5 mm, 10–20-flowered or more. Glumes yellowish white but sometimes middle yellowish brown to reddish brown striate, spirally imbricate, oblong-lanceolate, ca. 2 mm, slightly hyaline, 3–5-veined, keel green, apex elongated into a recurved muro. Stamens (1 or)2; anthers oblong. Style long; stigmas 2(3), usually yellow papillate. Nutlet narrowly oblong, ca. 1 mm, 3-sided or plano-convex, margin with white hyaline cells. Fl. and fr. Jun–Sep.

Wet places at water margins or river margins, paddy fields; near sea level to 300 m. Anhui, Fujian, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, E Hubei, Hunan, Jiangsu, Jilin, Liaoning, Shandong, N Xinjiang, SE Xizang, N and NW Yunnan, Zhejiang [India, Japan, Kashmir, Kazakhstan, Korea, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Thailand, Vietnam; SW Asia, Australia, Europe].


矮莎草 ai suo cao

Cyperus michelianus (Linnaeus) Link subsp. pygmaeus (Rottboll) Ascherson & Graebner. Annuals. Roots fibrous. Culms tufted, 12–18 cm tall, compressed triquetrous, slightly concave on 3 sides, few leaved basally. Leaves shorter than culm; sheath reddish brown, short; leaf blade 2–2.5 mm wide, flat, apical margin and midvein abaxially spinulose. Involucral bracts 4–7, leaflike, longer than inflorescence, ± horizontal to sometimes downward reflexed.
Inflorescences capitate, with numerous spikelets. Spikelets densely aggregated, narrowly oblong-ovoid to suboblong, 4–5 × ca. 1.5 mm, 10–15-flowered. Glumes yellowish white but middle rusty brown and shortly striate, distichous, oblong-lanceolate, ca. 2 mm, 3-veined, midvein green and apically forming a slight keel, apex acute and excurved mucronate. Stamens usually 1; anther short, linear; connective slightly prominent beyond anthers. Style short; stigmas 2(or 3), longer than style. Nutlet oblong, 1–1.2 mm, 2/3–3/4 as long as subtending glume, lenticular with one flat and one convex side, minutely papillose. Fl. and fr. Oct–Nov. 2

Pond margins, water margins, wet places in sand; ca. 100 m. Anhui, Guangdong, Guangxi, Henan, Hubei, Taiwan, Zhejiang [Afghanistan, India, Indonesia, Japan, Kashmir, Korea, Laos, Myanmar, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, S Asia, Australia, S Europe, Indian Ocean islands, Madagascar].

白鳞莎草 bai lin suo cao

Annuals. Roots many, slender, fibrous. Culms densely tufted, 5–20 cm tall, flaccid, compressed 3-angled, smooth, few leaved basally. Leaves usually shorter than to sometimes equaling culm; sheath reddish brown to purplish brown, submembranous; leaf blade 1.5–2 mm wide, flat or folded. Inflorescence bracts 3–5, leaflike, several times as long as inflorescence, basally slightly widened. Inflorescences usually capitate, globose, 1–2 cm in diam., sometimes with a 1–2 cm ray, with many densely arranged spikelets. Spikelets narrowly oblong-ovoid to ovoid-oblong, 3–8 × 1.5–2 mm, compressed, 8–30-flowered; rachilla wings white, hyaline. Glumes white on both surfaces but sometimes sparsely rusty brown shortly striate, slightly spreading, broadly ovate, ca. 2 mm, hyaline, several veined, midvein green, apex mucronate. Stamens 3; anthers linear-oblong. Style elongate; stigmas 2. Nutlet yellowish brown, oblong, ca. 1 mm, plano-convex, sometimes nearly concave-convex. Fl. and fr. Aug–Sep.

Mountain slopes, along trails, sunny places in fields; below 100–1000 m. Anhui, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Shanxi, Zhejiang [Japan, Korea, Russia (Far East)].


山东白鳞莎草 shan dong bai lin suo cao

Cyperus nipponicus Franchet & Savatier f. hilgendorfianus (Boeckeler) Kükenthal; C. shandongensis E. Z. Li.

Annuals. Roots fibrous. Culms tufted, 10–35 cm tall, 3-angled, basally with 1–3 leaves. Leaves shorter to rarely longer than culm; leaf blade 2–4 mm wide. Inflorescences bracts 5–9, leaflike, several times as long as inflorescence. Inflorescence a simple anehla; rays 3–6, longest 4–6 cm. Spikelets many, densely aggregated at apex of each ray, narrowly ovoid to oblong, 4–6 × ca. 1.5 mm, compressed, 10–20-flowered; rachilla wings white, narrow, hyaline. Glumes pale on both surfaces but middle green, slightly laxly imbricate, ovate, ca. 2 mm, several veined, apex mucronate. Stamens 2; anthers narrowly oblong. Style ca. 1 mm; stigmas 2. Nutlet yellowish brown, ellipsoid, ca. 1 mm, plano-convex or concave-convex.

Wet places at water margins; ca. 100 m. S Heilongjiang, Shandong (Tai’an) [Japan].

密穗莎草 mi sui suo cao

Cyperus vegetus Wldenow.

Perennials, rhizomatous. Culms caespitose, (25–)40–60(–90) cm tall, 3-angled to terete, smooth. Leaf blade (10–)25–50 cm × 5–8(–12) mm, flat or V-shaped. Inflorescences bracts 4–8, horizontal to ascending at 15–30°. Inflorescence an anehla, flat or sometimes V-shaped, 3–30(–50) cm × 1.5–8(–12) mm; rays (0–)3–10, 2.5–5(–12) cm; raylets usually absent. Globose head of (20–)30–50(–70) spikelets at apex of each ray, (1–)2–4 cm in diam. Spikelets oblong, 0.5–2 cm × 2.2–3 mm, compressed. Glumes (12–)20–30(–50), whitish to golden brown, ovate-deltoid, 2–2.3 × 1–1.4 mm, basally 2-keeled, laterally veinless. Stamens 1; anther 1–1.2 mm. Style 1–1.2 mm; stigmas 3, ca. 0.5 mm. Nutlet black to dark brown, with a ca. 0.1 mm stipe, broadly ellipsoid, 1.2–1.4 mm, 3-sided, punctulate, apex apiculate with a 0.2–0.3 mm beak. Fl. and fr. Jul–Aug. 2n = 42.

Damp grasslands, shores; below 200 m. Naturalized in N Taiwan [native to North and South America and Pacific islands (Easter Island)].

Cyperus eragrostis is naturalized in S Africa, Australia, and Europe.

This species is reported here for the first time from China, based on two collections: Taiwan: Taibei, Huang Chien-l 1640 (HAST); Yilan, Dongshan Xiang, Liong Wai-Chao 3809 (HAST).

长小穗莎草 chang xiao sui suo cao

Cyperus digitatus var. laxiflorus L. K. Dai; C. digitatus var. pingbienensis L. K. Dai.

Perennials. Rhizomes woody, very short. Culms tufted, 0.5–1.5 m tall, stout, triquetrous, smooth, basally with leaves. Leaves nearly as long as culm; sheath purplish brown, long; leaf blade 4–15 mm wide, flat or folded, subleathery. Inflorescences bracts 5–7, leaflike, longer than inflorescence. Inflorescence a compound or decumbent anehla; rays 6–10, usually to 18 cm, each with 4–7 raylets; raylets unequal in length. Spikes at apical part of raylets, cylindric, 3–6 × 0.4–2 cm, without a peduncle, with many laxly arranged spikelets. Spikelets subdicthious, linear to narrowly ovoid, 3–12 × 1–1.5 mm, slightly compressed to compressed, spreading to obliquely spreading, 4–40-flowered; rachilla winged, wings lanceolate and laterally detaching from rachilla with nutlet maturation, with successive glumes 0.9–1.2 mm apart. Glumes straw-colored, reddish brown, or golden-yellow on both surfaces, densely imbricate, ovate to elliptic, 3–5-veined, keel greenish, apex mucronate. Stamens 3; anthers yellow, linear, ca. 0.5 mm; connective not prominent beyond anther apex. Style long; stigmas 3, shorter than style. Nutlet dark gray at maturity, oblong-ellipsoid, 1/2–3/5 as long as subtending glume, 3-sided, punctulate. Fl. Jul–Oct, fr. Aug–Dec. 2n = 84, 104, 108.
Open areas in forests, ditches, wet places; near sea level to 1800 m. Guangxi, Hainan, Hong Kong, Taiwan, SE Xizang, Yunnan [Bangladesh, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, tropical America and Australia, Pacific islands].

If subspecies are recognized, plants in Asia would belong to *Cyperus digitatus* subsp. *digitatus* (Sieber ex Sprenger) Kükenthal occurs in Africa.


**Cyperus elatus**

Perennials. Rhizomes short, slightly thick, hardened. Culms laxly caespitose; to 3 m tall, stout, smooth, basally suberect, apically 3-angled. Leaves basal, nearly as long as culm; sheath purple; leaf blade 0.8–1.2 cm wide, flat, subleathery, midvein and margin scabrous. Involutural bracts 5–8, leaflike, shorter to longer than inflorescence. Inflorescence a compound anthela; rays 4–10, to 25 cm, unequal in length, each with 4–7 rachillules; rachillules usually to 8 cm, apex with 3–5 spikes. Spikes suberect to obliquely spreading, cylindric, 3×0.8–1.2 cm, with many spikelets. Spikelets obliquely spreading to suberect, linear, 4–7×ca. 1 mm, suberecte to obscurely quadrate, 10–14-flowered; rachilla wings yellow, lanceolate, easily deciduous. Glumes yellowish to golden yellow on both surfaces but middle green, densely imbricate, oblong to elliptic, ca. 1.5 mm, 3–5-veined, apex mucronate. Stamens 3; anthers oblong, ca. 1.5 mm; connective prominent and subulate beyond anther apex, prominent part ca. 1/3 as long as anther, apex setose. Style slender; stigmas 3. Nutlet dark gray at maturity, oblong-ellipsoid, ca. 1/2 as long and subtending glume, densely puncticulate. Fl. Jun–Aug.

Pond and stream margins; near sea level to 1500 m. Hainan, Yunnan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam].


**Cyperus exaltatus**

Perennials. Roots many, fibrous. Rhizomes short. Culms 1–1.5 m tall, stout, 3-angled, smooth, basally with leaves. Leaves nearly as long as culm; sheath purplish brown, long; leaf blade 6–10 mm wide, margin scabrous. Involutural bracts 3–6, basal ones longer than inflorescence. Inflorescence a compound or decompound anthela; rays 5–10, to 18 cm, unequal in length, each with several rachillules. Spikes 1–3 at rachile apex, cylindric or narrowly cylindric, 2–5 cm × 2.5–10 mm, with many spikelets. Spikelets subdistichous, densely or laxly arranged, narrowly oblong-ovoid, 2–6×1–1.5 mm, compressed, obliquely spreading, 4–25-flowered; rachilla wings white, linear, narrow, hyaline. Glumes dark grayish brown to yellowish brown, slightly densely imbricate, ovate, 1.5–1.6 mm, slightly shiny, 3–5-veined, keel green, apex obtuse, mucronate, and not excurred. Stamens 3; anthers linear, ca. 1 mm; connective prominent beyond anther apex. Style slender; stigmas 3. Nutlet obovoid to ellipsoid, less than 1/2 as long as subtending glume, 3-sided, smooth. Fl. and fr. Jun–Aug.

Grasslands, pond margins, sandy soil, moist or wet places; near sea level to 1100 m. Anhui, Fujian, Guangdong, S Guizhou, Hainan, E Hubei, Jiangsu, Jilin, Shandong, Taiwan, Zhejiang [Bangladesh, India, Indonesia, Japan, Kashmir, Korea, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Vietnam; tropical Africa, Australia, Indian Ocean islands].

1a. Spikelets narrowly cylindric, 2–4 cm × 2.5–4 mm; spikelets, 2–3 mm, 4–6-flowered. 27d. var. *tenuspicatus*

1b. Spikelets cylindric, 2–5 cm × 7–10 mm; spikelets 4–6 mm, 6–25-flowered.

2a. Spikelets very densely arranged, to 14 mm, 12–25-flowered. 27c. var. *megalanthus*

2b. Spikelets ± laxly arranged, 3–6 mm, 6–16-flowered.

3a. Spikelets slightly laxly arranged, 4–6 mm, 6–16-flowered. 27a. var. *exaltatus*

3b. Spikelets very laxly arranged, 3–4 mm, 6–8-flowered. 27b. var. *hainanensis*

#### 27a. Cyperus exaltatus var. *exaltatus*

**Cyperus exaltatus** var. *exaltatus*

高秆莎草 (原变种) gao gan suo cao (yuán biàn zhòng)

Spikes cylindric, 2–5 cm × 7–10 mm. Spikelets slightly laxly arranged, 4–6×1–1.5 mm, 6–16-flowered. Fl. and fr. Jun–Aug. 2n = 96.

Moist or wet places; (near sea level to) 500–1100 m. Anhui, Fujian, Guangdong, S Guizhou, Hainan, E Hubei, Jiangsu, Jilin, Shandong, Taiwan, Zhejiang [Bangladesh, India, Indonesia, Japan, Kashmir, Korea, Malaysia, Myanmar, Pakistan, Papua New Guinea, Sri Lanka, Thailand, Vietnam; tropical Africa, Australia, Indian Ocean islands].

**Cyperus exaltatus** var. *exaltatus* has been introduced to South America. It is similar to the Mexican endemic *Cyperus semiochraceus* Boeckeler.

The culms are used for making mats.


**Cyperus exaltatus** var. *hainanensis*

海南高秆莎草 hai nan gao gan suo cao

Spikes cylindric, 2.5 cm × 6–16-flowered. Fl. and fr. Sep–Nov.

- Grasslands, pond margins, sandy soil. Hainan.


**Cyperus exaltatus** var. *megalanthus*


长穗高秆莎草 chang sui gao gan suo cao

Spikes very densely arranged, to 1.4 cm, 12–25-flowered. Fl. and fr. Sep–Nov.

- Moist places; ca. 100 m. Anhui, Fujian, Jiangsu, Zhejiang.


**Cyperus exaltatus** var. *tenuspicatus*

广东高秆莎草 guang dong gao gan suo cao

Inflorescence a decompound anthela. Spikes narrowly
cylindric, 2–4 cm × 2.5–4 mm. Spikelets ± densely arranged, oblong, 2–3 mm, 4–6-flowered. Fl. Sep.

- Guangdong.

思茅莎草 si mao suo cao

Perennials. Roots many, fibrous. Rhizomes short. Culms tufted, 0.7–1.3 m tall, stout, obtusely 3-angled, smooth, with 3–5 leaves, basally enclosed by leaf sheaths. Leaves shorter than culm; sheath reddish brown but base dark brown, 10–35 cm; leaf blade 0.8–1.2 cm wide, basally folded, apically flat. Involucral bracts 8–15, leaflike, mostly to 1.3 m, usually longer than inflorescence. Inflor escence a compound anhma; rays 12–15, mostly to 25 cm, unequal in length, usually 8–12 each with 2–11 raylets; raylets radially spreading. Spikes cylindrical, 1.5–11 × 0.7–1.3 cm, usually not pedunculate but rarely pedunculate. Spikelets numerous, in 3–5 rows, densely arranged, narrowly oblong-ovoid, 4–8 × 1–1.5 mm, obliquely spreading, 4–10-flowered; rachilla wings white, narrow, hyaline, persistent. Glumes brownish yellow on both surfaces, densely imbricate, oblong-ovobate, 2.2–2.5 mm, slightly shiny, obscurely 3–5-veined, midvein forming a greenish keel, apex straight and mucronate. Stamens 3; anthers oblong. Style long; stigmas 3. Nutlet narrowly ellipsoid to sometimes subobovoid, 1.2–1.3 mm, 3-cronate. Stamens 3; anthers oblong. Style long; stigmas 3. Nutlet obovoid to subellipsoid, ca. 1/2 as long, 0.2–0.5 mm; connective prominent beyond anther apex. Glumes reddish brown on both surfaces but middle green, lax, oblong, 2–3 mm, papery, 3–5-veined, not keeled, margin slightly revolute at maturity, apex obtuse to rounded. Stamens 3; anthers linear; connective prominent beyond anther, apex sometimes setiferous. Style of medium length; stigmas 3. Nutlet brown dark brown, obovoid-oblong, ca. 1/2 as long as subtending glume, 3-sided, densely puncticulate. Fl. and fr. Nov–Jan. 2n = 208.

- River margins; ca. 1200 m. S Yunnan (Simao Diqu).

迭穗莎草 die sui suo cao

Cyperus densispicatus Hayata; C. imbricatus var. densepicatus (Hayata) Ohwi; C. imbricatus subsp. elongatus (Boeckeler) T. Koyama; C. imbricatus var. elongatus (Boeckeler) Kükenthal; C. mediorubescens Hayata; C. radiatus Vahl; C. radiatus var. elongatus Boeckeler.

Perennials. Rhizomes short. Roots many, fibrous. Culms 7–15 cm tall, stout, obtusely 3-angled, smooth, basally clothed by several leaf sheaths. Leaves basal, shorter than culm; sheath reddish brown to dark brown, long; leaf blade 0.5–1.5 cm wide, basally folded, apically flat. Involucral bracts 3–5, leaflike, longer than inflorescence. Inflor escence a compound anhma; rays 6–10, to 16 cm, unequal in length, each with 3–10 raylets; raylets radially spreading. Spikes 3–6 fasciculate at apex of raylet, sessile or subsessile, densely arranged, cylindrical, 1.5–4 × 0.6–1.4 cm, with many spikelets. Spikelets in several rows, narrowly ovoid to narrowly oblong-ovoid, 4–12 × 1.5–2 mm, slightly compressed, obliquely spreading, 8–30-flowered; rachilla wings white, narrow, hyaline, persistent; successive glumes 0.4–0.5 mm apart. Glumes brownish yellow to straw-colored, densely imbricate, broadly ovate, 1–1.2 mm (excluding micro), shiny, 3–5-veined, keel greenish ending in a straight to slightly excurved 0.3–0.5 mm micro. Stamens 3; anthers oblong, 0.2–0.5 mm; connective prominent beyond anther apex. Style long; stigmas 3. Nutlet obovoid to subellipsoid, ca. 1/2 as long as subtending glume, 3-sided, smooth. Fl. and fr. Sep–Oct.

Shallow water of ponds, shady moist places; 100–1400 m. Guangdong, Guangxi, Hainan, Taiwan [Afghanistan, Bangladesh, India, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam; tropical Africa and America, SW Asia, Indian Ocean islands, Madagascar].

红翅莎草 hong chi suo cao

Perennials. Rhizomes short, creeping. Culms 50–90 cm tall, stout, obtusely 3-angled, smooth. Leaves basally with a brown long sheath, apically bladeless or with a short blade. Involucral bracts 3–5, leaflike, longer than inflorescence. Inflor escence a decompound or compound anhma; rays 5–7, to 5 cm, unequal, each with 3–8 raylets. Spikes broadly ovoid, 1–2 × 1–2 cm, with 4–15 spikelets. Spikelets ± laxly arranged, linear, 8–20 × ca. 1.5 mm, slightly compressed, obliquely spreading, 6–30-flowered; rachilla wings reddish brown, linear-oblong. Glumes reddish brown on both surfaces but middle green, lax, oblong, 2–3 mm, papery, 3–5-veined, not keeled, margin slightly revolute at maturity, apex obtuse to rounded. Stamens 3; anthers linear; connective prominent beyond anther, apex sometimes setiferous. Style of medium length; stigmas 3. Nutlet brown dark brown, obovoid-oblong, ca. 1/2 as long as subtending glume, 3-sided, densely puncticulate. Fl. and fr. Nov–Jan. 2n = 208.

River margins, water margins; near sea level to 400 m. Hainan, Hunan, Sichuan [NE India, Myanmar, Nepal, Pakistan, Sri Lanka].

Cyperus pangorei is cultivated in India for making mats and may possibly be used for the same purpose in China.

线状穗莎草 xian zhuang sui suo cao

Perennials. Roots fibrous. Stolons ± short. Culms laxly tufted, 12–15 cm tall, thin, obtusely 3-angled, base swollen into a tuber, leaved at basal part. Leaves shorter to longer than culm; leaf blade 2–4 mm wide, usually plicate. Involucral bracts 3–5, leaflike, longer than inflorescence, suberect. Inflorescence a simple anhma; rays 4–7, erect. Spikes oblong, 2–4 cm × 3–4 mm, with several to 10 or more spikelets. Spikelets laxly arranged, erect, linear, 5–12 × ca. 1 mm, 8–22-flowered; rachilla wings lanceolate. Glumes pale brownish yellow but middle brown striate, densely imbricate, ovate, 1.5–2 mm, membranous, 3–5-veined, not keeled, apex obtuse to retuse. Stamens 3; anthers ellipsoid; connective slightly prominent beyond anthers. Style of medium length; stigmas 3, longer than style. Nutlet brown when mature, oblong, ca. 2/5 as long as subtending glume, 3-sided. Fl. and fr. Apr–May.

- Wet places by streams. S Yunnan (Xishuangbanna).

粗根茎莎草 cu gen jing suo cao

Perennials. Rhizomes long, ± thick, ± hardened, base of shoot with ellipsoid to ovoid tubers. Culms solitary, 8–22 cm tall, 3-angled, smooth, basal sheaths usually disintegrating into fibers. Leaves usually shorter than culm to rarely longer; leaf blade medium green, 2–4 mm wide, usually folded, rarely flat.
The tubers are used as a Chinese medicine. The species is generally considered to be one of the world’s worst weeds.


Cyperus rotundus Linnaeus subsp. tuberosus (Rottboll) Kükenthall.

Perennials. Rhizomes stoloniferous; stolons long and creeping, terminated by a tuber. Culms solitary, rarely few laxly tufted, 20–55 cm tall, slender, triquetrous, smooth, basally with several leaves. Leaves shorter than culm; sheath reddish brown, eventually disintegrating into fibers; leaf blade medium green, 3–6 mm wide, base flat or slightly folded. Involucral bracts 2 or 3, leaflike, shorter than or equaling inflorescence. Inflorescence a simple or rarely compound anthela; rays 2–6, to 8 cm, unequal in length. Spikes obdeltoid, with 2–11 laxly arranged spikelets. Spikelets linear, 0.8–2 cm × 1.5–2 mm, obliquely spreading, 8–20-flowered; rachilla wings white, broad, hyaline. Glumes brownish yellow to straw-colored on both surfaces but keel green, broadly ovate to elliptic, 3.5–4 mm, membranous, conspicuously 7-veined (nearly reaching margin), margin white hyaline, apex rounded. Stamens 3; anthers linear; connective slightly prominent beyond anthers. Style of medium length; stigmas 3. Nutlet oblong-obovoid, ca. 1/2 as long as subtending glume, 3-sided, puncticulate. Fl. and fr. Jun–Jul.

Open grasslands, along trails, sandy shores, gardens; below 1700 m. Sichuan, Taiwan, Yunnan [India, Japan (Ryukyu Islands), Malaysia, Sri Lanka; Africa, SW Asia (Yemen), Indian Ocean islands].


Cyperus mitis Bentham var. indicus C. B. Clarke; C. subcapitatus C. B. Clarke; C. tenuifolius L. K. Dai (1961), not (Steudel) Dandy (1944).

Perennials. Rhizomes creeping, sometimes with tubers. Culms solitary, 40–50[–80] cm tall, acutely triquetrous, smooth, with 1 or 2 leaves, basalmost part ± swollen. Leaves much shorter than culm; sheath brown, equaling or longer than leaf blade; leaf blade 1–1.5 mm wide. Spikes obdeltoid, with 3–10 slightly laxly arranged spikelets. Spikelets obliquely spreading, linear, 1–3 cm × 1.5–2 mm, 8–28-flowered; rachilla wings white, slightly broad, hyaline. Glumes blood-red to purplish brown on both surfaces but keel green, subdensely imbricate, ovate to oblong-ovate, ca. 3 mm, 5–7-veined (fading some distance before margin), apex acute to obtuse and muticous. Stamens 3; anthers linear; connective prominent beyond anthers. Style long; stigmas 3, longer than style, exserted from glume. Nutlet obovoid-oblong, 1/3–2/5 as long as subtending glume, 3-sided, puncticulate. Fl. and fr. May–Nov. 2n = 80, 84, 96, 100, 104, 108, 110, 112, 116, 124, 132, 138, 160, ca. 200.

Grasslands, wet or dry areas on mountain slopes, stream margins, along trails, sandbanks, ditch margins, water margins in valleys, paddy field margins; near sea level to 2100 m. Anhui, Chongqing, Dongsha Island, Fujian, Guangdong, Hainan, Taiwan, Xisha Qundao [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Laos, Malaysia, Myanmar, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; NE Australia, Indian Ocean islands, Madagascar, Pacific islands].

The tubers are used as a Chinese medicine. The species is generally considered to be one of the world’s worst weeds.
Leaves ± congested, longer to shorter than culm; sheath reddish cm tall, triquetrous, smooth, with several leaves at basal part. Leaves ± long. Nutlet brownish gray, ellipsoid, ca. 1/2 as long as subtending glume, 3-sided, shiny, densely punctulate.

Cultivated in Guangxi, Heilongjiang, Liaoning, Xinjiang, and Yunnan; collected as a naturalized plant in Shandong, Taiwan, and perhaps elsewhere [native to Mediterranean region].

_Cyperus esculentus_ var. _esculentus_ occurs in the Mediterranean region and differs by having globose to ovoid tubers, anthela rays to 4 cm, and ellipsoid nutlets. _Cyperus esculentus_ var. _sativus_ was introduced to China before the 1970s and is now grown as an oil plant. The oil is used as an edible or industrial oil. This herb grows and reproduces quickly and is good for soil conservation.

37. _Cyperus tenuiculmis_ Boeckeler, Linnaea 36: 286. 1870.

四棱穗莎草 si lengleng suosu cao

Perennials. Rhizomes short, woody. Culms laxly tufted, 40–75 cm, slender, triquetrous, smooth, basally with several leaves, base slightly swollen. Leaves shorter than culm; sheath brown, ± long; leaf blade 2–6 mm wide, margin revolute. Involucral bracts 2 or 3, leaflike, basalmost longer than inflorescence. Glumes yellowish to golden or pale brown, ± laxly divaricate after anthesis, 10–20-flowered; rachilla broadly winged. Glumes yellowish to golden or pale brown, ± laxly divaricate after anthesis, 6–14-flowered; rachilla flexuose, narrowly linear-ovoid to linear, 1–2 cm × 1.5–2 mm, 7-veined, margin apically white hyaline, apex truncate and mucronate. Stamens 3; anthers linear; connective slightly prominent beyond anthers into small ovoid appendage. Style long; stigmas 3, mucronate. Stamens 3; anthers linear; connective prominent beyond anthers. Style long; stigmas 3. Nutlet blackish brown, oblong, ca. 2/3 as long as subtending glume, 3-sided, slightly prominently punctate. Fl. and fr. Jul.–Aug.

Forests, swamps, grasslands, slightly dry or wet places on slopes, river margins, along trails; near sea level to 1800 m. Guangdong, Guangxi, Hainan, Taiwan, Xisha Qandao, Yunnan [Bhutan, Cambodia, India, Indonesia, Japan (Ryukyu Islands), Kashmir, Laos, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Central, North, and South America, Indian Ocean islands, Madagascar].


垂穗莎草 chuisuisuosu cao

Perennials. Rhizomes short, surculose. Culms 35–110 cm tall, slightly stout, compressed triquetrous, smooth, base slightly swollen. Leaves shorter than or equaling culm; sheath brown, long; leaf blade 4–6 mm wide, flat or slightly folded, margin scabrid. Involucral bracts 4–6, leaflike, basal 2 or 3 longer than inflorescence, remaining ones shorter than inflorescence. Inflorescence a compound or decompound anthela; rays 6–10, to 15 cm, each with 3–5 raylets; raylets to 7 cm, ± thin. Stipules broadly ovoid, with 8–18 spikelets. Spikelets laxly distichous, linear, 0.8–4 cm × less than 1 mm, suberecte, oblique to spreading, 6–32-flowered; rachilla thin, flexuose, wings white, hyaline, caducous. Glumes dark blood-red on both surfaces, lax, elliptic, ca. 2 mm, membranous, 3–5-veined, keel green, margin apically white hyaline, apex rounded. Stamens 3; anthers linear; connective prominent beyond anthers. Style short; stigmas 3. Nutlet blackish brown, oblong, ca. 2/3 as long as subtending glume, 3-sided, slightly prominently punctate. Fl. and fr. May–Nov.

Mountain slopes, open grasslands, streamsides, wet places under sparse forests, fields; 200–1600 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, SJapan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Pacific islands].

_Cyperus tenuiculmis_ was misidentified as _C. zollingeri_ Steudel by Tang and F. T. Wang (Fl. Reipubl. Popularis Sin. 11: 137. 1961).

38. _Cyperus distans_ Linnaeus f., Suppl. Pl. 103. 1782.

疏穗莎草 shuisuisuosu cao

Perennials. Rhizomes short, surculose. Culms 35–110 cm tall, slightly stout, compressed triquetrous, smooth, base slightly swollen. Leaves shorter than or equaling culm; sheath brown, long; leaf blade 4–6 mm wide, flat or slightly folded, margin scabrid. Involucral bracts 4–6, leaflike, basal 2 or 3 longer than inflorescence, remaining ones shorter than inflorescence. Inflorescence a compound or decompound anthela; rays 6–10, to 15 cm, each with 3–5 raylets; raylets to 7 cm, ± thin. Stipules broadly ovoid, with 8–18 spikelets. Spikelets laxly distichous, linear, 0.8–4 cm × less than 1 mm, suberecte, oblique to spreading, 6–32-flowered; rachilla thin, flexuose, wings white, hyaline, caducous. Glumes dark blood-red on both surfaces, lax, elliptic, ca. 2 mm, membranous, 3–5-veined, keel green, margin apically white hyaline, apex rounded. Stamens 3; anthers linear; connective prominent beyond anthers. Style short; stigmas 3. Nutlet blackish brown, oblong, ca. 2/3 as long as subtending glume, 3-sided, slightly prominently punctate. Fl. and fr. Jul.–Aug.

Forests, swamps, grasslands, slightly dry or wet places on slopes, river margins, along trails; near sea level to 1800 m. Guangdong, Guangxi, Hainan, Taiwan, Xisha Qandao, Yunnan [Bhutan, Cambodia, India, Indonesia, Japan (Ryukyu Islands), Kashmir, Laos, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Central, North, and South America, Indian Ocean islands, Madagascar].


移植莎草 cansuisuosu cao

_Cyperus nutans_ Vahl subsp. _eleusinoides_ (Kunth) T. Koyama; _C. nutans_ var. _eleusinoides_ (Kunth) Haines.
Perennials. Rhizomes short, surculose. Culms to 1 m tall, stout, 3-angled, smooth, base swollen into a tuber shape, with leaves at basal part. Leaves shorter than culm; sheath long, brown; leaf blade 6–12 mm wide, flat, margin scabrous. Involucral bracts 5 or 6, basal 2 or 3 longer than involucre. Inflorescence a compound or decompound anhela; rays 6–12, to 18 cm, each with 3–6 raylets; raylets mostly to 4 cm, unequal in length. Spikes oblong to cylindric, 1–3 cm × 4–10 mm, with very many spikelets. Spikelets densely arranged in several rows, linear-oblong, 4–8 × ca. 2 mm, 6–12-flowered; rachilla wings white, hyaline, caducous. Glumes pale and brown striate or brown, lax, ovate-elliptic, ca. 2 mm, membranous, 5–7-veined, keel green, apical margin white hyaline, apex mucronate. Stamens 3; anthers linear; connective prominent beyond anthers. Style short; stigmas 3, ± long. Nutlet dark brown, obovoid, 3-sided, ca. 2/3 as long as subtending glume, densely and slightly prominently punctate. Fl. and fr. Aug–Dec. 2

41. Cyperus glomeratus Linnaeus, Cent. Pl. 2: 5. 1756.

毛轴莎草 tou zhuang sui suo cao

Annuals. Roots fibrous. Culms scattered, 30–60(–90) cm tall, stout, obtusely 3-angled, smooth, basally with leaves, base slightly swollen. Leaves few, shorter to slightly longer than culm; sheath reddish brown, long; leaf blade 4–8 mm wide, margin smooth. Involucral bracts 3 or 4, leaflike, longer than involucre. Inflorescence a compound anhela; rays 3–8, mostly to 12 cm, unequal in length; raylets lacking. Spikes subglobose, ellipsoid, or oblong, 1–3 × 0.6–1.7 cm, not pedunculate, with very many spikelets. Spikelets very densely arranged in several rows, narrowly ovoid to linear, 5–10 × 1.5–2 mm, slightly compressed, 8–16-flowered; rachilla wings white, narrow, hyaline. Glumes reddish brown, lax, suboblong to oblong-lanceolate, ca. 2 mm, slightly spreading, veins very obscure, not keeled, margin involute, apex obtuse. Stamens 3; anthers short, oblong; connective prominent beyond anthers. Style slightly long; stigmas 3, ± short. Nutlet dark gray, narrowly oblong, ca. 1/2 as long as subtending glume, 3-sided, conspicuously reticulately striate. Fl. and fr. Jun–Oct.

Wet grasslands along trails, sandy soil at water margins, river margins, lake banks, paddy fields; 100–1300 m. Anhui, S Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Kazakhstan, Korea, Russia, Tajikistan, Uzbekistan; SW Asia, Europe].

42. Cyperus malaccensis Lamark, Tabl. Encycl. 1: 146. 1791.

茳芏 jiang du

Perennials. Rhizomes long, woody, rarely with thin stolons. Culms 0.5–1.5 m tall, 4–6 mm thick, acutely triquetrous, smooth, base brown and with a bladeless sheath, apical 1 or 2 sheaths with a blade. Leaf blade absent or to 3 cm × 4–8 mm, flat. Involucral bracts 3 or 4, leaflike, to 20 cm, longer to shorter than inflorescence. Inflorescence a simple or compound anhela; rays 6–10, mostly to 9 cm. Spikes broadly ovoid, with 5–10 spikelets; rachis strict, glabrous. Spikelets laxly arranged, linear, 0.8–2.5×(–3) cm × ca. 1.5 mm, slightly turgid, spreading, 10–42-flowered; rachilla wings white, narrow, hyaline. Glumes reddish brown but margin yellowish to straw-colored, lax, oblong to elliptic, 2–2.5 mm, papery, inconspicuously 7–9-veined, margin involute at maturity, apex obtuse to rounded. Stamens 3; anthers linear; connective prominent beyond anthers. Style short; stigmas 3, slender. Nutlet blackish brown when mature, narrowly oblong, 1.7–2 mm, almost as long as subtending glume, 3-sided, minutely punctate. Fl. and fr. Jun–Nov.

River margins, ditch margins, water margins, shallow water, ocean beaches, salt marsh margins, forest margins, fields (usually cultivated); near sea level to 700 m. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang [India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; SW Asia, N Australia].

The culms are used for making mats and hats.

1a. Apicalmost leaf with an elongated blade; basal involucral bracts longer than inflorescence, spreading; glumes incurved ........................................ 42a. subsp. malaccensis

1b. Leaves with short to very short blades, sometimes basalmost sheath bladeless; involucral bracts shorter than inflorescence; glumes not incurved ........................................ 42b. subsp. monophyllus

42a. Cyperus malaccensis subsp. malaccensis

茳芏(原亚种) jiang du (yuan ya zhong)


River margins, ditch margins (usually cultivated); below 100 m. Hainan, Taiwan [India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; SW Asia, N Australia].

42b. Cyperus malaccensis subsp. monophyllus (Vahl) T. Koyama, Fl. Taiwan 5: 266. 1978.

短叶茳芏 duan ye jiang du


Cyperus monophyllus Vahl, Enum. Pl. 2: 352. 1805; C. malaccensis var. brevifolius Boeckeler.


Ocean beaches, river margins, shallow water, fields (usually cultivated), forest margins, salt marsh margins; near sea level to 700 m. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang [Indonesia, Japan, Vietnam].


毛轴莎草 mao zhou suo cao

Cyperus obliquus Nees; C. pilosus var. obliquus (Nees) C.
B. Clarke; C. pilosus var. pauciflorus L. K. Dai; C. pilosus var. purpurascens L. K. Dai.

Perennials. Rhizomes with slender stolons. Culms scarted, 25–85 cm tall, stout, acutely triquetrous, smooth or scabrid on angles of apical part. Leaves shorter than culm; sheath brownish, short; leaf blade 6–8 mm wide, flat, margin serrulate scabrid. Involucral bracts 3–5, basal 2 or 3 longer than inflorescence, margin serrulate scabrid. Inflorescence a compound or decompound anthela; rays 3–10, mostly to 14 cm, unequal in length, each with 3–7 raylets broadly triangular in outline. Spikes ovoid to oblong, 2–3 × 1–2 cm, with 10–20 or more spikelets; rachis densely hispid. Spikelets laxly distichous, narrowly linear-ovoid to linear, 2.5–14 × 1–2.5 mm, slightly turgid, spreading, 4–26-flowered; rachilla wings white, narrow, hyaline. Glumes pale, brown, reddish brown, or dark purple on both surfaces with middle green, slightly lax, broadly ovate, 1.8–2.5 mm, thinly papery, 5–7-veined, keel incoisnicious, margin white hyaline, apex mucronate or muticous. Stamens 3; anthers linear-oblong, 0.5–0.8 mm; connective prominent beyond anthers. Style ca. 0.6 mm; stigmas 3, ca. 1 mm. Nutlet nearly black when mature, broadly ellipsoid to obvoid, 1/2–3/5 as long as subtending glume, 3-sided, apex mucronate. Fl. and fr. Aug–Nov. 2n = 36, 68.

Sparse forests, forest margins, grasslands on slopes, marshes, meadows, river margins, wet places, paddy fields, water margins, along trails, parks; near sea level to 2100 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hubei, Jiangsu, Jiangxi, Shanxi, Sichuan, Taiwan, SE Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Pacific islands].

Cyperus pilosus is naturalized in North America.

44. Cyperus procerus Rottboll, Descr. Icon. Rar. Pl. 29. 1773.

拟毛轴莎草 ni mao zhou suo cao

Perennials. Rhizomes with long stolons. Culms 45–85 cm tall, stout, compressed triquetrous. Leaves basal, equaling or slightly longer than culm; sheath reddish brown; leaf blade 5–10 mm wide, ± flat. Involucral bracts 3, leaflike, basal 1 or 2 longer than inflorescence. Inflorescence a simple or compound anthela; rays 3–7, mostly to 15 cm, unequal in length, obliquely spreading, smooth. Spikes 1–5, broadly ovoid, with 4–16 spikelets; rachis hispidulous or glabrous. Spikelets laxly arranged, narrowly linear-ovoid to linear-ovoid, 10–25 × ca. 3 mm, slightly turgid, obliquely spreading to spreading, 14–36-flowered; rachilla wings white, narrow, hyaline. Glumes yellowish brown and reddish brown punctate but middle greenish, slightly densely imbricate, broadly ovate, 2.5–3 mm, membranous, 7–9-veined, keeled, margin white hyaline and undulate, apex obtuse. Stamens 3; anthers linear-oblong, 1.2–1.8 mm; connective slightly prominent beyond anthers. Style short; stigmas 3. Nutlet brown, obvoid, 1.3–1.5 mm, ca. 1/2 as long as subtending glume, 3-sided, essentially smooth. Fl. and fr. Jun–Oct. 2n = 18, 64.

Fields, water margins, wet places, often in sandy soil; below 100 m. Guangdong, Hainan, Taiwan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Madagascar].


刺鳞莎草 ci lin suo cao

Cyperus babakensis Steudel ex Miquel; C. pilosus Vahl var. babakensis (Steudel ex Miquel) C. B. Clarke.

Perennials. Rhizomes stoloniferous. Culms 60–80 cm tall, slightly stout, compressed triquetrous, smooth. Leaves basal, slightly shorter than or subequaling culm; sheath brown and purplish red striate, basalmost bladeless; leaf blade ca. 8 mm wide, with short and transverse septate nodes, midvein and margin scabrous, basally folded, apically flat. Involucral bracts 3 or 4, leaflike, much longer than inflorescence, longest to 25 cm. Inflorescence a simple anthela; rays 3–5, 2.5–12 cm, each with a spike; raylets absent. Spikes ovoid to ellipsoid, ca. 2.5 × 1.8 cm, with several to many spikelets; rachis slightly densely yellowish brown hispidulous. Spikelets slightly densely arranged, spreading, narrowly linear-ovoid to linear-oblong, 0.8–1.2 cm × ca. 2.5 mm, subturgid, 12–30(–40)-flowered; rachilla wings white, narrow, hyaline. Glumes yellowish on both surfaces with purple striae, slightly densely arranged, ovate, 2.5–3 mm, membranous, 7–9-veined, keel green and spinulose especially distally, margin white hyaline, apex obtuse and mucronate. Stamens 3; anthers oblong, 0.7–1 mm; connective prominent beyond anthers. Style short; stigmas 3, ± longer than style. Nutlet black when mature, broadly obvoid to broadly ellipsoid, ca. 1/2 as long as subtending glume, 3-sided, densely punctulate. Fl. and fr. Jun–Oct.

Wet places, paddy fields; below 300 m. Hainan, SE Xizang [NE India, Indonesia, Laos, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam].


碎米莎草 sui mi suo cao

Annuals. Roots fibrous. Culms tufted, 8–80 cm tall, slender to slightly stout, compressed triquetrous, base few leaved. Leaves much shorter than culm; sheath reddish brown to brownish purple; leaf blade 2–5 mm wide, slightly folded or flat. Involucral bracts 3–5, leaflike, lowestor 2 or 3 longer than inflorescence. Inflorescence a compound or rarely simple anthela; rays 4–9, mostly to 12 cm, each with 5–10 or more spikes. Spikes ovoid to oblong-oblong, 1–4 cm, with 5–20 or more spikelets. Spikelets laxly arranged, ascending to slightly spreading, narrowly ovoid, very narrowly ovoid, or oblong, 4–10 × ca. 2 mm, compressed, 6–22-flowered; rachilla almost wingless, with successive glumes 0.7–0.9 mm apart. Glumes yellow to straw-colored, lax, broadly obovate, ca. 1.5 mm, membranous, 3–5-veined, keel middle abaxially green, margin apically white hyaline, apex retuse and mucronulate. Stamens 2(or 3); anthers ellipsoid; connective not prominent beyond anthers. Style very short; stigmas ± short. Nutlet dark brown, obovoid to subellipsoid, 1.2–1.4 mm, nearly as long as subtending glume, 3-sided, densely prominently punctulate. Fl. and fr. Jun–Oct. 2n = 108, 112, 116, 128.

Forest margins, under shrubs or forests, grasslands by water, mountain slopes, along trails in valleys, river margins, wet places, paddy fields; below 100–2000 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan,
Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, SE Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Japan, Kashmir, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Turkmenistan, Uzbekistan, Vietnam; tropical Africa, SW Asia, Australia, Indian Ocean islands, Madagascar, Pacific islands].

_Cyperus iria_ is naturalized in Central, North, and South America.

47. **Cyperus microtus** Steudel, Syn. Pl. Glumac. 2: 23. 1854.

具芒碎米莎草 _ju mang sui mi suo cao_

_Cyperus amuricus_ Maximowicz var. _japonicus_ Kükenthal (1936), not Miquel (1866).

Annuals. Roots fibrous. Culms tufted, 20–60 cm tall, slightly slender, acutely triquetrous, smooth, base several leaved. Leaves shorter than or equaling culm; sheath purplish brown; leaf blade ca. 2.5 mm wide, flat. Involutural bracts 3 or 4 (or more), leaflike, longer than inflorescence. Inflorescence a compound or decomposed anthela; rays 5–9, mostly to 13 cm, unequal in length. Spikes ovoid, broadly ovoid, or subconic, 2–4 × 1–3 cm, with many spikelets. Spikelets slightly laxly arranged, linear to very narrowly linear-narrow, 0.6–1.5 cm × ca. 1.5 mm, obliquely spreading to spreading, 8–24-flowered; rachilla wings white, narrow, straight, hyaline; successive glumes on rachilla 1–1.5 mm apart. Glumes straw-colored to pale, lax, 3-sided, densely prominently puncticulate. Fl. and fr. Aug–Oct.

Forests, under shrubs, grasslands on mountain slopes, wet places by river margins, ditch margins, seashores, fields; below 100–2500 m. Anhui, Chongqing, Fujian, N Guangxi, N Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Jilin, Liaoning, SE Shaanxi, Shandong, Shanxi, Sichuan, E Yunnan, Zhejiang [Japan, Korea, Russia (Far East)].

_Cyperus microtus_ is naturalized in North America.


三轮莎 _san lun cao_

Annuals. Roots fibrous. Culms slender, 8–65 cm tall, compressed triquetrous, smooth, with few leaves at basal part. Leaves shorter than or equaling culm; sheath brownish, ± long; leaf blade 3–6 mm wide, flat, margin scabrous. Involutural bracts 3 or 4, leaflike, very much longer than inflorescence or basal 1 or 2 longer than inflorescence, margin scabrous. Inflorescence a simple or rarely compound anthela; rays 5–11, mostly to 15–20 cm, unequal in length, each with 1(–5) spike. Spike ovate-oblong, broadly ovate, or oblong-cylindrical, 1.35 × 1–3 cm, with 5–32 or many spikelets; rachis white hispidulous on angles. Spikelets slightly laxly or densely arranged, obliquely spreading to suberect, sometimes divergent after anthesis, narrowly ovoid to linear, 0.3–2.5 cm × 1–2 mm, 6–46-flowered; rachilla wings white, narrow, hyaline; successive glumes on rachilla ca. 1 mm apart. Glumes purplish red on both surfaces, slightly lax, broadly ovate to elliptic, 1.4–1.5 mm, membranous, obscurely 5–7-veined, keel abaxially green, margin apically white hyaline, apex rounded to retuse and mucros. Stamens 3; anthers ellipsoid, short; connective prolonged. Style short; stigmas 3, slightly short. Nutlet brown, obovoid, nearly as long as subtending glume, 3-sided, densely prominently puncticulate. Fl. and fr. Jul–Oct.

Mountain slopes, river margins, ditch margins, grasslands, along trails, wet places, paddy fields; 300–1500 m. Anhui, Chongqing, Fujian, NE Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Jilin, Liaoning, NE Mongolia, Shaanxi, Shandong, Sichuan, E Yunnan, Zhejiang [Japan, Korea, Russia (Far East, E Siberia), Vietnam].

**Cyperus orthostachyus** is naturalized in North America.
49a. *Cyperus orthostachyus* var. *orthostachyus*

三轮草（原变种） 使兰草（原变种）

*Cyperus truncatus* Turczaninow var. *orthostachyus* (Franchet & Savatier) C. B. Clarke.


Mountain slopes, river margins, ditch margins, grasslands, along trails, wet places, paddy fields; 300–1500 m. Anhui, Chongqing, Fujian, NE Guizhou, Hebei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shandong, Zhejiang [Japan, Korea, Russia (Far East, E Siberia), Vietnam].


长苞三轮草 使兰长苞变种

Involucral bracts much longer than inflorescence. Spikes oblong to oblong-cylindric, with many spikelets. Spikelets densely arranged, 3–6 × ca. 1 mm, suberect, 6–12-flowered. Fl. Aug–Sep.

● Swamps. Heilongjiang, Liaoning.


扁穗莎草 使兰扁穗变种

Annuals. Roots fibrous. Culms tufted, 5–35 cm tall, ± slender, triquetrous, smooth, base with leaves. Leaves shorter than or sometimes equaling culm; sheath purplish brown; leaf blade 1.5–4 mm wide, flat, sometimes slightly plicate. Involucral bracts 3–5, leaflike, longer than inflorescence. Inflorescence a simple anthela; rays 2–7, 0.8–5 cm, each with 1 spike. Spike broadly ovoid to in outline subellipsoid, with 3–10 spikelets; rachis 2–5 mm. Spikelets densely and nearly digitately arranged, narrowly linear-ovoid, 1–2.5(–4) cm × 3–4 mm, basal ones spreading and apical ones obliquely spreading, 10–20-flowered; rachilla wings white, narrow, hyaline. Glumes pale to straw-colored on both surfaces and sometimes with rusty brown striate at middle green, sharply imbricate, ovate, 3–3.5 mm, thinly leathery, strongly folded, 9–13-veined, keeled, apex acute and with a straight and slightly long mucro. Stamens 3; anthers linear, 0.6–0.7 mm; connective apex reddish, ovate, ca. 0.1 mm. Style 0.9–1.3 mm; stigmas 3, 0.5–0.8 mm. Nutlet dark brown, obovoid, ca. 1/3 as long as subtending glume, 3-sided, slightly concave on 3 sides, punctulate. Fl. and fr. Jul–Dec. 2n = ca. 98, 112, 114, 128.

Grasslands, seashores, along trails, lake margins, forests, stony cliffs, wet sandy riverbanks, open fields, paddy field margins; near sea level to 900(–1600) m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hebei, Hunan, Jiangsu, Jiangxi, Liaoning, Nansha Qandao, Shandong, Shandong, Sichuan, Taiwan, Xisha Qandao, Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Japan, Kashmir, Laos, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific Ocean islands].


密穗砖子苗 羽状穗莎草

*Cyperus compactus* var. *macrostachys* (Boeckeler) Kükenthal; *C. dilitus* Vahl; *C. dilitus* var. *macrostachys* Boeckeler; *Mariscus compactus* (Retzius) Druce; *M. compactus* var. *macrostachys* (Boeckeler) F. C. How; *M. microcephalus* J. Presl & C. Presl.

Perennials. Rhizomes short. Culms scattered or sparsely tufted, 50–90 cm tall, stout, terete, with conspicuously transverse veins, basally with leaves, base slightly swollen. Leaves longer to slightly shorter than culm; sheath purplish red, cylindrical, mostly to 10 cm, usually splitting from membranous part; leaf blade 5–9 mm wide, flat, with conspicuously transverse veins, abaxial midveins and margin spinulose. Involucral bracts 3–5, leaflike, much longer than inflorescence, obliquely spreading, abaxially midvein and margin spinulose. Inflorescence a compound anthela, lax to slightly dense; rays 7–9, suberect, mostly to 15 cm, unequal in length, stiff, each with 5–10 raylets; raylets obliquely spreading, usually ± short, mostly to only 2 cm. Spikes with many spikelets congested into nearly a globose to half-globose spike at apex of raylets, 0.8–3.5 cm in diam. Spikelets many, radially spreading, subulate, 0.5–1.8 cm × less than 1 mm, 3–12-flowered; rachilla wings white, hyaline. Glumes blood-red to reddish brown on both surfaces but abaxially green at middle, narrowly oblong, 3–4 mm, slightly shiny, 5–7-veined, apex obtuse to acute. Stamens 3; anthers broadly linear; connective prominent beyond anthers. Style of long to medium length; stigmas 3, slender. Nutlet yellowish brown to brownish, narrowly oblong, 1/2–3/5 as long as subtending glume, 3-sided, densely punctulate, apex mucronate. Fl. and fr. Jun–Dec.

Grasslands, swamps, wet places, shaded places in sparse forests, river margins, along trails, valleys, open field margins, paddy fields, coastal marshes; near sea level to 1000 m. Fujian, Guangdong, Guangxi, S Guizhou, Hainan, Taiwan, SE Zizang, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia, Indian Ocean islands, Madagascar].


羽状穗莎草 羽状穗莎草

*Cyperus pennatus* Lamarck; *Mariscus albescens* Gaedtchau; *M. javanicus* (Houttuyn) Merrill & F. P. Metcalf; *M. pennatus* (Lamarck) Domin.

Perennials. Rhizomes short, thick, woody. Culms scattered, 30–105 cm tall, stout, obtusely 3-angled, papillose, basally with leaves, base swollen. Leaves longer than culm; sheath blackish brown; leaf blade 5–10 mm wide, leathery, base folded, apically gradually flattened, conspicuously transverse veined, midvein and margin spinulose. Involucral bracts 4–6, obliquely spreading, leaflike, much longer than inflorescence.Inflorescence a compound anthela; rays 6–10, obliquely spreading, mostly to only 10 cm, papillose, each with 3–7 raylets. Spikes cylindric, 1.5–3 × 0.8–1.2 cm, with many spikelets. Spikelets slightly densely arranged, spreading to downward reflexed, narrowly oblong-ovoid, 4.5–7 × 1.8–2.5 mm, slightly turgid, 4–6-flow-
ered; rachilla broadly winged. Glumes brownish to straw-colored and rusty brown striate, slightly densely imbricating, broadly ovate, ca. 3 mm, subulate, concave, 7–9-veined, not keeled, margin white hyaline, apex acute and not mucronate. Stamens 3; anthers broadly linear. Style long; stigmas 3. Nutlet blackish brown, broadly ellipsoid to obovoid-ellipsoid, ca. 1/2 as long as subtending glume, 3-sided, with dense punctate processes. Fl. and fr. Jul–Sep.

Coastal sandy areas, salt marshes, water margins; near sea level. Guandong, Hainan, Taiwan, Xisha Qundao (Cambodia, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Indian Ocean islands, Madagascar, Pacific islands).


具芒鳞砖子苗 ju mang lin zhuan zi miao

Cyperus aristatus Rottboll, nom. illeg. superfl.; Mariscus aristatus Cheirmeon (1938), nom. illeg. superfl., not (Bentham) Kuntze (1891); M. squarrosus (Linnaeus) C. B. Clarke; Scirpus intricatus Linnaeus.

Annuals. Roots fibrous. Culms densely tufted, 2–10 cm tall, compressed triquetrous, smooth, leaved at basal part. Leaves longer to slightly shorter than culm; sheath purplish brown; leaf blade ca. 2 mm wide, flat, smooth. Involucral bracts 3–5, leaflike, longer than inflorescence, obliquely spreading. Inflorescence a simple androstachys; rays 2–5–7, to 2.5 cm. Spikelets ovoid to oblong-ovoid, 1–1.5 cm × 6–8 mm, with many spikelets. Spikelets densely arranged, linear-oblong to oblong, 4–5 × 1.5 mm (excluding length of arista), slightly compressed, divergent, 8–10-flowered; rachilla wingless, caducous. Glumes reddish brown to brown, lax, ovate-oblong, ca. 2.5 mm (including length of awn), membranous, deciduous at maturity, 7–veined, keel abaxially conspicuous, apex with a 0.5–1(–1.3) mm arista. Stamens 1; anther ellipsoid, 0.2–0.3 mm. Style 0.3–0.5 mm; stigmas 3, 0.4–0.7 mm. Nutlet dark grayish brown, obovoid-oblong, 0.7–0.8(–1.1) mm, 3-sided, with punctate processes, apex truncate and apiculate. Fl. and fr. Sep–Oct. 2n = 98.

Grasslands in forests, wet places at river margins, mountain slopes, wet sandy areas, along trails and roadsides, field margins; 1200–4000 m. Sichuan, E and S Xizang, Yunnan [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Kashmik, Myanmar, Pakistan, Sichuan, Thailand, Vietnam; Africa, SW Asia (Arabian Peninsula), Australia, Central, North, and South America, Europe, Madagascar].


砖子苗 zhuan zi miao

Scirpus cyparoides Linnaeus, Mant. Pl. Alt. 181. 1771; Cyperus cyparoides var. microstachys Kükenthal; C. cyparoides var. subcompositus (C. B. Clarke) Kükenthal; C. subambellatus Kükenthal; C. umbellatus Bentham, nom. illeg. superfl.; Kyllinga sumatrensis Retzius; K. umbellata Roottboll, nom. illeg. superfl.; Mariscus cyparoides (Linnaeus) Urban (1900), not (Roxburgh) A. Dietrich (1832); M. philippensis Steudel; M. sieberianus Nees ex C. B. Clarke; M. sieberianus var. evolution C. B. Clarke; M. sieberianus var. khasianus C. B. Clarke; M. sieberianus var. subcompositus C. B. Clarke; M. sumatrensis (Retzius) J. Raynal; M. sumatrensis var. evolution (C. B. Clarke) C. Y. Wu ex Karthikeyan; M. sumatrensis var. khasianus (C. B. Clarke) C. Y. Wu ex Karthikeyan; M. sumatrensis var. microstachys (Kükenthal) L. K. Dai; M. sumatrensis var. subcompositus (C. B. Clarke) Karthikeyan; M. umbellatus Vahl, nom. illeg. superfl.; M. umbellatus var. evolution (C. B. Clarke) E. G. Camus; M. umbellatus var. microstachys (Kükenthal) Tang & F. T. Wang; M. umbellatus var. sieberianus (Nees ex C. B. Clarke) E. G. Camus; M. umbellatus var. subcompositus (C. B. Clarke) Tang & F. T. Wang.

Perennials. Rhizomes short, hardened. Culms laxly tufted, 10–60 cm tall, acutely triquetrous, smooth, base swollen and with more leaves. Leaves shorter than to equaling culm; sheath brown to reddish brown; leaf blade 3–6(–8) mm wide, folded at basal part but apically gradually flattened, margin not scabrous. Involucral bracts 5–8, obliquely spreading, leaflike, longer than inflorescence. Inflorescence a simple or subcompound anthela; rays several, 6–12 or sometimes more, short or 6–14 cm, unequal in length, each with 1–5 spikes. Spikes cylindric, 1–2.5–5 cm × 5–10 mm or sometimes narrower, with many dense spikelets. Spikelets narrowly linear-ovoid, 3–7 × ca. 0.7 mm or sometimes shorter, spreading to reflexed, each 1( or)2- or 3-flowered; rachilla wings white, lanceolate, broad, hyaline. Glumes yellow, yellowish green, or greenish, oblong, ca. 3 mm, veins several with middle 3 green and conspicuous, margin in-volute, apex obtuse and not mucronate. Stamens 3; anthers broadly linear, 0.8–1 mm; connective prominent beyond anthers. Style short; stigmas 3, slender. Nutlet straw-colored at first but dark brown when mature, narrowly oblong, 1.8–2.2 × ca. 0.5 mm, ca. 2/3 as long as subtending glume, 3-sided, minutely punctate. Fl. and fr. Apr–Dec. 2n = 82, 88, 134, 220, 224.

Sunny places on mountain slopes, grasslands along trails, ditch margins, river margins, wet places, forests, among herbs, sometimes in dry places; 100–1000(–3200) m. Anhui, Chongqing, Fujian, S Gansu, Guandong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xisha Qundao, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Kashmir, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, Atlantic Ocean islands, N Australia, Indian Ocean islands, Madagascar, Pacific islands].

Cyperus cyparoides is naturalized in tropical America. This widespread species occurs nearly throughout the tropical and warm-temperate regions of the Old World. Numerous varieties have been recognized in China, which may be identical with subspecies and varieties named in Africa (e.g., R. W. Haines & Lye, Sedges & Rushes E. Afr. 204–206, 1983) and S Asia (Karthikeyan, Fl. Ind. Enumerat. Monocot. 64. 1989). Such varieties were based on differences in ray and bract length, number of spikes per ray, and number of fertile glumes per spikelet. Intergradations have been noted by Haines and Lye (q.v.) and characterize some specimens from S China and SE Asia. D. A. Simpson and T. Koyama (Fl. Thailand 6(4): 382. 1998) noted variability in this species (as well as the following species) and recognized no infraspecific taxa. We follow their broad concept for this species and for C. cyparoides.

55. Cyperus cyperinus (Retzius) J. V. Suringar, Cyperus, 154. 1898.

莎状砖子苗 suo zhuang zhuan zi miao

Kyllinga cyparina Retzius, Observ. Bot. 6: 21. 1791;
**Cyperus cyperinus** var. *bengalensis* (C. B. Clarke) Kükenthal; *C. cyperoides* (Linnaeus) Kuntze subsp. *cyperinus* (Retzius) Kükenthal; *C. umbrellatus* Bentham f. *cyperinus* (Retzius) C. B. Clarke; *Mariscus cyperinus* (Retzius) Vahl; *M. cyperinus* var. *bengalensis* C. B. Clarke; *M. umbrellatus* Vahl var. *cyperinus* (Retzius) E. G. Camus.

Perennials. Rhizomes short. Culms scattered, 15–70 cm tall, slightly stout, acutely triquetrous, smooth, base many leaved. Leaves shorter than culm; sheath purplish red; leaf blade 5–7 mm wide, slightly flaccid or stiff, folded at basal part and spreading at apical part, abaxially midvein and margin scabrous. Involucral bracts 6–10, leaflike, longer to slightly shorter than inflorescence, margin scabrous. Inflorescence a simple anhela; rays 6–10, short or to 4.5 cm, unequal in length, with a single spike at apex. spikes oblong-ovoid, often appearing to taper toward base or rarely cylindrical, 1–1.8–3 × 0.8–1.2 cm, with many densely arranged spikelets, base cuneate to subtruncate. Spikelets erect to erect-spread, narrowly linear-ovoid to linear-oblong, 4.6–6.5 × ca. 1 mm, each (1 or)–2.4–flowered; rachilla wings lanceolate, broad. Glumes crowded, brownish to purplish red on both surfaces, elliptic, ca. 3.5 mm, papery, veins several with middle 3 conspicuous and green, keeled, apex obtuse to acute and not mucronate. Stamens 3; anthers broadly linear, 1–1.5 mm; connective prominent beyond anthers. Style of medium length; stigmas 3. Nutlet dark grayish brown, obovoid to ellipsoid, 3–4 × 1–1.5 mm, 2–3-flowered. Glumes brownish to yellowish green, purple puncticate on apical part, and green on abaxial middle, ovate, 2.5–3 mm, 9–13-veined, apex mucronate. Stamens 3; anthers linear-oblong, ca. 0.5 mm; connective not prominent beyond anthers. Nutlet oblong, 1/3–1/2 as long as subtending glume, ca. 1 mm wide, 3-sided, densely puncticate. Fl. and fr. Jul–Oct.

- Sandy areas at seashores; near sea level. Hainan.


**Cyperus hainanensis** (Chun & C. F. How) G. C. Tucker, *comb. nov.*


Perennials. Rhizomes short. Culms tufted, 15–25 cm tall, slender, compressed, base swollen into an oblong bulb shape and clothed with brown fibers from old leaf sheaths. Leaves much longer than culm; sheath brownish and usually purple maculate; leaf blade 3–4 mm wide. Involucral bracts 4 or 5, leaflike, much longer than inflorescence, slightly broad. Inflorescences capitulate; rays very short, with 4 or 5 spikes. Spikes subovoid to oblong-ovoid, with many spikelets. Spikelets densely arranged, ovoid-ellipsoid, 3–4 × 1–1.5 mm, 2–3-flowered. Glumes brownish to yellowish green, purple puncticate on apical part, and green on abaxial middle, ovate, 2.5–3 mm, 9–13-veined, apex mucronate. Stamens 3; anthers linear-oblong, ca. 0.5 mm; connective not prominent beyond anthers. Nutlet oblong, 1/3–1/2 as long as subtending glume, ca. 1 mm wide, 3-sided, densely puncticate. Fl. and fr. Jul–Oct.

- Sandy areas at seashores; near sea level. Hainan.

58. **Cyperus monospermus** (S. M. Huang) G. C. Tucker, *comb. nov.*

**Cyperus monospermus** (S. M. Huang) G. C. Tucker, *comb. nov.*


Perennials. Rhizomes short. Culms few, tufted, 10–16 cm tall, slender, compressed triquetrous, longitudinally sulcate, glabrous, base swollen into an ovoid to oblong-ovoid bulb shape and clothed with brown to dark brown fibers from old leaf sheaths. Leaves basal, shorter than to equaling culm; sheath brownish; leaf blade 1–2.5 mm wide, flat, margin scabrid. Involucral bracts 3–5, subspreading but pendent after anthesis, leaflike, mostly to 6 cm, base slightly broad. Inflorescences capitulate, 6–8 mm in diameter, with 2 or 3 spikes. Spikes with many spikelets. Spikelets densely arranged, ovoid-oblong, 2.5–3 mm, 1-flowered. Glumes yellowish brown on both surfaces, ovate to narrowly ovate, ca. 3 mm, membranous, usually purple punctate, tightly including nutlet, apex acuminate. Stamens 2; anthers oblong, ca. 1 mm. Style short. Nutlet brown, obovate to oblong, ca. 1.8 × 0.7 mm, compressed 3-sided, with dense punctulate processes. Fl. and fr. Jul–Oct.

- Waste grasslands at seashores; near sea level. Hainan.


**Cyperus serotinus** Rottbøll, Descr. Icon. Rar. Pl. 31. 1773.


Perennials. Rhizomes with long stolons. Culms 35–100 cm tall, stout, compressed triquetrous, smooth, few leaved at
basal part. Leaves shorter to sometimes longer than culm; leaf blade 3–10 mm wide, smooth, midvein abaxially forming a keel, base folded, apically flat. Involucral bracts 3 (or 4), leaf-like, longer than inflorescence, unequal in length, mostly to 8 mm wide. Inflorescence a compound or simple anthela; rays 4–7, obliquely spreading, mostly to 16 cm, each with 1–5 raylets; raylets each with a spike. Spikes with 5–17 spikelets; rachis laxly hispidulous or smooth. Spikelets laxly arranged, sub-spread, narrowly ovoid to linear-oblong, 0.8–2.5 cm × ca. 3 mm, 10–34-flowered; rachilla wings white, hyaline. Glumes reddish brown to dark reddish brown on both surfaces, densely imbricate at first but slightly lax after anthesis, broadly ovate, ca. (2–)2.5 mm, papery, 5–7-veined, midvein yellowish green, margin yellowish and hyaline, apex obtuse to rounded and sometimes emarginate. Stamens 3; anthers linear. Style short; stigmas 2, long. Nutlet brown, broadly ellipsoid, subglobose, or broadly obovoid, ca. 2 mm, plano-convex, slightly shiny, prominently puncticulate, apex apiculate. Fl. and fr. Jul–Nov.

Swamps, river margins, sandy places by water, shallow water, along trails, shady places, fields; below 100–1300 (–2500) m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, India, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, Taiwan, Xinjiang, Yunnan, Zhejiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Turkmenistan, Uzbekistan, Vietnam; SW Asia, Europe].

1a. Spikelets 0.8–2 cm; spike rachis laxly hispidulous; nutlet broadly ellipsoid to obovoid ............................... 59a. var. serotinus
1b. Spikelets ca. 2.5 cm; spike rachis smooth; nutlet broadly obovoid to subglobose ............................... 59b. var. inundatus

59a. Cyperus serotinus var. serotinus
水莎草 (原变种) shui suo cao (yuan bian zhong)

Cyperus serotinus f. depauperatus Kükenthal; Juncellus serotinus (Rottboll) C. B. Clarke; J. serotinus f. depauperatus (Kükenthal) L. K. Dai.


River margins, sandy places by water, shallow water, along trails, fields; 400–1300 (–2500) m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, India, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Pakistan, Russia, Turkmenistan, Uzbekistan, Vietnam; SW Asia, Europe].

Cyperus serotinus var. serotinus is naturalized in E North America.


广东水莎草 guang dong shui suo cao

Cyperus inundatus Roxburgh (1832), not R. Brown (1810); Juncellus serotinus var. inundatus (Kükenthal) L. K. Dai.


Swamps, shady places; below 100 m. Fujian, Guangdong [India].

60. Cyperus pannonicus Jacquin, Fl. Austriac. 5: 29. 1778.

沼生水莎草 zhao sheng shui suo cao

Juncellus pannonicus (Jacquin) C. B. Clarke.

Perennials. Roots many, fibrous. Rhizomes short. Culms densely tufted, 4–20 cm tall, compressed 3-angled, smooth, base with 1 leaf. Leaf sheath slightly long; leaf blade mostly to only 2.5 cm, ca. 1 mm wide. Involucral bracts 3, leaflike, usually 2 longer than inflorescence and 1 shorter; basalmost bract erect, culmlike, elongated, basally ± broad. Inflorescences capitate, with 1–8 spikelets. Spikelets ovoid-oblong to oblong, 0.5–1.5 cm × 2–5 mm, slightly turgid, 10–32-flowered; rachilla sub-quadrangular, slightly broad. Glumes dark blood-red on both surfaces but middle yellowish green, adaxially reddish brown striate, densely imbricate, orbicular-ovate, ca. 3 mm, subpapery, veins several, apex obtuse and sometimes with a very short mucro. Stamens 3; anthers linear; connective prominent beyond anthers. Style long; stigmas 2. Nutlet brownish yellow, subglobose, ellipsoid, or obovoid, ca. 2 mm, plano-convex, slightly shiny, reticulately striate. Fl. and fr. Aug–Sep.

Swamps, river margins, ditch margins, saline soil; 100–1300 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Nei Mongol, Ningxia, Shaanxi, Shanxi, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Turkmenistan, Uzbekistan; SW Asia, C Europe].


沼生水莎草 zhao sheng shui suo cao

Juncellus limosus (Maximowicz) C. B. Clarke; Pycreus limosus (Maximowicz) Schischkin.

Annuals. Roots fibrous. Culms tufted, 10–30 cm tall, compressed triquetrous, smooth, with few leaves. Leaves usually shorter to rarely slightly longer than culm; sheath slightly long; leaf blade 2–3 mm wide, usually folded, sometimes flat. Involucral bracts 3 or 4, leaflike, several times as long as inflorescence. Inflorescence a simple anthela, subcapitate; rays 3–6, very short, each with many spikelets congregated into a small capitulum. Spikelets narrowly oblong to oblong, 3–4 × ca. 1.5 mm, 10–18-flowered; rachilla wingless. Glumes straw-colored to sometimes pale rusty brown on both surfaces, slightly laxly imbricate, oblong, ca. 1 mm, membranous, 3-veined, apex obtuse and mucronate. Stamens 2; anthers ellipsoid, short. Style long; stigmata 2, exerted. Nutlet yellowish, oblong, ± as long as subtending glume, plano-convex. Fl. and fr. Aug–Sep.

Wet sandy places at river or lake margins. Heilongjiang [Russia (Far East), Vietnam].


断节莎 duan jie suo

Cyperus conglobatus Link; C. ferax Richard; C. ferax var. conglobatus (Link) Kükenthal; Mariscus ferax (Richard) C. B.
Annuals or short-lived perennials. Rhizomes short, with fibrous roots. Culms 30–120 cm tall, stout, 3-angled, ± longitudinally sulcate, smooth, basally with leaves, base swollen into tuber. Leaves shorter than culm; sheath purplish brown, long; leaf blade 4–10 mm wide, flat, slightly stiff. Involutral bracts 6–8, obliquely spreading, usually longer than inflorescence. Inflorescence a compound or decompound anthela; rays 5–12, mostly to 20 cm, slightly stiff, each with several raylets; raylets florescence a compound or decompound anthela; rays 5–12, flowered; rachilla with several to 10 or more articulations, ward reflexed, linear-cylindric, 0.8–2.5 cm × ca. 1 mm, 10–25-spikelets. Spikelets slightly laxly arranged, spreading to down-0–2 cm. Spikes oblong-cylindric, 2–3 × ca. 1.5 cm, with many 6–8, obliquely spreading, usually longer than inflorescence. Involucral bracts leaflike, basal 2 or 3 longer short, usually split; leaf blade 2–3 mm wide, flat, apical margin nate. Fl. and fr. Aug–Oct(–Mar).

Riverbanks, streambeds, paddy field margins; near sea level to 700 m. Shandong, Taiwan, Zhejiang [Japan, Korea, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; tropical Africa, E Australia, Central, North, and South America, Madagascar, Pacific islands].


翅鳞莎属 chi lin suo shu
Dai Lunkai (戴伦凯); Gordon C. Tucker, David A. Simpson

Herbs, annual or short-lived perennial. Roots fibrous. Culms scattered, with leaves basally. Leaves basal, 3-ranked; ligule absent. Involutral bracts several, leaflike, usually longer than inflorescence. Inflorescence a compound anthela; rays unequal in length, with several ± short raylets. Spikes at apex of ray or raylet, globose, with numerous spikelets. Spikelets densely arranged, each 1- or 2-flowered; rachilla articulate near base, deciduous at articulation when mature. Glumes distichous, persistent on and deciduous with rachilla, basalmost without a flower, remaining ones each with a bisexual flower, keel broadly winged. Flowers without hypogynous bristles or scalelike perianth parts. Style base not swollen, deciduous; stigmas 3. Nutlet 3-sided, one side toward rachilla.

Three species: Africa, Asia, Indian Ocean islands, Madagascar; one species in China.

翅鳞莎 cy lin suo

Kyllinga cyperoides Roxburgh, Fl. Ind. 1: 187. 1820; Cyperus pseudokyllingoides Kükenthal; Mariscus cyperoides (Roxburgh) A. Dietrich.

Culms 8–38(–80) cm tall, slightly slender, compressed cylindric, sometimes obtusely 3-angled at apical part, smooth. Leaves several, basal, shorter than to equaling culm; sheath short, usually split; leaf blade 2.3 mm wide, flat, apical margin spinulose. Involutral bracts 3–5, leaflike, basal 2 or 3 longer than inflorescence. Inflorescence a compound anthela; rays 3–7, mostly to 4.5 cm, unequal in length, each with (0–)3–6 raylets; raylets less than 1.5 cm. Spikes globose, 5–9 mm in diam., with 6–15 densely clustered spikelets. Spikelets broadly ellipsoid to ellipsoid, ca. 3 × 1.5–2 mm, strongly compressed, 1- or 2-flowered. Glumes yellowish brown, boat-shaped, 3.5–4 mm, membranous, laterally 1-veined, keel glaucous, broadly winged, and extending into an apical mucro. Stamens 3; anthers oblong. Style short; stigmas 3, slightly longer than style, laxly papiliferous. Nutlet dark reddish brown, narrowly oblong, 3-sided with sharp angles, 2.7–3 mm, densely puncticulate, apex acuminate. Fl. and fr. Jun–Sep. 2n = 10.

Grasslands on mountain slopes, ditch margins, along trails; 1000–1700(–1800) m. SE Xizang, C and S Yunnan [Bhutan, India, Laos, Myanmar, Nepal, Thailand, Vietnam; Africa, Indian Ocean islands, Madagascar].


海滨莎属 hai bin suo shu
Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker

Herbs, perennial. Rhizomes long, creeping. Culms 1 to few, 3-angled, smooth. Leaves many, aggregated on basal part of culm; ligule absent; leaf blade linear, stiff. Involutral bracts leaflike, spreading. Inflorescences spicate, sessile, with 2 to several clusters of spikelets. Spikelets falling as a unit when mature. Glumes subdistichous; basal 3 glumes veined, without a flower; apicalmost glume thickened, without veins, subtending a bisexual flower. Hypogynous bristles absent. Stamens 3; anthers linear-oblong; connective apex evident beyond anthers. Ovary oblong, 3-sided; stigmas 3. Nutlet long ellipsoid, 3-sided, apex without a beak.

One species: pantropical.

**Mieglia maritima** (Aublet) Willdenow; **Remirea pedunculata** R. Brown.

Rhizomes slender, long creeping, branching, rigid. Culms 6–15 cm tall, 1–2 mm thick, 3-angled, smooth, basally clothed with brown sheaths and their fibrous remnants and buried in sand. Leaves 3–15, covering base and lower culm, usually slightly longer than culm; sheath pale brown; leaf blade lanceolate, 4.5–6.5 mm wide; abaxial surface prominently keeled. Involucral bracts leaflike, longer than inflorescence. Inflorescences terminal, capitate, usually with 2–7 clusters, oblong-ellipsoid to ovoid-oblong, 1–2 × 0.7–1 cm, with many spikelets. Spikelets dense, fusiform-ellipsoid, ca. 5 mm; bractlets glumelike, ovate-lanceolate, ca. 3 mm, with brown lines, 1-veined, apex acute. Basal 3 glumes without a flower; basalmost glume broadly ovoid, ca. 2 mm, 2-veined and with brown lines, apex rounded; second glume ovoid, ca. 4 mm, 7-veined, apex rounded; third glume slightly longer than second one; fourth glume fleshy, ca. 3 mm, veinless, with brown minute spots, margin involute, apex slender. Stamens 3; anthers ca. 2 mm. Ovary oblong, 3-sided; style short; stigmas 3, slender, ± as long as style. Nutlet blackish brown, sessile, cylindric-ellipsoid, 2–2.5 mm, compressed 3-sided. Fl. and fr. Sep–Dec.

Moist sandy beaches; near sea level. Guangdong, Hainan, Taiwan [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and America, Austra, Indian Ocean islands, Madagascar, SE North America, Pacific islands].


**扁莎属** bian suo shu

Dai Lunkai (戴伦凯); Gordon C. Tucker, David A. Simpson

Herbs, annual or perennial. Rhizomes present or absent. Culms usually tufted, 3-angled or compressed 3-angled, rarely triquetrous. Leaves basal, 3-ranked; ligule absent; leaf blade usually present. Involucral bracts (1 or)2–5(–8), leaflike, rarely very thin. Inflorescences terminal, capitate; usually with 2–7 clusters, oblong-ellipsoid to ovoid-oblong, 1–2 × 0.7–1 cm, with many spikelets. Spikelets dense, fusiform-ellipsoid, ca. 5 mm; bractlets glumelike, ovate-lanceolate, ca. 3 mm, with brown lines, 1-veined, apex acute. Basal 3 glumes without a flower; basalmost glume broadly ovoid, ca. 2 mm, 2-veined and with brown lines, apex rounded; second glume ovate, ca. 4 mm, 7-veined, apex rounded; third glume slightly longer than second one; fourth glume fleshy, ca. 3 mm, veinless, with brown minute spots, margin involute, apex slender. Stamens 3; anthers ca. 2 mm. Ovary oblong, 3-sided; style short; stigmas 3, slender, ± as long as style. Nutlet blackish brown, sessile, cylindric-ellipsoid, 2–2.5 mm, compressed 3-sided. Fl. and fr. Sep–Dec.

More than 70 species: Africa, America, Asia, Europe, oceanic islands; 11 species (three endemic) in China.

1a. Cells on nutlet surface transversely oblong with an elevated margin resulting in nutlet surface transversely undulate striate or scabrously rugose.

2a. Culms 10–35 cm tall; spikelets narrowly oblong-ovoid to narrowly linear-ovoid, 0.8–2 cm × 3–3.5 mm, 16–30-flowered; glumes brown to dark brown .................................................................................................................. 9. **P. diaphanus**

2b. Culms 3–15 cm tall; spikelets ovoid, oblong-ovoid, or narrowly ovoid, 5–15 cm × 2.5–4 mm, 8–16-flowered; glumes straw-colored, yellowish brown, or purplish red.

3a. Culms slender; leaves 0.3–1.5 mm wide; inflorescence terminal, a simple or rarely compound anthela; rays several, long or very short, or inflorescence capitate. Spikelets few to many, arranged into a short spike or capitulum at apex of rays, or fascicled; rachilla not articulate at base, persistent, wingless or narrowly winged. Glumes distichous, gradually deciduous from base to apex of rachilla at maturity, basal 1 or 2 usually without a flower but remaining ones each with a bisexual flower. Flowers without hypogynous bristles or scalelike perianth parts. Stamens 1–3; connective apex prominent or not prominent beyond anthers. Style base not swollen; stigmas 2, deciduous at maturity. Nutlet biconvex, slightly compressed or slightly turgid, one margin facing rachilla, puncticate and reticulately striate or transversely undulately striate.

More than 70 species: Africa, America, Asia, Europe, oceanic islands; 11 species (three endemic) in China.

1a. Cells on nutlet surface transversely oblong with an elevated margin resulting in nutlet surface transversely undulate striate or scabrously rugose.

2a. Culms 10–35 cm tall; spikelets narrowly oblong-ovoid to narrowly linear-ovoid, 0.8–2 cm × 3–3.5 mm, 16–30-flowered; glumes brown to dark brown .................................................................................................................. 9. **P. diaphanus**

2b. Culms 3–15 cm tall; spikelets ovoid, oblong-ovoid, or narrowly ovoid, 5–15 cm × 2.5–4 mm, 8–16-flowered; glumes straw-colored, yellowish brown, or purplish red.

3a. Culms slender; leaves 0.3–1.5 mm wide; inflorescence terminal, a simple or rarely compound anthela; rays several, long or very short, or inflorescence capitate. Spikelets few to many, arranged into a short spike or capitulum at apex of rays, or fascicled; rachilla not articulate at base, persistent, wingless or narrowly winged. Glumes distichous, gradually deciduous from base to apex of rachilla at maturity, basal 1 or 2 usually without a flower but remaining ones each with a bisexual flower. Flowers without hypogynous bristles or scalelike perianth parts. Stamens 1–3; connective apex prominent or not prominent beyond anthers. Style base not swollen; stigmas 2, deciduous at maturity. Nutlet biconvex, slightly compressed or slightly turgid, one margin facing rachilla, puncticate and reticulately striate or transversely undulately striate.

More than 70 species: Africa, America, Asia, Europe, oceanic islands; 11 species (three endemic) in China.

黑鳞扁莎 *he lin bian suo*

*Cyperus delavayi* (C. B. Clarke) Kükelthaler.

Perennials. Roots fibrous. Rhizomes short. Culms tufted, 40–60 cm tall, slender, acutely triquetrous, with a few leaves basally. Leaves shorter than culm; leaf blade 1–2 mm wide, usually folded. Involucral bracts 2, subulate, longer than inflorescence. Inflorescence a simple anthela; rays 2 or 3, mostly to only 2 cm, sometimes very short and inflorescence almost ciliate, each with 2–10 spikelets. Spikelets laxly arranged, narrowly linear-ovoid to narrowly ovoid, 0.6–1.6 cm × 2.5–3 mm, obliquely spreading, 6–16-flowered; rachilla 4-angled, wingless, with successive glumes ca. 1.2 mm apart. Glumes blackish brown on both surfaces, slightly laxly imbricate, ovate, 2.7–3 mm, subleathery, veins 3 and straw-colored, apex acute. Staminodes 3; anthers linear, 1–1.2 mm. Style slightly short; stigmas 2, slender. Nutlet black, oblong-obovoid, ca. 1.2 mm, ca. 1/3 as long as subtending glume, biconvex, densely prominently puncticulate, apex mucronate. Fl. and fr. Jun.–Oct.

- Swamps, boggy seepages, shallow water; 2000–3000 m. Yunnan.


禾状扁莎 *he zhuan bian suo*


Perennials. Rhizomes short. Culms tufted, 2–50 cm tall, slender, stiff, 3-angled, smooth, with a few leaves basally. Leaves shorter than culm; leaf blade 3–4 mm wide, folded or flat, somewhat rigid. Involucral bracts 2–4, leaflike, basal 1 or 2 longer than inflorescence. Involucral bracts 2–4, longer than inflorescence, slender. Inflorescence a simple anthela; rays 1–6, mostly to 6 cm, unequal in length, sometimes very short, each with many to rarely few spikelets. Spikelets congested at apex of rays, linear-oblong to linear, 0.3–1.8 cm × 1–3 mm, strongly compressed, radially spreading and forming a globose spike, 6–34–(–66)-flowered; rachilla straight, 4-angled, with trabeculae in both lateral sulci. Glumes yellowish brown, reddish brown, dark purplish red, dark grayish brown, or purplish brown on both surfaces, lax or dense, oblong-ovate, 1.5–2 mm, 3-veined, keel abaxially green, margin narrowly white hyaline, apex obtuse. Stamens 2; anthers oblong, ca. 0.5 mm. Style of medium length; stigmas 2, slender. Nutlet brown to dark grayish brown, obvoid, 0.8–1.2 mm, ca. 1/3 as long as subtending glume, slightly compressed, biconvex, prominently puncticulate, apex mucronate. Fl. and fr. Jun.–Nov.

Swamps, shallow water, river margins, shady wet places, meadows, water margins, paddy field margins; below 100–3400 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, SE Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Kazakhstan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, S Europe, Indian Ocean islands, Madagascar].

1a. Spikelets radially arranged; rachilla 4-angled, with trabeculae in both lateral sulci; glumes brown to dark brown, laxly imbricate, apex obtuse; anthers oblong ............................ 3. *P. flavidus*

1b. Spikelets suberect; rachilla flexuose, narrowly winged; glumes straw-colored to rarely pale brown, densely imbricate, apex sometimes mucronate; anthers linear .... 4. *P. polysystachyos*

*Pycreus chekiangensis* appears to be based on immature plants of *P. unioloides*. Although the glumes are lighter, this variation can be found in *P. unioloides* in various parts of its pantropical range.


球穗扁莎 *qiu sui bian suo*

Perennials. Roots fibrous. Rhizomes short. Culms tufted, 2–50 cm tall, obtusely 3-angled, smooth, with a few leaves basally. Leaves shorter or longer than culm; sheath reddish brown at basal part, long; leaf blade 1–2 mm wide, folded or flat. Involucral bracts 2–4, longer than inflorescence, slender. Inflorescence a simple anthela; rays 1–6, mostly to 6 cm, unequal in length, sometimes very short, each with many to rarely few spikelets. Spikelets congested at apex of rays, linear-oblong to linear, 0.3–1.8 cm × 1–3 mm, strongly compressed, radially spreading and forming a globose spike, 6–34–(–66)-flowered; rachilla straight, 4-angled, with trabeculae in both lateral sulci. Glumes yellowish brown, reddish brown, dark purplish red, dark grayish brown, or purplish brown on both surfaces, lax or dense, oblong-ovate, 1.5–2 mm, 3-veined, keel abaxially green, margin narrowly white hyaline, apex obtuse. Stamens 2; anthers oblong, ca. 0.5 mm. Style of medium length; stigmas 2, slender. Nutlet brown to dark grayish brown, obvoid, 0.8–1.2 mm, ca. 1/3 as long as subtending glume, slightly compressed, biconvex, prominently puncticulate, apex mucronate. Fl. and fr. Jun.–Nov.

Swamps, shallow water, river margins, shady wet places, meadows, water margins, paddy field margins; below 100–3400 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, SE Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Kazakhstan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, S Europe, Indian Ocean islands, Madagascar].

1a. Culms 2–3 cm tall; inflorescence a simple anthela, with only 1 ray and 3–9 spikelets ............................................. 3d. var. *minimus*

1b. Culms 7–50 cm tall; inflorescence a simple anthela, with 2–6 rays each with many or rarely few spikelets.

2a. Leaves usually longer than culm; spikelets 3–8 × 1–1.5 mm, 6–14-flowered ............................... 3c. var. *strictus*

2b. Leaves shorter than culm; spikelets 6–18 × 1.5–3 mm or narrower, 12–34–(–66)-flowered.

3a. Spikelets 1.5–3 mm wide; glumes yellowish brown, reddish brown, or dark purplish red, lax ............................ 3a. *P. flavidus*
3b. Spikelets less than 1.5 mm wide; glumes dark grayish brown to purplish brown,
dense ........................................... 3b. var. nilagricus

3a. Pycreus flavidus var. flavidus

小球穗扁莎 (原变种) qiui sui bian suo (yu'an bian zhong)

Cyperus flavidus Retzius, Observ. Bot. 5: 13. 1788; C. globosus Allioni (1789), not Forsskål (1775); Pycreus globosus Reichenbach.

Culms tufted, 7–50 cm tall. Leaves shorter than culm. Inflorescence a simple anthela; rays 2–6, each with many to rarely few spikelets. Spikelets 0.6–1.8 cm × 1.5–3 mm, 12–34(–66)-flowered. Glumes yellowish brown, reddish brown, or dark purplish red, lax. Fl. and fr. Jun–Nov.


小球穗扁莎 xiao qiui sui bian suo

Cyperus flavidus Hochstetter ex Steudel, Syn. Pl. Glumac. 2: 2. 1854; C. globosus var. nilagricus (Hochstetter ex Steudel) C. B. Clarke; Pycreus globosus var. nilagricus (Hochstetter ex Steudel) C. B. Clarke.


Swamps, shallow water, river margins, shady wet places; 100–3000 m. Fujian, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, SE Xizang, Yunnan, Zhejiang [India, Japan, Korea, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; SW Africa, SW Asia, Australia, S Europe, Indian Ocean islands, Madagascar].


直球穗扁莎 zhi qiui sui bian suo

Cyperus strictus Roxburgh, Fl. Ind. 1: 203. 1820, not Lamark (1791); C. globosus var. strictus C. B. Clarke; Pycreus globosus var. strictus C. B. Clarke.


Meadows, swamps, river margins, water margins, shallow water, ditch margins, shady wet places, paddy field margins; 200–1400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Kashmir, Nepal; SW Asia (Iran), Australia, Indian Ocean islands, Madagascar].

3d. Pycreus flavidus var. minimus (Kükenthal) L. K. Dai, comb. nov.

矮球穗扁莎 ai qiui sui bian suo


● Shady wet places; ca. 800 m. Shanxi.


多枝扁莎 duo zhi bian suo

Cyperus polystachyos Rottbøll, Descr. Pl. Rar. 21. 1772; Pycreus polystachyos var. brevispiculatus How ex Y. F. Deng.

Annuals or short-lived perennials. Roots fibrous. Rhizomes short. Culms densely tufted, 8–60 cm tall, compressed 3-angled, stiff, smooth. Leaves shorter than culm; sheath brown at basal part, long; leaf blade 2–4 mm wide, flat, sometimes folded, slightly rigid. Involucral bracts 4–6, leaflike, longer than inflorescence. Inflorescence a simple or almost capitate anthela; rays 5–8, mostly to 3.5 cm but sometimes short, each with many spikelets. Spikelets linear to linear-oblong, (0.5–)0.7–1.8 cm × 1.5–2 mm, congested into a globose spike, 6–30-flowered or more; rachilla flexuose, narrowly winged. Glumes on both surfaces straw-colored, reddish brown, dark grayish brown, or blackish dark grayish brown, densely imbricate, ovate-oblong, ca. 2 mm, membranous, 3-veined, keel abaxially green, apex sometimes mucronate. Stamens (1 or)2; anthers linear; connective prominent beyond anthers. Style long; stigmas 2, slender. Nutlet suboblong to ovoid-oblong, ca. 1/2 as long as subtending glume, biconvex, punctulate, apex mucronate. Fl. and fr. May–Oct.

Wet places, sandy areas at seashores, water margins, shady areas in wet sand, paddy field margins; near sea level to 300 m. Fujian, Guangdong, E Guangxi, Hainan, Jiangsu, S Liaoning, Taiwan, Xisha Qundao, Zhejiang [Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Pakistan, Philippines, Russia (Far East), Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Australia, Central, North, and South America, S Europe, Indian Ocean islands, Madagascar, Pacific islands].

Plants with anthela rays short or nearly absent occur sporadically throughout the range of this pantropical and warm-temperate species. Such plants have been collected in S China (Guangdong) and given the name Pycreus polystachyos var. brevispiculatus. When the species is revised on a worldwide basis, it may be appropriate to provide a formal designation for these plants with a capitulum-like inflorescence.

丽江扁莎  li jiang bian suo

Perennials. Roots few, fibrous. Rhizomes very short. Culms scattered, (5–)15–40 cm tall, slightly slender, stiff, obliquely 3-angled or sometimes nearly half-cylindrical, smooth, with a few leaves basally. Leaves shorter than culm; sheath grayish brown, ± short; leaf blade 1–2 mm wide, usually folded, apical margin scabrous. Involucral bracts 3, leaflike, longer than in florescence. Inflorescence a simple anthela; rays 3–6, mostly to 2 cm, sometimes very short into a capitulum, each with 10–20 or more spikelets congested into a subglobose spike. Spikelets oblong to linear-oblong, 3 × 1.5–2 mm, compressed, 8–(30)–flowered; rachilla straight, wingless. Glumes darker purple to brown, densely imbricate, ovate to ovate-elliptic, 1.2–1.5 cm, 3–5-veined, keel abaxially green, laterally membranous and veinless, apex truncate-emarginate and with a 0.3–0.5 mm mucro. Stamens 1 or 2; anthers oblong, ca. 0.2 mm. Style ca. 0.5 mm; stigmas 2, ca. 0.3 mm. Nutlet grayish brown, obovoid to oblong, ca. 0.6 mm, 1/3–2/5 as long as subtending glume, compressed biconvex, densely punctulate. Fl. and fr. Jun.–Aug.

- Wet places at river and pond margins; 2000–3000 m. SW Sichuan, NW Yunnan.


槽果扁莎  cao guo bian suo


Annuals. Roots fibrous. Culms tufted, 5–40 cm tall, slender, 3-angled, smooth, with a few leaves basally. Leaves shorter than culm; sheath purplish brown; leaf blade 0.5–2 mm wide, usually folded, apical margin scabrous. Involucral bracts 3–5, spreading, leaflike, usually basal 1 or 2 longer than inflorescence. Inflorescence a simple anthela; rays 3–8, mostly to 7 cm, slender, each with 3–15 spikelets arranged into a spike. Spikelets spreading, linear, 0.5–1.5 [–3.5] cm × 1–1.5 mm, compressed, 8–20–flowered; rachilla flexuose, narrowly winged. Glumes straw-colored to brownish yellow on both surfaces, lax, ovate to oblong-ovate, ca. 1.8 mm, narrowly oblong, medially veins 3 and green, laterally membranous and veinless, margin narrowly white hyaline, apex obtuse and mucronate. Stamens 1; anther oblong, ca. 0.3 mm. Style of medium length; stigmas 2. Nutlet blackish brown, oblong, 1.2–1.3 cm, ca. 2/5 as long as subtending glume, slightly compressed, both surfaces concave and punc tulate. Fl. and fr. Jun.–Aug.

Under sparse forests in valleys, along trails on mountain slopes; 400–500 m. Guangdong, Guangxi, Hainan, Taiwan, SE Xizang, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; N Australia, Pacific islands].

7. **Pycreus pumilus** (Linnaeus) Nees, Linnaea 9: 283. 1834.

矮扁莎  ai bian suo

_Cyperus pumilus_ Linnaeus, Cent. Pl. 2: 6. 1756; _C. nitens_ Retzius.

Annuals. Roots fibrous. Culms tufted, 2–20[–35] cm tall, slightly slender, compressed 3-angled, smooth, with a few leaves basally. Leaves shorter to longer than culm; leaf blade 1–2 mm wide, folded or flat. Involucral bracts 3–5, leaflike, longer than in florescence. Inflorescence a simple anthela; rays 3–6, mostly to 2 cm, sometimes very short into a capitulum, each with 10–20 or more spikelets congested into a subglobose spike. Spikelets oblong to linear-oblong, 3 × 1.5–2 mm, compressed, 8–(30)–flowered; rachilla straight, wingless. Glumes pale to yellowish white, densely imbricate, ovate to ovate-elliptic, 1.2–1.5 cm, 3–5-veined, keel abaxially green, laterally membranous and veinless, apex truncate-emarginate and with a 0.3–0.5 mm mucro. Stamens 1 or 2; anthers oblong, ca. 0.2 mm. Style ca. 0.5 mm; stigmas 2, ca. 0.3 mm. Nutlet grayish brown, obovoid to oblong, ca. 0.6 mm, 1/3–2/5 as long as subtending glume, biconvex, densely prominently punctulate, apex obtuse. Fl. and fr. Aug.–Nov.

Water margins, wet places in fields; below 100–500 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, S Taiwan [Bangladesh, Bhutan, India, Indonesia, Kashmir, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, N Australia, Indian Ocean islands, Madagascar].

_Cyperus pumilus_ is naturalized in North and South America.


红鳞扁莎  hong lin bian suo


Annuals. Roots fibrous. Culms densely tufted, 5–50 cm tall, compressed 3-angled, smooth, with several leaves basally. Leaves several, usually shorter than culm to rarely longer; sheath usually reddish brown, short; leaf blade 2–4 mm wide or less, flat, apical margin denticulate. Involucral bracts 2–5, leaflike, longer than in florescence, subsplaying. Inflorescence a simple anthela; rays 3–5, mostly to 4.5 cm to sometimes very short and in florescence a capitulum, each with 4–12 or more spikelets congested into a short spike or nearly a capitulum. Spikelets radially spreading, narrowly ovoid to narrowly oblong-ovoid, 0.5–1.8 cm × 2.5–3 mm, 6–24–flowered; rachilla straight, 4-angled, wingless. Glumes straw-colored, brownish yellow, or blackish brown on both surfaces but middle yellowish green, slightly laxly imbricate, ovate, ca. 2 mm, membranous, medially 3–5-veined, often distinctly furrowed on both sides of keel, margin dark blood-red to dark brownish red, apex obtuse. Stamens (2 or)3; anthers linear, 0.7–1 mm. Style long;
stigmas 2, exserted, slender. Nutlet black at maturity, globose-obovoid to broadly ellipsoid, 1–1.3 mm, 1/2–3/5 as long as subtending glume, biconvex, slightly turgid, minutely punctate. Fl. and fr. Jul–Dec. 2n = 48, 50.

Sparse forest margins, grasslands on mountain slopes, meadows, swamps, lake margins, sunny places at river margins or shallow water, valleys, wet places along trails, field margins, old fields; below 100–3400 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia, Sri Lanka, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, Pacific islands].

*Cyperus sanguinolentus* is naturalized in North America.


水蜈蚣属 shui wu gong shu

*Cyperus diaphanus* Schrad ex Schultes, Mant. 2: 477. 1824; *C. latespicatus* Boeckeler; *C. latespicatus var. diaphanus* (Schrad ex Schultes) Kükenthal; *Pycreus latespicatus* (Boeckeler) C. B. Clarke.

Annuals. Roots fibrous. Culms densely tufted, 10–35 cm tall, slightly slender, obtusely 3-angled, smooth, with a few leaves basally. Leaves shorter than culm; leaf blade 1.5–2.5 mm wide, apical margin denticulate. Involucral bracts 2 or 3 (or 4), leaflike, longer than inflorescence. Inflorescence a simple anhela; rays 2–4, mostly to 7 cm but sometimes short, each with 3–6 spikelets arranged into a spike. Spikelets radiate spreading, narrowly oblong-ovoid to narrowly linear-ovoid, 0.8–2 cm × 3–3.5 mm, compressed, 16–36-flowered; rachilla slightly flexuose, wingless. Glumes dark grayish brown to brown on both surfaces, slightly laxly imbricate, ovate, ca. 2.5 mm, 3-veined, keel green, margin white hyaline, apex obtuse. Stamens 2; anthers linear; connective apex prominent beyond anthers. Style long; stigmas 2, slightly short. Nutlet black, broadly obovoid, ca. 1.5 mm, biconvex, inconspicuously transversely undulate striate to nearly reticulately striate, apex mucronate. Fl. and fr. Jul–Sep.

Meadows, wet sandy areas. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia (Far East)].


似宽穗扁莎 si kuan sui bian suo

Annuals. Culms 3–15 cm tall, 3-angled, smooth, base with leaves. Leaves shorter to longer than culm; sheath reddish brown, short, usually split; leaf blade 1–3 mm wide, flat, margin laxly denticulate. Involucral bracts 3 or 4, spreading, leaflike, longer than inflorescence. Inflorescence a simple anhela; rays 3–5, mostly to 2.5 cm, each with 3–8 spikelets arranged into a short spike. Spikelets congregated near apex of ray, oblong-ovoid to subovoid, 6–10 × ca. 2.5 mm, radially spreading, 8–14-flowered; rachilla substrict, wingless. Glumes straw-colored to yellowish brown, slightly laxly imbricate, ovate, ca. 3 mm, concave, slightly thick, 3-veined, apex obtuse and muticous. Stamens 2; anthers broadly linear; connective slightly prominent beyond anthers. Style long; stigmas 2. Nutlet brownish, obovoid, ca. 1/3 as long as subtending glume, slightly turgid, conspicuously and transversely undulate striate. Fl. and fr. Aug–Sep.

Paddy field margins; 1500–2100 m. Guizhou, Sichuan.


水蜈蚣属 shui wu gong shu

Dai Lunkai (戴伦凯); Gordon C. Tucker, David A. Simpson

Herbs, perennial or rarely annual, with rhizomes or only fibrous roots. Culms tufted or scattered, usually slightly slender, rarely slightly stout. Leaves basal, 3-ranked; ligule absent; leaf blade elongated or reduced. Involucral bracts spreading, leaflike. Inflorescences terminal, capitulate, with 1–3 spikes. Spikelets sessile, capitulate, with densely numerous spikelets. Spikelets short, compressed, each usually with 1 or 2 (~5) bisexual flowers; rachilla articulate near base, deciduous at articulation when mature. Glumes distichous, persistent on rachilla and deciduous with it, basal 2 without a flower, apicalmost rarely with a male flower, remaining ones...
each with a bisexual flower. Flowers without perianth bristles or scalelike perianth parts. Style base not swollen, deciduous; stigmas
2. Nutlet compressed biconvex, one angle toward rachilla.

About 75 species: tropics and warm temperate regions worldwide; seven species (one introduced) in China.

1a. Glumes abaxially keeled.
1b. Glumes not abaxially keeled.

2a. Perennials, with rhizomes; glumes with membranous spiny denticulate wings .................. 3. Kyllinga melanosperma
2b. Annuals, with fibrous roots; glumes with papery broadly dentate wings shaped like a cockcomb ............ 4. Kyllinga nemoralis

3a. Rhizomes short; culms tufted; spikes (1–3); glume abaxial keel without spinules.
3b. Rhizomes long and creeping; culms scattered, single at each node of rhizome; spike (1–3); glume abaxial keel spinulose.

4a. Middle spike broadly ovoid, 5–6 mm; lateral spikes globose, 3–4 mm; spikelets oblong, 1-flowered; glumes greenish yellow and reddish brown maculate .............................................................. 1. Kyllinga bulbosa
4b. Middle spike oblong-cylindric to oblong, 6–14 mm; lateral spikes oblong, ca. 6 mm; spikelets ovoid-ellipsoid to ovoid, 1- or 2-flowered; glumes greenish yellow to yellowish white and not reddish brown maculate .............................................................. 2. Kyllinga cylindrica

5a. Rhizomes thick; culms 30–120 cm tall, stout, very compressed 3-angled or nearly compressed; leaves bladeless or with a shorter than 15 cm blade on apical 1 or 2 sheaths; nutlet black at maturity, oblong to obovoid-oblong.
5b. Rhizomes thin; culms 5–30 cm tall, slender, compressed 3-angled; leaves bladeless on basal 2 sheaths, with a 5–15(or more) cm blade on apical 2 or 3 leaf sheaths; nutlet brown at maturity, obovoid .................. 5. K. brevifolia

6a. Involute bracts 3; leaf sheaths purplish ................................................................. 3. Kyllinga melanosperma
6b. Involute bracts 5–8; leaf sheaths brown ................................................................. 4. Kyllinga polyphylla


三头水蜈蚣 san tou shui wu gong

Kyllinga nana Nees.

Perennials. Rhizomes short. Culms tufted, 5–30 cm tall, compressed 3-angled, smooth, base swollen, bulbous, and clothed with persistent brown leaf sheath remains splitting into fibers. Leaves shorter than culm; leaf blade 2–3 mm wide, flaccid, folded or flat, apical margin sparsely denticulate. Involucral bracts 2 or 3, leafflike, longer than inflorescence, ± horizontal, downward reflexed after anthesis. Spikes usually 3, with numerous spikelets congested into a capitulate shape; middle spike broadly ovoid, 5–6 mm; lateral spikes globose, 3–4 mm. Spikelets radially arranged, oblong, 2–2.5 mm, 1-flowered. Glumes greenish yellow and reddish brown maculate, ovate to ovate-ellipsoid, 2–2.5 mm, concave, keel abaxially green, veins 2 or 3 on each side of keel, apex mucronate. Stamens 1–3. Style short; stigmas 2, longer than style. Nutlet yellowish brown, oblong, 2/3–3/4 as long as subtending glume, compressed plano-convex, with punctate processes. Fl. and fr. Jul–Oct. 2n = 14.

Kyllinga bulbosa is naturalized in E. Australia and Malaysia.

The name Kyllinga triceps Rottboll (Descr. Icon. Rar. Pl. 14. 1773) has been misapplied to this species (e.g., in FRPS 11: 185. 1961). That name was nomenclaturally superfluous when published and is therefore illegitimate because, in the protologue, Rottboll cited the older name Scirpus glomeratus Linnaeus (Sp. Pl. 1: 52. 1753) as a synonym.


圆筒矮水蜈蚣 yuan tong sui shui wu gong

Cyperus sesquiflorus (Torrey) Mattfeld & Kükenthal var. cylindricus (Nees) Kükenthal; Kyllinga odorata Vahl subsp. cylindrica (Nees) T. Koyama; K. sesquiflora Torrey subsp. cylindrica (Nees) T. Koyama.

Cyperus sesquiflorus (Nees) J. V. Suringar.

Perennials. Rhizomes thick, long creeping, internodes short, clothed with brown scales, with 1 culm at each node. Culms distant, 30–120 cm tall, very compressed 3-angled to nearly compressed, smooth, base bulbous, clothed with long leaf sheaths. Leaf sheath brown, cylindric, margin scarious, mouth obliquely truncate, apex mucronate, apical 1 or 2 with a blade; leaf blade ca. 5 cm × 3–5 mm or shorter, flat, apical mar-
gin denticulate. Involutral bracts 3, leaflike, spreading to downward reflexed. Spike 1, ovoid, oblong-ovoid, or subglobose, 6–12 × 6–8 mm, with numerous densely arranged spikelets. Spikelets narrowly ellipsoid-ovoid, ca. 3 mm, 1- or 2-flowered. Glumes straw-colored with rusty brown striation, ovate-lanceolate, ca. 3 mm, 5–7-veined, keel ± spinulose, apex mucronate. Stamens 3; anthers shortly linear; connective prominent beyond anthers. Style long; stigmas 2, shorter than style. Nutlet yellowish white at first but black when mature, oblong to obovoid-oblong, ca. 1/2 as long as subtending glume, plano-convex, with dense punctate processes, apex mucronate. Fl. and fr. Apr–Sep.

Wet places along trails, water margins, sandy areas; below 100–1000 m. Guangdong, S Guangxi, Hainan, Yunnan [India, Indonesia, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, NE Australia, Madagascar].


水蜈蚣 shui wu gong

*Cyperus aromaticus* (Ridley) Mattfeld & Kükenthal; *Kyllinga aromatica* Ridley; *K. erecta* Schumacher var. *polyphylla* (Kunth) Hooper.

Perennials. Rhizomes thick, horizontally long creeping, internodes short, clothed with brown to purple or blackish scales, with 1 culm at each node. Culms scattered, 25–90 cm tall; 3-angled, smooth, base bulbous, clothed with long leaf sheaths. Leaf sheath purplish, cylindric, margin scarious, mouth obliquely truncate, apex subacute, apical 1 or 2 with a blade; leaf blade 3–5(–15) cm × 2–6 mm or shorter, flat, apical margin spinulose. Involutral bracts 5–8, leaflike, longest to 15 cm, ± horizontal to slightly reflexed. Spikes 1–3, hemispheric to subglobose, 6–12 × 6–8 mm; lateral spikes much smaller, with numerous densely arranged spikelets. Spikelets narrowly ellipsoid-ovoid, ca. 3 mm, 1- or 2-flowered. Glumes straw-colored with rusty brown striation, ovate-lanceolate, 3–4 mm, 5–7-veined, midvein ± spinulose, apex mucronate. Stamens 3; anthers shortly linear; connective prominent beyond anthers. Style long; stigmas 2, shorter than style. Nutlet yellowish white at first but black when mature, oblong to obovoid-oblong, ca. 1/2 as long as subtending glume, plano-convex, densely punctate processse, apex mucronate. Fl. and fr. Jul–Oct.

Naturalized in moist or brackish sandy areas; below 300 m. Hong Kong, Taiwan [native to tropical Africa, Indian Ocean islands, and Madagascar].

*Kyllinga polyphylla* is also naturalized in tropical America, Asia, Australia, and Pacific islands.


短叶水蜈蚣 duan ye shui wu gong

Perennials. Rhizomes slender, long creeping, clothed with brown, membranous scales, internodes 1–2.5 cm, with 1 culm at each node. Culms serially arranged, sometimes also laxly tufted, 2–30 cm tall, compressed 3-angled, smooth, base not swollen, with 4 or 5 leaf sheaths. Leaves shorter to slightly longer than culm; sheaths brown, mouth obliquely truncate, apex acuminate, basal 2 bladeless, apical 2 or 3 with a blade; leaf blade 5–15 cm × 2–4 mm, flaccid, flat, midvein and apical margin spinulose. Involutral bracts 3, leaflike, longest erect to oblique or horizontal. Spike 1–3, globose to ovoid-globose, 5–11 × 4–10 mm, with numerous densely arranged spikelets. Spikelets narrowly oblong-ovoid to narrowly ovoid, ca. 3 × 1 mm, compressed, 1- or 2-flowered. Glumes white and rusty brown maculate or rarely straw-colored, ovate, 2.8–3 mm, keel spinulose or not, veins 2 or 3 on each side of keel, apex with a strict or recurved mucro or not mucronate. Stamens 1–3; anthers linear, ca. 0.7 mm. Style long; stigmas 2, less than 1/2 as long as style. Nutlet obovoid-oblong, 1–1.5 mm, biconvex, densely punctate. Fl. and fr. May–Oct.

Under shrubs or forests, grasslands, swamps, meadows, mountain slopes, valleys, wet places along trails, ditch margins, shallow water, river margins, wet places at seashores, paddy field margins; near sea level to 2800 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang Uigur, Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Russia (Far East), Sri Lanka, Thailand, Vietnam; tropical Africa, Atlantic Ocean islands, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

*Kyllinga brevifolia* var. *yunnanensis* E. G. Camus (Notul. Syst. (Paris) 1: 239. 1910) could not be treated here because no material was seen by the present authors.

1a. Culms 2–6 cm tall; spike 4–6 mm wide, with several to 20 or more spikelets; spikelets 1- or 2-flowered ................. 5c. var. *stellulata*

1b. Culms 5–30 cm tall; spike 4.5–10 mm wide, with numerous spikelets; spikelets 1-flowered.

2a. Keel of glumes spinulose, apex recurved mucronate; longest involucral bract erect to oblique .... 5a. var. *brevifolia*

2b. Keel of glumes not spinulose, apex without a mucro or sometimes with a strict mucro; longest involucral bract oblique to horizontal ............ 5b. var. *leiolepis*

5a. *Kyllinga brevifolia* var. *brevifolia*

短叶水蜈蚣(原变种) duan ye shui wu gong (yuan bian zhong)

*Cyperus brevifolius* (Rottboll) Endlicher ex Hasskarl.


Under shrubs or forests, grasslands, swamps, meadows, mountain slopes, valleys, wet places along trails, ditch margins, shallow water, river margins, paddy field margins; 100–2800 m. Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Heilongjiang, Henan, Hebei, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Sichuan, Taiwan, Xinjiang Uigur, Xizang, Yunnan, Zhejiang [Afghanistan, Bangladesh, Bhutan, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, Atlantic Ocean islands, Australia, Central, North, and South America, Indian Ocean islands, Madagascar, Pacific islands].

无刺鳞水蜈蚣 无 ci lin shui wu gong


Longest involucral bract oblique to horizontal. Spikelets slightly broad and turgid. Glumes not spinulose on keel, apex without a mucro or sometimes with a strict mucro. Fl. and fr. May–Oct.

Along trails, grassland slopes, river margins, shallow water, wet places at seashores, paddy field margins; near sea level to 1200 m. Anhui, Fujian, Gansu, Hebei, Henan, Hubei, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, NW Yunnan, Zhejiang [Japan, Korea, Nepal, Russia (Far East)].

Naturalized in E North America, this variety has a more northerly distribution than the others and has been treated as a species, *Kyllinga gracillima*, in some floras (e.g., Fl. N. Amer. 23: 193–194. 2002).


小星穗水蜈蚣 xiao xing sui shui wu gong

*Cyperus brevifolius* var. *stellulatus* J. V. Suringar, Cyperus, 48. 1898; *Kyllinga intermediata* R. Brown.

Culms 2–6 cm tall. Spike globose, 4–6 mm wide, with several to 20 or more spikelets. Spikelets laxly arranged, radially spreading, usually 1- or 2-flowered. Glumes not spinulose on keel. Fl. and fr. Jun–Jul.

Valleys; 1900–2700 m. NW Yunnan [S India, Indonesia, Papua New Guinea, Philippines].

*Kyllinga brevifolia* f. *pumila* (J. V. Suringar) Tang & F. T. Wang (Fl. Reipub. Popularis Sin. 11: 188. 1961; *Cyperus brevifolius* f. *pumila* J. V. Suringar, Geslacht Cyperus Mal. Archipel. 48. 1898) is similar to *K. brevifolia* var. *stellulata*, but the two taxa have not been provisionally combined here because the type of *f. pumila* has not been seen.


单穗水蜈蚣 dan sui shui wu gong


Perennials. Rhizomes long creeping. Culms distant or laxly tufted, 10–40 cm tall, slender, compressed triquetrous, base not swollen. Leaves usually shorter than culm; sheath brown or purplish brown maculate, short, basalmost bladeless; leaf blade 2.5–4.5 mm wide, flat, flaccid, margin laxly dentate. Involucral bracts 3 or 4, leaflike, much longer than inflorescence. Spike 1–3, ovoid to globose, 5–9 × 5–7 mm, with numerous spikelets. Spikelets subobovoid to narrowly ovoid-oblong, 2.5–3.5 × ca. 1.5 mm, compressed, 1-flowered. Glumes pale to straw-colored and rusty brown maculate, boat-shaped, 2.5–3.5 mm, keel wings narrow at basal part and ± broad from middle to apex, veins 3 or 4 on each side of keel, margin spinulose, apex slightly recurved mucronate. Stamens 3. Style long; stigmas 2. Nutlet brown, oblong to obovoid-oblong, ca. 1/2 as long as subtending glume, compressed plano-convex, densely punctulate, apex shortly mucronate. Fl. and fr. May–Aug. 2n = 18.

Under shrubs or forests, meadows, swamps in valleys, mountain slopes, wet places along trails, field margins, river margins, ditch margins; 100–1400 m. Guangdong, Guangxi, Hainan, Hunan, Yunnan [Bhutan, Cambodia, India, Indonesia, Japan, Kashmir, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, NE Australia, Indian Ocean islands, Madagascar, Pacific islands].

*Kyllinga nemoralis* is naturalized in tropical America.


冠鳞水蜈蚣 guan lin shui wu gong

*Cyperus metzii* (Hochstetter ex Steudel) Mattfeld & Kükenthal; *Kyllinga metzii* Hochstetter ex Steudel; *K. squamulosa* Kunth.

Annuals. Roots fibrous. Culms densely tufted, 2–20 cm tall, slender, compressed triquetrous, smooth, base not swollen. Leaves equaling or slightly shorter than culm; sheath brownish purple, basal 1 or 2 bladeless; leaf blade 2–3 mm wide, flaccid. Involucral bracts 3 or 4, leaflike, much longer than inflorescence, spreading to downward reflexed, base usually broadening. Spike 1–3, subglobose, 6–9 mm in diam., with many spikelets. Spikelets densely congested, broadly ovoid, 2.5–3 × 1.5–2 mm, compressed, 1-flowered. Glumes pale to straw-colored and sometimes rusty brown maculate, boat-shaped, 2.5–3 mm, keel green, winged, with 6–10 slightly broad teeth shaped like a cockscomb on apical ca. 2/3 of margin, and 1–3 spinelike trichomes at apex of teeth, apex with a strict mucro. Stamens 1 or 2; anthers oblong. Style of medium length; stigmas 2. Nutlet at first yellow but dark brown when mature, ellipsoid, ca. 2/3 as long as subtending glume, compressed, with dense punctate processes. Fl. and fr. Aug–Oct. 2n = 14.

Wet grasslands, forests in valleys; 2300–3000 m. SW Sichuan, Yunnan [Bhutan, India, Nepal, Pakistan, Vietnam; tropical Africa, NE Australia, Madagascar].

*Kyllinga squamulata* is naturalized in SE North America and the Caribbean.

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湖瓜草属 hu gua cao shu

Dai Lunkai (戴伦凯); Gordon C. Tucker

Herbs, annual or perennial. Leaves basal; leaf blade flat. Involucral bracts leaflike. Spikes 2–7, fascicled into a capitulum or rarely single, with many bractlets and spikelets; bractlets spirally arranged, each with a spikelet. Spikelet with 2 glumes (sometimes
absent) and a bisexual flower; rachilla very short, articulate at base, deciduous at article when mature; glumes alternate, membranous, several veined; basal glume without a flower; apical glume with a bisexual flower. Perianth bristles absent. Stamens 2. Stigmas 2. Nutlet 3-sided, biconvex, or plano-convex, included by subtending glume.

About 35 species: warm temperate and subtropical regions; four species in China.

1a. Leaf blade 2–4 mm wide; spikes (3 or)4–7-fascicled at culm apex; bractlet apex subtruncate, acuminate; nutlet biconvex......................................................................................................................................................................... 1. L. chinensis

1b. Leaf blade 1–2 mm wide; spikes 2- or 3(4)-fascicled at culm apex; bractlet apex abruptly contracted and forming a recurved micro; nutlet 3-sided to plano-convex.

2a. Bractlets blackish purple but mucro green; spikes 4–7 mm; nutlet blackish purple, narrowly ovoid ................. 4. L. tenera

2b. Bractlets greenish with reddish brown striae; spikes 2–5 mm; nutlet straw-colored, narrowly oblong.

3a. Culms 5–40 cm; nutlet 0.9–1 mm, subtended by 2 glumes .......................................................... 2. L. microcephala

3b. Culms 5–30 cm; nutlet 0.5–0.6 mm, subtended only by a squarrose bract .................................................... 3. L. squarrosa


华湖瓜草 hua hu gua cao


Perennials. Culms tufted, 10–60 cm tall, 1–1.5 mm thick, flat or compressed triquetrous, longitudinally sulcate, very laxly puberulent. Leaves basal; sheath tubular, 1.8–2.5 cm, glabrous, basal ones without a blade, apical ones with a blade; leaf blade linear, ca. 1/2 as long as culm, 2–4 mm wide, papery, margin revolute, apex acuminate. Involucral bracts 2 or 3, leaflike, slightly broad at base, not sheathing. Spikes 2- or 3(4)-fascicled, ovoid, 3–5 × ca. 3 mm, with numerous bractlets and spikelets; bractlets ob lanceolate to spatulate, ca. 2 mm, membranous, apex abruptly contracted and formed into recurved micro. Spikelets with 2 glumes and 1 bisexual flower; basal glume white, elliptic, ca. 1 mm, hyaline, 5-veined, apex obtuse; apical glume oblong, ca. 1 mm, membranous, several veined, with a bisexual flower, apex acute. Stamens 2; anthers linear-oblong, ca. 0.3 mm. Style slender, exserted from subtending glume; stigmas 3, pubescent. Nutlet straw-colored, narrowly oblong, 0.9–1 mm, slightly curved, 3-sided, densely puncticulate, shiny, apex mucronate. Fl. and fr. Jun–Oct. 2n = 26.

Water margins, wet places, swamps; 400–2100 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; Australia, Pacific islands].


毛毯细莞 mao tan xi guan


Annuals, without a rhizome. Culms 5–30 cm tall, ca. 0.7 mm thick, subterete, smooth. Leaves basal; sheath tubular, 1.5–2.5 cm, membranous, glabrous, basal ones without a blade, apical ones with a blade; leaf blade linear, 1–7 cm × 0.6–1 mm, papery, both surfaces glabrous, midvein obsolete, margin involute. Involucral bract 1, leaflike, dilated at base. Spikes 1 or 2, ovoid, 3–5 × ca. 3 mm; bractlets ob lanceolate to spatulate, ca. 2 mm, membranous, apex abruptly contracted and formed into recurved micro (i.e., squarrose). Spikelets without glumes, with 1 bisexual flower. Stamens 1 or 2; anthers ellipsoid, 0.2–0.3 mm. Style slender, exserted from subtending bract; stigmas 3. Nutlet pale yellowish brown, narrowly obovoid, 0.5–0.6 mm, 3-sided, densely puncticulate, shiny, apex mucronate.
Wastelands, shady sandy areas. Guangdong (Guangzhou), Hainan (Dongfang), Zhejiang [Cambodia, India, Indonesia (Java), Kashmir, Malaysia (Peninsular), Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam].


细秆湖瓜草 xí gàn hú guā cǎo

Lipocarpha atropurpurea Boeckeler.

Annuals, without a rhizome. Culms tufted, 10–18 cm tall, ca. 1 mm thick, compressed, longitudinally sulcate, glabrous. Leaves basal, ca. 1/3 as long as culm; sheath tubular, 1–1.5 cm; leaf blade ca. 1 mm wide, obsoletely midveined, glabrous, margin involute. Involucral bracts 2 or 3, leaflike, slender, not sheathing. spikes 2- or 3-fascicled at culm apex, rarely single, ovoid, 4–7 × ca. 2.6 mm, with many bractlets and spikelets; bractlets blackish purple, oblongate, keeled, glabrous, apex green, caudate-acuminate, and slightly recurved. Spikelets with 2 glumes and a bisexual flower; glumes oblong, ca. 1 mm, membranous, with several slightly thick veins, margin hyaline, apex acute to obtuse. Stamens 2; anthers oblong, as long as filamen. Style short, as long as stigma; stigmas 3. Nutlet blackish purple when mature, narrowly ovoid, ca. 1 mm, plano-convex to nearly 3-sided, densely blackish punctulate, apex rounded and mucronate. Fl. and fr. Oct–Dec.

Wet places at water margins; 1800–1900 m. Guangxi, Hainan, Yunnan [Vietnam; Africa].


扁穗草属 bian sui cao shu

Liang Songyun (梁松筠 Liang Song-jun); Gordon C. Tucker

Blysmopsis Oteng-Yeboah; Nomochloa P. Beauvois ex T. Lestiboudois.

Herbs, perennial. Rhizomes creeping. Culms nodose or not, 3-angled or terete, smooth or scabrous. Leaves basal or cauline, ligulate. Basalmost involucral bract leaflike, suberect; bractlets glumelike. Inflorescences spicate with few to many pseudodistichous spikelets, rarely with a lateral branch. Spikelets dark brown, with few bisexual flowers. Glumes imbricate, subdistichous. Perianth bristles 3–6, rarely absent, usually retrorsely scabrous. Stamens 3; connective apex evident beyond anthers. Style deciduous, base not thickened; stigmas 2. Nutlet stipitate, oblong, plano-convex, smooth, apex beaked.

About four species: temperate regions in N Africa, Asia, Europe, and North America; three species in China.


内蒙古扁穗草 nei meng gu bian sui cao

Schoenus rufus Hudson, Fl. Angl., ed. 2, 1: 15. 1778; *Blysmus rufus* (Hudson) Oteng-Yeboah; *Blymus exilis* (Printz) Ivan; *B. rufus* subsp. *exilis* Printz; *Scirpus rufus* (Hudson) Schrader.

Rhizomes slender. Culms 3–20 cm tall, subterete, clothed at base with brown bladeless leaf sheaths. Cauline leaves as long as or shorter than culm; leaf blade brown, narrowly linear, thickly crescentic in cross section, apex ± obtuse. Involucral bract dark reddish brown, leaflike or glumelike, many veined, apex acute. Inflorescences consisting of 4–7 spikelets arranged in a distichous spike, 0.7–1.7 cm. Spikelets oblong-ovoid, 5–6 mm, 2- or 3-flowered, apex ± obtuse. Glumes elliptic-ovate, ca. 5 mm, 2- or 3-veined, apex obtuse. Perianth bristles usually absent. Stamens 3; anthers 3–4 mm; connective apex ca. 2 mm. Stigmas 2. Nutlet yellowish, shortly stipitate, oblong-ovoid, ca. 3.5 × 1.5 mm, plano-convex, base subrounded. Fl. and fr. Jun–Sep. *2n = 40.*

Wet saline meadows, wet sandy places; 500–5000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Xinjiang [Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Uzbekistan; Europe, North America].


扁穗草 bian sui cao

*Schoenus compressus* Linnaeus, Sp. Pl. 1: 43. 1753; *Blysmopsis compressus* (Linnaeus) Oteng-Yeboah; *Nomochloa compressa* (Linnaeus) Beetle; *Scirpus compressus* (Linnaeus) Persoon.

Rhizomes 1–1.5 cm × 1.5–2 mm. Culms 9–30 cm tall, 3-angled, clothed at base with black bladeless leaf sheaths. Cauline leaves usually shorter than culm; sheath brown to rust-colored, mouth obliquely truncate, apex acuminate; ligule very short; leaf blade linear, flat, 1–3.5 mm wide, membranous. Involucral bract leaflike, slightly shorter or longer than inflorescence. Inflorescences consisting of 3–12 spikelets arranged in a simple distichous spike, oblong to obovoid, 1–2.2 × 0.4–0.9 cm. Spikelets ovoid to narrowly ovoid, 5–7 mm, 5–8-flowered. Glumes subdistichous, oblong-ovate, ca. 5 mm, membranous, 7-veined, apex obtuse. Perianth bristles 6, as long as nutlet, slightly flexuose at base, retrorsely scabrous. Stamens 3; anthers oblong, ca. 2 mm. Stigmas 2, as long as nutlet. Nutlet brown, obovoid, ca. 2 mm, plano-convex. Fl. and fr. Jul–Sep. *2n = 44, 79.*

Swampy meadows, valleys, wet places; 500–5000 m. Qinghai,
Shanxi (Lüliang Shan), Xinjiang, Xizang [Afghanistan, Bhutan, N India, Kashmir, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe].


**华扁穗草** hua bian sui cao

Rhizomes yellow, 2–7 cm × 2.5–3.5 mm, shiny, with black scales. Culms scattered, 5–60 cm tall, 0.7–4 mm thick, compressed 3-angled, clothed at base with brown to purplish brown leaf sheaths. Cauline leaves shorter than culm; ligule pale, very short; leaf blade flat, 0.5–4 mm wide, membranous, involute, margin scabrous, apex acuminate. Inflorescences consisting of 3–10 or more spikelets, densely arranged in a distichous or subdistichous spike; basal 1 or several spikelets usually remote, 1.5–3 × 0.6–1.1 cm. Spikelets narrowly ovoid, ovoid, or long ellipsoid, 5–7 mm, 2–9-flowered. Glumes rust-colored brown, subdistichous, long ovate, narrowly ovoid, ovoid, or long ellipsoid, 5–7 mm, 2–9-flowered. Flowers bisexual, subtended by penultimate large glume enclosed by wings of next glume; rachilla internodes short, ± elongated between flowers. Perianth bristles absent. Stamens 3. Style deeply 3-cleft, deciduous, basally distinctly thickened. Nutlet obovoid, 3-sided, ± 3-ribbed, smooth to slightly tuberculate.


Rhizomes creeping. Culms 12–50 cm tall, slender. Leaves

1a. Culms 0.7–1 mm thick; leaf blade 0.5–0.8 mm wide .......................................... 3c. var. *tenuifolia*


**细叶扁穗草** xi ye bian sui cao

Culms slender, 0.7–1 mm thick. Leaf blade finely linear, 0.5–0.8 mm wide. Fl. and fr. Aug.

- Slopes; ca. 2200 m. S Gansu (Minxian), Shanxi, W Sichuan.


**星穗莎属** xing sui shu

Perennials, shortly rhizomatous or stoloniferous. Culms scapose, tufted. Leaves ligulate; leaf blade very short or absent. Involucral bracts small. Inflorescences capitate with 2 to many spikelets. Spikelets with 4–7 distichous deciduous glumes of increasing length, 1(or 2)-flowered. Flowers bisexual, subtended by penultimate large glume enclosed by wings of next glume; rachilla internodes short, ± elongated between flowers. Perianth bristles absent. Stamens 3. Style deeply 3-cleft, deciduous, basally distinctly thickened. Nutlet obovoid, 3-sided, ± 3-ribbed, smooth to slightly tuberculate.

Four species: Africa, S and SE Asia, Australia, Indian Ocean islands, Madagascar, Pacific islands (New Caledonia); two species in China.

1a. Spikelets 3–7(–12), ovoid to narrowly ovoid; glumes reddish brown, thickly papery, apical half hairy; leaves with a blade ................................................................. 1. *A. yunnanensis*

1b. Spikelets 1 or 2(–6), narrowly ovoid; glumes brown, membranous, glabrous; leaves reduced to a bladeless sheath ................................................................. 2. *A. thouarsii*


**云南星穗莎** yun nan xing sui suo


Rhizomes creeping. Culms 12–50 cm tall, slender. Leaves

1b. Culms 1–4 mm thick; leaf blade 1.5–4 mm wide.

2a. Culms 5–20 cm tall, 1–1.2 mm thick; leaf blade 1.5–2.5 mm wide .............................................. 3a. var. *sinocompressus*

2b. Culms 26–60 cm tall, 3–4 mm thick; leaf blade 3–4 mm wide ........... 3b. var. *nodosus*
ate, basally inflated; stigmas 3. Nutlet white, obovoid, 1/3–1/2 as long as subtending glume, obtuse 3-sided, reticulation not prominent. Fl. and fr. Jun.

Mountain slopes; 1200–1300 m. Yunnan [N India, Thailand, Vietnam].

D. A. Simpson and T. Koyama (Fl. Thailand 6(4): 342. 1998) treated this as *Fimbristyris yunnanensis* but noted that its placement was uncertain.


R. chinensis


Actinoschoenus chinensis


4a. Perianth bristles absent; persistent style base saddle-shaped, much depressed and much broader than high; nutlet 1.3–1.5 mm, coarsely transversely wrinkled; leaf blade setaceous .......................... 6. *R. gracillima*

4b. Perianth bristles present; persistent style base compressed conic to almost subulate; nutlet 2–4 mm; leaf blade flat or canaliculate, not setaceous.

5a. Leaf blade 9–17 mm wide; nutlet 3–4 mm, deeply channelled; style hardly divided .................................. 1. *R. corymbosa*

5b. Leaf blade 0.5–4 mm wide, nutlet ca. 2 mm, not channelled; style 2-cleft.


6b. Perianth bristles less than 6, antorsely or retrorsely scabrous.

7a. Leaf blade 0.5–1 mm wide; perianth bristles retrorsely scabrous ............................................. 3. *R. faberi*

7b. Leaf blade 1.5–3 mm wide; perianth bristles antorsely scabrous.

8a. Spikelets 3–4.5 mm; perianth bristles shorter than nutlet and persistent style base ............... 4. *R. rugosa*

8b. Spikelets 7–9 mm; perianth bristles longer than nutlet and persistent style base ................. 5. *R. chinensis*


R. malasica

Perennials. Rhizomes short. Culms erect, 60–140 cm tall, stout, 3-angled, with several nodes, smooth or scaberulose on angles. Leaves basal and cauleine; sheath semiroounded, 2–6 cm, membranous, ligulate at mouth; leaf blade broadly linear, 30–60 × 0.9–1.7 cm, flat, herbaceous to thinly leathery, margin and abaxial midvein scabrous, apex long acuminate. Involucral
bracts 3–5, leaflike, shorter than inflorescence, base sheathing. Inflorescence a large compound panicule consisting of 2–5 distant corymbiform anthelae, 20–50 cm; anthelae compound, to 15 cm in diam., ± dense, diffuse, many branched; bractlets setaceous. Spikelets many, in clusters of 2–5, erect or obliquely patent, narrowly ovoid to fusiform, 7–10 mm; basal flower bisexual; apical 1 or 2 flowers male. Glumes 7 or 8, ovate to ovate-lanceolate, basal 4 and apicalmost empty. Perianth bristles 6, as long as nutlet, retrorsely scabrous. Stamens 3; filaments shorter than nutlet and style base; anthers linear; connective subulate. Style ca. 1.7 cm, base dilated; stigmas 2. Nutlet brown, oblong-obovoid to obovoid, 3–4 mm, compressed, finely transversely wrinkled in middle part, coarsely undulate rugose toward margin; persistent style base long conic, ca. 5.5 mm, ± as broad as nutlet, compressed, conspicuously grooved on both sides, smooth or asperous. Fl. and fr. Mar–Dec. 2n = 18.

Moist stream margins along valleys; 100–900 m. Guangdong, Guangxi, Hainan, Hunan, Taiwan, Yunnan [Bangladesh, India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Central and South America, Indian Ocean islands, Madagascar, Pacific islands].


白鳞刺子莞 bai lin ci zi guan

Schoenus albus Linnaeus, Sp. Pl. 1: 44. 1753.

Perennials. Rhizomes short, slender. Culms tufted, erect, 15–42(–50) cm tall, 0.5–0.8 mm thick, apically slightly scabrous. Leaves shorter than culm; sheath straw-colored brown, basal ones with a blade or bladeless; leaf blade filiform, 0.7–2 mm wide, papery, margin involute. Involucral bracts leaflike, basal ones with a sheath, apical ones sheathless. Inflorescences paniculate, consisting of terminal and lateral subcapitate anthelae. Spikelets fascicled in a group of 2–7, sessile or shortly pedunculate, narrowly ovoid, 5–6 mm, 2-flowered. Glumes 5 or 6, at first white turning pale brown, ovate to ovate-lanceolate, membranous, keeled, apex mucronate. Perianth bristles 9–13, longer than nutlet, retrorsely scabrous, base sparingly hispid. Stamens 2; filaments as long as nutlet and style base; anthers linear. Style filiform, base dilated; stigmas 2, almost as long as style. Nutlet yellowish green to greenish brown, obvoid to oblong-obovoid, 1.5–2.5 mm, biconvex, ± smooth to obscurely wrinkled; persistent style base conic-subulate, 1/2–2/3 as long as nutlet. Fl. and fr. Aug. 2n = 26.

Swamps, wet places; ca. 900 m. Jilin, Taiwan [Japan, Kazakhstan, Korea, Russia; SW Asia, Caribbean (Puerto Rico), Europe, North America].


细叶刺子莞 xi ye ci zi guan

Perennials. Rhizomes very short, with dense and slender fibrous roots. Culms tufted, erect, 20–40(–60) cm tall, 0.5–1 mm thick, 3-angled, basally clothed with pale yellowish bladeless sheaths, apically sometimes slightly scabrous. Leaves basal and a few cauline, shorter than culm; leaf blade filiform, 0.5–1 mm wide, 3-angled, sometimes slightly scabrous, apex finely acuminate. Involucral bracts leaflike or setaceous, sheathing. Inflorescences paniculate, consisting of a terminal and 3 or 4 lateral corymbiform anthelae; anthelae small, very distant, with 2–5 spikelets. Spikelets erect, dark brown, narrowly ovoid, ca. 3.5 mm, base subtruncate, apex acuminate. Glumes 5 or 6, ovate to elliptic-ovate, 1- or 2-flowered; basal 3 or 4 glumes narrowly ovate, empty. Perianth bristles 6, slightly longer than nutlet, retrorsely scabrous. Stamens 1; filament as long as nutlet and style base. Style slender; stigmas 2. Nutlet brown to pale reddish brown, broadly obovoid to obovoid-globose, 1.5–2 mm, biconvex, finely transversely wrinkled with longitudinally oblong epidermal cells; persistent style base narrowly conic, 1/3–2/3 as long as nutlet. Fl. and fr. Aug–Oct.

Swamps, stream margins; ca. 400 m. Fujian, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi, Shandong, Zhejiang [Japan, Korea, Russia (Far East)].


白喙刺子莞 bai hui ci zi guan

Rhynchospora brownii Roemer & Schultes, Syst. Veg. 2: 86. 1817; R. glauca Vahl var. condensata Kükenthal; R. rugosa var. condensata (Kükenthal) T. Koyama.

Perennials. Rhizomes very short. Culms tufted, erect, 30–55(–90) cm tall, slender, 3-angled, smooth but apically usually scabrous. Leaves basal and a few cauline and distant, shorter than culm; sheath brown, closed, 2.6–6 cm, glabrous, with very short ligule at mouth; leaf blade narrowly linear, 1.5–3 mm wide, flat or canaliculate, margin and abaxial midvein scabrous, apex long acuminate. Involucral bracts leaflike, basal ones sheathing, apically almost sheathless. Inflorescences paniculate, narrow, consisting of 3 or 4 dense to ± lax corymbiform anthelae; lateral peduncles solitary or 2 together, compressed, often long exserted from sheaths; rays very unequal, erect; raylets setaceous. Spikelets dark brown, ellipsoid to subovoid, 3–4.5 mm, 3- or 4-flowered, base ± obtuse, apex acute. Glumes 7 or 8, elliptic-ovate, ovate, or broadly ovate; basal 3 or 4 glumes empty. Perianth bristles 6, slightly shorter than nutlet, unequal, retrorsely scabrous. Stamens (1–)3; filaments longer than nutlet and style base. Ovary obovoid; style filiform; stigmas 2, as long as style. Nutlet pale rust-colored, broadly ellipsoid-obovoid, ca. 1.7 mm, biconvex, finely transversely wrinkled with longitudinally oblong epidermal cell; persistent style base broadly conic, shorter than nutlet. Fl. and fr. Jun–Oct. 2n = 36.

Swamps, moist river margins; 1000–2400 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Europe, Indian Ocean islands, Madagascar, Pacific islands].

Rhynchospora rugosa subsp. rugosa occurs in tropical America and South America.


华刺子莞 hua ci zi guan
Rhynchospora glauca Vahl. var. chinensis (Nees & Meyen ex Nees) C. B. Clarke; R. japonica Makino; R. longisetigera Hayata.

Perennials. Rhizomes very short. Culms tufted, erect, 25–60(–125) cm tall, slender, 3-angled, rigid, basally clothed with 1 or 2 bladeless sheaths, apically scabrous. Leaves basal and cauline, shorter than inflorescence; sheath 5–9 cm; ligule rust-colored brown, short, membranous; leaf blade narrowly linear, 1.5–2.5 mm wide, margin scabrous, apex acuminate. Involutrular bracts leaflike, longer than inflorescence, basal ones sheathing, apicallmost one shortly sheathing or sheathless. Inflorescences paniculate, consisting of 3–5 corymbiform antheticae, mostly binate, suberect; peduncle exerted, sublyaxly bearing 2–9 clusters of spikelets. Spikelets brown, narrowly ovoid, 7–8 mm, 2–5-flowered, base ± obtuse, apex acute. Glumes 5–8, brown to yellowish brown, elliptic-ovate to lanceolate-elliptic; basal 2 or 3 glumes empty; apical glumes broadly ovate to lanceolate-elliptic, membranous, 1-costate, apex mucronate to acuminate. Perianth bristles 6, antrorsely scabrous. Stamens 3; filaments slightly longer than nutlet and style base; anthers linear. Style ca. 2.3 mm, base much narrower than style. Nutlet dark reddish brown, broadly ellipsoid-oblanceolate, conic-subulate, 4–5 mm, glabrous. Fl. and fr. Sep.–Oct.

Swamps, moist places, wet grasslands; 100–1400 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hebei, Jiangsu, Jiangxi, Shandong [Japan, Myanmar, Sri Lanka, Thailand; Indian Ocean islands, Madagascar].


柔弱刺子莞 ruo rou ci guan

Rhynchospora kamphoeveneri Boeckeler.

Annuals or short-lived perennials. Culms densely tufted, 20–60 cm tall, filiform, 3-angled, smooth. Leaves shorter than culm; leaf blade setaceous, 0.5–1 mm wide, canaliculate, apex scabrous. Involutrular bracts setaceous, sheathing. Inflorescences laxly paniculate, consisting of 1–3 corymbiform antheticae to 4 cm; terminal anthea longer than lateral ones, simple or subcompound; lateral anthea simple, with peduncles exerted from sheaths; rays capitillary, 2–4 cm, often upcurved, smooth, subtended by setaceous bractlets. Spikelets solitary, narrowly ovoid, 3–4-flowered, apex acute; peduncle long. Glumes 7 or 8, pale rust-colored with purplish lines, spirally imbricate, broadly ovate, membranous, mutlicus. Perianth bristles absent. Stamens 2; anthers 1.5–2.3 mm. Style ca. 2.3 mm, base much depressed, saddle-shaped, 2-lobed, and almost as broad as nutlet, apex 2-cleft to middle. Nutlet grayish white, shortly stipitate, broadly obvoid, 1.3–1.5 × 1.3–1.5 mm, biconvex, deeply transversely wavy ridged, with longitudinally linear epidermal cells, apex truncate. Fl. and fr. Sep.–Oct.

Moist places, grassy slopes, forests; 900–1000 m. Fujian, Hong Kong [India, Indonesia, Papua New Guinea, Sri Lanka, Thailand; tropical Africa, NE Australia, Indian Ocean islands, Madagascar].

No specimens of Rhynchospora gracillima from China have been seen by the present authors. The plants from China would be R. gracillima subsp. gracillima; another subspecies occurs in tropical Africa and Madagascar.


日本刺子莞 ri ben ci guan

Rhynchospora nipponica Makino.

Perennials. Rhizomes short, creeping. Culms erect, simple, 60–100 cm tall, rigid, with several nodes, smooth, basally obtusely 3-angled and clothed with dusky brown bladeless sheaths, apically acutely 3-angled. Leaves longer than culm; sheath elongated, tightly surrounding culm; ligule rust-colored brown, short, membranous; leaf blade broadly linear, 5–9 mm wide, flattish, apex long acuminate to acute. Involutrular bracts spreading, 7–20 cm, much longer than inflorescence, sheathless. Inflorescences spicate, 3–20 cm, with 2–7 heads, basally interrupted, apically subcontiguous; heads sessile, globose, 1–1.5 cm in diam. Spikelets narrowly ovoid, 6–7 mm, weakly laterally compressed, 1-flowered, base contracted, apex acuminate. Glumes 5 or 6; basal 3 or 4 grayish brown, ovate, much smaller than others, membranous, 1-veined, apex acute; apical 2 glumes lanceolate-ovate. Perianth bristles 6, filiform, 3.5–4.5 mm, ca. 2 × as long as nutlet, flexuose, smooth. Stamens 3; anthers ca. 2 mm. Style slender; stigmas 2. Nutlet dark brown, obvoid to broadly obvoid, 2.3–2.5 mm, biconvex, indistinctly transversely wrinkled, shiny, base attenuate; persistent style base narrowly conic-subulate, 4–5 mm, glabrous. Fl. and fr. Sep.–Oct.

Swamps, rarely in shallow water. Guangdong, Taiwan [Indonesia, Japan, Korea, Malaysia].


刺子莞 ci guan

Schoenus ruber Loureiro, Fl. Cochinch. 1: 41. 1790; Morisia wallichii Nees; Rhynchospora wallichii (Nees) Kunth.

Annuals or short-lived perennials. Rhizome short. Culms tufted, 30–65 cm tall, 0.8–2 mm thick, terete, smooth. Leaves shorter than culm; sheath brownish straw-colored, 1–7 cm; leaf blade narrowly linear, 1.5–3.5 mm wide, papery, slightly scabrous, apex acuminate. Involutrular bracts 4–10, stiffly spreading, leaflike, 1.5–(8.5) cm, longer than inflorescence, unequal, densely ciliate at dilated base, sheathless. Inflorescence a single terminal head, brown to orangish brown, globose, 1–1.8 cm in diam., with many spikelets. Spikelets narrowly ovoid, 6–8 mm, shiny, 2.4–4-flowered. Glumes 7 or 8, brown, ovate-lanceolate to elliptic-ovate, thinly papery, keeled, vein 1, apex obtuse to acute; basal glumes each with a female flower; apical 1 or 2 glumes each with a male flower. Perianth bristles 4–6, unequal, 1/3–1/2 as long as nutlet, antrorsely scabrous. Stamens 2 or 3; filaments shorter to longer than subtending glume; anthers linear; connective evident. Style filiform; stigmas 2 or sometimes undivided, very short. Nutlet brown when mature, obvoid, 1.5–1.8 mm, biconvex, edges subacute with apical half hispid-serrulate, sides sparsely hispid-scarious mainly on apical half, obscurely spotted with minute isodia-
metric epidermal cells; persistent style base conic, 1/5–1/4 as long as nutlet, base abruptly widened. Fl. and fr. May–Nov.

Road margins, grassy slopes, wet places; 100–1400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Taiwan, S Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Laos, Malaysia, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Indian Ocean islands, Madagascar, Pacific islands].

Plants from China would be *Rhynchospora rubra* subsp. *rubra*; other subspecies occur in Africa and Madagascar.


**刺子莞**

*Rhynchospora submarginata* C. B. Clarke (1908), not (Liebmann) Steudel (1855).

Annuals. Roots fibrous. Culms tufted, erect, 10–60 cm tall, slender, 3-angled, smooth. Leaves basal and 1 or 2 cauline in lower 1/3 of culm, 1/4–3/4 as long as culm; leaf blade linear, 2–2.5 mm wide, glabrous or pubescent, margin slightly involu- lute, apex acuminate. Involucral bracts 3–6, leaflike, to 15 cm, base dilated and densely ciliate, apically slightly involute, sheathless, apex acuminate. Inflorescence a single terminal head, 1.2–2 cm in diam. Spikelets narrowly ovoid, 5–6 mm, shiny, 2-flowered. Glumes 6 or 7, rust-colored, ovate-lanceolate to elliptic-lanceolate; basal 3 or 4 empty, ± smaller; middle glumes ca. 4 mm, each with 1 female flower; apical 2 or 3 glumes each with a male flower. Perianth bristles 6, longer than nutlet and style base, antorse scabrous. Stamens 2 or 3; anthers linear, ca. 2 mm; connective slightly evident, reddish, pubescent. Nutlet blackish, linear-oblong, ca. 3.5 mm, sub-biconvex, whitish setulose to almost glabrous; persistent style base pale brown, ca. 1/2 as long as nutlet. Fl. and fr. Jun–Oct.

Sandy grasslands, paddy fields. Hainan [India, Indonesia, Malaysia, Papua New Guinea, Thailand, Vietnam; N Australia].


赤箭莎属 *chi jian suo shu*

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

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

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

1a. Inflorescences lax; spikelets ca. 2 cm; peduncle 10–15 cm
1b. Inflorescences dense; spikelets less than 1 cm; peduncle much shorter or inflorescences sessile.

2a. Culms densely tufted; perianth bristles absent
2b. Culms laxly tufted; perianth bristles 1–6.

3a. Culms 60–100 cm tall; leaf blade 1–5 mm wide; spikelets 7–14 × ca. 2.5 mm
3b. Culms 20–40 cm tall; leaf blade ca. 0.5 mm wide; spikelets 4–6 × ca. 1 mm


长穗赤箭莎 *chang sui chi jian suo*

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

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

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

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

赤箭莎 *chi jian suo*

*Schюсьnus sinensis* Handel-Mazzetti.

Perennials. Rhizomes short. Culms tufted, 60–100 cm tall, 2–5 mm thick, subterete, smooth. Leaves basal and cauline.
Basal leaves with sheath dark purple to dark reddish purple, 3–4 cm; leaf blade linear, 1–5 mm wide, margin scabrous. Cauline leaves 1–3, remote, rather short; sheath reddish brown, mouth oblique. Inflorescences paniculate; scape brown to reddish brown; basalmost bract with blade subequaling inflorescence. Inflorescence a narrow lax panicle; branches 2–4-nate, occasionally single. Spikelets brown, narrowly ovoid, ca. 2.5 mm × 0.8 mm, erect, slightly flattened, shortly pedunculate, 3–8-flowered. Glumes brown with a pale margin, distichous, ovate-lanceolate to ovate, 5–7 mm, papery, glabrous except for scabrous keel, keel yellowish green, apex acute; basal 2 or 3 glumes sterile and smaller. Perianth bristles (0 or) 1–3, ferruginous, antrorsely scabrous. Stigmas 3; filaments slender; anthers linear, ca. 3 mm, caducous; connective apex appendage white, to 0.5 mm. Style 3–4 mm; stigmas 3, much shorter than style. Nutlet rusty brown, obovoid, 1–1.5 mm, 3-sided, reticulate, apex his-}


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


3. Schoenus apogon 矮赤箭属 ai chi jian suo

Annuals or short-lived perennials, slender. Roots fibrous. Culms tufted, 20–40 cm tall, 0.5–1 mm thick, mostly 2-nodose, smooth. Leaves basal and cauline. Cauline leaves 2, shorter than culm; sheath reddish purple, 1–2 cm; leaf blade capillary, ca. 0.5 mm wide. Inflorescences paniculate; spikelets 7–9 mm, compressed, usually 2 or 3 more clustered, ± pedunculate, 3- or 4-flowered. Glumes brownish red, lanceolate to ovate, keel abaxially yellowish green, margin pale, apex mucronate in basal glume and obtuse in apical glumes; basal 2 or 3 glumes empty, apical ones with 3 or 4 bisexual flowers. Perianth bristles absent. Stamens 3; anthers linear, decidual. Style slender; stigmas 3, subulate. Nutlet brownish, broadly ovoid to ovoid-oblong, 1–1.3 mm, 3-sided, reticulate, apex sparsely pubescent or glabrous. Fl. and fr. Jul.

3. Schoenus apogon

About 30 species: S and SE Asia; three species in China.

1a. Inflorescences spike-like, dense; spikelets 7–10 mm .............................................................................................................................. 1. G. tristis
1b. Inflorescences panicle-like, lax; spikelets 4–5 mm.

2a. Spikelets usually 1-flowered; filaments elongating markedly after anthesis, persistent on nutlet and entangled in glumes thereby suspending fruit. Stigmas 3 or 4. Nutlet ovoid, ellipsoid, obovoid-fusiform, or globose, terete or 3-sided; endocarp blackish, thick, bony.

2b. Spikelets usually 2-flowered; filaments scarcely elongate after anthesis, sticky tips in bisexual flowers cohering with tips of basal male flower .............................................................................................................................. 3. G. baniensis

hei suo cao

Roots stout, rigid. Rhizomes short, woody. Culms 0.5–1.5 m tall, robust, hollow, noded. Leaves basal and cauline; sheath brown to reddish brown, 10–20 cm; leaf blade 0.4–1.8 m × 0.7–1.2 cm, papery to leathery, margin scabrous, apex acuminatus. Inflorescence a contracted panicle, spikelike, 14–40 × 2–3 cm, bearing 7–20 fascicles of partial panicles; partial panicles ovoid to ellipsoid, 2–5 cm; peduncles short, rigid, enclosed by inflorescence bract sheath. Spikelets numerous, densely congested, fusiform, 8–10 mm, 1-flowered. Glumes 8–10, initially yellowish brown but maturing to dark brown; basal 4–6 glumes ovate-lanceolate, papery, rigid, 1–veined, apex acuminate; apical 2 or 3 glumes broadly ovate, much shorter, margin apically ciliate, apex emarginate to rounded; apicalmost glume bearing a bisexual flower. Perianth bristles absent. Stamens 3. Stigmas 3; filaments strongly elongate after anthesis; filament tips enrolled by apex of glumes. Stigmas 3. Nutlet yellowish brown with a black apex, narrowly elliptic, ca. 3.8 mm, 3-sided, smooth, shiny. Fl. and fr. Apr–Oct.

Mossy forests, thickets in dry alpine grasslands. Yunnan [Indonesia, Malaysia, Papua New Guinea, Philippines, Vietnam; Pacific islands].

2. **Gahnia javanica** Zollinger & Moritzi in Moritzi, Syst. Verz. 98. 1846.

zhua wa hei suo cao

**Gahnia castanea** Ridley; **G javanica** f. **sinensis** Benl.

Culms 75–120 cm tall, robust, terete, solid, noded. Leaf sheath 10–15 cm; leaf blade usually longer than inflorescence, 8–15 cm wide, papery to leathery, margin scabrous. Inflorescence a panicle, spreading and lax, consisting of a terminal and several lateral panicles. Spikelets blackish, in clusters of 2 or 3 or solitary, oblong, 4–5 mm, 2-flowered. Glumes 7 or 8, blackish brown, rigid; basal or 6 glumes ovate to ovate-elliptic, 2–3 mm, keeled, empty, apex mucronate; apical 2 glumes broader, bearing a bisexual flower and next a functionally male flower, margin ciliate, apex obtuse. Perianth bristles absent. Stamens (2 or)3; filaments scarcely elongate after anthesis, sticky tips of filaments of bisexual flower cohering with tips of basal male flower. Stigmas 3. Nutlet reddish brown, ellipsoid, ca. 3 mm, 3-sided, smooth, shiny. Fl. and fr. Aug–Sep.

Moist hills and slopes; 800–1500 m. Fujian, Guangdong, Guangxi, Hainan [Indonesia, Japan, Malaysia (Peninsular), Vietnam; Australia].


ke la suo shu


ke la suo

**Cladium chinense** Nees in Hooker & Arnott, Bot. Beechey Voy. 228. 1837; **C. mariscus** (Linnaeus) Pohl subsp. **chinense** (Nees) Govaerts.

Herbs, clump-forming. Rhizomes short, creeping. Culms solitary, 1–2.5 m tall, terete at base, many noded. Leaves cauli-line; ligule absent; leaf blade broadly linear, 60–80 cm × 8–10 mm, V-shaped in cross section, thickly leathery, gradually tapering apically to a 3-angled caudate apex, margin and abaxial midvein strongly antorsely scabrous. Inflorescences with 5–8 terminal...
and lateral anheliae; peduncles compressed; bractlets glumelike, narrowly ovate to lanceolate, papery, veins brown, apex caudate to acuminate. Spikelets in 4–12 rusty brown globose heads, ovoid to broadly so, ca. 3 × 4–7 mm. Glumes 6–8, ovate to broadly ovate, apex obtuse to acute; basal 4 glumes empty, apical 2 fertile. Distal flower bisexual, basal flower functionally male. Anthers ca. 2 mm. Style slender; stigmas 3, as long as
style, pubescent. Nutlet brown, oblong-ovoid, ca. 2.5 mm, base rounded, apex obscurely beaked. Fl. and fr. May.

Wet places, swamps; ca. 2200 m. Guangdong, Guangxi, Hainan, Taiwan, E Xizang, Yunnan [India, Japan, Korea, Nepal, Vietnam; Pacific islands].

Cladium jamaicense subsp. jamaicense occurs in tropical America.


剑叶莎属 jian ye suo shu
Liang Songyun (梁松筠 Liang Song-jun); Jeremy J. Bruhl, Karen L. Wilson

Baumea Gaudichaud.

Herbs, perennial, often with long scaly rhizomes. Culms tufted, erect, flattened, angular, or terete, usually smooth, rarely rough. Leaves distichous; basal sheaths brown to purplish; ligule absent; leaf blade unifacial, compressed or terete, sometimes reduced to a sheath. Involucral bracts sheathing and with a short blade. Inflorescences paniculate, consisting of few to several partial panicles, main axis often sinuous. Spikelets often clustered, rarely solitary, ovoid to narrowly ovoid, compressed. Glumes distichous, basal 1 or 2 flowers bisexual, apical flower(s) male. Perianth bristles absent. Stamens 3. Style base distinctly thickened, conic or pyramidal, persistent; stigmas 3. Nutlet stipitate or sessile, ovoid, oblong, or oblong-ellipsoid, ± terete or 3-sided, smooth or rugulose, apex beaked.

About 50 species; mostly tropical and temperate regions, especially Australia; three species (two endemic) in China.

1a. Culms terete .......................................................... 3. M. rubiginosa
1b. Culms flattened.

2a. Leaf blade ca. 1.5 m, margin smooth; spikelets ca. 5 mm ................................................. 1. M. myriantha
2b. Leaf blade ca. 0.5 m, margin scabrous; spikelets 10–12 mm .............................................. 2. M. ensigera


多花剑叶莎 duo hua jian ye suo


Rhizomes short, stout. Culms to 2 m tall, 6–8 mm thick, flattened, several nodeose. Leaves basal; leaf blade ensiform, ca. 1.5 m × 1.8–2.2 cm, smooth, margin entire, apically gradually narrowed. Inflorescences paniculate, consisting of a terminal and several lateral branches, 20–60 cm. Spikelets 2–4 clustered, oblong-ovoid, 4–5 cm, 2–4-flowered; basal 1 or 2 spikelets bearing nutlet. Glumes 5 or 6, brown, ovoid to oblong, basal-most ca. 4 mm, pubescent, margins hyaline and ciliolate, apex obtuse. Perianth bristles 4–6, brown, shorter than style. Stamens 3; anthers oblong, 3.5–4 mm; connective apex apiculate. Style ca. 4 mm, persistent, with white hairs, base thickened; stigmas 3. Nutlet brown, obovoid, ca. 1 mm, acutely 3-sided, glabrous, apex beaked. Fl. and fr. Aug–Sep.

● Riversides, forests, ditch sides; 900–2800 m. Hainan.


剑叶莎 yuan ye jian ye suo

Cladium ensigerum Hance, J. Bot. 23: 80. 1885.

Rhizomes horizontal, 4.5–6.8 mm thick. Culms flattened. Leaves basal; leaf blade ensiform, 3.8–50 × 0.7–2.5 cm, rigid, many veined, margin purple, finely scabrous, and denticulate. Inflorescences paniculate, narrow, usually 3-branched. Spikelets purple, ca. 11.3 × 3.5 mm, 2- or 3-flowered. Glumes ovate-lan-

About 50 species: mostly tropical and temperate regions, especially Australia; three species (two endemic) in China.

鳞籽莎属 lin zi suo shu

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

Herbs, perennial. Rhizomes short, woody. Culms tufted, erect, terete or flattened. Leaves basal, distichous, usually equitant; leaf blade terete or flattened, similar to culm, sheathing. Inflorescences paniculate. Spikelets narrowly ovoid-oblong. Flowers usually (1 or 2) or (3–5), proximal one usually functionally male, distal one bisexual. Glumes 3–8, seemingly spirally arranged, mostly distally scaberulose, basal ones empty. Perianth scales [3 or]6, shorter than nutlet, fleshy. Stamens 3; connective apex apiculate. Style slender, base persistent. Nutlet oblong or oblong-ellipsoid, ± terete, usually smooth and shiny.

About 100 or more species: mostly Australia including many undescribed species, SE Asia, Pacific islands (New Zealand); one species in China.


鳞籽莎 lin zi suo

Rhizomes creeping. Culms tufted, erect, 45–90 cm tall, terete to obscurely angular, stiff. Leaves basal; sheath purplish black to blood-red, 3–8 cm, margins membranous; ligule present; leaf blade shorter than culm, 2–3 mm thick, terete, stiff, smooth, glabrous. Involucral bracts spathe-like, sheathing, glabrous. Inflorescences paniculate, 3–10 cm. Spikelets densely clustered, fusiform-oblong, 6–8 mm, 1- or 2-flowered. Glumes lanceolate, 4–6.5 mm, scabrous, apex obtuse and mucronate; basal 2 glumes empty, apical 2 with bisexual flowers. Perianth scales 6, whitish, very short, connate at base. Stamens 3; connective apex apiculate. Stigmas 3. Nutlet brownish yellow, ovoid to ellipsoid, 2.5–4 mm, terete, smooth, shiny. Fl. and fr. Jul–Dec.

Hillsides, wet places, riversides, sparse forests along valleys; 800–1500 m. Fujian, Guangdong, E Guangxi, Hainan, S Hunan, S Zhejiang [Indonesia, Malaysia, Papua New Guinea, Vietnam].


三肋果莎属 san lei guo suo shu

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

Herbs, perennial. Rhizomes short. Culms tufted, erect, 45–90 cm tall, terete to obscurely angular, stiff. Leaves basal; sheath purplish black to blood-red, 3–8 cm, margins membranous; ligule present; leaf blade shorter than culm, 2–3 mm thick, terete, stiff, smooth, glabrous. Involucral bracts spathe-like, sheathing, glabrous. Inflorescences paniculate, 3–10 cm. Spikelets densely clustered, fusiform-oblong, 6–8 mm, 1- or 2-flowered. Glumes lanceolate, 4–6.5 mm, scabrous, apex obtuse and mucronate; basal 2 glumes empty, apical 2 with bisexual flowers. Perianth scales 6, whitish, very short, connate at base. Stamens 3; connective apex apiculate. Stigmas 3. Nutlet brownish yellow, ovoid to ellipsoid, 2.5–4 mm, terete, smooth, shiny. Fl. and fr. Jul–Dec.

Hillsides, wet places, riversides, sparse forests along valleys; 800–1500 m. Fujian, Guangdong, E Guangxi, Hainan, S Hunan, S Zhejiang [Indonesia, Malaysia, Papua New Guinea, Vietnam].


三肋果莎 san lei guo suo


Herbs, tussock-forming. Roots thick. Culms 30–90 cm tall, 1–2 mm thick, rigid, obtusely 3-angled, sulcate-striate, smooth. Leaves basal, shorter than to as long as culm; leaf blade 1–3 mm wide, rigid, margin involute and scabrous. Inflorescences paniculate, branched, diffuse to dense, consisting of 4 or 5 fascicles; branches 2 or 3 together, unequal, ± exerted from sheath, compressed, rigid, flexuose, scabrous. Spikelets almost sessile, in clusters of 2–8, 1-flowered. Glumes 4, oblong-lanceolate, apex acute; basal 2 glumes ca. 2 mm, apical ones 4–5 mm. Perianth scales 6, lanceolate to linear-lanceolate, densely covered with white antorse short hairs. Stamens 3; anthers ca. 2 mm; connective apex 3-sided, oblong. Nutlet chestnut-brown to blackish, obtusely 3-sided, slightly reticulate-rugulose, with 3 whitish ribs, apex hispidulous.

Watersides near seacoast; near sea level. Hainan (Wenchang) [India, Indonesia, Malaysia, Papua New Guinea, Sri Lanka, Thailand, Vietnam; N Australia].


珍珠茅属 zhen zhu mao shu

Zhang Shuren (张树仁); Gordon C. Tucker, David A. Simpson

Herbs, perennial or annual, rhizomatous or not; stolons sometimes present. Culms erect, 3-angled or rarely terete. Leaves cauleine or both basal and cauline; sheaths at middle part of culm, winged or not, apex sometimes with contraligule opposite blade; leaf blade linear, scabrid, sheathing, usually prominently 3-veined. Involucral bracts leaflike and sheathing, setaceous, or glumelike; bractlets usually setaceous, rarely glumelike. Inflorescences terminal, paniculate, usually stout and elongated, sometimes reduced into a discontinuous spike. Unisexual spikelets usually dominant on inflorescence, rarely bisexual ones dominant; basal 2–4 glumes
of spikelets empty. Male spikelets with several flowers. Female spikelets with a single flower. Bisexual spikelets with a basal female flower and several male flowers. Flowers unisexual. Male flowers: stamens 1–3; anthers linear or linear-oblong; connective apex often protruding and subulate. Female flowers: style base not inflated; stigmas 3. Nutlet brick red, white, or yellowish purple, spherical or ovoid, often obtusely 3-sided, smooth or variously sculptured, mostly shiny, glabrous or hairy (hairs simple or stellate), usually borne on a gynophore apically dilated into a ± 3-lobed disk.

About 200 species: pantropical and extending into temperate regions in S Africa, E Asia, and North and South America; 24 species (three endemic) in China.

Note: nutlets and underground parts are essential for accurate identification.

1a. Bisexual spikelets dominant on inflorescences; disk subtending nutlet either stipelike or indistinct.
1b. Bisexual spikelets few or absent on inflorescences; disk subtending nutlet lobed or cup-shaped (but not well developed in S. novae-hollandiae).

2a. Annuals, without a rhizome; inflorescences spicate; glumes ovate; nutlet surface transversely rugose ............ 1. S. pergracilis
2b. Perennials, with a woody creeping rhizome; inflorescences paniculate; glumes lanceolate or ovate-lanceolate; nutlet surface smooth, subsmooth, or slightly rugose.

3a. Spikelets 4–10 mm, pilose; disk stalklike.
3b. Spikelets 3–4.5 mm, glabrous; disk appressed to nutlet.

4a. Nutlet 1.5–1.8 mm, covered with tufts of stellate hairs; contraligule absent ................................................. 2. S. neesii
4b. Nutlet 2.5–2.7 mm, glabrous; contraligule narrow .......................................................... 3. S. tonkinensis

5a. Culms 30–60 cm tall, 1.4–2 mm wide; leaf blade 1.5–2 mm wide; lateral branches of inflorescence often spicate, single; nutlet ca. 2.5 mm ........................................ 4. S. lithosperma
5b. Culms 60–200 cm tall, 3–7 mm thick; leaf blade 15–20 mm wide; lateral branches of inflorescence cymose, often binate; nutlet ca. 3.5 mm ................................................ 5. S. corymbosa

6a. Small annuals (or short-lived perennials); rhizomes absent or not well developed.
6b. Perennials; rhizomes well developed and prominent.

7a. Involucral bracts linear-lanceolate; nutlet ca. 1.5 mm in diam.; disk lobes obtuse .................................................. 7. S. rugosa
7b. Involucral bracts setaceous; nutlet ca. 2 mm in diam.; disk lobes acute or acuminate.

8a. Leaf sheath glabrous; disk ca. 1/2 height of nutlet, lobes brown, membranous, apex acuminate; nutlet surface smooth.
8b. Leaf sheath villous; disk 1/4–1/3 height of nutlet, lobes yellowish white, thick, apex acute; nutlet surface pitted with regular longitudinally elongate pattern.

9a. Nutlet ± spherical, apex with purple tip .............................................................. 8. S. biflora
9b. Nutlet trisulcate, apex with yellowish white tip .................................................. 9. S. laxa

10a. Nutlet 2–2.5 mm, subovoid-spherical; perianth lobes rounded at apex ....................... 6. S. novae-hollandiae
10b. Nutlet 2.8–3 mm, spheroid to obovoid-spherical; perianth lobes acute at apex ................ 10. S. parvula

11a. Culms terete or slightly 3-angled; leaf sheath not winged.
11b. Culms 3-angled or triquetrous; leaf sheath winged at middle part of culm (not obviously in S. hookeriana).

12a. Nutlet surface smooth, only apically slightly hispid; disk not cup-shaped, scarcely 1/5 height of nutlet, appressed to base of nutlet, lobes triangular, margins reflexed; leaves alternate, well spaced, not whorled .................................................. 23. S. harlandii
12b. Nutlet surface hexagonally reticulate, pilose; disk cup-shaped, 1/2–4/5 height of nutlet and enclosing it, lobe apex dentate, margins not reflexed; leaves ± 3-whorled ........................................ 24. S. sumatrensis

13a. Nutlet smooth.

14a. Inflorescences subspicate, branches short or without secondary branches; spikelets with 3–5 awns; nutlet 4–4.5 mm; disk obscurely 3-lobed ........................................... 19. S. psilorrhiza
14b. Inflorescences paniculate; spikelets without or with fewer fine awns; nutlet 3–3.5 mm; disk obviously 3-lobed.
15a. Bractlets glumelike, shorter than spikelet; leaf blade thickly leathery, contraligule scarcely developed; stamen 1; nutlet ca. 2.5 mm in diam.; disk lobes triangular .......... 20. S. poiformis
15b. Bractlets setaceous, longer than spikelet; leaf blade papery, contraligule conspicuous and triangular; stamens 3; nutlet ca. 2 mm in diam.; disk lobes subrounded at apex.
16a. Inflorescences with 4 or 5 lateral branches; disk lobes semicircular ....................... 21. S. radula
16b. Inflorescences with 1–3 lateral branches; disk lobes ovate ........................................ 22. S. oblata

17a. Glumes blackish purple; leaf sheath obscurely winged; inflorescences without or rarely with a distant branch ................................................................. 11. S. hookeriana
17b. Glumes brown or reddish brown; leaf sheath obviously winged; inflorescences with 1–3 distant branches.
18a. Contraligule oblong to oblong-lanceolate, 4–12 mm, glabrous ........................................ 12. *S. ciliaris*
18b. Contraligule depressed rounded, semicircular or nearly semicircular, at most 4 mm, ciliate or glabrescent.

19a. Disk slightly 3-lobed or barely lobed; lobes flatly semicircular, apex rounded.
   20a. Nutlet with white reticulation ...................................................................................... 13. *S. terrestris*
   20b. Nutlet with purplish brown reticulation ..................................................................... 14. *S. dulungensis*
19b. Disk deeply 3-lobed; lobes lanceolate-triangular or ovate-triangular, apex acute to subtruncate.
   21a. Nutlet ca. 2 mm in diam., rugose ................................................................................ 15. *S. levis*
   21b. Nutlet 2.5–2.8 mm in diam., reticulate-pitted or scrobiculate.

22a. Leaves alternate, not whorled; disk yellowish white ...................... 16. *S. jiangchengensis*
22b. Leaves in whorls of 2–5; disk brownish purple.

23a. Nutlet whitish when mature, 2.2–2.7 mm wide, scrobiculate to smooth ..................................................... 17. *S. scrobiculata*
23b. Nutlet at first whitish but brownish purple when mature, 1.7–2 mm wide, cancellate .............................. 18. *S. purpurascens*


纤秆茅 xian gan zhen zhu mao


Annuals. Rhizomes absent. Culms tufted, erect, 11–30 cm tall, ca. 0.5 mm wide, 3-angled, sulcate, glabrous. Leaves basal and cauleine, sheathing; contraligule rounded to obtuse; leaf blade capillary, ca. 1 mm wide. Involucral bracts setaceous, basal one to 0.6 cm and shorter than spikelet cluster; bractlets glumelike. Inflorescences spicate, 2.5–8.5 cm, formed by clusters of 2 or 3 spikelets each separated by 2–17 mm. Spikelets mostly bisexual, oval to ovoid, 3–4 mm, rarely basal one unisexual with a single male flower. Glumes ovate, keeled, both sides of midvein membranous with reddish brown lines, apex mucronate; basal 2 glumes empty; middle glume with a female flower; apical 1 or 2 glumes with a male flower. Male flowers: stamens 3; connective apex protruding, forming a thin tip. Female flowers: stigmas 3. Disk obscure. Nutlet white, subshperical, ca. 1 mm in diam., slightly 3-sided, transversely rugose, base with a brown stalk, apex tipped. Fl. and fr. Aug–Oct. 2n = 10.

Alpine grasslands, valley pastures; 1200–4000 m. Guangdong, Guangxi, Jiangsu, E Xizang, Yunnan [Bangladesh, Cambodia, India, Indonesia, Kashmir, Korea, Laos, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, NE Australia].


柄果珍珠茅 yue nan zhen zhu mao

_Perennials. Rhizomes short, thick, woody, creeping, densely covered with scales; scale brown, tubular, with several parallel veins. Culms 16–70 cm tall, thinner, sharply 3-angled, villous at apical part. Leaves basal and cauline. Basal leaves only with closed sheath, without leaf blade; sheath pale brown, 3-angled, edges villous, surfaces pubescent, not winged, apex with 3 triangular teeth. Cauline leaves with a sheath like that of basal leaves; contraligule absent; leaf blade linear, 1.5–3 mm wide but apically narrowing, both surfaces villous, margins scabrous, apex obtuse. Involucral bracts leafflike, basalmost to 5 cm, sheathing; bractlets setaceous, both surfaces villous. Inflorescences paniculate, 2.5–6 cm. Spikelets narrowly ovoid, 8–10 mm, villous, both bisexual and unisexual spikelets numerous, with 14–16 glumes. Glumes yellowish brown, awned, basal 1 or 2 empty, 1 above empty ones with a female flower, others with male flowers. Male flowers: stamens 3. Female flower: style slender; stigmas 3, longer than style, slightly puberulent. Disk brown, stalklike, not lobed. Nutlet white or light brown, subshperical, 1.5–2 mm, obscurely if at all 3-sided, tuberculate, shiny, with tufts of stellate hairs, apex rounded and with a fine tip. Fl. and fr. Apr–Jul.

Moist sandy open or shaded habitats; low elevations. Hainan [India, Laos, Malaysia (Peninsular), Sri Lanka, Thailand, Vietnam; Indian Ocean islands].


越南珍珠茅 yue nan zhen zhu mao

_Scleria kwangtungensis_ Chun & F. C. How; *S. levis_ Retzius var. _scaberrima_ Bentham.

_Perennials. Rhizomes short, thick, woody, creeping, densely covered with scales; scale brown, tubular, with several parallel veins. Culms 16–70 cm tall, thinner, sharply 3-angled, villous at apical part. Leaves basal and cauline. Basal leaves only with closed sheath, without leaf blade; sheath pale brown, 3-angled, edges villous, surfaces pubescent, not winged, apex with 3 triangular teeth. Cauline leaves with a sheath like that of basal leaves; contraligule dark reddish brown, narrowly triangular, membranous; leaf blade linear, 0.5–1.5 cm wide but apically attenuate, both surfaces villous, margins scabrous, apex obtuse. Involucral bracts leafflike, basalmost to 5 cm, sheathing; bractlets setaceous, both surfaces villous. Inflorescences paniculate, 2.5–6 cm. Spikelets narrowly ovoid, 8–10 mm, villous, both bisexual and unisexual spikelets numerous, with 14–16 glumes. Glumes pale brown to yellowish green, basal 1 or 2 empty, 1 above empty ones with a female flower, others with male flowers. Male flowers: stamens 3. Female flower: style slender; stigmas 3, longer than style, slightly puberulent. Disk brown, stalklike, not lobed. Nutlet white, broadly obovoid to subshperical, 3–3.5 mm, obscurely 3-sided, obscurely rugose to subsMOOTH, shiny, apex rounded with a fine tip. Fl. and fr. Apr–Jul.

Moist grasslands, thickets; below 100 m. Guangdong, Guangxi, Hainan [Cambodia, Thailand, Vietnam].
Scleria tonkinensis was misidentified as S. radula by Tang and F. T. Wang (Fl. Reipubl. Popularis Sin. 11: 206. 1961).

4. Scleria lithosperma (Linnaeus) Swartz, Prodr. 18. 1788.

石果珍珠茅 shi guo zhen zhu mao

Perennials. Rhizomes short, thick, woody, creeping. Culms tufted, 30–50 cm tall, 1.4–2 mm wide, 3-angled, glabrous. Leaves basal and cauline. Basal leaves sheathlike, bladeless. Cauline leaves with sheath 3-angled, closed, pilose; contraligule depressed rounded or depressed deltoid, ciliate; leaf blade narrowly linear, 1.5–2 mm wide, margins finely serrate, apex attenuate into a caudate tip. Inflorescences paniculate, well-developed on stems more than 30 cm, with 1–3 lateral branches or without branch at basal part; basal part often reduced to spikelike, 3.5–7 cm. Spikelets 1–3 in a cluster, 3–4.5 mm, with 4 or 5 glumes, with 1 or 2 male flowers and 1 female flower below male ones. Glumes ovate-lanceolate, keeled, both sides of midvein membranous with short brown lines, apex mucronate. Disk not well developed. Nutlet white, broadly obovoid to subellipsoid, ca. 2.5 mm, 3-sided or not, smooth or transversely rugose or irregularly ± reticulate with wavy ridges, shiny, base narrow and triangular. Fl. and fr. Jun–Oct.

Thickets in forests, woods; 100–1000 m. Guangdong, Hainan, Taiwan, SE Yunnan [India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, America, and Australia, Indian Ocean islands, North and South America, Pacific islands].

1a. Nutlet smooth ................................ 4a. subsp. lithosperma
1b. Nutlet transversely rugose or irregularly somewhat reticulate with wavy ridges .............................. 4b. subsp. linearis

4a. Scleria lithosperma subsp. lithosperma

石果珍珠茅(原亚种) shi guo zhen zhu mao (yuan ya zhong)


Nutlet smooth.

Thickets in forests; 100–1000 m. Guangdong, Hainan, Taiwan, SE Yunnan [India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa, America, and Australia, Indian Ocean islands, North and South America, Pacific islands].


线叶珍珠茅 xian ye zhen zhu mao

Scleria lithosperma var. linearis Bentham, Fl. Austral. 7: 430. 1878; S. lithosperma var. roxburghii C. B. Clarke; S. roxburghii (C. B. Clarke) Domin.

Nutlet transversely rugose or irregularly somewhat reticulate with wavy ridges.

Woods. Hainan [India, Indonesia, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Pacific islands (Fiji)].

5. Scleria corymbosa Roxburgh, Fl. Ind., ed. 1832, 3: 574. 1832.

伞房珍珠茅 san fang zhen zhu mao

Scleria ridleyi C. B. Clarke.

Perennials. Rhizomes thick, subwoody, covered with brown scales. Culms 0.6–2 m tall, 3–7 mm wide, sharply 3-angled. Leaves on apical part of culms nearly whorled; sheath laxly embracing culm; contraligule semicircular, margin ca. 1 mm wide and membranous; leaf blade linear, 50–80 × 1.4–2 cm, midvein and margins apically scabrid, apex acute. Inflorescences paniculate, leaflike, glabrous; bractlets setaceous, 1–1.5 cm, base dilated, margin ciliate. Inflorescences compound paniculate, ca. 40 cm; lateral inflorescence branches 5–7, cymose, often binate, ovoid, ca. 4 cm; inflorescence axes robust, 3-angled, slightly hairy. Spikelets 3–4 mm, 1–3 in a cluster, mostly bisexual, fewer male. Glumes broadly ovate to ovate-lanceolate, leathery, keel green, laterally brown with rust-colored short lines, apex mucronate. Male flowers: stamens 3; anthers linear, ca. 2 mm; connective apex protruding beyond anthers. Disk reduced, appressed to nutlet. Nutlet white or grayish white, obovoid to ellipsoid, ca. 3.5 × 2.5 mm, slightly 3-sided, smooth, glabrous, base attenuate, apex acute. Fl. and fr. summer and autumn.

Water margins, valleys, woods; elevation probably below 100 m. Guangdong, Hainan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand].


角架珍珠茅 jiao jia zhen zhu mao


Annuals. Rhizomes short, subwoody. Culms 30–60 cm tall, slender, 3-angled, glabrous. Leaves cauline; sheath 3-angled, not winged, glabrous; contraligule semicircular; leaf blade narrowly linear, 2.5–3.5(–5.5) mm wide, papery, slightly shiny, glabrous, margin scabrous, apex acute. Inflorescences paniculate; branches single or binate, (0.5–)1–2 cm, distant. Spikelets mostly unisexual, narrowly ovoid, ca. 5 mm, lax, with ca. 9 flowers, with 11 or 12 glumes. Bisexual spikelets with 1 or 2 empty basal glumes, middle glumes with a female flower, apicalmost glume empty or with a reduced flower. Glumes pale brown, ovate to ovate-lanceolate but apical ones lanceolate, membranous, keel abaxially green, apex acute. Perianth lobes rounded at apex. Male flowers: stamens 2 or 3. Female flowers: style slender; stigmas 2, almost as long as style. Disk not well developed. Nutlet white, subovoid-spherical, 2–2.5 mm (excluding stalk), obscurely reticulate, glabrous, base truncate, apex subrounded and without a tip. Fl. and fr. Jul–Oct.

Slopes, swamps; near sea level. Fujian (Zhao’an), Guangdong, Jiangsu (Lianyungang, Nanjing) [Indonesia, Papua New Guinea, Philippines, Vietnam; Australia, Pacific islands (Micronesia)].


垂序珍珠茅 chui xu zhen zhu mao
Scleria fenestrata Franchet & Savatier var. pubigera (Makino) Ohwi; S. onoei Franchet & Savatier; S. onoei var. pubigera (Makino) Ohwi; S. pubigera Makino.

Annuals. Roots fibrous. Rhizomes absent. Culms tufted, erect, 10–25 cm tall, 3-angled, glabrous or villous. Leaves cauline; sheath barely winged, pubescent to villous; contraligule semicircular, margin ciliate; leaf blade linear, 2–4 mm wide but apically attenuate, papery, both surfaces hairy, margins scabrous, apex obtuse. Inflorescences panicle, with 3–5 branches; branches 0.7–1.5 cm, distant, with few spikelets; branch peduncles 0.4–4 cm, usually winged. Spikelets 1 or 2 in a cluster, narrowly ovoid, 2–4 mm, mostly unisexual; female spikelets with 3–5 glumes and 1 female flower. Female flowers: ovary obovoid, smooth, glabrous. Disk 1/4–1/3 height of nutlet, 3-lobed; lobes semicircular, margin reflexed, apex rounded. Nutlet white or grayish white, spherical to subspherical, ca. 1.5 mm in diam., smooth, shiny, apex subrounded and slightly tipped.

Wet grassy places; 600–700 m. SW Fujian, Guangdong, Hainan, Jiangsu, Taiwan, S Yunnan [India, Indonesia, Japan, S Korea, Malaysia, Myanmar, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Indian Ocean islands, Pacific islands].


二花珍珠茅 er hua zhen zhu mao

Scleria biflora var. ferruginea J. Kern; S. ferruginea Ohwi (1938), not Peter (1937).

Annuals. Roots fibrous. Rhizomes absent. Culms nearly tufted, 30–40 cm tall, slender, 3-angled, glabrous. Leaves cauline; sheath tubular, 3-angled, barely winged, glabrous, apex of basal ones with triangular teeth; contraligule semicircular, pubescent; leaf blade linear, 2.5–5.5 mm wide but apically attenuate, papery, smooth, glabrous, margins scabrous, apex slightly obtuse. Inflorescences panicle, with 2 or 3 branches; branches 1.5–2.5 cm, with many spikelets; lateral branches distant. Spikelets 1 or 2 in a cluster, narrowly ovoid, 3.5–4 mm, mostly unisexual; female spikelets with 4 or 5 glumes and 1 female flower; male spikelets with 7–9 or more glumes. Glumes ovate to lanceolate, apically attenuate, keel green to same color as glume, apex acute and apiculate. Male flowers: stamens 2 or 3. Female flowers: ovary subspherical, glabrous. Disk yellowish white, 1/4–1/3 height of nutlet, slightly 3-lobed; lobes ovoid-triangular to subglobose, margin reflexed, apex truncate. Nutlet subspherical to obovoid-spherical, 2.8–3 × 1.8–2 mm, trisulcate, pitted with irregular longitudinally elongate lacunae (i.e., trabeculate), glabrous, apex with a yellowish white tip. Fl. and fr. Aug–Oct.

Grassy swamps; near sea level. Fujian (Zhao’an), Guangdong, Hainan [Papua New Guinea, Philippines; N Australia].


小型珍珠茅 xiao xing zhen zhu mao

Scleria fenestrata Franchet & Savatier; S. tessellata C. B. Clarke (1903), not Wildenow (1805).

Annuals. Roots fibrous. Rhizomes short or not well developed, thick. Culms tufted, 20–40 cm tall, slender, 3-angled, smooth, glabrous, apically often nodding. Leaves cauline; sheaths at culm base glabrous, barely winged, bladeless or with a short blade; sheaths at middle and apical part of culm narrowly winged, villous and more densely so near contraligules; contraligule semicircular, apex obtuse; leaf blade linear, 3.5–5.5 mm wide but apically attenuate, papery, both surfaces hairy or only on 2 lateral veins of abaxial surface, margins scabrous, apex slightly obtuse to acute. Inflorescences panicle, with 2–4 branches; branches 1.2–3 cm, distant, with few spikelets. Spikelets narrowly ovoid, 4–5 mm, mostly unisexual; female spikelets with 4 or 5 glumes and 1 female flower; male spikelets with 7–9 or more glumes. Glumes deeply straw-colored to brownish purplish, ovate to lanceolate, keeled, apex acute and apiculate. Male flowers: stamens 2 or 3. Female flowers: ovary subspherical, glabrous. Disk yellowish white, 1/4–1/3 height of nutlet, slightly 3-lobed; lobes ovoid-triangular to subglobose, margin reflexed, apex truncate. Nutlet subspherical to obovoid-spherical, 2.8–3 × 1.8–2 mm, trisulcate, pitted with irregular longitudinally elongate lacunae (i.e., trabeculate), glabrous, apex with a yellowish white tip. Fl. and fr. Aug–Oct.

Grassy swamps; near sea level. Fujian (Zhao’an), Guangdong, Hainan [Papua New Guinea, Philippines; N Australia].


疏松珍珠茅 shu song zhen zhu mao

Scleria trisulcata G. P. Li.

Annuals. Roots fibrous. Rhizomes short or not well developed, thick. Culms tufted, 20–40 cm tall, slender, 3-angled, smooth, glabrous. Leaves cauline; sheaths at culm base glabrous, barely winged, bladeless or with a short blade; sheaths at middle and apical part of culm narrowly winged, villous and more densely so near contraligules; contraligule semicircular, apex obtuse; leaf blade linear, 3.5–5.5 mm wide but apically attenuate, papery, both surfaces hairy or only on 2 lateral veins of abaxial surface, margins scabrous, apex slightly obtuse to acute. Inflorescences panicle, with 2–4 branches; branches 1.2–3 cm, distant, with few spikelets. Spikelets narrowly ovoid, 4–5 mm, mostly unisexual; female spikelets with 4 or 5 glumes and 1 female flower; male spikelets with 7–9 or more glumes. Glumes deeply straw-colored to brownish purplish, ovate to lanceolate, keeled, apex acute and apiculate. Male flowers: stamens 2 or 3. Female flowers: ovary subspherical, glabrous. Disk yellowish white, 1/4–1/3 height of nutlet, slightly 3-lobed; lobes ovoid-triangular to subglobose, margin reflexed, apex truncate. Nutlet subspherical to obovoid-spherical, 2.8–3 × 1.8–2 mm, trisulcate, pitted with irregular longitudinally elongate lacunae (i.e., trabeculate), glabrous, apex with a yellowish white tip. Fl. and fr. Aug–Oct.

Grassy swamps; near sea level. Fujian (Zhao’an), Guangdong, Hainan [Papua New Guinea, Philippines; N Australia].

Scleria biflora was misidentified as S. tessellata C. B. Clarke by Tang and F. T. Wang (Fl. Reipubl. Popularis Sin. 11: 208. 1961).
Slightly 3-lobed; lobes ovoid-triangular to subglobose, margin reflexed, apex acute. Nutlet subspherical to ovoid-spherical, 2.8–3 × 1.8–2 mm, pitted with regular longitudinally elongate lacunae, glabrous, apex with a yellowish white tip. Fl. and fr. Jul.–Oct.

Slopes, valleys, wastelands, paddy fields; 700–2700 m. Fujian, Guangdong, Guizhou, Hunan, NE Jiangsu, Jiangxi, Shandong, Sichuan, SE Zizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Japan, Korea, Laos, Nepal, Papua New Guinea, Philippines, Sri Lanka, N Thailand, Vietnam; tropical Africa].

Scleria parvula was misidentified as S. biflora by Tang and F. T. Wang [Fl. Reipubl. Popularis Sin. 11: 208. 1961].


Scleria hookeriana

Perennials, stoloniferous. Rhizomes short, woody, densely covered with purplish red oblong-ovate scales. Culms erect, 60–100 cm tall, 2–4 mm wide, 3-angled, slightly scabrous, sometimes pubescent. Leaf sheath 1–10 cm, sometimes pubescent; sheaths basalmost on culm purplish red to pale brown, obtusely 3-angled, with 3 triangular teeth of various sizes at opening; sheaths at middle part of culm green, sharply 3-angled, rarely narrowly winged; contraligule semicircular, with purple barbs; leaf blade linear, 4–35 cm × 4–8 mm, papery, slightly scabrous, glabrous or slightly pubescent. Inflorescences paniculate, 4–7 × 2–4 cm. Spikelets (1 or)2–4 in a close cluster, ca. 3 mm, mostly unisexual, rarely bisexual. Male spikelets oblong-ovoid; glumes ovate-lanceolate to oblong-lanceolate. Female spikelets usually at basal part of inflorescence branch, narrowly ovoid, with few glumes; glumes broadly ovate, triangular, or ovate-lanceolate. Male flowers: stamens 3. Female flowers: ovary villous; stigmas 3. Disk yellowish, ± 3-lobed; lobes semicircular, margin reflexed, apex rounded. Nutlet white, ovoid, ca. 2 mm in diam., reticulate, slightly rust-colored hispid, apex obtusely 3-sided. Fl. and fr. May–Jul.

Sunny slopes, valleys, scrub, roadsides, grasslands; 1400–2200 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [India, Vietnam].


Scleria ciliaris

Perennials. Rhizomes woody, covered with purple to purplish brown scales. Culms tufted, 70–120 cm tall, ca. 5 mm wide, 3-angled, slightly scabrous, glabrous. Leaf sheath 1–10 cm, papery, glabrous; sheaths at culm base brown to purplish brown, not winged, with 3 narrowly ovoid teeth of various sizes at opening; sheaths at middle part of culm green, wing 1–3 mm wide; contraligule brown to reddish brown, lanceolate to oblong-lanceolate, 4–12 mm (fragsile tip sometimes broken off), glabrous, margin sometimes apically purple; leaf blade linear, 15–35 cm × 6–9 mm, papery, slightly scabrous, glabrous. Inflorescences paniculate, with 1–3 slightly distant lateral branches; branches 6–10 × 2–6 cm, slightly condensed. Spikelets brown to purple, (1 or)2–4 in a cluster, ca. 4 mm, mostly unisexual. Male spikelets oblong-ovoid; glumes 3–4 mm, membranous, margin sometimes ciliate; basal glumes keeled, apex arista to apiculate. Female spikelets usually growing at base of branch, narrowly ovoid; glumes broadly ovate to ovate-lanceolate, keeled, apex arista to apiculate. Male flowers: stamens 3. Female flowers: ovary pubescent; stigmas 3. Disk yellow, 1.6–2 mm in diam., with dense rust-colored lines, 3-lobed; lobes nearly semicircular,margin reflexed, apex rounded. Nutlet white, subspherical, ca. 2.5 mm in diam., slightly 3-sided, slightly reticulately pitted, slightly stellate pubescent. Fl. and fr. Dec–Apr.

Valleys, forests, grasslands; (below 100–)300–900 m. Guangdong, Hainan [Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; tropical Australia, Pacific islands].


Scleria terrestris

Perennials, stoloniferous. Rhizomes woody, with dark purple scales. Culms sparse, 0.6–3 m tall, 4–7 mm wide, 3-angled, often scabrous, glabrous. Leaf sheaths 1–8 cm, papery; basal 2 or 3 sheaths on culm purplish red, not winged; sheaths at middle part of culm with wings 1–3 mm wide; contraligule semicircular, short, usually barbate, barbs purple; leaf blade linear, 30–40 cm × 6–10 mm, papery, slightly scabrous, glabrous. Inflorescences paniculate, 4–7 × 2–4 cm. Spikelet 1(or 2) in a cluster, entirely unisexual, oblong-ovoid to narrowly ovoid, apex truncate to acuminate. Glumes of male spikelets 2–3 mm, thickly membranous, basal ones keeled and with rust-colored short lines, apical ones pale colored and scarious. Female spikelets usually growing at base of branch; glumes broadly ovate to ovate-lanceolate, 2–4 mm wide, sometimes with rust-colored short lines, keeled, apex apiculate. Male spikelets 3-flowered. Male flowers: anthers linear. Female flowers: stigmas 3. Disk yellow, ca. 1.8 mm in diam., slightly 3-lobed to barely lobed; lobes semicircular, flat, margin reflexed. Nutlet white or pale brown, spherical to ovoid, ca. 2.5 mm in diam., sometimes ± 3-sided, reticulate, slightly hispid, apex tipped. Fl. and fr. May–Oct.

Slopes, dry or moist places, valleys, stream margins, under shrubs, open woods, beside farms or roads; near sea level to 2000 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hunan, Jiangsu; Jiangxi, Sichuan, Taiwan, SE Zizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Indonesia, S Japan, Kashmir, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia].

Rhizomes not seen. Culms to 100 cm tall, 5–8 mm wide, 3-angled, scabrous on ridges. Leaf sheath pale green, 3-angled, glabrous, not winged; centriligule oblong, barbate; leaf blade 15–20 cm, glabrous, veins and margin scabrous. Inflorescences paniculate, with 2–4 lateral branches; branches 2–7 × 1.5–5 cm, slightly distant. Spikelets 1 or 2 in a cluster, greenish purple to dark purple, 3.5–4.5 mm, unisexual. Male spikelets narrowly ovoid; basal glumes 1.5–3.3 mm, thickly membranous; apical glumes thinner and paler. Female spikelets usually at basal part of branch, narrowly ovoid; glumes 5; basal 2 glumes ovate, not keeled; apical 3 glumes ovate to ovate-lanceolate, keeled, apex acuminate. Male flowers: stamens 3. Female flowers: stigmas 3. Disk yellowish white, slightly narrower than nutlet, deepely 3-lobed, margins partly reflexed. Nutlet white, spherical, ca. 3 mm, puberulent, reticulate purplish brown, apex tipped. Fl. and fr. Aug.–Nov.

Grasslands bordering evergreen broad-leaved forests on slopes; 1300–1400 m. Yunnan (Gongshan).


Perennials, stoloniferous. Rhizomes woody, covered with purple scales. Culms laxly tufted to scattered, 70–90 cm tall, 3–5 mm wide, 3-angled, scabrous, pubescent. Leaf sheath pale green, not winged; centriligule half of culm green, wing 1–3 mm wide; centriligule nearly semicircular, short, barbate; leaf blade linear, ca. 30 cm × 7–10 mm. Inflorescences paniculate, with 2 or 4 lateral branches; branches 3–8 × 1.5–3 cm. Spikelets 1 or 2 in a cluster, brown, unisexual, sessile, ca. 3 mm. Male spikelets narrowly ovoid to oblanceolate-ovoid; glumes 1.5–3 mm, keeled, thickly membranous. Female spikelets usually at basal part of branch, narrowly ovoid; glumes oblong-ovate, broadly ovate, or ovate-lanceolate, keeled, with rust-colored short lines. Male flowers: stamens 3; anthers linear, ca. 1 mm; connective apex protruding, ca. 1/4 as long as anther. Female flowers: stigmas 3. Disk brown to purple, 3-lobed; lobes lanceolate-triangular, margin reflexed. Nutlet white, spherical to ovoid, ca. 2 mm in diam., bluntly 3-sided, smooth to rugulose, apex tipped. Fl. and fr. Jun.–Sep.

Dry places, grasslands on slopes, thickets in forests, scrub; near sea level to 1500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, SE Zizang, Yunnan, Zhejiang [Bangladesh, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; NE Australia, Pacific islands].


Perennials, stoloniferous. Rhizomes woody, covered with brown scales. Culms laxly tufted to scattered, 70–110 cm tall, 3–4 mm wide, 3-angled, slightly puberulent. Sheath brown to greenish brown at middle part of culm, 1–6 cm, puberulent, wings 1–3 mm wide; centriligules nearly semicircular, puberulent, barbate; leaf blade linear, apex 3 × 3–8 mm, both surfaces pubescent. Inflorescences paniculate, with 2–4 lateral branches; branches 2–7 × 1.5–5 cm, slightly distant. Spikelets 1 or 2 in a cluster, greenish purple to dark purple, 3.5–4.5 mm, unisexual. Male spikelets narrowly ovoid; basal glumes 1.5–3.3 mm, thickly membranous; apical glumes thinner and paler. Female spikelets usually at basal part of branch, narrowly ovoid; glumes 5; basal 2 glumes ovate, not keeled; apical 3 glumes ovate to ovate-lanceolate, keeled, apex acuminate. Male flowers: stamens 3. Female flowers: stigmas 3. Disk yellowish white, slightly narrower than nutlet, deeply 3-lobed, margins partly reflexed. Nutlet white, spherical, 2.5–2.8 mm in diam., 3-sided, reticulate, puberulent, apex tipped. Fl. and fr. Jul.–Sep.

Grasslands bordering evergreen broad-leaved forests on slopes; 1000–1100 m. Yunnan (Jiangcheng).


Perennials. Rhizomes hardened. Culms 1–2.5 m, 4–10 mm thick, triquetrous, scabrous on apical angles. Leaves ± in whorls of 2–5 at mid-culm (otherwise scattered); sheaths 4–6 cm, papery, glabrous, winged or not; centriligule depressed, rounded, margin ciliate; leaf blade linear, ca. 40 × 1–1.3 cm, thickly papery, slightly scabrous, apically attenuate. Inflorescences paniculate, with several branches; lateral branches spreading, often 2 or 3 in a cluster, 6–7 × ca. 10 cm, axes angled. Spikelets 2 or 3 in a cluster, brown, 3–4 mm, unisexual. Male spikelets oblong-ovoid, pedicellate, apex truncate; glumes rust-colored to brown, 3–4 mm, membranous, basal ones keeled and with a cupuliform apex. Female spikelets narrowly ovoid, apex acuminate; glumes broadly ovate to ovate-lanceolate, keeled. Male flowers: stamens 3; anthers linear, ca. 1 mm; connective apex protruding; ca. 1/4 as long as anther. Female flowers: stigmas 3. Disk brown to purple, 3-lobed; lobes smooth, narrow, apex acute. Nutlet whitish, globose, 2.5–3 × 2.2–2.7 mm, slightly 3-sided, with hexagonal reticulation, scrobiculate (marked with many shallow depressions, grooves, or pits), glabrous but sparsely pubescent on ridges, apex cupuliform. Fl. and fr. Apr.–Aug.

Evergreen broad-leaved forests; below 100–300 m. Guangdong (Lianzhou), Taiwan (Taichung) [Indonesia, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam; N Australia, Indian Ocean islands, Pacific islands].


Perennials. Rhizomes hardened. Culms 1–2 m tall, 3–7
mm thick, triquetrous, scabrous or smooth on apical angles, glabrous or pubescent. Leaves in whorls of 2–5 at mid-culm (otherwise scattered); sheath 3–6 mm, papery, glabrous, wingless; contraligule depressed rounded, margin hirsute-ciliate; leaf blade linear, 30–60 × 0.3–1.5 cm, thickly papery, slightly scabrous, apically long acuminate. Inflorescences bracts leaflike, basalmost to 15 cm, sheathing; bractlets setaceous. Inflorescences paniculate, 20–50 cm, with 1–4 branches; lateral branches often 2 or 3 clustered, spreading, 4–10 × ca. 10 cm, axes angled. Spikelets 2 or 3 in a cluster, brown, 3–4 mm, unisexual (rarely bisexual). Male spikelets oblong-ovoid, pedicellate, apex truncate; glumes rust-colored to brown, 3–4 mm, membranous, basal ones keeled and with a cuspidate apex. Female spikelets obovoid, apex acuminate; glumes broadly ovate to ovate, keeled. Male flowers: stamens 3; connective white but purplish brown when mature, ovoid, elliptoid, or obovoid, 2–2.5 × 1.7–2 mm, slightly 3-sided, with hexagonal reticulation, conspicuously cancellate, sparsely pubescent on ridges and apex, apex cuspidate. Female flowers: stigmas 3.


Perennials. Culms 60–100 mm tall, 2–4 mm wide, sharply 3-angled, smooth to scabrous, glabrous. Leaf sheath 1–15 cm; several sheaths brown at base of culm, membranous to papery, not winged; other sheaths yellowish green, papery, wing 2–5 mm wide; ligule yellowish brown, glabrous or pilose; contraligule ovate-deltoid; leaf blade linear, ca. 30 × 0.5–1.5 cm, papery, glabrous. Inflorescences bracts leaflike, basalmost to 23 cm, sheathing; bractlets setaceous, base dilated. Inflorescences paniculate, with 1 distant lateral branch; branch spicate. Spikelets usually 2 or 3 in a cluster, rust-colored brown, sessile, ca. 3.5 mm, unisexual [or bisexual]. Male spikelets ellipsoid to oblong; glumes 2–3 mm, thickly membranous. Female spikelets usually at base of branch, ellipsoid to narrowly ovoid; glumes broadly ovate-lanceolate to broadly ovate, keeled, apex aristate. Male flowers: stamens 3; anthers linear, ca. 1.5 mm. Female flowers: stigmas 3. Disk brown, triangular-cordate, ca. 1.5 mm in diam., 3-lobed; lobes triangular, short, margin reflexed, apex acute. Nutlet white or gray, ovoid, ca. 3 × 2.5 mm, bluntly triangular, smooth, shiny, glabrous. Fl. and fr. Apr.

Water margins. Hainan [Cambodia, India, Indonesia, Laos, Malaysia, Papua New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa and Australia, Madagascar].


Perennials. Rhizomes woody, covered with purple to purplish brown scales. Culms tufted, 60–120 cm tall, 2–3 mm wide, triquetrous, smooth, glabrous. Leaves cauleine; sheath 2–7 cm, papery, glabrous; sheath at culm base brown to purplish brown, not winged, with 3 ovoid-lanceolate teeth of various sizes at opening; sheath at middle part of culm green, wing 1–3 mm wide; contraligule brown to reddish brown, shortly deltate, 1–3 mm, glabrous or ciliate; leaf blade linear, 15–60 cm × 6–9 cm.
mm, papery, slightly scabrous, glabrous. Involucral bracts leaf-like, basalmost to 25 cm, sheathing; bractlets setaceous, base auriculate and hispid. Inflorescences paniculate, 10–20 cm, with 1–3 slightly distant lateral branches; branches 6–10 × 2–6 cm, slightly condensed. Spikelets 2 or 3 in a cluster, brown to purple, ca. 4 mm, unisexual. Male spikelets oblong-ovoid to narrowly ovoid-oblong; glumes 3–4 mm, membranous, margin sometimes ciliate; basal glumes keeled, apex aristate to apiculate. Female spikelets usually at base of branch, ovoid; glumes ovate-orbicular, keeled, apex acuminate. Male flowers: stamens 3. Female flowers: ovary pubescent; stigmas 3. Disk yellow, ca. 1.6–2 mm in diam., smooth, glabrous. Nutlet white, subspherical, ca. 2.5 mm in diam., bluntly 3-sided, smooth, shiny, only apical part sparsely hairy, apex tipped. Fl. and fr. Mar–Sep.

Slopes, valleys, woodlands; below 400 m. Fujian, Guangdong, Guangxi, Hainan, SE Yunnan [Vietnam].


Perennials. Culms 2–4 m tall, 6–7 cm wide, 3-angled, glabrous. Leaves ± in whorls of 3; sheaths ca. 4 cm, papery, glabrous, basal ones winged; contraligule nearly semicircular, very short, margin ciliate; leaf blade linear, ca. 40 × 1–1.3 cm, thickly papery, slightly scabrous, apically attenuate. Involucral bracts leaflike, basalmost to 25 cm, sheathing; bractlets setaceous, laterally hairy, base dilated. Inflorescences compound paniculate, with several branches; lateral branches often 2 or 3 in a cluster, 6–7 × ca. 10 cm, spreading, axes angled. Spikelets 1 or 2 in a cluster, brown, ca. 5 mm, unisexual, basal glumes distichous. Male spikelets oblong-ovoid, apex truncate; glumes rust-colored to brown, 2–3.5 mm, membranous, basal ones keeled and with a cuspidate apex. Female spikelets narrowly ovoid, apex acuminate; glumes broadly ovate-lanceolate, ovate, or oblong-ovate, keeled. Male flowers: stamens 3; anthers linear, ca. 1.2 mm; connective apex protruding, ca. 1/4 as long as anther. Female flowers: stigmas 3. Disk brown, purple, yellowish, or bright shiny red, cup-shaped, 1/2–4/5 height of nutlet and enclosing it, 3-lobed; lobes smooth, shiny, apex dentate. Nutlet flattened globose, ca. 1.5 × 2–2.5 mm, with hexagonal reticulation, sparsely pubescent, apex cuspidate. Fl. and fr. Apr.

Stream margins; 200–300 m or less. Hainan, Taiwan (Pingdong) [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Indian Ocean islands, Pacific islands].


裂颖茅属 lie ying mao shu

Zhang Shuren (张树仁); Gordon C. Tucker, Jeremy J. Bruhl

Herbs, annual or occasionally perennial, tenuous, with thin fibers. Leaves cauleine, sheathing, without a ligule, regularly spaced along stem; leaf blade linear, short. Inflorescence a capitulate cyme, condensed, exserted from leaf sheath. Spikelets unisexual. Male spikelets basal in inflorescence; glumes usually 3, usually thin and narrow, each with 1 or 2 male flowers. Female spikelets apical on inflorescence; glumes 2, opposite, equal in size, veined, each with 1 female flower, apex 3-lobed or not. Male flowers: anthers 1–3. Female flowers: stigmas 3. Disk present. Nutlet small, globose, with vertical ribs or reticulate, sometimes apically hairy, tightly enclosed in 2 subtending glumes and shed with them.

About six species: tropics into warm temperate regions of both hemispheres; two species in China.

1a. Glume subtending female flower prominently several veined, apex 3-lobed; nutlets globose, with 3 longitudinal ribs and rectangular reticulation .................................................................................................................. 1. D. caricinum

1b. Glume subtending female flower with only a prominent midvein, apex not lobed; nutlets depressed globose, with 3 longitudinal ribs and square reticulation between ribs ........................................................................... 2. D. reticulatum

裂颖茅  lie ying mao

Scleria caricina (R. Brown) Bentham.

Annuals. Culms 10–40 cm, slightly erect or sprawling, 3angled, glabrous. Veins of leaf blades and bracts purple, fine. Leaf sheath with narrow wings but apically broader; ligule absent; leaf blade linear, 1–4 cm × 1.5–3 mm, apex acute to acuminate. Involucral bracts and bractlets leaflike or glumelike; leaflike bracts green, 3–10 mm, papery. Inflorescence a capitate cyme, 1 or 2 at each node. Male spikelets with 3 glumes and 1 or 2 flowers; glumes scarious. Female spikelets oblong to ovoid, with 2 opposite glumes and 1 flower; glumes greenish yellow, suboblong, ca. 1.8 mm, membranous, prominently several veined, 3-lobed, middle lobe larger, longer, and apically mucronate. Male flowers: anthers 1 or 2. Female flowers: stigmas 3, pubescent. Disk adnate to base of nutlet, obscurely 3-sided. Nutlet included in 2 glumes, globose, 0.8–1 mm in diam., with 3 longitudinal ribs and rectangular reticulation, apex hispid. Fl. and fr. Sep.–Oct.

Water margins, shaded slopes, field margins; below 100–800 m. Fujian, Guangdong, S Guangxi, Hainan, S Jiangsu, Taiwan, S Zhejiang [Bangladesh, Cambodia, India, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; N Australia, Indian Ocean islands, Pacific islands].


网果裂颖茅  wang guo lie ying mao

Scleria reticulata (Holttum) J. Kern.

Annuals. Culms 10–40 cm, slightly erect or sprawling, 3angled, glabrous. Veins of leaf blades and bracts purple, fine. Leaf sheath with narrow wings but apically broader; ligule absent; leaf blade linear, 1–4 cm × 1.5–3 mm, apex acute to acuminate. Involucral bracts and bractlets leaflike or glumelike; leaflike bracts green, 3–10 mm, papery. Inflorescence a capitate cyme, 1 or 2 at each node. Male spikelets with 3 glumes and 1 or 2 flowers; glumes scarious. Female spikelets turbinate, 1.2–1.5 × ca. 1.2 mm; glumes greenish yellow and often with pale red spots, ovate to oblanceolate, ca. 1.2 mm, membranous, midvein prominent, lateral veins faint, apex entire (not 3-lobed) and mucronate. Disk adnate to base of nutlet, obscurely 3-sided. Nutlet depressed globose, ca. 1 mm in diam., with 3 longitudinal ribs and square reticulation between ribs, apex hispid. Fl. and fr. autumn and winter.

Wet grasslands. Hainan [Bangladesh, Malaysia (Peninsular), Myanmar, Thailand].

32. KOBRESIA Willdenow, Sp. Pl. 4: 205. 1805.

嵩草属  song cao shu

Zhang Shuren 张树仁; Henry J. Noltie

Herbs, perennial. Rhizomes usually very short, sometimes obliquely and shortly creeping, rarely stoloniferous and spreading. Stems usually tufted, rarely scattered. Leaves basal or sub-basal; basal leaf sheaths persistent and usually prominent; blade with midrib not distinct abaxially (margin involute, sometimes filiform), or with midrib distinct abaxially (flat, sometimes folded). Inflorescence terminal, paniculate to spicate, sometimes unisexual; lowest involucral bract leafy or glumelike, sheathless; branches of inflorescence sessile. Spikelets subtended by glumes, unisexual or bisexual; bisexual spikelets with 1 female flower at base and 1 to several male flowers at distal parts enclosed by prophylls; unisexual spikelets with a solitary female flower within prophylls. Sterile rachilla in female spikelet usually present. Flowers unisexual. Female flowers reduced to naked pistils; ovary 2- or 3-carpellate; style elongated; stigmas 2 or 3. Male flowers subtended by male glumes; stamens 1–3; filaments free, longer than glumes, slender; male glumes usually distinct in shape from glumes of female spikelets. Nutlets trigonous or flattened, usually included in prophylls, beaked or not, stipitate or not.

About 54 species: mainly in temperate regions of the N Hemisphere; 44 species (16 endemic, one unconfirmed) in China.

1a. Prophylls leafy in texture, utriculiform, inflated, much larger than nutlet at maturity.

2a. Leaves flat with midrib conspicuous abaxially; culms over 6 cm; prophylls over 5 mm; plants of meadows

and slopes up to 4600 m ......................................................... 16. K. inflata

2b. Leaves filiform, U-shaped in cross section, midrib not conspicuous abaxially; culms under 4 mm; prophylls to 5 mm; dwarf mat-forming plants of stony plateaus over 4800 m .............................................. 17. K. yadongensis

1b. Prophylls thinly textured, open or utriculiform, if utriculiform then closely enveloping nutlet at maturity.

3a. Nutlets mostly with 2 stigmas, compressed (biconvex) with 2 sharp edges.

4a. Spikes linear, more than 5 × as long as broad; sometimes some nutlets with 3 stigmas ......................... 28. K. myosuroides

4b. Spikes short, ca. 3 × as long as broad; nutlets all with 2 stigmas.

5a. Glumes pale brown to brown, margin hyaline or not; nutlets obovoid, very shortly stipitate; lower spikelets with 1 female and 2–5 male flowers (E China) ......................................................... 43. K. pusilla

5b. Glumes dark brown, occasionally brown, margin narrowly hyaline or not; nutlets oblong, distinctly stipitate; lower spikelets with 1 female and 1–3 male flowers (W China) .................. 44. K. karakorumensis

3b. Nutlets all or mostly with 3 stigmas (in K. capillifolia, K. filifolia, and K. myosuroides sometimes with 2), trigonous, although one of angles sometimes extremely weak (so nutlet appearing compressed).

6a. Rhizomes elongate, stoloniferous.
7a. Stigmas 3; nutlets not stipitate; prophylls usually over 7 mm; plants robust ............................................ 1. K. gammiei
7b. Stigmas 2; nutlets long stipitate at maturity (stipes to 1 mm); prophylls to 6.5 mm; plants slender.
   8a. Leaf blade flat, midrib distinct abaxially; prophylls to 3.6 mm; spikelets usually unisexual;
       glumes fawn brown ..................................................................................................................... 14. K. macrantha
   8b. Leaf blade filiform, U-shaped, midrib not distinct abaxially; prophylls over 4 mm; lower
       spikelets of lateral spikes usually bisexual; glumes dark reddish brown .................................... 15. K. hohxilensis
6b. Rhizomes extremely short, so plants densely tufted.
   9a. Inflorescence paniculate.
      10a. Prophylls utriculiform (open only near apex); most spikelets unisexual (some near base
           of inflorescence branches sometimes bisexual).
         11a. Prophylls to 3.5 mm; glumes of female spikelets to 3 mm .................................................. 6. K. fragilis
         11b. Prophylls over 3.5 mm; glumes of female spikelets over 4 mm.
         12a. Leaves usually over 5 mm wide; prophylls over 8 mm, rachilla much shorter than
             nutlet; inflorescence branches linear, elongate ...................................................................... 3. K. curticeps
         12b. Leaves never over 5 mm wide; prophylls under 7 mm (if more then inflorescence
             dense, clublike and lowest involucral bract glumelike), rachilla subequaling or
             exceeding nutlet.
         13a. Nutlet elliptic, ca. 2 × as long as wide (Yunnan only) ............................................... 5. K. loliacea
         13b. Nutlet narrowly elliptic to linear, ca. 3 × as long as wide (more widespread).
         14a. Surface of prophyll glabrous; branches ± equal in length throughout
             inflorescence, curving outward ........................................................................... 2. K. laxa
         14b. Surface of prophyll minutely hispid near apex; lower inflorescence
             branches longer than upper, appressed or obliquely ascending.
         15a. Rachilla shorter than nutlet; margins of glumes hyaline; culms
             slender .................................................................................................................. 4. K. sikkimensis
         15b. Rachilla almost or exceeding prophyll; margins of glumes
             not hyaline; culms stout ..................................................................................... 7. K. uncinioioides
9b. Inflorescence spicate.
   16a. Spikelets bisexual.
      17a. Leaves filiform; some nutlets with 2 stigmas ................................................................. 11. K. filifolia
      17b. Leaves flat; all nutlets with 3 stigmas.
         18a. Culms very stout, acutely triquetrous; inflorescence very dense,
             club-shaped .................................................................................................................... 12. K. kansuensis
         18b. Culms slender, not obviously triquetrous; inflorescence branches
             slightly spreading ........................................................................................................ 13. K. royleana
16b. Spikelets unisexual.
   19a. Rhizome stout, oblique, very shortly creeping, bearing short, bladeless
        sheaths .......................................................................................................................... 8. K. kuekenthaliana
   19b. Rhizome not developed, culms densely tufted, not bearing bladeless sheaths.
      20a. Leaves filiform .............................................................................................................. 9. K. condensata
      20b. Leaves flat, midrib distinct abaxially.
         21a. Prophylls over 5 mm, keels hispid ................................................................. 10. K. tunicata
         21b. Prophylls to 4 mm, keels not hispid ......................................................................... 13. K. royleana
9b. Inflorescence spicate.
   22a. Prophylls over 6 mm ............................................................................................................ 21. K. robusta
   22b. Prophylls under 6 mm.
      23a. Lower spikelets bisexual, with at least 1 male flower enclosed within prophyll.
         24a. Leaves flat, midrib distinct abaxially.
            25a. Prophylls with basal female and 2–7 male flowers ............................................ 18. K. humilis
            25b. Prophylls with basal female and 1 or 2 male flowers.
               26a. Prophylls utriculiform, open only above middle; glumes not or minutely
                   aristate; leaves short, stiff .................................................................................... 19. K. duthici
               26b. Prophylls open almost to base; glumes long aristate; leaves longer,
                   flaccid ................................................................................................................ 20. K. filicina
            24b. Leaves filiform, midrib not distinct abaxially.
               27a. Prophylls open in upper half (SW Xizang) ............................................. 22. K. burangensis
               27b. Prophylls open almost to base.
                  28a. Plants and spikes robust, basal sheaths conspicuous, papery, commonly
                      orange-brown, shiny; male flowers up to 7 per prophyll.
29a. Glumes aristate, with conspicuous greenish midrib; inflorescence elongate; nutlets 3–4.5 mm .................................................. 23. *K. cuneata*

29b. Glumes usually not aristate, midrib not conspicuous; inflorescence shorter and broader; nutlets 1.7–3.5 mm .......... 24. *K. schoenoides*

28b. Plants and spikes more slender, basal sheaths often dark brown; male flowers 1–5 per prophyll.

30a. Culm stout (to 1.5 mm in diam.), erect, exceeding leaves; spike very short in relation to culm .................................................. 27. *K. tibetica*

30b. Culm more slender (to 1.3 mm in diam.), not or slightly exceeding leaves; spike more elongate.

31a. Sheaths usually dark chocolate brown, sometimes shiny; glumes wide, blunt, with broad hyaline margin ............... 26. *K. capillifolia*

31b. Sheaths paler, dull; glumes narrower, more acute, not or narrowly hyaline margined.

32a. Spike club-shaped; glumes orange-brown; male flowers usually 3–5 per spikelet; nutlets all with 3 stigmas ................................................ 25. *K. setschwanensis*

32b. Spike linear; glumes dark brown; male flowers usually 1 per spikelet; some nutlets sometimes with 2 stigmas ................................................ 28. *K. myosuroides*

23b. All spikelets unisexual, prophylls enclosing a nutlet and sterile rachilla, male and female spikelets sometimes in separate inflorescences or on separate plants.

33a. Spikes clearly bisexual (androgynous), with female spikelets below and male spikelets at apex.

34a. Prophylls utriculiform, open only in upper half; glumes orange-brown ........ 29. *K. nepalensis*

34b. Prophylls open to base; glumes dark brown ................................................ 30. *K. cercostachys*

33b. Spikes unisexual (occasionally with a few reduced male spikelets at apex).

35a. Leaves flat.

36a. Prophylls narrowly elliptic or oblong, not embracing nutlets, keels obscure ................................................................. 32. *K. fissiglumis*

36b. Prophylls linear or linear-oblong, embracing nutlets, keels obvious and scabrid.

37a. Prophylls 2–3.5 mm, utriculiform when young; female inflorescence linear, 1.7–6.5 cm ...................................................... 31. *K. esenbeckii*

37b. Prophylls 5–5.5 mm, open to base even when young; female inflorescence oblanceolate, 1.5–2 cm ........................................... 33. *K. falcata*

35b. Leaves filiform.

38a. Prophylls utriculiform, open only in upper half.

39a. Midvein of glume conspicuous, ca. 1/3 width of glume, green ........ 34. *K. vidua*

39b. Midvein of glume less than 1/3 width of glume, not conspicuously green.

40a. Plants slender; glumes reddish brown to brown; prophylls elliptic (Sichuan) .................................................. 35. *K. yangii*

40b. Plants rigid; glumes pale brown; prophylls narrowly oblong or lanceolate (more widespread, especially Xizang).

41a. Plants robust (culms 1–2 mm in diam.); inflorescences large, female ones 15–40 × 2–3 mm, male ones 17–30 × 4–5 mm; prophylls 3.5–5 mm ....................... 36. *K. littledalei*

41b. Plants slender (culms less than 1 mm in diam.); inflorescences small, female ones 10–20 × 2–3 mm, male ones 6–13 × 2–5 mm; prophylls 2.5–3 mm ................. 37. *K. prainii*

38b. Prophylls open almost to base.

42a. Spikes club-shaped (ca. 2 × as long as wide).

43a. Dwarf, turf-forming plants; culms commonly under 5 cm; prophylls ca. 2.5 mm (widespread) ....................................... 38. *K. pygmaea*

43b. Erect, tufted plants; culms usually over 7 cm; prophylls over 3 mm (Gansu, Qinghai) .................................................. 39. *K. squamiformis*

42b. Spikes linear (more than 5 × as long as wide).

44a. Plants slender, culms ca. 0.5 mm in diam.; spikes slender, linear ................................................................. 40. *K. vaginosa*

根茎嵩草 gen jing song cao

*Kobresia williamsii* T. Koyama.

Rhizomes elongated, stoloniferous. Basal sheaths few, pale reddish brown, dull, retaining dried leaf blades. Culms loosely tufted, trigonous to subterete, 7–58 cm tall, slender, 1–1.5 mm in diam. Leaves basal or sub-basal, shorter than culms; blade flat, 1.5–4.5(–5) mm wide, midrib distinct abaxially. Inflorescence loosely or densely paniculate, reddish brown with green, club-shaped, 2.6–8 × 0.5–1.2 cm; lowest involucral bract leafy or glumelike with long arista, shorter than or exceeding inflorescence. Lowest spikelets of inflorescence branches bisexual with 1 basal female flower and 1 distal male flower, middle ones unisexual with only 1 female flower, apical ones male; glumes reddish brown, with green midvein, elliptic to oblong, (3.5–)5.5–8.5 × 3.2–4 mm, midvein broad, margin broadly hyaline, apex subacute to rounded-truncate. Prophylls pale green, partly brown, utriculiform, lanceolate, (5.6–)7–10.3 × 1–2 mm, membranous, 2-keeled, keels smooth, apex attenuate into a beak. Nutlets yellowish green, obovoid, trigonous, 3.3–4 × 1.5–2 mm, not beaked. Rachilla in unisexual spikelets, shorter than or subequalling nutlet, flat, prominent, sometimes with a sterile male glume at apex. Stigmas 3. Fl. and fr. May–Aug.

Grassy slopes, damp slopes in *Abies* forests, streambeds, cliffs; 3700–4400 m. Xizang [Bhutan, India (Sikkim), Nepal, Pakistan, Tajikistan].

2. **Kobresia laxa** Nees in Wight, Contr. Bot. India, 119. 1834 [*"Cobresia"*].

嵩穗嵩草 shu sui song cao

*Elyna laxa* (Nees) Kunth; *Hemicarex laxa* (Nees) Bentham; *Kobresia pseudolaxa* C. B. Clarke; *Schoenoxiphium laxum* (Nees) K. V. Ivanova.

Rhizomes shortly elongated. Basal sheaths few, pale to dark brown, dull, retaining dried leaf blades or not. Culms loosely tufted, obscurely trigonous, (4–)13–35 cm tall, slender, ca. 1 mm in diam. Leaves sub-basal, shorter than culms; blade flat, 1.4–4 mm wide, midrib distinct abaxially. Inflorescence a loose or sometimes slightly compact panicle, reddish brown, linear or oblong, 3.5–8 × 1–1.5 cm; inflorescence branches all similar in length, curving outward, lower branches again branched; lowest involucral bract leaflike, sometimes surpassing inflorescence. Inflorescence branches usually androgynous in upper part of inflorescence, those in lower part usually female, sometimes whole inflorescence composed of primarily male or primarily female spikelets; spikelets unisexual; glumes reddish brown, with green midvein, narrowly ovate or oblong, 3.5–5 × 1–1.4 mm, midvein narrow, margin broadly hyaline, apex aristate, acute, or rounded. Prophylls pale green, utriculiform, linear or linear-lanceolate, sometimes slightly curved, (3.5–)4.5–6.6 × 0.5–0.8 mm, membranous, 2-keeled, keels slightly scabrid, margins fused to apex or free in upper half. Nutlets pale yellow or brown, narrowly oblong or elliptic-oblong, trigonous, 2.5–3 × 0.4–0.6 mm, slightly beaked. Rachilla in female spikelets longer than nutlet, exserted from or included in prophyll, green, flat, margins scabrid. Stigmas 3. Fl. and fr. May–Jul.

Moist meadows, on wet rocks; 2200–3700 m. Xizang [Afghanistan, India (Himachal Pradesh, Sikkim), Kashmir, Nepal, Pakistan, Tajikistan].


短穗嵩草 duan geng song cao


Rhizomes short. Basal sheaths stout, pale brown, dull, retaining dried leaf blades, sometimes decaying to fibers. Culms tufted, erect, rigid, trigonous, 22–95 cm tall, 1.1–2.2 mm in diam. Leaves borne on lower half and subequalling culm; blade flat, (3.7–)5–7.5 mm wide, midrib distinct abaxially. Inflorescence densely paniculate, brown, narrow, 6.5–9.5 × 0.8–2.3 cm; lowest involucral bract erect, leaflike, sometimes exceeding inflorescence; branches usually androgynous in upper part of inflorescence, those in lower part usually female, sometimes whole inflorescence composed of primarily female spikelets; spikelets unisexual. Lower inflorescence branches linear, stiffly appressed (lowest to 6 cm), androgynous or female, sometimes again branched, bearing spikelets to base. Female glumes cream or brown, with green midvein, narrowly ovate or oblong, encircling branch, 5.5–10 × 2–3 mm, midvein broad, 3–5-ribbed, apex aristate. Prophylls utriculiform, linear-lanceolate, (6–)8–11.3 × 1–1.6 mm, 2-keeled, keels minutely scabrid, herbaceous and strongly ca. 4-veined between keels, usually minutely hispid near margins above, margins fused from base to just below apex. Nutlets cream or pale brown, very narrowly ellipsoid, trigonous, 5.5–6.5 × 1.3–1.7 mm, shortly stipitate. Rachilla in female spikelets less than 1/2 length of nutlet. Stigmas 3. Fl. and fr. Jun–Oct.

Open stony or sandy slopes in damp conifer (including *Abies*) forests [in Bhutan]; 2700–4100 m. S Xizang (Yadong) [Bhutan, India (Sikkim, West Bengal), Nepal].

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**CYPERACEAE**

44b. Plants stout, culms ca. 1 mm or more in diam.; spikes oblong.

45a. Basal sheaths fibrillose, dull; female glumes 5–6 × 1.5–2 mm, apex acute to obtuse, not hyaline; prophylls 5–6 mm .......................... 41. *K. graminifolia*

45b. Basal sheaths not fibrillose, slightly shiny; female glumes 6.2–8 × 2.5–4 mm, apex broad, very blunt, hyaline; prophylls 7–9 mm .......................... 42. *K. woodii*
锡金嵩草 xi jin song cao


Rhizomes short. Basal sheaths cream, dull, slender, retaining dried leaf blades. Culms tufted, rigid, erect, trigonom, 16–38 cm tall, ca. 1 mm in diam. Leaves borne on lower half, 1/2 as long as to equaling culm; blade flat, 2.4–3 mm wide, midrib conspicuous abaxially. Inflorescence densely paniculate, 1/2 as long as to equaling culm; blade flat, 2–4 mm wide, midrib distinct abaxially. Inflorescence loosely paniculate, yellowish green, linear, 2.5–6 × 1–1.5 cm; lowest involucral bract leafy, usually surpassing inflorescence; branches androgynous; spikelets unisexual. Lower inflorescence branches narrowly oblong, not stiffly appressed (lowest to 4 cm), androgynous, not bearing spikelets in lower 1/3. Female glumes brown, with green midvein, narrowly ovate or oblong, ca. 5.5 × 2 mm, midvein narrow, 3-ribbed, margin hyaline, apex aristate. Prophylls utriculiform, linear-lanceolate, 4.1–5.8 × 1–1.7 mm, 2-keeled, keels minutely scabrid, herbaceous and weakly ca. 4-veined between keels, usually minutely hispid above, margins fused from base to just below apex. Nutlets cream or pale brown, very narrowly ellipsoid, trigonom, 3–3.3 × 0.8–1.5 mm, shortly stipitate. Rachilla in female spikelets more than 1/2 length of nutlet. Stigmas 3. Fl. and fr. Jul–Aug.

黑麦嵩草 hei mai song cao

Rhizomes short. Basal sheaths few, pale brown, dull, not retaining dried leaf blades. Culms tufted, erect, trigonom, 15–45 cm tall, slender, 1–1.5 mm in diam. Leaves basal or sub-basal, shorter than culms; blade flat, 1.5–2 mm wide, midrib distinct abaxially. Inflorescence loosely paniculate, yellowish green, linear, 2.5–6 × 0.4–0.5 cm; lowest involucral bract leafy, longer than inflorescence. Spikelets bisexual with 1 basal female flower and 1–4 distal male flowers, sometimes unisexual with only 1 female flower; glumes yellowish green, oblong, 4.5–5.5 × 2–2.5 mm, apex mucronate. Prophylls yellowish green, utriculiform, oblong or elliptic, 5–6.6 × ca. 2 mm, papery, 2-keeled, keels smooth, many veined between keels, apex attenuate into beak. Nutlets pale to dark brown, obvoid-oblanceolate, obscurely trigonom, 2.8–3.8 × 1–2 mm, not beaked. Rachilla in unisexual spikelets prominent, flat, ca. 2/3 as long as nutlet, with a sterile male glume at apex. Stigmas 3. Fl. and fr. Jul–Sep.

● Slopes, roadsides, grasslands; 3200–3400 m. Sichuan, Xizang, Yunnan.


Cyperaceae 273


Rhizomes short. Basal sheaths few, pale brown, dull, not retaining dried leaf blades. Culms tufted, erect, trigonom or subterete, (1.5–)6–45 cm tall, slender, 0.5–1.1 mm in diam. Leaves basal or sub-basal, shorter than or equaling culms, sometimes curved; blade V-shaped in transverse section, inrolled, 1–2 mm wide, midrib not distinct abaxially. Inflorescence a loose or sometimes slightly compact panicle, yellowish brown, or green and partly brown, linear or narrowly cylindric, sometimes curved, 1–8 × 0.2–0.7 cm; branches mainly androgynous, subequal in length, appressed or slightly spreading; lower inflorescence branches compound or simple, linear-oblanceolate to ovate; lowest involucral bract leaflike, usually surpassing inflorescence. Spikelets usually unisexual (occasionally bisexual); glumes pale yellow to brown, sometimes marked with brown spots and lines, ovate or oblong, 2.3–5.5 × 1–1.7 mm, midvein green, broad, margin hyaline, apex aristate, acute, or rounded. Prophylls pale yellow or pale green, sometimes with reddish brown spots and lines, utriculiform, oblong, narrowly elliptic, or narrowly ovate to lanceolate, 2.4–3.5 × 0.8–1.5 mm, membranous, 2-keeled, keels slightly scabrid or smooth, margins fused to apex. Nutlets pale yellow or brown, narrowly oblong or elliptic-obovoid, trigonom, 1.5–2.5 × 0.5–1 mm, shortly beaked. Rachilla in female spikelets longer than nutlet, included in prophyll, green, flat, margins scabrid. Stigmas 3. Fl. and fr. Jun–Sep.

Open grassy slopes, grasslands under Quercus woods, riversides; 2600–4300 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

This species represents a complex on which further work is required. There are two distinct forms differing in micromorphology of nutlet surface, but these cannot be correlated with the forms that differ (often dramatically) in gross morphology (e.g., in habit—erect vs. weak) or the forms that are predominantly male.


钩状嵩草 gou zhuang song cao


Rhizomes very stout, shortly oblique. Basal sheaths few, pale brown or cream, dull, retaining dried leaf blades, decaying to fibers. Culms tufted, rigid and erect, obtusely trigonom or subterete, (1.5–)6–50 cm tall, 1–2.5 mm in diam. Leaves basal or sub-basal, shorter than culms; blade flat, 2–4 mm wide, midrib distinct abaxially. Inflorescence densely paniculate (very rarely spicate), yellowish brown and partly green, narrowly club-shaped, (1–)2.5–7 × 0.8–1.7 cm; lowest involucral bract glumelike, apex aristate, arista short or long (occasionally subequalling inflorescence); branches oblong or lanceolate, appressed, androgynous or female, lower branches sometimes
distant; spikelets unisexual with only 1 female flower; female glumes yellowish brown, with green midvein, oblong or ovate, 5–8 (excluding awn) × 2.4–3.6 mm, membranous, midvein extending into arista, margin not hyaline, apex aristate. Prophylls yellowish brown, utriculiform, narrowly lanceolate, 5.5–8.5–(10.5) × 1.4–1.5 mm, herbaceous, upper part often hairy, 2-keeled and many veined, keels scabrid, margins fused from base to just below apex. Nutlets chestnut-brown, narrowly oblong, trigonous, 3.1–4.5 × 0.8–1.4 mm, not beaked (but style base sometimes persistent), shortly stipitate. Rachilla in female spikelets longer than nutlet, slightly exerted from prophyll, green, flat, margins ciliate. Stigma 3. Fl. and fr. Jun.–Oct.

Alpine meadows, streamsides, lakesides, grassy slopes, forest margins, among shrubs; 2900–4900 m. Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim), Myanmar, Nepal].


玉龙嵩草 yu long song cao

Schoenoxiphium kuekenthalianum (Handel-Mazzetti) K. V. Ivanova.

Rhizomes shortly and obliquely elongate, bearing pale brown scales (bladeless sheaths). Basal sheaths persistent, brown, not retaining dried leaves. Culms densely tufted, erect, obtusely trigonous, 25–40 cm, slender, ca. 1 mm in diam. Leaves basal, longer than culms; sheaths with reddish brown, membranous margins; blade flat or folded, 1.5–2.5 mm wide, midrib distinct abaxially. Inflorescence densely paniculate, pale brown, linear-lanceolate, 2.6–4 × 0.6–0.8 cm; branches ± equal in length, slightly spreading; lowest involucral bract glumelike, apex aristate. Inflorescence branches androgynous, with 1 (perhaps sometimes more) basal female spikelet, and ca. 6 upper and terminal male flowers. Glumes pale brown or brown, with yellowish brown midvein, ovate or ovate-oblong, 4.5–5.5 × 1.5–2 mm, membranous, midvein narrow, margin hyaline, apex acute or mucronate. Prophylls yellowish brown, oblong or oblong-elliptic, 4.3–5 × 1–1.5 mm, membranous, 2-keeled, keels smooth, margins free from apex almost to base, apical rounded or slightly 2-toothed. Immature nutlets yellowish, oblong-ovoid, ca. 3 × 1 mm. Rachilla sometimes present in female spikelets, very short. Stigmas 3. Fl. and fr. Apr.

● Sandy ground; ca. 2700 m. S Sichuan (Xichang).

This taxon is known only from the immature type specimen; further collections are required to assess its status, in particular its relationship with Kobresia royleana subsp. minshanica.


密穗嵩草 mi sui song cao


Rhizomes short. Basal sheaths prominent and persistent, outer ones dark brown, inner ones orange-brown, margins and apices fibrillose, retaining dried leaf blades. Culms densely tufted, erect, stiff, obtusely trigonous, 14–44 cm, slender, 1–1.8 mm in diam. Leaves basal, shorter than culms; blade stiffly erect, filiform, V-shaped in cross section, 0.5–1 mm wide. Inflorescence a dense panicle, brown, oblong-lanceolate, to 2–4 × 0.6–1 cm; branches short, obliquely appressed; lowest involucral bract glumelike, apex shortly aristate. Lateral branches androgynous with 1 or 2 basal female spikelets and up to 10 male flowers, or unisexual with up to 6 female spikelets. Glumes brown, with conspicuous green midvein, ovate-oblong, 5.5–6 × 2.7–3 mm, papery, midvein broad, margin hyaline, apex acute or mucronate. Prophylls yellowish brown, oblong, 4–4.5 × 1.5–1.8 mm, membranous, strongly 2-keeled, keels minutely scabrid, margins free nearly to base, apex hyaline, truncate. Nutlets cream, oblong, compressed trigonous, 3–3.5 × 1.1–1.7 mm, not or very shortly beaked, very shortly stipitate. Stigmas 3. Fl. and fr. Jun.–Jul.

● Streambeds, river terraces and wet meadows with shrubs, open areas in mixed conifer forests; 3200–4000 m. SW Sichuan (Duocheng, Xiangcheng), NW Yunnan (Lijiang).


玉龙嵩草 yu long song cao

Rhizomes short. Basal sheaths prominent and persistent, brown, not shiny, not retaining dried leaf blades. Culms densely tufted, erect and rigid, trigonous, 20–25 cm tall, ca. 1.5 mm in diam. Leaves basal, longer than culms; blade flat or folded, 1.5–3 mm wide, midrib distinct abaxially. Inflorescence loosely paniculate, brown, lanceolate, ca. 5 cm × 7 mm; lowest involucral bract glumelike, blunt; inflorescence branches linear, androgynous; spikelets unisexual, terminal spikelets male (up to 3), lower ones (up to 9) female. Female glumes brown, with green midvein, ovate-lanceolate or oblong-ovate, 5.5–5.5 × 1.5–2 mm, midvein narrow, margin hyaline, apex subacute or obtuse. Prophylls pale brown, linear-lanceolate, 5.2–6 × ca. 1 mm, papery, apex hyaline, 2-keeled, keels scabrid, margins free to base, overlapping. Immature nutlets narrowly elliptic, obscurely trigonous, ca. 4 mm (including stipe) × 0.8 mm, stipitate, crowned with stout beaklike style base, beak ca. 1 mm. Stigmas 3. Sterile rachilla of female spikelets flat, ca. 2 mm, sometimes with vestigial glume at apex. Fl. and fr. May–Sep.

● Alpine grasslands, marshes at edges of pools; 3300–4300 m. Sichuan, Yunnan.

Both Kükenthal and Ivanova (in schedis, 1939, 1941) referred the type specimen of Kobresia tunicata (Handel-Mazzetti 3525, WU) to *K. kausensisis*, of which it may only be a less-robust form with unisexual spikelets. It is also possible that it is a form of *K. graminifolia* with a branched inflorescence, but further collections are required.


丝叶嵩草 si ye song cao

Rhizomes short. Basal sheaths prominent and persistent, orange-brown, not retaining dried leaf blades, sometimes decaying to fibers. Culms densely tufted, obtusely trigonous, 15–50 cm, slender, 0.6–1 mm in diam. Leaves basal, shorter than or subequaling culms; blade filiform, weak, margin involute, 0.5–5 cm, slender, 0.6–1 mm in diam. Leaves basal, shorter than or caying to fibers. Culms densely tufted, obtusely trigonous, 15–50 cm, orange-brown, not retaining dried leaf blades, sometimes de-cylindric, 1–3 × 0.3–0.7 cm, branches short, appressed; lowest involucral bract glumelike, apex aristate. Lower inflorescence branches with terminal spikelets male, lower spikelets bisexual. Bisexual spikelets 2–7-flowered, basal one female, other 1–6 male. Glumes reddish brown or brown, with yellowish brown midvein, ovate or ovate-oblong, (3–)4–4.5(–6.2) (excluding arista) × 1.5–2.8 mm, membranous, margin broadly hyaline, apex acute or aristate. Prophylls brown or yellowish brown, ovate-oblong or oblong-elliptic, 3–4 × 1–1.8 mm, membranous, 1– or 2-keeled, keels slightly scabrid, margins free to base, apex rounded or slightly 2-toothed. Nutlets dark brown, obovoid or oblong-obovoid, trigonous or biconvex, 2–3.5 (excluding beak) × 1–1.2 mm, very shortly stipitate, shortly beaked, beak slightly conic. Stigmas usually 3, occasionally both 3 and 2 on same inflorescence. Fl. and fr. May–Oct. 2n = ca. 60.

Wet grassy slopes, boggy meadows; 1700–2000 m. Gansu, Hebei, Nei Mongol, Qinghai, Shandong [Mongolia, Russia].

Forms with simple (spicate) inflorescences are similar to Kobresia myosuroides subsp. bistaminata and to K. capillifolia (both of which share the bigeminate tendency). Such forms differ from both taxa in having weaker leaves; and they differ from the latter in having dull, orange-brown, shorter basal sheaths and usually more than 2 male flowers per spikelet.


甘肃嵩草 gan su song cao

Kobresia pseuduncinoides Noctie.

Rhizomes short, thick, woody. Basal sheaths prominent, dark brown, shiny, leathery, not retaining dried leaf blades. Culms densely tufted, erect, sharply triquetrous, (14–)20–70 cm tall, stout, 2.2–4(–6) mm in diam. Leaves basal, shorter than or ± equaling culms; blade flat, sometimes folded at base, 4–9 mm wide, midrib distinct abaxially. Inflorescence densely paniculate (occasionally spicate), brown or dark brown, partly green, narrowly obovoid or lanceolate, 2.7–5 × 1.5–2.8 mm, membranous, 2-keeled, keels subacute, margins open to base. Nutlets narrowly oblong, trigonous, 1.7–4 mm, beak to 0.6 mm, very shortly stipitate. Sterile rachilla sometimes present in male spikelets, to 1/3 as long as nutlet. Stigmas 3. Fl. and fr. May–Sep.

Moist habitats, among scrub; 700–5200 m. Gansu, Qinghai, Shandong, Xinjiang, Xizang, Yunnan [Afghanistan, India (Himachal Pradesh, Uttar Pradesh), Kashmir, Kyrgyzstan, Nepal, Pakistan, Tajikistan].

1a. Spikelets bisexual; culms rigid, acutely trigonous, or subterete in lower part, 5–35 cm tall, 1.5–2.5 mm in diam.; leaf blade 2–4 mm wide .................. 13a. subsp. royleana

1b. Spikelets unisexual; culms trigonous, or subterete in lower part, 30–75 cm tall, slender, 1–1.5–(1.8) mm in diam.; leaf blade 1.5–2(–2.5) mm wide ... 13b. subsp. minshania

13a. Kobresia royleana subsp. royleana

喜马拉雅嵩草 xi ma la ya song cao (原亚种) xia ma la ya song cao (yuan ya zhong)

Trilepis royleana Nees, Edinburgh New Philos. J. 17: 267. 1834; Elyna kokanica Regel; E. stenocarpa Karelin & Kirilov; Kobresia paniculata Meinshausen; K. royleana var. kokanica (Regel) Kükenthal; K. royleana var. paniculata (Meinshausen) Kükenthal; K. stenocarpa (Karelin & Kirilov) Steudel; K. stenocarpa var. royleana (Nees) C. B. Clarke; K. stenocarpa var. simplex Y. C. Yang.

Culms rigid, acutely trigonous, or subterete in lower part, 5–35 cm tall, 1.5–2.5 mm in diam. Leaves basal, blade flat, 2–4 mm wide. Inflorescence a dense panicle, lower branches some-
times slightly distant, 1–3.5 × 0.6–1.2 cm. Terminal spikelets of inflorescence branches male, lateral ones bisexual or unisexual. Lower spikelets of branches usually bisexual with 1 basal female flower and 2 or 3(–6) distal male flowers. Glumes ovate-oblong, 2.6–4.5 × 3.2–3.5 mm. Prophylls 3–5 mm. Nutlets 2.4–4 mm, beak to 1 mm.

Moist habitats; 700–5200 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, India (Himachal Pradesh, Uttarakhand), Kashmir, Kyrgyzstan, Nepal, Pakistan, Tajikistan].


眠山嵩草 min shan song cao


Culms trigonus, or subterete in lower part, 30–75 cm tall, slender, 1–1.5(–1.8) mm in diam. Leaf blade flat, 1.5–2(–2.5) mm wide. Inflorescence narrowly paniculate, compact or slightly loose in lower part, 1.2–3.5 × 0.7–0.9 cm. Lower spikelets of inflorescence branches usually unisexual with 1 female flower only (occasionally bisexual with 1 basal female flower and 2–5 distal male flowers). Glumes ovate to ovate-lanceolate, 3.3–5.1 × 1.7–2.1 mm. Prophylls 2.7–4.4 mm. Nutlets 1.7–3 mm, beak ca. 0.4 mm. Sterile rachilla in female spikelets much shorter than nutlet.

- Moist places, hillsides, among scrub; 2900–3800 m. Gansu, Qinghai, Sichuan, Yunnan.


大花嵩草 da hua song cao


Rhizomes elongate, slender, stoloniferous. Basal sheaths pale brown, retaining dried leaf blades. Culms scattered, erect, trigonous, 3–17 cm tall, 1–1.5 mm in diam. Leaves basal, shorter than culms; blade flat, 1–3 mm wide, midrib distinct abaxially. Inflorescence paniculate, cylindrical to ovoid, 1–2 × 0.6–1 cm; inflorescence branches androgynous or unisexual (whole inflorescence sometimes ± unisexual), lowest branch sometimes slightly distant; lowest involucral bract leaf-like or glumelike, apex long aristate. Spikelets usually unisexual; glumes chestnut-brown with green midvein, ovate to ovate-lanceolate, 4.6–3.2 × 2.3 mm, margin broadly hyaline, apex acute or obtuse. Prophylls yellowish brown, ovate-lanceolate, 3.3–5.6 × 1.2–2 mm, thinly membranous, 2-keeled, keels smooth, margins free or coninate at base. Nutlets elliptic-ovoid or subcircular, flattened, 1.4–2 × 0.8–1 mm, not beaked, conspicuously stipitate, stipe 0.6–1 mm. Sterile rachilla of female spikelets terete, minute, subequalling stipe of nutlet. Stigmas 2, very long. Fl. and fr. Jun–Aug.

Open ground, sandy soils, meadows in river valleys; 2500–4800 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang [Nepal].


Rhizomes elongate, slender, stoloniferous. Basal sheaths yellowish brown or brown, 2–5 cm, retaining dried leaf blades or not. Culms scattered, erect or curved, subterete, slender, 3–20 cm tall, 0.6–1 mm in diam. Leaves basal, shorter than culms; blade filiform, margin involute, 0.4–0.8 mm wide. Inflorescence narrowly paniculate, sometimes spicate, reddish brown, cylindric to narrowly ovoid, 1.5–2 × ca. 0.8 mm; lower inflorescence branches androgynous, or with mixed female and male spikelets, upper part of inflorescence spicate consisting of bisexual and terminal male spikelets; lowest involucral bract glumelike, apex long aristate. Spikelets unisexual and bisexual; glumes reddish brown, with yellowish brown midvein, narrowly ovate, 5.6–6.5 × 2–3 mm, margin hyaline, apex rounded or acute. Prophylls yellow to yellowish brown, narrowly ovate, 4.3–6.5 × 1.6–2.7 mm, papery to leathery, margins free or coninate at base and overlapping. Nutlets broadly oblong, flattened, 2.3–3.1 × 1.8–2 mm, not beaked, stipe 0.6–1 mm. Sterile rachilla of female spikelets terete, minute. Stigmas 2, very long, slender. Fl. and fr. Jun–Sep.

- Sandy or rocky and sandy ground, open grassy plains; 3100–4900 m. Gansu, Qinghai, Xizang.


膨囊嵩草 peng nang song cao

Rhizomes obliquely and shortly elongate. Basal sheaths yellowish brown, dull, retaining dried leaf blades. Culms tufted, obscurely trigonous, 4–12 cm tall, usually slender, 0.6(–1.4) mm in diam. Leaves basal, shorter than culms, curved; blade flat, 2–3 mm wide, midrib distinct abaxially. Inflorescence spicate or sometimes paniculate, 2.5–3.3 × 0.7–2 cm, predominantly unisexual; branches if present short, appressed; lowest involucral bract glumelike, apex aristate to varying degrees. Spikelets unisexual (sometimes bisexual), shortly stipitate; glumes brown to yellowish brown, ovate, 4–7 × 3–3.5 mm. Prophylls brown or yellowish green marked with brown, utriculiform, inflated (not tightly appressed to nutlet at maturity), ovoid, beaked, 5.5–8 × 2.3–3 mm, thickly papery or leathery, 2-keeled, keels smooth, apex weakly notched. Nutlets obovoid, triquetrous, 2.5–4 × 1.8–2.5 mm, not beaked, style base disklike. Sterile rachilla of female spikelets flat, subequalling or exceeding nutlet, sometimes with 1 or 2 male flowers distally. Stigmas 3. Fl. and fr. Jul–Sep.

Alpine meadows, grasslands on slopes, dry banks by streams, scree; 3600–4600 m. Xizang, Yunnan [Bhutan].

This species is similar to Kobresia nitens C. B. Clarke of the W Himalayas, which differs in having bisexual spikelets.

线形嵩草 xian xing song cao

Rhizomes short. Basal sheaths persistent, brown, reddish brown, or yellowish brown, dull, not fibrillose, retaining a few dried leaf blades. Culms tufted, flaccid or slightly stiff, obtusely trigonous, 8–35 cm tall, slender, 0.4–0.8 mm in diam. Leaves basal, slightly shorter than to exceeding culms; blade flat or partly folded, 0.6–2(–3) mm wide, usually flaccid, midrib distinct abaxially. Inflorescence spicate, yellowish green or partly brown, linear or linear-oblong, 1–4(–5) × 0.1–0.3 cm, dense above, basal spikelets usually slightly distant; a few terminal spikelets male, lower ones bisexual; lowest involucral bract glumelike, apex aristate, arista to 8 mm. Bisexual spikelets usually 2-flowered, basal one female, distal one male, male flower with 1 or 2(3) stamens. Glumes yellowish brown laterally, with green midvein, ovate-oblong, 2–3 × 1.5–2.6 mm, midvein broad, 3-ribbed, margin hyaline, apex acute or obtuse, sometimes with very short scabrid aristae; male glume 2.3–3.6 mm, stamen 1. Prophylls pale green or yellowish brown with ferruginous spots and lines, oblong or linear-oblong, 2.2(–2.5) × 0.7–1 mm, membranous, 2-keeled, keels scabrid, margins united above middle, apex obtuse or 2-toothed. Nutlets pale brown, narrowly oblong, trigonous, 1.9–2.8 × 0.6–0.9 mm, beak 0.5–1.5 mm, exserted from prophyll when mature, shortly stipitate. Stigmas 3. Fl. and fr. May–Sep.

Bare mossy peat, wet and open marshes, exposed and dry rocky ridges, grassy slopes; 3600–4600 m. Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim, Uttarakhand), Nepal].


矮生嵩草 ai sheng song cao


Rhizomes short. Basal sheaths prominent, pale brown to brown, dull, retaining dried leaf blades. Culms densely tufted, erect, obtusely trigonous, 2–15 cm tall, 0.8–1.5 mm in diam. Leaves basal, shorter than culms, sometimes recurved; blade flat, midrib distinct abaxially, folded at base, 1.2–2 mm wide. Inflorescence spicate, brown, densely cylindric, 0.8–1.7 × 0.4–0.6 cm, with up to 10 spikelets; lowest involucral bract glumelike, apex aristate. Terminal spikelets of inflorescence male, lower ones bisexual with 1 basal female flower and 2–7 distal male flowers. Glumes brown, with a yellowish green or green midvein, oblong, ovate-elliptic, or ovate, 3–5 × 1.5–2.5 mm, margin broadly hyaline, apex obtuse or rounded, sometimes aristate. Prophylls pale brown, oblong or elliptic, 3–5 × 1.5–2 mm, membranous, glabrous, 2-keeled, keels scabrid, margins open to base. Nutlets brown or grayish brown, narrowly obovoid or elliptic, trigonous, 2.5–3 × 1–1.5 mm, very shortly stipitate, shortly beaked. Stigmas usually 3. Fl. and fr. Jun–Sep.

Sunny slopes, alpine meadows; 2500–4400 m. ?Ningxia, ?Qinghai, Xinjiang, Xizang [Afghanistan, India (Sikkim), Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Tajikistan, Uzbekistan; SW Asia].

This species sometimes has two stigmas, and may then resemble Kobresia pusilla.


蕨状嵩草 jue zhuang song cao


Rhizomes short. Basal sheaths persistent, brown, reddish brown, or yellowish brown, dull, not fibrillose, retaining a few dried leaf blades. Culms tufted, flaccid or slightly stiff, obtusely trigonous, 8–35 cm tall, slender, 0.4–0.8 mm in diam. Leaves basal, slightly shorter than to exceeding culms; blade flat or partly folded, 0.6–2(–3) mm wide, usually flaccid, midrib distinct abaxially. Inflorescence spicate, yellowish green or partly brown, linear or linear-oblong, 1–4(–5) × 0.1–0.3 cm, dense above, basal spikelets usually slightly distant; a few terminal spikelets male, lower ones bisexual; lowest involucral bract glumelike, apex aristate, arista to 8 mm. Bisexual spikelets usually 2-flowered, basal one female, distal one male, male flower with 1 or 2(3) stamens. Glumes yellowish brown laterally, with green midvein, ovate-oblong, 2–3 × 0.5–1 cm, midvein broad, 3-ribbed, margin hyaline, apex aristate or acute, arista to 2 mm. Prophylls yellowish green or yellowish brown with ferruginous spots and lines, oblong or linear-oblong, 2–2.6 × 0.5–0.7 mm, membranous, 2-keeled (sometimes obscurely), keels scabrid, margins open to middle part or below, apex rounded. Nutlets narrowly oblong, trigonous, 1.9–2.4 × 0.6 mm, beak ca. 0.5 mm, exserted from prophyll when mature, shortly stipitate, stipe ca. 0.2 mm. Stigmas 3, short. Fl. and fr. Jul–Oct.

Forest understories, dry riverbeds, on rocks; 2000–4000 m. Sichuan, Xizang, Yunnan [Bhutan, India (Himachal Pradesh, Sikkim, Uttarakhand), Nepal].
A specimen with wide leaves and long spikes from Yunnan was described as *Kobresia filicina var. subfilicinaoides*, but similar forms have been seen from Nepal and are not worth taxonomic recognition.


粗壮嵩草 cu zhuang song cao

*Kobresia robusta* var. *sargentiana* (Hemsley) Kükenthal; *K. sargentiana* Hemsley.

Rhizomes short or obliquely elongated and rarely stoloniferous, thick, woody. Basal sheaths prominent and persistent, yellow to yellowish brown, slightly shiny, to 5 cm, not retaining dried leaf blades. Culms densely tufted, erect or curved, rigid, obtusely trigonous or subterete, 5–60 cm tall, stout, 1.2–3 mm in diam. Leaves basal, longer or shorter than culms; blade rigid, erect or curved, filiform, 0.7–1.7(–2) mm wide, margin involute. Inflorescence densely spike, with ca. 10 spikelets, lower spikelets sometimes distant, very pale orange-brown, cylindrical, 2–5 × 0.4–0.8 cm; terminal spikelets male, lower spikelets bisexual; lowest involucral bract glumelike, apex rounded. Bisexual spikelets with 1 basal female flower and 1–3 distal male flowers. Glumes yellowish brown laterally, with pale yellow to yellowish green midvein, broadly ovate, (7.2–)7.8–10 × 5.5–6.5 mm, midrib broad, 3–9-veined, margin very broadly hyaline, apex obtuse. Prophylls yellowish brown, utricle-like, broadly elliptic or broadly ovate or ovate-elliptic, abruptly narrowed above, 6.5–10 × 2.5–3.5 mm, membranous, obscurely 2-keeled, keels smooth, margins free in upper 1/3 or almost to base. Nutlets grayish brown, oblong or broadly elliptic, trigonous, concave, 4.5–2×2.4 mm, very shortly beaked, stipitate, stipe ca. 1 cm. Stigmas 3. Fl. and fr. May–Sep.

- Sandy soils, herb-rich meadows; 2900–5200 m. Gansu, Qinghai, Xinjiang, Xizang. [?Mongolia].


普兰嵩草 pu lan song cao

Rhizomes short. Basal sheaths prominent, yellowish brown to pale brown, shiny, not retaining dried leaf blades. Culms densely tufted, rigid and erect, subterete, 8–12 cm tall, 1–1.2 mm in diam. Leaves basal, erect, longer than or ± equaling culms; blade filiform, 0.5–0.8 mm wide, margin involute. Inflorescence densely spike, yellowish brown, narrowly elliptic to lanceolate, 1.8–2(–2.5) × 0.2–0.3 cm; terminal spikelets male, lower ones bisexual; lowest involucral bract glumelike, apex obtuse or rounded. Bisexual spikelets with 1 basal female flower and 2 or 3 distal male flowers. Glumes yellowish brown, with pale green or yellowish green midvein, ovate-oblong or oblong, 5–7 × 2.5–3 mm, obtuse and rounded, midvein broad, margin broadly hyaline. Prophylls lower part pale yellow, upper part brown, obovate-oblong, 3.5–4 × ca. 1.2 mm, membranous, apex truncate and hyaline, 2-keeled, keels slightly scabrid, margins united from base to halfway. Immature nutlets elliptic, obliquely trigonous. Stigmas 3. Fl. Jul.

- Grassy slopes; ca. 5000 m. SW Xizang (Burang).

This species is known only from the immature type specimen.


截形嵩草 jie xing song cao

*Kobresia lepidochlamys* F. T. Wang & Tang ex P. C. Li.

Rhizomes short, thick, woody. Basal sheaths prominent, brown or dark brown, margins fibrillose, retaining dried leaf blades. Culms densely tufted, erect and stout, obtusely trigonous, (10–)15–45 cm tall, 1.5–2.5 mm in diam. Leaves basal, shorter than or ± equaling culms; blade filiform, 1–3(–5) mm wide, V- or U-shaped in cross section, midrib not distinct abaxially. Inflorescence a dense spike, sometimes interrupted at base, brown or dark brown, oblong to narrowly oblong, 2–6 × 0.5–1.2 cm; lowest involucral bract glumelike, apex aristate. Spikelets (except a few terminal ones that may be male only) bisexual, with a basal female flower and (1–)3–7 distal male flowers; glumes brown or chestnut-brown, with yellowish green or green midvein, oblong, oblong-elliptic, or oblong-ovate, 5–6 × 2–3 mm, margin hyaline or not, apex obtuse or rounded and aristate; arista sinuate, 1–5 mm, margin hirsute. Prophylls yellow or whitish yellow in lower part, brown above, oblong, 5–8 × 1.8–3 mm, papery, 2-keeled, keels smooth or very minutely scabrid, with up to 8 veins between keels, margins open to base, apex truncate. Nutlets yellow or yellowish brown, oblong, trigonous, 3–4.5 × 2–3 mm, very shortly stipitate, not or shortly beaked. Stigmas 3. Fl. and fr. May–Sep.

- Alpine meadows among shrubs, alpine swampy meadows, wet grassy slopes, grassy areas under woods; 3000–4800 m. Gansu, ?Qinghai, Sichuan, Xizang, Yunnan.

This is like a robust form of *Kobresia schoenoides*, from which it is distinguished by its fibrillose sheaths; longer spikes; midribs of glumes broader, green, developed into an arista; and nutlets larger, narrower. In the description of *K. lepidochlamys*, the male flowers were misinterpreted as perianth scales. A specimen from Yunnan (*Rock 9600*) is intermediate between *K. cuneata* and *K. kansuensis*: it has the spike inflorescence and fibrillose leaf sheaths of the former, but the very robust habit and flat leaves (midribs distinct abaxially) of the latter.


赤箭嵩草 chi jian song cao


Rhizomes short. Basal sheaths prominent, commonly yellowish- to reddish brown (occasionally dark brown), shiny, leathery, not retaining dried leaf blades. Culms densely tufted, erect, subterete or upper part trigonous, 3–60(–70) cm tall, stout, 1–2.5 mm in diam. Leaves basal, erect or sometimes curved, longer or shorter than culms; blade filiform, 1–2 mm wide, midrib not distinct abaxially, margin involute. Inflorescence densely spicate, dark to yellowish brown, oblong to clavate, occasionally ovate or narrowly ovate, 1–4 × 0.2–1 cm. Spikelets (except a few terminal ones that may be male only) bisexual; lowest involucral bract glumelike, apex aristate or not.
Bisexual spikelets with 1 basal female flower and (1–)4–7 distal male flowers; glumes brown, with yellowish green midvein, oblong to narrowly ovate or sometimes broadly ovate, 3–6 × 1.2–3.6 mm, midvein broad, margin broadly to narrowly hyaline, apex obtuse or mucronate. Prophylls yellowish brown to brown, oblong, narrowly elliptic, or lanceolate, (3–)3.5–7.3 × (0.9–)1.4–2.5 mm, papery to membranous, 2-keeled (sometimes obscurely so), keels smooth, sometimes many veined between keels, margins free to base. Nutlets pale yellow to grayish brown, obovoid or oblong-obovoid, 1.7–3.5 × 1–2.1 mm, 1/2–2/3 as long as prophyll, shortly stipitate, shortly beaked, beak 0.5–0.7 mm. Stigmas 3. Fl. and fr. May–Sep.

Boggy places among shrubs, sedge mires, streambeds, shaded places; 2500–5800 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, India (Himachal Pradesh, Sikkim), Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Uzbekistan; SW Asia (Iran)].


四川嵩草 si chuan song cao


Rhizomes short. Basal sheaths prominent and persistent, brown to dark brown, often shiny, apexes and margins sometimes fibrously, not retaining dried leaf blades. Culms densely tufted, stiffly erect, obtusely trigonous, 5–20(–40) cm tall, slender, 0.7–1.3 mm in diam. Leaves basal, shorter than culms; blade folded or margin involute, stiff, 1–2 mm wide, midrib not distinct abaxially. Inflorescence usually a dense spike (occasionally with 1 or 2 branches at base), greenish brown, cylindric, 1–3.5 × 0.3–0.6 cm; lowest involucral bract glume-like, apex long or shortly aristate; terminal few spikelets male, lower ones bisexual with 1 female and 2–5 male flowers. Glumes brown, with yellowish green to green midvein, oblong-ovate to oblong-lanceolate, 3–4.5 × 1.5–2.5 mm, papery, midvein broad, margin usually narrowly hyaline, apex usually subacute, sometimes shortly aristate. Prophylls yellowish brown, oblong, 2–4.5 × 1–1.6 mm, membranous, 2-keeled, keels smooth or slightly scabrid, sometimes veined between keels, margins free nearly to base, apex rounded or acute. Nutlets yellowish, narrowly obovoid, compressed trigonous, 2.1–3 × 1.3–1.1 mm, not beaked, subsessile. Stigmas 3. Fl. and fr. May–Sep.

- Grassy slopes, alpine meadows, swampy meadows and marshes by lakes, dry limestone slopes, forest (including Pinus) understoreys, Quercus scrub; 2300–4300 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.

This is a slender version of Kobresia schoenoides with narrower spikelets—linking that species with K. capillifolia and K. tibetica, together forming a complex that requires further work.

Plants with slender culms, filiform leaves, and small spikes from Pinus forests (i.e., dry habitats) in NW Yunnan were described as Kobresia pinetorum; but specimens with equally small spikes have been seen from wet habitats, and forms from Pinus forests with robust culms and larger spikes are also known: all of these seem best referred to a variable K. setschwanensis.


线叶嵩草 xian ye song cao


Rhizomes short. Basal sheaths prominent and persistent, brown to dark brown, often shiny, apices and margins sometimes fibrously, not retaining dried leaf blades. Culms densely tufted, erect, slightly stiff, obtusely trigonous, (5–)10–45 cm tall, slender, 0.6–1 mm in diam. Leaves basal, shorter than to equaling culms; blade stiffly erect, filiform (tubular in section), margin involute, 0.7–1 mm wide. Inflorescence a dense spike, lowest spikelets sometimes slightly distant, brown, narrowly cylindrical, 2.5–4.5 × 0.2–0.4 cm; lowest involucral bract glume-like, apex aristate or not; terminal few spikelets male, lower ones bisexual. Bisexual spikelets with 1 basal female floret and (1 or)2–4 distal male florets. Glumes pale brown to dark brown, with yellowish green to green midvein, usually broadly oblong-lanceolate to ovate, 4–6 × 2.5–2.8 mm, papery, midvein narrow or wide, margin broadly hyaline, apex usually rounded. Prophylls brown, oblong, lanceolate, or elliptic, 2.5–5.3 × 0.8–1.8 mm, membranous, 1- or 2-keeled, keels smooth or slightly scabrid, margins free nearly to base, apex rounded or truncate. Nutlets brown to dark brown, elliptic to obovoid, trigonous, (2–)3.5–3.5 × 0.8–1.6 mm, shortly beaked, subsessile. Stigmas (2 or)3. Fl. and fr. May–Sep.

Dry and open grassy and rocky slopes, slopes in Juniperus scrub, disturbed slopes in Picea forests, grassy areas within Abies forests; 2000–4800 m. Gansu, Qinghai, Sichuan, Xizang [Afghanistan, Bhutan, India (Himachal Pradesh, Sikkim), Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Tajikistan].

Kobresia kashgarica, described from high elevations in Xingjiang, appears to be an extremely reduced form of K. capillifolia but is also similar to K. myosuroides subsp. bistaminata. Reduced forms of many species can be found; they appear to represent phenotypic responses to extreme habitats and (while often difficult to identify) do not merit specific treatment.


西藏嵩草 xi zang song cao

Kobresia capillifolia (Decaisne) C. B. Clarke var. tibetica (Maximowicz) Kükenthal.

Rhizomes short. Basal sheaths prominent, brown to dark brown, dull, not retaining dried leaf blades. Culms densely tufted, rigid and erect, subterete or upper part trigonous, 10–40 cm tall, 1–1.5 mm in diam. Leaves basal, erect, shorter than culms; blade filiform (tubular in section), 0.5–1 mm wide. Inflorescence spicate, brown or dark brown, broadly and densely cylindric, 1.2–2.5 × 0.3–0.4 cm; terminal spikelets male, lower ones bisexual; lowest involucral bract glume-like, apex aristate or not. Bisexual spikelets with a basal female flower and 2–4 distal male flowers. Glumes brown or dark brown, with pale
midvein, oblong to ovate-oblong, 3.5–4.5 × 1.5–2.5 mm, obtuse, midvein narrow, margin narrowly hyaline or not. Prophylls pale colored to yellowish brown or occasionally brown, oblong-ovate, 2.1–3 × 1.1–1.4 mm, hyaline to very thinly membranous, usually without keels and veins, rarely obscurely keeled, margins free to base. Nutlets brown or dark brown, oblong or narrowly ovoid-oblong, flattened-trigonous, slightly shorter than prophylls, 1.5–2.5(–3) × 1.1–1.4 mm, very shortly stipitate, shortly beaked. Stigmas 3. Fl. and fr. May–Aug.

- Alpine swampy meadows, weedy plains, marshes, riversides; 2500–4600 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang.

This species is distinguished from Kobresia capillifolia with difficulty: the culm is wider, and longer in relation to the leaves, and the spike is shorter in proportion to breadth, and much shorter in proportion to the length of the culm (resembling an Eleocharis).


嵩草 song cao

Rhizomes short. Basal sheaths prominent and persistent, reddish brown to dark brown, dull or slightly shiny, margins and apices sometimes fibrillose, not retaining dried leaf blades. Culms densely tufted, erect, slightly stiff, obtusely trigonous or subterete, 3–30–(40) cm tall, 0.5–1 mm in diam. Leaves basal, shorter than or as long as culms; blades stiffly erect, filiform (tubular in cross section), 0.25–0.7 mm wide. Inflorescence a dense spike, reddish brown to brown, narrowly cylindric, 1–3 × 0.2–0.3 cm, lowest spikelets sometimes slightly distant; lowest involucre bract glumelike, apex aristate or not; a few terminal spikelets male, others bisexual (lower ones occasionally female only). Bisexual spikelets with basal female flower and 1(or 2) male flowers. Glumes yellowish- or reddish brown to dark brown, with pale midvein, ovate or oblong-ovate, 2.4–1.2–2.7 mm, submembranous, midvein very narrow, margin broadly to not or narrowly hyaline, apex acute or rounded. Nutlets brown to dark brown, slightly shiny, oblong-obovoid, trigonous or flattened-trigonous, 1.8–3 (in- cluding beak) × 0.8–1 mm, shortly beaked, subsessile. Stigmas 2 or 3 (sometimes both on same plant). Fl. and fr. May–Sep. 2n = 56.

- Moist or dry open places in calcareous soils, alpine meadows, on rocks, dry ridges, grassy slopes, among shrubs; 1500–3500 m. Gansu, Hebei, Jilin, Xinjiang, Xizang.

The frequent bistigmatic tendency found in Chinese plants has not been noted elsewhere in the range of the widespread circumboreal Kobresia myosuroides. A similar tendency (though to a lesser degree) is also found in Chinese K. capillifolia. Further work may confirm that specific rank for the bistigmatic “Greater Tibetan” taxon is more appropriate.


尼泊尔嵩草 ni bo er song cao

Uncinia nepalensis Nees in Wight, Contr. Bot. India, 129. 1834; Carex linearis Boott (1858), not Clairville (1811); C. linearis var. elachista C. B. Clarke; Kobresia nepalensis var. elachista (C. B. Clarke) Kükenthal.

Rhizomes short. Basal sheaths prominent and persistent, pale brown or brown, dull, fibrillose, not retaining dried leaf blades. Culms densely tufted, erect and rigid, occasionally filiform, obtusely trigonous, (2–)30–44 cm tall, 0.7–1.5 mm in diam. Leaves basal, ± equaling culms; blade filiform, margin involute, 0.3–1.1 mm wide. Inflorescence spicate, androgynous, linear, 1.5–8 × 0.2–0.5 cm, dense above, looser below; lowest involucral bract glumelike, apex long aristate. Spikelets all unisexual, 1-flowered. Male glumes yellowish brown laterally, with green midvein, narrowly oblong, ca. 7.5 × 1.5 mm, sides papery, margin not hyaline, apex obtuse. Female glumes brown laterally, with green midvein, ovate to lanceolate, 3.3–4 × 2–2.4 mm, midvein broad, margin hyaline or not, apex mucronate, acute, or obtuse. Prophylls lower part pale green, apex brown,
Rhizomes short. Basal sheaths prominent and persistent, brown or dark brown, shiny, sometimes decaying to fibers, not retaining dried leaf blades. Culms densely tufted, erect, trigonous (sometimes obtusely), 3–32 cm tall, slender, 0.5–1 mm in diam. Leaves basal, flat equaling culms; blade flat, 1.5–5 mm wide, midrib distinct abaxially. Inflorescence spicate, unisexual or androgyrous, male and female spikes sometimes borne on same plant; all spikes 1-flowered (occasionally a few at base bisexual with a single male flower). Male spikes compact, 3.5–5 × ca. 0.4 cm; male glumes yellowish brown, narrowly oblong, 7.8–8.5 × 1.5–2 mm, 1-veined, margin broadly hyaline, apex obtuse. Female and androgyrous spikes linear, 1.7–6.5 × 0.15–0.4 cm, spikelets usually loosely arranged; lowest involucral bract glumelike, apex aristate. Female glumes brown laterally, with green midvein, oblong or ovate, 2.2–4 × 1–2 mm, midvein narrow, margin narrowly hyaline, apex mucronate, acute, or obtuse. Prophylls utriculiform when young, splitting to base when mature, pale brown, linear-oblong, 2.3–7 × 0.4–0.7 mm, membranous, 2-keeled, keels ciliate, apex truncate and rounded. Nutlets narrowly oblong or elliptic, curved or not, very shortly stipitate and beaked, 2.5–3.7 (excluding beak) × 0.7–1 mm, stipe ca. 0.5 mm, beak 0.8–2 mm. Stigmas 3, twisted, white in field, thick. Sterile rachilla of female spikelets linear, minute, to 1/4 as long as nutlet. Fl. and fr. May–Oct.

Wet rocks, crevices of cliffs, grassy slopes, lakeshores, on trees; 2800–4000(–4900) m. Sichuan, Xizang, Yunnan [Butantan, India (Himalachald Prades, Sikkim, Uttarakhand), Myanmar, Nepal].


柄果嵩草 bing guo song cao


Rhizomes short. Basal sheaths prominent and persistent, brown or dark brown, shiny, sometimes decaying to fibers, not retaining dried leaf blades. Culms densely tufted, erect, trigonous (sometimes obtusely), 3–32 cm tall, slender, 0.5–1 mm in diam. Leaves basal, flat equaling culms; blade flat, 1.5–5 mm wide, midrib distinct abaxially. Inflorescence spicate, unisexual or androgyrous, male and female spikes sometimes borne on same plant; all spikes 1-flowered (occasionally a few at base bisexual with a single male flower). Male spikes compact, 3.5–5 × ca. 0.4 cm; male glumes yellowish brown, narrowly oblong, 7.8–8.5 × 1.5–2 mm, 1-veined, margin broadly hyaline, apex obtuse. Female and androgyrous spikes linear, 1.7–6.5 × 0.15–0.4 cm, spikelets usually loosely arranged; lowest involucral bract glumelike, apex aristate. Female glumes brown laterally, with green midvein, oblong or ovate, 2.2–4 × 1–2 mm, midvein narrow, margin narrowly hyaline, apex mucronate, acute, or obtuse. Prophylls utriculiform when young, splitting to base when mature, pale brown, linear-oblong, 2.3–7 × 0.4–0.7 mm, membranous, 2-keeled, keels ciliate, apex truncate and rounded. Nutlets narrowly oblong or elliptic, curved or not, very shortly stipitate and beaked, 2.5–3.7 (excluding beak) × 0.7–1 mm, stipe ca. 0.5 mm, beak 0.8–2 mm. Stigmas 3, twisted, white in field, thick. Sterile rachilla of female spikelets linear, minute, to 1/4 as long as nutlet. Fl. and fr. May–Oct.

Grassy slopes, on rocks and cliff ledges; 3200–4300 m. Zizang, Yunnan [Butantan, India (Himalachald Prades, Sikkim, Uttarakhand), Nepal].


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*Kobresia prainii* var. *elliptica* Y. C. Yang; *K. utriculata* C. B. Clarke.

Rhizomes short. Basal sheaths prominent and persistent, pale brown, dull, not retaining dried leaf blades. Culms densely tufted, erect, rigid, subterete, 3–10(–25) cm tall, slender, 0.5–1 mm in diam. Leaves basal, shorter to longer than culms; blade erect or recurved, filiform, less than 0.5 mm wide, margin involute. Inflorescence spike-like, unisexual; all spikelets 1-flowered. Male spikes cream to pale brown, narrowly elliptic, often curved, 6–13 × 2–5 mm; male glumes whitish or pale brown, linear-lanceolate, 5.5–7.5 × 0.8–1 mm, membranous, apex obtuse. Female spike slightly lax, pale brown, linear-elliptic or narrowly oblong, 1–2 × 0.2–0.3 cm; lowest involucral bract glumelike, blunt; female glumes brown or yellowish brown laterally, with paler midvein, ovate to lanceolate, 3.5–6 × 1–1.5 mm, midvein narrow, margin narrowly hyaline, apex acute or obtuse. Prophylls lower parts yellowish green, upper parts brown, utriculiform, oblong, 2.5–3 × 0.8–1 mm, membranous, 2-keeled, keels ciliate, margins fused to apex, or obtuse. Nutlets brown, oblong or elliptic, trigonous, 1.8–2.4 × 0.7–1 mm, not stipitate, not beaked. Stigmas 3. Sterile rachilla of female spikelets much shorter than as a slender subspecies of the latter, when it could equally well be recognized as a distinct species.

Dry and open grassy places, wet alpine meadows, turf in wet habitats, rocky slopes, on sand and gravel beside rivers; ca. 3000–5600 m. Gansu (Hebei, Nei Mongol, Qinghai, Shansi, Sichuan, ?Xinjiang, Xinjiang, Yunnan [Bhutan, India (Himachal Pradesh, Sikkim, Uttarakhand), Kashmir, Myanmar, Nepal, Pakistan].


夏河嵩草 か ひ ろ こ ぼ ね


Rhizomes short, plants densely tufted. Basal sheaths persistent, brown, dull, not retaining dried leaf blades. Culms stiffly erect, obtusely trigonous, very short, 9–16 cm tall, ca. 0.8 mm in diam. Leaves basal, ca. as long as culms; blade erect, filiform, ca. 0.5 mm wide, margin involute. Inflorescence a dense spike, brown, cylindric, 1–1.5 × 0.3–0.5 cm, androgy nous; lowest involucral bract glumelike, apex shortly aristate; spikelets usually all unisexual, terminal few male, lower ones female (occasionally with a single reduced male flower within prophyll). Male glumes brown, with yellowish green midvein, lanceolate, ca. 3.5 × 1.5 mm, apex rounded. Female glumes brown, with yellowish green midvein, ovate or oblong-ovate, 3–3.5 × 1.8–2.5 mm, papery, midvein broad, margin very narrowly hyaline, apex rounded. Prophylls brown, oblong, 3.3–8 × 1.2–1.5 mm, membranous, 2-keeled, keels smooth, margins free to base. Nutlets brown to dark brown, shiny, oblong-elliptic, trigonous, 2.3–2.5 × 1.3–1.6 mm, not beaked, not stipitate. Stigmas 3. Sterile rachilla of female spikelets much shorter than to subequalling nutlet, sometimes bearing a vestigial male glume. Fl. and fr. Jul–Oct.

- Grass slopes; 2900–3600 m. Gansu (Xiahe), E Qinghai (Zêkog).

This appears to form a link between *Kobresia pygmaea* and *K. setschwanensis*; it seems more logical to recognize it as a distinct species than as a slender subspecies of the latter, when it could equally well be recognized as a robust subspecies of the former.


发秆嵩草 は か む さ こ こ


Rhizomes short, or shortly and obliquely elongated, plants forming a turf. Basal sheaths prominent and persistent, reddish brown or pale brown, dull, fibrous, not retaining dried leaf blades. Culms densely tufted, erect or curved, subterete, 3.5–10 cm tall, slender, ca. 0.5 mm in diam. Leaves basal, equaling or exceeding culms; blade filiform, flaccid, ca. 0.5 mm wide, margin involute. Inflorescence spike-like, linear, rather lax, usually unisexual, occasionally gynaecandrous or androgy nous, plants with male and female inflorescences on same individual, or sometimes dioecious; spikelets unisexual. Male spikes 1.5–3 × ca. 0.2 cm; male glumes oblong-lanceolate, 6–8 × 1.2–2 mm,
midvein green, margin and apex hyaline. Female spikes 2–3.5 × ca. 0.2 cm; lowest involucral bract glumelike, apex acute or shortly aristate; female glumes brown, with pale brown or pale green midvein, lanceolate, 5–6.2 × 1.7–2 mm, midvein narrow, margin broadly hyaline, apex subacute or obtuse. Prophylls lower part yellow, upper part and margin brown, linear, 4.7–5.7 × ca. 0.7 mm, 2-keeled, keels scabrid, margins free to base, apex truncate, hyaline. Nutlets narrowly oblong or obovate, trigonous, shortly stipitate and beaked, 3.5–4 (excluding beak) × 0.6–1.2 mm, beak 0.5–1 mm. Stigmas 3. Sterile rachilla of female spikelets to 1/2 as long as nutlet. Fl. and fr. Jul–Sep.

Dry slopes, on rocks in alpine meadows; 4000–4800 m. Xizang, Yunnan [India (Sikkim), ?Nepal].


禾叶嵩草 he ye song cao

Rhizomes short. Basal sheaths prominent and persistent, pale brown or yellowish brown, dull or slightly shiny, margins and apices fibrilllose, not or retaining a few dried leaf blades. Culms densely tufted, erect and rigid, obscurely trigonous, (7–)20–45 cm tall, 1–1.5 mm in diam. Leaves basal, shorter to on same plant. Male inflorescence narrowly cylindric or narrowly androgynous or gynaecandrous), male and female spikes borne on same plant. Male inflorescence ca. 4 × 0.3 cm; male glumes oblong-obovate, ca. 8 × 2.5 mm, margin narrowly hyaline, apex rounded. Female inflorescence dense, lower spikelets sometimes distant, brown, ca. 6 × 0.6 cm; lowest involucral bract glumelike, apex aristate, arista ca. 5 mm; female glumes brown laterally, with green midvein, oblong-ovate, 6.2–8 × 2.5–3.9 mm, midvein broad, margin very narrowly hyaline or not hyaline, apex obtuse. Prophylls lower part pale brown, apex brown, linear-oblong, 7–10 × 1–1.5 mm, papery, 2-keeled, keels minutely scabrid, margins free to base, overlapping. Nutlets linear, obscurely trigonous, body ca. 2.5 × 0.7 mm, with stipe ca. 1 mm, beaked with stout style base (ca. 1.5 mm). Stigmas 3. Fl. and fr. May–Sep.

Grasslands, alpine meadows; 3300–4800 m. S Xizang (Yadong) [Bhutan].


高原嵩草 gao yuansong cao


Rhizomes short. Basal sheaths pale brown to brown, dull, retaining dried leaf blades. Culms densely tufted, erect, ob- tusey trigonous, 2–15 cm tall, 0.7–1 mm in diam. (relatively stout for length). Leaves basal, shorter than or ± equaling culms, sometimes recurved; blade flat, folded at base (V-shaped in cross section), 1–1.5(–2) mm wide, midrib distinct abaxially or not. Inflorescence densely spicate (occasionally branched in lower part), brown, narrowly elliptic or narrowly ovate-oblong, 0.5–1.2 × 0.3–0.4 cm; lowest involucral bract glumelike, apex shortly aristate. Terminal spikelets of inflorescence male, lower ones bisexual with 1 basal female flower and (1 or)2–5 distal male flowers. Glumes brown or pale brown, with yellowish green or green midvein, oblong, ovate, or lanceolate, 3.2–5 × 1.5–2.5 mm, margin hyaline or not, apex obtuse or acute. Prophylls pale brown, oblong, ovate-oblong, or elliptic, 2.9–4 × 1–2 mm, membranous, abaxially sometimes hairy, 2-keeled, keels scabrid, margins open to base, apex truncate or 2-toothed. Nutlets brown and shiny, elliptic or oblong-obovate, flattened, body 1.6–2.5 × 0.8–1.5 mm, shortly stipitate, very shortly beaked. Stigmas 2. Fl. and fr. May–Oct.

- Exposed dry slopes, alpine meadows, shaded places, marshes; 3100–5300 m. Gansu, Hebei, Nei Mongol, Qinghai, Sichuan, Xizang.

This species is similar to Kobresia humilis, differing largely in its bistigmatic nutlets.


喀拉昆仑嵩草 ka la kun lun song cao

Rhizomes short. Basal sheaths pale brown to brown, dull, retaining dried leaf blades. Culms densely tufted, dwarf, erect and rigid, subterete in lower part, trigonous above, (2–)3–15(–20) cm tall, 0.5–0.7 mm in diam. Leaves basal, usually
shorter than culms; blade V-shaped in section, recurved, 1–2.5 mm wide, midrib not distinct axially. Inflorescence spicate (rarely compound), brown or dark brown, densely and broadly cylindric, 0.5–1.2 × 0.2–0.4 cm; lowest involucral bract glume-like. Terminal spikelets of inflorescence male, lower ones bisexual with 1 basal female flower and (1 or)2( or 3) distal male flowers. Glumes brown or dark brown, with pale midvein, ovate, 2.5–3 × ca. 2 mm, midvein narrow, margin very narrowly or not hyaline, apex obtuse. Prophylls pale brown at upper part, narrowly elliptic, ca. 3.3 × 0.9 mm, membranous, glabrous, hyaline at base, obscurely 2-keeled, margins connate in lower 1/4(–1/2). Nutlets brown or pale brown, oblong-elliptic, flattened, body ca. 1.5 × 0.9 mm, stipe ca. 0.5 mm, very shortly beaked. Stigmas 2. Fl. and fr. Jul–Sep.

High alpine turf; (3100–)3800–5000 m. Xinjiang, Xizang [Afghanistan, India (Himachal Pradesh), Kashmir, †Nepal, Pakistan, Tajikistan].

This is, perhaps, a western form of Kobresia pasilla, but it is also close to K. myosuroides subsp. bistaminata.


豪草属 tai cao shu

Dai Lunkai (戴伦凯), Liang Songyun (梁松筠 Liang Song-jun), Zhang Shuren (张树仁), Tang Yancheng (汤彦承 Tang Yen-cheng);
Tetsuo Koyama, Gordon C. Tucker

Herbs, perennial; rhizome usually stoloniferous. Culms tufted or sparse, lateral or central, erect, trigonous, bladeless sheathed at base. Leaves basal or basal and cauline, flat, rarely involute or revolute on margins, linear or lorate, rarely lanceolate, sheathed at base. Involutal bracts leathrice, rarely scale-shaped or setaceous, sheathed or not. Flowers unisexual, 1 male flower or 1 female flower in a unisexual spikelet, female spikelet included by prophyll, prophyll wholly connate at margins into utricle, sometimes reduced spikelet axis present in utricle, with scalelike bractlet at base. Spikes 1 to numerous, usually numerous spikes arranged in spicate, racemose, or paniculate inflorescence, composed of many unisexual or bisexual spikes, bisexual spike androgyrous or gynaecandrous, usually plants monoecious, rarely dioecious, pedunculate or sessile, with or without sheathlike or utriculiform cladoprophyll at base; male flower with (2 or)3 stamens, filaments distinct; female flower with 1 pistil, style slightly slender, persistent or deciduous, base usually not thickened; stigmas 2 or 3. Utricles trigonous, plano-convex or biconvex, with slightly long or short beak. Nutlets rather tightly or loosely enveloped in utricle, trigonous or plano-convex.

About 2,000 species: cosmopolitan; 527 species (260 endemic) in three subgenera and 69 sections (two endemic) in China.

1a. Spikes numerous, all bisexual, sessile, usually densely arranged in spicate inflorescence, cladoprophyll not present; stigmas usually 2, rarely 3 .......................................................... 3. C. subg. Vignea

1b. Spikes few to numerous, unisexual or bisexual, pedunculate, rarely shortly pedunculate to subsessile, rarely single and terminal, usually loosely arranged in racemose or paniculate inflorescence, rarely in spicate inflorescence, cladoprophyll present; stigmas usually 3, rarely 2.

2a. Spikes bisexual and androgyrous, very rarely unisexual, usually arranged in complex inflorescence, cladoprophyll utriculiform at spike base, with a female flower .................................................. 1. C. subg. Vigneastra

2b. Spikes unisexual, or unisexual and bisexual, rarely all bisexual, spikes 1 to several borne in an involucral bract sheath, rarely arranged in complex inflorescence, cladoprophyll sheathlike, without female flower .......................................................... 2. C. subg. Carex


复序豪草亚属 fu xu tai cao ya shu

Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker


Inflorescence simple or compound. Spikes few to numerous, usually bisexual and androgyrous, rarely unisexual; cladoprophyll utriculiform, with or without a developed female flower.

About 100 species: tropical and subtropical Asia; 36 species (16 endemic) in ten sections (one endemic) in China.

Key to sections

1a. Each cladoprophyll with a developed female flower inside; inflorescence spicate; spikes numerous and densely arranged .......................................................... 1. C. sect. Japonicae

1b. Cladoprophylls without flowers or some with flowers; inflorescence paniculate or racemose, if inflorescence spicate then spikes fewer.

2a. Cladoprophyll below terminal spike with a developed female flower inside, others without flower;
rachilla present at base of nutlet; inflorescence racemose.

3a. Terminal spike androgyrous; utricle with smooth straight beak; nutlets with flat faces ............... 2. C. sect. Mundae

3b. Terminal spike male; utricle with scabrous geniculate beak; nutlets with concave faces ........ 3. C. sect. Hangzhouenses
2b. Cladoprophyls without flowers; rachilla absent; inflorescence paniculate or spicate.

4a. Inflorescence spicate; spikes fewer, densely arranged in capitate spicate inflorescence ................................ 10. C. sect. Scabrellae

4b. Inflorescence paniculate.

5a. Spikes unisexual, male ones at upper parts of inflorescence branches, female ones at lower parts ........................................................................................................................................ 9. C. sect. Hypolytroides

5b. Spikes bisexual, androgynous.

6a. Culm lateral; cauline leaves reduced and spathelike; involucral bracts spathelike.

7a. Radical leaves fasciated, leaf blades elliptic to linear-elliptic ......................................................... 7. C. sect. Hemiscaposae

7b. Several radical leaves forming a high shoot, leaf blades linear ................................................. 8. C. sect. Surculosae

6b. Culm central; cauline leaves well developed and leafy; involucral bracts leafy.

8a. Leaf blades and involucral bracts elliptic to linear-elliptic, with prominent transverse veins; inflorescence branches with fewer spikes ........................................................................... 6. C. sect. Euprepes

8b. Leaf blades and involucral bracts linear, without transverse veins; inflorescence branches bearing numerous spikes, very rarely bearing few spikes.

9a. Spikes cylindric, larger, 2–8 cm, with numerous spikelets ................................................. 4. C. sect. Polystachyae

9b. Spikes oblong, smaller, less than 2 cm, with fewer spikelets .................................................... 5. C. sect. Indicae


日本薹草组 ri ben tai cao zu
Zhang Shuren (张树仁); Tetsuo Koyama

Plants small. Involucral bracts leafy, without sheaths. Inflorescence spicate, single, with many densely arranged spikes. Spikes arising from utriculiform cladoprophyls; cladoprophyll with 1 developed female flower inside.

One species: China, Japan, Philippines, Vietnam.


砂地薹草 sha di tai cao

Carex nikoensis Franchet & Savatier; C. satsumensis var. longiculma Hayata; C. satsumensis var. nakaii Hayata.

Rhizome elongate and creeping. Culms loosely tufted, triangular, 7–20 × ca. 0.15 cm, glabrous, striate. Leaves shorter or longer than culms, flat, 1.5–7 mm wide, slightly stiff, glabrous; basal leaf sheaths blackish brown, fibrirform. Involucral bracts linear, shorter than inflorescence, without sheaths. Inflorescence spicate, terminal, oblong-cylindric, 3–8 × 1.7 cm. Spikes numerous, androgynous, dense and patent, oblong, arising from cladoprophyls with a developed female flower inside, several basal ones sometimes branched; male part of spikelet tiny, 2–3 mm, with 4 or 5 flowers; female part with numerous and dense flowers; male glumes pale yellow or pale brown, lanceolate, 2.5–3 mm, membranous, apex acuminate; female glumes pale yellow or pale brown laterally, ovate, 2–2.5 mm, membranous, with 1 midrib, margins hyaline, apex acute. Utricles pale yellow-brown at maturity, patent, slightly longer than glumes, oblong-lanceolate, bluntly trigonous, 2.5–3 mm, membranous, with 2 raised lateral veins and several fine veins abaxially, nerveless and paler adaxially, base contracted abruptly into a short stipe, apex attenuate into a long beak, orifice obliquely truncate. Nutlet pale yellow at maturity, oblong, bluntly trigonous, ca. 1.5 mm, base attenuate, apex not apiculate; style base slightly thickened; stigmas 3.

Sandy places. Taiwan [Japan, Philippines, Vietnam].


秀丽薹草组 xiu li tai cao zu
Zhang Shuren (张树仁); Tetsuo Koyama

Inflorescence racemose. Spikes 3–8, bisexual, androgynous, long pedunculate, single or binate, terminal one usually 1- or 2-branched at base, branched spike arising from utriculiform cladoprophyll with a female flower inside, others arising from involucral bract sheaths. Rachilla often present at nutlet base.

Four species: Himalayas and adjacent China; two species (one endemic) in China.

1a. Rhizome creeping; spikes 3–7, lowest one single, middle ones binate, upper ones binate or ternate; utricle elliptic, glabrous; leaf blade 2.5–3.5 mm wide; basal persistent sheaths pale brown ........................................................................... 2. C. munda

1b. Rhizome not creeping; spikes 5 or 6, all single; utricle obovate-lanceolate, pubescent; leaf blade 1–2 mm wide; basal persistent sheaths dark brown ......................................................................... 3. C. yulungshanensis


秀丽薹草 xiu li tai cao

Rhizome creeping. Culms 20–40 cm, less than 1 mm thick,
trigonous, tenuous, soft, smooth. Leaves slightly longer than culms, 2.5–3.5 mm wide, glabrous; basal persistent leaf sheaths pale brown. Involucral bracts leafy, longer than spikes, with long sheaths. Spikes 3–7, bisexual, androgyneous, distant, linear-cylindric, 1.5–2 cm, lowest one single and often arising from base of culm, middle ones binate, upper ones binate or ternate, terminal one with 1 or 2 branches, male part longer than female part, branched spikes arising from cladoprophylls with a developed female flower inside; male part of lateral spikes shorter than female part, lateral spikes borne from sheaths; male glumes yellowish brown, ovate-lanceolate, 3–3.5 mm, membranous, with 1 midrib, acuminate; female glumes yellowish brown laterally, green at middle, ovate or oblong, 2.5–3 mm, 3-veined, margins hyaline, apex obtuse or emarginate, apiculate. Utricles yellowish green, upright, longer than glumes, elliptic, 2–8 cm, base shortly stipitate, apex apiculate; style base truncate. Nutlet pale brown at maturity, ovate, trigonous, 3–4 mm, membranous, with 2 lateral veins and several fine veins abaxially, base contracted into a short stipe, apex abruptly contracted into a short excurved beak, orifice truncate. Nutlet pale brown at maturity, ovate, trigonous, ca. 2 mm, base shortly stipitate, apex apiculate; style base slightly thickened; stigmas 3. Rachilla if present 0.2–0.3 mm, flat.

Abies forests, alpine shrubs and meadows; 3500–3900 m. SE Xizang [Bhutan, NE India, Nepal].


杭州薹草组 hang zhou tai cao

Zhang Shuren (张树仁); Gordon C. Tucker

Inflorescence subracemose. Terminal spike pedunculate, male, unbranched; lateral secondary inflorescences 1–3, each with 6–10 closely branched androgyneous spikes; each branched spike produced from a sacculate cladoprophyll with a female flower inside. Rachilla present at nutlet base.

● One species: China.


杭州薹草 hang zhou tai cao

Rhizome short. Culms densely tufted, 30–60 cm, trigonous, glabrous. Leaves longer than culms, flat or with involute margins, 2.5–4 mm wide, glabrous; basal leaf sheaths smooth. Involucral bracts linear, shorter than inflorescence, with sheaths 1.5–2.5 cm. Inflorescence subracemose, terminal, oblong-cylindric, 3–8 × 1–1.7 cm, terminating in a male spike 4–4.5 cm; lowermost peduncle to 8 cm; lateral secondary inflorescences each with a terminal male clavate spike 1.5–2 cm. Spikes patent, oblong; lateral androgyneous spikes each with a solitary female flower and apically with 4–6 male flowers; male glumes pale yellow or pale brown, oblong, ca. 8 mm, membranous, apex obtuse; female glumes green, broadly ovate, ca. 8.5 mm, subleathery, with 1 midrib prolonged into awn ca. 3 mm, apex acute. Utricles pale yellow-brown when mature, patent, ± equaling glumes, obvoid, obtusely trigonous, 6.5–7 mm, membranous, smooth, with 2 raised lateral veins and several fine veins abaxially, nerveless and paler adaxially, base cuneate, apex contracted into a short beak, orifice 2-toothed. Nutlet castaneous, ellipsoid to obvoid, trigonous with concave faces, 3.5–4 mm, base sessile, apex retuse; style base slightly thickened; stigmas 3; vestigial rachilla ca. 2 mm. Fl. and fr. Apr–May.

● On rocks in forests; below 100 m. Zhejiang (Hangzhou).

This is a peculiar species in Carex. Its affinity is uncertain and needs further study.


多穗薹草组 duo sui tai cao

Zhang Shuren (张树仁); Tetsuo Koyama

Panicle compound or simple. Spikes numerous, bisexual, androgyneous, arising from flowerless utriculiform cladoprophylls, cylindric, 2–8 cm.
Four species: tropical and subtropical continental Asia; four species in China.

1a. Utricles inflated, red to purplish red ............................................................. 5. Carex baccans

1b. Utricles not inflated, pale green to brown.

2a. Utricles ovate-globose, flatly trigonous, 3–3.5 mm, shortly beaked, margins of upper part hairy; female glumes hairy abaxially; persistent sheaths pale brown ............................................. 8. Carex composita

2b. Utricles obovate-lanceolate, obtusely trigonous, 3.5–4 mm, with beak of medium length, margins of upper part scabrid; female glumes glabrous abaxially; persistent sheaths dark brown.

3a. Inflorescence branches few spiked; spikes often single; female glumes pale green, margins membranous and brown ................................................................. 6. Carex myosurus

3b. Inflorescence branches many spiked; spikes binate; female glumes brown, margins hyaline ...................... 7. Carex eminens


Rhizome woody. Culms densely tufted, erect and robust, 80–150 × 0.5–0.6 cm, trigonous, glabrous, leafy below middle. Leaves longer than culms, flat, 8–12 mm wide, glabrous abaxially, scabrid adaxially; basal persistent leaf sheaths red-brown, reticulate. Involucral bracts leafy, longer than inflorescence, long sheathed. Panicle compound, 10–35 cm, 3–8-branched; inflorescence branches single, oblong, 5–6 × 3–4 cm; peduncles of inflorescence branches rigid, basal one 12–14 cm, upper ones gradually shorter, usually enclosed in sheaths; inflorescence axes bluntly triquetrous, subglabrous; bractlets glumelike, lanceolate, 3.5–4 mm, leathery, only basal one with short sheath, others sheathless, awned. Spikes numerous, bisexual and androgynous, arising from utriculiform cladoprophylls, cylindric, 3–6 cm; male part of spike tenuous, few flowered, 1/3–1/2 length of female part; female part with dense and numerous flowers; male glumes pale green, oblong-lanceolate, 3.5–4 mm, membranous; female glumes green or pale green at middle and pale brown laterally, oblong, 2.5–3 mm, papery, with 1 scabrid midrib, upper margin hyaline, apex acuminate, shortly awned. Utricles pale green, longer than glumes, obovate-lanceolate, trigonous, 4.4–5 mm, papery, with several fine veins, glabrous or lateral keels hairy, base attenuate, sub sessile, apex shortly beaked, beak 1/5–1/4 length of utricle, orifice minutely 2-toothed. Nutlet dark brown at maturity, closely enclosed in utricle, elliptic, trigonous, base shortly stipitate, apex nearly not apiculate; style base slightly thickened; stigmas 3.

Margins of woods, riversides; 200–2700 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Cambodia, India, Laos, Malaysia, Nepal, Thailand, Vietnam].


鼠尾薹 shu wei tai cao

Carex myosurus subsp. spiculata Boott.

Rhizome woody. Culms tufted, robust, 80–120 × ca. 0.3 cm, trigonous, scabrid, leafy below middle. Leaves longer than culms, flat, 5–7 mm wide, glabrous abaxially, scabrid adaxially; basal persistent leaf sheaths dark brown, fibri form. Involucral bracts leafy, longer than inflorescence, long sheathed. Panicle compound, 20–30 cm, 3–6-branched; inflorescence branches racemose, single, 5–8 cm, 2–4-spiked; peduncles of inflorescence branches tenuous, 3–11 cm; inflorescence axes tri quetrous, scabrid; bractlets glumelike. Spikes single, bisexual and androgynous, cylindric, 20–60 × 3.5–4.5 mm; male part of spike 1/4–1/2 length of or very rarely equaling female part; female part with dense and numerous flowers; male glumes pale green, oblong-lanceolate, 3.5–4 mm, membranous; female glumes green or pale green at middle and pale brown laterally, oblong, 2.5–3 mm, papery, with 1 scabrid midrib, upper margin hyaline, apex acuminate, shortly awned. Utricles pale green, longer than glumes, obovate-lanceolate, trigonous, 4.4–5 mm, papery, with several fine veins, glabrous or lateral keels hairy, base attenuate, sub sessile, apex shortly beaked, beak 1/5–1/4 length of utricle, orifice minutely 2-toothed. Nutlet dark brown at maturity, closely enclosed in utricle, elliptic, trigonous, base shortly stipitate, apex nearly not apiculate; style base slightly thickened; stigmas 3.

Evergreen forests and forest margins; 1200–2000 m. SE Xizang, NW Yunnan [India, Myanmar, Nepal, Vietnam].


显异薹 xian yi tai cao

Carex composita Boott var. eminens (Nees) Boeckeler; C. floribunda Boeckeler; C. peiana F. T. Wang & Tang.

Rhizome woody. Culms tufted, tall and robust, 80–120 × 0.3–0.4 cm, trigonous, smooth. Leaves basal and cauline, longer than culms, flat, 5–8 mm wide, glabrous abaxially, scabrid adaxially; basal persistent leaf sheaths dark brown, fibri form. Involucral bracts leafy, longer than inflorescence, long sheathed. Panicle compound, 3–8-branched; inflorescence branches simply paniculate, single or binate, broadly ovate, 5–8 × 2–3 cm, many spiked; peduncles of inflorescence branches rigid, 4–15 × 0.1–0.2 cm, scabrid; inflorescence axes triquetrous, densely hairy on edges; bractlets glumelike. Spikes single or 2 or 3 clustered, bisexual and androgynous, cylindric, 2–6 cm; male part of spike ca. 1/2 length of or equaling female part; female part with dense and numerous flowers; male glumes brown, oblong-lanceolate, 3–4 mm, membranous; female glumes brown or purplish brown, oblong or oblong-lanceolate, 2.5–3 mm, papery, with 1 scabrid or smooth midrib, margins hyaline, apex acute, shortly awned. Utricles yellowish green with brown spots, obovate-lanceolate, bluntly trigonous, 3–4 mm, membranous, lateral keels hairy, with few fine veins, base attenuate, apex contracted into short excrusted beak, beak ca. 1/4 length of utricle, orifice minutely 2-toothed. Nutlet dark brown at maturity, closely enclosed in utricle, elliptic, trigonous, ca. 2 mm, base shortly stipitate, apex nearly not apiculate; style base slightly thickened; stigmas 3.

Slopes, roadsides, grasslands, margins of evergreen forests; 300–2000 m. Hunan, Sichuan, Xizang [Bhutan, India (Sikkim), Kashmir, Nepal].
8. Carex composita  

**Summary**
- **Boott, Ill. Gen. Carex 1: 3. 1858.**
- **Common Name:** 复序薹草 fu xu tai cao
- **Description:** Rhizome woody. Culms tufted, 40–60 × 0.15–0.2 cm, trigonous, smooth. Leaves basal and cauline, flat, 2–3 mm wide, glabrous abaxially, prominently scabrid adaxially; basal persistent leaf sheaths pale brown, fibriform. Involucral bracts leafy, longer than inflorescence, long sheathed. Panicle simple, 20–30 cm, 2–4-branched; inflorescence branches racemose, single, 5–8 cm, 3–8-spiked; peduncles of inflorescence branches tenuous, 5–8 cm, usually not exserted from sheaths; inflorescence axes loosely hairy on edges; bractlets glumelike. Spikes bisexual and androgynous, cylindric, 2–6 cm; male part of spike usually ca. 1/2 length of or rarely equaling female part; female part with many dense flowers; male glumes brown or brown laterally and pale green at middle, lanceolate, 3–3.5 mm, membranous, margins narrowly hyaline, apex aciculate; female glumes yellowish green at middle and reddish brown or purplish brown laterally, oblong-lanceolate, 2.5–3 mm, membranous, loosely pubescent, 3-veined, margins narrowly hyaline, apex acuminate, shortly awned. Utricles pale green, obovate or ovate-globose, flatly trigonous, slightly inflated, 3–3.5 mm, papery, with several fine veins, upper part with brown spots and loosely pubescent, base sub sessile, apex shortly beaked, orifice minutely 2-toothed. Nutlet brown at maturity, loosely enclosed in utricle, ovate to triangular-ovate, trigonous, ca. 1.5 mm, base shortly stipitate, apex with contorted apiculus; style base slightly thickened; stigmas 3.

**Location:** Forests, grasslands; 1300–2500 m. Guizhou, Yunnan [Bhutan, India].

5. Carex sect. Indicae  

**Summary**
- **Tuckerman, Enum. Meth. Caric. 10. 1843.**
- **Common Name:** 印度薹草 组 yin du tai cao zu
- **Description:** Panicle compound. Spikes numerous, bisexual, androgynous, arising from flowerless utriculiform cladophylls, oblong, less than 2 cm. Utricles not inflated or slightly inflated, several veined.

**About 20 species:** tropical and subtropical Asia; 13 species (four endemic) in China.

1a. Female glume awnless (sometimes awned or mucronate); utricle less than 3 mm, brown to reddish brown or pale brown with dense reddish brown spots and lines; style base not thickened or slightly thickened.

2a. Female glume awned or mucronate; upper part of utricle hairy.

3a. Inflorescence branches linear; beak of utricle straight, strongly 2-toothed ....................................................... 14. C. burttii

3b. Inflorescence branches oblong-lanceolate to ovate-triangular; beak of utricle straight, minutely 2-toothed or obliquely truncate.

4a. Inflorescence branches ovate-triangular, single; utricle pale brown with dense brown spots and lines; beak slightly shorter than 1/2 length of utricle; style base slightly thickened ........................................... 20. C. continua

4b. Inflorescence branches oblong-lanceolate, usually binate; utricle reddish brown, beak ca. 1/2 length of utricle; style base not thickened .............................................................. 21. C. rafflesiana

2b. Female glume awnless, glabrous abaxially; utricle glabrous.

5a. Inflorescence branches compact; female glumes and utricles pale brown, pale yellowish green, or pale green, sometimes with scattered brown spots and lines .................................................. 19. C. subfelicinoides

5b. Inflorescence branches lax and lax; female glumes and utricles brown to reddish brown or pale brown with dense reddish brown spots and lines.

6a. Utricle elliptic or narrowly elliptic, with many fine veins, beak ca. 1/2 length of utricle; inflorescence branches triangular-ovate ........................................................... 17. C. filicina

6b. Utricle ovate-oblong, with several raised veins, beak slightly shorter than 1/2 length of utricle; inflorescence branches elliptic .......................................................... 18. C. doisutepensis

1b. Female glume aristate; utricle 3.5–10 mm, pale brown to pale green; style base usually thickened.

7a. Male part of spike oblong, 6–7 × 2–3 mm; utricle 5.5–10 mm, beak thin and long, nearly 2 × as long as utricle body; inflorescence branches loosely few spiked; leaf blade 2–2.5 mm ........................................... 9. C. commixta

7b. Male part of spike oblong-cylindrical or cylindrical, 5–8 × ca. 1 mm; utricle 3.5–5 mm, beak shorter than or as long as utricle body; inflorescence branches many spiked (only C. temuipaniculata with few spikes); leaf blade 5–12 mm.

8a. Female glume with excurved or twisting awn, awn 1–2 × as long as glume.

9a. Inflorescence branches compact; male part longer than or as long as female part of spike; utricle ovate or elliptic, trigonous, slightly inflated, green, pale brown when dried; female glume yellowish brown, 1/3–1/2 length of utricle .................................................... 10. C. indica

9b. Inflorescence branches lax and outspread; male part 1/5–1/3 length of female part of spike; utricle rhomboid-ovate, trigonous, not inflated, pale green; female glume yellowish white, ca. 1/4 length of utricle ................................................................. 11. C. indiciformis

8b. Female glume with straight awn, awn shorter than glume.

10a. Female glume yellowish white, with dense brown spots and lines; inflorescence axes densely hairy; orifice of utricle beak 2-toothed.
11a. Inflorescence branches many spiked; peduncles of inflorescence branches and
inflorescence axes rigid; utricle elliptic ................................................................. 12. C. cruciata
11b. Inflorescence branches 3–8-spiked; peduncles of inflorescence branches and
inflorescence axes flaccid; utricle narrowly elliptic or oblanceolate ......................... 13. C. temuniculata
10b. Female glume brown or pale yellowish green; inflorescence axes slightly hairy or
glabrous; orifice of utricle beak obliquely truncate.
12a. Female glume brown, falling off with utricle at maturity, apex emarginate;
inflorescence branches lax; utricle narrowly elliptic, ca. 5 mm; ligule of
cladoprophyll ca. 2 × as long as body ........................................................................... 15. C. decuquisquama
12b. Female glume pale yellowish green, stramineous when dried, persistent, apex
rounded or obtuse; inflorescence branches compact; utricle oblong or ovate-
oblung, ca. 3.5 mm; ligule of cladorhophylly nearly as long as body ............................... 16. C. stramentita

细长喙薹 xi chang hui tai cao

Carex chuniana F. T. Wang & Tang; C. hainanensis Merrill ex Chun & F. C. How; C. humbertii F. T. Wang & Tang
(1949), not Chermезon (1926); C. hypolytrifolia T. Koyama; C. spatiosa Boott.

Rhizome thick. Culms tufted, erect and robust, 30–100 ×
0.3–0.5 cm, trigonous, smooth. Leaves basal and caulin, linear,
2.5–2.5 cm wide, glabrous or slightly scabrid; persistent sheaths
brown, fibiform. Involucral bracts leafy, longer than inflo-
crescence, long sheathed. Panicule simple or compound, 25–30 cm,
1–5-branched; inflorescence branches single, ovate-triangular,
4–10 × 2–6 cm, sometimes binate; peduncles of inflorescence
branches rigid, upper part hairy; inflorescence axes trigonous,
hair on edges; peduncles of inflorescence branches tenuous, tri-
agonous, lowest one 7–8 cm, upper ones gradually shorter, hairy
on edges; inflorescence axes trigonous, hairy; bractlets glume-
like, ca. 1.5 mm, emarginate, with awns 4–6 mm. Spikes nu-
merous, bisexual, androgynous, arising from cladoprophylls, 6–
10 mm; male part of spike longer than or as long as female part;
female part 2–8–flowered; male glumes pale yellow at middle,
pale brown laterally, lanceolate, 5–7 mm, membranous, with
1 midrib, with awns 2–3 mm; female glumes pale yellowish
brown or yellowish white at middle, pale brown laterally, ovate
or oblong, 2–2.5 mm, papery, 3-veined, margins broadly hya-
line, apex acute or emarginate, with awns ca. 3 mm. Utricles
pale brown, patent, ovate or elliptic, trigonous, slightly inflated,
ca. 3.5 mm, papery, many veined, loosely pubescent, subsessile,
apex elongate into beak of medium length, beak slightly shorter
than utricle body, hairy laterally, orifice obliquely truncate. Nut-
lets brown at maturity, oblong, trigonous, ca. 2 mm; style base
prominently thickened; stigmas 3.

Forests, forest margins; 600–1300 m. Hainan [Indonesia, Malay-
sia, Myanmar, Thailand, Vietnam].

印度薹 yin du tai cao

Rhizome thick, tufted, woody. Culms tufted, 60–100 × 0.2–0.4
cm, trigonous, smooth. Leaves basal and caulin, longer than
culms, flat, 8–15 mm wide, glabrous; persistent sheaths pale
brown, fibiform. Involucral bracts leafy, longer than inflo-
crescence branches, long sheathed. Panicule compound, 4–6-
branched; inflorescence branches single, paten, loose, triangu-
lar-ovate, 5–8 × 4–5 cm; peduncles of inflorescence branches
tenuous, trigonous, lowest one 12–14 cm, upper ones gradually
shorter, smooth or upper part hairy; inflorescence axes trigon-
ous, hairy on edges; bractlets glumelike, ca. 1 mm, membran-
ous, glabrous, with awns 3–5 mm. Spikes numerous, bisexual,
androgynous, arising from cladoprophylls, loose and patent, ter-
nal one 10–20 mm, lateral ones 5–16 mm; male part of spike
oblung, 1/5–1/3 length of female part; female part of terminal
one 6–9-flowered, female part of lateral ones 4–7–flowered;
male glumes pale green, lanceolate, 2.5–3 mm, membranous,
apex acuminated, with awns 1–1.5 mm; female glumes pale yel-
lowish white, ovate or oblong, 1–1.5 mm, membranous, apex
rounded or emarginate. Utricles pale green, obliquely patent,
much longer than glumes, ovate or rhomboid-ovate, trigonous,
4.4 2 mm, papery, many veined, apex attenuate into beak of
medium length, orifice obliquely truncate. Nutlets brown at maturity, ovate or rhomboid-ovate, trigonous, ca. 2 mm; style base thickened and conic; stigmas 3.

- Forests, shady slopes; 400–1000 m. Guangxi, Guizhou, Hainan, Yunnan.


Cyperaceae

Rhizome thick, woody, with stolons. Culms tufted, 40–90 × 0.3–0.5 cm, trigonous, smooth. Leaves basal and cauline, longer than culms, flat, 4–13 mm wide, scabrid abaxially, glabrous adaxially; persistent sheaths dark brown, fibroform. Involucral bracts leafy, longer than inflorescence branches, long sheathed. Panicle compound; inflorescence branches usually single, rarely binate, ovate-triangular, 4–15 × 3–6 cm; peduncles of inflorescence branches rigid, bluntly trigonous, lowest one 10–18 cm, upper ones gradually shorter, smooth; inflorescence axes trigonous, hairy; bractlets glumelike, ca. 1.5 mm, hairy abaxially. Spikes numerous, bisexual, androgynous, arising from several veined, abaxially hairy clado prophylls, patent, 4–5 mm; male part of spike nearly as long as female part; male glumes pale brownish white with dense brown spots and short lines, lanceolate, 2.5–3 mm, membranous, with 1 midvein, apex acuminate, shortly awned; female glumes pale brown with dense brown spots and short lines, ovate, 2.5–3 mm, membranous, with 1 midvein, apex mucronate. Utricles pale brown with dense brown spots and short lines, narrowly elliptic or lanceolate, trigonous, slightly inflated, 3–3.5 mm, papery, upper part loosely hairy, with 2 to several raised veins, subsessile, apex contracted into beak of medium length, beak slightly shorter than utricle body, orifice minutely 2-toothed. Nutlets yellowish brown at maturity, narrowly elliptic, trigonous, ca. 2 mm, base shortly stipitate, apex not mucronate; style base slightly thickened; stigmas 3.

- Forests; ca. 2100 m. C Yunnan (Kunming).


伯特薹草 bo te tai cao

Carex vesiculosa Boott f. pallida Kükenthal; C. vesiculosa var. pallida (Kükenthal) R. C. Srivastava.

Rhizome thick, woody, without stolons. Culms tufted, 40–80 × 0.3–0.5 cm, trigonous, smooth. Leaves basal and cauline, slightly exceeding culms, flat, 2–3.5 mm wide, hispid when young; persistent sheaths reddish purple, margins fibrolose. Involucral bracts leafy, slightly longer than inflorescence branches, long sheathed. Panicle compound, 18–36 cm; inflorescence branches linear, 4–15 × 3–6 cm, 2–4 per node; peduncles of inflorescence branches stiff, bluntly trigonous; inflorescence axes trigonous, hairy; bractlets with conspicuous long filiform points; clado prophylls utriculiform, without a flower, several veined and hairy abaxially. Spikes few, bisexual, androgynous, arising from clado prophylls, suberect, 5–12 mm; male part of spike nearly as long as female part; male glumes pale brownish white, with dense brown spots and short lines, lanceolate to oblong-elliptic, 2.4–3.5 mm, membranous, obtuse, mucronate; anthers ca. 2 mm; female glumes ovate, 1.5–2.5 mm, membranous, glabrous, obtusely emarginate, mucronate. Utricles whitish green, with chestnut-brown spots, suberect at maturity, slightly longer than body of glumes, narrowly elliptic, trigonous, inflated, 2.4–2.9 mm, distal part sparsely hairy, sessile, apex attenuate into beak ca. 1/3 length of utricle, hispid, orifice distinctly 2-toothed. Nutlets not seen; stigmas 3. Fl: Apr–May, fr. Aug–Oct.

- Wet cliffs, on rocks, among bamboo; ca. 2300 m. SE Xizang (Cona: Nyam Jang Chu) [Bhutan, India (Sikkim)].


落鳞薹草 luo lin tai cao

Rhizome short. Culms tufted, up to 1 m high, ca. 3 mm thick, trigonous, smooth. Leaves basal and cauline, flat, 5–7 mm wide, scabrid abaxially, glabrous adaxially; persistent sheaths dark brown, fibroform. Involucral bracts leafy, ± as long as or slightly shorter than inflorescence branches, long sheathed. Panicle compound, ca. 20 cm; inflorescence branches single, oblong, 4–7 × 2.5–3 cm; peduncles of inflorescence branches tenuous, trigonous, subsmooth, lowest one 12–14 cm; inflorescence axes trigonous, loosely hairy; bractlets glumelike, oblong, 2.5–3.5 mm, apex emarginate, with awns ca. 2 mm.
Spikes numerous, bisexual, androgynous, arising from cladophylls, distant, slightly patent, cylindric, 1–2 cm, terminal one to 3 cm; male part of spike as long as female part, with over 10 flowers; female part with 2–10 slightly distant flowers; male glumes not deciduous at maturity, pale brown, oblong, 3.5–4.5 mm, with 1 midvein, apex margined with micro; female glumes deciduous at maturity, pale brown, oblong, 3–4 mm, papery, 3-veined at middle, apex margined, with awns up to 2 mm. Utricles pale yellowish brown, narrowly elliptic, trigonous, slightly inflated, ca. 5 mm, papery, many veined, sessile, apex attenuate into long beak, orifice obliquely truncate. Nutlets brown at maturity, narrowly elliptic, trigonous, ca. 2.5 mm, sessile, apex mucronate; style base thickened and conic; stigmas 3.

● Woods; 2300–2500 m. NW Yunnan (Gongshan).


草黄薹 cao huang tai cao

Rhizome long, obliquely elongate, woody. Culms tufted, 30–75 cm, bluntly trigonous, smooth. Leaves basal and caudine, nearly as long as culms, flat, 1–2 mm wide; persistent sheaths dark brown, fibriform. Involucrals bracts leafy, longer than inflorescence branches, long sheathed. Panicle compound, 20–30 cm, 3–5-branched; inflorescence branches single, triangular-ovate, 5–7.5 × 4–5 cm; peduncles of inflorescence branches rigid, trigonous, scarbid on edges; inflorescence axes sharply trigonous, hairy; bractlets glumelike, with long awns. spikes numerous, bisexual, androgynous, arising from cladophylls, dense, obliquely patent, oblong, 10–12 mm; male part of spike longer than female part, with over 10 flowers; female part with over 10 flowers; male glumes pale yellow, oblong-lanceolate, 3–4 mm, papery, apex obtuse and mucronate; female glumes stramineous when dried, slightly shining, ovate-oblong, 2.5–3 mm, papery, 3-veined, margins hyaline, apex obtuse or rounded with short awns. Utricles brownish green, longer than glumes, oblong or ovate-oblong, trigonous, slightly inflated, ca. 3.5 mm, many veined, subsessile, apex contracted into long beak, orifice obliquely truncate. Nutlets broadly ovate, trigonous, 2.5–3 mm; style base thickened; stigmas 3.

Grasslands by woods; 100–1000 m. Guangxi, Guizhou, Yunnan [Bhutan, India, Indonesia (Java), Myanmar, Nepal, Thailand, Vietnam].


蕨状薹 jue zhuang tai cao

Carex caricina (D. Don) Ghildyal & U. C. Bhattacharyya; C. filicina var. meiogyna (Nees) Strachey; C. filicina subsp. pseudofilicina (Hayata) T. Koyama; C. filicina var. subdensa F. T. Wang & Tang; C. meiogyna Nees; C. pseudofilicina Hayata; Cyperus caricinus D. Don.

Rhizome thick, woody. Culms densely tufted, 40–90 × 0.2–0.25 cm, sharply trigonous, glabrous. Leaves longer or rarely shorter than culms, flat, 5–14 mm wide, scarbid abaxially or glabrous on both surfaces; persistent sheaths purplish red or purplish brown, fibriform. Involucrals bracts leafy, longer than inflorescence branches, long sheathed. Panicle compound, 20–50 cm, 4–8-branched; inflorescence branches single, rarely binary, triangular-ovate, 4–15 × 3–7 cm; peduncles of inflorescence branches tenuous, trigonous, lowest one 10–20 cm, upper ones gradually shorter, loosely hairy on edges; inflorescence axes sharply trigonous, hairy; bractlets glumelike, 2–3 mm, apex long awned. Spikes numerous, bisexual, androgynous, arising from cladophylls, patent or slightly patent, oblong or oblong-cylindric, 5–15 mm, terminal one 8–20 mm; male part of spike shorter than female part, 3–7-flowered; female part 2–16-flowered; male glumes brown or reddish brown, lanceolate, 2–3 mm, membranous, apex acuminate; female glumes brown, reddish brown, or pale brown with reddish brown spots and short lines, ovate or lanceolate, 1.5–2 mm, membranous, glabrous, with 1 midrib, apex acuminate or acute. Utricles with lower part yellowish white and upper part brown or reddish brown, or wholly pale brown with reddish brown spots and short lines, elliptic or narrowly elliptic, trigonous, ca. 3 mm, membranous, glabrous, with 2 lateral veins and several fine veins abaxially, subsessile, apex contracted into long excurved beak, beak ca. 1/2 length of utricle, orifice obliquely truncate. Nutlets yellowish brown at maturity, elliptic, trigonous, ca. 1.5 mm; style base not thickened; stigmas 3.

Forests, grasslands; 1200–2800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].


景洪薹 jing hong tai cao

Rhizome thick, creeping. Culms up to 150 cm, trigonous, glabrous. Leaves basal and caudine, linear, 3–4 mm wide, flat or folded; persistent sheaths brown, fibriform. Involucrals bracts leafy, longer than inflorescence branches, sheath to 4 cm. Panicle compound, up to 60 cm, 4–7-branched; inflorescence branches single, oblong-elliptic; peduncles of inflorescence branches long, smooth; inflorescence axes sharply trigonous, densely hairy. Spikes numerous, bisexual, androgynous, arising from cladophylls, patent or horizontally patent, ovate-elliptic, 4–8 × 3.5–5 mm; male part of spike shortly linear, slightly shorter than or as long as female part, fewer flowered; female part 3–6-flowered; male glumes brownish ferruginous, lanceolate, ca. 2.5 mm; female glumes brown with dark brown spots, ovate-triangular, 1.8–2.3 mm, membranous, with 1 midrib, apex acute with excurved mucro. Utricles ovate-oblong, trigonous, 2.5–3.5 mm, patent, membranous, with many raised veins, base attenuate, apex contracted abruptly into long beak, orifice deeply 2-toothed. Nutlets blackish brown at maturity, broadly elliptic, trigonous, 1.4–1.5 mm; style base not thickened; stigmas 3.

S Yunnan (Xishuangbanna) [N Thailand].


近蕨薹 jin jue tai cao

Rhizome with thick fibers. Culms tufted, 50–90 × 0.25–0.3 cm, trigonous, glabrous. Leaves basal and caudine, longer than culms, flat, 7–12 mm wide, glabrous or scarbid along veins abaxially, prominently scarbid adaxially; persistent sheaths pur-
Cyperaceae

Volucral bracts leafy, longer than inflorescence branches, long sheathed. Panicle compound, 20–50 cm, 4–9-branched; inflorescence branches distant, binate, rarely single, lanceolate, 3.5–9 × 1.5–3 cm; peduncles of inflorescence branches tenuus, 10–20 cm, obtusely trigonous, upper part pubescent; inflorescence axes sharply trigonous, loosely hairy; bractlets glumelike, ca. 1 mm, loosely hairy, awned. Spikes numerous, bisexual, androgy nous, arising from cladoprophylls, ovate or oblong, 5–10 mm; male part of spike thinner and shorter than female part, 4–6-flowered; female part 5–12-flowered; male glumes yellowish green, lanceolate, ca. 3 mm, membranous, with 1 midrib, apex acuminate; female glumes pale green at middle, white or pale brown laterally, ovate, 1.7–1.8 cm, trigonous, ca. 1.5 mm, sessile, apex not mucronate; curved beak of medium length, orifice obliquely truncate. Nutlets elliptic, trigonous, ca. 1.7 mm, sessile, apex not mucronate; style base slightly thickened; stigmas 3.

Among shrubs on slopes; ca. 1100 m. S Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].


红头薹草 hong tou tai cao

Carex rafflesiana Boott var. continua (C. B. Clarke) Kükenthal.

Rhzomé short, subwoody. Culms tufted or single, 80–200 × 0.3–0.5 cm, trigonous, smooth, base covered by 1 or 2 reddish brown sheaths. Leaves shorter than culms, flat, 10–13 mm wide; sheaths long, reddish brown; persistent sheaths fibrom. Involucral bracts leafy, long sheathed, lowest one as long as or longer than inflorescence, upper ones gradually shorter. Panicle compound, ca. 20 cm, 8–11-branched; inflorescence branches usually binate, oblong-lanceolate, 5–15 cm, slightly dense, lower part branched. Spikes numerous, bisexual, androgy nous, arising from cladoprophylls, ovate-oblong, 3–6 mm; male part of spike nearly as long as female part, ovate-oblong, 2.7–3.5 mm, herbaceous, with several veins, upper part hairy, apex attenuate into beak, beak excurved, nearly as long as utricle body, orifice minutely 2-toothed. Nutlets elliptic, trigonous, ca. 1.5 mm; style base not thickened; stigmas 3.

Forest margins, grasslands on slopes; 500–600 m. Taiwan [Indonesia, Malaysia, Philippines, Thailand; Australia].


连续薹草 lian xu tai cao

Carex rafflesiana Boott var. continua (C. B. Clarke) Kükenthal.

Rhizome with thick fibers. Culms tufted, 60–90 × ca. 0.3 cm, trigonous, glabrous. Leaves basal and cauline, longer than culms, flat, 6–8 mm wide, scabrid along margins and abaxially, glabrous adaxially; persistent sheaths dark brown, fibrom. Involucral bracts leafy, longer than inflorescence, long sheathed. Panicle compound, ca. 30 cm, 5–9-branched; inflorescence branches single, sometimes binate, ovate-triangular, 3–8 × 1.5–3 cm; peduncles of inflorescence branches tenuus, lowest one to 14 cm, upper ones gradually shorter, trigonous, glabrous; inflorescence axes sharply trigonous, densely hairy on edges; bractlets glumelike, ca. 1.5 mm, loosely hairy abaxially, with long scabrid awns. Spikes numerous, bisexual, androgy nous, arising from cladoprophylls, patent, oblong-cylindric, 4–10 mm; male part of spike shorter than female part, oblong, densely 4–10-flowered; female part 3–9-flowered, slightly dense; male glumes pale brownish white with dense brown spots and short lines, lanceolate, 1.7–2.5 mm, membranous, with 1 midrib, upper margins hairy, apex acuminate, mucronate; female glumes pale brownish white with dense brown spots and short lines, ovate, 1.8–2.5 mm, membranous, glabrescent, with 1 midrib, apex acute, awned or mucronate. Utricles pale brownish green with brown spots and short lines, elliptic, trigonous, 2.7–3 mm, membranous, upper part scabrid, with several raised veins adaxially, subsessile, apex attenuate into excurved long beak, orifice obliquely truncate. Nutlets elliptic, trigonous, ca. 1.7 mm, subsessile, apex not mucronate; style base slightly thickened; stigmas 3.

Two or three species: S China and Indochina; one species (endemic) in China.


菰叶薹草 gu ye tai cao

Culms aphyllodic, surrounded at base with only bladeless sheaths. Blade-bearing leaves borne on upper part of culms; leaf blade lanceolate to narrowly elliptic, narrowed toward both ends, transversely separte. Involucral bracts much longer than inflorescence. Inflorescence spike or spikelike. Spikes androgy nous. Utricles densely pubescent.

Rhizome short. Culms tufted, 60–70 × ca. 0.2 cm, obtusely trigonous, lower part only bearing sheaths, from middle up bearing leaves. Leaves loosely arranged, longer than culms; leaf blade narrowly elliptic or lanceolate, 15–25 × 2–2.5 cm, scabrid
along veins, with prominent transverse veins, margins loosely hairy, base cuneate, apex acuminate; sheaths 1.4–2 cm, glabrous, sheath mouth loosely pubescent and then glabrescent. Inflorescent bracts similar to leaves, much longer than inflorescence branches. Panicle compound, 5–6 × 1–1.5 cm, 14–16-branched; inflorescence branches single, spicate or spikelike, 8–12 mm, arising from axil of inflorescent bract; peduncles of inflorescence branches tenuous, glabrous; inflorescence axes sharply trigonous, hairy on edges; bractlets glumelike, ca. 2 mm, awned. Cladophylls utriculiform, ca. 1 mm, apex ligulate, ligule as long as cladophyll, hairy along veins; spikes bisexual, androgynous, 5–6 mm; male part of spike slightly longer than female part; female part fewer flowered; female glumes ovate, ca. 2 mm, hairy, margins erose, midrib extending into scabrid awn. Utricles ovate-elliptic, ca. 3 mm, densely hairy, apex attenuate into beak, orifice minutely 2-toothed. Nutlets immature.


Carex scaposa

Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Culms lateral. Leaves basal and 1 or 2 on upper part of culm. Radical leaves with sheath elongate, pipeline; leaf blade lanceolate or narrowly elliptic, narrowed toward both ends; culm leaves much reduced, sheathlike. Inflorescence paniculate; partial panicles subtended by a sheathlike bract bearing a short blade much surpassed by the subtended partial panicle. Spikes androgynous.

Ten to 12 species: S China, India, Laos, Vietnam; nine species (six endemic) in China.

1a. Inflorescence branches with 1 or 2(3) spikes; leaf blade replicate; utricle with many raised veins.
   2a. Inflorescence branches single, rarely binate; spike linear-cylindric; basal leaf single ......................................... 30. C. kucyniakii
   2b. Inflorescence branches binate or ternate; spike oblong; basal leaves 2 or 3 tufted ................................. 31. C. peliosanthifolia

1b. Inflorescence branches with 10 or more to numerous spikes; leaf blade flat; utricle only with 2 lateral veins abaxially.
   3a. Panicle simple, usually with only 1 terminal branch, rarely with 1 or 2 lateral branches; culms soft.
      4a. Leaf blade linear, margins flat; male part of spike cylindric, 3–5 × ca. 1 mm; culms hairy and later glabrescent ................................................................. 28. C. ypsilandrifolia
      4b. Leaf blade narrowly elliptic, margins replicate; male part of spike circular or oblong, 2.5–4 × ca. 3 mm; culms hairy ................................................................. 29. C. lingii

3b. Panicle compound, with several branches; culms rigid.
   5a. Inflorescence branches paniculate; male part of spike linear-lanceolate or linear.
      6a. Male glume 1–1.5 mm; nutlet ovoid, style base conic ......................................................... 24. C. damiaoshanensis
      6b. Male glume 3–3.5 mm; nutlet elliptic, style base not conic ..................................................... 23. C. scaposa
   5b. Inflorescence branches subcorymbose; male part of spike circular, oblong, or oblong-cylindric.
      7a. Leaf blade linear or linear-oblong-lanceolate; utricle ovate, beak only ca. 1/4 length of utricle .............. 27. C. houansana
      7b. Leaf blade narrowly elliptic, narrowly elliptic-lanceolate, or narrowly elliptic-oblong-lanceolate, rarely narrowly elliptic-linear; utricle elliptic, beak slightly shorter than 1/2 length of utricle.
      8a. Leaf blade margins densely ciliate; petiole loosely or densely hairy; nutlet elliptic ............... 25. C. densifimbriata
      8b. Leaf blade margins smooth; petiole glabrous; nutlet ovate ......................................................... 26. C. adrienii


Carex scaposa

Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Culms lateral. Leaves basal and 1 or 2 on upper part of culm. Radical leaves with sheath elongate, pipeline; leaf blade lanceolate or narrowly elliptic, narrowed toward both ends; culm leaves much reduced, sheathlike. Inflorescence paniculate; partial panicles subtended by a sheathlike bract bearing a short blade much surpassed by the subtended partial panicle. Spikes androgynous.

Ten to 12 species: S China, India, Laos, Vietnam; nine species (six endemic) in China.

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1b. Inflorescence branches with 10 or more to numerous spikes; leaf blade flat; utricle only with 2 lateral veins abaxially.
   3a. Panicle simple, usually with only 1 terminal branch, rarely with 1 or 2 lateral branches; culms soft.
      4a. Leaf blade linear, margins flat; male part of spike cylindric, 3–5 × ca. 1 mm; culms hairy and later glabrescent ................................................................. 28. C. ypsilandrifolia
      4b. Leaf blade narrowly elliptic, margins replicate; male part of spike circular or oblong, 2.5–4 × ca. 3 mm; culms hairy ................................................................. 29. C. lingii

3b. Panicle compound, with several branches; culms rigid.
   5a. Inflorescence branches paniculate; male part of spike linear-lanceolate or linear.
      6a. Male glume 1–1.5 mm; nutlet ovoid, style base conic ......................................................... 24. C. damiaoshanensis
      6b. Male glume 3–3.5 mm; nutlet elliptic, style base not conic ..................................................... 23. C. scaposa
   5b. Inflorescence branches subcorymbose; male part of spike circular, oblong, or oblong-cylindric.
      7a. Leaf blade linear or linear-oblong-lanceolate; utricle ovate, beak only ca. 1/4 length of utricle .............. 27. C. houansana
      7b. Leaf blade narrowly elliptic, narrowly elliptic-lanceolate, or narrowly elliptic-oblong-lanceolate, rarely narrowly elliptic-linear; utricle elliptic, beak slightly shorter than 1/2 length of utricle.
      8a. Leaf blade margins densely ciliate; petiole loosely or densely hairy; nutlet elliptic ............... 25. C. densifimbriata
      8b. Leaf blade margins smooth; petiole glabrous; nutlet ovate ......................................................... 26. C. adrienii


Carex scaposa

Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Culms lateral. Leaves basal and 1 or 2 on upper part of culm. Radical leaves with sheath elongate, pipeline; leaf blade lanceolate or narrowly elliptic, narrowed toward both ends; culm leaves much reduced, sheathlike. Inflorescence paniculate; partial panicles subtended by a sheathlike bract bearing a short blade much surpassed by the subtended partial panicle. Spikes androgynous.

Ten to 12 species: S China, India, Laos, Vietnam; nine species (six endemic) in China.

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   2a. Inflorescence branches single, rarely binate; spike linear-cylindric; basal leaf single ......................................... 30. C. kucyniakii
   2b. Inflorescence branches binate or ternate; spike oblong; basal leaves 2 or 3 tufted ................................. 31. C. peliosanthifolia

1b. Inflorescence branches with 10 or more to numerous spikes; leaf blade flat; utricle only with 2 lateral veins abaxially.
   3a. Panicle simple, usually with only 1 terminal branch, rarely with 1 or 2 lateral branches; culms soft.
      4a. Leaf blade linear, margins flat; male part of spike cylindric, 3–5 × ca. 1 mm; culms hairy and later glabrescent ................................................................. 28. C. ypsilandrifolia
      4b. Leaf blade narrowly elliptic, margins replicate; male part of spike circular or oblong, 2.5–4 × ca. 3 mm; culms hairy ................................................................. 29. C. lingii

3b. Panicle compound, with several branches; culms rigid.
   5a. Inflorescence branches paniculate; male part of spike linear-lanceolate or linear.
      6a. Male glume 1–1.5 mm; nutlet ovoid, style base conic ......................................................... 24. C. damiaoshanensis
      6b. Male glume 3–3.5 mm; nutlet elliptic, style base not conic ..................................................... 23. C. scaposa
   5b. Inflorescence branches subcorymbose; male part of spike circular, oblong, or oblong-cylindric.
      7a. Leaf blade linear or linear-oblong-lanceolate; utricle ovate, beak only ca. 1/4 length of utricle .............. 27. C. houansana
      7b. Leaf blade narrowly elliptic, narrowly elliptic-lanceolate, or narrowly elliptic-oblong-lanceolate, rarely narrowly elliptic-linear; utricle elliptic, beak slightly shorter than 1/2 length of utricle.
      8a. Leaf blade margins densely ciliate; petiole loosely or densely hairy; nutlet elliptic ............... 25. C. densifimbriata
      8b. Leaf blade margins smooth; petiole glabrous; nutlet ovate ......................................................... 26. C. adrienii

1a. Male part of spike 10–13 mm, much longer than female part .................. 23b. var. dolicostachya
1b. Male part of spike less than 7 mm, usually shorter than female part.

2a. Leaves glabrous on both surfaces or scabrid abaxially; style base not thickened .................. 23a. var. scaposa
2b. Leaves densely hairy abaxially; style base slightly thickened ............ 23c. var. hirsuta

23a. Carex scaposa var. scaposa

23b. Carex scaposa var. dolicostachya

23c. Carex scaposa var. hirsuta


大苗山薹草 da miao shan tai cao

Rhzizome woody. Culms lateral, 25–40 × 0.1–0.3 cm, trigonous, base with leafless pale brown sheaths. Leaves basal and cauline; basal leaves tufted, longer or shorter than culms, elliptic to elliptic-linear, 10–35 × 2–5 cm, glabrous on both surfaces, without transverse veins, base attenuate, apex acuminate; petiole 6–10 cm, glabrous, sometimes leaf base extending downward forming narrow wings; cauline leaves reddish brown, spathelike, papyraceous, glabrous. Involucral bracts spathelike, with blades, usually shorter than inflorescence branches. Panicule compound, 4–6-branched; inflorescence branches paniculate, single, triangular-ovate, 0.8–1.2 × 1–2 cm; peduncles of inflorescence branches rigid, trigonous, 4–8 cm, glabrous; inflorescence axes sharply trigonous, glabrous; bractlets brownish white with deep brown spots, glumelike, lanceolate, 4–5.5 mm. Spikes 3 or 4, bisexual, androgynous, arising from flowerless utriculiform cladocephylls, patent, oblong-cylindric, 8–12 mm; male part of spike linear, 4–7 mm; female part 1–3-flowered; male glumes pale brown, ovate-deltate, 1–1.5 mm, membranous, densely spotted; female glumes brown laterally, yellowish green with brown spots and 1 vein medially, broadly ovate, 1.5–2 mm, membranous, glabrous, apex obtuse. Utricles fulvous, densely spotted, ovoid, trigonous, 4–5 mm, membranous, glabrous, many veined, subseisile, apex contracted gradually into an emarginate beak ca. 2 mm. Nutlets ash brown, ovoid, trigonous, 2.2–2.5 mm; style base conic; stigmas 3. Fl. and fr. May–Sep.


流苏薹草 liu su tai cao

Rhzizome woody. Culms lateral, 30–80 × 0.12–0.25 cm, trigonous, densely hairy, rarely glabrous, base with pale brown sheaths. Leaves basal and cauline; basal leaves tufted, usually shorter or rarely longer than culms, elliptic to narrowly lanceolate, 25–40 × 2.8–4.5 cm, glabrous on both surfaces or scabrid or densely hairy abaxially, base attenuate, margins densely ciliate, apex acuminate; petiole 2–20 cm, hairy; cauline leaves spathelike, lower part green and upper part pale brown, margins ciliate. Involucral bracts spathelike. Panicule compound, 2–to several branched; inflorescence branches subcorymbose, single or binate, triangular-ovate, 1.5–2.5 × 2–3 cm; peduncles of inflorescence branches tenuous, 4–8 cm, densely hairy; inflorescence axes densely hairy; bractlets glumelike, oblong, 4–5 mm, membranous, densely hairy abaxially, apex obtuse. Spikes 4–12, bisexual, androgynous, patent, ovate to oblong, 5–10 mm; male part of spike oblong, longer than or equaling female part; female part 4–10-flowered; male glumes oblong-lanceolate, 3–4.5 mm, apex acuminate; female glumes pale green at middle, brownish white laterally with dense brown spots and short lines, ovate-oblong, 2.8–3 mm, papyraceous, apex obtuse. Utricles pale yellowish white, sometimes with dense brown spots and short lines, slightly longer than glumes, obliquely patent, elliptic, trigonous, 3–3.5 mm, with 2 lateral veins abaxially, subseisile, apex contracted into beak of medium length, beak slightly shorter than 1/2 length of utricle, orifice obliquely truncate. Nutlets brown at maturity, elliptic, trigonous, ca. 2 mm; style base thickened; stigmas 3.

25a. Carex densifimbriata var. densifimbriata

流苏薹草(liu su tai cao) liu su tai cao (yuan bian zhong)

Leaves glabrous on both surfaces or scabrid abaxially.

1a. Leaves glabrous on both surfaces or scabrid abaxially .................. 25a. var. densifimbriata
1b. Leaves densely hairy abaxially .................. 25b. var. hirsuta


毛流苏薹草 cu mao liu su tai cao

Leaves densely hairy abaxially.

● Grassy places in valleys. Guizhou, Hunan.

广东薹草 guang dong tai cao


Rhizome subwoody. Culms tufted, lateral, 30–50 × 0.1–0.2 cm, trigonous, densely hairy, base with pale brown leafless sheaths. Leaves basal and cauline; basal leaves tufted, shorter than culms, narrowly elliptic to elliptic-linear, 25–35 × 2–3 cm, scabrid abaxially, glabrous axadially, margins entire, apex acuminate; petiole 5–15 cm, glabrous; cauline leavesspathelike, lower part green, upper part pale brown, with dense brown spots and lines, margins ciliate and glabrescent later. Involucral bracts spathe-like. Panicle compound, 2–6-branched; inflorescence branches subcorymbose, single or binate, slightly distant, bracts spathe-like. Panicle compound, 2–6-branched; inflorescence branches subcorymbose, single or binate, slightly distant, 2.5–3 mm, densely hairy; bractlets glumelike, 3–3.5 mm, densely hairy. Spikes 20 or less, bisexual, androgynous, patent, oblong-cylindric, 7–10 × 2–2.5 mm; male part of spike longer than female part, oblong, with more than 10 flowers; female part ± densely 3–10-flowered; male glumes brown, oblong, ca. 3 mm, membranous, apex obtuse; female glumes brownish white with dense brown spots and short lines, ovate-oblong, 2.5–3 mm, membranous, 1-veined, apex obtuse. Utricles pale brownish white with dense brown spots and short lines, elliptic, obliquely or horizontally patent, trigonous, ca. 3 mm, with 2 lateral veins abaxially, base obtuse, contracted into beak of medium length, beak slightly shorter than 1/2 length of utricle, orifice obliquely truncate. Nutlets brown at maturity, ovate, trigonous, ca. 1.5 mm; style base thickened; stigmas 3.

Evergreen forests, watersides, shady places; 500–1200 m. Fujian, Guangdong, Guangxi, Hunan, Yunnan [Laos, Vietnam].


刘氏薹草 liu shi tai cao

Rhizome woody. Culms tufted, lateral, 20–40 × ca. 0.1 cm, trigonous, loosely hairy and glabrescent later, base with pale brown sheaths. Leaves basal and cauline; basal leaves tufted, linear or linear-elliptic, 15–25 × 1.5–3 cm, glabrous, apex acuminate; petiole 1–10 cm, base covered with brown sheaths, upper part with narrow wings formed by leaf blade base; cauline leaves often absent, if present then brown, spathe-like, membranous, glabrous or loosely pubescent. Involucral bracts spathe-like. Panicle simple, triangular-ovate, 1.5–3 × 2–3 cm; peduncles of inflorescence branches tenuous, 4–6 cm, densely hairy or glabrous; inflorescence axes trigonous; bractlets pale yellow with dense brown spots and short lines, lanceolate, 3–7 mm, membranous. Spikes 1–10, bisexual, androgynous, arising from flowerless utriculiform cladocephyllops, oblong-cylindric, 7–10 mm; male part of spike nearly same length as female part, oblong-cylindric, female part 3–8-flowered; male glumes pale brownish white with dense brown spots and short lines, lanceolate, 3–4 mm, with 1 midrib, apex acuminate; female glumes pale brownish white with dense brown spots and short lines, lanceolate, 2–3 mm, membranous, glabrous, 1-veined, apex obtuse. Utricles pale brownish white with dense brown spots and short lines, rhomboid-ovate or elliptic, trigonous, petant, 3.5–4 mm, membranous, with 2 lateral veins abaxially, sub sessile, apex contracted into long beak, beak slightly shorter than 1/2 length of utricle, orifice obliquely truncate. Nutlets brown at maturity, subovate, trigonous, 1.5–2 mm; style base thickened; stigmas 3.

Evergreen forests; 300–1100 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi.


丫蕊薹草 ya rui tai cao

Rhizome woody. Culms tufted, lateral, flaccid, 15–20 × ca. 0.1 cm, trigonous, loosely hairy and glabrescent later, base with pale brown sheaths. Leaves basal and cauline; basal leaves tufted, linear or linear-elliptic, 15–25 × 1.5–3 cm, glabrous, apex acuminate; petiole 1–10 cm, base covered with brown sheaths, upper part with narrow wings formed by leaf blade base; cauline leaves often absent, if present then brown, spathe-like, membranous, glabrous or loosely pubescent. Involucral bracts spathe-like. Panicle simple, triangular-ovate, 1.5–3 × 2–3 cm; peduncles of inflorescence branches tenuous, 1–3 cm, loosely pubescent; bractlets pale yellow with dense brown spots and short lines, glumelike, lanceolate, 3–7 mm, membranous. Spikes 1–10, bisexual, androgynous, arising from flowerless utriculiform cladocephyllops, oblong-cylindric, 7–10 mm; male part of spike nearly same length as female part, oblong-cylindric, female part 3–8-flowered; male glumes pale brownish white with dense brown spots and short lines, lanceolate, 3–4 mm, with 1 midrib, apex acuminate; female glumes pale brownish white with dense brown spots and short lines, lanceolate, 2–3 mm, membranous, glabrous, 1-veined, apex obtuse. Utricles pale brownish white with dense brown spots and short lines, rhomboid-ovate or elliptic, trigonous, petant, 3.5–4 mm, membranous, with 2 lateral veins abaxially, sub sessile, apex contracted into long beak, beak slightly shorter than 1/2 length of utricle, orifice obliquely truncate. Nutlets brown at maturity, subovate, trigonous, 1.5–2 mm; style base thickened; stigmas 3.

Evergreen forests, watersides, shady places; 300–1100 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi.


林氏薹草 lin shi tai cao

Carex sinocrispa Raymond.

Rhizome woody. Culms tufted, lateral, flaccid, 15–20 × ca. 0.1 cm, trigonous, loosely hairy and then glabrescent, base with pale to deep brown sheaths. Leaves basal and cauline; basal leaves tufted, narrowly elliptic to linear-elliptic, 12–30 × 2–2.5 cm, glabrous or scabrid along abaxial veins, base attenuate, margins densely replicate, apex acuminate; petiole 5–20 cm, subglabrous; cauline leaves pale greenish white, sometimes with brown spots and short lines, spathe-like, loosely pubescent. Involucral bracts spathe-like. Panicle simple, triangular-ovate, 1.5–
3 × 2–3 cm, ca. 10-spiked; peduncles of inflorescence branches tenuous, densely hairy; bractlets glumelike, 2.5–3 mm, glabrous. Spikes bisexual, androgyrous, arising from flowerless utriculiform cladoprophylls, oblong, patent horizontally, 4–10 mm; male part of spike suborbicular to oblong; female part 3–10-flowered, nearly as long as male part; male glumes pale brownish white with dense brown spots and short lines, oblong-lanceolate, 2.2–2.5 mm, membranous, with 1 midrib, apex obtuse; female glumes similar to male ones. Utricles brownish white with dense brown spots and short lines, ovate-elliptic, trigonous, ca. 3 mm, membranous, with 2 lateral veins abaxially, subsessile, apex contracted into long beak, orifice obliquely truncate. Nutlets brown at maturity, ovate, trigonous, 1.5–1.8 mm; style base thickened; stigmas 3.

- Woods, shady places. Fujian, Zhejiang.


棕叶薹草 zong ye tai cao

Rhizome thick, woody, with stolons. Culms loosely tufted, lateral, slender, 22–35 × 0.2–0.25 cm, trigonous, lower part smooth, upper part loosely pubescent, base with brown sheaths. Leaves basal and cauline; basal leaf single, elliptic or elliptic-lanceolate, 22–42 × 4–10 cm, scabrid abaxially, glabrous adaxially, 7–14-veined, replicate, entire, base attenuate, apex acute; petiole 7–10 cm, folded, glabrous; cauline leaves green, spathelike, loosely pubescent, margins brown, membranous. Involucral bracts spathelike. Panicle compound, several branched; inflorescence branches racemose, single or binate, often 1 or 2 (or 3)-spiked; peduncles of inflorescence branches tenuous, lowest one up to 8 cm, upper ones gradually shorter, scabrid; bractlets glumelike, ovate-lanceolate, 3–4 mm, loosely hairy. Spikes bisexual, androgyrous, arising from flowerless utriculiform cladoprophylls, linear-cylindric, 25–40 × 3–4 mm; male part of spike nearly as long as female part, oblong; female part loosely many flowered; male glumes dark brown, oblong, 4.5–5 mm, membranous, 3-veined, apex obtuse; female glumes pale brown with dark brown spots and short lines, oblong, 4.5–5 mm, membranous, loosely hairy abaxially, 3-veined, apex acuminate. Utricles pale brown with dark brown spots and short lines, elliptic, trigonous, ca. 4 mm, membranous, with 2 lateral veins abaxially, subsessile, apex contracted into beak of medium length, orifice obliquely truncate. Nutlets brown at maturity, obovate-oblong, trigonous, ca. 2.5 mm; style base not thickened; stigmas 3.

- Streamsides. Guangxi.


蘖枝薹草组 nie zhi tai cao zu

Zhang Shuren (张树仁); Tetsuo Koyama

Culms lateral. Leaves radical or cauline, several radical leaves often forming a high shoot, leaf blades linear, less than 1 cm wide; cauline leaves and involucral bracts spathelike. Inflorescence branches only with 3–10 spikes.

Four species: E and SE Asia; three species (two endemic) in China.

1a. Leaves densely hairy abaxially; utricles 2.5–3 mm, ovate-rhomboid, upper part with brownish red papillae ................................................................. 32. C. kwangsiensis

1b. Leaves glabrous; utricles 3.5–4 mm, elliptic or oblong, without papillae.

2a. Utricles loosely hairy, beak ca. 1/3 length of utricle, orifice prominently 2-toothed; radical leaves shorter than culms; female glumes mucronate ................................................................. 33. C. oligostachya

2b. Utricles glabrous, beak ca. 1/2 length of utricle, orifice not prominently 2-toothed; radical leaves longer than culms; female glumes not mucronate ................................................................. 34. C. tsangii

- Streamsides. Guangxi.

广西薹草 guang xi tai cao

Rhizome woody, with stolons. Culms lateral, 30–50 × ca. 0.15 cm, trigonous, loosely pubescent when young and glabrescent later, with brown sheaths at base. Leaves radical and cauline; radical leaves longer than culms, several ones forming a high shoot, leaf blades linear, flat, 5–7 mm wide, with dense white hairs abaxially, base covered with persistent brown sheaths; cauline leaves brown, spathe-like, loosely hairy along veins. Inflorescences branches tenuous. Panicle compound; inflorescence branches subcorymbose, single or terminal ones binate, 2–3 × 2–2.5 cm, 3–10-spiked; peduncles of inflorescence branches tenuous, 5–10 cm, loosely pubescent; inflorescence axes sharply trigonous, densely hairy; bracts glumelike, lanceolate, lowest one 5–10 mm, upper ones gradually shorter, terminal one awnlike, pale brown, loosely pubescent. Spikes bisexual, androgynous, obliquely or horizontally patent, 7–18 mm; male part of spike cylindric, longer than or equaling female part; female part 2–13-flowered; peduncles of spikes arising from flowerless utriculiform cladoprophylls, tenuous, lowest one 2–2.5 mm, upper ones gradually shorter, loosely pubescent; male glumes brown laterally, pale green at middle, lanceolate, 3.5–4 mm, loosely pubescent and glabrescent later, with 1 midrib, margins ciliate, membranous, apex obtuse; female glumes brown laterally, pale green at middle, oblong-lanceolate, 2.2–2.5 mm, membranous, loosely pubescent, with 1 midrib, apex obtuse. Utricles ovate-rhomboid, inflated trigonous, 2.5–3 mm, upper part with brownish red papillae, with many raised veins, hairy, subsessile, apex contracted into an excurred long beak of ca. 1/2 length of utricle, orifice obliquely truncate. Nutlets brown at maturity, ovate-rhomboid, trigonous, ca. 1.8 mm; style base thickened; stigmas 3.

- Among shrubs in shady valleys. Guangxi.


少穗薹草 shao sui tai cao

Carex rhizomatosa Steudel.

Rhizome stoloniferous, woody. Culms lateral, 20–80 × ca. 0.1 cm, trigonous, glabrous, base with brown sheaths. Leaves radical and cauline; radical leaves shorter than culms, several ones forming a high shoot, leaf blades linear, flat, 2–5 mm wide, base covered with brown sheaths; cauline leaves brown, spathe-like. Inflorescences branches tenuous. Panicle compound, with 6–12 distant branches; inflorescence branches subcorymbose, single or binate, 3–5-spiked; peduncles of inflorescence branches tenuous, erect, slightly scabrid; inflorescence axes loosely hairy on edges; bractlets glumelike, ca. 3 mm. Spikes bisexual, androgynous, patent, 4–10 mm; male part of spike nearly as long as or longer than female part; male glumes brown, lanceolate, 3–3.5 mm, glabrous; female glumes pale brown with dense purplish red spots and short lines, ovate to lanceolate, 2–3 mm, upper part loosely pubescent, margins hyaline, apex obtuse, mucronate. Utricles brownish green to purplish brown, patent, oblong, slightly inflated, trigonous, 2.5–4 mm, with several raised veins, hairy, apex contracted into excurred beak of medium length, beak ca. 1/3 length of utricle, orifice prominently 2-toothed. Nutlets elliptic, trigonous, 2–2.3 mm; style base not thickened; stigmas 3.

Grasslands on slopes; 900–1200 m. Guangxi, Guizhou [India, Indonesia, Malaysia, Myanmar, Papua New Guinea, Philippines, Vietnam].


念薹草 san nian tai cao

Carex surculosa Raymond.

Rhizome woody, with stolons. Culms tufted, lateral, 40–60 × ca. 0.1 cm, trigonous, glabrous, base with brown sheaths. Leaves radical and cauline; radical leaves longer than culms, several ones forming a high shoot, leaf blades linear, flat, 5–7 mm wide, glabrous, margins entire or scabrid, base covered with brown sheaths; cauline leaves brown, spathe-like, loosely pubescent and glabrescent later. Inflorescences branches spathelike, with linear blades, shorter than inflorescence branches. Panicle compound, 6–10 cm, 3–6-branched; inflorescence branches subcorymbose, single or binate, 3–10-spiked, broadly ovate, ca. 2 × 2–3 cm; peduncles of inflorescence branches tenuous, 3.5–5 cm, slightly scabrid; inflorescence axes sharply trigonous, densely hairy and glabrescent later; bracts pale brown laterally, pale green at middle, glumelike, lanceolate, 2.5–3 mm, loosely pubescent. Spikes bisexual, androgynous, obliquely or horizontally patent, 10–15 mm; male part of spike cylindric, longer than female part; female part 3–9-flowered; male glumes pale green with brown spots and short lines, lanceolate, 3.5–3.5 mm, with 1 midrib, apex acuminate; female glumes pale brown with brown spots and short lines, ovate-lanceolate, 2.5–3 mm, membranous, loosely pubescent and glabrescent later, with 1 midrib, margins ciliate, apex acute. Utricles brown, elliptic or broadly elliptic, obtusely trigonous, 3.5–4 mm, papery, glabrous, with several fine veins, apex contracted into long beak, beak nearly as long as utricle, orifice minutely 2-toothed. Nutlets elliptic or broadly elliptic, trigonous, 1.5–2 mm; style base thickened; stigmas 3.

- Among shrubs on slopes. Guangdong.


宝兴薹草组 bao xing tai cao zu

Zhang Shuren (张树仁); Tetsuo Koyama

Culms bearing leaves from base to inflorescence. Leaves papillose abaxially. Panicle compound; inflorescence branches corymbose. Spike unisexual; male spikes at upper part of inflorescence branches, female spikes at lower part.

Two species: SE Asia; one species (endemic) in China.

宝兴薹草 bao xing tai cao

Homalostachys sinensis Boeckeler.

Rhizome stoloniferous, woody. Culms 20–50 × 0.3–0.4 cm, stiff, trigonous, base with persistent brown sheaths. Leaves longer or shorter than culms, flat, 3–5 mm wide, pubescent and glabrescent later, papillose abaxially, scabrid adaxially, long sheathed, sheath mouth villous. Involutral bracts same as leaves, shorter than inflorescence, much longer than inflorescence branches. Panicle compound, 10–20 cm, 4–10-branched; inflorescence branches corymbose, simple, 5–12-spiked, 2–3 × 1.5–2 cm; peduncles of inflorescence branches tenuous, 6–8 cm, trigonous, loosely pubescent; inflorescence axes sharply trigonous, loosely pubescent; bractlets brown, glumelike, lanceolate, 3–4 mm, loosely pubescent. Spikes unisexual, male ones at upper part of inflorescence branches, female at lower part, arising from flowerless utriculiform cladoprophylls; male spikes oblong, 6–10 mm, many flowered, sometimes with few female flowers at base; female spikes oblong, 7–10 mm, densely many flowered, sometimes with few male flowers at top; male glumes brown, lanceolate, 2.5–3.5 mm, membranous, with 1 midrib, apex acuminate; female glumes brownish white with dense brown spots, lanceolate, 2.5–3.5 mm, with 1 midrib, margins narrowly hyaline, apex acuminate. Utricles brownish white with brown spots, obliquely patent, shorter than glumes, obovate, sometimes obliquely obovate, slightly inflated, trigonous, ca. 2 mm, papery, glabrous, 2-veined abaxially, apex contracted abruptly into short beak, orifice obliquely truncate. Nutlets yellowish white at maturity, obovate, trigonous, ca. 1.2 mm; style base thickened; stigmas 3.

● Shady slopes, roadsides. Guizhou, Hubei, Sichuan, Yunnan.


粗糙薹草组 cu cao tai cao zu
Zhang Shuren (张树仁); Tetsuo Koyama

Involutral bracts leafy, with or without sheaths. Inflorescence spicate, 1–5-branched; inflorescence branches subsessile. Spikes fewer, androgynous, dense, few flowered.

About seven species: tropical Asia and tropical America; one species in China.


三头薹草 san tou tai cao

Rhizome oblique. Culms tufted, 18–40 × ca. 0.1 cm, slender, trigonous, scabrid at upper part. Leaves longer or shorter than culms, flat, 4–8 mm wide, margins and veins scabrid; persistent sheaths brown, fibriform. Involutral bracts leafy, without sheaths, lowest one longer than inflorescence, others very short, setaceous. Panicle spicate, 1–4-branched; inflorescence branches subsessile, fewer spiked, sometimes with sterile spike at lower part. Spikes bisexual, androgynous, dense, ovate-globose, 5–8 × 4–7 mm, subsessile; male part of spike not prominent, usually not exserted from female part, 3–5-flowered; female part densely fewer flowered; male glumes yellowish white, lanceolate, 4.5–5 mm, membranous, upper part hairy, with 1 midrib, apex acuminate; female glumes yellowish white, lanceolate, 3–3.5 mm, densely hairy, with 1 midrib and several fine veins, apex acuminate, with short awns. Utricles yellowish white, slightly inflated, trigonous, 4.5–5 mm, membranous, densely hairy, with 2 lateral keels and several fine veins, subsessile, margins very narrowly winged, apex contracted into long beak, orifice minutely 2-toothed. Nutlets pale yellow at maturity, ovate, trigonous, ca. 3 mm; style base thickened and pyriform; stigmas 3.

Forests; 700–1100 m. S Yunnan (Xishuangbanna) [Cambodia, Indonesia, Laos, Myanmar, Thailand, Vietnam].

2. Carex subg. Carex

薹草亚属 tai cao ya shu
Dai Lunkai (戴伦凯), Liang Songyun (梁松筠 Liang Song-jun), Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Herbs, perennial. Rhizome stoloniferous or without stolons. Spikes few to numerous, unisexual or unisexual and bisexual, rarely all bisexual, bisexual spike usually androgynous (male flowers at upper part), sometimes gynaecandrous (female flowers at upper part), rarely single and terminal, usually arranged in spicate, racemose, or paniculate inflorescence; cladoprophyll sheathlike, without flower. Utricles trigonous, plano-convex, or biconvex. Nutlets trigonous, plano-convex, or biconvex; style slightly slender, base thickened or not thickened; stigmas usually 3, rarely 2.

About 1,450 species: ± worldwide; 443 species (235 endemic) in 42 sections in China.

1a. Spike single, terminal.

2a. Nutlets biconvex or plano-convex, stigmas 2.

3a. Spikes bisexual, androgynous; utricles not spongy at base ........................................................... 51. C. sect. Capituligerae

3b. Spikes unisexual; utricles spongy at base ........................................................... 52. C. sect. Physoglochin
1b. Spikes 2 to numerous, usually 1 to several spikes borne in an involucral bract sheath, rarely arranged in compound inflorescence.

8a. Utricles plano-convex or biconvex; stigmas 2.

9a. Involucral bracts sheathed; female spikes sparsely flowered, rarely slightly densely flowered ....... 45. C. sect. Graciles

9b. Involucral bracts without sheaths; female spikes densely many flowered.

10a. Spikes pedunculate, ± pendent.

11a. Spikes 2–6 borne in every involucral bract sheath on inflorescence ...................... 44. C. sect. Tuminenses

11b. Spikes solitary in every involucral bract sheath on inflorescence .......................... 43. C. sect. Praelongae

10b. Spikes nearly sessile or only lowermost or basal spike rather long pedunculate.

12a. Utricles distinctly beaked, beak 0.5–1.5 mm, 2-toothed at orifice ........................... 42. C. sect. Forficulae

12b. Utricles long beaked (beak not over 1 mm), veins obscure on abaxial surface .......... 49. C. sect. Grallatoriae

8b. Utricles trigonous; stigmas 3.

13a. Utricles nearly beakless or with short beak, truncate, emarginate, or very shortly 2-toothed at orifice.

14a. Female spikes densely flowered; involucral bracts usually without sheath or only very shortly sheathed.

15a. Female spikes remote, pedunculate.

16a. Male spikes 2–6 (only 1 male spike in C. inamis); utricles hispidulous or scabrous ......................................................... 15. C. sect. Hirtae

16b. Male spike solitary, terminal; utricles glabrous ......................................................... 16. C. sect. Anomala

15b. Female spikes contiguous or rather congregate, rarely lower 1 or 2 remote, without peduncle or very shortly pedunculate, rarely lowermost one rather long pedunculate.

17a. Involucral bracts leaflike or lower ones leaflike, rarely setaceous; terminal spike gynaecandrous, rarely male ................................................................. 11. C. sect. Racemosae

17b. Involucral bracts scale-shaped or lower ones linear, upper ones scale-shaped; terminal spike male.

18a. Female glumes red-brown or dark brown; utricles glabrous, usually shiny, obliquely truncate at orifice of beak; style base thickened .... 14. C. sect. Lamprochlaenae

18b. Female glumes brown or brownish; utricles hirtellous or papillate, emarginate or very shortly 2-toothed at orifice of beak.


19b. Utricles hirtellous; style base not thickened ............................................. 13. C. sect. Acrocytis

14b. Female spikes sparsely flowered; involucral bracts usually sheathed.

20a. Utricles glabrous or scabrid.

21a. Leaf blades usually revolute at margins; involucral bracts sheathlike, without blades; male spike few flowered; style base thickened and globose ....................... 22. C. sect. Albae

21b. Leaf blades flat; involucral bracts leaflike or spathelike, with short blades; male spike many flowered; style base not thickened.

22a. Culms lateral; leaf blades rather broad, 6–30 mm wide (very few species with 3–6 mm wide blades); spikes bisexual, androgynous; female glumes pale or reddish brown ..................................................... 25. C. sect. Siderostictae

22b. Culms central; leaf blades rather narrow, 2–5 mm wide; spikes unisexual; female glumes ferruginous-brown or yellow-brown.

23a. Involucral bracts shortly sheathed; female spikes densely flowered, slenderly pedunculate, usually pendulous; style exserted from utricle .............................................................................................................. 23. C. sect. Limosae
23b. Involucral bracts long sheathed; female spikes sparsely flowered, slightly thickly pedunculate, erect; style included in utricle (only stigmas exserted) .......................................................... 24. C. sect. Paniceae

20b. Utricles pubescent or hispidulous, rarely glabrous.
   24a. Involucral bracts spathelike, without blade, rarely leaflike; nutlets not thickened at apex into annulate shape; style base slightly thickened or not thickened, rarely thickened and conic. 20. C. sect. Radicales
   25a. Involucral bracts leaflike, rarely sheathlike; spikes bisexual, androgynous; utricles subleathery or papery; style base thickened and conic ........................................... 21. C. sect. Clandestinae

23a. Involucral bracts with short blades; nutlets thickened at apex into annulate shape; style base thickened into different shapes.
   27a. Nutlets with persistent and bent style base at apex ........................................... 17. C. sect. Cryptostachyae
   27b. Nutlets ± thickened into disk shape, not concave at apex, persistent style base thickened into cucullate shape ........................................... 19. C. sect. Mitratae

13b. Utricles with a long beak or medium-sized beak (beak rather short in C. sect. Paludosae), long or shortly 2-toothed at orifice, rarely subtruncate or very shortly toothed.

28a. Leaf blades with transverse septate nodes between longitudinal veins.
   29a. Utricles ± hispidulous or pubescent, rarely glabrous or ciliate on margins of beak.
      30a. Female glumes ovate or broadly ovate, apex acute, mucronate; utricles obtusely trigonous, ca. 4 mm, rarely 5 mm, shortly beaked, shortly 2-toothed at orifice ........................................... 39. C. sect. Occlusae
   30b. Female glumes lanceolate, narrowly ovate, or oblong-ovate (broadly ovate in C. latisquamea), apex acuminate, aristate or mucronate; utricles slightly inflated trigonous or inflated trigonous, 5–10 mm, rarely ca. 4 mm, medium to long beaked, ± long to long 2-toothed at orifice ........................................... 40. C. sect. Carex

29b. Utricles glabrous.
   31a. Female glumes long aristate; utricles eventually horizontally patent or downward reflexed, obtusely trigonous, long beaked, deeply splitting into 2 long teeth at orifice ........................................... 36. C. sect. Pseudocypereae
   31b. Female glumes muticous or mucronate, rarely aristate; utricles eventually obliquely patent, rarely horizontally patent or downward reflexed, inflated trigonous or slightly so, medium to long beaked or very shortly beaked.
      32a. Female glumes oblong-lanceolate or narrowly ovate, without mucro or awn; utricles inflated trigonous, membranous or subleathery, medium to long beaked ........................................... 37. C. sect. Physocarpae
      32b. Female glumes ovate or broadly ovate, mucronate, rarely aristate; utricles slightly inflated trigonous, leathery or suberose, very shortly beaked ........................................... 38. C. sect. Paludosae

28b. Leaf blades without transverse septate nodes between longitudinal veins.
   33a. Female glumes dark purple-red or brown; utricles compressed trigonous, rarely trigonous.
      34a. Spikes numerous, bisexual, androgynous, usually several spikes borne in an involucral bract sheath .......................................................... 26. C. sect. Decorae
      34b. Spikes 2–7, unisexual, solitary in an involucral bract sheath, terminal spikes male, rarely gynaeandrous, lateral spikes female ........................................... 27. C. sect. Aulocystis
   33b. Female glumes pale, rarely dark brown; utricles trigonous or inflated trigonous (subplano-convex in C. sect. Secalinae).
      35a. Culms lateral, rarely central; nutlets usually constricted or with constriction on angles, rarely not constricted or without constriction; style base thickened or inflated, rarely not thickened.
36a. Female spikes densely many flowered; nutlets usually constricted or with constriction on angles, rarely not constricted ........................... 34. C. sect. Rhomboidales

36b. Female spikes sparsely several flowered; nutlets not constricted on angles ................................................................................... 35. C. sect. Careyanae

35b. Culms central; nutlets not constricted or without constrictions on angles; style base not thickened.

37a. Male spikes 1–3, borne at apex of culm; utricles leathery, subplano-convex ................................................................. 33. C. sect. Secalinae

38a. Female spikes densely many flowered; involucral bracts usually without sheaths or with very short sheath; utricles eventually divaricate, horizontally patent, or downward reflexed, rarely obliquely patent, distinctly several veined.

39a. Female glumes long aristate, rarely mucronate (C. ischnostachya and C. subtumida without mucro or awn); utricles eventually horizontally patent or slightly downward reflexed, rarely slightly divaricate, brown-green or dark brown or black-brown at maturity ............... 31. C. sect. Confertiflorae

39b. Female glumes mucronate or muticous, rarely arista; utricles eventually obliquely patent, rarely horizontally patent, yellowish green or stramineous, rarely brownish yellow .................................................................................. 32. C. sect. Molliculae

38b. Female spikes usually sparsely flowered (densely flowered in C. sect. Hymenochlaenae); involucral bracts sheathed; utricles erect or slightly obliquely patent, greenish or greenish yellow, obscurely veined.

40a. Female spikes oblong or shortly cylindric; utricles less than 3 mm ................................................................. 28. C. sect. Chlorostachyae

40b. Female spikes cylindric, narrowly cylindric, or linear-cylindric; utricles 4–7 mm, rarely 3–3.5 mm.

41a. Female spikes cylindric, rather densely flowered; utricles elliptic or obovate-elliptic, shortly 2-toothed at orifice ............... 29. C. sect. Hymenochlaenae

41b. Female spikes narrowly cylindric or linear-cylindric, sparsely or very loosely flowered; utricles oblong-lanceolate, lanceolate, or narrowly oblong, obliquely truncate or very shortly 2-toothed at orifice ........................................................................ 30. C. sect. Debiles

11. Carex sect. Racemosae

G. Don in Loudon, Hort. Brit. 376. 1830.

褐色薹草组 he sui tai cao zu

Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama

Involucral bracts leaflike or setaceous. Spikes erect, rarely pendent; terminal spike gynaecandrous, rarely male; lateral spikes female, sometimes with a few apical male flowers. Female glumes dark purple-brown. Utricles yellow-green or pale brown, usually tinged with dark purple-brown, elliptic, ovate, or obovate, membranous or leathery, glabrous, minutely papillose or punctate, apex shortly beaked, orifice entire, emarginate, or 2-toothed. Style base thickened; stigmas 3, rarely 2.

About 60 species: Asia, Europe, North America; 28 species (ten endemic) in China.

1a. Female glumes 9–10 mm ........................................................................................................................................... 37. C. praeclara

1b. Female glumes less than 8 mm.

2a. Utricles densely papillose, gray-green.

3a. Female glumes acuminate or with short awn at apex, longer than utricles ................................................................. 38. C. tarunensis

3b. Female glumes obtuse at apex, equaling or slightly shorter than utricles.

4a. Female spikes 5–12 mm, sessile ................................................................................................................................. 39. C. meyeriana

4b. Female spikes 10–25 mm, shortly stipitate ................................................................................................................... 40. C. hongyuanensis

2b. Utricles smooth or minutely punctate, yellowish green, stramineous, pale brown, or dark purple-red.

5a. Upper 3 or 4 spikes male, rarely with a few female flowers at base ........................................................................... 41. C. polymascula
5b. Terminal spikes male or gynaecandrous or all spikes gynaecandrous.
   6a. All spikes gynaecandrous .................................................................  42. C. aristulifera
   6b. Spikes gynaecandrous or with terminal spike male.
      7a. Terminal spike male (rarely bisexual in C. melanantha).
         8a. Female glumes broadly white hyaline on margins .........................  45. C. moorcroftii
         8b. Female glumes narrowly white hyaline on margins or not.
            9a. Utricles 2-toothed at orifice ....................................................  46. C. minxianensis
            9b. Utricles emarginate at orifice.
               10a. Spikes distant; leaves soft .................................................  43. C. augustinowiczii
               10b. Spikes approximate at culm apex, only lowest spike distant; leaves slightly stiff ................................................................. 44. C. melanantha
      7b. Terminal spike gynaecandrous.
         11a. Utricles scabrous above on margins ..............................................  47. C. obscura
         11b. Utricles smooth on margins.
            12a. Female glumes with a scabrous long awn at apex ..........................  48. C. gmelinii
            12b. Female glumes without scabrous long awn at apex.
               13a. Utricles veined.
                  14a. Utricles elliptic or elliptic-lanceolate.
                     15a. Spikes distant; female glumes pale or light ferruginous; orifice of utricles yellow-green, 2-toothed .......................................................... 59. C. peiktusani
                     15b. Spikes approximate; female glumes dark purple; orifice of utricles purple-red, emarginate ............................................................... 60. C. schneideri
                  14b. Utricles obovate-elliptic, obovate, or oblanceolate.
                     16a. Utricles inflated.
                        17a. Utricles 2–2.2 mm; female glumes broadly ovate, ca. 1.2 mm .................................................................  61. C. lehmannii
                        17b. Utricles (2.5–)3–3.3 mm; female glumes oblong, 2–2.5 mm .................................................................  62. C. montis-wutaii
                     16b. Utricles not inflated.
                        18a. Utricles oblanceolate or narrowly elliptic, beak 2-toothed at orifice ...............................................................  63. C. serreana
                        18b. Utricles obovate or elliptic-ovate, beak short and subtruncated at orifice .................................................................  64. C. caucasica
                  13b. Utricles nerveless (except for 2 costas on edges).
                     19a. Spikes contiguous forming a capitate or spicate inflorescence.
                        20a. Utricles membranous, vesicular, nerveless .........................  51. C. melanocephala
                        20b. Utricles leathery, granulose or glabrous, 3–5-veined.
                           21a. Rhizome long; utricles ovate, glabrous, 4–5 mm; sandy plants .................................................................  49. C. sabulosa
                           21b. Rhizome short, culms loosely tufted; utricles obovate, minutely granulose, 2.5–3 mm ..................  50. C. melananthiformis
                     19b. Spikes loosely disposed in racemose inflorescence.
                        22a. Female glumes 2–3 mm; female spikes 4–15 mm.
                           23a. Utricles inflated, horizontally patent at maturity ..................  57. C. hancockiana
                           23b. Utricles compressed or slightly inflated, not horizontally patent at maturity.
                              24a. Culms 30–60 cm tall; female glumes white hyaline on margins .........................................................  55. C. angarae
                              24b. Culms 15–25 cm tall; female glumes not white hyaline on margins .........................................................  56. C. duthiei
                        22b. Female glumes 4–6 mm; female spikes (20–)25–35 mm.
                           25a. Utricles stramineous, sometimes upper yellow-brown or purple punctate, compressed .........................................................  52. C. kansuensis
                           25b. Utricles dark brown to purple-brown.
                              26a. Female glumes 6–6.5 mm; nutlets ca. 2.5 mm ..................  53. C. bijiangensis
                              26b. Female glumes 3.5–4 mm; nutlets 1.5–1.7 mm.
                                 27a. Utricles elliptic or ovate, shallowly 2-toothed at orifice .................................................................  58. C. atrata
                                 27b. Utricles narrowly obovate, obliquely truncate at orifice .................................................................  54. C. obliquitruncata
37. Carex praeclara Nelmès, Hooker’s Icon. Pl. 35: t. 3403. 1940.

沙生薹草 sha sheng tai cao

Rhizome long creeping. Thick. Culms 20–30 cm tall, trigonous, slightly rigid, clothed at base with purple-brown sheaths. Leaves shorter than culm, blades linear, 3–5 mm wide, flat, apex acuminate. Involucral bracts sheathless, lowest one with setaceous blade, remaining ones glumelike. Spikes 3–8, densely disposed in a head, androgynous except 1 or 2 bearing female flowers at base, oblong, 1.3–2.5 cm, sub sessile. Nutlets light brown, obovate-oblong or elliptic, trigonous, ca. 2.5 mm; stigmas 3. Fl. and fr. Sep.

Grassy slopes, sandy soil; 4800–5400 m. Xizang, Yunnan [India (Sikkim)].


长鳞薹草 chang lin tai cao

Rhizome long creeping. Culms erect, 20–60 cm tall, acutely trigonous, scabrous below inflorescence, clothed at base with purple bladeless sheaths often disintegrating into reticulate fibers. Leaves nearly equaling culm, blades linear, 2–3 mm wide, flat, margins revolute. Lower involucral bract setaceous or leafy, upper ones glumelike. Spikes 3 or 4, approximate; terminal spike with female flowers in middle and male flowers at apex and base; lateral spikes female, ovate-oblong, 1–1.5 cm, sub sessile. Female glumes purple-brown, green at middle, narrowly ovate-lanceolate, 4.4–5.5 mm (including awn), margins white hyaline, 1-veined costa forming short awn at apex, apex acuminate. Utricles light gray-green, shorter than glume, elliptic, 1.5–2 mm, base shortly stipitate, apex rounded; style base not thickened; stigmas 3. Fl. and fr. Mar.

Meadows, wet places in forests; 1400–1500 m. S Jilin (Changbai Shan) [Japan].


乌拉草 wu la cao

Rhizome short, densely caespitose. Culms tufted, 20–50 cm tall, 1–1.5 mm wide, slender, obscurely trigonous, rigid, smooth, clothed at base with chestnut-brown lustrous bladeless sheaths disintegrating into fibers. Leaves shorter than or subequaling culm, blades setaceous, flexuose, rather stiff, folded, margins scabrous. Involucral bracts sheathless, lowest one setaceous, upper ones glumelike. Spikes 2 or 3, approximate; terminal spike male, cylindric, 1.5–2 cm; lateral spikes female, globose or ovate, 5–12 × ca. 0.5 mm, densely flowered. Female glumes dark purple or red-brown, ovate-oblong, 2.8–3.5 mm, finely 3-veined, margins narrowly white hyaline, apex obtuse. Utricles bluish green to gray, equaling or nearly longer than glume, ovate or elliptic, compressed trigonous, 2.5–3 mm, finely 5- or 6-veined, densely papilllose, base shortly stipitate, apex abruptly contracted into a cylindrical entire beak. Nutlets brown, tightly enveloped, obovate-elliptic, compressed trigonous, 1.5–2 mm, base shortly stipitate, apex rounded; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Marshes. Heilongjiang, Jilin, Liaoning, Nei Mongol, Sichuan [Japan, Korea, Mongolia, Russia (Far East, Siberia)].


红原薹草 hong yuan tai cao

Rhizome short, woody. Culms to 50 cm tall, trigonous, smooth, scabrous above, clothed at base with brown sheaths. Leaves shorter than culm, blades linear, 3–4 mm wide, flat, margins scabrous. Involucral bracts leafy, shorter than inflorescence, sheathless. Spikes 4, approximate; terminal spike male, long cylindric, 23–25 × 2–4 mm, with peduncle ca. 4 mm; lateral spikes female, cylindric, 1.25 × 0.5–0.6 cm, densely flowered, peduncles 1.27 cm. Female glumes dark brown, yellowish, or pale yellow, oblong, ca. 3.5 × 1.5 mm, 1-veined, apex obtuse. Utricles yellow-green, longer than glume, elliptic, compressed trigonous, ca. 4 × 2 mm, glabrous, 7–9-veined, constricted at both ends, beak short, orifice entire. Stigmas 3.

• Ditch sides; ca. 3600 m. S Sichuan (Hongyuan).


多雄薹草 duo xiong tai cao

Rhizome stoloniferous. Culms 60–70 cm tall, subrigid, scabrous above, clothed at base with brown sheaths. Leaves shorter than culm, blades linear, 3–4 mm wide, flat, slightly soft. Lower involucral bracts subleafy, sheathless, upper ones glumelike. Spikes 5–7, contiguous, lowest spike much spaced, cylindric, 25–36 × 6–7 mm, densely flowered, upper 3 or 4 male (rarely with a few female flowers at base), remaining spikes female, usually with a few male flowers at apex; peduncles slender, with dense papillae, upper ones rather short. Female glumes dark purple or brown, oblong-lanceolate, 4–4.5 mm, margins white hyaline, 1-veined green costa ending in a mucro at apex. Utricles pale brown, shorter than glume, subrounded or broadly ovate, compressed trigonous, 2.3–2.5 mm, purple punctate, glabrous, nerveless, apex abruptly contracted into a very short beak, orifice hyaline and emarginate. Nutlets loosely enveloped, elliptic, base abruptly contracted into short stipe; style base not thickened; stigmas 3. Fl. and fr. Jul–Aug.

• Abies forests, alpine meadows in thickets; 3700–4200 m. W Sichuan.


具芒薹草 ju mang tai cao

Rhizome short. Culms tufted, 15–30 cm tall, slender, pendent apically, trigonous, clothed at base with dark brown
bladeless sheaths. Leaves shorter than culm, blades linear, 1.5–2 mm wide, flat, papillose abaxially. Spikes 2 or 3, gynaecandrous, with male part ca. 1/3 length of spike, approximate, or lowest spike distant, oblong, 10–20 × ca. 5 mm, densely flowered, slenderly pedunculate, pendent. Female glumes dark purple, oblong, 2.8–3.2 mm, densely minutely papillose, 3-veined green costa often forming a scabrous long awn at apex. Utricles yellow-green, slightly longer than glume, elliptic, compressed trigonous, 3.2–3.5 mm, membranous, densely finely granulose toward apex, apex abruptly contracted into a short beak, bead entire at purple orifice. Nutlets loosely enveloped, obovate-oblong, trigonous, base shortly stipitate; style base not thickened; stigmas 3. Fl. and fr. Jul.

- Rocky places in thickets of alpine grasslands; 3200–3500 m. NW Yunnan (Gongshan).


短鳞薹草 duan lin tai cao

Carex augustinowiczii subsp. sayaeensis (Kükenthal) T. V. Egórova; C. elusinoides Turczaninow var. flaccidor F. Schmidt; C. flaccidor (F. Schmidt) Miyabe & Kudô; C. soyaeensis Kükenthal.

Rhizome shortly stoloniferous. Culms tufted, 30–50 cm tall, trigonous, slender, slightly scabrous, clothed at base with purple-brown bladeless sheaths disintegrating into fibers. Leaves green, slightly shorter than or equaling culm, blades 2–3 mm wide, soft. Lowest involucral bract leafy, sheathing, remaining ones setaceous. Spikes 3–5, ± distant; terminal spike male, cylindric, 1–1.7 cm; lateral spikes female, rarely few with male flowers at base, cylindric, 1.5–3.5 cm; lowest spike with short peduncle, others subsessile. Female glumes dark sanguineous or purple-red, pale green at middle, oblong, 2–2.8 mm, apex acuminate or obtuse. Utricles pale gray-green or yellow-green, longer than glume, ovate-lanceolate or oblong-lanceolate, obtusely trigonous, ca. 3 mm, finely many veined, base cuneate, apex gradually narrowed into a beak, orifice emarginate. Nutlets elliptic, trigonous, ca. 2 mm; style slender, base not thickened; stigmas 3. Fl. and fr. Jul–Sep.

- Forests, riversides, sandy wet places. Hebei, Heilongjiang, Jilin, Liaoning [Japan, Russia (Far East)].

44. Carex melanantha C. A. Meyer in Ledebour, Fl. Altaic. 4: 216. 1833.

黑花薹草 hei hua tai cao

Rhizome creeping, thick. Culms 7–20 cm tall, trigonous, firm, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 2–4 mm wide, flat, leathery, margins scabrous. Involucral bracts setaceous, shorter than inflorescence, sheathless. Spikes 4 or 5, approximate, lowest spike ± distant, densely many flowered; terminal spike male, oblong or cylindric, 1–1.8 cm; lateral spikes female, ovate or oblong, 0.7–1.8 cm, sessile or lowest with rather short peduncle. Female glumes purple, ovate-lanceolate, 5–6 mm, margins broadly white hyaline, apex acuminate. Utricles yellow-green, purple above, equaling or slightly shorter than glume, elliptic-ovobrigo, trigonous, leathery, faintly veined, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets obovate, trigonous, 2–2.3 mm; stigmas 3. Fl. and fr. Jul–Sep.

Alpine meadows in thickets, grasslands, lakesides, plateaus; 3400–5700 m. Qinghai, W Sichuan, Xizang [NE India].


陇南薹草 long nan tai cao

Rhizome stoloniferous. Culms 25–40 cm tall, trigonous, smooth, slightly scabrous above, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, apex acuminate. Lowest involucral bract setaceous, base auriculate surrounding culm, sheathless, upper ones glumelike. Spikes 4–6; terminal spike male, cylindric, 1.2–3 cm; lateral spikes female, oblong or cylindric, 1–2.5 cm, densely many flowered, upper ones approximate, sessile, lowest distant, with peduncle. Female glumes dark purple, ovate-lanceolate, 4.5–5 mm, 1-veined, margins sometimes narrowly white hyaline, apex acuminate, mucronate. Utricles yellow-green, dark purple above, shorter than glume, ovate, trigonous, 3.5–4 mm, base gradually attenuate, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets tightly enclosed, obovate, trigonous, ca. 2 mm; stigmas 3. Fl. and fr. Jun–Jul.

- Wet places along valleys; ca. 3000 m. S Gansu (Minxian).


刺囊薹草 ci nang tai cao

Rhizome short, rarely obliquely ascending. Culms tufted,
15–80 cm tall, acutely trigonous, smooth below, scabrous above, clothed at base with purple sheaths. Leaves shorter than culm, blades linear, 2–5 mm wide, flat, margins scabrous, apex long acuminate. Basal 1 or 2 involucral bracts longer than inflorescence, sheathless. Spikes 3–6; terminal spike gynaecandrous, oblong, 1–1.5 cm; lateral spikes female, oblong, 8–12 mm, with short peduncles or subsessile. Female glumes dark purple, ovate or broadly ovate, 1.8–2 mm, apex slightly acute or obtuse. Utricles pale green, longer than glume, obovate-elliptic or broadly ovate, 1.8–2 mm, apex slightly acute or obtuse.

No specimens have been seen by the present authors.


尤尔都斯薹  you er du si tai cao

Rhizome short, with stolons. Culms 10–30 cm tall, erect to slightly curved, scabrous above, clothed at base with brownish red bladeless sheaths disintegrating into fibers. Leaves slightly shorter than or subequaling culm, blades linear, 2.5–3 mm wide, apex long acuminate. Spikes 3–6, disposed in an interrupted spicate inflorescence; terminal spike gynaecandrous, ovate to oblong, clavate, 1–2.5 × 0.6–0.8 cm; remaining spikes female, ovate to oblong, 0.8–1.5 × 0.6–0.8 cm; lowest peduncle ca. 0.8 cm. Female glumes dark ferruginous, lighter on midrib, ovate, margins white hyaline, apex obtuse or acute. Utricles yellowish, ferruginous above, shorter than glume, obovate, 2.5–3 mm, minutely granulose, faintly 3- or 4-veined on both surfaces, base cuneate, apex abruptly contracted into a very short, smooth, emarginate beak. Fl. and fr. Jun–Aug.

Meadows, riversides, sands, swampy grasslands, lakesides; 100–2100 m. Xinjiang [N Mongolia, Russia (E Siberia); C Asia].

No specimens have been seen by the present authors.


黑鳞薹 hei lin tai cao

Rhizome short. Culms 10–20 cm tall, trigonous, firm, erect, scabrous above, clothed at base with pale brown bladeless sheaths. Leaves shorter than culm, ca. 1/2 length of culm, blades 2–4 mm wide, flat, apex acuminate. Lowest involucral bract sessate, sheathless. Spikes 3 or 4, disposed in a capitate inflorescence; terminal spike gynaecandrous, oblong, 8–10 mm; lateral spikes female, globose or oblong to oblong-elliptic, trigonous, ca. 3 mm, membranous, nerveless, base cuneate, apex gradually tapering into a beak, orifice 2-toothed and white hyaline. Nutlets loosely enveloped, obovate, trigonous, ca. 1.5 mm; stigmas 3. Fl. and fr. Jul–Aug.

Wet places; 1800–2400 m. Xinjiang [N Mongolia, Russia (Far East, Siberia); C Asia].
upper ones setaceous. Spikes 4–6, approximate; terminal spike 
gynaecandrous; lateral spikes female with a few male flowers 
at base, densely many flowered, oblong-cylindric, 1.5–3.5 cm; 
lowest peduncle (ca. 2 mm) slender, pendulous. Female glumes 
dark purple, elliptic-lanceolate, 4–4.5 mm, margins narrowly 
white hyaline, apex acuminate. Utricles stramineous, sub-
dark purple, elliptic-lanceolate, 4–4.5 mm, margins narrowly 
white hyaline, apex acuminate. Utricles stramineous, sub-
narrowly white hyaline, apex acuminate. Utricles stramineous, sub-
narrowly white hyaline, apex acuminate. Utricles stramineous, sub-

53. Carex bijiangensis S. Yun Liang & S. R. Zhang, Novon 

Rhizome short. Culms tufted, 50–60 cm tall, 2.5–3.5 mm 
wide, trigonocephalous, clothed at base with purple 
shiny sheath, sheathless, upper ones setaceous, shorter than inflorescence, sheathless. Spikes 4– 
6, approximate, lowest 1 or 2 distant; terminal spike gynaecan-
drous, cylindric, 2–3 × 0.8–0.9 cm; lowest peduncle 8–12 
mm, upper spikes with short peduncle or sessile. Female 
glumes dark brown, ovate-lanceolate, 6–6.5 (awn 1–1.5 mm) × 
ca. 2 mm, membranous, 1-veined, costa forming a scabrous long 
awn at apex. Utricles yellowish green to dark purple, shorter 
than glume, narrowly elliptic, 4–5 mm, membranous, subleath-
erly, apex gradually narrowed into a short beak, orifice truncate or emarginate. Nutlets enveloped, narrowly obo-
ventrigo, ca. 2.5 mm; stigmas 3. Fl. and fr. Jul–Sep.

54. Carex obliquitruncata Y. C. Tang & S. Yun Liang, Novon 

Rhizome short. Culms tufted, 25–50 cm tall, 1–2.5 mm 
wide, trigonocephalous, scabrous above, clothed at base with purple 
or dark purple bladless sheaths disintegrating into fibers. 
Leaves shorter than culm, blades 2–3.5 mm wide, flat, apex 
acuminate. Lowest involucral bract leafy, overlapping inflores-
cence, sheathless, remaining bracts setaceous. Spikes 3 or 4, 
contiguous or lowest distant; terminal spike gynaecandrous, 
1.5–2.5 × ca. 0.8 cm; lateral spikes female, or occasionally 
with a few male flowers at base, purplish brown, oblong or 
cylindric, 1.5–2.5 × ca. 0.8 cm; lowest peduncle 2–5 mm, upper 
spikes subsessile. Female glumes dark purple-brown, long lan-
ceolate, 3.5–4 mm, 1-veined. Utricles dark purple-brown, 
longer than glume, narrowly oblong or long elliptic, 3.2–4.5 
mm, membranous, without conspicuous veins except for 2 
costas on edges, base contracted into a short stipe, apex 
gradiually narrowed into a beak, orifice obliquely truncate. Nut-
lets castaneous, enveloped, ovate, trigonous, rather small, ca. 
1.5 mm, sessile; stigmas 3. Fl. and fr. Sep.


Rhizome shortly creeping. Culms 30–60 cm tall, trigo-
nous, slender, ± scabrous above, rarely smooth, clothed at base 
with purple bladeless sheaths. Leaves shorter than culm, 
blades 2–3 mm wide, flat, slightly revolute, apex acuminate. 
Involutural bracts leaflike, longer than inflorescence, sheathless. Spikes 3–5, upper 3 approximate; terminal spike gynaecan-
drous, oblong, 6–8 mm; lateral spikes female, ovate or oblong-
var. C. gracilenta (Boott ex Strachey) P. C. Li.

Culms 15–25 cm tall, loosely tufted, scabrous below inflo-

cence. Leaves equaling to shortly overtopping culm, blades 
3–5 mm wide, gradually tapering to acute apex; basal sheaths 
brownish and red-purple tinged, scarcely disintegrating into 
fibers. Spikes 3 or 4, approximate, oblong-elliptic, 10–15 × 4–5 
mm; terminal spike gynaecandrous with short basal male part 
no more than 3 mm; lateral spikes female or with several male 
flowers at base. Female glumes dark purple-brown, ovate to 
the ovate-oblong, ca. 2 × 1–1.5 mm, midrib stramineous, nearly 
as long as utricle, apex acute. Utricles oblong-obovate to obovate, 
rather conspicuously veined, base attenuate, apex contracted 
into a purple-tinged beak ca. 0.5 mm, orifice subtruncated. Nut-
lets rather tightly enveloped, obovate, trigonous, ca. 1.25 mm; 

Subalpine meadows or forest margins; 2700–3600 m. SW and W 
Sichuan, NW Yunnan [Bhutan, India].

57. Carex hancockiana Maximowicz, Bull. Soc. Imp. Natu-
ralistes Moscou 54(1): 66. 1879.

Rhizome shortly creeping, woody. Culms tufted, 30–80 
cm tall, slender, trigonous, slightly scabrous, clothed at base 
with purple bladeless sheaths disintegrating into reticulate fibers. 
Leaves shorter or longer than culm, blades linear, 2–5 mm wide,
flat, densely minutely papillose abaxially, margins scabrous. Involucre bracts leaflike, longer than inflorescence, sheathless. Spikes 3–5; terminal spike gynaecandrous, cylindric, 1–2 cm, densely many flowered, with slender, often pendulous peduncle; lateral spikes female, oblong, 1–1.5 cm, with slender peduncles 1.5–3 cm. Female glumes purple-brown, pale green at middle, ovate-lanceolate, ca. 2 mm, 3-veined, margins broadly white hyaline, apex acuminate. Utricles yellowish green, longer than glume, elliptic or oblong-lanceolate, inflated, horizontally patent and fr. Jun–Jul.

Toothed. Nutlets obovate, trigonous, ca. 1.5 mm; stigmas 3. Fl. attenuate, apex abruptly contracted into a short beak, orifice 2.5–3 mm, finely 5- or 6-veined, base gradually attenuate, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets obovate, trigonous, ca. 1.5 mm; stigmas 3. Fl. and fr. Jun–Jul.

Forest grasslands, wet places, alpine meadows; 400–2700 m. Gansu, Hebei, Jilin, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang [Korea, Mongolia, Russia (Siberia)].


黑穗薹草 [he sui tai cao] (yuan ya zhong)

Rhizome usually short. Culms densely tufted, 15–65 cm tall, trigonous, scabrous above, slightly inclined at apex, clothed at base with purple-red bladeless sheaths disintegrating into slightly reticulate fibers. Leaves shorter than culm, blades linear, 3–5 mm wide. Lower 1 or 2 involucral bracts leaflike, sheathless, upper ones setaceous or glumelike. Spikes 3–5, contiguous; terminal spike gynaecandrous, obovate or oblong; lateral spikes female, oblong, 10–15 × 5–6 mm, lower 2 with long peduncles, pendulous. Female glumes brown, dark brown, or purple-brown, ovate to narrowly ovate, 1-veined pale brownish costa forming a mucro at apex, apex acute to acuminate. Utricles brownish especially on upper part, nearly equaling or slightly shorter or longer than glume, elliptic or ovate, plano-convex, 3–3.5 mm, minutely papillose, without conspicuous veins except for 2 costas on edges, apex abruptly contracted into a conic short beak, orifice shallowly 2-toothed. Nutlets loosely enveloped, obovate, trigonous, 1.5–1.7 mm; style base not thickened; stigmas 3.

Alpine frozen soil, thickets. Jilin, Taiwan [Bhutan, India, Japan, Korea, Russia; Europe].


尖鳞薹草 [jian lin tai cao]

Female glumes lanceolate, apex long acuminate. Utricles shortly stipitate, apex abruptly contracted into a very short beak or beakless, orifice emarginate.

Alpine meadows; 3000–4800 m. W Sichuan, Taiwan, SE Xizang, NW Yunnan [India (Sikkim), Nepal].


大桥薹草 [da qiao tai cao]


Utricles 4–4.5 mm.

Xinjiang [Mongolia, Russia (Siberia); C Asia, Europe].


长匍匐薹草 [chang pu fu jing tai cao]


Rhizome long, creeping.

● Sichuan.


白头山薹草 [bai tou shan tai cao]

Carex hancockiana Maximowicz var. peiktusani (Komarov) Kükenthal.

Rhizome short. Culms 30–60 cm tall, trigonous, clothed at base with purple sheaths slightly disintegrating into fibers. Leaves longer than culm, blades gray-green, linear, 2–4.5 mm wide, flat, margins scabrous, apex acuminate. Involucral bracts leaflike, longer than inflorescence, sheathless. Spikes 3 or 4; terminal spikes gynaecandrous, 2–2.5 cm, cylindric, with peduncle 0.7–1 cm; lateral spikes female, 1.8–2.5 mm, oblong or long cylindric, lowest spike 2–3 cm, slightly pendulous. Female glumes pale ferruginous or greenish whitish, lanceolate or ovate-lanceolate, 3–4 mm, 3-veined. Utricles yellowish green, obliquely patent, equaling or slightly longer than glume, elliptic, trirnorous, 3.5–4 mm, 5- or 6-veined, apex gradually nar-
rowed into a short beak, orifice 2-toothed. Nutlets obovate or obovate-elliptic, trigonous, ca. 2 mm, base shortly stipitate; stigmas 3. Fl. and fr. Jun.–Aug.

Forests, riversides; 1000–1700 m. Hebei, Heilongjiang, Liaoning, Shandong, Shanxi [Korea, Russia (Far East)].


川滇薹 chuan dian tai cao

Rhizome short. Culms tufted, 60–90 cm tall, acutely trigonous, scabrous above, clothed at base with purple-brown sheaths often disintegrating into fibers. Leaves shorter than culm, blades linear, 2–4 mm wide, flat, margins scabrous, apex acuminate. Involucrals bracts leaflike, lowest one longer than inflorescence. Spikes 4 or 5, approximate; terminal spike gynaecandrous, oblong-cylindric, 1.5–2 cm; lateral spikes female, oblong-cylindric, 2–2.5 cm; peduncle slender, lowest one 2–4 cm, rarely up to 15 cm, becoming shorter upward. Female glumes dark purple, lanceolate, 3.5–4.5 mm, 1-veined, apex acuminate. Utricles yellowish green, short or longer than glume, elliptic-lanceolate, trigonous, slightly inflated, 3.5–4 mm, veined, apex gradually narrowed to a short beak, orifice purple, emarginate. Nutlets loosely enveloped, oblong, trigonous, ca. 2 mm; stigmas 3. Fl. and fr. Jul.–Aug.

- Thickets, grasslands, rocky slopes; 2000–4100 m. Sicuan, Xi-zang, Yunnan.


彭囊薹 peng nang tai cao

Rhizome stoloniferous. Culms 15–70 cm tall, slender, triconus, clothed at base with purple-brown sheaths. Leaves nearly equaling culm, blades linear, 2–5 mm wide, flat, soft. Involucral bracts leaflike, longer than inflorescence. Spikes 3–5; terminal spike gynaecandrous, oblong, 5–8 mm; lateral spikes female, ovate or oblong, 5–9 mm; upper spikes with short peduncles or subsessile, lowest with peduncle 1–4 cm. Female glumes dark purple or dark brown, broadly ovate, ca. 1.2 mm, 1-veined, apex obtuse or subacute. Utricles yellowish green, longer than glume, obovate or obovate-elliptic, trigonous, 2–2.2 mm, inflated, veined, apex abruptly contracted into a short beak, orifice emarginate or truncate. Nutlets obovate, trigonous, 1.2–1.7 mm; style short; stigmas 3. Fl. and fr. Jul.–Aug.

Mountain slopes, grasslands, forests, riversides; 2800–4100 m. Gansu, Henan, Hubei, Qinghai, Shanxi, Shaxi, W Sicuan, SE Xi-zang, NW Yunnan [Bhutan, India, Japan, Korea, Nepal].


五台山薹 wu tai shan tai cao

Rhizome stoloniferous. Culms 55–88 cm tall, erect, trigonous, scabrous above, clothed at base with chestnut-colored or brown, sometimes brown-red, bladeless or shortly bladed sheaths slightly disintegrating into fibers. Leaves longer or shorter than culm, blades linear, 3–5 mm wide, plicate, rather soft, margins scabrous, inrolled. Lower 2 involucral bracts leaflike, longer than inflorescence, remaining bracts setaceous, sheathless. Spikes 3 or 4, approximate; terminal spike gynaecandrous, oblong-obovate, 10–15 mm, male part shorter than female part; lateral spikes female, oblong, 9–12 × 4–6 mm, densely many flowered, scabrous above, with slender peduncles, pendulous. Female glumes brown-red or brown-purple, oblong or ovate-oblong, 2.2–5 × ca. 0.6 mm, 1-veined, margins white hyaline, apex acuminate. Utricles longer than glume, obovate or elliptic, inflated, (2.5–)3–3.3 × 1.5–1.8 mm, membranous, glabrous, densely finely granular, 3–7-veined, base cuneate, beak 0.3–0.4 mm, smooth, curled, orifice white hyaline, 2-toothed. Nutlets brown, loosely enveloped, obovate, trigonous, 1.5–1.8 × ca. 1 mm, base gradually attenuate, apex rounded or truncate; style slightly elongate; stigmas 3.

- Shanxi (Wutai Shan).


紫缘薹 zi hui tai cao

Carex wencheni F. T. Wang & Tang

Rhizome short. Culms tufted, 25–60 cm tall, trigonous, slender, smooth, clothed at base with purple-brown sheaths. Leaves shorter than culm, blades 2–3 mm wide, soft. Involucral bracts setaceous, sheathless. Spikes 2 or 3, approximate; terminal spike gynaecandrous, ovate or oblong, 5–10 mm; peduncles slender, lowest one 5–12 mm. Female glumes dark purple-red, ovate or ovate-lanceolate, 2–2.2 mm, 3-veined, margins narrowly white hyaline, apex acute or obtuse. Utricles yellowish green or pale brown, longer than glume, oblong-lanceolate or narrowly elliptic, trigonous, 3–3.5 × ca. 1 mm, not inflated, veined, apex abruptly contracted into a short beak, orifice dark purple, 2-toothed. Nutlets oblong, trigonous, ca. 2 mm; style long, base not thickened; stigmas 3. Fl. and fr. Jul.–Aug.

- Forests, wet places. Gansu, Hebei, Qinghai, Shanxi.


高加索薹 gao jiao suo tai cao

Rhizome short. Culms densely or subloosely tufted, 25–70 cm tall, trigonous, scabrous above, clothed at base with dark purple, lustrous bladeless sheaths disintegrating into fibers. Leaves as long as or shorter than culm, blades 3–8 mm wide. Lowest involucral bracts leaflike, slightly longer than inflorescence, remaining bracts setaceous, sheathless. Spikes 4–7; terminal spikes gynaecandrous, obovate or oblong, 15–25 × 5–6 mm; remaining spikes female, ovate or oblong to clavate, 1.5–3 × 0.6–0.8 cm, densely many flowered, with peduncle 4–5 cm, lowest 1 or 2 pendent on elongate peduncle. Female glumes dark purple-brown to purple-black, lanceolate, oblong-ovate, or lanceolate-elliptic, 3.2–3.8 mm, membranous, margins white hyaline, 3-veined yellowish costa forming a mucro at apex, apex acute to cuspidate. Utricles yellowish greenish, upper part ± stained with purple or ferruginous-yellow at length, obovate, obovate-elliptic, or compressed trigonous, 3–4 mm, faintly 3–5-veined at base or 7–9-veined abaxially, apex abruptly contracted into an erect short beak, orifice subtruncate or 2-toothed-emarginate. Nutlets loosely contained, obovate or elliptic, trigonous, 1.9–2.5 mm; stigmas 3. Fl. and fr. Jun.–Jul.
Alpine meadows and grasslands. Taiwan, Xinjiang [C Asia, SW Asia (Caucasus), Europe].

No specimens have been seen by the present authors.

1a. Leaf blades 4–8 mm wide; utricles 3.5–4 mm, faintly 3–5-veined at base; nutlets obovate, ca. 2.5 mm .... 64a. subsp. caucasica

1b. Leaf blades 3–5 mm wide; utricles 3–3.5 mm, 5–9-veined abaxially; nutlets elliptic, 1.9–2.1 mm

........................................................................................................................................  64b. subsp. jisaburo-ohwiana

64a. Carex caucasica subsp. caucasica

高加索薹草(原亚种) gao jia suo tai cao (yuan ya zhong)

Carex atrata Linnaeus subsp. caucasica (Steven) Küken-thal.

Leaf blades 4–8 mm wide. Utricles 3.5–4 mm, faintly 3–5-veined at base. Nutlets obovate, ca. 2.5 mm.

Meadows in valleys. Xinjiang [C Asia, SW Asia (Caucasus), Europe].

64b. Carex caucasica subsp. jisaburo-ohwiana (T. Koyama)

大井扁果薹草 da jing bian guo tai cao


Leaf blades 3–5 mm wide. Utricles 3–3.5 mm, 5–9-veined abaxially. Nutlets elliptic, 1.9–2.1 mm.

● Alpine grasslands. Taiwan.


米柱薹草组 mi zhu tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Rhizome stoloniferous. Involucral bracts not sheathed. Spikes few, remote; terminal spike male; lateral spikes female, densely many flowered, sessile or shortly pedunculate. Female glumes purple-brown, ovate. Utricles yellow-brown, obliquely patent, ovate or broadly ovate, inflated trigonous, subleathery, papillose, distinctly veined, apex abruptly narrowed into a very short beak, orifice emarginate. Style base thickened; stigmas 3.

One species: NE China, Korea, E Russia.


米柱薹草 mi zhu tai cao

Dai Lunkai (戴伦凯); Tetsuo Koyama

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One species: NE China, Korea, E Russia.


玉簪薹草组 yu zan tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Culms usually rather short. Leaf blades narrow, lower leaf sheaths red-brown. Involucral bracts shorter than inflorescence, blades scalelike or lowermost one linear or setaceous. Spikes 3–5, rather contiguous; terminal spike male; lateral spikes female, sessile or subsessile. Female glumes red-brown. Utricles obliquely patent, ovate or ovate, inflated trigonous, membranous, usually hirtellous, apex shortly beaked, orifice emarginate or slightly 2-toothed. Nutlets tightly enveloped, trigonous; style base not thickened; stigmas 3.

About 35 species: circumboreal in Asia, Europe, and North America; five species in China.

1a. Utricles distinctly veined.

2a. Leaf blades glabrous; female glumes ovate, ca. 2 mm, costa not projecting beyond apex forming a mucro; utricles obovate, 2.5–3 mm ................................................................................................................................. 66. C. globularis

2b. Leaf blades hispid; female glumes oblong, ca. 4 mm, costa usually projecting beyond apex forming a mucro; utricles oblong-ovate, 4–4.5 mm ................................................................................................................................. 67. C. ulobasis
1b. Utricles obscurely veined or nerveless.

3a. Involucral bracts scalelike; female glumes mucronate at apex ........................................ 70. Carex vanheurckii

3b. Lower involucral bract blades leaflike, sometimes rather narrow, upper ones scalelike; female glumes not mucronate at apex.

4a. Female glumes broadly ovate, 2.2–2.5 mm; utricles obovate, 2.5–2.8 mm, yellowish green ........... 68. Carex chinganensis

4b. Female glumes ovate, ca. 3 mm; utricles oblong-obovate, 3–3.5 mm, yellowish brown ................... 69. Carex amgunensis


玉筒薹草 yu zan tai cao

Rhizome obliquely ascending, stoloniferous; stolons slender, clothed with red-brown leaf sheaths. Culms loosely tufted, 20–60 cm tall, slender, triquetrous, slightly scabrous on upper part, red-brown and bladeless sheathed at base; sheaths at membranous part usually disintegrating into reticulate fibers. Leaves equaling or slightly shorter than culm, blades 1–2 mm wide, rather soft, glabrous, margins revolute, upper margin scabrous; sheaths rather long, hispidulous adaxially. Lower involucral bracts leaflike, linear, shorter than inflorescence, nearly not sheathed, upper involucral bracts scalelike, not sheathed. Spikes 3 or 4, male spike and uppermost female spike approximate, remaining spikes remote; terminal spike male, linear, 1–2 cm, subsessile; lateral spikes female, oblong, ovate, or subglobose, 0.5–1.2 cm, few flowered; lowermost spike very shortly pedunculate, upper ones sessile. Female glumes yellow-brown at middle, ovate, ca. 2 mm, membranous, 3-veined, sometimes 2 lateral veins indistinct, margins yellowish white, apex obtuse, muticous. Utricles green-brown, obliquely truncate or emarginate. Nutlets yellowish green, ferruginous on upper part and beak, obliquely truncate, nearly not sheathed, upper involucral bracts scalelike, not sheathed. Spikes 2 or 3, congested at top of culm, lowermost one slightly remote; terminal spike male, clavate or linear, 0.8–1.2 cm, subsessile; lateral spikes female, globose or broadly ovate, ca. 5 mm, few flowered, sessile. Female glumes brownish, broadly ovate, 2.2–2.5 mm, 1-veined, margins hyaline, apex acuminate. Utricles yellowish green, slightly pale brown at base and near apex, obliquely truncate, slightly longer than or equaling glume, obovate, obtusely trigonous, 2.5–2.8 mm, herbaceous, densely hispidulous, not veined or indistinctly few veined at base, base cuneate, margins hyaline, apex abruptly contracted into a short beak, orifice obliquely truncate or emarginate. Nutlets yellowish, tightly enveloped, subelliptic or elliptic-obovate, obtusely trigonous, ca. 2 mm, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Lax forests and among shrubs on sunny mountain slopes, meadows. Heilongjiang, Nei Mongol [Korea, Russia (Far East, E Siberia)].


兴安薹草 xing an tai cao

Rhizome slender, creeping or obliquely ascending, clothed with red-brown and bladeless sheaths. Culms tufted, 20–40 cm tall, slender, compressed triquetrous, smooth on lower part, scabrous on angles of upper part, red-brown sheathed at base. Leaves shorter than culm, blades 1–1.5 mm wide, flat, scabrous on upper surface and margins, sheathed; sheaths usually split at one side. Lowermost involucral bract leaflike, linear, upper ones scalelike, aristate, not sheathed. Spikes 2 or 3, congested at top of culm, lowermost one slightly remote; terminal spike male, clavate or linear, 0.8–1.2 cm, subsessile; lateral spikes female, globose or broadly ovate, ca. 5 mm, few flowered, sessile. Female glumes brownish, broadly ovate, 2.2–2.5 mm, 1-veined, margins hyaline, apex acuminate. Utricles yellowish green, slightly pale brown at base and near apex, obliquely truncate, slightly longer than or equaling glume, obovate, obtusely trigonous, 2.5–2.8 mm, herbaceous, densely hispidulous, not veined or indistinctly few veined at base, base cuneate, margins hyaline, apex abruptly contracted into a short beak, orifice obliquely truncate or emarginate. Nutlets yellowish, tightly enveloped, subelliptic or elliptic-obovate, obtusely trigonous, ca. 2 mm, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Grasslands on mountain slopes, wet places in forests, swamps. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia; Europe].

The stems and leaves of this species are good pasture for sheep, cows, and horses.


卷叶薹草 juan ye tai cao

Carex montana Linnaeus var. manshuriensis Komarov.

Rhizome short, ligneous. Culms densely tufted, 15–25 cm tall, slightly compressed triquetrous, smooth on lower part, slightly scabrous on upper part, red-brown and bladeless sheathed at base, sheaths eventually disintegrating into fibers. Leaves equaling or shorter than culm, blades 1–2.5 mm wide, ± stiff, flat, loosely pubescent on adaxial surface, scabrous on margins, long and red-brown sheathed; sheaths usually split at membranous side, eventually blade at base usually volute. Involucral bracts scalelike, ovate, hyaline on margins, basal part closing around stem, aristate at base. Spikes 2 or 3, rather congested at top of culm; terminal spike male, lanceolate or clavate, 0.8–1.5 cm, subsessile; lateral spikes female, ovate, 0.8–1.2 cm, densely 10–or more flowered, sessile. Female glumes ferruginous, oblong, ca. 4 mm, membranous, 1-veined, costa pale brown, apex emarginate, mucronate or shortly awned. Utricles yellowish green, ferruginous on upper part and beak, obliquely patent, equaling or slightly shorter than glume, obovate-obovate, compressed trigonous, 4–4.5 mm, loosely white villous, distinctly many veined, base gradually narrowed to a short stipe, apex gradually narrowed to a short beak, orifice obliquely truncate or emarginate. Nutlets brown, rather tightly enveloped, ovate or oblong-obovate, trigonous, ca. 2.5 mm, base shortly stipitate; style base not thickened; stigmas 3 Fl. and fr. May–Jul.

Forests on mountain slopes. Heilongjiang, Jilin, Nei Mongol [Russia (Far East)].


球穗薹草 qiu sui tai cao

Carex amgunensis var. chloroleuca (Meinshausen) Küchenthal; Carex chloroleuca Meinshausen.

Rhizome slender, creeping or obliquely ascending, with slender stolons. Culms densely tufted, 15–35 cm tall, slender, triquetrous, smooth, scabrous on angles of upper part, with few brown and bladeless sheaths at base, sheaths eventually disintegrating into fibers. Leaves shorter than or nearly equaling...
culm, blades 1–2 mm wide, flat, slightly soft, scabrous on upper surface and margins, slightly long sheathed, eventually split at membranous side. Lowermost involucral bract green, leaflike, rather thin, longer than spike, upper ones scallike, brownish, not sheathed. Spikes 2 or 3, rarely 4, congregated at top of culm; terminal spike male, lanceolate, 5–10 mm, subsessile; lateral spikes female, subglobose or broadly ovoid, 5–6 mm, 6–10-flowered, sessile. Female glumes yellowish brown, ovate, ca. 3 mm, 1-veined, margins hyaline, apex acute. Utricles yellow-brownish, obliquely patent, slightly longer than glume, oblong-obovate, plano-convex-trigoneous, 3–3.5 mm, herbaceous, densely hispidulous on upper part, indistinctly veined, base cuneate, margins hyaline, apex abruptly contracted into a short beak, orifice obliquely truncate or emarginate. Nutlets stramineous, tightly enveloped, elliptic, trigoneous, ca. 2.5 mm, base shortly stipitate; style base not thickened; stigmas 3. Fl. and fr. May–Jun.

Shady places on mountain slopes, swamps; ca. 2000 m. Hebei, Heilongjiang [Mongolia, Russia; E Europe (Ukraine)].


鱗苞薹草 lin bao tai cao

Rhizome slender, clothed with dark brown, bladeless sheaths, stoloniferous. Culms tufted, 10–30 cm tall, slender, obtusely trigonous, scabrid on upper part, brown sheathed at base, sheaths disintegrating into fibers. Leaves slightly shorter than culm, blades 1–2 mm wide, flat, scabrous on upper surface and margins, sometimes slightly revolute on margins when dry, long sheathed. Involucral bracts scallike, rarely lowermost one subulate, green, long aristate. Spikes 2 or 3, congregated at top of culm, sometimes lowermost one slightly remote; terminal spike male, linear or fusiform, 0.7–1.5 cm, nearly sessile; lateral spikes female, globose or ovate, 4–7 mm, few flowered, sessile. Female glumes brown laterally, ovate, ca. 2.5 mm, with a pale midrib, hyaline on upper margin, apex acuminate, mucronate. Utricle yellowish green, slightly brown on upper part, obliquely patent, nearly equaling glume, elliptic or obovate, plano-convex-trigoneous, 2.5–3 mm, laxly hispidulous, not veined, base cuneate, apex abruptly contracted into a short beak, hispidulous on margins of beak, orifice emarginate. Nutlets tightly enveloped in utricle, broadly obovate, trigoneous, ca. 1.7 mm; style base not thickened; stigmas 3. Fl. and fr. May–Jun.

Forests or grasslands on mountain slopes; ca. 1200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, N Korea, Mongolia, Russia (Far East, E Siberia)].


黄囊薹草组 huang nang tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Rhizome creeping. Culms tufted, slightly slender, clothed with red-brown, bladeless sheaths. Leaves usually rather narrow. Involucral bracts scallike or lowermost one leaflike, linear, rarely setiform, nearly not sheathed or very shortly sheathed. Spikes 2–5; terminal spike male, rare species with 2 male spikes, linear-lanceolate, lanceolate, or clavate; lateral spikes female, ovate, broadly ovate, or subglobose, subdensely flowered, sessile or rarely shortly pedunculate. Female glumes red-brown or yellow-brown, margins broadly hyaline. Utricles obliquely patent or eventually divaricate, obovate or elliptic-obovate, obtusely or inflated trigonous, glabrous, rarely hispid, shiny, shortly beaked, orifice obliquely truncate, emarginate, or shortly 2-toothed. Nutlets tightly enveloped; style base slightly thickened; stigmas 3.

Twelve species: circumboreal in Asia, Europe, and North America, also in N Africa; seven species (five endemic) in China.

1a. Culms 2–8 cm tall; utricles 2–3 mm.

2a. Spikes 2 or 3, female spikes congregated at top of culm; involucral bracts scallike, aristate at apex, not sheathed; utricles shorter than glume, 2–2.2 mm .......................... 71. C. pseudosupina

2b. Spikes 3 or 4, female spikes congregated at base of culm, lower than leaves; involucral bracts setaceous, shortly sheathed; utricles equaling or longer than glume, 2.5–3 mm .......................... 72. C. tangulashanensis

1b. Culms 10–35 cm tall (C. aridula only 5–20 cm tall); utricles 3–4 mm.

3a. Lowermost involucral bract leaflike, upper involucral bracts scallike or setiform, shortly sheathed; female spikes (0.5–)0.8–1.5 cm, shortly pedunculate or lowermost female spike rather long sheathed.

4a. Spikes 3–5, lowermost spike slightly remote, upper spikes congregated at top of culm, terminal spikes 1 or 2 male, female spikes 2–4, 1–1.5 cm, densely flowered, shortly pedunculate; utricles smooth, glabrous .............................................................. 76. C. turkestanica

4b. Spikes 2 or 3, congregated at top of culm, terminal spike male, female spikes 1 or 2, (0.5–)0.8–1.2 cm, rather loosely flowered, lowermost spike long pedunculate, others shortly pedunculate; utricles hispid .................................. 77. C. asperifructus

3b. Involucral bracts scallike, lowermost one long awned, not sheathed; female spikes 0.5–0.8(–1) cm, sessile.

5a. Female spikes congregated at top of culm; utricles dark brown at maturity .......................... 73. C. ivanoviae

5b. Lowermost female spikes rather remote; utricles yellow or yellowish green at maturity.

6a. Utricles elliptic or obovate, inflated trigonous, 3–4 mm, yellow ............................................. 74. C. korshinskii

6b. Utricles globose-obovate, obtusely trigonous, ca. 3 mm, yellowish green ............................. 75. C. aridula

高山薹草 gao shan tai cao

Rhizome with slender stolons, clothed with brown bladeless leaf sheaths. Culms tufted, 5–8 cm tall, triquetrous, smooth on lower part and scabrous on angles of top, clothed with few yellow-brown or red-brown, bladeless sheaths at base, sheaths partly splitting into fibers. Leaves slightly longer than or shorter than culm, blades 0.5–1 mm wide, rather thin, flat or slightly revolute on margins, sheathed; sheaths membranous at one side, usually split. Involutral bracts yellowish brown, scalelike, lanceolate, awned at apex, not sheathed. Spikes 2 or 3, congregate at top of culm; terminal spike male, lanceolate, 7–8 mm, sessile; lateral spikes female, ovate-oblong, 5–6 mm, densely several flowered, sessile. Female glumes dark brown, ovate, 3.5–4 mm, membranous, with 1-veined yellowish costa, hyaline on upper margin, apex acute, mucronate. Utricles dark brown, suberect or slightly obliquely patent, shorter than or equaling glume, ovate, obtusely trigonous, 3.5–4 mm, thinly leathery, shiny, indistinctly veined, base cuneate, shortly stipitate, apex abruptly contracted into a short beak, orifice very shortly 2-toothed. Nutlets brownish yellow, subelliptic, trigonous, ca. 2 mm, sessile, apex mucronate; style short, base slightly thickened; stigmas 3. Fl. and fr. Jul–Aug.

● Wet places; 4000–5300 m. Qinghai, Xizang.


唐古拉薹草 tang gu la tai cao

Rhizome slender. Culms loosely tufted, 2–4 cm tall, compressed triquetrous, smooth, few dark brown and bladeless sheathed at base. Leaves slightly shorter than culm, blades 2–3 mm wide, flat, ± stiff, scabrid on veins and upper margins. Involucral bracts setaceous or mucro-shaped, membranous sheathed, usually clothed by leaf sheath. Spikes 3 or 4; terminal spike male, lanceolate or lanceolate-ovate, 6–12 mm, densely 10- or more flowered; lateral spikes female, congregate at base of culm, hidden in leaf tuft, ovate or ovoid, 4–7 mm, densely 5–10-flowered, with short peduncle. Female glumes yellow-brown laterally, yellow-green at middle, ovate, 2.5–3 mm, membranous, 1-costate, margins hyaline, apex acute, mucronate. Utricles yellow-brown, slightly obliquely patent, equaling or slightly longer than glume, elliptic, obtusely trigonous, 2.5–3 mm, thinly leathery, base broadly cuneate, margins hyaline, apex abruptly contracted into a short beak, orifice emarginate. Nutlets yellowish, elliptic, obtusely trigonous, ca. 1.5 mm; style slightly thick and short; stigmas 3. Fl. and fr. Jun–Aug.

● Mountain slopes; 1000–1300 m. Gansu, Heilongjiang, Liaoning, Nei Mongol, Shaanxi, Xinjiang [Korea, Mongolia, Russia (Far East, E Siberia)].


无穗柄薹草 wu sui bing tai cao

Rhizome rather long, creeping or obliquely ascending. Culms densely tufted, 10–15 cm tall, nearly half-tetere, smooth, several brown and old leaves and sheaths usually disintegrating into fibers. Leaves shorter than culm, not up to 1 mm wide, usually involute into needle-shape, smooth, brown and membranous sheathed. Involucral bracts scale-shaped, lanceolate, long aristate at apex, longer than or slightly shorter than spike, not sheathed. Spikes 2–4, congregate at top of culm; terminal spike male, narrowly lanceolate, 8–15 mm, sessile; lateral spikes female, ovate, 5–8(–10) mm, densely several flowered, subsessile. Female glumes dark brown, ovate, 3.5–4 mm, membranous, with 1-veined yellowish costa, hyaline on upper margin, apex acute, mucronate. Utricles dark brown, suberect or slightly obliquely patent, shorter than or equaling glume, ovate, obtusely trigonous, 3.5–4 mm, thinly leathery, shiny, indistinctly veined, base cuneate, shortly stipitate, apex abruptly contracted into a short beak, orifice very shortly 2-toothed. Nutlets brownish yellow, subelliptic, trigonous, ca. 2 mm, sessile, apex mucronate; style short, base slightly thickened; stigmas 3. Fl. and fr. Jun–Aug.

Grasslands, mountain slopes, sand dunes; 700–1300 m. Gansu, Heilongjiang, Liaoning, Nei Mongol, Shaanxi, Xinjiang [Korea, Mongolia, Russia (Far East, E Siberia)].


黄薹草 huang nang tai cao

Carex supina Wahlenberg var. costata Meinshausen; C. supina subsp. korshinskii (Komarov) Malyschev; C. supina var. korshinskii (Komarov) Kükenthal.

Rhizome slender, creeping or obliquely ascending. Culms densely tufted, 15–35 cm tall, slender, compressed triquetrous, smooth on lower part and scabrid on upper part, with few yellow-brown or red-brown bladeless sheaths and rudimentary sheaths at base, rudimentary sheaths usually disintegrating into fibers. Leaves shorter or longer than or equaling culm, blades 1–2 mm wide, slightly stiff, scabrid on upper surface and margins, sheathed. Involucral bracts scale-shaped, lowermost sometimes long awned at apex. Spikes 2 or 3 (or 4), uppermost female spike and male spike approximate, lowermost female spike rather remote; terminal spike male, clavate or lanceolate, 1–2.5 cm, sessile; lateral spikes female, ovate or subglobose, 5–10 mm, densely several to 10-flowered, sessile. Female glumes brown, ovate, ca. 3 mm, with 1 midrib, margins white hyaline, apex acute. Utricles yellow, first obliquely patent, later slightly divergent, elliptic or obovate, inflated trigonous, 3–4 mm, leathery, shiny, smooth, obscurely veined, base obtuse, apex abruptly contracted into a very short beak, orifice obliquely truncate or emarginate. Nutlets gray-brown, tightly enveloped in utricle, elliptic, trigonous, 2–2.5 mm, apex mucronate; style base slightly thickened; stigmas 3. Fl. and fr. Jul–Sep.

Grasslands, mountain slopes, sand dunes; 4000–5000 m. Qinghai, Xizang.

75. Carex aridula

干薹草 gan sheng tai cao

Rhizome long stoloniferous. Culms tufted, 5–20 cm tall, slender, compressed triquetrous, smooth on lower part and
scabrous on angles of upper part, few red-brown and bladeless sheathed and rudimentary sheathed at base, rudimentary sheaths usually disintegrating into fibers. Leaves shorter or slightly longer than culm, blades 1–1.5 mm wide, scabrous on upper surface and margins, sometimes slightly involute on margins. Involucral bracts scalelike, lowermost long awned at apex, enclosing culm at base. Spikes 2 or 3, uppermost female spike and male spike approximate, lowermost female spike rather remote; terminal spike male, clavate, 1–1.5 cm, subse ssile; lateral spikes female, globose or oblong, 5–8 mm, densely several to 10-flowered, sessile. Female glumes red-brown, ovate or broadly ovate, ca. 3 mm, membranous, with 1 midrib, margins white hyaline, apex acute. Utricles yellowish green, slightly brownish at maturity, first obliquely patent, later nearly horizontally divaricate, globose-obovate, obtusely trigonous, ca. 3 mm, smooth, shiny, nerveless, base broadly cuneate, margins white hyaline, apex abruptly contracted into a very short beak, orifice obliquely truncate. Nutlets dark brown, ovate or broadly obovate, trigonous, ca. 2 mm, base cuneate, apex mucronate; style base thickened; stigmas 3. Fl. and fr. Jun–Sep.

Mountain slopes, valleys, forests; 1000–2600 m. Gansu, Xinjiang [Afghanistan, Russia (W Siberia), Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan].


粗囊薹草 cu cao nang tai cao

Rhizome rather long, obliquely ascending, slender stoloniferous. Culms loosely tufted, 10–20 cm tall, slender, acutely triquetro us, smooth, red-brown and bladeless sheathed at base, rudimentary sheaths usually disintegrating into fibers. Leaves shorter than or nearly equating culm, blades 1–2 mm wide, flat, scabrous on upper surface and margins; sheaths yellowish, distinctly many veined, veins sometimes pal lid or reddish. Involucral bracts shortly sheathed, lowest involucral bract leaflike, upper ones setiform. Spikes 2 or 3, rather approximate, congregated at top of culm; terminal spike male, clavate-linear or oblong, 0.8–1.2 cm, subse ssile; lateral spikes female, ovate or subelliptic, 5–12 mm, loosely few to several flowered, lowest spike with slender peduncle, upper with very short peduncle or subse ssile. Female glumes yellowish brown or brown, ovate, ca. 3 mm, membranous, with broad midrib, apex acute. Utricles stramineous in upper part and brownish on basal surface, obliquely patent, equaling or slightly longer than glume, obovate, obtusely trigonous, 3–3.5 mm, leathery, hispidulous, rather dense on upper part, with 2 distinct lateral veins abaxially, base cuneate, apex abruptly contracted into a short beak, orifice truncate and membranous. Nutlets yellow, elliptic or obovate-elliptic, trigonous, 2.5–2.8 mm, apex mucronate; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Sep.

● Forests on mountain slopes; 2100–3700 m. Qinghai, Shanxi.


糙果薹草组 cao guo tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Rhizome sometimes stoloniferous. Involucral bracts leaflike or lowest leaflike and upper setiform. Spikes unisexual and bisexual, upper spikes rather congregated, sessile, lowest spike rather remote, ± pedunculate; male spikes usually 2–6; female spikes 2–7, densely many flowered, sometimes with male flowers at upper part. Female glumes mucronate or aristate at apex. Utricles membranous, white hispidulous, with short beak, orifice emarginate. Style base not thickened, stigmas 3.

About 30 species: circumboreal in Asia, Europe, and North America, also in S Asia; three species (one endemic) in China.

Some authors (e.g., Reznicek & Catling, Fl. N. Amer. 23: 491. 2002) include Carex sect. Hirtae in C. sect. Paludosae.

1a. Rhizome short and thick; male spike 1, terminal, lateral spike female or sometimes with few male flowers at top; utricles broadly obovate or obovate, 2–2.5 mm, shortly 2-toothed at beak orifice

81. Carex inanis Tul.
1b. Rhizome with slender stolons; male spikes 1–4, inserted at top, remaining spikes bisexual and unisexual, androgynous and male or androgynous and female; utricles 2.5–3 mm, truncate and slightly emarginate at apex.

2a. Spikes slightly laxly many flowered, male spikes 1–4, inserted at top, remaining spikes androgynous (female in var. schlagintweitiana); female glumes ovate, ca. 3 mm, mucronate at apex; utricles obovate, laxly hispidulous; nutlets obovate, ca. 1 mm.................................................................................................................................. 79. C. setigera

2b. Spikes rather densely many flowered, male spikes 2 or 3, sometimes with few female flowers at base, remaining spikes female, rarely androgynous; female glumes lanceolate, 6–8 mm, aristate at apex, aristae 2–4 mm; utricles elliptic or broadly elliptic, densely white hispidulous; nutlets orbicular-ovate or orbicular, ca. 2 mm .......................................................................................................................... 80. C. lancisquamata


毛囊薹草 mao nang tai cao

Rhizome short and thick, ligneous. Culms densely tufted, 10–50 cm tall, slender, obtusely trigonous, smooth, clothed with few red-brown and bladeless sheaths, rudimentary sheaths usually disintegrating into reticulate fibers. Leaves shorter or slightly longer than culm, blades 1–2 mm wide, scabrous and revolute on margins, sheathed. Involucral bracts leaflike, slender, longer than inflorescence, lower involucral bracts shortly sheathed, upper very shortly sheathed or almost not sheathed. Spikes 4–7, lowest spike inserted near base of culm or rather remote, remaining spikes congregated at top of culm; terminal spike male, narrowly cylindric or narrowly lanceolate, 1.5–4 cm, sub sessile; lateral spikes female, sometimes with few male flowers at apex or branching bearing secondary spikes at base, female spikes oblong or oblong-cylindric, 0.8–2.5 cm, densely many flowered, lower spikes shortly pedunculate, upper subsessile. Female glumes yellowish brown, oblong or subovate, 2–3 mm, membranous, costate, apex acuminate. Utricles stramineous, sometimes brownish at base, obliquely patent, shorter than glume, broadly ovate or ovate, trigonous, 2–2.5 mm, membranous, densely white hispidulous, indistinctly veined, base abruptly contracted into a very short stipe, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets brown, tightly enveloped in utricle, obovate, broadly obovate, or subelliptic, trigonous, ca. 1.5 mm, base shortly stipitate, apex with torsional macro; style base not thickened; stigmas 3. Fl. and fr. Jul.–Aug.

Dense forests, riversides, mountain slopes; 2300–3500 m. Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan].


长茎薹草 chang jing tai cao

Rhizome with slender, ligneous stolons. Culms hardly tufted, 8–35 cm tall, slender, obtusely trigonous, smooth, red-brown and bladeless sheathed at base, rudimentary sheaths usually disintegrating into reticulate fibers. Leaves longer or shorter than culm, blades 1–3 mm wide, flat, scabrous on margins, sheathed. Involucral bracts leaflike, linear, lower involucral bracts longer than inflorescence, sheathed, uppermost shorter than inflorescence, not sheathed. Spikes 3–6, congregated at top of culm, approximate; male spikes 1–4, inserted at top of culm, cylindric or oblong-lanceolate, 5–25 mm, nearly sessile; remaining spikes bisexual or female, oblong-cylindric, narrowly oblong, or oblong, 0.8–3 cm, slightly laxly many flowered, lower spikes pedunculate, upper spikes sessile or subsessile. Female glumes purple-brown, ovate, ca. 3 mm, membranous, costate, costa yellowish, apex acuminate. Utricles yellowish green, purple-brown flecked, obliquely patent, shorter than glume, obovate, trigonous, 2.5–3 mm, membranous, laxly hispidulous, indistinctly veined, base gradually attenuate into a short stipe, apex attenuate into a short beak, orifice obliquely truncate and emarginate. Nutlets dark brown, tightly enveloped, obovate, trigonous, ca. 1 mm, base very shortly stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jun.

Wet places at riversides, forests on mountain slopes, grasslands; 2300–4100 m. Xizang, Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan].

1a. Culms 25–35 cm tall; leaves longer or slightly shorter than culm; male spikes 2–4, congregated at top of culm, cylindric, 5–25 mm, remaining spikes bisexual, androgynous, oblong-cylindric or narrowly oblong, 2–3 cm; utricles 2.5–3 mm ................................................. 79a. var. setigera

1b. Culms 8–15 cm tall; leaves shorter than culm; male spike 1, terminal, oblong-lanceolate, 6–8 mm, remaining spikes androgynous or female, oblong, 0.8–1 cm; utricles ca. 2 mm ................................................. 79b. var. schlagintweitiana

79a. Carex setigera var. setigera

長茎薹草(原变种) chang jing tai cao (yuan bian zhong)

Carex aristata D. Don ex Tilloch & Taylor (1823), not Honckenya (1792), nor R. Brown (1823).

Culms 25–35 cm tall. Leaves longer or slightly shorter than culm. Male spikes 2–4, congregated at top of culm, cylindric, 0.5–2.5 cm; remaining spikes bisexual, androgynous, oblong-cylindric or narrowly oblong, 2–3 cm. Utricles 2.5–3 mm.

Wet places at riversides, forests on mountain slopes, grasslands; 2700–4100 m. Xizang, Yunnan [Bhutan, India, Nepal].


小长茎薹草 xiao chang jing tai cao


Culms 8–15 cm tall. Leaves shorter than culm. Male spike 1, terminal, oblong-lanceolate, 6–8 mm; remaining spikes female, oblong, 8–10 mm. Utricles ca. 2 mm.
1b. Utricles purple-red papillate or glandular punctate. Culms tufted, blades 3–6 mm wide, flat, sometimes slightly revolute on short sheaths at base. Leaves slightly shorter than glume, elliptic or obovate-oblong, 1.5–3 cm, subsessile; remaining spikes female or androgynous, cylindric, 4–5 cm, densely many flowered, lower spikes with slender peduncles, upper ones with short peduncles. Female glumes purple-brown or yellow-brown laterally, lanceolate, 6–8 mm, membranous, 1-costate, apex acuminate, long aristate, arista 2–4 mm. Utricles olivaceous and slightly red-brown at base and beak, obliquely patent, shorter than glume, elliptic or broadly elliptic, obtusely trigonous or plano-convex, ca. 3 mm, herbaceous, densely white hispidulous, indistinctly veined, base abruptly contracted into a short stipe, apex abruptly narrowed into a ± long beak, orifice subtruncate or emarginate. Nutlets brown, tightly enveloped in utricles, orbicular-ovate or suborbicular, trigonous, ca. 2 mm; style base deflexed, not thickened; stigmas 3. Fl. and fr. May–Jun.


### 披针鳞薹

**Carex dineuros** C. B. Clarke.

Rhizome short, ligneous, rather stout stoloniferous. Culms densely tufted, 30–85 cm tall, rather stout, obtusely trigonous, scabrid on upper angles, yellowish brown and with bladeless or shortly bladed sheaths at base. Leaves slightly shorter than glume, blades 3–6 mm wide, flat, sometimes slightly revolute on margins, slightly stiff, with 2 distinct lateral veins, scabrous on veins and margins; long sheaths of lower leaves up to 10 cm. Lower involucral bracts leaflike, longer than inflorescence, shortly sheathed, upper 2 or 3 setaceous, shorter than inflorescence, usually not sheathed. Spikes 5–7, lower 1 or 2 slightly remote, upper ones rather approximate; terminal spike male, rarely 2 male spikes, occasionally with few female flowers at apex, oblong-cylindric or cylindric, 1.5–5 cm, subsessile; remaining spikes female, narrowly cylindric, 1.5–6 cm, densely many flowered, lower spikes with slender peduncles and slightly pendent, upper spikes shortly pedunculate or subsessile. Female glumes yellowish brown laterally, green between veins, ovate or narrowly ovate, ca. 2.5 mm, 3-veined, apex subacute and mucronate. Utricles greenish or yellowish green, obliquely patent, nearly equaling glume, elliptic or obovate-oblong, distinctly trigonous, ca. 2.5 mm, membranous, glabrous, purple punctate, obscurely veined, base cuneate, shortly stipitate, apex abruptly contracted into a very short beak, orifice subtruncate or emarginate. Nutlets tightly enveloped, obovate, trigonous, ca. 1.5 mm, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jun.

Riversides in valleys, wet places at ditch sides or in forests; 400–1500 m. Hebei, Jilin, Liaoning [Korea, Russia (Far East)].

### 80. Carex lancisquamata


**鸭绿薹**

* Carex jaluensis Sada 20: 369. 1901.

Forests on mountain slopes, wet places in grasslands; 2300–3000 m. Xizang, Yunnan [India, Kashmir, Pakistan].

### 81. Carex jaluensis


**鸭绿薹**

* Carex jaluensis

Rhizome stoloniferous, stolons slightly thick and long, clothed with purple-brown sheaths. Culms tufted, 40–45 cm tall, rather slender, obtusely trigonous, scabrid on angles, few purple-brown and bladeless sheathed at base, rudimentary sheaths usually disintegrating into reticulate fibers. Leaves slightly shorter or slightly longer than culm, blades 2–4 mm wide, canaliculate on midrib of upper surface, revolute on margins, scabrous on upper surface and margins, rather long sheathed, sheaths 5–6 cm and purple-brown at lower part of culm. Involucral bracts leaflike, lower 1 or 2 longer than inflorescence, shortly sheathed, upper ones linear, shorter than inflorescence, not sheathed. Spikes 6 or 7, rather congregated at top of culm, sometimes lowest one rather remote; uppermost spikes 2 or 3 male, sometimes with few female flowers at base, lanceolate or cylindric, 1.5–3 cm, subsessile; remaining spikes female or androgynous, cylindric, 4–5 cm, densely many flowered, lower spikes with slender peduncles, upper ones with short peduncles. Female glumes purple-brown or yellow-brown laterally, lanceolate, 6–8 mm, membranous, 1-costate, apex acuminate, long aristate, arista 2–4 mm. Utricles olivaceous and slightly red-brown at base and beak, obliquely patent, shorter than glume, elliptic or broadly elliptic, obtusely trigonous or plano-convex, ca. 3 mm, herbaceous, densely white hispidulous, indistinctly veined, base abruptly contracted into a short stipe, apex abruptly narrowed into a ± long beak, orifice subtruncate or emarginate. Nutlets brown, tightly enveloped in utricles, orbicular-ovate or suborbicular, trigonous, ca. 2 mm; style base deflexed, not thickened; stigmas 3. Fl. and fr. May–Jun.

藏南薹草 zang nan tai cao

Rhizome short, covered with brown scales not disintegrated into fibers. Culms 55–80 cm tall, smooth, sometimes 1-leaved at middle. Leaves 4–6, blades linear, slightly shorter than culm, 5–7 mm wide, herbaceous; sheaths long, uppermost up to 30 cm, brownish abaxially, bearing ca. 0.5 mm ferruginous ligule at mouth. Lower 2 involucral bracts bladed and overtopping inflorescence, shortly sheathing. Spikes 4–6, ± contiguous; terminal spike gynaecandrous, 2–5 cm, male part brownish or reddish brown, 2–3.5 cm × ca. 3 mm, female part up to 1/2 as long as spike, 6–8 mm wide; lateral spikes female, at times upper 1 or 2 bearing short male part, olive-brownish, 2.5–4 cm × 5–8 mm, densely many flowered, long pedunculate. Female glumes brownish, ovate, 2–3 × 1.2–1.5 mm, membranous, 3-veined costa excurrent beyond apex into an erect awn ca. 1 mm. Utricles glaucous green, longer than body of glume but surpassed by awn, obovate to broadly obovate, 2.8–3 × 1.5–2 mm, herbaceous, glabrous, strongly 2-costate and bearing 4 or 5 veins reaching halfway up utricle, base cuneate-attenuate, apex rounded-contrasted into a very short beak, orifice scarcely 2-toothed. Nutlets loosely enveloped, obovate, 1.5–2 × 1–1.5 mm; style ca. 1.8 mm; stigmas 3, ca. 1.5 mm.

Deciduous and coniferous forests; 2700–3100 m. S Xizang [Nepal].


斑点薹草 ban dian guo tai cao

Rhizome slender, ligneous. Culms tufted, 30–35 cm tall, rather thin, obtusely trigonous, smooth, brown and bladeless sheathed at base. Leaves shorter or slightly longer than culm, blades 3–6 mm wide, flat, smooth, sheathed. Involucral bracts leaflike, longer than inflorescences, sheathed, sheath rather long in lowermost part and short in upper part. Spikes 3 or 4, lowermost spike remote, others approximate at top of culm; terminal spike male, narrowly cylindric, 2.5–5 cm, subsessile; lateral spikes female, narrowly cylindric, 1.5–3.5 cm, densely many flowered, lowest spike slightly long pedunculate, upper ones shortly pedunculate or subsessile. Female glumes yellowish brown, with short red-brown striae, narrowly oblong, ca. 1.8 mm, membranous, 1-costate, costa green, apex obtuse, muticous. Utricles yellowish brown, obliquely patent, slightly longer than glume, broader obovate or broadly elliptic, trigonous, ca. 2 mm, densely purple-red glandular punctate, distinctly 5-veined, base cuneate or broadly cuneate, slightly stipitate, apex attenuate into a short beak, orifice subtruncate or emarginate. Nutlets yellowish white, tightly enveloped in utricles, obovate, trigonous, ca. 1.2 mm, apex with inflected mucro; style base not thickened; stigmas 3. Fl. and fr. Apr–May.

● Wet places on mountain slopes; ca. 1600 m. Sichuan (Emei Shan, Mabian).


隐穗薹草组 yin sui tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama

Rhizome elongate. Flowering culms usually solitary, rarely 2, arising from axes of leaves, scapelike. Involucral bracts bristle-like, sheathed. Spikes nearly all (at least terminal one) androgynous. Utricles oblong-rhombic to obovate-fusiform, with concave-convex surface. Nutlets trigonous, rhombic, angles constricted at middle, faces excavated in both upper and lower parts; style base persistent, bent.

One species: Australia, China, Indonesia, Malaysia, Philippines, Thailand, Vietnam.


隐穗薹草 yin sui tai cao

Rhizome long, woody, covered with dark brown fibrous remnants of basal sheaths. Flowering culms arising from axes of leaves, 12–30 cm tall, compressed trigonous, scapelike, flaccid. Leaves longer than culm, blades 6–15 mm wide, flat,
smooth, leathery, margins scabrid. Involutral bracts bristlelike, sheathed, sheath 5–15 mm. Spikes 6–10, nearly all (at least terminal one) androgynous, oblong or cylindrical, 8–25 mm, loosely flowered; male part short, 3–5 mm; peduncle 7–25 mm, slender. Female glumes pale brown to yellow-green, ovate-oblong, ca. 2.2 mm, costa green, apex acute or mucronate. Utricles yellow-green, longer than glume, oblong-rhombic to obovate-fusiform, obscurely trigonous, 4–5 mm, membranous, densely puberulent above and ciliate on margins, many veined, base cuneate, with a stipe ca. 1 mm, apex attenuate into a short beak, orifice minutely 2-toothed. Nutlets trigonous, rhombic, 2.5–3 mm, faces excavated in both upper and lower parts, angles constricted at middle; style base persistent, bent; stigmas 3. Fl. winter, fr. next spring.

Wet places in dense forests; 100–1200 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan [Indonesia, Malaysia, Philippines, Thailand, Vietnam; Australia].


Tang Yancheng (汤彦承 Tang Yan-cheng), Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker


Rhizome short or oblique. Flowering culm central or arising from basal leaf axils, slender or soft, scapelike. Leaves longer than culm. Involutral bracts short, bladed or leafy, sheathed. Spikes 3–6 or more; terminal spike male; lateral spikes female. Female glumes oblong-ovate or obovate. Utricles fusiform or rhombic-fusiform. Nutlet rhombic or fusiform, with faces excavated both at upper and lower parts; style base cylindric, slightly thickened, persistent, apex truncate or shallowly concave.

About 12 species: E and SE Asia; eight species (four endemic) in China.

1a. Lower involucral bracts surpassing inflorescence.

2a. Utricles 3.5–5 mm; leaves 4–7 mm wide; culms 10–20 cm tall ................................................. 92. C. breviscapa

2b. Utricles 5–6.5 mm; leaves 2–3 mm wide; culms 5–10 cm tall .................................................. 87. C. rhynchachaenium

1b. All involucral bracts much shorter than inflorescence.

3a. Utricles 3–6 mm .................................................................................................................... 86. C. truncatigluma

3b. Utricles 2–4 mm.

4a. Inflorescence short, much surpassed by leaves ........................................................................ 93. C. temuispica

4b. Inflorescence tall, equaling to longer than leaves.

5a. Nutlets constricted at middle on angles.

6a. Culms, leaves, and bracts glabrous; leaves 2–4 mm wide ...................................................... 90. C. ascotreta

6b. Culms, leaves, and bracts pilose; leaves 4–12 mm wide ....................................................... 91. C. densipilosa

5b. Nutlets not constricted on angles.

7a. Male spikes linear, ca. 1 mm wide ...................................................................................... 88. C. ligata

7b. Male spikes linear-cylindric, ca. 3 mm wide ........................................................................ 89. C. taihuensis


截鳞薹草 jie lin tai cao

Carex gracilispica Hayata.

Rhizome obliquely ascending, covered with dark brown fibrous remains of old leaf sheath. Flowering culms arising from axils of leaves, 10–30 cm tall, trigonous, slender, slightly scabrid. Leaves equaling to longer than culm, blade 3–10 mm wide, flat, scabrid on both surfaces, herbaceous. Involucral bracts shortly bladed, sheathed, sheath 6–9 mm. Spikes 4–6; terminal spike male, narrowly cylindrical, 1–1.5 cm, ca. 1 mm thick, sessile or with peduncle 0.5–2 cm; lateral spikes female, cylindric, 20–50 × 2.5–3 mm, loosely flowered, uppermost female spike surpassing male spike, with peduncle enclosed in involucral bract sheath, lower female spikes spaced, with exerted peduncles, lowest peduncle 2–4(–6) cm. Female glumes dark yellow, broadly obovate, margins broadly hyaline, green costa projecting into a mucro 0.1–0.3 mm, apex truncate to rounded, often emarginate. Utricles olive-green, longer than glume, fusiform, obscurely trigonous, 3–6 × ca. 1 mm, membranous, minutely pubescent, many veined, base cuneate, stipitate, apex attenuate into a beak, orifice 2-toothed. Nutlet pale brown, tightly enveloped, fusiform, trigonous, 2.5–3 mm, with faces excavated both at upper and lower parts, base stipitate, stipe 0.2–0.3 mm, apex with a distinct, stout, cylindric neck, neck ca. 0.5 mm, truncate or shallowly concave at top; style base slightly thickened, persistent; stigmas 3. Fl. and fr. Mar–May.

Forests, grasslands on mountain slopes, streamssides; 500–1200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Malaysia, Philippines, Vietnam].


喙果薹草 hui guo tai cao

Carex hatusimana Ohwi; C. truncatigluma C. B. Clarke subsp. rhynchachaenium (C. B. Clarke) Y. C. Tang & S. Yun Liang.

Plants densely tufted in small clumps. Rhizome short, clothed with hard, dark brown fibers. Culms very low, hidden
by leaves, 5–10 cm tall. Leaves narrowly linear, very elongate, 15–28 cm, 2–3 mm wide, gradually tapering to long acute apex. Lower 2 or 3 involucral bracts leaflike, much surpassing inflorescence, up to 20 cm, shortly sheathing. Spikes 3–6, subfascinate except lowest, erect; terminal spike male, linear, 1–2 cm, shorter than next female spike; lateral spikes female, shortly cylindric, 1–2 cm, sublaxly and continguously few flowered, peduncle enclosed in sheath. Female glumes stramineous, oblong-elliptic, hard membranous, slenderly many veined besides oblique 3-veined costa, ciliolate, apex truncate-rounded, occasionally mucronate. Utricles upright, lageniform with weak constriction at middle, 2 × as long as glume, 5–6.5 mm, thickly membranous, wholly pubescent, slenderly many veined, base stipitate, apex gradually narrowed to erect short beak, orifice shallowly 2-toothed. Nutlets tightly enclosed, ovate-oblong,ca. 4 mm, trigonous, base cuneate, apex with neck ca. 1 × 0.7 mm, and truncate at top; style short, base thickened; stigmas 3, short.

Taiwan [Philippines, Vietnam].

This species, which can be discerned at once by the short, slender culms concealed by the leaf tussocks, clearly differs from Carex transcantiluna by the larger (5.5–6.5 mm vs. 3–3.7 mm) utricles of thicker texture and the mucous (vs. cuspidate) subtending glumes.


香港薹 xiàng gāng tái cáo

Carex hongkongensis Franchet; C. ligata var. nixa (Boott ex Bentham) Kükenthal; C. nixa Boott ex Bentham.

Rhizome short. Flowering culms arising from axes of leaves, 25–50 cm tall, slender, obtusely trigonous, smooth. Basal sheaths split into dark brown fibers. Leaves longer than culm, blade glaucous green, 4–6 mm wide, flat, stiff, scabrid abaxially and along margins. Involucral bracts shortly bladed; sheath purple, 1–2 cm. Spikes 3 or 4, spaced, terminal spike male, linear, 3–5 cm, ca. 1 mm thick, with peduncle 3.5–5.5 cm; lateral spikes female, cylindric, 10–20 × 3–4 mm, rather densely or subdistichously flowered, with slender peduncle 1.5–3.5 cm. Female glumes yellowish green, obovate-oblong, ca. 2.7 mm, green costa 1–3-veined, midvein distinct, margins hyaline, apex somewhat rounded. Utricles longer than glume, rhombic-fusiform, trigonous, 3–3.5 mm, membranous, minutely pubescent above, many veined, base shortly stipitate, apex gradually attenuate into a beak ca. 1 mm, orifice 2-toothed. Nutlet tightly enveloped, fusiform, trigonous, ca. 2.7 mm, faces excavated in both upper and lower parts, base shortly stipitate, stipe ca. 0.3 mm, apex with a white, short, cylindrical neck, neck 0.2–0.3 mm, shallowly concave at top; style base thickened; stigmas 3. Fl. and fr. Apr.–May.

Shady places in forests. Anhui, Fujian, Guangdong.


太湖薹 tai hu tái cáo

Rhizome short. Culm 40–65 cm tall, slender, trigonous, smooth. Basal sheaths scalelike, brown-purple, slightly shining, slightly split into fibers. Involucral bracts bristlelike, sheathed, lower sheaths longer, upper sheaths shorter. Spikes 3 or 4, spaced; terminal spike male, yellowish brown, linear-cylindric, 3–4.5 cm, ca. 3 mm thick, pedunculate; lateral spikes female, linear-cylindric, 2–3 cm, ca. 3 mm thick, loosely flowered, peduncles not exserted. Female glumes pale yellow to yellowish brown, oblong-ovate, ca. 2.5 mm, costa excurrent into a muco, apex ± acute. Utricles pale green, longer than glume, narrowly fusiform, ca. 4 mm, membranous, sparsely puberulent, many veined, base attenuate into a stipe, apex contracted into a short or medium-sized beak, bead slightly recurved, shallowly emarginate at orifice. Nutlet tightly enveloped, oblong-ovate, trigonous, ca. 3 mm, base shortly stipitate, apex contracted into a short neck; style base slightly thickened; stigmas 3.

Waysides on mountain slopes. Anhui.


宜昌薹 yi chăng tái cáo


Rhizome stout, covered with fibrous, brown remnants of old scales. Culms 10–60 cm tall, obscurely trigonous, smooth, basal leaf sheaths dark brown, split into fibers. Leaves shorter than culm, blades 2–4 mm wide, flat, margins scabrid. Involucral bracts leafy, blade shorter than inflorescence, sheathed, sheath 5–18 mm. Spikes 4–6; peduncles erect, nearly enclosed in involucral bract sheath; terminal spike male, linear, 1–4 × ca. 0.2 cm, with peduncle 2–14 mm; lateral spikes female, oblong to cylindric, 12–40 × 2–4 mm, upper ones contiguous, lowermost spaced. Female glumes pale yellow-green, elliptic, 2.5–3 mm (excluding awn), green costa 3-veined, excurrent into a scabrid awn 2–4 mm, apex emarginate or acute. Utricles green, slightly longer than or nearly equaling glume, fusiform, 3.5–4 mm, membranous, puberulent, many veined, base attenuate into a short stipe 0.5–0.6 mm, apex attenuate into a slightly recurved beak, orifice obliquely truncate. Nutlet yellow-brown, tightly enveloped, fusiform, ca. 2.5 mm, with angles contracted at middle and faces excavated in both upper and lower parts, base with stipe ca. 1 mm, apex with short cylindrical neck, neck shallowly concave at top, pale yellow, 0.4–0.5 mm; style base slightly thickened; stigmas 3. Fl. and fr. Apr.–May.

Foressts on low hills, wet places, waysides; 100–1100 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Taiwan [Japan, Korea].


金华薹 jiān huái tái cáo

Rhizome oblique, covered with fibrous, brown remnants of old scales. Culms 15–35 cm tall, obscurely trigonous, smooth, basal leaf sheaths dark brown, split into fibers. Leaves shorter than culm, blades 4–12 mm wide, flat, densely pilose throughout, margins scabrid. Involucral bracts leafy, pilose,
blade much shorter than inflorescence, sheath 3–7 mm. Spikes 4–6; peduncles erect to flexuose, well exerted from involucral bract sheath; terminal spike male, ca. 10-flowered, cylindrical, 1–2 × 0.2–0.25 cm, with peduncle 2–14 mm; lateral spikes female, oblong to cylindrical, 12–40 × 2–4 mm, upper 2 contiguous, lower ones widely spaced. Female glumes pale yellow-green, broadly obovate, 2–2.5 mm, green costa 3-veined, apex truncate to rounded, awnless. Urticles greenish brown, ca. 1.5 × as long as glume, fusiform, ca. 3.5 mm, membranous, puberulent, several veined, base attenuate into a short stipe 0.3–0.4 mm, apex attenuate into a straight beak, orifice weakly 2-toothed. Nutlet yellow-brown, tightly enveloped, trigonous, fusiform, ca. 2.5 mm, with angles constricted at middle and faces excavated in both upper and lower parts, base with stipe ca. 1 mm, apex with short cylindrical neck 0.4–0.5 mm; style base slightly thickened; stigmas 3. Fl. and fr. Apr–Jun.

- Hillsides. Zhejiang (Jinhua).


纤穗薹草 duan ting tai cao

Carex laxisquamata Tang & F. T. Wang; C. lutchuensis Ohwi; C. obtusobracteata Hayata.

Rhizome short. Culms 10–20 cm tall, trigonous. Basal sheaths dark brown, split into fibers. Leaves longer than culm, blades 4–7 mm wide, flat, smooth, leathery. Involucral bracts leafy, much longer than inflorescence, sheathed. Inflorescence 3–5-noded; spikes many, 3–5 at each node; terminal spike male, linear, 17–45 × 1–1.5 mm, shortly pedunculate; lateral spikes female or mostly with male part at apex, narrowly cylindric, 3–4.5 cm, ca. 3 mm thick, subloosely flowered, sessile or shortly pedunculate. Female glumes ovate-oblong, 2.5–3 mm, ciliate, apex rounded. Urticles green, longer than glume, rhombic-fusiform, trigonous, 3.5–5 mm, membranous, many veined, glabrous or puberulent above, base cuneate, stiptate, apex gradually attenuate into a conic beak, beak ca. 1 mm, 2-toothed at orifice. Nutlet brown to dark brown, tightly enveloped, rhombic, trigonous, 2.5–3 mm, faces excavated in both upper and lower parts, base cuneate, shortly stiptate, apex with distinct short neck ca. 0.3 mm, neck shallowly concave at top, neck and angles yellowish white; style base slightly thickened; stigmas 3. Fl. winter, fr. next spring.

Forests; 400–1000 m. Fujian, Hainan, Taiwan [Indonesia, Japan, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; Australia].


纤穗薹草 xian sui tai cao

Rhizome short. Flowering culms arising from axes of leaves. Basal sheaths dark brown, split into fibers. Leaf blades 12–40 cm × 2–3 mm, flat, margins scabrid, apex acuminate. Lowest involucral bract leafy, longer than inflorescence, uppermost scalelike. Spikes 5 or 6; terminal spike male, linear, 3–4 cm, ca. 0.5 mm thick, with peduncle 3–4(–17) mm; lateral spikes female, 4 or 5, narrowly cylindric, 10–40 × 1.5–2 mm, subloosely flowered, with slender peduncle 4–10 cm. Female glumes pale brown, broadly ovate, 1.2–1.5 mm, membranous, 1–3–veined, costa green, margins ciliate, hyaline, apex rounded. Urticles pale brown, longer than glume, rhombic-fusiform, trigonous, 2–3 mm, ca. 1 mm wide, membranous, puberulent, many veined, apex attenuate into a beak, orifice emarginate. Nutlet brown, tightly enveloped, rhombic or fusiform, trigonous, 1.5–2 mm, with faces excavated in both upper and lower parts, base shortly stiptate, apex bearing a short cylindrical neck, neck pale yellow, 0.1–0.2 mm, truncate at top; style base not thickened; stigmas 3. Fl. and fr. winter.

- Shady places in mixed forests of valleys; ca. 400 m. Fujian, Guangdong.


灰帽薹草组 hui mao tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Spikes usually unisexual; terminal spike male; lateral spikes often female, rarely androgynous, female spike long cylindric, cylindrical, or linear. Urticles herbaceous, glabrous or puberulent, shortly beaked or nearly beakless, orifice truncate or 2-toothed. Nutlet tightly enveloped, trigonous, sometimes with contracted angles and excavated faces, apex often discoid-annulate; stigmas 3.

About 60 species: C, E, and SE Asia, Australia, Europe, Pacific islands (New Zealand); 27 species (16 endemic) in China.

1a. Nutlet contracted on angles or excavated at faces.
2a. Nutlet contracted on angles.
3a. Nutlet excavated at faces ................................................................. 103. C. chungii
3b. Nutlet not excavated at faces.
4a. Leaves not trabeculate; urticles 2–2.5 mm ........................................ 94. C. foraminata
4b. Leaves trabeculate; urticles 3.5–5 mm.
5a. Peduncles of female spikes mostly included; nutlets ca. 2 mm .......... 97. C. tungfangensis
5b. Peduncles of female spikes mostly exerted; nutlets ca. 4 mm .......... 95. C. tianmushanica
2b. Nutlet not contracted on angles.
6a. Urticle distinctly convex adaxially, beak recurred; nutlet only slightly excavated at lower part of face ................................................................. 98. C. foraminatiformis
6b. Urticle indistinctly convex adaxially, beak erect; nutlet excavated at both upper and lower part of face.

CYPARACEAE
| 9a. Leaf sheaths and blades puberulent | 102. C. davalliana |
| 7a. Leaf sheaths and blades puberulent | 100. C. dolichostachya |
| 7b. Leaf sheaths and blades glabrous | 8a. Utricles ovate-fusiform, 2.5–4 mm |
| 8b. Utricles elliptic-rhombic, oblung-ellipsoid, or rhombic-oblung, 2.5–3 mm | 9a. Male spike 25–45 mm; nutlet 2.5–3 mm |
| 9b. Male spike 10–30 mm; nutlet 1.5–2 mm | 10a. Female spike linear-cylindric, 2–2.5 mm wide, loosely flowered |
| 10b. Female spike cylindric or oblung-cylindric, 3–4 mm wide, densely flowered | 11a. Utricles lanceolate-ovate, 3.5–4.5 mm |
| 11b. Utricles ellipsoid, ovoid, or ovate-fusiform, 2–3(–4) mm | 12a. Spikes usually 2; terminal male spike ovate-clavate; lateral spike androgynous |
| 12b. Spikes 2–4; terminal male spike linear-oblung; lateral spikes female | 13a. Lower involucral bracts hardly or shortly sheathing (3–7 mm) |
| 13b. Lower involucral bracts long sheathing (1–3 cm) | 14a. Male spike shortly pedunculate, base not surpassing next female spike |
| 14b. Male spike long pedunculate, base surpassing next female spike | 15a. Male spike pale brown; female spikes linear to linear-cylindric, 2–3 mm wide |
| 15b. Male spike pale green; female spikes ellipsoid to ovoid, more than 3 mm wide | 16a. Utricles rhombic-elliptic to broadly ovate or obovate |
| 16b. Utricles ovate-elliptic or ovate-oblung. | 17a. Utricles puberulent, stipe very short and not conspicuous |
| 17b. Utricles only sparsely puberulent, stipe conspicuous though short | 18a. Rhizome slender, long creeping; costa of female glumes not excurrent beyond apex |
| 18b. Rhizome short; plants densely tufted; costa of female glumes excurrent into a mucro | 19a. Male glumes usually connate at margin forming a cuplike structure; most spikes fastigate to subfastigate; male spike linear |
| 19b. Male glumes scalelike, not connate at margin; spikes racemose; male spike ovate-cylindric. | 20a. Leaves slightly verruculose on upper surface; male glumes with margins connate |
| 20b. Leaves not verruculose on upper surface; male glumes with margins connate or free | 21a. Female spike ovate, ovate-oblung, or cylindric, 4–5 mm thick, with denser utricles |
| 21b. Female spike linear to linear-cylindric, rarely oblung-oblung, 2–3 mm thick, with rather lax utricles. | 22a. Utricle nearly beakless, orifice entire |
| 22b. Utricle shortly beaked, orifice minutely or acutely 2-toothed. | 23a. Female glumes pale; utricle sparsely puberulent |
| 23b. Female glumes pale or stramineous and pale brown on upper margins; utricle glabrous | 24a. Leaf blade hairlike, up to 2 mm wide |
| 24b. Leaf blade 2–4 mm wide. | 25a. Beak of utricle ± recurved, orifice toothless |
| 25b. Beak erect, orifice 2-toothed. | 26a. Utricle densely puberulent; female glumes with mucro; nutlet glabrous |
| 26b. Utricle glabrous; female glumes without mucro; nutlet ashy gray-black, ovate, shortly stipitate |
| 穿孔薹草 chuan kong tai cao | 112. C. brevistriata |

Rhizome stout, covered with fibrous remains of old scales. Culms 40–70 cm tall, rather stout, trigonous, smooth, surrounded at base by dark brown bladeless sheaths, sheaths usually disintegrating into fibers. Leaves longer than or equaling culm, blades 4–7 mm wide, flat, leathery, smooth, margins scabrid. Lower involucral bracts shortly leaflike, upper one bristlelike, shorter than subtending spike, sheath 2–5 cm. Spikes 4–6; terminal spike male, cylindric, 50–80 × 3–5 mm, with peduncle 4–6 cm; lateral spikes female, spaced, cylindric, 50–80 × 3–5 mm, densely flowered, ± nodding at apex, peduncle 2–4 cm, slightly exerted but upper ones enclosed in involucral bract sheath. Female glumes pale brown on both upper sides,
oblong, 3–3.5 mm, costa pale green, with a distinct midrib, apex acute. Utricles shorter than glume, obovate, 2–2.5 mm (including stipe), prominently many veined, puberulent, base stipitate, apex slightly recurved, emarginate at orifice. Nutlet stramineous, tightly enveloped, shortly oblong, 1.5–2 mm, with angles contracted at middle, base with short and bent stipe, apex abruptly contracted into a short cylindric beak; style base slightly thickened, most parts not persistent; stigmas 3. Fl. and fr. Apr–May.

- Forest margins on mountain slopes, shady places near rocks in valleys, ditch sides; 300–800 m. Anhui, Fujian, Guizhou, Jiangxi, Zhejiang.


天目山薹草  tian mu shan tai cao

Rhizome short. Culms tufted, 30–50 cm tall, slender, compressed triquetrous, smooth, covered at base by dark brown bladeless sheaths. Leaves longer than or shorter than culm, blades 4–7 mm wide, flat, trabeculate, margins scabrid. Lower involucral bracts leaflike, short, upper one bristlelike, shorter than subtending spike, sheath 1–2 cm. Spikes 3; terminal spike male, linear-cylindric, 30–60 × 3–5.5 mm, with peduncle 3–6 cm; lateral spikes female, widely spaced, linear-cylindric, 25–50 × 3–5 mm, laxly flowered, peduncle 1.5–5 cm, all including upper ones slightly exserted from involucral bract sheaths. Female glumes pale brown, oblong, 3–3.5 mm, costa pale green, with a distinct midrib, apex acuminate. Utricles longer than or equaling glume, elliptoid, 4–5 mm, sparsely pubescent to subglabrous, prominently many veined, base rounded, apex with a straight beak ca. 1.5 mm, orifice slightly emarginate. Nutlet ashy brown, tightly enveloped, oblong-ovoid, ca. 2 mm, with faces slightly excavated both in upper and lower parts, base abruptly narrowed to a short stipe, apex abruptly contracted into an annulate disk; style base thickened; stigmas 3. Fl. and fr. Apr–Jun.

- Forests on mountain slopes; 1000–1500 m. Zhejiang.


天目山薹草  tian mu shan tai cao

Rhizome short, indurate. Culms tufted, 40–55 cm tall, slender, trigonous, smooth, covered at base by dark brown bladeless sheaths. Leaves shorter or longer than culm, blades 4–7 mm wide, flat, trabeculate, scabrid along distal margins. Involucral bracts setaceous, shorter than subtending spikes, sheath 0.5–2 cm. Spikes 4 or 5; terminal spike male, cylindric, clavate, 25–45 mm, with peduncle 1–2.5 cm; lateral spikes female, rather widely spaced, linear-cylindric, 25–40 mm, densely flowered, peduncle 1–2.5 cm, barely exserted from bract sheath. Female glumes pale green, elliptic-ovate, 3.5–4 mm, costa yellow-green, with a distinct midrib, apex acuminate with a short scabrous awn. Utricles green, slightly longer than glume, oblong-ellipsoid, trigonous, 4–5 mm, sparsely pubescent distally, prominently many veined, base attenuate, not stipitate, apex with a straight beak ca. 1.5 mm, orifice distinctly emarginate. Nutlet stramineous, tightly enveloped, oblong-ovoid, 2.5–3 mm, faces concave in proximal half, angles not constricted at middle, base with a short straight stipe, apex gradually contracted into a short cylindric beak; style base slightly thickened; stigmas 3. Fl. and fr. Apr–May.

- Forests and roadsides on mountain slopes; 500–1300 m. NW Zhejiang (Lin’an).


东方薹草 dong fang tai cao

Rhizome rather short. Culms up to 80 cm tall, compressed trigonous, slender, straight. Basal sheath bladeless, brown, shiny. Leaves longer than culm, blades 6–7 mm wide, with distinct midvein and transverse veinlets, margins scabrid. Involucral bracts sheathed, lower 2 or 3 leaflike, upper 1 or 2 bristlelike. Spikes 4 or 5; terminal spike male, linear-cylindric, 4–10 × ca. 0.4 cm, shortly pedunculate; lateral spikes female, linear-cylindric, 3–3.5 cm, ca. 4 mm thick; peduncles 1.5–5 cm, mostly enclosed in involucral bract sheaths. Female glumes pale yellow, oblong, ca. 3 mm, membranous, with distinct costa excurrent into a mucro, apex acute. Utricles greenish yellow, ovate or ovate-lanceolate, ca. 3.5 mm, herbaceous, minutely hisrate or subglabrous, with a few slender veins, base attenuate, apex gradually attenuate into a short beak ca. 1 mm, orifice obliquely truncate and minutely 2-toothed. Nutlet brown-yellow, tightly enveloped, elliptic-ovate, obtusely trigonous, ca. 2 mm, with angles contracted at middle and faces excavated both in upper and lower parts, base abruptly narrowed to a short stipe, apex abruptly contracted into an annulate disk; style base thickened; stigmas 3.

- Mountain slopes; 900–1400 m. Hainan.


拟穿孔薹草 ni chuan kong tai cao

Rhizome stout, clothed with fibrous remains of old scales. Flowering culms both central and arising from axils of leaves, 30–40 cm tall, compressed, smooth, surrounded at base by pale brown bladeless sheaths or their fibrous remains. Leaves shorter or longer than culm, blades 6–12 mm wide, soft, flat, smooth, margins scabrid. Involucral bracts shorter than spike, sheathed, sheaths 1–3.5 mm, lower involucral bracts shortly leaflike, upper ones bristlelike. Spikes 4 or 5; terminal spike male, cylindric, 30–60 × 1.5–2 mm; lateral spikes female, remotely spaced, cylindric, 2–3.5 cm, ca. 4 mm thick, densely flowered; peduncles 1–4.5 cm, lower ones slightly exserted, upper ones enclosed in involucral bract sheaths. Female glumes oblong, 2–2.5 mm, membranous laterally, costa with 3 distinct veins and pale yellow-green, apex mucronate. Utricles nearly equaling glume, ovate, ca. 2.5 mm, sparsely puberulent, with many prominent veins, base nearly stipitate, apex slightly beaked, beak ca. 0.5 mm, recurved, emarginate at orifice. Nutlet brown at maturity, tightly enveloped, ovate, 1.5–2 mm, with faces slightly excavated in lower part, base nearly stipitate, apex abruptly contracted into a very short beak; style base thickened, miter-shaped, persistent; stigmas 3. Fl. and fr. Mar–Apr.

- Ditch sides, grassy areas in woods; 600–800 m. Guizhou, Sichuan.

伴生草  ban sheng tai cao

Carex atronucula Hayata; C. daibuensis Hayata; C. ligata
Boott ex Bentham var. strictior (Kükenthal) Kükenthal; C. nexa
Boott ex Bentham var. strictior Kükenthal; C. transalpina
Hayata; C. uraiensis Hayata.

Rhizome short. Culms tufted, 20–50 cm tall, slender, smooth. Basal sheaths bladeless, dark brown, disintegrated into fibers. Leaf blades 3–6 mm wide, flat, rather stiff to herbaceous, with rather short sheaths. Lower 2–4 involucral bracts leaflike, nearly equaling inflorescence, lowest one with rather long sheath. Spikes 4–8, spaced or upper 2 or 3 contiguous; terminal spike male, green, linear-cylindric, 1.5–3 cm; lateral spikes female, rarely androgynous or very rarely with a few male flowers at base, single or binate at each node, green, cylindric or oblong-cylindric, 15–40 × 3–4 mm, densely flowered; peduncles slightly exserted or encased in involucral bract sheaths. Female glumes oblong, ca. 3 mm (including awn), membranous, 1–3–veined green costa excurrent into a short awn 0.7–1 mm. Utricles elliptic-fusiform, trigonous, ca. 2.5 mm, puberulent, many veined, abruptly contracted at both ends, apex shortly beaked, orifice shallowly 2-toothed. Nutlet tightly enveloped, ca. 1.5 mm, trigonous, abruptly contracted at both ends, apex discoid-annulate; style base thickened; stigmas 3.

Grasslands, forests. Taiwan [Japan].

No specimens have been seen by the present authors. The description is largely taken from Fl. Taiwan (5: 338–340. 1978).


长穗薹草 chang sui tai cao

Rhizome stout, covered with fibrous remains of scales. Culms several to a clump, 30–60 cm tall, slender, smooth. Basal sheaths bladeless, purple-brown to dark brown, usually split into fibers. Leaves shorter or longer than culm, blades 3–10 mm wide, flat, leathery, stiff, scabrous along margins and on abaxial midvein. Involucral bracts sheathed, sheath 1–3.5 cm, lower involucral bracts leaflike, upper ones bristlelike, shorter than to nearly equaling subtending spike. Spikes 4 or 5; terminal spike male, linear-cylindric, 35–50 × 1.5–2 mm; lateral spikes female, linear-cylindric to cylindrical, 20–40 × 1.5–2 mm, loosely flowered; peduncules slender, erect, 1.5–7 cm. Female glumes obvoate-oblong, 2.5–3.5 mm, membranous, 1–3–veined green costa excurrent into a micro, apex rounded. Utricle longer than glume, ovate-fusiform, 2.5–4 mm, puberulent or more densely pubescent, prominently many veined, base attenuate into a short stipe, apex attenuate into a short beak, orifice 2-toothed. Nutlet tightly enveloped, ovate, trigonous, 2–2.5 mm, apex discoid-annulate; style base thickened, persistent; stigmas 3.

Forests, ditch sides on mountain slopes; 800–1600 m. Anhui, Shaanxi, Sichuan, Taiwan, Zhejiang [Japan, Philippines].

1a. Utricle 3.5–4 mm, puberulent;
leaf blade 5–10 mm wide ...... 100a. subsp. dolichostachya

1b. Utricle 2.5–3.5 mm, more densely pubescent; leaf blade 3–5 mm wide

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100a. Carex dolichostachya subsp. dolichostachya

长穗薹草原亚种 chang sui tai cao (yuan ya zhong)

Carex matsudaee (Hayata) Hayata ex Makino & Nemoto;
C. aizemensis S. W. Su & S. M. Xu; C. rankanensis Hayata;
Diplocarex matsudaee Hayata.

Leaf blade 5–10 mm wide. Utricle 3.5–4 mm, puberulent.

Forest margins on mountain slopes, waysides. Anhui, Shaanxi, Sichuan, Taiwan, Zhejiang [Japan, Philippines].

100b. Carex dolichostachya subsp. trichosperma (Ohwi) T. Koyama, Fl. Taiwan 5: 341. 1978.

阿里山宿柱薹 a li shan su zhu tai


Leaf blade 3–5 mm wide. Utricle 2.5–3.5 mm, more densely pubescent.

• Forests. Taiwan.


横纹薹草 heng wen tai cao

Rhizome short, with creeping stolons. Culms arising from axes of leaves, 20–50 cm tall, slender, obtusely trigonous, smooth, clothed at base with fibrous remains of old basal leaf sheaths. Leaves slightly shorter than or nearly equaling culm, blades 2–(4–)5 mm wide, flat, glabrous, margins scabrid. Involucral bracts with blades, longer than subtending spike, sheathed, sheath 0.5–2.5 cm. Spikes 4 or 5, upper spikes contiguous, lower ones spaced; terminal spike male, linear-cylindric, 10–20 × 1.5–2 mm, sessile or shortly pedunculate, surpassing next female spikelet; lateral spikes female, linear-cylindric, 15–28 × 2–2.5 mm, densely flowered, with peduncle enclosed in involucral bract sheath or slightly exserted. Female glumes yellow-white, oblong, 2.5–3 mm, with 1-veined green costa, apex cuneate, mucronate. Utricle pale green, longer than glume, rhombic-oblong, obtusely trigonous, ca. 3 mm, thinly membranous, glabrous, many veined, apex gradually attenuate into a conic beak, beak ca. 0.5 mm, minutely 2-toothed at orifice. Nutlet tightly enveloped, oblong, ca. 2 mm, with faces excavated both in upper and lower parts, not contracted at angles, base shortly stipitate, apex discoid-annulate; style base slightly thickened; stigmas 3. Fl. and fr. May.

Forest margins on mountain slopes, waysides. Anhui, Fujian [Japan].


三阳薹草 san yang tai cao

Carex sachalinensis F. Schmidt var. duvaliana (Franchet & Savatier) T. Koyama; C. tenissima Boo. var. duvaliana (Franchet & Savatier) Kükenthal.
Rhizome short, with creeping stolons. Culms tufted, 20–35 cm tall, slender, obtusely trigonous, puberulent. Leaves slightly shorter than culm, blades pale green, 1.5–3 mm wide, flat, puberulent; basal sheaths pale yellow to pale brown, densely puberulent. Lower involucral bracts with blades, longer than subtending spike, long sheathed, sheath 1–4.5 mm, upper involucral bracts bristlelike, shortly sheathed, puberulent. Spike 3–5, spaced, sometimes upper ones slightly contiguous; terminal spike male, cylindric, 15–22 × 2–3 mm, with peduncle 1.5–2 cm; lateral spikes female, cylindric, 10–20 × 2–3 mm, loosely flowered, with peduncle enclosed in involucral bract sheath or shortly exserted. Female glumes yellowish white, obovate, ca. 3 mm, green costa 1–3-veined, rather prominent and excurrent into a short awn. Utricles pale green, longer than glume, ovate-fusiform, trigonous, 3.5–4 mm, membranous, many veined, sparsely puberulent, base attenuate into a stipe 0.5–1 mm, apex contracted into a medium-sized beak ca. 1 mm, orifice 2-toothed. Nutlet tightly enveloped, ovate, trigonous, 1.5–2 mm, base shortly stipitate, stipe slightly bent, apex discoid-annulate; style short, base conically thickened; stigmas 3. Fl. and fr. Apr–May.

Waysides on mountain slopes, forest margins; 600–1700 m. Anhui [Japan].


仲氏薹草 zhong shi tai cao

Rhizome short. Culms tufted, 25–50 cm tall, slender, trigonous, slightly scabrid. Basal sheaths bladeless or with short blades, usually split into fibers. Leaves longer or shorter than culm, blades 1.5–2(-3) mm wide, flat. Basal involucral bract leafy, rarely shortly leaflike, longer than subtending spike, sheathed, sheath 1–2.2(-3) cm. Spikes (3 or)4 or 5; terminal spike male, linear-cylindric, 15–60 × 2–3 mm, with exserted peduncle 0.8–5 cm; lateral spikes female, cylindric, 1–3.5 cm, 2–3 mm thick, rather densely or loosely flowered, lower ones pedunculate, upper ones subsessile. Female glumes pale, ovate or oblong, 2–2.5 mm (excluding awn), green costa 3-veined, excurrent into an awn 1–2.5 mm. Utricles green, longer than glume, rhombic-elliptic, 3–3.5 mm, membranous, sparsely puberulent, many veined, irregularly excavated, base attenuate, shortly stipitate, apex contracted into a short conic beak, orifice 2-toothed. Nutlet tightly enveloped, ovate, trigonous, ca. 2 mm, with angles contracted at middle, with faces excavated both in upper and lower parts, base shortly stipitate, apex discoid-annulate; style short, base conically thickened; stigmas 3. Fl. and fr. Apr–May.

Waysides on mountain slopes, waysides, bogs. Anhui, Fujian, Hainan, Jiangsu, Shaanxi, Sichuan, Zhejiang.

1a. Male glumes free, filament of stamen threadlike, free ........................................ 104a. var. tristachya

1b. Male glumes connate from base to above middle, filament of stamen flat and connate ........................................ 104b. var. pociilliformis

104a. Carex tristachya var. tristachya

三穗薹草 (原变种) san sui tai cao (yuán biàn zhòng)

Male glumes free; filaments of stamens threadlike, free.

Waysides on mountain slopes, wet places in forests. Anhui, Hainan, Jiangsu, Zhejiang [Japan, Korea].

合鳞薹草 he lin tai cao


Male glumes conenate from base to above middle; filaments of stamens flat and connate.

Grasslands on mountain slopes, forests, wet places in field margins; 300–1100 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang [Japan, Korea].


拟三穗薹 ni san sui tai cao

Rhizome short. Culms tufted, 15–20 cm tall, slender, triquetrous, smooth. Basal sheaths dark brown, disintegrating into persistent fibers. Leaves equaling to exceeding culm, blades 3–5 mm wide, flat, slightly verruculose on upper surface, scabrid along involute margins. Involutural bracts leaflike, shorter or longer than subtending spikes, sheath 5–10 mm. Spikes 2–4, upper ones separated; terminal spike male, linear, 10–25 × ca. 1 mm, subsessile, male glumes with connate margins from base to middle, filament of stamen flat, free (not connate); lateral spikes cylindrical, 10–25 × ca. 3 mm, sparingly flowered; upper peduncles short and enclosed in involucral bract sheath, lowest one exserted, 0.5–1 cm, erect, slender. Female glumes pale brown, broadly ovate, ca. 1.5 mm, apex acute. Utricles yellowish green, longer than glume, erect, ovate-fusiform, trigonous, 4.5–5 mm, membranous, puberulent, many veined, base attenuate and stipitate, apex gradually attenuate into a beak, orifice minutely 2-toothed. Nutlet yellowish, tightly enveloped, ovate, ca. 3 mm, apex disoid-annulate; style base conically thickened; stigmas 3. Fl. and fr. Apr–May.

● Forests, roadsides; ca. 1200 m. S Zhejiang (Baishanzu).


灰帽薹草 hui mao tai cao

Rhizome short. Culms tufted, 15–40 cm tall, slender, trigonous. Basal sheaths dark brown, split into fibers. Leaves equaling to exceeding culm, blades 1.5–2(–3) mm wide, flat, scabrid. Basal involucral bract bristlelike, shorter than inflorescence, shortly Inflorescence, 2.5–3 cm, shortly sheathed ca. 1.5 mm. Spikes 2; terminal spike male, pale yellow, ovate-clavate, 7–10 mm, with peduncle 5–12 mm; lateral spike androgynous, oblong-ovate or suborbicular, 7–12 × 5–8 mm, densely flowered, subsessile. Female glumes pale yellow, oblong, ca. 2 × 1 mm, midvein distinct, apex obtuse. Utricles stramineous, longer than glume, ovate-lanceolate, 3.5–3.8 mm, membranous, densely puberulent, many veined, base attenuate, ovate, ca. 5 mm, apex disoid-annulate; style base conically thickened; stigmas 3. Fl. and fr. Apr–May.

● Forests; ca. 600 m. Fujian.


直蕊薹草 zhi rui tai cao

Carex breviculmis R. Brown var. cupulifera (Hayata) Y. C. Tang & S. Yun Liang; C. orthostemon var. cupulifera Hayata.

Plants densely tufted with short erect rhizome. Culms slender, 6–30 cm tall, ± recurved. Leaves shorter than to briefly overtopping culms, blades 2–5 mm wide; sheaths short, brownish, eventually disintegrating into brown fibers. Involu-
cral bracts shortly sheathing (3–6 mm), lower 1 or 2 bladed and surpassing spikes. Spikes 2–4, subfastigate or lowest spaced; terminal spike male, pale brownish, linear-oblong, several flowered; lateral spikes female, ovoid to oblong, 5–20 mm, laxly several flowered, subsessile or lower ones with short enclosed peduncle. Female glumes tinged with light brown, ovate, ca. 2 mm, costa ending in a short mucro at acute apex. Utricles much longer than glume, lanceolate-oblong, suberect, 3.5–4.5 mm, sparsely pubescent, slenderly many veined, base gradually narrower to a shortly stipe, apex gradually attenuate into a short beak, orifice shallowly 2-lobed. Nutlets tightly enveloped, lanceolate-oblong, 2.5–3 mm, base shortly stipitate, apex annulate; style base dilated; stigmas 3.

- Grassy openings of mountain forests. Taiwan.

This is a good species that can be readily separated from the widespread Carex breviculmis not only by its slender lanceolate-oblong (vs. obovate) utricles but by its subleathery (vs. herbaceous) leaves.

青绿薹草 qing lü tai cao

Rhizome short or elongate and stoloniferous. Culms tufted, 8–40 cm tall, trigonous, scabrid above. Basal sheaths pale brown, split into fibers. Leaves shorter than culm, blades 2–3–(5) mm wide, flat, stiff, margins scabrid. Lowest involucral bract leafy, longer than inflorescence, shortly sheathed, sheath 1.5–2 mm, remaining bracts bristlelike, nearly sheathless. Spikes 2–5, upper ones contiguous, lower ones spaced; terminal spike male, oblong, 10–15 × 2–3 mm, subsessile, close to next female spike; lateral spikes female, oblong or oblong-ovate, subcylindric, 6–15–(20) × 3–4 mm, densely flowered, sessile or lower one with peduncle 2–3 mm. Female glumes pale, oblong or obovate-oblong, 2–2.5 × (excluding awn) × 1.2–2 mm, membranous, green costa 3-veined and excurrent into an awn 2–3.5 mm, apex truncate or rounded. Utricles pale green, nearly equaling glume, obovate, obtusely trigonous, membranous, densely puberulent above, several veined, base attenuate and shortly stipitate, apex abruptly contracted into a conic beak, orifice emarginate. Nutlet chestnut-colored, tightly enveloped, ovate, ca. 1.8 mm, apex discoïd-annulate; style base conically thickened; stigmas 3.

Grasslands on mountain slopes, waysides, ditch sides in valleys; 400–2300 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Myanmar, Russia (Far East)].

109a. Carex breviculmis var. breviculmis

青绿薹草(原变种) qing lü tai cao (yuán biàn zhòng)

Carex breviculmis f. filiculmis (Franchet & Savatier) Kükenthal; C. breviculmis f. longearistata Kükenthal; C. breviculmis subsp. royleana (Nees) Kükenthal; C. filiculmis Franchet & Savatier; C. leucochloa Bunge; C. leucochloa var. filiculmis (Franchet & Savatier) Kitagawa; C. leucochloa f. longearistata (Kükenthal) Kitagawa; C. leucochloa var. longearistata (Kükenthal) K. T. Fu; C. filiculmis var. fibrillosa (Franchet & Savatier) A. Brullo.


Grasslands on mountain slopes, waysides, ditch sides in valleys; 400–2300 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Myanmar, Russia (Far East)].

绿囊薹草 lu nang tai cao

Rhizome short. Culms tufted, 20–45 cm tall, slender, obtusely trigonous. Basal sheaths dark brown, split into fibers. Leaves longer than culm, blades 1–2.5 mm wide, flat, margins scabrid. Lowest involucral bract leafy, longer than subtending spike, shortly sheathed, sheath 1–1.5 mm. Spikes 2 or 3; terminal spike male, clavate, 8–15 × 3–4 mm, with peduncle 5–9 mm; lateral spikes female, obovate or oblong-ovate, 4–7 × 3–4 mm, densely flowered, with short peduncle 2–4 mm. Female glume pale brown, broadly elliptic or obovate-ovate, ca. 2.5 × 1.2 mm, membranous, green costa 1-veined, excurrent into a scabrid mucro. Utricle pale yellowish green, longer than glume, rhombic-elliptic or broadly ovate, obtusely trigonous, ca. 2.5 mm, puberulent, distinctly veined abaxially, faintly veined adaxially, base abruptly contracted into a very short beak, apex abruptly contracted into a conic beak, orifice 2-toothed. Nutlet pale brown, tightly enveloped, ovate, trigonous, ca. 1.5 mm, apex discoïd-annulate; stigmas 3. Fl. and fr. May–Jun.

Meadows on mountain slopes, Pinus forests; 400–500 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].

无喙囊薹草 wu hui nang tai cao

Carex kengiana Z. P. Wang.  

Rhizome obliquely ascending. Culms tufted, 20–65 cm tall, slender, obtusely trigonous. Basal sheaths dark brown, split
into fibers. Leaves longer than culm, blades 2–5 mm wide, flat, margins scabrid. Leaves longer or shorter than culm, blades 2–3 mm wide, flat, margins scabrid. Involucral bracts shortly leafy, shorter than subtending spike, long sheathed, lowest sheath 1.5–3 mm. Spikes 3–5, spaced; terminal spike male, clavate-cylindric, 12–40 × 3–5 mm, with peduncle 2.5–5.5 cm; lateral spikes female, cylindric, 12–40 × 3–6 mm, densely flowered; peduncle erect, lowest one exserted, upper ones enclosed in involucral bract sheath. Female glumes pale yellowish white, oblong, 2.5–3 mm, green costa 3-veined, excurrent into a scabrid awn 2.5–3 mm, apex truncate or emarginate. Utricles green, obovate-elliptic or elliptic, trigonous, ca. 3 mm, membranous, puberulent, many veined, base abruptly contracted into a very short stipe ca. 0.5 mm, apex abruptly contracted and nearly beakless, orifice truncate. Nutlet tightly enclosed in involucral bract sheath but lowest one exserted. Female glumes pale, obovate-oblong, ca. 2.5 mm, membranous, puberulent, many veined, base abruptly contracted into a short neck; orifice obliquely truncate. Nutlet tightly enclosed in involucral bract sheath but lowest one exserted. Female glumes pale yellowish white, oblong, 2.5–3 mm, with peduncle 0.4–2.5 cm; lateral spikes female, cylindric or oblong, 6–12 × ca. 3 mm, rather densely flowered, with peduncle enclosed in involucral bract sheath or slightly exserted. Female glumes rusty colored, obovate or ovate, margins white membranous, green costa with distinct midrib excurrent into a scabrid mucro, apex acute. Utricles pale green, longer than or nearly equaling glume, obovate or broadly obovate, obtusely trigonous, 2–2.7 mm, sparsely puberulent, faintly few veined, base attenuate into a short stipe, apex abruptly contracted into a conic beak, beak slightly recurved, emarginate axially and truncate axially at orifice. Nutlet tightly enveloped, broadly obovate, obtusely trigonous, 1.2–1.5 mm, base shortly stipitate, apex discoid-annulate; stigmas 3. Fl. and fr. Apr–Jun.

Grasslands on mountain slopes, forest margins; 400–1200 m. Anhui, Gansu, Hubei, Shaanxi, Sichuan, Zhejiang.


Rhizome obliquely ascending. Culms tufted, 15–35 cm tall, slender, compressed trigonous, smooth. Basal sheaths dark brown, split into fibers. Leaves longer or shorter than culm, blades 3–5 mm wide, flat, margins scabrid. Involucral bracts shortly leafy, shorter than inflorescence, long sheathed, sheath 1.2–2 mm. Spikes 3 or 4, spaced; terminal spike male, clavate-cylindric, 15–30 × 2–3 mm, with peduncle (0.5–1.5) cm; lateral spikes female, cylindric, 17–30 × 3–4 mm, densely flowered; peduncle enclosed in involucral bract sheath but lowest one exserted. Female glumes pale, obovate-oblong, ca. 2.5 mm (excluding awn), green costa 3-veined, excurrent into a scabrid awn 1.5–2 mm, apex obtuse or rounded. Utricles pale green, longer than or equaling glume, sometimes slightly recurved, elliptic or obovate, ca. 3 mm, membranous, sparsely puberulent, many veined, base attenuate into a short stipe, apex attenuate into a short beak; beak conic, recurved, 2-toothed at orifice. Nutlet pale brown, tightly enveloped, obovate, trigonous, ca. 1.8 mm, base shortly stipitate, apex contracted into a short neck, neck apex discoid-annulate; style base conically thickened; stigmas 3. Fl. and fr. Apr–Jul.

Grasslands on mountain slopes, wet and shady places in forests; 400–1800 m. Anhui, Gansu, Hunan, Shaanxi, Zhejiang.
Rhizome short or stoloniferous. Culms tufted, 15–50 cm tall, slender, compressed trigonous, smooth or slightly scabrid. Basal sheaths pale yellow-brown to rusty brown. Leaves shorter or longer than culm, blades 2–3(–4) mm wide, flat, margins scabrid. Involutural bracts sheathed, sheath 5–18 mm, lower ones leafy, upper ones bristlelike, shorter than or equaling inflorescence. Spikes 2–4, spaced; terminal spike male, narrowly cylindric, 15–20 cm; lateral spikes female, sometimes with male flowers at apex, oblong-cylindric or narrowly cylindric, 10–30 × 2–3 mm, loosely flowered, peduncles enclosed in involucral bract sheath or slightly exerted. Female glumes pale or pale brown, obovate, green costa 1–3–veined, excruciant into a micro, apex truncate. Urticles pale yellow-green, longer than or nearly equaling glume, ovate-elliptic, obtusely trigonous, ca. 3 mm, densely puberulent, slightly many veined, base attenuate into a short stipe, apex attenuate into a conic beak, orifice 2-toothed. Nutlet gray-black at maturity, tightly enveloped, ovate, trigonous, ca. 1.5 mm, base shortly stipitate, apex discoid-annulate; stigmas 3. Fl. and fr. May–Jun.

- Forests on mountain slopes; 400–1400 m. Anhui, Hubei, Liaoning, Shandong [Japan].


贺州薹 he zhou tai cao

Rhizome short. Culms tufted, 20–55 cm tall, slender, compressed trigonous with rounded angles, smooth, covered at base by dark brown bladeless sheaths. Leaves shorter or longer than culm, blades 2.5–4 mm wide, flat, trareculate, margins scabrid. Lower involucral bracts leaflike, short, upper one bristlelike, shorter than subtending spike, sheath 1–2 cm. Spikes 4 or 5; terminal spike male, linear, 30–60 mm, with peduncle 1–2.5 cm; lateral spikes female, widely spaced, linear-cylindric, 10–35 × 3–5 mm, laxly flowered, ± erect, peduncle 0.6–5 cm, all except upper ones slightly exserted from bract sheath. Male glumes narrowly oblanceolate, ca. 6 mm, apex obtuse. Female glumes pale brown, ovate-oblong, 7.5–8 mm, costa 1-veined, apex subacute. Urticles longer than glume, oblong-ellipsoid, 3–4 mm, glabrous, prominently many veined, base narrowly cuneate, not stipitate, apex with straight beak 0.8–1 mm, orifice 2-toothed. Nutlet ashy brown, tightly enveloped, ellipsoid, trigonous, 1.5–2 mm, with angles not constricted at middle, base cuneate to substipitate, apex contracted into a short pillose beak; style base thickened; stigmas 3. Fl. and fr. Apr–May.

- Streamside in valleys, waysides, rock crevices; 900–1900 m. Anhui, S Gansu (Xiaolong Shan), Shaanxi.

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terminal spike male, narrowly lanceolate or oblanceolate, (5–)8–18 × 1.5–2 mm, with peduncle 8–15 mm; lateral spikes female, oblong or nearly cylindric, 8–15 × 2–3 mm, slightly loosely flowered, with peduncles 6–20 mm. Female glumes pale rusty colored, obvate to ovate, ca. 2.5 mm, green costa 1–3-veined, margins white membranous, apex acute or obtuse. Utricles pale yellow-green, slightly longer than glume, ovate-elliptic, obtusely trigonous, 2.5–3 mm, sparsely puberulent at upper part, distinctly and slenderly many veined, base narrowly cuneate, apex attenuate into a conic beak, orifice abaxially and truncate adaxially. Nutlet tightly enveloped, elliptic, trigonous, ca. 1.8 mm, base shortly stipitate, apex discoid-annulate; stigmas 3. Fl. and fr. Jun–Jul.

Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia (Far East)].

Grazlands on mountain slopes, broad-leaved forests, thickets. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia (Far East)].


江苏薹草 jiang su tai cao

Carex conica Boott ex Perry var. densa Kükenthal.

About 20 species: E, S, and SE Asia; 13 species (ten endemic) in China.

1a. Culms 35–55 cm tall; leaf blades 8–20 mm wide; spikes 2–6, cylindric, 4–6 cm, 3–5 mm thick; peduncles short, enclosed in involucral bract sheath; utricles glabrous; style base not thickened ........................................ 121. C. courtallensis

1b. Culms not exceeding 30 cm tall; leaf blades 2–5 mm wide or filiform; spikes 1–5, ovate to cylindric, 3–40 mm, 2–6 mm thick; peduncles slender, exserted from involucral bract sheath; utricles pubescent, hispidulous, or glabrous; style base thickened.

2a. Culms short, shorter than leaves; involucral bract leaf setaceous or scalelike; utricles 2–2.5 mm; style densely brown granular-punctate.

2b. Culms long, longer than or equaling leaves; involucral bract leaflike; utricles 3.5–6.5 mm; style smooth or hairy, sometimes style and nutlets granular-punctate.


根穗薹草组 gen sui tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama


Involucral bracts leaflike, longer than inflorescence, long sheathed. Spikes androgynous, 1 to several, usually remote, lowest spike borne from middle part or base of culm, rarely contiguous. Utricles papery or subleathery, pubescent, hispidulous, or glabrous, usually ciliate on margins, many veined, apex abruptly contracted into a short beak. Style base usually thickened, rarely not thickened; stigmas 3.

About 20 species: E, S, and SE Asia; 13 species (ten endemic) in China.

1a. Culms 35–55 cm tall; leaf blades 8–20 mm wide; spikes 2–6, cylindric, 4–6 cm, 3–5 mm thick; peduncles short, enclosed in involucral bract sheath; utricles glabrous; style base not thickened ........................................ 121. C. courtallensis

1b. Culms not exceeding 30 cm tall; leaf blades 2–5 mm wide or filiform; spikes 1–5, ovate to cylindric, 3–40 mm, 2–6 mm thick; peduncles slender, exserted from involucral bract sheath; utricles pubescent, hispidulous, or glabrous; style base thickened.

2a. Culms short, shorter than leaves; involucral bract leaf setaceous or scalelike; utricles 2–2.5 mm; style densely brown granular-punctate.

3a. Culms obtusely trigonous, filiform, not exceeding 0.5 mm thick; involucral bract leaf setaceous; spikes ovate or ovate-oblong, 2–5 mm; style flat ............................................................................................. 122. C. tsoi

3b. Culms flat, ca. 1 mm thick; involucral bract leaf scalelike; spikes cylindric, 5–10 mm; style cylindric .................................................................................................................. 123. C. planiscapa

2b. Culms long, longer than or equaling leaves; involucral bract leaflike; utricles 3.5–6.5 mm; style smooth or hairy, sometimes style and nutlets granular-punctate.

4a. Leaves subleathery, stiff; culms robust, stiff.

5a. spikes ovate, 2.5–3 cm, 8–10 mm thick; utricles 6–6.5 mm ................................................................. 133. C. pterocaulos

5b. spikes cylindric, 2.5–4.5 cm, 5–6 mm thick; utricles not surpassing 5.5 mm.

6a. Leaf blades flat, 3–4 mm wide; utricles ovate; nutlets smooth on surface ..................................................... 131. C. caudispicata

6b. Leaf blades linear, ca. 1 mm wide; utricles elliptic or oblong; nutlets granular-punctate

4b. Leaves herbaceous, soft; culms thin.

7a. spikes 4–6, lowermost one remote, others approximate, peduncles rather short, enclosed in involucral bract sheath, except lowermost one ......................................................... 124. C. cylindrostachys

7b. Spikes 1–3, remote, borne at middle part or base of culm, except terminal spike, long pedunculate and exserted, male flower part usually shorter than or nearly equaling female flower part.
8a. Culms and leaves hispidulous; culms, female glumes, and utricles granular-punctate on surface; style thickened, globose ................................................................. 125. *C. chlorocepha lula*

8b. Culms and leaves glabrous; culms, female glumes, and utricles not granular-punctate on surface; style base thickened.

9a. Spikes ovate; lower female glumes with a rather long or short awn at apex.

10a. Utricles hispidulous; style pubescent; spikes 5–8 mm ........................................ 126. *C. chuana*

10b. Utricles glabrous; style smooth; spikes 8–20 mm ........................................ 127. *C. delavayi*

9b. Spikes oblong to cylindric; female glumes without an awn at apex.

11a. Leaves linear, blades 1–1.5 mm wide; utricles obovate-oblong, 4–4.2 mm; nutlet and style granular-punctate on surface ......................................................... 130. *C. tsaiana*

11b. Leaves flat, blades 2–10 mm wide; utricles oblong or obovate; nutlet and style smooth.

12a. Utricles oblong, 4–5 mm, green, thinly few veined, pubescent, eventually glabrescent; style base slightly thickened; leaf blades 4–10 mm wide ................ 128. *C. speciosa*

12b. Utricles obovate, ca. 4 mm, yellowish brown, thickly several veined, glabrous; style base thickened, conic; leaf blades 2–4 mm wide .......... 129. *C. fun huangshanica*


(C. speciosa Kunth var. courtallensis) (Nees ex Boott)

Kükenthal.

Rhizome elongate. Culms loosely tufted, 35–55 cm tall, 1.5–2 mm thick, triquetrous, stiff, smooth. Leaves shorter than culm, blades flat, 0.8–2 cm wide, smooth, soft, with few dark brown persistent leaf sheaths. Involucral bracts leaflike, longer than involucrum, flat, 8–12 mm wide, long sheathed. Spikes 2–6, androgy nous, remote, lowest one borne at middle part or base of culm, cylindric, 4–6 cm, 3–5 mm thick, densely many flowered; male part of spike slightly shorter than female part, slightly thin. Female glumes green, ovate or obovate-oblong, 3.5–4 mm, papery, 1-costate and few thinly veined, ciliate on margins of upper part, apex rounded or obtuse. Utricles green, elliptic, slightly inflated trigonous, 4.8–5 mm, papery, glabrous, many veined, base attenuate, spongyiform, margins narrowly winged and ciliate, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets brown at maturity, obovate-oblong, trigonous, 2.5–3 mm, base shortly stipitate, apex rounded and beakless; style base not thickened; stigmas 3. Fl. and fr. May–Aug.

Evergreen broad-leaved forests; 1300–2800 m. Yunnan [India, Laos, Nepal, Vietnam].


线茎薹草 xian jing tai cao

Rhizome long, ligneous. Culms densely tufted, usually 1 or 2 borne in a leaf axil, 8–18 cm tall, ca. 1 mm thick, compressed, soft and smooth. Leaves equaling or longer than culm, flat, 1–5.5 mm wide, soft, glabrous, with dark brown persistent leaf sheaths. Involucral bracts sheetlike, blade setiform. Spikes 1–5, androgy nous, remote, ovate, or obovate, 2–5 mm, ca. 3.5 mm thick, densely many flowered; male part of spike shorter than or nearly equaling female part, slightly thin. Female glumes white or pale green, ovate, 1.2–1.5 mm, papery, 1-costate and laterally few veined, margins narrowly membranous, apex rounded or obtuse. Utricles pale green, longer than glume, ovate-elliptic, compressed trigonous, 2–2.5 mm, papery, loosely pubescent and ciliate, distinctly 2-veined laterally and thinly few veined, base cuneate, nearly estipitate, apex attenuate into an indistinct short beak, orifice obliquely truncate. Nutlets dark brown at maturity, obovate-oblong, trigonous, sides slightly concave, 1–1.5 mm, base cuneate, nearly estipitate, apex with a slightly recurved beak; style rather inflated, slightly compressed, densely brown granular-punctate; stigmas 3. Fl. and fr. May–Sep.

On wet rocks in forests, wet grasslands at riversides; 500–800 m. Hainan (Ding’an).


扁茎薹草 bian jing tai cao

Rhizome short. Culms densely tufted, 1 or 2 borne in a leaf axil, 8–18 cm tall, ca. 1 mm thick, compressed, soft and smooth. Leaves 2 × as long as culm or more, flat, 3.5–7 mm wide, soft, glabrous, scabrous on margins, with brown persistent sheaths. Involucral bracts sheetlike, blade scalelike. Spikes usually 1 or 2, androgy nous, remote, cylindric, 5–10 mm, 2–3 mm thick; male part of spike 2 × as long as female part or more (rarely both parts equal), densely many flowered; female part few flowered; lateral spike usually borne from upper part of culm, peduncle short and compressed. Female glumes yellowish, broadly obovate or oblong, 1.5–2 mm, papery, green 1-costate and thinly few veined, margins narrowly membranous, apex obtuse. Utricles pale green, ovate-elliptic, compressed trigonous, 2–3 mm, papery, loosely pubescent on upper part, later glabrescent, 2-veined laterally and thinly few veined, base subrounded, margins ciliate, apex attenuate into an indistinct beak, orifice obliquely truncate. Nutlets dark brown at maturity, elliptic, trigonous, sides slightly concave, ca. 2 mm, base cuneate, nearly estipitate, apex attenuate, with a secund and short beak; style cylindric, brown granular-punctate, base slightly thickened; stigmas 3. Fl. and fr. Sep–Dec.

On rocky mountain slopes in forests or grasslands at riversides; 1600–2800 m. Hainan (Wuzhi Shan).


柱穗薹草 zhui sui tai cao
Rhizome long, ligneous, creeping or obliquely ascending. Culms dark brown, loosely tufted, 12–20 cm tall, 1.5–2 mm thick, stiff, triquetrous, scabrous on angles, persistent sheathed at base. Leaves longer than culm, flat, blades 2–3 mm wide, stiff, slightly scabrous. Involucral bracts leaflike, longer than inflorescence, ca. 2 mm wide, long sheathed. Spikes 4–6, androgyneous, cylindric, 2–3 cm, ca. 2.5 mm thick, lowermost one remote and with an erect and long peduncle, remaining spikes approximate, with very short peduncle and usually enclosed; male part of spike longer than female part, densely many flowered; female part densely few flowered. Female glumes pale green laterally, green at middle, oblong, 4–4.5 mm, papery, 3-veined, thinly several veined, margins white hyaline, apex acute. Utricles greenish, longer than glume, obovate-oblong or ovate, 4.5–5 mm, papery, densely pubescent, 2-veined laterally and thinly several veined, base contracted into a ± long stipe, margins very narrowly winged, ciliate, apex constricted into a short beak, orifice 2-toothed. Nutlets yellowish green at maturity, ovate, trigonous, 2.2–2.8 mm, base contracted into a slightly long stipe, apex shortly beaked or nearly beakless; style with a thickened and conic base; stigmas 3. Fl. and fr. Jun–Sep.

- *Pinus* forests on high mountains, wet grasslands; 1900–3400 m. SW and W Sichuan, NW Yunnan.


*绿头薹* lù tou tai cao

Rhizome short. Culms densely tufted, 6–30 cm tall, ca. 1 mm thick, triquetrous, densely hispidulous and granular-punctate, brown and persistent sheathed at base. Leaves equaling culm, blades 1.5–3 mm wide, flat, soft, densely hispidulous on both surfaces, margins slightly revolute. Involucral bracts leaflike, shorter than inflorescence, densely hispidulous, sheathed. Spikes 2 or 3, androgyneous, oblong, 1–1.5 cm, 3–3.5 mm thick, terminal 2 usually borne in an involucral bract sheath, lateral 1 borne at base of culm, with a filiform and long peduncle; male part of spike shorter than or equaling female part, both slightly densely few flowered; sometimes lateral spike with only 2 or 3 male flowers. Female glumes yellowish green laterally, green at middle, oblong, 3.4–3.6 mm, granular-punctate, 3-veined, margins white hyaline, apex attenuate and mucronate. Utricles greenish, slightly longer than glume, obovate-oblong, obtusely trigonous, ca. 4 mm, thickly papery, granular-punctate and densely hispidulous, 2-veined laterally and thinly several veined, base attenuate into a stipe, margins ciliate, apex abruptly contracted into a short beak, orifice emarginate. Nutlets brown at maturity, obovate-oblong, trigonous, ca. 2 mm, base attenuate, nearly estipitate, margins winged and ciliate, apex contracted into a short beak, orifice slightly patent 2-toothed. Nutlets yellowish brown at maturity, broadly ovate, trigonous, slightly concave on sides, ca. 3.5 mm, base shortly stipitate or nearly estipitate, apex beakless; style base slightly thickened, conic; stigmas 3. Fl. and fr. Jul–Aug.

- *Pinus* forests, among shrubs on dry mountain slopes; 2200–3000 m. W Yunnan (Dali, Jingdong, Lijiang).


*桂龄薹* guì líng tai cao

Rhizome short. Culms brown, densely tufted, 10–20 cm tall, ca. 1 mm thick, slender, triquetrous, scabrous on angles, persistent sheathed at base. Involucral bracts leaflike, linear, blades ca. 1 mm wide, longer than subtending spike, sheathed. Spike single, rarely 2, androgyneous, terminal spike ovoid, 5–8 mm, 4–6 mm wide, sometimes a lateral spike borne at base of culm, usually long pedunculate; male part of spike shorter than female part, densely few flowered; female part 3- or 4-flowered. Female glumes greenish, broadly ovate, 1.8–3 mm, membranous, several veined, apex acute and long awned. Utricle green, obliquely patent, longer than glume, obovate-elliptic, slightly inflated trigonous, ca. 5 mm, densely hispidulous, distinctly 2-veined laterally and thinly several veined, base cuneate, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets yellowish green at maturity, ovate, trigonous, 2.2–2.8 mm, base contracted into a slightly long stipe, apex not mucronate; style with a thickened, conic base, loosely pubescent; stigmas 3. Reduced rachilla sometimes present and setaceous. Fl. and fr. Jun–Aug.

- Thickets or meadows on high mountains, *Pinus* forests or evergreen broad-leaved forests; 900–3000 m. S Sichuan (Yanbian), NW Yunnan.


*年佳薹* nián jiā tai cao

Rhizome long, ligneous, and obliquely ascending. Culms loosely tufted, 10–30 cm tall, acutely triquetrous, slightly stiff, densely papillose, scabrous on angles, dark brown and persistent sheathed at base. Leaves longer than culm, blades 3–5 mm wide, flat, scabrous on upper surface. Involucral bracts leaflike, linear, shorter than inflorescence, shortly sheathed. Spike single, terminal, or 2 or 3, lateral spikes borne at middle or lower part of culm, terminal spike broadly ovate or ovate-orbicular, 8–20 cm, 6–10 mm thick, lateral spikes rather small; peduncle filiform, rather long; male part of spike oblong-cylindric, densely several to many flowered; female part rather short, loosely 3–10-flowered. Female glumes stramineous laterally, green at middle, ovate or broadly ovate, ca. 4 mm, papery, 3-veined and thinly few veined, margins white hyaline, apex slightly recurved and long awned. Utricles brownish green, patent, slightly longer than glume, elliptic, ca. 5 mm, subleathery, glabrous, 2-veined laterally and thinly several veined, base attenuate, nearly estipitate, margins winged and ciliate, apex contracted into a short beak, orifice slightly patent 2-toothed. Nutlets yellowish brown at maturity, broadly ovate, trigonous, slightly concave on sides, ca. 3.5 mm, base shortly stipitate or nearly estipitate, apex beakless; style base slightly thickened, conic; stigmas 3. Fl. and fr. Jul–Aug.

- Meadow thickets on high mountains, mixed forests, grasslands on gully sides; 1800–3700 m. SW Sichuan, NW Yunnan (Eryuan).


*翠丽薹* cuì lì tai cao

Rhizome long, ligneous. Culms densely tufted, 15–30 cm tall, 1–1.5 mm thick, slender, compressed triquetrous, winged or not, slightly scabrous. Leaves shorter or longer than culm, flat, blades 4–10(–16) mm wide, soft, smooth, with dark brown persistent sheathes. Involucral bracts leaflike, longer than
inflorescence, blades 2.5–5 mm wide, long sheathed. Spike single, terminal, or 2 or 3(–7), lateral spikes borne at middle or base of culm, androgynous, cylindric, 1–4 cm, 3–5 mm thick, long pedunculate at middle and rather shortly pedunculate at base; male part of spike usually shorter than female part, rather thin, densely few to many flowered; female part densely many flowered. Female glumes greenish, broadly ovate to oblong, 2–4.4 mm, papery, distinctly 1–3-veined at middle, thinly several veined on both sides, margins membranous, apex acute or acuminate. Utricles green, longer than glume, oblong, trigonous, 4–5 mm, papery, loosely pubescent on upper part, later glabrescent, 2-veined laterally and thinly few veined, base contracted into a short stipe, margins narrowly winged or not winged, loosely ciliate, apex attenuate into a short beak, orifice small 2-toothed. Nutlets oblong, 2.5–3 mm, base contracted into a short stipe, apex beakless; style base thickened or not thickened; stigmas 3. Fl. and fr. Jun–Sep.

*Cyperus*, coniferous, and evergreen broad-leaved forests, thickets or grasslands on riversides; 1000–3400 m. SW Sichuan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Nepal, Thailand, Vietnam].

1a. Leaves 0.4–1 cm wide; female glumes 2–3 mm ..............................  128a. subsp. *speciosa*

1b. Leaves 1–1.6 cm wide; female glumes 3–4.4 mm ..............................  128b. subsp. *dilatata*

128a. *Carex speciosa* subsp. *speciosa*

翠丽薹草 (原亚种) cui li tai cao (yuán yà zhòng)

*Carex longispica* Boeckeler; *C. speciosa* var. *abscondita* Kükenthal; *C. speciosa* var. *angustifolia* Boot; *C. speciosa* var. *minor* Boeckeler.

Culms not winged. Leaves equaling or longer than culm, 0.4–1 cm wide. Spikes 1–3. Female glumes 2–3 mm.

*Quercus*, coniferous, and evergreen broad-leaved forests, thickets or grasslands on riversides; 1000–3400 m. SW Sichuan, Yunnan [Cambodia, India, Indonesia, Laos, Nepal, Thailand, Vietnam].


尾薹草 wei sui tai cao

Culms winged. Leaves shorter than culm, 1–1.6 cm wide. Spikes 2–7. Female glumes 3–4.4 mm.

Dense evergreen broad-leaved forests; 2500–2900 m. W Yunnan (Gengma, Lincang) [Bhutan, NE India, Nepal].


凤凰山薹草 fēng huáng shān tài cao

Rhizome elongating. Culms loosely tufted, 10–30 cm tall, 1–1.5 mm thick, filiform, triquetrous. Leaves longer than or slightly shorter than culm, blades 3–5 mm wide, flat, stiff, scabrous on both surfaces, dark brown and persistent sheathed. Involutul bracts linear, equally triangular, ovate, nearly equisemence, sheathed. Spikes 1 or 2(3), androgynous, oblong, 2–3 cm, ca. 5 mm thick; male part of spike slightly shorter than or equaling female part, both parts densely white flowered; middle spike borne at middle of culm, with erect long peduncle. Female glumes pale green laterally, green at middle, ovate, subovate-oblong, 2.8–3.2 mm, subleathery, green 1-costate, margins brownish and narrowly membranous, apex acute. Utricles greenish, longer than glume, ovarate-oblong, 4–4.2 mm, subleathery, 2-veined laterally and thinly several veined, winged at lower part, base stipitate, margins ciliate, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets brown at maturity, ovarate-oblong, 2.3–2.5 mm, granular-punctate, base contracted to a short stipe, apex beakless; style base thickened, conic; stigmas 3. Fl. and fr. Jun–Jul.

- Forest margins, rock crevices in sparse forests; 1100–1600 m. SE Yunnan (Pingbian).
CULM TALL, RARELY UP TO 60 CM TALL, EXserted; LEAVES GLABROUS.


Rhizome slightly short. Culms tufted, 40–45 cm tall, 1.2–1.5 mm thick, stiff, triquetrous, scabrous on upper part of angles. Leaves longer than culm, flat, blades 10–11 mm wide, stiff, slightly scabrous on veins of lower surface and margins, glabrous, few sheaths brownish, persistent at base. Involucral bracts leaflike, longer than inflorescence, shortly sheathed. Spikes single or terminal, sometimes 1 or 2 lateral spikes borne on middle or lower part of culm, remote, not well developed; terminal spike ovate, 2.5–3 cm, 8–10 mm thick; male part of spike slightly shorter than or equaling female part, oblong, densely many flowered; female part densely many flowered. Female glumes pale greenish laterally, green at middle, ovate or broadly ovate, 6–6.5 mm, thickly papery, several veined, pubescent on veins, base attenuate into a short stipe, margins densely hispidulous, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets brown at maturity, ovate-elliptic, trigonous, 4–4.5 mm, base abruptly contracted into a short stipe, apex beakless; style base thickened, conic; stigmas 3. Fl. and fr. Oct–Nov.


指状薹草组 zhi zhuang tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama, Gordon C. Tucker

Involucral bracts spathaceous, long sheathed, blade indistinct, often setaceous. Spikes 2–6; terminal spike male; lateral spikes female. Female glumes brownish or dark purple-brown, rarely greenish or yellow-green. Utricles obovate to obovate-oblung, densely pubescent, rarely glabrous, with a short beak or beakless. Stigmas 3.

Thirty-five species: temperate to tropical regions of Asia, Europe, and North America; 29 species (21 endemic) in China.

1. **Carex** sect. Digitatae (Fries) H. Christ; C. [unranked] Digitatae Fries.

1a. Culms 2–6 cm tall, concealed in lower part of leaves; leaves pubescent.

2a. Leaves thin, hair-shaped; rhizome slender, creeping or obliquely ascending; culms loosely tufted; female spike loosely 1–3-flowered; female glumes lanceolate, ferruginous or pale ferruginous ............... 134. C. callitrichos

2b. Leaves flat, 1–1.5 mm wide; rhizome short; culms densely tufted; female spike loosely 2–5(–7)-flowered; female glumes brown or purple-brown.

3a. Female glumes ovate, ca. 4 mm, apex acute ........................................ 135. C. humilis

3b. Female glumes oblong or obovate-lanceolate, ca. 3 mm, apex rounded, shortly awned, or aristate.

4a. Culms roundly trigonous; male spike 4–6 mm; nutlets ovate, long stipitate ................. 136. C. minuticulmis

4b. Culms subterete; male spike 7–7.5 mm; nutlets narrowly elliptic, shortly stipitate ........... 137. C. pseudohumilis

1b. Culms 10–40 cm tall, rarely up to 60 cm tall, exerted; leaves glabrous.

5a. Culms lateral; female spike 2–10- or more flowered.

6a. Male spike lower than adjacent female spike, female spike 2–4-flowered, rachis tortuous ............. 138. C. quadriflora

6b. Male spike taller than adjacent female spike, female spike 4–10- or more flowered, rachis strict.

7a. Female spike 4–6-flowered; female glumes purplish brown; utricles with ± long and conic beak at apex; leaf blades 6–7 mm wide, sheaths dark brown and persistent ................................. 139. C. lancifolia

7b. Female spike 10- or more flowered; female glumes brown; utricles with short beak at apex; leaf blades 2–4 mm wide, sheaths purple-red or dark red and persistent .......................... 140. C. erythrobasis
5b. Culms centric; female spike 10- or more to many flowered, rarely 2–4-flowered.

8a. Female glumes yellowish or greenish.

9a. Female glumes yellowish; nutlets long beaked at apex and exserted from orifice; male spike
taller than or equaling adjacent female spike; leaf blades 0.5–1.5 mm wide, soft ...................... 141. C. yuexiensis

9b. Female glumes greenish; nutlets shortly beaked at apex, not exserted from orifice; male spike
distinctly taller than adjacent female spike; leaf blades 2–4 mm wide, stiff.

10a. Female spikes long pedunculate and exserted from involucral bract sheath; utricles nearly
equaling glume, 2-veined laterally and thinly several veined; leaves shorter than culm, persistent sheaths dark brown ................................................................. 142. C. tapinzensis

10b. Female spikes shortly pedunculate, not or slightly exserted from involucral bract sheath;
utricles shorter than glume, 2-veined laterally, not thinly veined; leaves nearly equaling culm, persistent sheaths yellow-brown or brown .......................................................... 143. C. qingyangensis

8b. Female glumes brownish, brown, or purple-brown.

11a. Rhizome long and creeping; culms loosely tufted.

12a. Utricles broadly obovate, with several convex veins, ± estipitate; spikes approximate,
female spikes oblong, densely flowered or loosely few flowered at lower part; female
glumes brown; leaf blades linear, not up to 0.5 mm wide ................................................. 144. C. pachyneura

12b. Utricles obovate-oblong, 2-veined laterally and not thinly veined, shortly stipitate;
spikes remote, female spikes linear, loosely flowered; female glumes purple-brown;
leaf blades flat, 1–2.5 mm wide .................................................................................. 145. C. capilliculmis

11b. Rhizome short, obliquely ascending; culms densely tufted.

13a. Leaves stiff; male spike 4–8 cm.

14a. Female spikes cylindric, 3.5–5 cm, 5–7 mm thick, peduncle slightly stiff, usually
not exserted from involucral bract sheath; male glumes narrowly lanceolate,
8–10 mm, apex acuminate; female glumes narrowly oblong, 4–4.5 mm ............. 149. C. shuchengensis

14b. Female spikes linear-cylindric, 2–4 cm, 3–4 mm thick, peduncle slender, long
exserted from involucral bract sheath; male glumes oblong, 6–8 mm, apex
rounded, acute, or truncate; female glumes oblong, 3–3.5 mm.

15a. Male glumes 8–8.5 mm, apex truncate; female glumes green at middle,
brown or brown-red laterally, rounded at apex ................................................. 148. C. macrosandra

15b. Male glumes 6–7 mm, apex rounded or acute; female glumes brownish.

16a. Leaves slightly shorter than culm, abaxial surface pale cinereous,
densely papillose; female glumes rounded at apex; culms
40–100 cm tall .......................................................................................... 146. C. sichouensis

16b. Leaves longer than culm, slightly scabrous abaxially; female glumes
acuminate at apex; culms 30–50 cm tall ................................................. 147. C. meihsienica

13b. Leaves soft; male spike not exceeding 3 cm.

17a. Female spikes with rather short peduncle, usually not exserted or slightly exserted
from involucral bract sheath, lowermost one slightly remote, but not basal.

18a. Female spikes 2–4-flowered; utricles broadly ovoid or obovate-elliptic,
2-veined laterally and thinly several veined, apex abruptly contracted
into a short or medium-sized beak.

19a. Rhizome elongate and creeping; spikes usually 2, male spike
1.2–1.3 cm, taller than adjacent female spike; utricles broadly
ovoid, ca. 3.5 mm, apex abruptly contracted into a medium-sized beak ........................................ 161. C. scolopendriformis

19b. Rhizome short; spikes usually 3 or 4, male spike ca. 0.5 cm,
shorter than adjacent female spike; utricles obovate-elliptic
or elliptic, 5–6 mm, apex abruptly contracted into a short beak ...................... 162. C. infossa

18b. Female spikes densely many flowered; utricles obovate or obovate-oblong,
2-veined laterally, with or without thin veins, apex shortly beaked.

20a. Leaves involute on margins, linear, shorter than culm; spikes approximate
except lowermost one remote ........................................................................ 158. C. crebra

20b. Leaves flat, longer than or equaling culm; spikes remote.

21a. Involucral bract blades shortly leaflike, involucral bract sheaths
green, narrowly membranous and white at sheath mouth; spike
densely many flowered; rachis strict; leaves shorter than or
equaling culm .................. 159. C. pediformis
21b. Lower 1 or 2 involucral bract blades setaceous, remaining blades mucro-shaped, green abaxially, elsewhere brown, membranous and white at sheath mouth and margins; spike loosely or somewhat densely 5–10- or more flowered; rachis tortuous; leaves longer than culm after flowering .............................................................. 160. *C. lanceolata*

17b. Female spike long stipitate, peduncle filiform, pendulous, long exserted from involucral bract sheath, lowermost one far from upper spike or subbasal.

22a. Female glumes only ca. 2 mm, brownish; utricles narrowly elliptic, 2–2.5 mm; male spike sometimes with 1–3 female flowers at base, female spike sometimes with a few male flowers at apex or 1–3-branched at base; persistent leaf sheaths brownish ................................................................. 150. *C. shaanxiensis*

22b. Female glumes longer than 3 mm, usually purple-brown or dark purple-brown, sometimes brown, dark brown, or brownish; utricles oblong or obovate-oblong, 3–5 mm; male spike without female flowers, female spike without male flowers; persistent leaf sheaths dark brown.

23a. Female glumes 3–3.5 mm, without white hyaline margins; utricles 3–3.2 mm ....................................................................................................................... 151. *C. laeta*

23b. Female glumes 3–5 mm, with broad white hyaline margins; utricles 3–5 mm.

24a. Utricles ca. 3 mm, nearly beakless at apex; style thickened, ovoid, all exserted from utricle; female glumes purple-brown, ca. 3 mm ............................................................................................................. 152. *C. globistylosa*

24b. Utricles longer than 4 mm, shortly beaked at apex; style not thickened or only slightly thickened at base, not exserted from utricle; female glumes 3.8–5 mm.

25a. Utricles hispidulous on veins and upper margins; female spike densely flowered but loosely flowered at lower part; female glumes truncate or emarginate at apex .......... 153. *C. huolushanensis*

25b. Utricles densely pubescent or puberulent; female spike densely flowered; female glumes rounded or emarginate at apex.

26a. Female glumes dark brown, scabrous abaxially and on veins; leaves much shorter than culm; involucral bract blades setaceous ........................................... 154. *C. chiwuana*

26b. Female glumes brownish or dark purple-brown, smooth abaxially; leaves shorter than or nearly equaling culm; involucral bract blades shortly leaflike.

27a. Female glumes dark purple-brown, mucronate at apex; utricles only 2-veined laterally ...................................................... 157. *C. obovatosquamata*

27b. Female glumes brownish, shortly awned or muticous at apex; utricles 2-veined laterally and thinly several veined.

28a. Culms trigonous, scabrous; female glumes 4.3–4.7 mm .............................................................. 155. *C. cardiolepis*

28b. Culms subterete, smooth; female glumes 2–3 mm .......................................................... 156. *C. dayuongensis*


羊须草 yang xu cao

Rhizome elongate, creeping or obliquely ascending. Culms loosely tufted, 2–6 cm tall, hair-shaped, obtusely trigonous, smooth; sheaths red-brown, persistent at base. Leaves 5–6 × as long as culm, blades 0.2–0.8(–1) mm wide, hair-shaped, soft, glabrous, rarely loosely pubescent. Involucral bracts spathe-like, 7–10 mm, smooth, acute at apex, membranous on margins of sheath mouth, without distinct involucral bract blade. Spikes 2–4, remote; terminal spike male, cylindric, 5–8 mm, 1–1.5 mm thick, few flowered; lateral spikes 1–3, female, linear, 5–7 mm, loosely 1–3-flowered; peduncle short, usually not exserted from involucral bract sheath; rachis tortuous. Female glumes ferruginous or pale ferruginous laterally, green at middle, lanceolate, 3–4 mm, 1-veined, margins broadly white hyaline, apex acuminate or acute, mucronate. Utricles greenish, shorter than glume, obovate, obtusely trigonous, 2.5–3 mm, pubescent, distinctly 2-veined laterally and obscurely thinly several veined, base abruptly contracted to a bent and short stipe, apex rounded and very shortly beaked, orifice emarginate or truncate, usually
brownish. Nutlets brown at maturity, oblong-obovate, trigono-

nous, 2.3–2.5 mm, base contracted into a short stipe, apex

rounded and shortly beaked; style base slightly thickened; stig-


Pinus forests, mixed forests, mountain slopes; 800–1000 m.

Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia

(Far East, E Siberia)].

The stems and leaves may be used for making paper and rope.

1a. Male spike few flowered, male

glumes acute at apex, female

spike 1–3-flowered ......................... 134a. var. callitrichos

1b. Male spike 3- or 4-flowered, male

glumes acuminate at apex, female

spike 1- or 2-flowered ....................... 134b. var. nana

134a. Carex callitrichos var. callitrichos

羊须草(原变种) yang xu cao (yuán biàn zhòng)

Carex humilis Leysser f. callitrichos (V. I. Kreczetowicz)

T. Koyama; C. humilis var. callitrichos (V. I. Kreczetowicz)

Ohwi.

Male spike few flowered; male glumes acute at apex; fe-

dmale spike 1–3-flowered.

Pinus forests; 800–1000 m. Heilongjiang [Japan, Korea, Russia

(Far East)].

134b. Carex callitrichos var. nana (H. Léveillé & Vaniot)


1936.

矮丛薹草 ai cong tai cao

Carex lanceolata Bootz var. nana H. Léveillé & Vaniot,


Male spike 3- or 4-flowered; male glumes acuminate at

apex; female spike 1- or 2-flowered. Fl. and fr. Apr–Jul.

Mountain slopes, mixed or Pinus forests; below 1000 m. Hebei,

Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia

(Far East, E Siberia)].


低矮薹草 di ai tai cao

Rhizome short. Culms densely tufted, 2–5 cm tall, subcy-

lindric, smooth, brown and persistent sheathed at base. Leaves

3–5 × as long as culm, flat, blades 1–2 mm wide, soft or

slightly stiff, loosely pubescent. Involucral bracts reddish

brown, spathe-like, with broad white hyaline margins at sheath

mouth, involucral bract blades setaceous. Spikes 2–5, remote;

terminal spike male, linear-cylindric, 1–1.4 cm, ca. 2 mm thick,

many flowered; lateral spikes 1 or 2, female, ovate or oblong,

5–7 mm, loosely 2–7–flowered; peduncles short, enclosed in

sheath or lowermost one slightly exserted; rachis tortuous.

Female glumes red-brown laterally, green at middle, ovate, ca.

4 mm, 1-veined, margins broadly white hyaline, base enclosing

rachis, apex acute. Utricles greenish, slightly shorter than glume,

obovate-oblong, trigonous, 3–3.2 mm, membranous, loosely

ferrugineous punctate, densely pubescent, 2-veined laterally, not

distinctly thinly veined, base abruptly contracted into a short

stipe, apex subrounded and shortly beaked, beak purple-red,

truncate at orifice. Nutlets dark brown at maturity, elliptic or

obovate-oblong, trigonous, 2.5–3 mm, base attenuate into a

short stipe, apex with bent short beak; style base slightly


Pinus or Xylosma forests, sunny places on mountain slopes,

mountains near the sea; 100–1000 m. Anhui, Hebei, Liaoning, Shanxi

[Japan, Russia; Europe].

This species is cultivated in grasslands and used as feed for

domestic animals.

1a. Leaves soft, 1–1.5 mm wide; spikes

2 or 3, female spikes 2–4–flowered ....... 135a. var. humilis

1b. Leaves slightly stiﬀ, ca. 2 mm wide;

spikes 4 or 5, female spikes

4–7–flowered ................................. 135b. var. scirrobasis

135a. Carex humilis var. humilis

低矮薹草(原变种) di ai tai cao (yuán biàn zhòng)

Carex callitrichos V. I. Kreczetowicz var. austrohinganica


Leaves soft, 1–1.5 mm wide. Spikes 2 or 3; female spikes

2–4–flowered.

Pinus or Xylosma forests, sunny places on mountain slopes;

100–1000 m. Anhui, Liaoning [Japan, Russia; Europe].

135b. Carex humilis var. scirrobasis (Kitagawa) Y. L. Chang


鈛田薹草 chu tian tai cao


Leaves slightly stiﬀ, ca. 2 mm wide. Spikes 4 or 5; female


Mountains near the sea, Pinus forests on mountain slopes;

100–1000 m. Hebei, Liaoning, Shanxi.


矮秆薹草 di ai tai cao

Rhizome short, oblique. Culms densely tufted, 1–4(–5) cm

tall, roundly trigonous, hair-shaped, smooth, base with dark

purple persistent sheaths. Leaves much longer than culm (up to

15 cm), flat, blades 3–4 mm wide, soft or slightly stiff, smooth.

Involucral bracts reddish brown, leaflike, sheath 3–6 mm.

Spikes 3 or 4, approximate; terminal spike male, linear-cylind-

ric, 0.4–0.6 cm, ca. 2 mm thick, many flowered; lateral spikes

1 or 2, female, ovate or oblong, 5–7 mm, loosely 2–5–flowered;

peduncles short, enclosed in sheath or lowermost one slightly

exserted; rachis straight. Female glumes red-brown laterally,

green at middle, obovate-lanceolate, ca. 2 mm, 3-veined, mar-

gins broadly white hyaline, base enclosing rachis, apex aristate.

Utricles greenish, decidedly longer than glume, broadly ovate,

obtusely trigonous, 3–3.5 mm, leathery, purple punctate, hir-

sute to glabrescent, 2-veined laterally, otherwise nerveless, base

abruptly contracted into a stipe 1–1.3 mm, apex subrounded,
Rhizome short. Culms tufted, 3–5 cm tall, slender, hair-shaped, triquetrous, smooth, brown and persistent sheathed at base. Leaves longer than or equaling culm, flat, blades 1.2–2 mm wide, slightly stiff, glabrous, scabrous on upper surface and margins, triquetrous and revolute at apex. Involucral bracts brown, spathelike, involucral bract blades awn-shaped and slightly scabrous. Spikes 2 or 3, basal one radicicolous, remaining spikes approximate; terminal spike male, obovate-oblong, 7–7.5 mm, 3–5-flowered; lateral spikes 1 or 2, female, oblong, 7–8 mm, ca. 3 mm thick, loosely 4–6-flowered; peduncles slender, hair-shaped, basal one 2.5–2.7 cm, upper rather short, ca. 10 mm, enclosed in involucral bract sheath; rachis tortuous. Female glumes brown laterally, green at middle, oblanceolate, ca. 3.5 mm, base contracted into a short stipe, apex abruptly constricted into a short beak, orifice 2-toothed. Nutlets dark brown at maturity, obovate, trigonous, ca. 5 mm, membranous, 1-veined, without white hyaline margins, apex emarginate, mucronate. Utricles green, longer than glume, oblong, 3.5 mm, membranous, 1-veined, without white hyaline margins, apex emarginate, mucronate. Utricles green, longer than glume, oblong, trigonous, ca. 5 mm, membranous, pubescent, distinctly 2-veined laterally, not thinly veined, base attenuate into a long stipe, apex contracted into a medium-sized to long and conic beak, orifice 2-lobed. Nutlets brown at maturity, oblong, trigonous, ca. 3 mm, base contracted into a long stipe, apex attenuate, beakless; style base slightly thickened; stigmas 3. Fl. and fr. Jul.–Aug.

- Grasslands in valleys; ca. 3000 m NW Yunnan (Lijiang).


似矮薹草 si ai tai cao

Rhizome short. Culms tufted, 3–5 cm tall, slender, hair-shaped, triquetrous, smooth, brown and persistent sheathed at base. Leaves longer than or equaling culm, flat, blades 1.2–2 mm wide, slightly stiff, glabrous, scabrous on upper surface and margins, triquetrous and revolute at apex. Involucral bracts brown, spathelike, involucral bract blades awn-shaped and slightly scabrous. Spikes 2 or 3, basal one radicicolous, remaining spikes approximate; terminal spike male, obovate-oblong, 7–7.5 mm, 3–5-flowered; lateral spikes 1 or 2, female, oblong, 7–8 mm, ca. 3 mm thick, loosely 4–6-flowered; peduncles slender, hair-shaped, basal one 2.5–2.7 cm, upper rather short, ca. 10 mm, enclosed in involucral bract sheath; rachis tortuous. Female glumes brown laterally, green at middle, oblanceolate, ca. 3.5 mm, base contracted into a long stipe, apex abruptly constricted into a short beak, orifice 2-toothed. Nutlets dark brown at maturity, obovate, trigonous, ca. 5 mm, membranous, 1-veined, without white hyaline margins, apex emarginate, mucronate. Utricles green, longer than glume, oblong, trigonous, ca. 5 mm, membranous, pubescent, distinctly 2-veined laterally, not thinly veined, base attenuate into a long stipe, apex contracted into a medium-sized to long and conic beak, orifice 2-lobed. Nutlets brown at maturity, oblong, trigonous, ca. 3 mm, base contracted into a long stipe, apex attenuate, beakless; style base slightly thickened; stigmas 3. Fl. and fr. Jul.–Aug.

- Grasslands in valleys; ca. 3000 m NW Yunnan (Lijiang).


四花薹草 si hua tai cao


Rhizome short, obliquely ascending. Culms densely tufted, lateral, 15–30 cm tall, not exceeding 1 mm thick, triquetrous, scabrous at upper part, purple-red sheathed at base. Leaves shorter than culm, nearly equaling culm after fruiting, blades 2–4 mm wide, soft, flat, smooth, purple-red and persistent sheathed. Involucral bracts red-brown, spathelike, membranous on margins, truncate at apex, involucral bract blade awn-shaped. Spikes 2 or 3, remote; terminal spike male, shorter than adjacent female spike, linear, 4.5–10 mm, 1–2 mm thick; lateral spikes 1 or 2, female, linear, 1–1.5 cm, 2–2.5 mm thick, loosely 2–4–(6)-flowered; peduncles filiform, 1–3 cm, soft; rachis tortuous. Female glumes ferruginous laterally, green at middle, obovate-oblong, ca. 3 mm, 1-veined, margins broadly white hyaline, apex rounded, mucronate. Utricles yellowish green, longer than glumes, obovate, obtusely trigonous, subplano-convex, 4–5 mm, loosely pubescent, 2-veined laterally, not distinctly thinly veined, base abruptly contracted into a short stipe, apex rounded and shortly beaked, beak ferruginous, truncate at orifice. Nutlets pale ferruginous at maturity, obovate, trigonous, 3.5–4 mm, base contracted into a short stipe, apex abruptly contracted into a short beak; style short, base not thickened; stigmas 3. Fl. and fr. May–Jun.

Xylosma or Pinus forests; 800–1400 m. Hebei, Heilongjiang, Liaoning [Korea, Russia (Far East)].


披针薹草 pi zhen tai cao

Carex glandulifolia Kükenthal.

Rhizome short. Culms densely tufted, lateral, 10–15 cm tall, slender, soft, slightly compressed, smooth, clothed with purple-red long sheaths and short blades at lower part. Leaves longer than or equaling culm, flat, blades 6–7 mm wide, smooth, some sheaths bladeless; persistent sheaths dark brown, usually disintegrating into fibers. Involucral bracts sheathlike, without distinct involucral bract blade, only lowermost one with awn-shaped blade. Spikes 4 or 5, remote, basal one radicicolous; terminal spike male, usually not taller or slightly taller than adjacent female spike, linear, ca. 1 cm, 1.5–2 mm thick; lateral spikes 3 or 4, female, linear-cylindric, 1–1.5 cm, loosely 4–6-flowered; peduncles erect, usually exserted from involucral bract shear; rachis strict. Female glumes purplish brown laterally, green at middle, obovate-oblong, ca. 3.5 mm, membranous, 1-veined, without white hyaline margins, apex emarginate, mucronate. Utricles green, longer than glume, oblong, trigonous, ca. 5 mm, membranous, pubescent, distinctly 2-veined laterally, not thinly veined, base attenuate into a long stipe, apex contracted into a medium-sized to long and conic beak, orifice 2-lobed. Nutlets brown at maturity, oblong, trigonous, ca. 3 mm, base contracted into a long stipe, apex attenuate, beakless; style base slightly thickened; stigmas 3. Fl. and fr. Mar.–May.

- Lax forests on mountain slopes; 1500–2700 m. W Hubei, S Shaanxi (Qin Ling).


红鞘薹草 hong qiao tai cao

Carex hallaisanensis H. Léveillé & Vaniot; C. pedunculata Muhlenberg ex Willdenow var. erythrobasis (H. Léveillé & Vaniot) T. Koyama.

Rhizome short. Culms densely tufted, lateral, 12–25 cm tall, slender, compressed triquetrous, slightly scabrous, with purple-red or dark purple and bladeless sheaths at base. Involucral bracts spathelike, involucral bract sheaths green and slightly purple-red or dark purple, lower involucral bracts with short blade, upper blades setaceous. Spikes 3 or 4, lowermost one remote, borne from base of culm, remaining spikes approximate; terminal spike male, usually taller than adjacent female spike, cylindric, 7–10 mm; lateral spikes female, oblong, 2–3 mm, loosely 10- or more flowered; peduncles slightly stiff, lowermost one rather long, others short, slightly exserted from involucral bract sheath. Female glume pale brown laterally,
green at middle, oblong, 2.5–3 mm, 3-veined, membranous, apex rounded or truncate, with awn 0.8–1 mm. Utricles yellowish, slightly longer than glume, elliptic, trigonous, ca. 4 mm, papery, loosely pubescent, 2-veined laterally, base attenuate into a long stipe, apex contracted into a short beak, orifice obliquely truncate. Nutlets yellowish, elliptic, trigonous, ca. 3 mm, base stipitate, apex contracted into a short beak; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Broad-leaved or 


Cyperaceae

Rhizome short. Culms densely tufted, 20–35 cm tall, triquetrous, slightly scabrous. Leaves nearly equaling culm, linear, blades 0.5–1.5 mm wide, soft, smooth, yellow-brown and persistent sheathed at base. Involucral bracts spathelike, yellowish abaxially, white and hyaline adaxially, with setaceous involucral bract blade. Spikes 3 or 4, lowermost one remote, others approximate; terminal spike male, oblong, ca. 1 cm, not exceeding or slightly exceeding adjacent female spike; lateral spikes 2 or 3, female, uppermost one approximate to male spike, oblong, 1–1.5 cm, 3.5–4 mm thick, loosely several flowered; peduncles slightly scabrous, only lowest one exerted from sheath, others enclosed in sheath. Female glumes yellowish brown laterally, green at middle, oblong, ca. 5 mm, 1-veined, margins white membranous, apex rounded, mucronate. Utricles yellowish green, shorter than glume, obovate-oblong, ca. 3.2 mm, papery, densely pubescent, 2-veined laterally and thinly several veined, base attenuate into a short stipe, apex contracted into a short beak, orifice obliquely truncate. Nutlets obovate-oblong, ca. 2.5 mm, base attenuate, nearly estipitate, apex abruptly contracted into a long beak exerted from utricle; style base slightly thickened; stigmas 3. Fl. and fr. Apr–May.

Mountain slopes, roadsides. SW Anhui (Taihu, Yuexi).

Carex tapinzensis var. lamprosandra (Franchet) Kükenthal.

Rhzizome long, ligneous, obliquely ascending. Culms densely tufted, 15–70 cm tall, ca. 1 mm thick, slender and stiff, triquetrous, scabrous on angles. Leaves shorter than culm, flat, blades 2–4 mm wide, stiff, slightly scabrous, dark brown sheathed at base, sheaths eventually disintegrating into fibers. Involucral bracts spathelike, involucral bract sheath green, white and membranous at sheath mouth, lowermost involucral bract leaflike, rather long, but shorter than inflorescence, other setaceous. Spikes 3–5; terminal spike male, usually taller than adjacent female spike, cylindric, 2–3 cm, densely many flowered; lateral spikes 2–4, female, uppermost one approximate to male spike, others remote, cylindric, 2–4 cm, rather densely many flowered, sometimes with few male flowers at apex; peduncles slender, slightly stiff, long exerted from involucral bract sheath, upper ones gradually shortened. Female glumes greenish or yellowish green laterally, dark green at middle, oblong or obovate-oblong, 4–4.5 mm, papery, 3-veined, scabrous on costa and short awn, margins broadly white hyaline, apex acuminate, acute, subrounded, or truncate. Utricles greenish, nearly equaling glume, oblong or obovate-oblong, obutely trigonous, 4–4.5 mm, papery, densely pubescent, 2-veined laterally and thinly several veined, base attenuate into a long stipe, apex abruptly contracted into a recurved and short beak, orifice obliquely truncate. Nutlets brown at maturity, obovate-oblong, trigonous, 2.5–3 mm, base attenuate into a short stipe, apex with a recurved and short beak; style short, base thickened; stigmas 3. Fl. and fr. May–Aug.

Forest margins on mountain slopes. Anhui (Qingyang: Jiuhua Shan).

Rhzizome slender, creeping. Culms loosely tufted, 10–25 cm tall, less than 1 mm thick. Leaves shorter than culm, elongate after flowering, involute on margins, filiform, blades 0.3–0.5 mm wide, slightly stiff, brown and persistent sheathed at base, sheaths eventually disintegrating into fibers. Involucral bracts green, spathelike, lowermost involucral bract blade shortly leaflike, upper ones setaceous. Spikes 2 or 3; terminal spike male, taller than adjacent female spike, clavate or cylindric, 9–18 mm, densely many flowered; lateral spikes 1 or 2, female, lowermost one remote, sometimes borne at base of culm, upper one approximate to male spike, oblong, 7–15 mm, densely several flowered, sometimes loosely few flowered at
lower part; peduncles slender, exserted from involucral bract sheath. Female glumes brown laterally, green at middle, ovate, 2.5–3.5 mm, membranous, 3-veined, narrowly white hyaline on upper margin, apex acute, mucronate. Utricles brown, slightly longer than glume, obovate, inflated trigonous, 2.5–2.8 mm, papery, smooth on lower part, loosely pubescent near apex, with several convex veins, base broadly truncate, estipitate, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets yellow at maturity, obovate, trigonous, 1.7–2.2 mm, base subsessile, apex abruptly contracted into a short beak; style base slightly thickened; stigmas 3. Fl. and fr. Jul–Aug.

- Mountain slopes of grassland regions; ca. 1500 m. Jilin, Nei Mongol.


丝秆薹草 si gan tai cao


Rhizome long and thick, obliquely ascending. Culms loosely tufted, 15–20 cm tall, slender, filiform, obtusely trigonous, scabrous on angles. Leaves shorter than culm, elongate after flowering, flat, blades 1–2.5 mm wide, soft, sheaths dark brown, persistent. Involucral bracts spathelike, involucral bract sheaths long, with short blade. Spikes 2 or 3, lowermost one remote or nearly borne at base of culm, others approximate; terminal spike male, linear, 7–10 mm, 1.5–2 mm thick, few flowered; lateral spikes 1 or 2, female, oblong or narrowly oblong, 7–10 mm, 2–3 mm thick, loosely few flowered; peduncles slender, filiform, long exserted from involucral bract sheath; rachis straight or tortuous. Female glumes purple-brown laterally, green at middle, ovate-oblong, 3.3–3.8 mm, papery, 1-veined, scabrous on vein, margins white hyaline, apex acute, mucronate. Utricles pale greenish, slightly longer than glume, obovate-oblong, obtusely trigonous, 3.5–4 mm, papery; densely pubescent, 2-veined laterally, not thinly veined, base contracted into an incurved long stipe, apex abruptly contracted into an indistinctly recurved, short beak, orifice emarginate. Nutlets brownish at maturity, elliptic, trigonous, 1.5–1.8 mm, base nearly estipitate, apex shortly beaked; style base slightly thickened; stigmas 3. Fl. and fr. May–Aug.

- Picea and Abies forests, thickets, alpine meadows; 1100–4300 m. S Gansu, E Qinghai, Shaanxi (Taibai Shan), SW and W Sichuan, NW Yunnan.


西畴薹草 xi chou tai cao

Rhizome ligneous, obliquely ascending. Culms densely tufted, 40–100 cm tall, 1.5–2 mm thick, triquetrous. Leaves slightly shorter than culm, flat, 4–5 mm wide, stiff, scabrous on upper part and margins, abaxial surface cineraceous, densely papillate. Involucral bracts green or brown, scabridulous, involucral bract blades setaceous. Spikes 4 or 5, rather remote; terminal spike male, cylindric, 4–5 cm, ca. 3 mm thick, peduncle ca. 4 cm, taller than adjacent female spike; lateral spikes female, line-ar-cylindric, 2–2.5 cm, ca. 3 mm thick, densely many flowered, peduncles slender, ± long exserted from involucral bract sheath. Female glumes brown punctate on upper part, yellow-green on lower part, oblong, ca. 3 mm, membranous, 1-veined, apex rounded, mucronate. Utricles oblong, obtusely trigonous, ca. 3 mm, papery, densely hispidulous, several veined, base attenuate into a short stipe, apex contracted into a recurved short beak, orifice emarginate. Nutlets oblong, trigonous, ca. 2 mm, base shortly stipitate, apex rounded; style recurved, base inflated; stigmas 3. Fl. and fr. Mar–Apr.

- Rock crevices on mountain slopes, forests; 700–1700 m. SE Yunnan (Funing, Xichou).


眉县薹草 mei xian tai cao

Rhizome ligneous, creeping. Culms erect, stiff, 30–50 cm tall, obtusely trigonous, smooth, dark brown and persistent sheathed at base. Leaves longer than culm, flat, blades 3–4 mm wide, ± rigid, margins involute. Involucral bracts green at lower part and nearly pale at upper part, spathelike, brownish on margins, with short involucral bract blade. Spikes 3–5, remote; terminal spike male, clavate-cylindric, 5–6.5 cm; lateral spikes 2–4, female, linear-cylindric, 3–4 cm, ca. 4 mm thick, densely many flowered; peduncles slender, basal one 7–8 cm, upward gradually shorter, rather long exserted from involucral bract sheath. Female glumes brownish laterally, green at middle, ovate-oblong, 3.3–3.5 mm, membranous, 3-veined, margins white hyaline, apex acuminate, mucronate. Utricles brownish, slightly shorter than glume, obovate-oblong, 2.5–3 mm, membranous, laxly pubescent, 2-veined laterally and thinly several veined, base attenuate, nearly estipitate, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets brownish at maturity, elliptic, trigonous, 1.5–1.8 mm, base nearly estipitate, apex shortly beaked; style base slightly thickened; stigmas 3. Fl. and fr. Apr–Jun.

- Streamsides in valleys; 1000–1400 m. Shaanxi.


大雄薹草 da xiong tai cao


Rhizome ligneous. Culms densely tufted, 30–80 cm tall, triquetrous, 1.5–1.5 mm thick. Leaves slightly shorter than or equaling culm, flat, blades 3–5 mm wide, rigid, stiff, scabridulous on both surfaces, slightly revolute on margins, base attenuate into a stipe; stipe stiff, rigid, glabrous; sheaths brown, persistent, eventually disintegrating into fibers. Involucral bracts brown-red, spathelike, obliquely truncate at mouth of involucral bract sheath, without involucral bract leaf. Spikes 4–7, rather remote; terminal spike male, cylindric, 4–8 cm, 3–4 mm thick, densely many flowered, peduncle 4–5 mm, taller than adjacent female spike; lateral spikes female, linear-cylindric, 2.5–3.5 cm, ca. 3 mm thick, densely many flowered, peduncles slender,
rather long exserted from involucral bract sheath. Male glumes 8–8.5 mm, apex truncate; female glumes brown or brown-red laterally, green at middle, oblong, 3.5–3.8 mm, hirsute on upper part, 1-veined, scabrous on veins, margins broadly white hyaline, apex rounded, mucronate. Utricles green, obovate-oblong, obtusely trigonous, 2.5–3.1 mm, thickly papery, densely hirsute, not distinctly veined laterally, thinly several veined, base attenuate into a curved stipe, apex contracted into a curved short beak, orifice truncate. Nutlets brown at maturity, obovate-oblong or obovate, trigonous, 1.8–2 mm; style erect or bent, base thickened; stigmas 3. Fl. and fr. Mar–May.

- Sunny mountain slopes; 700–1000 m. Hubei (Yichang), Sichuan.


舒城薹草 shu cheng tai cao

Rhizome ligneous, obliquely ascending. Culms 30–45 cm tall, 2–2.5 mm thick, obtusely trigonous, smooth. Leaves longer than culm, flat, blades 6–10 mm wide, stiff, rigid, margins scabrous; basal sheaths dark brown, persistent, usually disintegrating into fibers. Involucral bracts red-brown, spathelike, margins white hyaline, apex acute, without distinct involucral bract leaf. Spikes 5 or 6, remote; terminal spike male, clavate, 7–8 cm, 5–7 mm thick, densely many flowered, peduncle rather long, taller than adjacent female spike; lateral spikes 4 or 5, female, cylindric, 3.5–5 cm, ca. 5 mm thick, densely many flowered, laxly several flowered at base, peduncles usually not exserted or slightly exserted from involucral bract sheath at lower part. Female glumes red-brown laterally, green at middle, narrowly oblong, 4–4.5 mm, papery, 3-veined, margins broadly white hyaline, apex acute. Utricles yellowish green, shorter than glume, elliptic, obtusely trigonous, ca. 3 mm, laxly pubescent, 2-veined laterally and thinly several veined, base attenuate into a short stipe, apex abruptly contracted into a short beak, orifice obliquely truncate. Nutlets obovate-oblong, trigonous, ca. 2 mm, base gradually narrowed, shortly stipitate, apex rounded and tortuously beaked; style base slightly thickened; stigmas 3.

- Shady places at forest margins on mountain slopes. Anhui (Shucheng).


陕西薹草 shan xi tai cao

Rhizome stout. Culms densely tufted, 30–35 cm tall, rather slender, ca. 1.5 mm thick, soft, smooth. Leaves shorter than culm, flat, blades 1–2 mm wide, soft, brownish and persistent sheathed at base. Involucral bracts spathelike, greenish sheathed, with involucral bract leaf at apex. Spikes 3 or 4, lowermost one remote or nearly basal, others approximate; terminal spike male, cylindric, 1.4–1.6 cm, ca. 2 mm thick, densely many flowered, sometimes with 1–3 female flowers at base; lateral spikes female, linear-cylindric, 1.7–3 cm, ca. 2 mm thick, sometimes 1–3-branched at base with branches arising from flowered utriculiform cladophylls, sometimes with a few male flowers at apex; peduncles filiform, very long exserted from involucral bract sheath. Female glumes brownish laterally, green at middle, oblong, ca. 2 mm, papery, 3-veined, margins narrowly white hyaline, apex truncate or emarginate, mucronate. Utricles greenish, equaling or slightly longer than glume, narrowly elliptic, obtusely trigonous, 2–2.5 mm, papery, densely pubescent, 2-veined laterally, not thinly veined, base gradually narrowed to a short stipe, apex attenuate into a short beak, orifice emarginate. Nutlets brown at maturity, narrowly elliptic, 1.8–2 mm, trigonous; style base not thickened; stigmas 3. Fl. and fr. Jul–Sep.

- Grasslands on mountain slopes, wet places in valleys; 2800–3200 m. S Gansu, Shaanxi (Taibai Shan).


明亮薹草 ming liang tai cao

Carex pisanensis T. Koyama.

Rhizome obliquely ascending, ligneous, several branched. Culms densely tufted, 10–30 cm tall, ca. 1 mm thick, slender, obtusely trigonous, smooth. Leaves shorter than culm, flat, blades 1–1.5 mm wide, soft, dark brown and persistent sheathed at base; basal sheaths eventually disintegrating into fibers. Involucral bracts spathelike, involucral bract sheaths long, green, white hyaline on margins, lowermost one with short involucral bract leaf, upper ones setaceous. Spikes 3 or 4; terminal spike male, oblong, 8–10 mm, taller than adjacent female spike, densely few flowered; lateral spikes 2 or 3, female, lowermost one sometimes basal, uppermost one near male spike, others remote, cylindric, 1–2.5 cm, ca. 3 mm thick, densely many flowered. Female glumes brown or purple-brown, oblong, 3–3.5 mm, papery, green 1-veined, apex obtuse, mucronate. Utricles yellow-brown or greenish, equaling glume, obovate, trigonous, 3–3.2 mm, densely pubescent, 2-veined laterally, not distinctly thinly veined, base contracted into a short stipe, apex abruptly contracted into a short beak, orifice obliquely truncate. Nutlets brown at maturity, obovate, trigonous, ca. 2.2 mm, base subsessile, apex shortly beaked; style base not thickened; stigmas 3.

- Meadow thickets on high mountains, forest margins or grasslands at riversides; 2000–4300 m. SW and W Sichuan, E Xizang, NW Yunnan [Bhutan, NE India, Nepal].


球柱薹草 qiu zhu tai cao

Rhizome stout, ligneous. Culms densely tufted, 40–60 cm tall, ca. 1 mm thick, slender, obtusely trigonous. Leaves shorter than culm, flat or plicate, blades 1–2 mm wide, adaxial surface scabrous, dark brown and persistent sheathed at base. Involucral bracts green, spathelike, with linear bracteal leaf at apex. Spikes 3; terminal spike male, cylindric, 2–3 cm, densely many flowered, peduncles slender, soft, 6–6.5 cm; lateral spikes 2, female, remote, lower one nearly basal, cylindric, 1.8–3 cm, ca. 2 mm thick, densely many flowered, peduncles slender, filiform, soft, lower one up to 20 cm, upper one ca. 10 cm. Female glumes purple-brown laterally, green at middle, oblong, ca. 3 mm, 3-veined, margins broadly white hyaline, apex truncate or emarginate, mucronate. Utricles greenish, equaling glume, obovate-oblong, obtusely trigonous, ca. 3 mm, papery, densely
火炉山薹草 huo lu shan tai cao

Rhizome stout, stoloniferous. Culms densely tufted, 15–40 cm tall, ca. 1.5 mm thick, slender, obtusely trigonous. Leaves shorter than culm, flat blades 1–3 mm wide, soft, margins scabrous, base dark brown and persistent sheathed. Involutral bracts spathelike, sheaths brownish, with linear involucral bract leaf at apex. Spikes 3 or 4; terminal spike male, cylindric, 2–2.5 cm, ca. 3 mm thick, densely many flowered, peduncle slender, 3.5–4 cm, taller than adjacent female spike; lateral spikes 2 or 3, female, remote, cylindric, 1–4 cm, 2–3 mm thick, many flowered, loosely several flowered at lower part, densely many flowered at upper part, peduncles slender, soft, rather long exserted from involucral bract sheath. Female glumes dark purple-brown laterally, green at middle, obovate-oblong or obovate, trigonous, ca. 4 mm, 2-veined laterally and not thinly veined, hispidulous on veins and margins, base gradually narrowed to a stipe, apex contracted into a short beak, orifice emarginate. Nutlets brownish at maturity, obovate-oblong, trigonous, ca. 2 mm, base shortly stipitate, apex nearly beakless; style short, thickened, ovoid, exserted from orifice of utricle; stigmas 3.

- Rocky mountain slopes; 4300–4400 m. SW Sichuan (Xiangcheng).

启无薹草 qi wu tai cao

Rhizome short. Culms densely tufted, 18–30 cm tall, ca. 1.5 mm thick, slender, obtusely trigonous, stiff. Leaves shorter than culm, flat, blades 3–5 mm wide, slightly stiff, dark brown and persistent sheathed at base. Involucral bracts spathelike, sheaths greenish, involucral bract mouth white and membranous, with linear bract leaf at apex. Spikes 3 or 4; terminal spike male, oblong, 1.2–1.3 cm, ca. 3 mm thick, densely many flowered, peduncle 4.5–7 cm, taller or not taller than adjacent female spike; lateral spikes 2 or 3, female, remote, cylindric, 2–3 cm, ca. 4 mm thick, densely many flowered, peduncles slender, very long exserted from involucral bract sheath. Female glumes dark brown laterally, green at middle, oblong or obovate-oblong, 3.8–4.2 mm, 1–3-veined, scabrous abaxially and on veins, broadly white hyaline on upper margin, apex rounded or emarginate, mucronate. Utricles yellowish green, slightly longer than glume, obovate-oblong, obtusely trigonous, 4–4.2 mm, papery, densely hispidulous, 2-veined laterally, not thinly veined, base gradually narrowed to a long stipe, apex abruptly contracted into a short beak, orifice obliquely truncate, membranous. Nutlets obovate-oblong, 2.1–2.5 mm, base nearly estipitate, apex rounded; style thickened into conic shape at base, erect or recurved; stigmas 3. Fl. and fr. Jun–Jul.

- *Rhododendron* thickets, *Pinus* and *Larix* forests; 2800–4500 m. NW Yunnan (Lijiang, Zhongdian).

藏东薹草 zang dong tai cao

Rhizome obliquely ascending, ligneous, stout. Culms densely tufted, 20–40 cm tall, ca. 1 mm thick, slightly scabrous. Leaves slightly shorter than or nearly equalling culm, elongating after flowering, flat or plicate, blades 1–2 mm with soft, dark brown persistent sheaths at base. Involucral bracts spathelike, sheaths green, membranous on margin, shortly leafy at apex. Spikes 3 or 4, remote, rarely lowermost one basal; terminal spike male, clavate-cylindric, 1.5–2 cm, 2–2.5 mm thick, densely many flowered; lateral spikes 2 or 3, female, cylindric, 1–2 cm, ca. 3 mm thick, laxly many flowered; peduncles filiform, very long exserted from involucral bract sheath. Female glumes brownish laterally, green at middle, obovate-oblong or obovate, 4.3–4.7 mm, papery, 3-veined, margins white hyaline, apex rounded or emarginate, with scabrous awn. Utricles greenish, shorter than or equaling glume, obovate-oblong, inflated trigonous, 4–4.5 mm, papery, densely pubescent, 2-veined laterally and thinly several veined, base gradually narrowed into a short stipe, apex abruptly contracted into a recurved and short beak, orifice entire. Nutlets obovate-oblong, 2.5–2.8 mm, trigonous, base shortly stipitate, apex recurved and short beak; style base slightly thickened; stigmas 3. Fl. and fr. May–Sep.

Meadow thickets on high mountains, forests; 3000–4300 m. S Qinghai, SW and W Sichuan, E and S Xizang. NW Yunnan [Afghanistan, India, Kashmir, Nepal].

大庸薹草 da yong tai cao

Rhizome ± horizontal, indurate, slender. Culms densely tufted, 20–30 cm tall, ca. 1 mm thick, subterete, smooth. Leaves longer than or equalling culm, flat or plicate, blades 1–2 mm wide, rough margined; sheaths brown, persistent as fibrous remnants. Involucral bracts spathelike, sheaths green, reddish brown basally, membranous on margin, with short leaflike blade. Spikes 4 or 5, remote; terminal spike male, clavate, 3.5–4.5 cm, 2.5–3 mm thick, sub laxly many flowered; peduncles slender, scabrous or smooth, well exserted from involucral bract sheath. Male glumes ligulate, ca. 6 mm, apex obtuse to acuminate; female glumes pale brown laterally, green at middle, oblong, 2–3 mm, papery, obscurely 3-veined, margins white hyaline, apex rounded or emarginate, muticous. Utricles greenish, ± equaling glume, obovate, trigonous, 2.5–3 mm, membranous, densely puberulent, 2-veined laterally and thinly several veined, base cuneate, apex abruptly contracted into a short straight beak, orifice weakly 2-toothed. Nutlets obovate-oblong, 2.5–2.8 mm,
trigonal, base shortly stipitate, apex with minute beak; style base conical; stigmas 3, ± as long as utricle.

- Forests in valleys; ca. 300 m. NW Hunan (Zhangjiangiaj).


Rhizome short. Culms densely tufted, 20–40 cm tall, ca. 1 mm thick, slender, triquetrous, smooth. Leaves slightly shorter than or equaling culm, flat, soft, smooth, blades 1.3–2.2 mm wide, plicate at upper part, linear, dark brown and persistent sheathed at base. Involucral bracts spathelike, sheaths long, involucral bract leafy at apex, linear, longer than peduncle. Spikes 3 or 4, remote, lowest one basal; terminal spike male, cylindric, 1.5–2.5 cm, ca. 3 mm thick, densely many flowered; lateral spikes 2–4, female, cylindric, 2–3 cm, ca. 3.5 mm thick, densely many flowered; peduncles slender, filiform, soft, very long exserted from involucral bract sheath. Female glumes dark purple-brown, green at middle, obovate-oblong or oblong, 3.5–4.8 mm, papery, 3-veined, narrowly white hyaline margined at upper part, apex subrounded, mucronate. Utricles green, slightly longer than glume, obovate-oblong, obtusely trigonous, 4.2–5.5 mm, papery, densely white pubescent, indistinctly 2-veined laterally, not thinly veined, base gradually narrowed to a short stipe, apex abruptly contracted into a short beak, orifice obliquely split, 2-toothed. Nutlets brown at maturity, obovate-oblong, trigonous, 2.5–3.5 mm, base shortly stipitate, apex nearly beakless; style erect or slightly bent, base inflated; stigmas 3. Fl. and fr. Jul–Sep.

- Sunny meadow thickets on high mountains; 1700–3900 m. Gansu, Qinghai, SW and NW Sichuan, E and S Xizang, NW Yunnan.


Rhizome short or elongate and obliquely ascending. Culms densely or loosely tufted, 25–40 cm, slender, ca. 1.5 mm thick, triquetrous, slightly scabrous, subrigid. Leaves shorter than or equaling culm, flat, blades 2–3 mm wide, slightly stiff, brown or dark brown and persistent sheathed at base, sheaths usually disintegrating into fibers. Involucral bracts spathelike, sheaths brown on lower part, green abaxially, white hyaline on margins, involucral bract leaf short or setaceous. Spikes 3 or 4, lowermost one slightly remote, others approximate or all spikes rather remote; terminal spike male, surpassing adjacent female spike, clavate-cylindric, 8–20 mm, ca. 3 mm thick, densely several or many flowered; lateral spikes 2 or 3, female, oblong or oblong-cylindric, 1–2 cm, 3–3.5 mm thick, loosely or densely many flowered; peduncles usually not exserted or slightly exserted from involucral bract sheath; rachis erect. Female glumes brown or brown-red laterally, green at middle, obovate, ovate-oblong, or oblong, 4–4.5 mm, papery, 1–3-veined, margins broadly white hyaline, apex obtuse or acute, mucronate or aristate. Utricles greenish, slightly shorter than glume, obovate or obovate-oblong, obtusely trigonous, 3.5–4.5 mm, densely white pubescent, nerveless or indistinctly shortly veined abaxially, 2-veined laterally and thinly several veined or shortly veined adaxially, rarely nerveless or convexly several veined on both surfaces, base gradually narrowed to a long stipe, apex rounded, abruptly contracted into a recurved and short beak, orifice emarginate. Nutlets yellow-brown at maturity, obovate, trigonous, 2.5–3 mm, base shortly stipitate, apex with very short and recurved beak; style base thickened; stigmas 3. Fl. and fr. May–Sep.

Grasslands, mountain slopes, lax forests; 500–2000 m. Gansu, Hebei, Helongjiang, Jilin, Nei Mongol, Shanxi, Xinjiang [Korea, Mongolia, Russia [Far East, Siberia]].

1a. Utricles usually nerveless or indistinctly shortly veined abaxially, 2-veined laterally and thinly several veined or shortly veined adaxially, rarely nerveless or convexly several veined on both surfaces .... 159a. var. pediformis

1b. Utricles usually convexly several veined on both surfaces ............... 159b. var. pedunculata

159a. Carex pediformis var. pediformis

柄状薹草 (原变种) bing zhuang tai cao (yuan bian zhong)

Carex aneurocarpa V. L. Kreczetowicz, C. ayousiensis X. Y. Mao & Y. C. Yang; C. hankaensis Kitagawa; C. kirilowii Turczaninow; C. macroura Meinshausen; C. pediformis var. floribunda Korshinsky; C. pediformis var. macroura (Meinshausen) Kükenthal; C. rhizina Blytt ex Lindblom; C. rhizodes Blytt ex Boott var. abbreviata Meinshausen; C. supermascula V. I. Kreczetowicz; C. sutchanensis Komarov.

Cyperaceae
Utricles usually nerveless or indistinctly shortly veined abaxially, 2-veined laterally and thinly several veined or shortly veined adaxially, rarely nerveless on both surfaces.

Grasslands, mountain slopes, lax forests; 500–2000 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia (Far East, Siberia)].

The plants are used for forage.

We have examined a large number of specimens in China and find that, although the spikes, glumes, and utricles of this species have many variable characters, these characters form a continuum and are very difficult to correlate with separate species. Therefore, we agree with Y. L. Chang and Y. L. Yang (Fl. Pl. Herb. Chin. Bor.-Orient. 11: 116. 1976) in combining Carex hankaensis, C. macraura, and C. supermascula with C. pediformis.


大披针 草 zuo tai cao

Utricles usually convexly several veined on both surfaces. Fl. and fr. May–Jun.

Forests; 500–600 m. Heilongjiang, Jilin, Nei Mongol [Korea, Russia (Far East)].


大披针 草 da pi zhen tai cao

Rhizome stout, obliquely ascending. Culms densely tufted, 10–35 cm tall, ca. 1.5 mm thick, slender, compressed triquetrous, scabrous on upper part. Leaves shorter than culm when young, eventually elongating, equaling or longer than culm, blades 1–2.5 mm wide, flat, soft, margins slightly scabrous, base purple-brown and persistent sheathed, sheaths eventually disintegrating into fibers. Involucral bracts spathelike, sheath green and brown lined, brownish abaxially, white and membranous at sheath mouth and adaxially, lower 1 or 2 involucral bract blades setaceous, remaining blades mucro-shaped. Spikes 3–6, remote; terminal spike male, linear-cylindric, 5–15 cm, 1.5–2 mm thick, shorter than or equaling adjacent female spike; lateral spikes 2–5, female, oblong or oblong-cylindric, 1–1.7 cm, 2.5–3 mm thick, loosely or subdensely 5–10-flowered, or loosely 2- or 3-flowered; peduncles usually not exerted from involucral bract sheath, lowermost one slightly exerted; rachis slightly or distinctly flexuose. Female glumes purple-brown laterally, green at middle, lanceolate, obovate-lanceolate, obovate, slightly or distinctly flexuose. Female glumes obovate or obovate-oblong. Utricles 2-veined laterally and convexly several veined.

Culms 10–35 cm tall. Female spikes loosely or slightly densely 5–10-flowered. Female glumes lanceolate or obovate-lanceolate. Utricles 2-veined laterally and convexly several veined.


Forests, grasslands at forest margins, dry grasslands on sunny slopes; 100–2300 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East, E Siberia)].

1a. Culms shorter than 10–35 cm tall; female spikes only loosely 2- or 3-flowered; rachis distinctly flexuose ............................ 160c. var. laxa

1b. Culms 10–35 cm tall; female spikes loosely or slightly densely 5–10-flowered; rachis slightly flexuose.

2a. Female glumes obovate or obovate-lanceolate; utricles 2-veined laterally and convexly several veined ............................ 160a. var. lanceolata

2b. Female glumes obovate or obovate-oblong; utricles only 2-veined laterally ............................ 160b. var. subpediformis

160a. Carex lanceolata var. lanceolata

大披针草(原变种) da pi zhen tai cao (yuan bian zhong)

Carex lanceolata var. alashanica T. V. Egorova; C. longisquamata Meinshausen ex Komarov.

Culms 10–35 cm tall. Female spikes loosely or slightly densely 5–10-flowered. Female glumes lanceolate or obovate-lanceolate. Utricles 2-veined laterally and convexly several veined.


Forests, grasslands at forest margins, dry grasslands on sunny slopes; 100–2300 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East, E Siberia)].

The culms and leaves are used for making paper, and the young plants are used as animal feed.


亚柄 草 ya bing tai cao

Carex prevernalis Kitagawa; C. pseudolanceolata V. I. Kreczetowicz; C. subpediformis (Kükenthal) Suto & Suzuki.

Female glumes obovate or obovate-oblong. Utricles only 2-veined laterally, not distinctly thinly veined. Fl. and fr. Apr–Jul.

Mountain slopes, thickets, watersides, field margins; 300–2200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Russia (Far East)].


少花大披针 草 shao hua da pi zhen tai cao

Carex karafutoana Ohwi.

Culms shorter than 10–35 cm tall. Female spikes only loosely 2- or 3-flowered; rachis distinctly flexuose. Fl. and fr. May–Jun.

On rocks of mountain slopes near forests. Jilin, Nei Mongol [Japan, Russia (Far East, E Siberia)].

蜈蚣薹 white gong tai cao  

Rhizome elongate, creeping. Culms 15–30 cm tall, 0.5–0.8 mm thick, slender and soft. Leaves shorter than or equaling culm, filiform, soft, dark brown and persistent sheathed at base. Involucral bracts sheathlike, brown, with setaceous blade. Spikes 5; terminal spike male, linear, 1.2–1.3 cm, ca. 1 mm thick, densely many flowered; peduncle thin, 2.5–3 cm, surpassing lower female spike; lateral spike 1, female, oblong, 5–6 mm, laxly 2- or 3-flowered; peduncle rather slender, slightly exserted from involucral bract sheath. Female glumes brown, subovate, 2.4–2.6 mm, papery, 1-veined, margins broadly white hyaline, apex attenuate and mucronate. Utricles gray-green, nearly erect, longer than glume, elliptic or obovate-elliptic, trigonous, 5–6 mm, brown punctate, pubescent, 2-veined laterally and indistinctly thinly several veined, base abruptly contracted into a short stipe and apex into a long or short beak, orifice 2-toothed. Nutlets broadly elliptic, trigonous, ca. 3.5 mm, base with tortuous stipe, apex concave; style short, base slightly thickened; stigmas 3. Fl. and fr. May–Jun.  

- Wet grasslands on mountain slopes, thickets, Pinus forests; 1000–3500 m. NW Hunan (Zhangjiajie: Tianmen Shan), SW Sichuan, NW Yunnan (Lijiang, Zhongdian).


隐匿薹 yin ni tai cao  

Rhizome short. Culms up to 30 cm tall, slender, triquetrous, shortly bracteate or bractless sheathed at base, sheaths dark purple, sometimes disintegrating into fibers. Leaves shorter than culm, blades 2.5–3 mm wide, soft, both surfaces or abaxial side scabrous. Involucral bracts sheathlike, linear, longer than spike, shortly sheathed. Spikes 3 or 4; terminal spike male, lower than or surpassing adjacent female spike, narrowly obovate or sublinear, ca. 5 mm, slightly pedunculate, lower spikes remote; lateral spikes female, oblong, 0.8–2 cm, laxly 3- or 4-flowered, rarely 5- or 6-flowered, slightly long pedunculate. Female glumes pale, greenish at middle, oblong or oblong-ovate, ca. 3.5 mm, membranous, 3-veined, apex mucronate or shortly awned. Utricles gray-green, nearly longer than glume, elliptic or obovate-elliptic, trigonous, 5–6 mm, brown punctate, pubescent, 2-veined laterally and indistinctly thinly several veined, base abruptly contracted into a short stipe and apex into a long or short beak, orifice 2-toothed. Nutlets broadly elliptic, trigonous, ca. 3.5 mm, base with tortuous stipe, apex concave; style short, base slightly thickened; stigmas 3. Fl. and fr. May–Jun.  

- Mountain slopes, forests, gully sides. Anhui, Jiangsu.

1a. Terminal male spike rather short, lower than adjacent female spike, lowermost female spike not basal; utricles shortly beaked at apex ........................................ 162a. var. infossa  

1b. Terminal male spike rather long, surpassing adjacent female spike, lowermost female spike nearly basal; utricles rather long beaked at apex ...... 162b. var. extensa

162a. Carex infossa var. infossa  

隐匿薹 (原变种) yin ni tai cao (yuan bian zhong)  

Terminal male spike rather short, lower than adjacent female spike, lowermost female spike not basal. Utricles shortly beaked at apex.  

- Mountain slopes, forests, gully sides. Anhui (Langya Shan), Jiangsu.


显微薹 xian sui tai cao  

Terminal male spike rather long, surpassing adjacent female spike, lowermost female spike nearly basal. Utricles rather long beaked at apex.  

- S Anhui (Qimen).


白鳞薹组 bai lin tai cao zu  

Dai Lunkai (戴伦凯); Tetsuo Koyama


Rhizome stoloniferous. Culms obtusely trigonous. Leaves narrow, involute on margins. Involucral bracts sheathlike, bladeless. Spikes unisexual; terminal spike male; lateral spikes female, loosely few flowered, with slender peduncle. Female glumes very broadly hyaline on margins. Utricles swollen trigonous, glabrous, shiny, shortly beaked, beak obliquely truncate at orifice. Nutlets tightly enveloped in utricle; style base thickened and globose; stigmas 3.

Four species: Asia, Europe, North America; two species in China.

1a. Leaves ca. 1/2 height of culms; terminal spike usually lower than adjacent female spike, female spikes 2–6-flowered; female glumes shorter than utricle; utricles 3.5–4 mm, yellow-green, shiny ........................................ 163. C. alba  

1b. Leaves equaling culms; terminal spike surpassing adjacent female spike, female spikes 2–4-flowered; female glumes equaling utricle; utricles ca. 3 mm, dark brown, not shiny ........................................ 164. C. ussuriensis


白鳞薹 白鳞 tai cao  

Rhizome stoloniferous. Culms tufted, 15–30 cm tall, rather slender, obtusely trigonous, smooth; sheaths leafless at base. Leaves rather shorter than culm, blades flat, ca. 1 mm wide,
eventually involute on margins, soft, brown sheathed at base. Involutral bracts brown-green, sheathlike, ca. 1 cm, hyaline on margins, without involucral bract leaf. Spikes usually 3, rarely 2 or 4, slightly approximate; terminal spike male, usually not surpassing adjacent female spike, linear, 1.5–1.8 cm; lateral spikes usually 2, rarely 1 or 3, female, oblong or subovate, 5–10 mm, loosely 2–6-flowered, peduncles slender. Female glumes stramineous or yellow-brownish, broadly ovate, ca. 3 mm, membranous, not hyaline margined, green 1-veined, apex acute. Utricles yellow-green, brownish yellow at maturity, obliquely patent, slightly longer than glume, broadly obovate or elliptic-ovobovate, obtusely trigonous, 3.5–4 mm, leathery, glabrous, shiny, several slightly concave veined, base obtusely rounded, margins hyaline, apex contracted into a short beak, orifice obliquely truncate. Nutlets dark brown, tightly enveloped in utricle, obovate-elliptic, trigonous, ca. 2.5 mm, brownish yellow and slightly convex on angles, tuberculate on surface; style base thickened and globose; stigmas 3. Fl. and fr. Jun–Jul.

On rocks of mountain slopes, sandy areas, swamps. Xinjiang [Russia; WC Europe].


乌苏里草 wu su li tai cao


湿生薹草组 shi sheng tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Rhizome stoloniferous. Involucral bracts ± spathelike, usually short involucral bract leafy, sheaths long or short. Spikes few, unisexual, rather remote; terminal spike male; lateral spikes female, subdensely few to many flowered; peduncles slender, usually pendent. Female glumes long or shortly mucronate or awned. Utricles leathery, glabrous, papillate or granular punctate, nearly beakless or very shortly beaked, orifice truncate or emarginate. Nutlets rather tightly enveloped in utricle; style exserted from utricle, base not thickened; stigmas 3.

Four species: polar and alpine regions of Asia, Europe, and North and South America; two species in China.

1a. Lowermost involucral bract shortly sheathed, sheath less than 5 mm; female glumes slightly longer than utricle; utricles ovate or elliptic ................................................................. 165. C. limosa

1b. Lowermost involucral bract long sheathed, sheath up to 2 cm, female glumes shorter than utricle; utricles oblong-elliptic ............................................................. 166. C. laxa


湿生薹草 湿生薹草 wu sheng tai cao

Rhizome long stoloniferous. Culms 20–45 cm, triquetrous, rather slender, scabrid at upper part, red-brown sheathed at base, sheaths sometimes disintegrating into fibers. Leaves shorter than culm, blades 1.5–2.5 mm wide, slightly plicate, grooved at middle, scabrous on margins, sheathed. Involucral bracts leaflike, with short involucral bract leaf, involucral bract sheaths short. Spikes 2 or 3, remote; terminal spikes male, erect, linear, 2.2–5 cm, pedunculate; lateral spikes female, sometimes with few male flowers at apex, oblong or ovate, 1–2 cm, subdensely many flowered, peduncles slender, often pendent. Female glumes yellowish brown, ovate or lanceolate-ovate, 4–6 mm, green at middle, 1–3-veined, apex hard mucronate. Utricles suberect, slightly shorter than glume, ovate or elliptic, compressed trigonous, 3.5–4 mm, leathery, glabrous, densely punctate, several veined, base rounded, shortly stipitate, apex abruptly narrowed into a very short beak, orifice truncate or emarginate. Nutlets slightly loosely enveloped in utricles, elliptic, compressed trigonous, ca. 2 mm; style exserted from utricle, persistent, base not thickened; stigmas 3. Fl. and fr. May–Jul.

Swamps, grasslands at watersides. Heilongjiang, Liaoning [Japan, Korea, Mongolia, Russia (Far East, Siberia); Europe, North America].


稀花薹草 xi hua tai cao

Rhizome slender stoloniferous. Culms 25–35 cm tall, slender, sometimes slightly pendent at apex, obtusely trigonous, smooth, brownish and bladeless sheathed at base. Leaves
shorter than culm, blades 1–2 mm wide, flat, sometimes longitudinally grooved, slightly soft, scabrid on margins, sheathed. Involucral bracts leaflike, with long sheath and short blade. Spikes usually 3, rather remote; terminal spike male, linear-lanceolate; lateral spikes female, oblong, 1–2 cm, subdensely few flowered, peduncles slender, pendent. Female glumes yellowish brown, ovate or oblong-ovate, ca. 3 mm, membranous, green 1-veined, apex obtuse, mucronate. Urticles greenish, suberect, slightly longer than glume, oblong-elliptic, indistinctly trigonous, ca. 3.5 mm, leathery, glabrous, densely papillose, few veined, base gradually narrowed and cuneate, shortly stipitate, apex abruptly contracted into a short beak, beak ferruginous-brown, truncate at orifice. Nutlets rather tightly enveloped in utricle, obovate, trigonous; style exserted from utricle, base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

Swamps, wet places on lakesides or riversides. Heilongjiang, Liaoning, Nei Mongol [Japan, Russia; Europe].


少花薹草组 shao hua tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Rhizome stoloniferous. Culms usually slightly slender. Leaves much shorter than culm, rather narrow. Involucral bracts rather long sheathed. Spikes 3–6, unisexual; terminal spike male; lateral spikes female, rather remote, loosely flowered, pedunculate. Female glume usually mucronate. Urticles membranous or subleathery, inflated trigonous, glabrous, densely puncticulate, shortly beaked; style base not thickened or slightly thickened; stigmas 3.

Fourteen species: Asia, Europe, North and South America; one species in China.


少花薹草 shao hua tai cao

Rhizome slender stoloniferous. Culms 20–50 cm tall, slender, obtusely trigonous, smooth, leafy at lower part. Leaves much shorter than culm, blades 3–5 mm wide or wider, flat, slightly soft; sheaths brown, sometimes purplish red. Involucral bracts with long sheath and rather short blade. Spikes 2–4, usually 3, rather remote; terminal spike male, subclavate, 1–1.5 cm; lateral spikes female, oblong-cylindric or oblong, 1–2.5 cm, loosely several flowered; peduncles long and erect. Female glumes ferruginous-brown, broadly ovate, ca. 3 mm, membranous, green 3-veined, margins hyaline, apex obtuse or acute. Urticles yellow-green, obliquely patent, longer than glume, ovate, inflated trigonous, 4–6 mm, subleathery, glabrous, indistinctly veined, base broadly cuneate, apex abruptly narrowed into a short or medium-sized beak, orifice emarginate or 2-toothed. Nutlets rather loosely enveloped in utricle, obovate, trigonous, ca. 2.5 mm, base shortly stipitate; style base slightly thickened; stigmas 3. Fl. and fr. May–Jul.

Forests, thickets, grasslands, grassland margins. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia; Europe].

1a. Leaf blades 3–5 mm wide; utricles ca. 4 mm ........................................ 167a. var. vaginata

1b. Leaf blades much wider; utricles 5–6 mm ........................................ 167b. var. Petersii

167a. Carex vaginata var. vaginata

少花薹草(原变种) shao hua tai cao (yuan bian zhong)

Carex panicea Linnaeus var. sparsiflora Wahlenberg; C. sparsiflora (Wahlenberg) Steudel.

Leaf blades 3–5 mm wide. Urticles ca. 4 mm.

Wet places in forests or at grassland margins. Heilongjiang, Liaoning [Japan, Korea, Russia; Europe].


大少花薹草 da shao hua tai cao


Leaf blades much wider. Urticles 5–6 mm.

Forests, thickets, grasslands. Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia, Russia].


宽叶薹草组 kuan ye tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Rhizome elongate, rarely shortened. Leaf blades linear or oblanceolate, midvein prominent abaxially, 2 lateral veins prominent adaxially. Involucral bract sheaths ± inflated above and spathelike, blade often shorter to slightly longer than sheath. Spikes androgynous, linear to linear-cylindric. Urticles trigonous, often prominently many veined, nearly beakless to shortly beaked, orifice subtruncate. Stigmas 3.

Twelve species: E and SE Asia; eight species (six endemic) in China.

1a. Lowermost involucral bract blades nearly equaling to longer than sheaths.

2a. Spikes less than 2 cm; utricles with beak erect.
3a. Spikes subcapititate, 5–7 mm .......................................................... 172. C. subcapitata
3b. Spikes linear-cylindric, 10–20 mm .................................................. 171. C. grandiligulata
2b. Spikes 2–5 cm; utricles with beak recurved.
4a. Leaves linear, 5–7 mm wide; utricles broadly ovoid, glabrous 173. C. wayishanensis
4b. Leaves oblanceolate, 10–30 mm wide; utricles oblong-elliptic, sparsely hairy 169. C. oblanceolata
1b. Lowermost involucral bract nearly bladeless or blades much shorter than sheaths.
5a. Leaves oblong-oblanceolate, 1–3 cm wide.
6a. Plants stoloniferous; utricles nearly beakless 168. C. siderosticta
6b. Plants tufted without stolons; utricule beaked .................................. 170. C. esquirioliana
5b. Leaves linear, less than 1 cm wide.
7a. Spike linear-cylindric, male part 1/4–1/2 length of spike; utricles ca. 3 mm, convex adaxially, beak bent downward, 1/8–1/4 length of utricle; female glume slightly shorter than utricle, apex acute .......................................................... 174. C. glossostigma
7b. Spike linear, male part 1/2–3/4 length of spike; utricles ca. 4.5 mm, not convex adaxially, beak erect, ca. 1/3 length of utricle; female glume ca. 1/2 length of utricle, apex subtruncate ......... 175. C. longshengensis


宽叶薹草 kuan ye tai cao
Rhihzome elongate. Flowering culms and vegetative culms spaced; flowering culms clothed by bladeless sheaths at base, pale brown, without leaves. Leaf blades of vegetative culms oblanceolate, 10–20 × 1–2.5 cm, sometimes with white stripes, midvein and 2 lateral veins rather distinct, sometimes ciliate, glabrous adaxially, sparsely pilose on veins abaxially or on both surfaces. Flowering culms up to 30 cm tall; involucral bract sheaths inflated above and spathelike, 2–2.5 cm, with blade 5–10 mm. Spikes 3–6 (–10), single or binate at each node, androgynous, or terminal spike usually male, linear-cylindric, 1.5–3 cm, loosely flowered; peduncles 2–6 cm, usually exserted. Female glumes elliptic-oblong to lanceolate-oblong, 4–5 mm, hyaline-membranous laterally, sparsely rusty punctate, green costa 3-veined, apex obtuse. Utricles obovate or elliptic, trigonous, 3–4 mm, glabrous or pilose, slenderly and prominently many veined, base attenuate into a very short stipe, apex contracted into a short beak or beakless, orifice truncate. Nutlets tightly enveloped, elliptic, trigonous, ca. 2 mm; style persistent, base not thickened, slightly exserted from utricle; stigmas 3. Fl. and fr. Apr–May.

Needle-leaved and broad-leaved mixed forests and forest margins or broad-leaved forests, rather dry grasslands; 1000–2000 m. Anhui, Hebei, Heilongjiang, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Russia (Far East)].

1a. Utricle glabrous; leaf blade margin glabrous .......................... 168a. var. siderosticta
1b. Utricle pilose; leaf blade margin ciliate .............................. 168b. var. pilosa

168a. Carex siderosticta var. siderosticta

宽叶薹草(原变种) kuan ye tai cao (yuan bian zhong)
Carex siderosticta var. variegata Akiyama.

Leaf blade glabrous at margins, glabrous adaxially and sparsely pilose on veins abaxially. All spikes androgynous. Utricle glabrous.

Needle-leaved and broad-leaved mixed forests and forest margins or broad-leaved forests; 1000–2000 m. Anhui, Hebei, Heilongjiang, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Russia (Far East)].


毛缘宽叶薹草 mao yuan kuan ye tai cao

Leaf blades ciliate and sparsely pilose on both surfaces. Terminal spike usually male. Utricle pilose. Fl. and fr. Apr–May.

Rather dry grasslands, forest margins. Anhui, Jiangsu, Liaoning, Zhejiang [Japan, Korea].


矩圆薹草 ju yuan tai cao
Rhizomes thick, with stolons. Culms lateral, longer than leaves, 40–50 cm. Leaves basal, clustered, 1–3 cm wide, with many prominently raised veins, glabrous on both surfaces, middle part of culm bearing 1 leaf, cauline leaf oblanceolate, 60–80 × 6–8 mm, long sheathed. Involucral bract usually leafy, 1.5–5 cm, shorter than spikes, long sheathed. Spikes 4 or 5, distant, androgynous, linear, 30–50 × 2–3 mm; male part ca. 1/5 length of spike, much shorter than female part, densely flowered; female part loosely flowered; peduncles slender, 1–4 cm, often exserted from involucral bract sheaths. Male glumes oblong, ca. 1 mm, with 1 midvein, apex subtruncate or retuse; female glumes brown or castaneous, subsquarose or broadly oblong, ca. 1.5 × 1 mm, papery, glabrous, conspicuously many veined, margins ciliate, apex truncate. Utricles pale green, oblong-elliptic, ca. 3 × 1 mm, with 8–10 raised veins, sparsely hairy, base gradually attenuate into a short stipe, apex narrowed into a beak ca. 0.5 mm, orifice 2-toothed. Nutlets elliptic, ca. 2 × 0.5 mm; style base not thickened; stigmas 3.

● Guangdong.


贵州薹草 gui zhou tai cao
Plants tufted, 8–28 cm, without stolons. Culms lateral, shorter to longer than leaves, slender. Leaves basal, clustered,
10–25 × 0.5–2.5 cm, blades oblanceolate to linear-oblongate, herbaceous to thinly papery, glabrous, many veined, midvein protruding abaxially and sunken adaxially, base narrowed into petiole, margins entire or slightly rugose, apex long acuminate or caudate. Involucral bracts purplish, sheathlike, with a bristle-like blade, shorter than sheath. Terminal spike male, linear, 1–4 × ca. 0.1 cm, male flowers compact, glumes purplish brown, oblong, ca. 3 × 1 mm, membranous; lateral spikes 2–4, female or with a few male flowers at top, 0.8–4 × 0.1–0.3 cm. Female glumes brown, broadly ovate, ca. 2 × 1.1 mm, membranous, midrib yellowish green or paler, apex acute or rounded. Utricles dark brown, narrowly elliptic, ca. 3.5 × 1 mm, upper margins ciliate, base with a greenish stipe 0.3–0.5 mm, apex long beaked, orifice with 2 small teeth. Nutlets brown, elliptic-oblong, ca. 2 × 1 mm, smooth. Fl. and fr. May–Jul.

On rocks; 300–500 m. Guangxi, Guizhou [Vietnam].


大舌薹草 da she tai cao

Rhizome slender and elongate. Flowering culms and vegetative culms spaced; sub-basal sheaths of flowering culms with blades; blades of vegetative culms narrowly linear, 20–40 cm × 2.5–4 mm, herbaceous, midvein and sometimes 2 lateral veins prominent, glabrous. Flowering culms 20–30 cm tall, with spikes at nodes above middle; involucral bract sheaths not distinctly inflated above, involucral bract blades equaling or slightly longer than sheath, ligule up to 2 mm, lowest sheath densely puberulent. Spikes androandrogynous, single or binate at node, linear-cylindric, 1–2 cm; male part of spike usually equaling female part, with denser male flowers and 2 or 3 female flowers; peduncles 1–5 cm, shortly exserted. Female glumes tinged with pale brown, ovate-oblong, ca. 4 mm, hyaline-membranous laterally, rusty punctate, costa green, apex obtuse. Utricles elliptic, 4.5–5 mm, faintly veined, rusty punctate, apex attenuate into a short beak, orifice subtruncate. Nutlet tightly enveloped, elliptic, trigonous, ca. 2.5 mm; style base not thickened; stigmas 3. Fl. and fr. Apr–May.

● Lax forests, rocky places; 1600–1800 m. Hebei, Shaanxi, Sichuan.


近头状薹草 jin tou zhuang tai cao

Rhizome slender, woody. Culms loosely tufted, compressed trigonous, 20–30 cm tall; sub-basal sheaths of flowering culms with blades; blades of vegetative culms narrowly linear, 40–50 cm × 3–5 mm, herbaceous, glabrous, acuminate. Inflorescence with spikes at nodes above middle; lowermost bract with sheath nearly equaling blade, upper branches with shorter bracts and sheaths. Spikes androandrogynous, single or binate at node, subcapitate, 5–7 mm, male part ± equaling female part, with denser male flowers and 4–7 female flowers; peduncles 6–8 cm, well exserted. Male glumes reddish brown, ca. 1.5 mm, 1-veined; female glumes ovate-oblong, ca. 2.5 mm, laterally reddish punctate, 3-veined, apex rounded. Utricles brown, broadly elliptic, ca. 4 mm, many veined, apex attenuate into an erect beak 1.5–2 mm, orifice 2-toothed. Nutlet tightly enveloped, ovoid, trigonous, faces concave, ca. 2 mm; style base slightly thickened; stigmas 3. Fl. and fr. Apr–May.

● Wet and shady places in forests; 800–1500 m. Anhui, Fujian, Guangdong, Guanxi, Hunan, Jiangxi, Zhejiang.

秆叶薹草 long sheng tai cao

Rhizome stout, sometimes elongate. Sub-basal sheaths of flowering culms bladeless; blades of vegetative culms herbaceous to papery, broadly linear, 40–50 × 1.5–3.5 cm, glabrous, midvein and 2 lateral veins distinctly prominent. Flowering culms 30–50 cm tall, with spikes at nodes above middle; involucral bract sheaths slightly inflated above and spathelike, 2.5–5 cm (except uppermost one very short), glabrous, nearly bladeless or blades up to 1 cm, not ligulate. Spikes androgynous, single or binate at each node, linear, 2.5–4.5 cm, pedunculate; peduncle 1–8 cm, slender, often exserted; male part nearly 1/2–3/4 length of spike, distinctly longer than female part, rather densely flowered; female part with 2–5 flowers, utricles sparse at maturity. Female glumes brown, subsquare to horizontally oblong, ca. 2.5 mm, rusty punctate, with 3 distinct veins at middle, faintly veined at both lateral sides, apex subtruncate. Utricles brown, oblong-elliptic, trigonous, 4.5–5.5 mm, rusty punctate, prominently many veined, apex abruptly contracted into an erect beak ca. 1.5 mm, orifice subtruncate. Nutlets oblong or elliptic-ovate, trigonous; stigmas 3.

About 26 species: E, S, and SE Asia; 11 species (eight endemic) in China.

1a. Leaves cauline ............................................................................................................................................................. 176. C. insignis
1b. Leaves basal, rarely cauline.

2a. Spikes sessile or subsessile, several spikes aggregated in capitate inflorescences .................................... 184. C. superakensis
2b. Spikes pedunculate, not forming capitate inflorescences.

3a. Leaf blades 7–12 mm wide.
   4a. Style base curved .................................................................................................................................................. 182. C. zhengkangensis
   4b. Style base erect.
   5a. Utricles glabrous, faintly veined; style base glabrous .................................................................................. 183. C. baiposhanensis
   5b. Utricles hispidulous, conspicuously veined.
   6a. Style base hispidulous ........................................................................................................................................ 185. C. perakensis
   6b. Style base glabrous .............................................................................................................................................. 186. C. mortii

3b. Leaf blades 2–5 mm wide.
   7a. Utricles ca. 2.3 mm; culms compressed cylindric ......................................................................................... 177. C. pomiensis
   7b. Utricles 3–7 mm; culms trigonous.
   8a. Female glumes ± equaling utricle, apex obtuse, muticous; utricles hispidulous, curved, stipitate ................. 178. C. jizhuangensis
   8b. Female glumes much shorter than utricle, 1-veined costa excurrent into an awn at apex;
      utricles glabrous or sparsely pubescent, contracted at base.
   9a. Utricles lanceolate, 6–7 mm, sparsely pubescent ................................................................. 181. C. urelytra
   9b. Utricles elliptic, 3–4 mm, glabrous.
   10a. Spikes 3–4 cm; utricles yellowish green ....................................................................................... 179. C. dielsiana
   10b. Spikes 1–2 cm; utricles chestnut-brown ...................................................................................... 180. C. anomaloe


美穗薹草组 mei sui tai cao zu
Liang Songyun 梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker


Rhizome short or long creeping. Culms slightly stout. Leaves basal or cauline. Involucral bracts leaflike, rarely setaceous, sheathing. Inflorescence a panicle, each partial panicle with 2–7 spikes; terminal 1 or 2 male; remaining spikes androgynous, with unequal peduncles. Female glumes pale brown, purple-red, or blood-red. Utricles suberect or obliquely patent, elliptic or ovate-lanceolate, compressed trigonous, glabrous or hispid, beak long, orifice pale hyaline. Nutlets oblong or elliptic-ovate, trigonous; stigmas 3.

About 26 species: E, S, and SE Asia; 11 species (eight endemic) in China.

1a. Leaves cauline ............................................................................................................................................................. 176. C. insignis
1b. Leaves basal, rarely cauline.

2a. Spikes sessile or subsessile, several spikes aggregated in capitate inflorescences .................................... 184. C. superakensis
2b. Spikes pedunculate, not forming capitate inflorescences.

3a. Leaf blades 7–12 mm wide.
   4a. Style base curved .................................................................................................................................................. 182. C. zhengkangensis
   4b. Style base erect.
   5a. Utricles glabrous, faintly veined; style base glabrous .................................................................................. 183. C. baiposhanensis
   5b. Utricles hispidulous, conspicuously veined.
   6a. Style base hispidulous ........................................................................................................................................ 185. C. perakensis
   6b. Style base glabrous .............................................................................................................................................. 186. C. mortii

3b. Leaf blades 2–5 mm wide.
   7a. Utricles ca. 2.3 mm; culms compressed cylindric ......................................................................................... 177. C. pomiensis
   7b. Utricles 3–7 mm; culms trigonous.
   8a. Female glumes ± equaling utricle, apex obtuse, muticous; utricles hispidulous, curved, stipitate ................. 178. C. jizhuangensis
   8b. Female glumes much shorter than utricle, 1-veined costa excurrent into an awn at apex;
      utricles glabrous or sparsely pubescent, contracted at base.
   9a. Utricles lanceolate, 6–7 mm, sparsely pubescent ................................................................. 181. C. urelytra
   9b. Utricles elliptic, 3–4 mm, glabrous.
   10a. Spikes 3–4 cm; utricles yellowish green ....................................................................................... 179. C. dielsiana
   10b. Spikes 1–2 cm; utricles chestnut-brown ...................................................................................... 180. C. anomaloe


秆叶薹草 gan ye tai cao

Rhizome long stoloniferous. Culms 90–100 cm tall, trigonous, smooth, clothed at base with purple bladeless sheaths. Leaves cauline, shorter than culm, blades linear, 4–5 mm wide, flat, scabrous adaxially, with purple-reddish long sheaths. Involucral bracts leaflike, with purple-reddish long sheaths, 3.5–4.5 mm. Spikes numerous, 3–5 each arising from involucral bract axil, long linear, androgynous or terminal male, 1.5–5 cm. Female glumes pale brown, ovate, 2–2.5 mm, margins hyaline, 3-veined costa excurrent into a scabrous awn, apex emarginate and ciliate. Utricles olive-green, longer than glume, elliptic, trigonous, 3–3.5 mm, membranous, purple puncticulate, hispidulous above or later glabrous, base truncate, apex abruptly contracted into a scabrous long beak, orifice hyaline, emarginate or subentire. Nutlets dark chestnut, tightly enveloped, rhomboid-trigonous, ca. 2 mm; style base slightly thickened; stigmas 3. Fl. and fr. May–Jun.

● Dense forests. Guangxi.

波密薹草  bo mi tai cao

Rhizome short. Culms 40–50 cm tall, densely tufted, compressed cylindrical, smooth, clothed at base with castaneous sheaths. Leaves basal, shorter than culm, blade linear, 2–3 mm wide, flat, margins scabrous. Lower involucral bracts leaflike. Spikes linear, 1–4 cm, 4–7 each arising from involucral bract axil, usually female, only one spike gynaecandrous; peduncles unequal. Female glumes pale castaneous, elliptic, ca. 2 mm, 1-veined, narrowly white hyaline margined. Utricles slightly longer than glume, ca. 2.3 mm, base shortly stipitate, apex abruptly contracted into a short beak, orifice truncate, hyaline. Nutlets loosely enveloped, trigonous, ca. 1.5 mm; style base thickened; stigmas 3. Fl. and fr. May–Jul.

- Ditch sides in forests, moist places; 2100–2800 m. SE Xizang (Médog).


季荘薹草  ji zhuang tai cao

Rhizome long creeping. Culms 40–60 cm tall, trigonous, smooth, clothed at base with purple-reddish sheaths disintegrating into fibers. Leaves slightly shorter than culm, blades linear, 2–3 mm wide, leathery, stiff. Lower involucral bracts leaflike, shorter than inflorescence, sheathing, 3–4 mm, purple-reddish, upper blades setaceous. Spikes numerous, arising single or binate from involucral bract axil; upper 1–3 male, 1–3 cm; remaining spikes androgenous, male part longer than or equaling female part, with slender smooth peduncles. Female glumes purple-reddish, oblong, ca. 3 mm, green 3-veined at middle, upper margins white hyaline, apex obtuse. Utricles olive-green, equaling or longer than glume, long cylindric, trigonous, 3–3.5 mm, densely hirsute, many veined, base shortly stipitate, apex gradually tapering into a short beak, orifice entire. Nutlets tightly enveloped, oblong, trigonous, 3–5 mm, base curved stipitate, apex abruptly contracted into a short beak; stigmas 3. Fl. and fr. Jul–Aug.

- Ditch sides in forests, moist places; 2100–2800 m. SE Xizang (Médog).


丽江薹草  li jiang tai cao

Rhizome short, woody. Culms densely tufted, 25–60 cm tall, trigonous, smooth. Leaves basal, almost equaling or longer than culm, blades linear, ca. 2 mm wide, flat, scabrous above, rigid, with brown-green sheaths, longest sheath bladeless. Lowest involucral bract leaflike, longer than inflorescence. Spikes 4–7, androgyneous, linear-cylindric, 3–4 cm, upper ones usually binate, lower ones single, rarely branched at base, with long peduncles. Female glumes reddish, ovate-oblong, 1-veined costa excurrent into a mucro. Utricles yellowish green, longer than glume, elliptic, obtusely trigonous, 3–4 mm, glabrous, many veined, base contracted, apex gradually narrowed into a beak of medium length, orifice truncate, hyaline. Nutlets loosely enveloped, trigonous, ca. 1.5 mm; style base thickened; stigmas 3. Fl. and fr. May–Jul.

- Grassy slopes, moist places along streams, forest margins; 1900–3800 m. SW Sichuan, NW Yunnan.

The following variety could not be treated here because no material was seen by the present authors: Carex dielsiana var. pallidior Handel-Mazzetti (Symb. Sin. 7: 1267. 1936), described from Sichuan.


中甸薹草  zhong dian tai cao


Rhizome short, woody. Culms densely tufted, 22–55 cm, roundly trigonous, smooth. Leaves cauline, almost equaling or longer than culm, blades linear, ca. 2 mm wide, flat, scabrous above, rigid, with brown-green sheaths, lowest sheath bladeless. Lowest involucral bract leaflike, longer than inflorescence. Spikes 4–7, androgyneous or female, linear, 1–2 cm, 2–4 per node, with peduncles up to 6 cm (androgyneous spikes usually on longer peduncles). Female glumes reddish brown, ovate-oblong, margins hyaline, 1-veined costa excurrent into a mucro ca. 0.6 mm. Utricles chestnut-brown, shiny, longer than glume, narrowly elliptic, obtusely trigonous, 3–3.5 mm, glabrous (except for few hairs on margins of beak), weakly veined, base gradually contracted, apex gradually narrowed into a beak of medium length, orifice 2-toothed, hyaline. Nutlets loosely enveloped, trigonous, ca. 1.5 mm; style base thickened; stigmas 3. Fl. and fr. Jul–Aug.

Calcareous rocks in coniferous forests; ca. 2700 m. NW Yunnan (Zhongdian) [Bhutan, India (Sikkim), Nepal].


扁果薹草  bian guo tai cao

Rhizome short. Culms tufted, rigid, 20–60 cm tall, trigo- nous, subsmooth, occasionally 1-leaved at middle, clothed at base with purple or dark brown sheaths disintegrating into parallel fibers. Leaves shorter than culm, blades linear, 3–5 mm wide, flatish or with ± revolute margins, with purple-brown veins. Lower involucral bracts equaling or shorter than subtending spike, long sheathing, upper involucral bracts shortly sheathing, blades setaceous. Spikes 7–10 at 5–7 nodes, middle ones 2- or 3-nate, rarely 4-nate, upper ones ± contiguous, lower one spaced, all androgyneous, with male part 1/3–2/5 length of spike, cylindric to oblong-cylindric, 2–5 cm, male part 1–2 mm wide, female part 3–4 mm wide, densely many flowered, peduncles exserted. Female glumes yellow-brown, ovate to lanceolate-ovate, 3–4 mm (excluding awn), membranous, margins pale hyaline, 1-veined costa excurrent into a scabrous awn 1–3 mm, apex acute. Utricles erect, yellowish green with brown flecks or turning brown, longer than glume, lanceolate, flattened trigonous, 6–7 mm, thinly membranous, sparsely puberulent, faintly veined, base contracted, upper margins serrulate, apex gradually tapering into a beak, orifice deeply 2-lobed. Nutlets elliptic, trigonous, ca. 2.5 mm, base stipitate; stigmas 3, persistent.

鎮康薹 zhen kang tai cao

Rhizome stoloniferous. Culms 65–70 cm tall, trigonous, smooth, clothed at base with dark brown sheaths. Leaves subequaling culm, blades broadly linear, 7–10 mm wide, herbaceous, slightly stiff, flat, apex acuminate. Involutral bracts leaflike, shorter than inflorescence, long sheathing, 3–3.5 mm. Inflorescence subpaniculate, spikes numerous; terminal spike male, 1–1.5 cm; remaining spikes androgyneous, male part longer than female part, cylindric, 1.5–4.5 cm, loosely flowered, with slender unequal peduncles. Female glumes yellow-brown, oblong-lanceolate, 5.8–6.5 mm, margins white hyaline, apex acuminate. Utricles longer than glume, obliquely patent, 7–7.5 mm (including beak), glabrous, nerveless except for 2 costas on edges, base shortly stipitate, stipe ca. 1 mm, apex abruptly contracted into a long beak ca. 3.5 mm, orifice obliquely truncate, 2-toothed. Nutlets oblong, ca. 2 mm, base shortly stipitate; style ca. 2.5 mm, base curved, glabrous; stigmas 3. Fl. and fr. Jun–Jul.


百坡山薹 bai po shan tai cao

Rhizome woody, stoloniferous. Culms tufted, 40–50 cm tall, slender, clothed at base with reddish brown sheaths. Leaves subequaling culm, blades linear, 5–7 mm wide, flat, scabrous above. Involutral bracts leaflike, longer than inflorescence, long sheathing. Spikes numerous, 2–5 at each node on 5 or 6 nodes, all spaced, upper 3–6 spikes male, lower spikes usually female, occasionally becoming androgyneous, linear-cylindric, 2–3.5 cm, loosely flowered, with slender peduncles. Female glumes sanguineous-red, oblong, 4.4–5.5 mm, margins broadly hyaline, yellowish green 3-veined costa forming a short awn at apex, apex subrounded or emarginate. Utricles green, almost longer than glume, ovate-rhomboidal, trigonous, 5–7 mm, membranous, glabrous, finely veined, base shortly stipitate, apex gradually narrowed into a scabrous long beak, orifice shortly 2-toothed. Nutlets brown, elliptic, 2.8–3.3 mm; style base thickened; stigmas 3. Fl. and fr. Jul.

● Forests; ca. 900 m. Sichuan.


类霹雳薹 lei pi li tai cao

Rhizome short, stout, woody. Culms 50–70 cm tall, trigonous, thick, clothed at base with brown sheaths disintegrating into fibers. Leaves longer than culm, blades purple-brown, linear, 7–11 mm wide, many veined, scabrous abaxially, base usually plicate. Lower involucral bracts leaflike, longer than inflorescence, long sheathing, upper involucral bracts with short blades or setaceous or glumelike, shorter than inflorescence, nearly sheathless. Spikes numerous, 3–7 disposed in a head, androgyneous, ovate-cylindric, male part 1/4–1/3 length of spike, almost without peduncles. Female glumes broadly ovate, ca. 2.5 mm, margins white hyaline, green 3-veined costa excurrent into a short mucro, apex acute. Utricles pale greenish, longer than glume, ovate-elliptic, flattened, trigonous, ca. 3 mm, membranous, densely white hispidulous, apex gradually narrowed to a beak, orifice sharply 2-toothed. Nutlets pale brown, elliptic, ca. 2 mm, compressed trigonous with faces slightly concave; style base thickened, scabrous; stigmas 3. Fl. and fr. Jun–Jul.

● Forests; ca. 900 m. Fujian (Yong’an).


霹雳薹 pi li tai cao

Carex dumnnii Hayata; C. praunii C. B. Clarke (1904), not Kükenthal (1903); C. setulifolia Nelmes; C. tatewakiana Ohwi; C. tonkinensis Franchet.

Rhizome stout, woody. Culms central, 30–120 cm tall, ca. 2 mm thick near base, trigonous, with several nodes, clothed at base with shortly bladed or bladeless dark purple-red sheaths disintegrating into fibers. Leaves basal or cauline, some overtopping culm, blades broadly linear, 4–12 mm wide, stiff, flatish, leathery; cauline leaves rather long, sheathing, dark brown, membranous, pale greenish and black-brown veined abaxially. Lower involucral bracts leaflike, longer than inflorescence, long sheathing, upper involucral bracts glumelike. Inflorescence an interrupted panicle, 30–40 cm, with 3–6 partial panicles, partial panicles 2–5 cm, lower ones single or binate, upper ones binate or occasionally ternate, each bearing 3–7 sessile spikes, lower ones with long peduncles; spikes bisexual, androgyneous, lanceolate or oblong-lanceolate, 1.5–3 cm, male part 1/3–1/2 length of spike. Female glumes pale or slightly brown, broadly ovate to oblong, 2.2–4.5 mm, membranous, 1-veined costa excurrent into a short awn 1–1.5 mm, apex acute to subobtuse. Utricles longer than glume, obovate-elliptic or ovate-fusiform, trigonous, 4.5–6 mm, herbaceous, hispidulous above, many veined, gradually tapering at both ends, beak conic, 1–2 mm, hispidulous or glabrescent, obliquely truncate at hardly 2-toothed orifice. Nutlets dark brown, tightly enveloped, obovate-elliptic, trigonous, 2.5–3 mm, faces concave; style erect, sparsely hispidulous, base slightly thickened; stigmas 3. Fl. and fr. Jul–Oct.

Shady and moist places in forests; 700–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [Indonesia, Malaysia, Thailand, Vietnam].


森氏薹 sen shi tai cao

Rhizome short. Culms 70–120 cm tall, acutely trigonous, several nodose, smooth, clothed at base with brown or chestnut-brown sheaths ± disintegrating into fibers. Leaves basal and a few upper spaced on culm, usually shorter than culm, blades linear, 4–9 mm wide, flattish, leathery. Involutral bracts leaflike, lower 2 overtopping inflorescence, remaining bracts...
much shorter, lower involucral bract sheaths 3–5 cm. Inflorescence paniculate, interrupted, with 3–6 partial panicles, partial panicles binate or ternate, 3–9 cm, some further branched, bearing 3–14 spikes; peduncles exserted; spikes androgynous, oblong or ovate-oblong, 1–2 cm, male part shorter than female part, subdensely flowered, sessile or shortly pedunculate. Female glumes light brown, ovate to ovate-elliptic, 2.8–3 mm, thinly membranous, margins broadly whitish, faintly many veined, green 3-veined costa projecting beyond apex a short micro, apex acute. Utricles pale brownish, longer than glume, suberect, fusiform, lanceolate-elliptic, compressed trigonous, 4.5–6.5 mm, herbaceous, hispidulous on upper 1/2–2/3, finely many veined, attenuate at both ends, beak ca. 1 mm, orifice 2-toothed. Nutlets tightly enveloped, rhomboid-elliptic, trigonous, 3.5–4 mm; style base thickened; stigmas 3.

● Tropical forests; 500–1000 m. Taiwan.

No specimens have been seen by the present authors.


冻苔草组 dong yuan tai cao zu
Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama

Carex sect. Frigidae Fries ex Kükenthal.

Rhizome short or stoloniferous. Culms trigonous, smooth, rarely scabrous above. Involucral bracts leaflike or setaceous, usually sheathing or sheathless. Spikes 2–7(–10); terminal spike male (sometimes gynaecandrous); lateral spikes female, upper ones contiguous, lower ones spaced, with slender long peduncles, usually pendant. Female glumes dark purple-red or brown, awned. Utricles yellow-green or brown, elliptic or narrowly trigonous, usually flattened, membranous, hispidulous or glabrous, margins scabrous, apex gradually attenuate into a long beak, orifice hyaline, obliquely truncate or 2-toothed. Style base thickened or not; stigmas 3, rarely 2.

About 60 species: Asia, Europe, North America; 38 species (24 endemic) in two subsections in China.

1a. Terminal spike male; female glumes elliptic, obtuse at apex ................................................. 199.
1b. Terminal 2 or 3 spikes male; female glumes broadly ovate, acuminate at apex ....... 200.


黑色苔草亚组 hei se tai cao ya zu

Involucral bracts shortly bladed, sheathing or sheathless. Spikes 3–7(–13); terminal spike male or gynaecandrous or all spikes gynaecandrous; lateral spikes female, subclavate-oblong, cylindric, or ovate, densely flowered, all with long peduncles, usually pendant, rarely sessile. Female glumes dark brown. Utricles glabrous; stigmas 3.

About 20 species: Asia, Europe; 14 species (seven endemic) in China.

1a. Terminal or all spikes gynaecandrous.
2a. All spikes gynaecandrous; female glumes much longer than utricle ........................................ 192. C. atrofuscoides
2b. Terminal 1 or 2 spikes gynaecandrous; female glumes shorter than or equaling utricle.
3a. Plants without creeping rhizomes .................................................................................. 193. C. viridimarginata
3b. Plants with creeping rhizomes.
4a. Upper 1 or 2 spikes gynaecandrous, remaining ones female; utrices dark purple-red, apex abruptly contracted into a short beak ................................................. 194. C. nivalis
4b. Terminal spike gynaecandrous or merely male, remaining ones female; utrices yellow-green, apex abruptly contracted into a long beak .................................................. 195. C. psychrophila

1b. Terminal spike male.
5a. Involucral bracts sheathless .............................................................................................. 196. C. neodigyna
5b. Involucral bracts sheathing.
6a. Rhizomes neither creeping nor stoloniferous.
7a. Leaf blades 3–4 mm wide; utrices narrowly lanceolate, scabrous on upper margins .......... 197. C. cruenta
7b. Leaf blades 1–2.5 mm wide; utrices oblong.
8a. Spikes 7–13 .................................................................................................................. 198. C. gonggaensis
8b. Spikes 4–6.
9a. Terminal spike male; female glumes elliptic, obtuse at apex .............................................. 199. C. nakaoana
9b. Terminal 2 or 3 spikes male; female glumes broadly ovate, acuminate at apex ...... 200. C. kwangtoushanica
6b. Rhizomes creeping, emitting stolons.
10a. Leaf blades ca. 1 mm wide, involute toward apex.
11a. Lateral female spikes sessile; utrices abruptly contracted into a long beak ........ 187. C. mucronatiformis
11b. Lateral female spikes with peduncles, slender, slightly pendent; utrices abruptly contracted into a short beak or beakless .......................................................... 188. C. montis-everestii

Rhizome long creeping. Culms 10–20 cm tall, slender, smooth, clothed at base with pale brown sheaths eventually disintegrating into reticulate fibers. Leaves shorter than culms, blades green, linear, ca. 1 mm wide, papery, involute, slightly firm, apex acuminate. Lower involucral bracts setaceous, upper glumelike. Spikes 2 or 3, approximate; terminal spike male, clavate, 1–1.5 cm, with a short peduncle; lateral spikes female or with several male flowers at apex, ovate, 6–10 mm, sessile. Female glumes brown, oblong-lanceolate, ca. 4 mm, margins or with several male flowers at apex, ovate, 6–10 mm, sessile. Glumelike. Spikes 2 or 3, approximate; terminal spike male, occasionally with 1 or 2 female flowers at base, oblong, 10–15 × 3–4 mm; remaining spikes female, elliptic or oblong, 10–17 × 5–10 mm, densely many flowered, with slender, smooth peduncles 2–4 cm. Female glumes pale ferruginous below, purple-brownish above, ovate, ovate-oblong, or ovate-lanceolate, 4–4.2 × ca. 2 mm, with a green midrib, margins narrowly white hyaline, apex acute or acuminate. Nutlets yellowish brown, longer than glume, broadly elliptic, much compressed trigonous, 4.8–5.2 × ca. 3 mm, glabrous, faintly veined, base and apex subrounded, margins pale green, sometimes upper margins minutely dentate, apex abruptly contracted into a short, narrowly cylindric beak, orifice pale hyaline, 2-toothed. Nutlets yellowish, very loosely enveloped, ca. 1.5 mm, base with a stipe ca. 1 mm; style slender, erect, base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

Wet grasslands on riverbanks, boggy meadows, slopes, marshes; 700–3500 m. Gansu, Hebei, Heilongjiang, Nei Mongol, Qinghai, Shanxi [Mongolia, Russia (Siberia)].

1a. Female glumes ovate or ovate-oblong, apex acute ............................ 189a. subsp. coriophora

1b. Female glumes ovate-lanceolate, apex acuminate ............................ 189b. subsp. langtaodianensis

189a. Carex coriophora subsp. coriophora

丘陵草地(原亚种) bian nang tai cao (yu an ya zhong)

Carex atrofusca Schkuhr var. coriophora (Fischer & C. A. Meyer ex Kunth) Kükenthal.

Female glumes ovate or ovate-oblong, apex acute.

Wet grasslands on riverbanks, boggy meadows, slopes; 700–3500 m. Gansu, Heilongjiang, Nei Mongol, Qinghai, Shanxi [Mongolia, Russia (Siberia)].


189b. Carex coriophora subsp. langtaodianensis

Rhizome shortly stoloniferous. Culms 50–70 cm tall, trigonous, smooth, clothed at base with pale brown sheaths disintegrating into fibers. Leaves linear, ca. 1/3 length of culm, blades pale green, 3–5 mm wide, flat, firm, upper margins scabrous, apex acuminate. Involutural bracts leaflike, shorter than inflorescences, sheathing. Spikes 3–5; upper 1 or 2 spikes male, oblong, 10–15 × 3–4 mm; remaining spikes female, elliptic or oblong, 10–17 × 5–10 mm, densely many flowered, with slender, smooth peduncles 2–4 cm. Female glumes pale ferruginous below, purple-brownish above, ovate, ovate-oblong, or ovate-lanceolate, 4–4.2 × ca. 2 mm, with a green midrib, margins narrowly white hyaline, apex acute or acuminate. Nutlets yellowish brown, longer than glume, broadly elliptic, much compressed trigonous, 4.8–5.2 × ca. 3 mm, glabrous, faintly veined, base and apex subrounded, margins pale green, sometimes upper margins minutely dentate, apex abruptly contracted into a short, narrowly cylindric beak, orifice pale hyaline, 2-toothed. Nutlets yellowish, very loosely enveloped, ca. 1.5 mm, base with a stipe ca. 1 mm; style slender, erect, base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

1b. Female glumes ovate-lanceolate, apex acuminate ............................ 189b. subsp. langtaodianensis

189b. Carex coriophora subsp. langtaodianensis

Rhizome long creeping. Culms 10–20 cm tall, slender, smooth, clothed at base with pale brown sheaths eventually disintegrating into reticulate fibers. Leaves shorter than culms, blades green, linear, ca. 1 mm wide, papery, involute, slightly firm, apex acuminate. Lower involucral bracts setaceous, upper glumelike. Spikes 2 or 3, approximate; terminal spike male, clavate, 1–1.5 cm, with a short peduncle; lateral spikes female or with several male flowers at apex, ovate, 6–10 mm, sessile. Female glumes brown, oblong-lanceolate, ca. 4 mm, margins pale hyaline, green 1-veined costa forming a mucro at apex. Utricles yellow-green below, red-brown above, ovate-trigonomus, 4–4.5 mm, glabrous, faintly veined, base contracted and shortly stipitate, apex abruptly contracted into a long beak, orifice white hyaline, obliquely truncate, 2-toothed. Nutlets chestnut-colored, tightly enveloped, ovate-trigonomus, ca. 2 mm; style base not thickened; stigmas 3.

- Alpine meadows, sands; 2000–3900 m. Gansu, Qinghai.


窄叶薹草 zhai ye tai cao

Rhizome woody, stoloniferous. Culms tufted, (2–)5–15 cm tall, slender, obtusely trigonomus, smooth, clothed at base with purple-red sheaths. Leaves linear, shorter than culm, blades pale green, ca. 1 mm wide, involute, margins minutely dentate, apex curved. Lower involucral bracts setaceous, upper glumelike. Spikes usually 2, rarely 3 or 4, approximate; terminal spike male, occasionally with 1 or 2 female flowers at base, oblong, ca. 10 × 3 mm; lateral spikes female, oblong or ovate, 10–15 × 6–10 mm, densely many flowered; peduncles slender, smooth. Female glumes dark purple-red, ovate-lanceolate, 5–6.5 mm, lustrous, margins broadly white hyaline, green 1-veined costa forming a mucro at apex. Utricles pale green below, dark purple-red above, subequalling glume, elliptic or ovate, compressed, ca. 5 × 2.5 mm, faintly veined, glabrous though slightly scabrous on upper margins, base subrounded, apex abruptly contracted into a short beak or beakless, orifice 2-toothed. Nutlets loosely enveloped, elliptic, ca. 1.2 mm, base with short stipe ca. 0.5 mm; style ca. 3 mm; stigmas 3. Fl. and fr. Jun–Aug.

Slopes, flood lands, thickets, meadows, grasslands; 4000–5500 m. Xizang [India (Sikkim), Nepal].


扁叶薹草 bian nang tai cao

Rhizome shortly stoloniferous. Culms 50–70 cm tall, trigonous, smooth, clothed at base with pale brown sheaths disintegrating into fibers. Leaves linear, ca. 1/3 length of culm, blades pale green, 3–5 mm wide, flat, firm, upper margins scabrous, apex acuminate. Involutural bracts leaflike, shorter than inflorescences, sheathing. Spikes 3–5; upper 1 or 2 spikes male, oblong, 10–15 × 3–4 mm; remaining spikes female, elliptic or oblong, 10–17 × 5–10 mm, densely many flowered, with slender, smooth peduncles 2–4 cm. Female glumes pale ferruginous below, purple-brownish above, ovate, ovate-oblong, or ovate-lanceolate, 4–4.2 × ca. 2 mm, with a green midrib, margins narrowly white hyaline, apex acute or acuminate. Nutlets yellowish brown, longer than glume, broadly elliptic, much compressed trigonous, 4.8–5.2 × ca. 3 mm, glabrous, faintly veined, base and apex subrounded, margins pale green, sometimes upper margins minutely dentate, apex abruptly contracted into a short, narrowly cylindric beak, orifice pale hyaline, 2-toothed. Nutlets yellowish, very loosely enveloped, ca. 1.5 mm, base with a stipe ca. 1 mm; style slender, erect, base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

Female glumes ovate or ovate-oblong, apex acute ............................ 189a. subsp. coriophora

1b. Female glumes ovate-lanceolate, apex acuminate ............................ 189b. subsp. langtaodianensis
Rhizome long creeping. Culms 10–70 cm tall, trigonous, smooth, clothed at base with brown sheaths. Leaves shorter than culm, 1/7–1/5 length of culm, blades pale green, (2–)3–5 mm wide, flat, slightly stiff, apex acuminate. Lowest involucral bract leafy, green, shorter than spike, sheathing, upper glume-like, dark purple-red. Spikes 2–5; upper 1 or 2 spikes male, oblong or ovate, 7–15 × ca. 6 mm, densely many flowered; peduncles pendant, slender, 0.5–2.5 cm. Female glumes dark purple-red, ovate-lanceolate or oblong-lanceolate, 4–5 mm, with a light midrib, margins narrowly white hyaline, apex long acuminate. Urticles dark purple above, longer than glume, oblong or elliptic, compressed, 4.5–5.5 × 2.5–2.8 mm, glabrous, nerveless, base subrounded, apex abruptly contracted into a short beak, orifice white hyaline, 2-toothed. Nutlets loosely enveloped, oblong, compressed trigonous, 1.5–1.8 mm, base with a stipe 0.5–1 mm; style base not thickened; stigmas 3. Fl. and fr. Jul.–Aug.

- Alpine and subalpine meadows in thickets; 2000–5200 m. Gansu, Qinghai, Shaanxi, Xizang, NW Yunnan [Afghanistan, India, Kashmir, Nepal; C Asia].

190. Carex atrofuscoides


Culms at 15–20 cm tall, slender, trigonous, smooth, clothed at base with purple-red sheaths slightly disintegrating into fibers. Leaves nearly equaling culm, blades linear, ca. 2 mm wide. Lowest involucral bracts leaflike, sheathless, shorter than inflorescence, upper ones glumelike. Spikes 3 or 4, slightly approximate; terminal spikes gynaecandrous, obovate-lanceolate, 1.3–1.5 cm; lateral spikes female, oblong, 8–12 mm, ca. 3 mm wide, densely many flowered; lowest spike with short peduncle, remaining ones sessile. Female glumes dark brown, ovate, ca. 3 mm, margins white hyaline, green 3-veined costa projecting beyond apex forming a short mucro. Urticles stramineous, subequaling or slightly longer than glume, elliptic, trigonous, 3–3.5 mm, membranous, glabrous, finely veined, base cuneate, margins green, apex abruptly contracted into a conic beak, beak slightly scabrous on margins, orifice brown, 2-toothed. Nutlets loosely enveloped, elliptic, trigonous, ca. 2 mm; stigmas 3. Fl. and fr. Jul.

- Alpine grasslands; ca. 2500 m. Shanxi.

194. Carex nivalis


Culms 20–40 cm tall, trigonous, clothed at base with brown-purple sheaths. Leaves shorter than culm, blades broadly linear, 6–7 mm wide, flat, apex acuminate. Lower involucral bracts leaflike, gradually attenuate above to a long cusp, softly sheathing, upper ones glumelike. Spikes 3–5, subfastigiate, dark purple-red, clavate-cylindric, 2–3.5 cm; upper 1 or 2 gynaecandrous or male, sessile; remaining spikes female, with slender peduncles, lowest one sometimes remote. Female glumes dark purple-red, lanceolate or oblong, 4–5 mm, green 1-veined costa forming a mucro or not at apex. Urticles dark purple-red, pale at base, longer than glume, elliptic or ovate, compressed trigonous, 5–6 mm, papery, glabrous, nerveless, base rounded, with a very short stipe, upper margins slightly scabrous, apex abruptly contracted into a short beak, orifice hyaline, obliquely truncate, 2-toothed. Nutlets loosely enveloped, oblong or elliptic, ca. 2.5 mm, base long stipitate; style enclosed in utricle, base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Grasslands in Picea forests, alpine grasslands in thickets; 3000–5200 m. W Sichuan, W Xizang, NW Yunnan [Afghanistan, India (Sikkim), Kashmir, Kyrgyzstan, Nepal, Pakistan, Uzbekistan].

黄绿薹草 huang lü tai cao

Rhizome stoloniferous. Culms 30–60 cm tall, slender, acutely trigonous, scabrous above, pendent, clothed at base with purple-red bladeless sheaths disintegrating into reticulate fibers. Leaves subequaling culm, blades linear, 2–3 mm wide, flat, margins scabrous. Lower involucral bracts leaflike, sheathless. Spikes 3–5, oblong-cylindric, 10–20 × ca. 6 mm, densely many flowered, upper ones approximate, subsessile, lowest one remote, with long peduncle; terminal spike gynaecandrous or merely male, clavate; lateral spikes female. Female glumes dark purple-red, lanceolate-ovate, 1-veined costa excurrent into a mucro at apex. Nutlets narrowly elliptic, base long stipitate; style base not thickened; stigmas 3. Fl. and fr. Jul–Sep.

Picea forests, alpine meadows in thickets, grasslands; 3000–5600 m. W Sichuan, S Xizang (Yadong) [India (Sikkim), Kashmir, Nepal, Pakistan].


贡嘎薹草 gong ga tai cao

Rhizome short. Culms tufted, 25–35 cm tall, slender, acutely trigonous, rigid, smooth, clothed at base with brown sheaths. Leaves shorter than culm, blades linear, 1–2 mm wide, flat, soft. Lower involucral bracts leaflike, shorter than inflorescence, sheathing, upper ones glumelike. Spikes 7–13, upper ones fastigiate, with short peduncles, lower spikes slightly spaced, with long peduncles, sometimes lowest one subradical and distant, 20–30 × 1.5–2 mm; terminal spike male; lateral spikes female, erect, densely many flowered at base, subloosely flowered above. Female glumes ovate-oblong, 1.8–2.5 mm, green 1-veined costa scabrous and excurrent into a micro at apex. Utricles stramineous-green, narrowly oblong, compressed trigonous, 4–4.8 mm, glabrous, several veined, gradually narrowed at both ends, orifice white hyaline, obliquely truncate, 2-toothed. Nutlets narrowly oblong, base long stipitate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Grassy slopes, moist places on riversides; 2000–3400 m. W Sichuan (Gongga Shan).


钝鳞薹草 dun lin tai cao

Rhizome short. Culms tufted, 25–35 cm tall, rigid, clothed at base with brown bladeless sheaths. Leaves shorter than culm, blades linear, 3–4 mm wide, flat, stiff. Involucral bracts reduced to shortly bladed, sheathless. Spikes 4 or 5, lowest one subradical; upper 1–3 spikes male; remaining spikes female, ovate, 1–1.5 × 0.6–0.7 cm, densely many flowered, with short peduncles. Female glumes brown, oblong, 4–6 mm, glabrous, margins white hyaline, green 1-veined costa excurrent into a mucro at apex. Utricles pale below, brown above, equaling glume, oblong, slightly compressed, papery, glabrous, faintly veined, base contracted and shortly stipitate, margins hispid, apex gradually attenuate into an obliquely truncate long beak, 2-toothed. Nutlets suborbicular, ca. 2 mm; style puberulent, base not thickened; stigmas 2. Fl. and fr. Jul–Sep.

Alpine thickets and meadows; 3900–4100 m. Sichuan.


双柱薹草 shuang zhu tai cao

Rhizome short, stoloniferous. Culms tufted, 8–13 cm tall, rigid, clothed at base with brown bladeless sheaths. Leaves shorter than culm, blades linear, 3–4 mm wide, flat, stiff. Involucral bracts reduced to shortly bladed, sheathless. Spikes 4 or 5, terminal spike male, oblong, 1.2–1.5 cm; lateral spikes female, ovate, 1–1.5 × 0.6–0.7 cm, densely many flowered, pressed trigonous, smooth, clothed at base with brown sheaths, long sheathing, upper ones glumelike. Spikes 7–13, upper ones fastigiate, with short peduncles, lower spikes slightly spaced, with long peduncles, sometimes lowest one subradical and distant, 20–30 × 1.5–2 mm; terminal spike male; lateral spikes female, erect, densely many flowered at base, subloosely flowered above. Female glumes ovate-oblong, 1.8–2.5 mm, green 1-veined costa scabrous and excurrent into a micro at apex. Utricles stramineous-green, narrowly oblong, compressed trigonous, 4–4.8 mm, glabrous, several veined, gradually narrowed at both ends, orifice white hyaline, obliquely truncate, 2-toothed. Nutlets narrowly oblong, base long stipitate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Grassy slopes, moist places on riversides; 2000–3400 m. W Sichuan (Gongga Shan).


狭囊薹草 xia nang tai cao

Rhizome creeping. Culms 20–75 cm tall, erect, acutely trigonous, slender, slightly pendent, clothed at base with brown sheaths. Leaves shorter than culm, blades linear, 3–4 mm wide, flat. Lower involucral bracts leaflike, shorter than inflorescence, long sheathing, upper ones glumelike. Spikes 4–7; upper 1–3 male or mixed with female flowers, sometimes gynaecandrous; remaining spikes female, oblong, 1.5–3 cm, densely many flowered, pendent, with slender peduncles 2–7 cm. Female glumes dark sanguineous, ovate or lanceolate, ca. 4 mm, midrib stramineous, apex acuminate. Utricles longer than glume, narrowly lanceolate, upper margins scabrous. Nutlets narrowly elliptic, base long stipitate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Gravelly slopes, thickets; 4000–5000 m. Xizang [India (Sikkim), Nepal].


光头山薹草 guang tou shan tai cao

Rhizome short. Culms tufted, 10–20 cm tall, slender, compressed trigonous, smooth, clothed at base with purple-red, bladeless sheaths disintegrating into fibers. Leaves shorter than culm, blades 1–1.5 mm wide, flat, margins scabrous. Involucral bracts leaflike, shorter than inflorescence, sheathing. Spikes 4

CYPERACEAE
or 5; upper 2 or 3 male, approximate, linear-cylindric, 8–12 mm, sessile; remaining 2 or 3 spikes female, distant, narrowly cylindric, 8–12 mm, 5–7-flowered, with slender slightly scabrous peduncles. Female glumes ferruginous, broadly ovate, margins narrowly white hyaline, apex subacuminate. Utricles suberect, castaneous, lustrous, elliptic, trigonous, ca. 4 mm, longer than glume, glabrous, nerveless, base contracted, apex gradually attenuate into a scabrous long beak, orifice 2-toothed. Nutlets pale, tightly enveloped, elliptic, obtusely trigonous, ca. 2.2 mm; style base not thickened; stigmas 3. Fl. and fr. May–Jul.

● Rock crevices on mountaintops; ca. 2700 m. Shaanxi (Huxian).


Culms slender. Involucral bracts leaflike, sheathing. Spikes 3–9(–12); upper 1–3 male; remaining spikes female, ovate or cylindrical, lower ones with long peduncles, usually pendent. Female glumes brown or purple-red. Utricles hispidulous, finely veined or nerveless, margins scabrous; stigmas 2 or 3.

About 38 species: Asia, Europe, North America; 24 species (17 endemic) in China.

1a. Stigmas 2, rarely 3.

2a. Female glumes red-brown, margins narrowly white hyaline; utricles red-brown above, pale stramineous below ................................................................. 201. C. przewalskii

2b. Female glumes pale brown, margins broadly white hyaline; utricles stramineous-green ........................................... 202. C. yajiangensis

1b. Stigmas 3.

3a. Utricles ca. 2 mm .............................................................. 203. C. limprichtiana

3b. Utricles 3.5–7 mm.

4a. Rhizome stoloniferous.

5a. Female spikes densely many flowered.

6a. Female glumes obovate, ciliate on upper margins; terminal spike with long peduncle, remote from next lateral spike ................................................................. 204. C. chrysolepis

6b. Female glumes ovate-oblong, not ciliate on upper margins; terminal spike with short peduncle, near next lateral spike ................................................................. 205. C. drepanorhyncha

5b. Female spikes loosely flowered.

7a. All spikes androgynous, narrowly cylindric ........................................... 206. C. karlongensis

7b. Terminal spike male, lateral spikes female, narrowly oblong.

8a. Utricles glabrous; female spikes oblong, 10–20 × 5–8 mm ......................................... 207. C. tatsiensis

8b. Utricles densely hispid; female spikes narrowly cylindric, 25–45 × ca. 5 mm .......... 208. C. brachyathera

4b. Rhizome without stolons.

9a. Utricles trigonous.

10a. Leaves longer than culm, with purple-red sheaths at base ......................... 209. C. purpureovagina

10b. Leaves shorter than culm, with dark brown sheaths at base.

11a. Peduncles 15–21 cm; utricles obovate-oblong, 4.2–4.5 mm ...................... 210. C. ridongensis

11b. Peduncles 2.5–5.5(–13) cm; utricles narrowly elliptic, ca. 4 mm .................. 211. C. setosa

9b. Utricles compressed trigonous.

12a. Utricles with green or pale green margins.

13a. Plants slender, 10–25 cm tall; leaf blades ca. 1 mm wide ....................... 212. C. hirtelloides

13b. Plants slightly stiff, 25–70 cm tall; leaf blades 1.5–3 mm wide .................. 213. C. haematostoma

12b. Utricles without green or pale green margins.

14a. Female glumes with ciliate upper margins.

15a. Utricles with curved beak .............................................................. 214. C. fulvorubescens

15b. Utricles with short beak .............................................................. 215. C. makinoensis

14b. Female glumes not ciliate on upper margins.

16a. Utricles with short beak or beakless.

17a. Utricles hispid above.

18a. Upper 2–4 spikes male; style scabrous ........................................... 220. C. heshuonensis

18b. Upper 7–11 spikes male; style glabrous ........................................... 221. C. graminiculmis

17b. Utricles wholly hispid.

19a. Terminal spike gynaecandrous or male, upper 1 or 2 lateral spikes subsessile, near terminal spike ......................... 223. C. sioumensis

19b. Terminal spike male or with few female flowers at base, lateral spikes pedunculate, spaced ........................................... 224. C. cranocarpa

16b. Utricles with long beak.

20a. Style scabrous or pubescent.
21a. Basal sheaths disintegrating into reticulate fibers; utricles oblongelliptic with erect long beak; style scabrous ......................... 222. Carex przewalskii var. ramosa Y. C. Yang.

21b. Basal sheaths disintegrating into parallel fibers; utricles lanceolate-trigonous with curled very long beak; style pubescent ................. 217. Carex stenocarpa

20b. Style glabrous.

22a. Female spikes sessile, erect; leaf blades plicate, ca. 1 mm wide .................................................. 218. Carex kunlunensis

22b. Female spikes with peduncles 3–6 cm, pendent; leaf blades flat, 3–6 mm wide.

23a. Spikes 5–8; female spikes narrowly linear ................................ 219. Carex regeliana

23b. Spikes 3–5; female spikes ovate to oblong-ovate .................. 216. Carex chrysolepis


红棕薹草 hong zong tai cao

Carex haematostoma Nees var. digyna Kükenthal; C. przewalskii var. ramosa Y. C. Yang.

Rhizome short, creeping. Culms tufted, 15–45 cm tall, erect, trigonous, clothed at base with brown sheaths eventually disintegrating into fibers. Leaves shorter than or equaling culm, blades linear, 2–3 mm wide, flat, apex acuminate. Lowest involucral bract shortly bladed, shorter than inflorescence, sheathing, 4–10 mm. Spikes 3–7, approximate; upper 1–5 spikes male, cylindric, 7–20 mm; remaining spikes female, sometimes with male flowers at apex, oblong or ovate-elliptic, 10–20 mm, densely many flowered, with short peduncles. Female glumes red-brown, oblong-ovate or oblong-lanceolate, 3.5–5 mm, margins narrowly white hyaline, apex acute. Utricles red-brown above, stramineous-yellow below, longer than glume, ovate-elliptic, compressed trigonous, 4–6 mm, membranous, apex gradually attenuate into a beak, orifice white hyaline, emarginate. Nutlets loosely enveloped, elliptic or broadly ovate, compressed trigonous, ca. 2 mm, base with a stipe ca. 1 mm; style pubescent; stigmas 2, rarely 3. Fl. and fr. Jun–Sep.


雅江薹草 ya jiang tai cao

Rhizome short, woody. Culms 40–50 cm tall, smooth, clothed at base with yellow-brown sheaths. Leaves shorter than culm, blades gray-green, linear, 1–2 mm wide, flat, slightly soft, apex acuminate. Involucral bracts leaflike, shorter than inflorescence, sheathing. Spikes 4–7; upper 2 or 3 spikes male, 10–12 mm; remaining spikes female, occasionally few spikes with male flowers at apex, cylindric, 1–2 cm, many flowered, with peduncles 5–20 mm. Female glumes yellow-brown, ovate, 3–3.2 mm, hispid, 1-veined, margins broadly white hyaline, apex acute. Utricles stramineous-green, longer than glume, ovate-trigonous, 3.5–4.4 mm, membranous, hispid, faintly veined, base shortly stipitate, apex gradually attenuate into a beak, orifice 2-toothed. Nutlets yellow-brown, oblanceolate, ca. 2.5 mm, base with a stipe ca. 0.5 mm; style ca. 1.5 mm, pubescent, base not thickened; stigmas 2.

● Sichuan.


小果薹草 xiao guo nang tai cao

Rhizome with slender, rigid stolons. Culms 8–14 cm tall, slender, trigonous, slightly scabrous, clothed at base with sheaths disintegrating into reticulate fibers. Leaves shorter than culm, blades pale green, linear, ca. 1 mm wide, margins revolute. Involucral bracts reduced to shortly bladed, lowest one equaling inflorescence, shortly sheathing. Spikes 3, approximate, sessile; terminal spike gynaecandrous, subclavate, ca. 8 mm; lateral spikes female, oblong or ovate, densely many flowered but loosely flowered at base. Female glumes brown, ovate, margins narrowly white hyaline, 1-veined costa excurrent into a mucro at apex, apex acute. Utricles stramineous-ferruginous, longer than glume, ovate-elliptic, obtusely trigonous, obliquely patent, ca. 2 mm, membranous, faintly veined, base contracted, apex abruptly contracted into a smooth long beak, orifice 2-toothed; stigmas 3.

● About 3500 m. Sichuan.


黄花薹草 huang hua tai cao

Carex chrysolepis var. odontostoma (Kükenthal) Ohwi; C. gokwanensis Hayata; C. odontostoma Kükenthal.

Rhizome short, stolons elongate. Culms subloosely tufted, 10–35 cm tall, slender, erect or ± curved, subsmooth, clothed at base with yellow-brown to dark brown sheaths disintegrating into fibers. Leaves longer than culm, blades linear, 1.5–3 mm wide, flat or slightly curved. Lower involucral bracts with sheaths 1–1.5 cm, lowest with a setaceous blade, upper glume-like. Spikes 2–5, upper ones close together, lower 2 or 3 somewhat distant, erect, with long peduncles; terminal spike male, linear-clavate, 10–30 × ca. 5 mm; lateral spikes female, linear-cylindric, 1.3 × 0.5–0.8 cm, subloosely to subdensely many flowered, mostly with short peduncles enclosed in involucral bract sheaths. Female glumes reddish or purplish brown, ovate-lanceolate or oblanceolate, somewhat shiny, upper margins ciliate, green 1-veined costa ending in a mucro, apex acute. Utricles stained with reddish brown above, longer than glume, erect to erect-patent, ovate-lanceolate, compressed trigonous, 4–7 mm, faintly veined, wholly pubescent, margins subdensely hispidulous, beak rather long, deeply lobed at orifice. Nutlets tightly enveloped, elliptic-oblanceolate; style beaklike, base thickened; stigmas 3.
Rather dry grasslands in forests. Taiwan [Japan].


打箭薹 lian hui tai cao

Rhizome woody, rigid, stoloniferous. Culms tufted, 20–45 cm tall, slender, obtusely trigonous, smooth, clothed at base with dark brown sheaths eventually disintegrating into reticulate fibers. Leaves longer than culm, blades pale green, linear, 3–5 mm wide, flat, slightly rigid, margins scabrous. Involuclar bracts reduced to shortly bladed, sheathing 8–15 mm, lowest one setaceous. Spikes 4 or 5; terminal spike male, larger, clavate, 3–5 × 0.3–0.5 cm, with short peduncle; lateral spikes female, distant, narrowly cylindric, 2–5 × 0.4–0.5 cm, densely many flowered, subloosely flowered at base. Female glumes red-brown, obovate-oblong, ca. 3.5 mm, margins narrowly white hyaline, 1-veined costa ending in a mucro, apex truncate or emarginate. Utricles yellow-green and ferringrous, longer than glume, obovate or narrowly elliptic, trigonous, 4.2–4.5 mm, membranous, densely hispid, base gradually attenuate into stipe ca. 1 mm, apex abruptly contracted into beak 1.2–1.8 mm, orifice obliquely truncate, 2-toothed. Nutlets pale brown, tightly enveloped, ovate, trigonous, 1.5–2 mm; style base slightly thickened; stigmas 3.

- Forests, alpine thickets, meadows, roadsides; 2000–4000 m. W Sichuan, NW Yunnan.


卡郎薹 ka lang tai cao

Rhizome long creeping. Culms 20–25 cm tall, slender, compressed trigonous, smooth, basal sheaths pale brown. Leaves longer than culm, blades linear, 1.5–2 mm wide, flat, scabrous abaxially, smooth adaxially, margins scabrous, apex acuminatae. Involuclar bracts leaflike, shorter than involuclence, sheathing 0.5–3 mm. Spikes 3, slightly spaced, androgy nous, narrowly cylindric, 2.5–3 cm; male part of spike line, densely many flowered, equaling or slightly longer than female part; female part loosely many flowered, with slender peduncles 1–3 cm, lowest peduncle 3.5–10.5 cm, scabrous. Female glumes pale brown, obovate or ovate-oblong, 2.8–3 mm, margins broadly white hyaline, green 1-veined costa forming a mucro at apex, apex acute. Utricles yellow-green or olivaceous-green, equaling glume, obovate, trigonous, 3–3.5 mm, pubescent, especially on upper part, nerveless except for 2 costas on edges, base cuneate, apex abruptly contracted into a beak ca. 1 mm, orifice white hyaline, obliquely truncate, 2-toothed. Nutlets brown, tightly enveloped, obovate, trigonous, ca. 2 mm, base with a short stipe ca. 0.5 mm; style erect, base not thickened; stigmas 3.

- Flood lands, alpine meadows; 3000–4000 m. W Sichuan.


打箭薹 da jian tai cao


Rhizome with long stolons. Culms 15–30 cm tall, slender, acutely trigonous, smooth, basal sheaths purple-brown. Leaves shorter than culm, blades pale green, linear, 1–2 mm wide, flat, rarely plicate, soft, margins scabrous, apex acuminate. Involuclar bracts leaflike, shorter than involuclence, sheathing 0.7–1.5 cm, purple-brown above. Spikes 3–5; terminal spike male, linear, 1–2 cm; remaining spikes female, distant, rarely with several male flowers at apex, oblong, 1–2 × 0.5–0.8 cm, loosely flowered, with slender scabrous peduncles. Female glumes brown or castaneous, ovate-lanceolate or oblong, 3.5–4 mm, margins broadly white hyaline, 1-veined costa forming a mucro, apex acute. Utricles ferrugineous, slightly longer than glume, obliquely patent at maturity, ovate-elliptic, obtusely trigonous, 5–5.5 mm, membranous, slightly lustrous, glabrous, nerveless except for 2 costas on edges, base cuneate, apex abruptly contracted into a scabrous beak 2–3 mm, orifice obliquely truncate, 2-toothed. Nutlets pale brown, tightly enveloped, ovate-elliptic, trigonous, 2.8–3.2 mm, base with a stipe ca. 1 mm; style erect, base not thickened; stigmas 3. Fl. and fr. Jul.

- Alpine meadows, shady and moist grasslands on forested slopes; 3000–4000 m. Gansu, Qinghai, W Sichuan.


垂穗薹 chui sui tai cao

Rhizome woody, rather thick, usually stoloniferous. Culms loosely tufted, 30–60 cm tall, slender, trigonous, scabrous above, clothed at base with brown or dark brown sheaths ± disintegrating into fibers. Leaves shorter than culm, blades linear, 1.5–2.5 mm wide, slightly stiff, flattish or flattish plicate. Lowest involucral bract leaflike, shorter than spike, sheathing 3–5 cm, upper ones setaceous. Spikes 3–5, upper spikes contiguous to closely contiguous, suberect, lowest one very remote and pendent on long exserted, filiform peduncle; terminal spike male or rarely with a few female flowers at base, clavate to linear-clavate, 2–3 cm; lateral spikes female, narrowly cylindric, 2.5–4.5 × ca. 0.5 cm, sub laxly many flowered, peduncles exserted, filiform. Female glumes deep chestnut-brown with pale upper margin, oblong, thinly herbaceous, greenish 1-veined costa forming a straight scabrous awn ca. 1 mm, apex truncate or shallowly emarginate. Utricles slightly longer than glume, erect, ovate-fusiform, trigonous, 4.5–5 mm, membranous, densely hispid except at very base, nearly nerveless except for 2 costas on edges, gradually attenuate at both ends, base shortly stipitate, apex rather long beaked, orifice obliquely truncate, 2-toothed. Nutlets tightly enveloped, ovate-elliptic, compressed trigonous, 2–2.5 mm, base shortly stipitate; style base thickened; stigmas 3. Fl. and fr. Jul.

- Sandy grasslands at high elevations. Taiwan.


紫红鞘薹 zi hong qiao tai cao

Rhizome oblique, woody. Culms tufted, 25–28 cm tall, obtusely trigonous, smooth, basal sheaths purple-red, disintegrating into fibers. Leaves longer than culm, blades greenish, linear, ca. 2.5 mm wide, margins scabrous, apex long acuminate. Involuclar bracts reduced to shortly bladed, shorter than involu-
Cyperaceae, sheathing 1.5–2 cm. Spikes 3, distant; terminal spike male, linear, 48–50 × 1.5–2.5 mm, densely many flowered; lateral spikes female, cylindric, 2.8–3.2 × 0.3–0.4 cm, slightly densely many flowered, with peduncles 3–9 cm. Female glumes brown, ovate or broadly oblong, 3.3–3.5 mm, margins white hyaline, green 1-veined costa forming a muro, apex acute. Utricles stramineous, longer than glume, obovate-oblong, trigonous, 3.5–4 mm, hirsute, veins slightly conspicuous, contracted at both ends, base shortly stipitate, apical beak 1–1.3 mm, hispidulous on margins, orifice obliquely truncate, shallowly 2-lobed. Nutlets tightly enveloped, elliptic, trigonous, 2–2.2 mm; style erect, base conspicuously thickened; stigmas 3. Fl. and fr. Apr–May.

- Shady valleys, rocky places in sparse forests; 1000–1700 m. Guangxi.


日东薹草 里东薹草

Rhizome woody, oblique. Culms tufted, 70–80 cm tall, slender, basal sheaths dark brown, bladeless. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, scabrous. Involucral bracts reduced to shortly bladed, long sheathing. Spikes 4, distant, cylindric, 3.5–4 × 0.3–0.4 cm; terminal spike male; lateral spikes female, slightly densely many flowered, with peduncles 15–21 cm, pendent. Female glumes brown, oblong, 3.2–3.5 mm, green 3-veined costa excurrent into a muro. Utricles longer than glume, obovate-oblong, 4.2–4.5 mm, hirsute, nerveless except for 2 costas on edges, base gradually attenuate into a short stipe, apex abruptly contracted into a brown long beak, orifice white hyaline, 2-toothed. Nutlets obovate-oblong, ca. 2 mm; style base slightly thickened; stigmas 3. Fl. and fr. Sep.

- Alpine meadows in thickets; 3000–4000 m. Xizang.


刺毛薹草 侧毛苔草

Rhizome elongate or rarely short, oblique. Culms 15–45 cm tall, slender, obtusely trichonous, smooth, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades greenish, linear, 2–4 mm wide, slightly stiff, margins scabrous. Involucral bracts setaceous, sheathing for 1–2 cm, or spathaceous. Spikes 3–7; terminal spike male, cylindric, 3–4 × ca. 0.4 cm, slightly laxly flowered; peduncles slender, 2.5–5.5(–13) cm, scabrous above. Female glumes ferruginous, oblong, 3–3.5 mm, scabrous adaxially, margins very narrowly white hyaline, green 1-veined costa excurrent into a short muro, apex subrounded or emarginate. Utricles stramineous-green or ferruginous above, equaling glume, narrowly elliptic, trigonous, ca. 4 mm, hirsute, ferrugineous punctate or not, base gradually attenuate into a short stipe, apex abruptly contracted into a beak, orifice obliquely truncate, 2-toothed. Nutlets stramineous, tightly enveloped, oblong or obovate, trigonous, 2.5–3 mm, base shortly stipitate; style erect, base slightly thickened or not; stigmas 3. Fl. and fr. Jun–Jul.

Subalpine meadows in thickets, grassy areas on mountaintops, sandy areas at stream-sides of hills; 1400–3700 m. Gansu, Guangxi, Guizhou, Hunan, Qinghai, Shaanxi, Sichuan, Yizang, Yunnan [Kashmir, India (Sikkim), Kashmir, Nepal].

1a. Utricles ferruginous punctate ............... 211b. var. punctata
1b. Utricles not ferruginous punctate.

2a. Involucral bracts setaceous .............. 211a. var. setosa
2b. Involucral bracts spathaceous

.......................... 211c. var. mianxianica

211a. Carex setosa var. setosa

刺毛薹草(原变种) 侧毛苔草(原变种)

Carex pachyrrhiza Franchet.

Involucral bracts setaceous. Utricles not ferruginous punctate.

Subalpine meadows in thickets; 1400–3700 m. Gansu, Guizhou, Hunan, Qinghai, Sichuan, Yizang, Yunnan [Kashmir, Nepal].


锈点刺毛薹草 xiu di an ci mao tai cao

Utricles ferrugineous punctate.

- Grass areas on mountaintops. Guangxi, Sichuan.


沔县刺毛薹草 mian xian ci mao tai cao


- Sandy areas at stream-sides of hills. SW Shaanxi (Mianxian).


流石薹草 liu shi tai cao


Rhizome short, woody. Culms 10–25 cm tall, slender, smooth, often pendent, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades finely linear, ca. 1 mm wide, slightly weakly curved. Involucral bracts leaflike, shorter than inflorescence, sheathing. Spikes 3–6; terminal spike male, 8–12 × 0.2–0.3 cm, oblong, upper spikes with short peduncles, lowest spike with a long peduncle, remote. Female glumes dark purple-red, 1/2–2/3 length of utricle, ovate, 2.6–3 mm, margins very narrowly white hyaline, green 3-veined costa forming a muro, apex acute. Utricles gray-green, longer than glume, narrowly oblong-lanceolate, compressed trigonous, 4.2–4.5 mm, membranous, hirsute, faintly veined, base shortly stipitate, apex gradually attenuate into a beak, orifice 2-toothed. Nutlets brown, oblong, ca. 2.2 mm, base with short stipe ca. 0.5 mm; style slightly scabrous, base hirsute; stigmas 3. Fl. and fr. Jul–Sep.

- Slopes; 3000–4900 m. W Sichuan, NW Yunnan.

红嘴薹 hong zuì tai cao

Rhizome woody. Culms tufted, 25–70 cm tall, smooth, clothed at base with pale brown sheaths disintegrating into fibers. Leaves shorter than culm, blades gray-green, linear, 1.5–3 mm wide, flattish, slightly revolute, margins scabrous, apex acuminate. Involucral bracts leaflike, shorter than inflorescence, shortly sheathing. Spikes 4–8; upper 2–4 male, approximate, subclavate-cylindric, 1.4–1.8 cm; remaining spikes female, cylindric, 1–3 cm, lower 1 or 2 distant, sometimes lowest one branched, densely many flowered; peduncles 2–8 cm, scabrous. Female glumes dark brown or dark purple-red, oblong, 2.5–3.5 mm, margins very narrowly white hyaline, green 1-veined costa gradually narrowed to a long curved beak, orifice deeply 2-toothed. Nutlets pale brown, loosely scabrous and excurrent into a mucro. Utricles dark brown with a stipe ca. 0.7 mm; style erect, scabrous; stigmas 3. Fl. and enveopment, oblong-trigonous, subcompressed, ca. 1.8 mm, base 0.4–0.6 cm, subloosely many flowered, erect, with rather dense flowers, mainly many flowered. Female glumes dark brown or golden brown, lanceolate-ovate, 2–5 mm, membranous, upper margins ciliate, apex acute. Utricles longer than glume, erect, linear-oblong or lanceolate, compressed trigonous, 4–8 mm, membranous, sparsely pubescent, ciliate on margins, finely many veined, base gradually attenuate into a short stipe, apex gradually narrowed to a long curved beak, orifice deeply 2-toothed. Nutlets ovate-oblong, ca. 1.5 mm, base with a long, filiform stipe 2–3 mm; style slender, base not markedly thickened; stigmas 3.

- Sandy or rocky slopes in montane regions. Taiwan.

1a. Leaves rather narrow, 1.5–3 mm wide; male spike 2–4 cm, female spikes 1–3 cm; female glumes dark brown ...................... 214a. subsp. fulvorubescens

214a. Carex fulvorubescens subsp. fulvorubescens

茗色薹 (原亚种) cha se tai cao (yuan ya zhong)

Leaves rather narrow, 1.5–3 mm wide. Male spike 2–4 cm; female spikes 1–3 cm. Female glumes dark brown.

- Sandy or rocky slopes in montane regions. Taiwan.

No specimens have been seen by the present authors.

214b. Carex fulvorubescens subsp. longistipes (Hayata) T. Koyama.

长梗扁果薹 chang geng bian guo tai cao


Leaves rather broad, 3–5 mm wide. Male spike up to 12 cm; female spikes up to 10 cm. Female glumes golden brown.

- Poorly vegetated rocky or sandy slopes in montane regions. Taiwan.


牧野薹 mu ye tai cao

Carex shimadai Hayata; C. shimadai var. longibracteata Hayata; C. warburgiana Kükenthal.

Rhizome short. Culms densely tufted, 20–80 cm tall, slender, trigonous, rigid, subsessile but scabrous below inflorescence, clothed at base with brown or purple-brown sheaths eventually disintegrating into parallel fibers. Leaves longer than culm, blades linear, 2–5 mm wide, stiff, plicate. Lowest involucral bract with a leaflike blade, remaining bracts nearly bladeless or with a short setaceous blade. Spikes 3–7, upper spikes approximate, lower 2 or 3 distant; terminal spike male, purple-brown, linear-cylindric, 4–10 × ca. 0.25 cm; lateral spikes female or androgynous, cylindric or linear-cylindric, 3–7 × 0.4–0.6 cm, subloosely many flowered, erect, with rather short mostly enclosed peduncle. Female glumes dark brown to chestnut-brown, sometimes light brown, ovate or ovate-oblong, membranous, upper margins ciliate, pale 3-veined costa forming a mucro at apex, apex acute. Utricles longer than glume, lanceolate, compressed trigonous, suberect, 4–6 mm, membranous, sparsely hirsute on upper half, finely many veined, apical beak short, orifice sharply 2-lobe. Nutlets tightly enveloped, elliptic or oblong, trigonous, 2.5–3 mm, contracted at both ends, base stipitate; style base not thickened; stigmas 3.

Grasslands on low mountains or near the seacoast. Taiwan [Japan].


细果薹 xi guo tai cao

Rhizome short. Culms tufted, 20–55 cm tall, smooth, clothed at base with light brown sheaths. Leaves 1/3–1/2 length of culm, blades light green, linear, 2–5 mm wide, flat, margins scabrous, apex acuminate. Involucral bracts leaflike, shorter
than subtending spike, sheathing. Spikes 3–5; upper 1 or 2 male, approximate, oblong, 1–1.2 × 0.3–0.5 cm; remaining spikes female, ovate to oblong-ovate, 1.2–1.4 × 0.5–0.7 cm, slightly remote, lowest one remote, with slender, scabrous peduncles 3–4 cm. Female glumes castaneous to ferruginous-brown, broadly ovate or oblong, 3.5–4.5 mm, 1-veined, margins rather broadly white hyaline, apex obtuse. Utricles greenish yellow below, brown above, longer than glume, oblong-ovate, compressed trigonous, 3–6 mm, hirsute abaxially and on margins, nerveless, base contracted, apex gradually attenuate into a conic beak, beak scabrous margined, obliquely truncate, orifice hyaline, 2-toothed. Nutlets brown, tightly enveloped, oblong-trigonous, 2.5–3 mm, base contracted into a short stipe; style erect; stigmas 3. Fl. and fr. Jul–Aug.

Alpine meadows; 900–4200 m. Gansu, Xinjiang [Russia].


昆仑薹 cao hui tai cao

Rhizome elongate. Culms 25–70 cm tall, slender, obtusely trigonous, smooth, clothed at base with dark brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 1–3 mm wide, flat, margins slightly scabrous. Involucral bracts leaflike, shorter than inflorescence, long sheathing 1–3 mm. Spikes 3–5; upper 1 or 2 (or 3) male, slightly distant, cylindric, 1–2 × 0.4–0.6 cm; lateral spikes 2 or 3, female, oblong-ovate, ca. 1 cm, loosely flowered. Female glumes dark brown, ovate or ovate-lanceolate, 3.5–4 mm, margins white hyaline, 1-veined costa forming a mucro, apex acuminate. Utricles stramineous below, dark above, 2 × as long as glume, suberect, lanceolate, subcompressed trigonous, 6–7 mm, membranous, finely many veined, base contracted into a stipe, margins hirsutulous, apex abruptly contracted into a long beak, orifice obliquely truncate, white hyaline, 2-toothed. Nutlets light brown, obovate-oblong, compressed trigonous, 2–2.5 mm; style slender, long, sparsely pubescent; stigmas 3. Fl. and fr. Jul–Aug.

● Alpine meadows or moist places, Picea forests; 3000–4600 m. Gansu, Qinghai, Shaanxi, Sichuan, Xinjiang.


昆仑薹 kun lun tai cao

Rhizome horizontal. Culms (3–)7–16 cm tall, slender, erect, smooth, clothed at base with brown sheaths. Leaves equaling or slightly longer or shorter than culm, blades linear, plicate, filiform, ca. 1 mm wide, glabrous. Lower involucral bracts leaflike, shorter than inflorescence, sheathing, brown. Spikes (2 or)3(or 4), slightly distant; terminal spike male, 1–1.5 × ca. 0.3 cm; remaining spikes female, oblong, 0.8–1.5 × ca. 0.3 cm, sessile. Female glumes dark purple-brown, ovate, 4–5 mm, 1-veined, margins hyaline. Utricles purple above, green below, lanceolate, trigonous, 3.5–4 mm, nerveless, margins slightly scabrous, apex long beaked, orifice 2-toothed; stigmas 3. Fl. and fr. Jun–Aug.

● Alpine meadows; 4000–4300 m. SE Xinjiang (Ruoqiang).

This name was originally published by N. R. Cui (Fl. Xinjiang. 6: 435, 604. 1996, "kunlunsanensis"), where the type was indicated as having been collected in Ruoqiang Xian and deposited in three herbaria in Xinjiang (XJA, XJBI, XJNU). However, because no collector’s name, number, or date was cited, the requirements of Vienna Code Art. 37 were not satisfied and consequently the name was not validly published there. The name was validated by S. Y. Jin and Y. L. Chen by full and direct reference to N. R. Cui’s validating Latin description and indication of the holotype at XJNU.


和硕薹 shou guo tai cao

Rhizome stout, ascending. Culms densely tufted, 40–70 cm tall, obtusely trigonous, slender, smooth, glabrous, clothed at base with pale brown sheaths disintegrating into parallel fibers. Leaves crowded in basal rosettes, 1/4–1/3 length of culm, blades linear, 3–5 mm wide, rigid, flat to subcanaliculate. Lower involucral bracts leaflike, longer than spike but shorter than inflorescence. Spikes 5–8, slightly distant; terminal 1 or 2 male, erect, narrowly lanceolate to lanceolate-ellavate, 1.5–2.5 cm; remaining spikes female, linear, 1–2 cm, rather sparsely flowered, especially below, solitary, pendent, with slender, scabrous peduncles 3–4 cm. Female glumes slightly ferruginous, ovate, finely 1-veined, margins broadly white hyaline, apex subobtuse. Utricles purplish brown to blackish brown, oblong-ovate, faintly trigonous, subplano-convex, ca. 4 mm, hirsute, nerveless, base shortly stipitate, apex gradually tapering into an elongate beak, beak obliquely truncate, white hyaline margined. Fl. and fr. May–Sep.

● Alpine meadows and marshes; 1400–4300 m. Xinjiang.


和硕薹 cao hui tai cao

Rhizome woody. Culms 30–60 cm tall, obtusely trigonous, smooth, clothed at base with brown sheaths disintegrating into parallel fibers. Leaves shorter than culm, blades light green, linear, 1–2 mm wide, flatish, margins scabrous, apex acuminata. Involucral bracts reduced to shortly bladed, sheathing. Spikes 3–7; upper 2–4 male, approximate, clavate, 0.7–1.5 cm; remaining spikes female, rarely with male flowers at apex, 1–1.5 cm, slightly remote, with short peduncles. Female glumes ferruginous, broadly ovate or ovate-oblong, 4–4.5 mm, margins white hyaline, green 3-veined costa forming a mucro, apex acute. Utricles stramineous, longer than glume, elliptic-oblong or obovate-oblong, compressed trigonous, 5.5–7 mm, membranous, hirsute, ferruginous punctate and scabrous margined above, 6-or 7-veined abaxially, nerveless adaxially, base contracted, apex abruptly contracted into a very short beak, orifice obliquely truncate, 2-toothed. Nutlets yellow-brown, elliptic-trigonous, ca. 2.5 mm, base with a stipe ca. 0.7 mm; style scabrous; stigmas 3. Fl. and fr. Aug.

● Forested slopes; 2000–2800 m. Xinjiang (Hoshud).

禾秆薹草 he gan tai cao

Rhizome short, woody, with 1 or 2 rather long stolons, brown. Culms 60–70 cm tall, erect, rigid, slender, obtusely trigonous, smooth, clothed at base with brown-yellow sheaths disintegrating into parallel fibers. Leaves ca. 1/2 length of culm, blades linear, 1.5–5 mm wide, flatish, revolute, margins scabrous, apex long acuminate. Basal involucral bracts leaflike, slightly shorter than or equaling inflorescence, shortly sheathing, 1.5–2.5 cm, remaining bracts setaceous, very shortly sheathing. Spikes 9–21, approximate, subfastigate, disposed in a panicle, rarely spicate; upper 7–11 spikes male, castaneous-red, sessile or sometimes lower 1 or 2 slightly shortly pedunculate; terminal spike oblong-elliptic, 15–20 × 3–9 mm, densely many flowered; remaining spikes female, oblong, obovate, or obovate-oblong. 8–25 × 3–8 mm, declined, densely many flowered, sometimes loosely flowered at base. Female glumes red-brown or castaneous, ovate or broadly rhomboid-elliptic, 4–4.5 × 2–2.3 mm, lustrous, densely hirsute, 5–7-veined, veins scabrous, apex acute. Utricles brown-purple, elliptic-ovate, 2.5–3.5 mm, margins white hyaline, yellow-green 1-veined costa excurrent into a mucro, apex acute. Utricles yellow-green or purple-brown at apex, longer than glume, oblong-lanceolate, compressed trigonous, 4–5.5 mm, membranous, hisrurate, finely veined, base cutaneate, margins scabrous, apex gradually attenuate into a beak, orifice 2-toothed. Nutlets light brown, loosely enveloped, oblong, compressed trigonous, 2.5–2.5 mm, base with stipe ca. 1 mm; style erect, base not thickened; stigmas 3. Fl. and fr. Jul–Aug.

- Alpine grasslands, rock crevices, cliffs; 2000–2400 m. Jilin [Japan, Korea].


硬毛薹草 ying mao tai cao


Rhizome short, oblique. Culms tufted, 20–65 cm tall, slender, obtusely trigonous, clothed at base with red-brown to dark brown sheaths eventually disintegrating into parallel fibers. Leaves shorter than culm, involute, slightly rigid, gray-green, margins scabrous, apex acuminate. Invovlucral bracts setaceous, shorter than inflorescence, shortly sheathing. Spikes 4–6; upper 3 or 4 male, approximate, linear-cylindric, 0.8–2 cm, sessile; remaining spikes female, remote, oblong-cylindric, 1–3 cm, with slender, slightly scabrous peduncles. Female glumes castaneous, pale at middle, broadly ovate or ovate-oblong, 4–4.5 mm, margins broadly white hyaline. Utricles yellow-green, brown above, longer than glume, suberect, oblong-elliptic, compressed trigonous, 5–7 mm, membranous, many veined, base gradually narrowed to a stipe, margins hispidulous, apex abruptly contracted into a conic long beak, orifice white hyaline. Nutlets stramineous, oboong-ovobate, trigonous, ca. 2.5 mm, base with stipe ca. 0.7 mm; style erect, scabrous; stigmas 3. Fl. and fr. Jul.


冻原薹草 dong yuan tai cao

Rhizome short, woody, oblique. Culms densely tufted, 10–22 cm tall, slender, compressed trigonous, slightly scabrous, clothed at base with light brown sheaths eventually disintegrating into parallel fibers. Leaves equaling or shorter than culm, blades linear, 1–2 mm wide, flatish, sometimes involute, margins scabrous, apex acuminate. Lower involucral bracts leaflike, shorter than inflorescence, sheathing 1–2 mm, upper involucral bracts glumelike. Spikes 3–7; terminal spike gynaeccorous, rarely male, clavate, 1.4–1.8 cm; remaining spikes female, cylindric, 1–2 cm, upper 1 or 2 approximate, sessile or subsessile, lowest spike slightly distant, with long peduncle. Female glumes purple-brown, elliptic-ovate, 2.5–3.5 mm, margins white hyaline, yellow-green 1-veined costa excurrent into a mucro, apex acute. Utricles yellow-green or purple-brown at apex, longer than glume, oblong-lanceolate, compressed trigonous, 4–5.5 mm, membranous, hirsute, finely veined, base cutaneate, margins scabrous, apex gradually attenuate into a beak, orifice 2-toothed. Nutlets light brown, loosely enveloped, oblong, compressed trigonous, 2.5–2.5 mm, base with stipe ca. 1 mm; style erect, base not thickened; stigmas 3. Fl. and fr. Jul–Aug.

- Rock crevices, sunny slopes, roadsides; 1500–3000 m. Hebei, Nei Mongol, Shaanxi.


鹤果薹草 he guo tai cao

Rhizome oblique, woody. Culms tufted, 50–80 cm tall, obtusely trigonous, smooth, scabrous above, clothed at base with brown sheaths eventually disintegrating into parallel fibers. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, margins scabrous, apex long acuminate. Invovlucral bracts reduced to shortly bladed, shorter than inflorescence, sheathing 1–2 cm. Spikes 4–9; upper 3–5(–7) male, approximate, cylindric, 1–2 cm, sessile; remaining spikes female, rarely with male flowers at apex, cylindric or oblong, 2–3.2 × ca. 0.4 cm, densely many flowered, with slender, scabrous peduncles 1.5–5 cm. Female glumes castaneous, elliptic-lanceolate or broadly ovate, 5–5.5 mm, scabrous on 2 lateral veins of costa, margins broadly white hyaline. Utricles stramineous below, purple-brown above, longer and broader than glume, elliptic-lanceolate, compressed trigonous, 7–8 mm, papery, densely papillose, conspicuously veined abaxially, finely veined adaxially, base contracted, apex gradually narrowed into a beak, orifice obliquely truncate, white hyaline. Nutlets brown, loosely enveloped, oblong, trigonous, ca. 2.5 mm, base with short stipe 0.5–0.8 mm; style long and erect, hispidulous, base not thickened; stigmas 3. Fl. and fr. Jul–Sep.

- Rock crevices, sunny slopes, roadsides; 1500–3000 m. W Sichuan, Xizang, Yunnan [Afghanistan, Kashmir, Nepal].


green strobus Carex lü sui tai cao zu

Dai Lunkai (戴珑凯), Tetsuo Koyama

Rhizomes short, rarely stoloniferous. Culms slender. Leaves narrow. Involucral bract leaf-shaped, sheathed. Spikes few, 1 per involucral bract sheath; terminal spike male or bisexual, sometimes with few female flowers at base or apex; lateral spikes female, rarely bisexual, usually pendulous, loosely or subdensely few to 10-flowered or over 10-flowered; peduncles slender (upper slightly short). Female glumes obtuse to rounded at apex, rarely aristate or mucronate, early deciduous. Utricles obtusely trigonous or swollen trigonous, membranous, obscurely veined, rarely 2-veined laterally, beak short, rarely slightly long, scabrous on both margins, truncate or emarginate at orifice. Stigmas 3.

About ten species: N Africa, Asia, Europe, North America; seven species (one endemic) in China.

1a. Rhizome stoloniferous; spikes androgynous, loosely few flowered, sometimes lateral spikes female; female glumes slightly longer or shorter than utricle, aristate at apex ................................................................. 225. C. handelii

1b. Rhizome without stolons; terminal spike male, sometimes with few female flowers at apex or base, lateral spikes female; female glumes shorter than utricle.

2a. Utricles greenish or yellowish green at maturity, not nitid; terminal spike male, sometimes with female flowers at apex or base.

3a. Leaves sulcate on upper face; terminal spike androgynous, lateral spike loosely 3–7-flowered .......... 226. C. sedakowii

3b. Leaves flat, not sulcate; terminal spike male or sometimes with few flowers at apex, lateral spike rather densely many flowered.

4a. Utricles obovate or suborbicular, 1.5–2 mm, with very short beak or nearly beakless; terminal spike gynaecandrous or male ................................................................. 227. C. karoi

4b. Utricles oblong-lanceolate, 3–4.5 mm, stipitate, with rather long beak; terminal spike male .......... 228. C. tenuiformis

2b. Utricles wholly or partly yellow-brown at maturity, nitid; terminal spike male (sometimes with few female flowers in C. capillaris).

5a. Utricles ovate or narrowly ovate, 3.5–4 mm, gradually attenuate to a slightly long beak at apex .......... 229. C. capillaris

5b. Utricles ovate or obovate-fusiform, ca. 3 mm, abruptly contracted to a rather short or very short beak at apex.

6a. Terminal male spike oblong-lanceolate, not surpassing uppermost female spike; utricles obtusely trigonous, rather swollen, at maturity, abruptly contracted to a very short beak at apex ................................................................. 230. C. chlorostachys

6b. Terminal male spike oblong-lanceolate or clavate, surpassing uppermost female spike; utricles obtusely trigonous, not swollen, yellowish brown, abruptly contracted to a short beak at apex ................................................................. 231. C. ledebouriana


双脉囊薹 shuang mai nang tai cao

Carex karlongensis Kükenthal subsp. handelii (Kükenthal) P. C. Li.

Rhizome slightly long, stoloniferous. Culms densely tufted, 15–25 cm tall, slender, trigonous, smooth, clothed with a few bladeless or shortly bladed sheaths at base. Leaves shorter than or nearly equaling culm, blades 1–2 mm wide, rather soft, flat, rather smooth proximally, scabrous distally and at margins, longest sheath ca. 3 cm. Involucral bracts shorter or longer than spike, lower blades leaflike, upper involucral bracts with setaceous blade, sheathed. Spikes 1–3, usually 2, single in an involucral bract sheath, distance between spikes 4–5 cm, androgynous, with male part longer than female part, many male flowers in upper part and loosely with few female flowers in lower part, cylindric, 1.5–3 cm; peduncles slender. Female glumes brownish yellow, narrowly oblong or oblong-lanceolate, ca. 5 mm, membranous, green 1-veined, apex acuminate, mucronate, sometimes aristate in basal glumes. Utricles greenish, suberect, shorter than glume, obovate, obtusely trigonous, ca. 3 mm, herbaceous, 2-veined laterally, whitish hispidulous on veins and margins, base broadly cuneate, apex abruptly contracted into a rather long beak, orifice 2-toothed. Nutlets dark brown, tightly enveloped, obovate, obtusely trigonous, ca. 2 mm, base broadly cuneate, apex mucronate; style persistent, base thickened; stigmas 3, rather short, ca. 1 mm.

- Mixed forests in ravines, forests and grassy areas on mountain slopes; 2500–3100 m. Sichuan, Yunnan.


沟叶薹草 gou ye tai cao

Rhizome short. Culms densely tufted, 8–40 cm tall, slender, obtusely triquetrous, smooth. Leaves basal, 1/3–1/2 height of culms, blades ca. 1 mm wide, involute and hair-shaped, sulcate on upper faces of blades, scabrous on margins, sheathed; sheaths ca. 1 cm, usually dehiscent at membranous part, proximally red-brown, distally stramineous. Lowest involucral bract leaflike, slender, surpassing spike, blades of upper involucral bracts setaceous or reduced to bladeless sheaths, shorter than spike, sheaths 0.8–2 cm. Spikes 2–4, remote, single in an involucral bract sheath; terminal spike androgynous, 0.7–1 cm,
with few male flowers at upper part, with 3 or 4 female flowers at lower part; lateral spikes female, narrowly oblong or ovate, 5–8 mm, loosely 3–5-flowered; peduncles slender. Female glumes brownish yellow to red-brown, ovate, ca. 2 mm, membranous, 1-veined, early deciduous, apex obtuse, muticous. Utricles ferrugineous-brown at maturity, suberect, slightly longer than glume, obovate, obtusely trigonous, ca. 2.5 mm, membranous, glabrous, ± nitid, obscurely veined, base attenuate into a short stipe, apex abruptly contracted into a rather long beak, orifice white hyaline, obliquely truncate. Nutlets brown, stramineous on angles, rather tightly enveloped, elliptic, trigonous, ca. 2 mm; style persistent, base thickened; stigmas 3. Fl. and fr. Jun–Aug.

Grassy mountain slopes, morass in forests, streamsides; 600–3200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia (Far East, Siberia)].


小粒薹草 xiao li tai cao

Carex capillaris Linnaeus var. parvirostris Kükenthal; C. karoi var. parvirostris (Kükenthal) Á. Löve et al.; C. licentii Nelmes; C. selengensis K. V. Ivanova; C. takenakae Nakai.

Rhizome short. Culms densely tufted, 10–40 cm tall, rather slender, lower part smooth, upper part scabrous, clothed at base with sheaths disintegrating into fibers. Leaves nearly basal, shorter than culm, blades 1–2 mm wide, slightly stiff, base plicate and gradually flattened distally, margins scabrous; sheaths 1–2 cm. Lowest involucr al bracts leaflike, surpassing subtending spike, upper involucral bracts with setaceous blade, uppermost usually leaflike. Spikes 3 or 4(–6), single in an involucral bract sheath, lower remote and upper contiguous; terminal spike gynaecandrous, female part shorter than male part, or sometimes male, surpassing uppermost female spike, oblong-ovoboar or clavate, 4–10 mm; lateral spikes female, oblong or shortly cylindric, 4–15 mm, densely many flowered; peduncles slender, lower ones rather long and upper short. Female glumes yellowish, broadly ovate or suborbicular, ca. 1.5 mm, membranous, 1-veined, apex obtuse, muticous. Utricles yellowish green, obliquely patent, slightly longer than glume, broadly ovate or suborbicular, inflated trigonous, 1.5–2 mm, membranous, inconspicuously veined, base broadly cuneate, apex abruptly contracted into a very short beak or nearly beakless, slightly scabrous on margins, orifice obliquely truncate. Nutlets loosely enveloped, broadly elliptic or obovate-elliptic, trigonous, ca. 1.2 mm, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

Wet places in thickets, riversides, swamps. Hebei, Liaoning, Nei Mongol, Shanxi [Mongolia, Russia].


細形薹草 x i xing tai cao

Carex koreana Komarov.

Rhizome short. Culms densely tufted, 20–40 cm tall, rather slender, obtusely trigonous, smooth, slightly scabrous at upper part, closed at base with brownish or red-brown sheaths, old sheaths usually disintegrated into fibers. Leaves slightly shorter than culm, blades 2–2.5 mm wide, flat, rather soft, scabrous on margins, rather long sheathed. Involucral bracts leaflike, usually shorter than subtending spike, sheathed, rather long. Spikes 3, rather remote; terminal spike male, lanceolate or broadly linear, 1.2–1.7 cm, conspicuously longer than adjacent female spike; lateral spikes female, broadly linear or oblong-linear, 1.5–2 cm, loosely 10- to more flowered; peduncle slender, up to 6 cm, slightly scabrous, slightly pendent or erect. Female glumes ferruginous, elliptic or obovate-oblong, 2.5–3 mm, membranous, green 1-veined, margins broadly hyaline at upper part, apex obtuse or acute. Utricles yellowish green, suberect, longer than glume, oblong-lanceolate, compressed trigonous, 3.5–4.5 mm, membranous, nerveless or 2-veined laterally, gradually tapering to a short stipe at base and a long beak at apex, beak scabrous on margins, obliquely truncate at orifice, slightly ferruginous. Nutlets rather loosely enveloped, obovate, trigonous, ca. 2 mm, apex mucronate; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Jul.

Forests, grasslands on forest margins or in thickets, sometimes on mountain slopes. Heilongjiang, Nei Mongol [Japan, Korea, Russia (Far East, E Siberia)].


细秆薹草 xi gan tai cao

Rhizome short, without stolons. Culms densely tufted, 15–40 cm tall, rather slender, obtusely trigonous, smooth, with brown sheaths at base, old sheaths usually disintegrated into fibers. Leaves much shorter than culm, 1/3–1/2 height of culm, blades 1.5–2 mm wide, flat, rather soft, scabrous on margins, shortly sheathed. Involucral bracts leaflike, linear, shorter than subtending spike, with rather long sheath. Spikes 3 or 4, rather remote, slightly pendulous; terminal spike male, sometimes with 2 or 3 female flowers at base or apex, narrowly lanceolate, 0.5–1 cm, not surpassing uppermost female spike; lateral spikes female, narrowly oblong, 0.8–1.5 cm, loosely 6–10-flowered; peduncles slender, longest up to 5 cm, smooth or slightly scabrous. Female glumes early deciduous, yellow-brown or brown, obovate, ca. 2.5 mm, membranous, green 3-veined, with veins and midrib convex, margins broadly white hyaline, apex obtuse or acute and mucronate. Utricles dark yellow-green or brown-green, suberect, longer than glume, otake-oblong or narrowly ovate, obtusely trigonous, 3.5–4 mm, membranous, nerveless, base gradually attenuate into a short stipe, apex gradually narrowed into a ± long beak, beak slightly scabrous on margins, white hyaline and obliquely truncate or emarginate at orifice. Nutlets yellowish, tightly enveloped, obovate, trigonous, ca. 1.5 mm; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Jul.

Alpine grasslands and meadows, mountain slopes, streamsides, watersides. Gansu, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi [Japan, Korea, Russia; Europe, North America].


绿穗薹草 li sui tai cao

Rhizome short. Culms densely tufted, 10–30(–50) cm tall,
slender, subrigid, obtusely trigonous, smooth, bearing many leaves at lower part. Leaves shorter than culm, blades 2–2.5 mm wide, flat, rather soft, smooth, slightly scabrous distally, sheaths short. Lower involucral bracts leaflike, upper involucral bracts setaceous, 5–15 mm, sheathed. Spikes 3–6, single in an involucral bract sheath, lower remote, longest space up to 6 cm, upper approximate; terminal spike male, oblong-lanceolate, 6–10 mm; lateral spikes female, cylindric or oblong, 8–18 mm, loosely (6–)8–10(–12)-flowered; peduncles slender, usually pendulous. Female glumes brownish yellow or stramineous, obovate or subelliptic, ca. 2 mm, membranous, 1-veined, early deciduous, apex rounded, muticous. Urticles yellow-green or brown at maturity, obliquely patent, longer than glume, ovate-fusiform, obovate-fusiform, or subelliptic, obtusely trigonous, 2–3 mm, membranous, shiny, nerveless, base abruptly constricted into a short stipe, apex abruptly narrowed to a very short beak not up to 0.5 mm, orifice obliquely truncate, white hyaline on margins. Nutlets brown, subloosely enveloped, broadly obovate, trigonous, ca. 1.5 mm, base estipitate; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Aug.

Thickets on mountain slopes, grasslands, riversides, lakeshores, wet places in ravines; 1100–3200 m. Gansu, Hebei, Nei Mongol, Qinghai, Shanxi, Sichuan, Xinjiang, Xizang [Japan, Korea, Russia (European part, Siberia)].

1a. Spikes remote, longest space up to 6 cm, upper spikes approximate; urticles ovate-fusiform or obovate-fusiform, ca. 3 mm, beak short. 230a. var. chlorostachys

1b. Spikes approximate; urticles subelliptic, 2–2.5 mm, nearly beakless. 230b. var. conferta

230a. Carex chlorostachys var. chlorostachys


Dai Lunkai (戴伦凯); Tetsuo Koyama, Gordon C. Tucker


Involucral bracts leaflike, with long sheaths. Spikes usually bisexual, rarely unisexual, cylindric or oblong, densely or subdensely many flowered, rarely loosely flowered, single in an involucral bract sheath, rarely ramose and arranged in a panicle. Female glume lanceolate-ovate or ovate, rarely oblong. Urticles elliptic or obovate-elliptic, rarely narrowly ovate, obtusely trigonous or slightly inflated trigonous, inconspicuously veined, rarely distinct, with rather long or slightly long beak, orifice 2-toothed or emarginate. Nutlets subloosely enveloped; style base not thickened; stigmas 3.

Between 50 and 60 species: Africa, Asia, Central and North America, Europe; 15 species (13 endemic) in China.
1a. Spikes bisexual, androgynous, or terminal spike male, lateral spikes bisexual.
  2a. Terminal spike male, lateral spikes bisexual; utricles 5–7 mm, distinctly veined.
    3a. Leaf blades 2–3 mm wide; terminal spike male or sometimes with few female flowers; female
        glumes ovate-oblong, 3.5–4 mm, apex mucronate; utricles 5–6 mm, stramineous, red-fuscous
        punctate; nutlets broadly elliptic, fuscous ................................................................. 236. C. spachiana
    3b. Leaf blades 3–5 mm wide; terminal 1 or 2 spikes male; female glumes ovate, ca. 2.5 mm (except
        length of aristae), apex long aristate; utricles 6–7 mm, stramineous, shiny; nutlets oblong,
        pale yellow ..................................................................................................................... 237. C. nitidiutriculata

2b. Spikes bisexual, androgynous; utricles 3–4 mm, inconspicuously veined.
  4a. Spikes arranged in loose or dense panicles.
    5a. Spikes numerous, female part subequal to or longer than male part, male parts oblong or
        ovoid; glumes patent; utricles estipitate; nutlets dark brown ......................................... 232. C. neopolycephala
    5b. Spikes 10 or more, female part much longer than male part, male parts linear; glumes
        not patent; utricles shortly stipitate; nutlets brownish yellow ....................................... 233. C. shuangbaiensis

4b. Spike single in an involucral bract sheath, not arranged in a panicle.
  6a. Culms slender, 25–45 cm tall; leaves shortly sheathed, blades 1.5–2 mm wide; spikes
      2 or 3, 1–3 cm; utricles ca. 3 mm .................................................................................. 234. C. aristatisquamata
  6b. Culms robust, 50–60 cm; leaves long sheathed, clothing lower part of culm up to 15 cm
      tall, blades 4–5 mm wide; spikes 7–10, 2–5 cm, sometimes ramose at base, female spikes
      sometimes with several male flowers; utricles ca. 4 mm .................................................. 235. C. wenshanensis

1b. Spikes unisexual, terminal spike male, with few female flowers at base or apex in rare species, lateral
  spikes female.
  7a. Male spike sometimes with few female flowers at base or apex; utricles emarginate at orifice.
    8a. Female spikes oblong-cylindric, 3–4 mm wide; utricles ca. 3.5 mm .................................. 238. C. yunnanensis
    8b. Female spikes oblong, 7–8 mm wide; utricles 4.5–5 mm .................................................. 239. C. magnoutriculata
  7b. Male spike without female flowers; utricles rather long 2-toothed at orifice.
    9a. Utricles obtusely trigonous, not inflated, 4–6 mm.
      10a. Utricles obovate or broadly elliptic, thinly leathery, 5–6 mm ........................................... 246. C. zekogensis
      10b. Utricles narrowly ovate or narrowly oblong, papery or membranous, 4–4.5 mm.
        11a. Male spikes 3–6, borne at apex of culm; female spike with several to 10 or more
            utricles; utricles glabrous ............................................................................................ 244. C. tangii
        11b. Male spike 1, terminal; female spikes with many utricles; utricles hispid ..................... 245. C. sutchuensis
    9b. Utricles inflated trigonous, 5–7 mm.
      12a. Female spikes usually 2 or 3 in an involucral bract sheath; female glumes pale,
          ca. 3 mm, earlier deciduous than utricles; utricles horizontally patent at maturity ........ 240. C. jiuxianshanensis
      12b. Female spikes usually single in an involucral bract sheath; female glumes yellowish
          brown, 3.5–4 mm, not early deciduous; utricles obliquely patent at maturity.
          13a. Terminal spike gynaecandrous, rarely male; utricles red-brown punctate; nutlets elliptic ..... 243. C. metallica
          13b. Uppermost 1–3 spikes male; utricles not red-brown punctate; nutlets obovate.
            14a. Male spike 1; lower involucral bracts with short sheath ........................................... 242. C. minquinensis
            14b. Male spikes 2 or 3; lower involucral bracts sheathless ............................................. 241. C. arnelli


新多穗薹草  xin duo sui tai cao

Rhizome very short, lageniform. Culms densely tufted, 25–50 cm tall, obtusely trigonous, smooth, clothed with bladeless
sheaths at base. Leaves many, nearly basal, shorter or slightly longer than culm, blades 3–8 mm wide, stiff, smooth on both
surfaces, scabrous on upper margins, margins revolute; sheaths 3.5–8 cm, eventually splitting. Involucral bracts leaflike,
surpassing subtending spikes, sheathed. Spikes numerous, usually 5–9 borne in an involucral bract sheath, sometimes ramose and
dispersed in a panicle, androgynous, female part and male part
subequal or female part slightly longer, oblong or oblong-cylindric,
sometimes narrowly ovate, 10–25 × ca. 5 mm, densely
many flowered; lower peduncles slender, upper rather short. Female
glumes pale yellow, ovate-lanceolate, ca. 4 mm, mem-
branous, 1–3-veined, margins white hyaline, apex attenuate,
mucronate or muticous. Utricles yellowish green, nearly hori-
zontally patent or obliquely patent at maturity, shorter than or
equaling glume, elliptic or ovate-elliptic, trigonous, ca. 3.5 mm,
membraneous, glabrous, 5-veined, 2 lateral veins distinct and
others inconspicuous, base subrounded, estipitate, apex attenuate
into a ± long beak, orifice shortly 2-toothed. Nutlets dark
brown, tightly enveloped, broadly ovate, trigonous, ca. 1.2 mm,
base estipitate; stigmas 3. Fl. and fr. Apr–May.

● Among rocks, ravines; 1300–2700 m. C Yunnan (Kunming).

1a. Spikes numerous, 5–9 borne in an
involucral bract sheath, sometimes
ramose and dispersed in a panicle;
utricles with ± long beak, nearly
horizontally patent at
maturity ............................................. 232a. var. neopolycephala
1b. Spikes 10 or more, 1 to few borne in an involucral bract sheath, racemously disposed; utricles with rather long beak, obliquely patent at maturity ............................................. 232b. var. simplex

232a. Carex neopolycephala var. neopolycephala

新多穗薹(原变种) xin duo sui tai cao (yuany bian zhong)


● Among rocks; ca. 2700 m. C Yunnan (Kunming).


简序薹 茅 jian xu tai cao

Spikes 10 or more, 1 to few borne in an involucral bract sheath, racemously disposed. Utricles with rather long beak, obliquely patent at maturity. Fl. and fr. May.

● Ravines; 1300–2700 m. C Yunnan (Kunming).


双柏薹 shuang bai tai cao

Rhizome short. Culms ca. 75 cm tall, obtusely trigonous, smooth. Leaves caulline and basal, shorter than or subequaling culm, blades 3–6 mm wide, smooth on both surfaces, base plicate and flattened distally, upper margins scabrous; sheaths long, brownish, adaxially membranous, usually split. Involucral bracts leaflike, upper blade linear; lowest sheath ca. 3 cm, upper rather short. Spikes 10 or more, 3 or 4 spikes racemously disposed and 3–5 racemes composed in a narrowly conic panicle, androgynous, female part longer than male part, cylindric, male part linear, (1–)2.5–4 cm; peduncles very short or nearly absent. Female glumes brownish yellow, ovate, 2–2.5 mm, membranous, green 1-veined, apex acute, mucronate. Utricles stramineous, longer than glume, obliquely patent, obovate-elliptic or obovate-oblong, trigonous, ca. 3.5 mm, membranous, 3-veined abaxially, base stiitpate, apex abruptly attenuate into a short beak, beak slightly recurved, shortly 2-toothed at orifice. Nutlets brownish yellow, tightly enveloped, elliptic, trigonous, ca. 2 mm, base stiitpate, apex mucronate; stigmas 3. Fl. and fr. Apr–Oct.

● Forests; ca. 2000 m. C Yunnan (Wenshan).


芒鳞薹 茅 mang lin tai cao

Rhizome short, liguineous. Culms tufted, 25–45 cm tall, rather slender, compressed triquetrous, smooth, with few bladeless sheaths. Leaves shorter than culm, blades ca. 1.5 mm wide, flat, margins scabrous. Lower involucral bracts leaflike, shorter than inflorescence, sheaths 7–9 mm, upper blades setaceous. Spikes 2 or 3, androgynous, male part shorter than female part, ovate-lanceolate or narrowly cylindric, 1–3 cm × 4–5 mm, with slender peduncle. Female glumes brownish yellow or straminous, ovate or oblong-ovate, 3–4.5 mm, membranous, 1-veined, upper margins white hyaline, apex mucronate or shortly aristate. Utricles yellow-green, longer than glume or slightly shorter than glume at lower part of spike, elliptic or elliptic-ovate, trigonous, 3–3.5 mm, inconspicuously veined, base cuneate, apex attenuate into a medium-sized to long beak, orifice shallowly 2-toothed. Nutlets yellow-brown, rather loosely enveloped, elliptic-ovate, trigonous, ca. 1.5 mm; stigmas 3.

● Forests, ca. 2000 m. C Yunnan (Shuangbai).


澳蒴薹 ao men tai cao

Rhizome liguineous. Culms tufted, 30–60 cm tall, slightly slender, smooth. Leaves longer than culm, blade 2–3 mm wide, flat, ± stiff, with brown sheath. Lower involucral bracts leaflike, longer than inflorescence, sheathed, upper blades of involucral bracts setaceous, very shortly sheathed. Spikes 4–9; terminal spike male or sometimes only with male flowers at base or apex, with remaining flowers female; lateral spikes usually androgynous, rarely with few male flowers at base, oblong or oblong-cylindric, 1.5–2.5 cm, densely many flowered; peduncles slender. Female glumes pale yellowish, ovate-oblong, 3.5–4 mm, membranous, 1-veined, apex acute or obtuse. Utricles stramineous, longer than glume, suberect, narrowly elliptic, plano-convex, 5–6 mm, red-fuscous punctate, inconspicuously 5-veined, base cuneate, apex abruptly attenuate into a long beak, scabrous on upper and beak margins, orifice shortly 2-toothed. Nutlets fuscous, loosely enveloped, broadly elliptic, trigonous, ca. 2 mm, base shortly stipitate; style long; stigmas 3.

亮果薹草 liang guo tai cao

Rhizome rather slender, ligneous. Culms tufted, 25–70 cm tall, triquetrous, smooth, clothed with red-brown bladeless or shortly bladed sheaths at base. Leaves basal, shorter or longer than culm, blades 3–5 mm wide, with 2 distinct lateral veins, smooth, scabrous on upper margins; sheaths red-brown, splitting at membranous part. Involutral bracts leaflike, usually longer than subtending spike, sheathed, with liguliform or semi-orbicular ligule at mouth of sheath. Spikes 5–8; terminal 1 or 2 spikes male, oblong or narrowly cylindric, 1–3 cm; remaining spikes androgynous, female part longer than male part, cylindrical or lanceolate, (1.5–)3–6 cm, densely many flowered; peduncles slender, lowest peduncle 5–11 cm, upper ones rather short. Female glumes cinereous-green at middle, brownish on margins. Nutlets yellow-green, longer than glume, obovate-elliptic, trigonous 4.5–5 mm, inconspicuously veined, base cuneate, apex gradually narrowed to a long beak, orifice shortly 2-toothed. Nutlets brown, elliptic, trigonous, ca. 1.5 mm, base shortly stipitate; stigmas 3, slender. Fl. and fr. May–Jun.

- Open places on mountain slopes, roadsides, stream sides; 1500–2600 m. Sichuan, Yunnan.


云南薹草 yun nan tai cao

Rhizome short, without stolons. Culms densely tufted, 20–50(–85) cm tall, slender, compressed triquetrous, smooth, with few bladeless sheaths at base. Leaves basal, shorter than culm, blades 2–3 mm wide, plicate near base and gradually flattened distally. Lower involucral bracts leaflike, upper blades of involucral bracts setaceous, sheaths up to 2 cm. Spikes 3 or 4; terminal spike male or sometimes with female flowers at apex or base; lateral spikes female, single in an involucral bract sheath, oblong-cylindric or oblong, (8–)15–20(–30) mm, densely many flowered; peduncles slender. Female glumes brown-yellow, ovate-lanceolate, 2.8–3 mm, green 3-veined, apex acute, muticous. Utricles pale green, longer than glume, horizontally patent at maturity, elliptic-ovate, plano-convex, ca. 6 mm, papery, shiny, 3-veined abaxially, base broadly cuneate, apex gradually narrowed to a long beak, orifice thinly membranous, shortly 2-toothed. Nutlets loosely enveloped, elliptic, trigonous, ca. 2 mm, base stipitate; stigmas 3. Fl. and fr. May–Jun.

- Open places on mountain slopes, roadsides, stream sides; 1400–2600 m. Sichuan, Yunnan.


九仙薹草 jiu xian shan tai cao

Rhizome rather thick, ligneous, clothed with sheaths, sheaths usually disintegrating into fibers. Culms tufted, 30–70 cm tall, obliquely trimerous, smooth. Leaves basal, equaling or shorter than culm, blades (3–)5–7 mm wide, flat, scabrous on both surfaces and margins, sheathed. Lower involucral bracts leaflike, sheaths up to 3 cm, upper blades of involucral bracts setaceous, shortly sheathed, sheaths only 2–3 mm. Spikes 8–10 or more, usually 1–3 in an involucral bract sheath, lower spikes remote, upper spikes ± contiguous; terminal spike male, linear; lateral spikes female, cylindric, 3–6 cm, loosely many flowered. Female glumes deciduous earlier than utricles, pale, lanceolate-ovate, ca. 3 mm, membranous, 1-veined, hispid on vein, apex mucronate or aristate. Utricles yellowish green, longer than glume, horizontally patent at maturity, elliptic-ovate, plano-convex, ca. 6 mm, papery, shiny, 5-veined abaxially, base broadly cuneate, apex gradually narrowed to a long beak, orifice thinly membranous, shortly 2-toothed. Nutlets loosely enveloped, elliptic, trigonous, ca. 2 mm, base stipitate; stigmas 3. Fl. and fr. May–Jun.

- Open places on mountain slopes, roadsides, stream sides; 1400–2600 m. Sichuan, Yunnan.
setaceous, shorter than subtending spike; sheaths short, not up to 1 cm. Spikes 5–7; upper 2 or 3 spikes male, narrowly oblong, subsessile; lower 3 or 4 spikes female, remote, cylindric, 2–3.5 cm, loosely many flowered, peduncles slender, ± pendulous. Female glumes stramineous or brownish yellow, lanceolate-ovate, 3.5–5 mm (including arista), membranous, green 1–3-veined, scabrous on upper part of costa and margins of arista, apex acuminate and aristate, arista short or slightly long. Utricles green-yellow, obliquely patent, equaling or slightly longer than glume, elliptic or obovate-elliptic, inflated trigonous, 4–4.5 mm, papery, glabrous, shiny, nerveless, base broadly cuneate, apex abruptly contracted into a medium-sized to long beak, orifice 2-toothed. Nutlets loosely enveloped, obovate or broadly ovate, trigonous, ca. 2.5 mm, sessile, apex mucronate; stigmas 3. Fl. and fr. May–Jun.

Mountain slopes, forests, meadows, wet places by watersides; 200–1700 m. Hebei, Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Mongolia, Russia].


闽清薹草 min qing tai cao

Rhizome short, indurate. Culms tufted, 50–90 cm tall, triquetrous, smooth, nodding, clothed at base with sheaths splitting into fibers. Leaves basal, shorter than culm, blades 4–6 mm wide, flat, scabrous above, smooth below. Lower involucral bracts leaflike, sheathed. Spikes 7 or 8; terminal spike male, narrowly linear; lateral spikes female, 2.5–4.5 cm, subdensely many flowered; peduncles slender, lowermost 4–5 cm, gradually shorter upward. Female glumes pale yellow to whitish, ovate to elliptic, 4–5 mm, membranous, 1-veined, apex obtuse (rarely acute) to emarginate (sometimes mucronate). Utricles pale stramineous, ovate-lanceolate or lanceolate, ca. 5 mm, 1-veined, margins white hyaline, apex acuminate. Utricles pale green, shorter than or equaling glume, narrowly ovate, ca. 4.5 mm, papery, obscurely 2-veined laterally on abaxial surface, base broadly cuneate, apex gradually narrowed to a long beak, orifice shortly 2-toothed. Nutlets loosely enveloped, obovate; style rather long; stigmas 3. Fl. and fr. May–Jun.

● Wet places at forest margins, grasslands, ravines; 1600–1700 m. Hebei (Wuling Shan).


四川薹草 si chu an tai cao

Rhizome slender, creeping. Culms densely tufted, slender, 30–40 cm tall, compressed triquetrous, upper part scabrous, lower part smooth, with 4 or 5 bladeless sheaths at base; sheaths red-brown, usually splitting into reticulate fibers at lateral side. Leaves usually shorter than culm, rarely equaling culm, blades 2–3 mm wide, flat, verrucose on upper surface, margins scabrous. Lower involucral bracts leaflike, sheathed, involucral bracts at base of male spikes scalelike. Spikes 4–8; upper 3–6 male, contiguous at top of culm, subsessile; remaining spikes female, oblong or oblong-cylindric, 1.5–2.5 cm × 3–5 mm, loosely many flowered; peduncles slender. Female glumes stramineous, ovate-lanceolate or lanceolate, ca. 5 mm, 1-veined, margins white hyaline, apex acuminate. Utricles pale green, shorter than or equaling glume, narrowly ovate, ca. 4.5 mm, papery, obscurely 2-veined laterally on abaxial surface, base broadly cuneate, apex gradually narrowed to a long beak, orifice shortly 2-toothed. Nutlets tightly enveloped, elliptic, trigonous, ca. 2 mm, apex mucronate; stigmas 3.

● Sichuan (Emei Shan).


泽库薹草 ze ku tai cao

Rhizome slender. Culms 15–20 cm tall, slightly slender, 0.3–0.8 mm thick, obtusely trigonous, glabrous. Leaves basal, shorter than or equaling culm, blades 1–2 mm wide, flat,
smooth on both surfaces. Involutral bracts leaflike, shorter than inflorescence, rather long sheathed. Spikes 4 or 5; upper 2 or 3 spikes male, contiguous, band-shaped, uppermost one 1.5–2 cm, others rather short; female spikes 1 or 2, remote, narrowly oblong, 2–3 cm, loosely 4–10-flowered; peduncles slender, usually pendulous; rachis flexuose. Female glumes brownish, ovate or ovate-lanceolate, 4–5 mm, 1-veined, margins narrowly white hyaline, apex acuminate. Utricles purplish brown, obliquely pai-
tent, longer than glume, obovate or broadly elliptic, obtusely tri-
gonous, 5–6 mm, leathery, glabrous, shiny, distinctly 2-veined laterally, base broadly cuneate, apex abruptly contracted into a long beak, beak 2–2.5 mm, orifice deeply 2-lobed. Nutlets yellow-green, obovate or broadly elliptic, obtusely trigonous, ca. 3 mm; style base not thickened; stigmas 3. Fl. and fr. Jul.–Aug.

- Mountain slopes; ca. 3200 m. E and S Qinghai.


Spikes unisexual, rarely bisexual, female spikes linear-cylindric, cylindric, rarely oblong, loosely or very loosely flowered, usually solitary in an involucral bract sheath, 2 or 3 spikes exserted from an involucral bract sheath or disposed in racemose or paniculate inflorescences. Female glumes lanceolate-ovate, oblong-ovate, ovate, or oblong. Utricles elliptic, oblong-lanceolate, lanceolate, or narrowly oblong, rarely obovate, obtusely trigonous, inconspicuously veined, rarely 2-veined laterally (utricles conspicuously veined in Carex baohuashanica), base usually stipitate, apex with long beak, orifice obliquely truncate, sometimes emarginate or shortly 2-toothed. Nutlets tightly enveloped; style base not thickened; stigmas 3.

Ten species: E Asia; eight species (five endemic) in China.

1a. Spikes bisexual or unisexual and bisexual.

2a. Spikes bisexual, androgyneous, 10–20 or more disposed in a narrow and rather long panicle; utricles laxly hispidulous .......................................................... 247. C. hirtiutriculata

2b. Spikes unisexual and bisexual, terminal spike and terminal spike of partial panicles usually bisexual, androgyneous or gynaecandrous, remaining spikes female, sometimes with few male flowers.

3a. Spikes 2 or 3, usually solitary in an involucral bract sheath, terminal spike androgyneous, lateral spikes female or sometimes with few male flowers; utricles hispidulous on upper part ................. 248. C. wutuensis

3b. Spikes numerous, disposed in a panicle, terminal spike of partial panicles bisexual, gynaecandrous, remaining spikes female; utricles glabrous .......................................................... 249. C. fastigiata

1b. Spikes unisexual, terminal spike male, lateral spikes female, usually solitary in an involucral bract sheath, rarely 2 or 3 spikes borne in an involucral bract sheath, 1 spike male, 1 or 2 spikes female, rarely with few male flowers at apex.

4a. Spikes usually 3 borne in an involucral bract sheath, 1 spike male and 2 spikes female, rarely with few male flowers at apex of female spikes, spikes only solitary in lowermost 1 or 2 involucral bract sheaths, 2 male spikes in uppermost, male spikes linear, 3–5.5 cm; female and male glumes purple-brown .................................................. 250. C. purpureosquamata

4b. Spikes solitary in an involucral bract sheath, terminal spike male, clavate or narrowly lanceolate, not up to 3 cm (only C. finitima with male spike linear, ca. 5 cm), lateral spikes female; female and male glumes brownish yellow or brown-yellow.

5a. Male spike linear, to 5.5 cm, female spikes linear-cylindric, to 12 cm; female glumes ovate, ca. 1/2 length of utricle ..................................................... 251. C. finitima

5b. Male spike clavate or narrowly lanceolate, not up to 3 cm, female spikes cylindric or oblong, 2–6 cm; female glumes oblong, narrowly oblong, ovate-lanceolate, or ovate, ca. 2/3 length of utricle or more.

6a. Female spikes oblong, 2–3.5 cm, loosely 4–6-flowered; female glumes ovate; utricles obovate; nutlets obovate .......................................................... 252. C. baohuashanica

6b. Female spikes cylindric, 3–6 cm, loosely many flowered; female glumes oblong, narrowly oblong, or ovate-lanceolate; utricles narrowly oblong or lanceolate; nutlets narrowly oblong or oblong.

7a. Female glumes ovate-lanceolate; utricles lanceolate, 6–7 mm, glabrous; style longer than utricle .......................................................... 253. C. bostrychostigma

7b. Female glumes oblong or narrowly oblong; utricles narrowly oblong, ca. 4.5 mm, loosely hispidulous on 2 lateral veins and margins of beak; style shorter than utricle .................. 254. C. deqinensis


糙毛薹草 cao mao tai cao

Rhizome slightly elongate, ligneous, with long stolons. Culms 45–60 cm tall, rather slender, obtusely trigonous, smooth, eventually disintegrating into fibers at base. Leaves slightly longer than culm, blades ca. 5 mm wide, relatively stiff, with 2
conspicuous lateral veins, base plicate and flattened distally, upper surface and margins scabrous; sheaths up to 10 cm, sometimes eventually splitting. Involucral bracts leaflike, longer than inflorescence, long sheathed. Panicle rather narrow and loose, longest up to 40 cm, with 10–20 or more spikes, lowermost 1 or 2 partial panicles remote, with slender peduncle, upper peduncles rather short; spikes androgynous, male part longer than female part, only with few female flowers, narrowly cylindric, 1.5–2.5 cm, with medium-sized peduncle. Female glumes brown-yellow, ovate, ca. 3.5 mm, membranous, green 1-veined, apex acute, muticous. Utricles greenish, longer than glume, suberect, oblong-lanceolate, trigonous, ca. 5 mm, fimbriate and distally flat, base abruptly contracted into a stipe, apex gradually narrowed to a medium-sized beak, orifice obliquely truncate or emarginate, white hyaline, apex acuminate. Utricles gray-green, brownish at lower part, ovate, ca. 4 mm, membranous, 1-veined, margins white hyaline, apex mucronate or aristate. Utricles brownish yellow, suberect, longer than glume, elliptic, trigonous, 5–6 mm, hispidulous on upper part, distinctly 2-veined laterally, base attenuate, apex abruptly contracted into a long beak, orifice obliquely truncate or emarginate, white hyaline on margins. Nutlets brown, tightly enveloped, oblong, trigonous, ca. 2.5 mm, style base not thickened; stigmas 3. Fl. and fr. Apr–May.

- Forests on mountain slopes; ca. 2300 m. Yunnan (Jingdong: Wuliang Shan).


武都薹草  wu du tai cao

Rhizome short. Culms 30–40 cm tall, rather slender, triquetrous, smooth, clothed with red-brown bladeless sheaths at base. Leaves shorter than culm, blades 1.5–2 mm wide, flat, smooth on both surfaces, margins scabrous. Involucral bracts leaflike, rather short at upper part, shorter than spike, sheathed. Spikes 2 or 3, remote; terminal spike androgynous, 3.5–4.5 cm, male part longer than female part, loosely with a few female flowers at base; peduncles slender, pendent. Female glumes brownish, oblong-ovate or ovate, ca. 4.5 mm, membranous, 1-veined, margins white hyaline, apex mucronate or aristate. Utricles brownish yellow, suberect, longer than glume, elliptic, trigonous, 5–6 mm, hispidulous on upper part, distinctly 2-veined laterally, base attenuate, apex abruptly contracted into a long beak, orifice obliquely truncate or emarginate, white hyaline on margins. Nutlets brown, tightly enveloped, oblong, trigonous, ca. 2.5 mm, style base not thickened; stigmas 3. Fl. and fr. May–Jun.

- Roadsides on mountain slopes; ca. 2400 m. Gansu (Wudu).


簇穗薹草  cu sui tai cao

Rhizome short, ligneous. Culms tufted, 20–50 cm tall, rather thick, obtusely trigonous, smooth, bearing a few leaves near base. Leaves shorter than culm, blades 5–9 mm wide, plicate near base and flattened distally, scabrous on both surfaces and margins, sheaths ± long, membranous at one side. Involucral bracts leaflike, upper ones linear, shorter than inflorescence, scabrous, shortly sheathed, lowermost sheath up to 6 cm. Inflorescence a compound panicle with several partial panicles, each partial panicle usually with a few spikes; all spikes of terminal partial panicle and terminal spikes of lateral partial panicles gynaecandrous, sessile; remaining spikes female, ± stipitate, usually slightly pendulous; spikes narrowly cylindric, 3–4 cm, loosely many flowered. Female glumes brownish yellow, ovate-lanceolate, ca. 4 mm, membranous, midrib keeled, margins white hyaline, apex acuminate. Utricles greenish, suberect, longer than glume, elliptic-lanceolate, trigonous, ca. 5 mm, papery, glabrous, slightly shiny, distinctly 2-veined laterally, other veins inconspicuous, base cuneate, apex gradually narrowed to a long beak, beak ca. 2 mm, scabrous on both margins, orifice obliquely truncate, white hyaline on margins. Nutlets brownish, tightly enveloped, oblong, trigonous, ca. 2 mm, sessile; stigmas 3.

Mountain slopes, ravines, grasslands; 2500–3600 m. Sichuan, Yunnan [Bhutan, Nepal].


紫鳞薹草  zi lin tai cao

Rhizome short, stoloniferous. Culms tufted, 60–65 cm tall, slightly thick, compressed triquetrous, smooth, clothed with 2 or 3 bladeless sheaths at base. Leaves shorter than culm, blades 4–7 mm wide, flat, with 2 conspicuous lateral veins on upper surface, smooth, scabrous on margins and near apex, sheathed; lowermost sheath up to 8 cm. Involucral bracts leaflike, longer than subtending spike, scabrous near apex and on margins, sheathed. Spikes 11–15; uppermost 2 spikes male; usually 3 spikes borne in an involucral bract sheath (1 spike male and 2 spikes female or bearing a few male flowers at apex); only 1 female spike borne in lowest involucral bract sheath; male spikes linear, 3.5–5.5 cm, slenderly pedunculate; female spikes narrowly cylindrical or oblong, 1.2–6 cm, subloosely 10–20-flowered, lowermost peduncle up to 12 cm, upper ones rather short. Female glumes dark brown, yellowish at margin of apex, oblong, ca. 5 mm, membranous, 1-veined, apex obtuse or rounded, muticous. Utricles gray-green, brownish at lower part, suberect, longer than glume, oblong-lanceolate, obtusely trigonous, 7–8 mm, distinctly 2-veined laterally, base attenuate, shortly stipitate, apex gradually narrowed to a long beak, beak 3–3.5 mm, truncate or emarginate at orifice. Nutlets brown, tightly enveloped, elliptic, trigonous, ca. 2 mm, apex mucronate; stigmas 3, slender. Fl. and fr. Jun–Jul.

- Roadsides in ravines; ca. 3200 m. W Yunnan (Bijiang).


亮绿薹草  liang lü tai cao

Rhizome short, ligneous. Culms tufted, 25–80 cm tall, slightly thick, obtusely trigonous, smooth, bearing rather many leaves at base. Leaves shorter than or equaling culm, blades 4–8 mm wide, flat, scabrous on veins of upper surface and margins of top; lower sheaths up to 6 cm, reddish brown. Involucral bracts leaflike, longer than or slightly shorter than inflorescence, sheathed, sheathing mouth concave. Spikes 4–7, lowermost spaced up to 10 cm, uppermost 2–4 contiguous; terminal spike male, linear, 1–5.5 cm; remaining spikes female, linear-cylindric, 2–12 cm, loosely many flowered; peduncles slender, slightly pendulous. Female glumes brownish yellow, ovate, ca. 3.5 mm, membranous, 1-veined, margins white hyaline, upper margin praemorse, apex acute, mucronate or muticous. Utricles
brownish green, suberect, longer than glume, elliptic-lanceolate, trigonous, 5–7 mm, membranous, glabrous, shiny, 2 lateral veins elevated, base attenuate, shortly truncate, apex gradually narrowed to a long beak, beak ca. 2.5 mm. Nutlets tightly enveloped, narrowly elliptic, trigonous, ca. 2.5 mm; stigmas 3. Fl. and fr. Jun–Jul.

Forests, stream sides, grasslands at watersides; 2000–3000 m. S Gansu, Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia (Sumatra), Nepal, New Guinea].

1a. Culms 40–80 cm tall; leaves slightly shorter than or equaling culm; male spike 2–5.5 cm; female spikes 5–10 cm; utricles 6–7 mm ................................. 251a. var. finitima

1b. Culms 25–35 cm tall; leaves much shorter than culm; male spike 1–2.5 cm; female spikes 2–4(–5) cm; utricles ca. 5 mm ................................. 251b. var. attenuata

251a. Carex finitima var. finitima

亮绿薹（原变种）liang lü tai cao (yuán biàn zhòng)

Carex fusiformis Nees subsp. finitima (Boott) Noltie; C. fusiformis var. majijishanica Y. C. Yang; C. remotiflora Hayata.

Culms 40–80 cm tall. Leaves slightly shorter than or equaling culm. Male spike 2–5.5 cm; female spikes 5–10 cm. Utricles 6–7 mm.

Forests, stream sides, roadsides; 2100–2600 m. S Gansu (Xiaolong Shan), Sichuan, Taiwan, Yunnan [NE India (Darjeeling, Sikkim), Indonesia (Sumatra), New Guinea].


短叶亮绿薹 duan ye liang lü tai cao

Culms 25–35 cm tall. Leaves much shorter than culm. Male spike 1–2.5 cm; female spikes 2–4(–5) cm. Utricles ca. 5 mm.

Grasslands at watersides, roadsides; 2000–3000 m. Yunnan [Bhutan, India, Nepal].


宝华山薹 bao hua shan tai cao

Rhizome short, ligeous. Culms 50–60 cm tall, rather slender, compressed triquetrous, smooth, clothed with reddish brown bladeless sheaths. Leaves shorter than culm, blades 3–4 mm wide, flat, scabrous on upper margins, sheathed, lower sheaths up to 6 cm, usually splitting. Lower involucral bracts leaflike, upper ones subulate, usually shorter than subtending spike; sheaths 1–3 cm. Spikes 3 or 4, solitary in an involucral bract sheath, remote; terminal spike male, cylindric, ca. 3 cm; lateral spikes female, shortly cylindric or cylindric, very loosely 4–6-flowered; peduncles slender, lowermost up to 6.5 cm, upper 1–2 cm. Female glumes white hyaline or sometimes yellowish, gray-green at middle, ovate, ca. 5 mm, membranous, 1-veined, apex acuminate. Utricles brown, suberect, longer than glume, obovate, trigonous, ca. 7 mm, papery, glabrous, several veined, base attenuate into a short stipe, apex contracted into a long beak, orifice obliquely truncate. Nutlets yellow, tightly enveloped, obovate, trigonous, ca. 3 mm; style base persistent, not thickened; stigmas 3. Fl. and fr. Mar–Apr.

● Ravines. Jiangsu (Baohua Shan).


卷柱薹（juan zhu tou tai cao）

Rhizome elongate, ligeous, clothed with sheaths eventually disintegrating into dark brown fibers. Culms densely tufted, 20–50 cm tall, slightly slender, obtusely trigonous, smooth. Leaves shorter than or nearly equaling culm, blades 3–4 mm wide, flat, scabrous on 2 lateral veins of adaxial surface and costa of abaxial surface, sheathed. Lowermost 1 or 2 involucral bracts leaflike, upper ones setaceous, slightly scabrous, sheathed. Spikes 5–8, solitary in an involucral bract sheath; terminal spike male, linear-cylindric, 2–4 cm, peduncle slender; lateral spikes female, space up to 6 cm, rather short near top, narrowly cylindric, 2–4 cm, loosely many flowered; peduncles rather short and thin, enclosed in involucral bract sheath. Female glumes brownish yellow, ovate-lanceolate, 4.5–5 mm, membranous, 3-veined, 2 lateral veins inconspicuous, costa scabrous, margins broadly white hyaline, apex acute. Utricles yellowish green, suberect, longer than glume, narrowly lanceolate, trigonous, ca. 7 mm, membranous, base attenuate, apex gradually narrowed to a long beak, orifice obliquely truncate, white hyaline on margins, sometimes shortly 2-toothed. Nutlets yellow-brown, tightly enveloped, narrowly oblong, trigonous, ca. 3.5 mm, base shortly stipitate; style much longer than utricle; stigmas 3. Fl. and fr. May–Jul.

Meadow moors, watersides, wet places at roadsides; 200–1000 m. Jilin, Liaoning, Shannxi, Zhejiang [Japan, Korea, Russia (Far East)].


德钦薹 de qin tai cao

Rhizome slightly elongate, ligeous. Culms 65–80 cm, slender, obtusely trigonous, smooth, clothed with sheaths at base eventually disintegrating and fiberlike. Leaves 1/4–1/2 height of culms, blades 2–3 mm wide, subrigid, scabrous on both surfaces and margins; sheaths long, brownish yellow, outer sheaths usually later splitting. Lower involucral bracts leaflike, long sheathed, upper involucral bract blades awn-shaped, shortly sheathed. Spikes 4 or 5, uppermost 1 or 2 spikes remote, space up to 20 cm; terminal spike male, clavate, 2–2.5 cm; peduncles slender, most up to 10 cm. Female glumes brown, oblong or narrowly oblong, 3–4 mm, membranous, 1-veined, apex acute, mucronate or aristate. Utricles green-brown, suberect, longer than glume, narrowly oblong, plano-convex, ca. 4.5 mm, membranous, distinctly 2-veined laterally, hispidulous on veins, base attenuate, shortly stipitate, apex gradually narrowed to a long beak, beak scabrous on margins, orifice 2-toothed. Nutlets tightly enveloped, oblong, trigonous, ca. 2 mm, base stipitate; style persistent, base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

● Forests; 2900–3300 m. NW Yunnan (Dêqên).

密花茅草组 mi hua tai cao zu
Dai Lunkai (戴伦凯); Tetsuo Koyama, Gordon C. Tucker

Involucral bracts sheathed or not sheathed. Spikes unisexual; terminal spikes male; lateral spikes female (Carex olivacea with a few male flowers at apex), long cylindric, densely many flowered. Female glumes ovate-lanceolate, apex aristate (C. ischnostachya and C. subtumida with female glumes ovate, not mucronate or aristate). Utricles dark brown or brown-green, ovate or elliptic, inflated trigonous, nearly horizontally patent or ± reflexed low in some species, many veined, beak ± long or slightly short, rather long in few species, orifice 2-toothed. Nutlets rather loosely enveloped; stigmas 3.

About 20 species: E and SE Asia, Australia, Pacific islands; 16 species (seven endemic) in China.

Carex cercedascus C. B. Clarke (J. Linn. Soc., Bot. 36: 279. 1903) could not be treated here because no material was seen by the present authors.

1a. Male spike linear, shorter than 3 cm; female glumes ovate or broadly ovate, shorter than 1/2 length of utricle, mucronate at apex.
2a. Female glumes broadly ovate; utricles suberect or slightly obliquely patent, ovate-oblong, ca. 4 mm; male flower with 3 stamens ................................................................................................................................. 255. C. ischnostachya
2b. Female glumes ovate; utricles nearly horizontally patent, elliptic or obovate, ca. 3 mm; male flower with 1 stamen ........................................................................................................................................ 256. C. subtumida

1b. Male spike cylindric, narrowly cylindric, or clavate, usually longer than 3 cm (rather short in C. brownii and C. transversa); female glumes narrowly ovate, oblong, or lanceolate, longer than 2/3 length of utricle or much more, mucronate or aristate at apex.
3a. Utricles hispidulous.
4a. Leaf blades 6–8 mm wide; spikes contiguous at top of culm; female glumes attenuate at apex, long aristate; utricles ca. 3 mm, equaling glume, dark brown, beak usually recurved ........................................ 257. C. nemostachys
4b. Leaf blades 3–6 mm wide; spikes remote; female glumes mucronate at apex; utricles 2–2.8 mm, longer than glume, brown-green, beak straight ................................................................. 258. C. sclerocarpa

3b. Utricles smooth, glabrous.
5a. Culms lateral; female glumes dark purple-red.
6a. Female glumes awned, ca. 5 mm; nutlets ellipsoid ............................................................................ 259. C. retrofracta
6b. Female glumes emarginate, 2–2.5 mm; nutlets obovoid ................................................................ 260. C. obliquicarpa
5b. Culms central; female glumes usually pale, greenish or brownish.
7a. Female spikes cylindric-oblong, 1–2 cm; utricles distinctly many veined.
8a. Utricles broadly obovate, ca. 3 mm, apex abruptly contracted into a short beak ...................... 261. C. brownii
8b. Utricles oblong-ovate, 4–6 mm, apex gradually narrowed to a long beak.
9a. Utricles distinctly stipitate, 2-toothed at orifice ........................................................................ 262. C. benkei
9b. Utricles broadly cuneate at base, obliquely truncate or minutely 2-toothed at orifice ...... 263. C. transversa
7b. Female spikes long cylindric, longer than 3 cm, longest up to 10 cm; utricles few veined.
10a. Male spike linear or linear-cylindric; female glumes ovate, awned at apex, length of awn 1–2.5 × as long as utricle; utricles suberect or slightly obliquely patent at maturity, brown-green, beak straight.
11a. Male spike 6–14 cm; female spikes 6–14 cm; utricles ovate, ca. 3 mm, with medium-sized beak .................................................. 264. C. oedorrhampha
11b. Male spike 2.5–3 cm; female spikes 2.5–5.5 cm; utricles broadly ovate, ca. 4 mm, with rather long beak ................................................................................................. 265. C. sinoaristata
10b. Male spike rather thick, long cylindric; female glumes lanceolate or oblong-lanceolate, mucronate or aristate at apex, awn shorter than 1/2 length of glume (C. olivacea with female glumes sometimes with long awn, slightly longer than 1/2 length of glume); utricles obliquely patent to ± horizontally patent, sometimes reflexed downward, dark brown or nearly black-brown, rarely yellow-brown, beak ± recurved.
12a. Female spikes rather remote, loosely flowered; utricles horizontally patent or slightly reflexed downward, nearly black-brown, beak distinctly recurved .......... 266. C. recurvisaccus
12b. Female spikes contiguous at top of culm, densely many flowered; utricles obliquely patent or nearly horizontally patent, not reflexed downward, yellow-brown or dark brown, beak slightly recurved.
13a. Leaf blades 8–18 mm wide; female spikes usually with few male flowers at upper part; utricles inflated trigonous, ca. 4 mm; nutlets subloosely enveloped ...... 267. C. olivacea
13b. Leaf blades 4–8(–12) mm wide; female spike without male flowers; utricles not inflated trigonous or slightly inflated trigonous, ca. 3 mm; nutlets rather tightly enveloped.
14a. Leaf blades 8–12 mm wide; female glumes dark brown, rather long aristate; utricles dark brown at maturity, irregularly rugose or verrucose ................................................................. 268. *C. confertiflora*

14b. Leaf blades 4–8 mm wide; female glumes purple-red on margins, mucronate or aristate; utricles brown-yellow at maturity.  
15a. Utricles with transverse rugae at maturity, beak purple-red at upper part; nutlets stramineous ................................................................. 269. *C. dispalata*

15b. Utricles smooth at maturity, beak red-brown at upper part; nutlets dark brown ................................................................. 270. *C. pseudodispalata*


狭穗薹草 xia sui tai cao

Rhizome thick and short, ligneous. Culms tufted, 30–60 cm tall, rather slender, triquetrous, smooth, leafy at base, purple-brown bladeless sheathed at lowest part. Leaves slightly shorter than or nearly equaling culm, blades 4–6 mm wide, flat, rather soft, distinctly 2-veined laterally; sheaths rather long. Involucral bracts leaflike, longer than uppermost spike, rather long sheathed. Spikes 4 or 5, upper 3 or 4 contiguous at apex of culm, lowermost 1 or 2 remote; terminal spike male, linear, 1.5–3 cm, with short peduncle; lateral spikes 3–5, female, narrowly cylindric, 2–6 cm, rather loosely and biserrately many flowered, upper spikes sub sessile, lower 1 or 2 with peduncles. Female glumes yellowish white, ovate, 1.5–1.8 mm, membranous, 1 -veined, apex acute, mucronate or aristate; utricles brown-yellow at maturity. 

Roadsides, mountain slopes, watersides. Fujian, Guizhou, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang [Japan, Korea].


条穗薹草 tiao sui tai cao

Rhizome thick and short, ligneous, stoloniferous. Culms 40–90 cm tall, thick, triquetrous, scabrous on upper part, sheaths at base eventually disintegrating into yellow-brown fibers. Leaves longer than culm, blades 6–8 mm wide, rather stiff, plicate near base and flattened distally, distinctly 2-veined laterally, scabrous on veins and margins. Involucral bracts longer or shorter than culm, lower ones leaflike, upper one setaceous, not sheathed. Spikes 5–8, contiguous at top of culm; terminal spike male, linear, 5–10 cm, sub sessile; lateral spikes female, cylindric, 4–12 cm, densely many flowered, sub sessile or with short peduncle at lower part. Female glumes pale, narrowly lanceolate, 3–4 mm, membranous, green 1–3-veined, apex aristate, scabrous on margins of awn. Utricles brown, patent, slightly shorter than glume (including length of awn), ovate or broadly ovate, obtusely trigonous, ca. 3 mm, membranous, hirsute, very few veined, base cuneate, apex abruptly contracted into a slender, recurved beak, orifice obliquely truncate, sometimes minutely 2-toothed. Nutlets brownish yellow, loosely enveloped, broadly obovate or sub elliptic, trigonous, ca. 1.8 mm; stigmas 3 Fl. and fr. Sep–Dec.

Streamsides, moors, shady and wet places in forests; 300–1600 m. Anhui, Fujian, Guangdong, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Bangladesh, Cambodia, India, Japan, Myanmar, Thailand, Vietnam].


硬果薹草 ying guo tai cao

Rhizome obliquely ascending. Culms tufted, 30–60 cm tall, medium thick, triquetrous, smooth, clothed with bladeless brown-red sheaths at base. Leaves shorter than culm, blades 3–6 mm wide, flat, distinctly 2-veined laterally, lower sheaths usually brown-red. Involucral bracts leaflike, shorter than culm, long sheathed. Spikes 6 or 7; terminal spike male, linear, ca. 4 cm; lateral spikes female, narrowly cylindric, 2.5–7 cm, densely many flowered, uppermost 2 contiguous at top of culm, sub sessile, lower ones slightly remote, with very short peduncle. Female glumes pale, lanceolate, ca. 2 mm, membranous, greenish
1-veined, apex acuminate, with a short awn. Utricles brown-green, obliquely patent, longer than glume, elliptic, obtusely trigonous, 2–2.8 mm, membranous, inconspicuously 5-veined, hispidulous on veins, base cuneate, apex abruptly contracted into a ± long beak, orifice obliquely truncate or later emarginate. Nutlets yellowish, rather tightly enveloped, subelliptic, trigonous, ca. 1 mm, verrucose; style base thickened; stigmas 3, rather short. Fl. and fr. May–Jun.

- Forests; 900–1700 m. Anhui, Hunan, Sichuan.


反折果薹 fan zhe guai tai cao

Rhizome robust and elongate, ligneous. Culms loosely tufted, 60–100 cm tall, rather thick, compressed triquetrous, smooth, with purple-brown bladeless sheaths at base. Leaves shorter than culm, blades 1–1.8 cm wide, flat, with distinct midrib and 2 lateral veins on both surfaces, upper surface smooth, lower surface loosely hispidulous; sheaths rather long. Involucral bracts leaflike, longer than subtending spike, sheaths rather long, but upper ones very short. Spikes 4 or 5, lower 2 remote, upper ones contiguous; terminal spike male, cylindrical, 3–6 cm, shortly pedunculate; lateral spikes female, cylindrical, 4–10 cm, loosely many flowered, lower 2 rather long pedunculate, upper ones shortly pedunculate or subsessile. Female glumes pale brown, dark green at middle, ovate, ca. 5 mm (including length of awn), 3-veined, apex with long awn, awn scabrous on margins. Utricles dark brown-green, obliquely patent, horizontally patent or reflexed later, ovate or obovate, slightly inflated trigonous, 4–5 mm, membranous, inconspicuously 3–5-veined, slightly shiny, base obtusely rounded, apex abruptly contracted into a long beak, orifice obliquely truncate. Nutlets yellowish, rather tightly enveloped, elliptic, trigonous, ca. 2 mm, apex mucronate; style base slightly thickened; stigmas 3. Fl. and fr. Mar–Apr.

- Wet places in forests. N Zhejiang (Hangzhou).


斜果薹 xie guo tai cao

Rhizome short, indurate. Culms loosely tufted, 50–65 cm, trigonous, smooth, with red brown bladeless sheaths at base. Leaves equal to culm, blades 0.9–1.9 cm wide, flat, with distinct veins on both surfaces, surfaces and margin smooth; sheaths 3–6 cm. Involucral bracts leaflike, ± equal to inflorescence, sheaths of lowestmost equaling its blade. Spikes 4 or 5, lowest remote, upper contiguous; terminal spike male, linear-cylindric, 3–4 cm, shortly pedunculate; lateral spikes female, cylindric, 3–5 cm, many flowered. Male glumes narrowly elliptic, 4–4.5 mm, apex obtuse; female glumes reddish brown, dark green medially, narrowly obovate, 2–2.5 mm, smooth, 2-veined, apex truncate, aestival. Utricles dark brown-green, obliquely patent, obovate, obtusely trigonous, 3.5–4 mm, slightly shiny, membranous, inconspicuously 3–5-veined, base obtusely cuneate, apex abruptly contracted into a long beak, orifice emarginate. Nutlets chestnut-brown, rather tightly enveloped, obovoid, trigonous, ca. 2 mm, apex emarginate; style base slightly thickened; stigmas 3. Fl. and fr. May.

- Wet places in forests; 800–900 m. E Guangxi (Hezhou).


亚澳薹 草 ya ao tai cao

Carex nipposinica Ohwi.

Rhizome short. Culms tufted, 30–60 cm tall, medium thick, triquetrous, smooth, clothed with bladeless brown sheaths at base, few sheaths disintegrating into fibers. Leaves shorter than culm, blades 3–4 mm wide, flat, rather stiff, sheathed. Involucral bracts longer than culm, leaflike, lowest sheath long, upper ones rather short. Spikes 3 or 4, rather remote; terminal spike male, linear, 1–2 cm, shortly pedunculate; lateral spikes female, oblone or oblong-cylindric, 1–3 cm, densely many flowered, lowest long pedunculate, upper ones rather shortly pedunculate. Male glumes pale, lanceolate-ovate, ca. 2.8 mm, membranous, 1–3-veined, apex acuminate, with an awn. Utricles brown-green, obliquely patent, horizontally patent at maturity, slightly longer than glume, broadly obovate, inflated trigonous, ca. 3 mm, membranous, glabrous, many veined, base broadly cuneate, estipitate, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets pale brown, yellowish on angles, slightly loosely enveloped, nearly broadly elliptic or broadly obovate, trigonous, ca. 2 mm; stigmas 3, short. Fl. and fr. Apr–May.

Ditch sides, forests, wet places in low-lying lands; 400–1700 m. Anhui, Gansu, Henan, Jiangsu, Jiangxi, Shanxi, Sichuan, Taiwan, Zhejiang [Indonesia, Japan, Korea; Australia, Pacific islands (New Zealand)].


东亚薹 草 dong ya tai cao

Rhizome short. Culms tufted, 30–60 cm tall, triquetrous, smooth, clothed with bladeless light brown sheaths at base, few sheaths disintegrating into fibers. Leaves shorter than culm, blades 3–4 mm wide, flat, rather stiff. Involucral bracts longer than culm, leaflike, lowest sheath long, upper ones rather short. Spikes 3 or 4, rather remote; terminal spike male, linear, 1–2 cm, shortly pedunculate; lateral spikes female, oblong or oblong-cylindric, 1–3 cm, densely many flowered, lowest long pedunculate, upper ones rather shortly pedunculate. Female glumes pale, lanceolate-ovate, 4–5 mm, membranous, 1–3 veined, apex with an awn. Utricles brown-green, obliquely patent, perpendicularly patent at maturity, slightly longer than glume, broadly obovate, inflated trigonous, ca. 4.5 mm, membranous, glabrous, many veined, base distinctly stipitate, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets brown, slightly loosely enveloped, broadly elliptic or broadly obovate, trigonous, ca. 2 mm; stigmas 3, short. Fl. and fr. Apr–May.

Anhui [Japan].


横果薹 草 heng guo tai cao

Carex brownii Tuckerman var. transversa (Boott) Küken-thal.
Rhizome short. Culms tufted, 30–60 cm tall, acutely triquetrous, clothed with purple-brown bladeless sheaths at base. Leaves shorter than or slightly longer than culms, blades 3–5 mm wide, flat, rather soft; sheaths rather long. Involutrual bracts longer than subtending spike, leaflike, sheathing portion ca. 1/2 length of subtending peduncle. Spikes 3–5, upper 2 or 3 slightly contiguous, lower ones rather remote; terminal spike male, narrowly cylindric, 1–1.5 cm, with peduncle; lateral spikes female, broadly cylindric or suboblong, 2–3 cm, densely many flowered, with rather long peduncle. Female glumes pale and hyaline laterally, ovate, 4–5 mm, membranous, green 1–3-veined, apex acuminate, with a long awn. Utricles brown-green, obliquely patent, longer than or as long as glume (including length of awn), ovate or elliptic-ovate, trigonous, ca. 3 mm, base stipitate, apex mucronate; stigmas 3. Fl. and fr. Apr–May.

Forests, grasslands, wet places; 500–800 m. Anhui, Fujian, Guangdong, Hunan, Jiangsu, Jiangxi, Zhejiang [Japan, Korea].


肿喙薹 zhong hui tai cao

Carex oedorrhampha

Rhizome short, ligneous. Culms loosely tufted, rather thick, triquetrous, smooth, with several yellowish brown bladeless sheaths at base. Leaves longer than culm, blades 3–6 mm wide, flat, plicate proximally, with 2 distinct lateral veins, scabrous on both surfaces and margins, long sheathed; sheaths up to 15 cm. Involutrual bracts leaflike, longer than subtending spike, lower sheaths rather long and upper sheaths rather short. Spikes 5 or 6, upper 3 or 4 approximate, lower 2 slightly remote; terminal spike male, linear-cylindric, 6–14 cm, with short peduncle or subsessile; lateral spikes female, cylindric, (3–)5–14 cm, densely many flowered, upper 2 with very short peduncle, lower ones with slightly long peduncle. Male glumes pale yellow, narrowly lanceolate, (5–)7–9 mm, membranous, 1-veined, apex acuminate, with a long awn, awn ca. 1/2 length of glume and hispidulous along margins; female glumes pale yellow, ovate, ca. 2.8 mm, membranous, 1-veined, apex attenuate, with a long awn, awn as long as or longer than 1/2 length of glumes and hispidulous along margins. Nutlets brownish green, obliquely patent, slightly longer than glume, elliptic or obovate, obtusely trigonous, 2.8–3 mm, membranous, 3–5-veined abaxially, base cuneate, shortly stipitate, apex contracted into a medium-sized to long beak, orifice truncate or minutely 2-toothed. Nutlets yellowish, rather tightly enveloped, obovate or suborbicular, trigonous, ca. 2 mm; stigmas 3. Fl. and fr. May–Jun.

- Shady and wet areas. Chongqing (Nanchuan: Jinfo Shan).


垂果薹 chui guo tai cao

Rhizome short, ligneous, with numerous and rather thick roots. Culms loosely tufted, 55–75 cm tall, rather robust, acutely triquetrous, smooth on lower part and scabrid on upper angles, with many leaves at base. Leaves longer than culm, blade 0.7–1.5 cm wide, flat, with 2 distinct lateral veins, smooth on both surfaces and lower margins, scabrid on upper margins, sheathed, basal sheaths usually dehiscent. Involutrual bract leaflike, much longer than subtending spike, not sheathed. Spikes usually 6; uppermost 1 or 2 spikes male, narrowly cylindric, 5–12 cm, shortly pedunculate or nearly sessile; remaining spikes female, rather remote, cylindric, 8–11 cm, densely many flowered, lowermost 1 or 2 spikes shortly pedunculate, upper spikes nearly sessile. Female glumes red-brown on sides, yellowish green between 2 lateral veins, lanceolate or narrowly ovate, 3–4 mm (including length of awn), membranous, 3-veined, apex attenuate, with a long awn, awn 1/3–1/2 length of glume, slightly scabrous on margins. Nutlets black-brown, obliquely patent, horizontally patent or pendant at maturity, slightly longer than or as long as glume, ovate-oblong, inflated trigonous, 4–5 mm, membranous, 5-veined abaxially, base abruptly contracted into a short stipe, apex attenuate into a medium-sized to long beak, beak recurved, truncate or emarginate at orifice. Nutlets loosely enveloped, obovate, trigonous, ca. 2 mm, base cuneate, apex mucronate; stigmas 3. Fl. and fr. Feb–Mar.

- Mountain slopes, ditches, shady and wet areas, lax forests; ca. 1300 m. Guangdong, Yunnan.


横绿果薹 lan li guo tai cao

Rhizome rather thick and short, ligneous, with elongate
and rather thick stolons. Culms loosely tufted, 45–95 cm tall, acutely triquetrous, slightly scabrous on angles, densely with many leaves at base. Leaves longer than culm, blades 8–18 mm wide, flat, with 2 distinct lateral veins, smooth on both surfaces, scabrous on margins, sheathed, basal sheaths usually dehiscent. Involute bracts leaflike, longer than subtending spike, very shortly sheathed or nearly not sheathed. Spikes 5–7, usually congregate at top of culm; uppermost 1 or 2 spikes male, cylindric or narrowly cylindrical, 3–7 cm, shortly pedunculate or nearly sessile; remaining spikes female, sometimes with few male flowers at apex; cylindric, 5–10 cm, lowermost spike sometimes with rather long peduncle, upper spikes with much shorter peduncle or nearly sessile. Female glumes at base of spike subovate, ca. 8.5 mm (including ca. 5 mm awn), apex with long awn, upper glumes oblong-lanceolate, 4–5 mm, apex attenuate or truncate, with a short awn or macro, ferruginous, membranous, 1–3-veined. Urticules dark brown-green, nearly equaling glume, shorter than glume at base of spike, nearly horizontally patent at maturity, ovate, broadly ovate, or subobovate, inflated trigonous, ca. 4 mm, membranous, glabrous, several veined, transversely rugose and several tubercles between veins, base broadly cuneate, apex abruptly contracted into a medium-sized to long or rather short beak, beak recurved, emarginate or shortly 2-toothed at orifice. Nutlets yellowish brown, rather loosely enveloped, elliptic or subobovate, trigonous, ca. 2 mm, densely tuberculate on surface, base very shortly stipitate, apex with recurved mucro; stigmas 3.

Marshes, wet areas; 1200–3000 m. Sichuan, Yunnan [Bhutan, NE India].


密花薹草 mi hua tai cao

Carex confertiflora var. angustior Küтенхальт.

Rhizome short, stoloniferous. Culms 60–95 cm tall, acutely triquetrous, winged on 3 angles, medium thick, clothed with bladeless or shortly bladed sheaths at base, and with 1 or 2 leaves on upper part. Leaves slightly shorter than culm, uppermost leaf usually longer than culm, blades 8–12 mm wide, flat, with 2 distinct lateral veins, smooth on both surfaces, scabrous on margins, sheathed, lower sheaths usually dehiscent. Involute bracts leaflike, longer than subtending spike, upper involucral bracts narrow, nearly not sheathed. Spikes 4–6, ± contiguous at upper part of culm; terminal spike male, cylindric or narrowly cylindrical, 4–8 cm, shortly pedunculate; lateral spikes female, cylindric, (2–)3.5–8 cm, densely many flowered, lower 1 or 2 spikes shortly pedunculate, upper spikes nearly sessile. Female glumes ferruginous, narrowly oblong or narrowly oblong-ovate, 3–3.5 mm, membranous, green 1-veined, apex attenuate, awned. Urticules ferruginous, slightly shorter than glume, horizontally patent at maturity, ovate or subobovate, trigonous, ca. 3 mm, membranous, glabrous, several veined abaxially, base broadly cuneate, apex attenuate into a short beak, beak straight or slightly recurved, obliquely truncate or sometimes shortly 2-toothed at orifice. Nutlets brown at maturity, rather loosely enveloped, subobovate, trigonous, ca. 2 mm, base estipitate, apex with torsional mucro; stigmas 3. Fl. and fr. May–Jul.

Wet areas in forests, watersides or grasslands among shrubs; 1800–2700 m. Guizhou, Hubei, Yunnan [Japan].


皱果薹草 zhou guo tai cao

Carex dispalata var. costata Kükenthal; C. pollens C. B. Clarke; C. pollens var. angustior C. B. Clarke.

Rhizome thick, ligneous, with elongate and thick stolons. Culms 40–80 cm tall, acutely triquetrous, medium thick, slightly scabrous on upper angles, red-brown and bladeless sheathed, sheaths eventually disintegrating into reticulate fibers on one side. Leaves nearly equaling culm, blades 4–8 mm wide, flat, with 2 distinct lateral veins, smooth on both surfaces, scabrous on upper margins, lower leaves long sheathed, upper leaves nearly not sheathed. Involute bracts leaflike, lower involucral bracts longer than subtending spike, upper ones shorter than spike, not sheathed. Spikes 4–6, approximate, usually ± contiguous at upper part of culm; terminal spike male, cylindric, 4–6 cm, pedunculate; lateral spikes female, cylindric, 3–9 cm, densely many flowered, sometimes with several male flowers at apex, subsessile or shortly pedunculate at lowest spike. Female glumes red-brown on sides, yellowish green at middle, ovate-lanceolate or lanceolate, ca. 3 mm, membranous, 3-veined, apex acuminate, muticous or mucronate. Urticules brownish green, slightly longer than glume, obliquely patent or nearly horizontally patent at maturity, ovate, slightly inflated trigonous, 3–4 mm, thickly papery, glabrous, transversely rugose, indistinctly few veined, base rounded, stipitate, apex abruptly contracted into a medium-sized to long beak, beak slightly recurved, purple-red at top, obliquely truncate or emarginate at orifice. Nutlets stramineous, slightly loosely enveloped, obovate or elliptic-ovate, trigonous, ca. 2 mm, apex mucronate; stigmas 3. Fl. and fr. May–Jul.

Ditches, marshes, wet areas; 500–2900 m. Anhui, Hebei, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shansi, Zhejiang [Japan, Korea].


似皱果薹草 si zhou guo tai cao

Rhizome with stolons. Culms 40–60 cm tall, slightly thick, acutely triquetrous, scabrous on upper angles, basal sheaths usually disintegrated into fibers. Leaves nearly equaling culm, blades 4–8 mm wide, flat, rather stiff, scabrous on margins, sheathed. Involute bracts leaflike, lower involucral bracts nearly equaling subtending spike, upper involucral bract shorter than subtending spike. Spikes 4–6, lowermost spike remote, upper spikes rather approximate; terminal spike male, cylindric, 4–7 cm, pedunculate; lateral spikes female, cylindric, 2–7.5 cm, densely many flowered, lower spikes long pedunculate, upper spikes subsessile. Female glumes red-brown, ovate-lanceolate, ca. 3 mm, membranous, green 1-veined, apex acuminate, mu-
cronate or aristate, scabrous on awn. Utricles greenish yellow, longer than glume, obliquely patent, elliptic, trigonous, ca. 3 mm, papery, glabrous, 5–7-veined, base attenuate, apex abruptly contracted into a medium-sized to long beak, beak slightly recurved, upper part red-brown, obliquely truncate and laterally 2-toothed at orifice. Nutlets dark brown, slightly loosely enveloped, broadly obovate or subelliptic, trigonous, ca. 1.7 mm; style base not thickened; stigmas 3. Fl. and fr. Apr–Jul.

- In low water; ca. 700 m. S Shaanxi (Qin Ling).


Dai Lunkai (戴伦凯); Tetsuo Koyama, Gordon C. Tucker

Rhizome stoloniferous. Involucral bracts not sheathed or shortly sheathed. Spikes usually unisexual, terminal spike male, lateral spikes female (Carex harrysmithii and C. agglomerata with unisexual spikes and bisexual spikes), cylindric, rarely oblong, densely many flowered. Female glumes ovate or lanceolate-oblong, apex acuminate, mucronate, aristate, or muticous. Utricles yellowish green or stramineous, erect or obliquely patent, ovate, elliptic, or oblong, slightly inflated or inflated trigonous, many veined, beak medium sized to long or rather long, orifice shortly 2-toothed, rarely obliquely truncate or emarginate. Nutlets rather loosely enveloped; stigmas 3.

About 20 species: E and SE Asia; 18 species (nine endemic) in China.

1a. Spikes unisexual and bisexual, uppermost 1 or 2 spikes androgynous or gynaecandrous, remaining spikes female, or uppermost 1 or 2 spikes male and remaining female or bisexual.

2a. Uppermost 1 or 2 spikes bisexual, androgynous or gynaecandrous, remaining spikes female, spikes oblong, not over 2 cm, approximate, usually congregate at top of culm; female glumes stramineous or yellowish green.

3a. Spikes 2, rarely 3, androgynous, with few male flowers at top of spike; female glumes lanceolate, ca. 2 mm; utricles ca. 3 mm; nutlets stiptate ............................................................ 271. C. harrysmithii

3b. Spikes 3 or 4, rarely 2, terminal spike gynaecandrous, lateral spikes female; female glumes ovate, ca. 3 mm; utricles 3.5–4 mm; nutlets sessile .................................................. 272. C. agglomerata

2b. Uppermost 1 or 2 spikes male, remaining spikes female or bisexual, bisexual spikes androgynous or gynaecandrous, spikes cylindric, 2.5–10 cm, remote, not congregate at top of culm; female glumes purple or brown-red.

4a. Rhizome stoloniferous; leaves glabrous; female spikes densely many flowered, usually with few male flowers at base; female glumes muticous or mucronate; utricles with a short beak .......................... 273. C. alliiformis

4b. Rhizome without stolons; leaves pubescent abaxially; female spikes laxly flowered, usually with few male flowers at top; female glumes long aristate or awned; utricles with a long beak.

5a. Leaves 7–12 mm wide; male spike 7–10 cm; utricles spreading ........................................... 274. C. purpureotincta

5b. Leaves up to 17 mm wide; male spike 4–6 cm; utricles reflexed ............................................. 275. C. xiangxiensis

1b. Spikes usually unisexual, uppermost 1 or 2 spikes male (C. planiculmis sometimes bearing male spikes with several female flowers at top), remaining spikes female, sometimes with few male flowers at top (e.g., C. doniana).

6a. Utricles wholly scabrid pubescent ......................................................................................... 282. C. scabrisacca

6b. Utricles glabrous, not scabrid.

7a. Spikes approximate, usually congregate at top of culm, male spikes clavate, 1.5–2 cm, female spikes oblong, not over 2.5 cm (only C. huashanica with male spikes 2–5 cm, female spikes 3–6 cm), sub sessile or shortly pedunculate.

8a. Female spikes cylindric, 3–6 cm; female glumes with long awn at apex, scabrous on margins at awn; utricles ca. 5 mm, obliquely truncate or emarginate at orifice ................................. 276. C. huashanica

8b. Female spikes oblong, not over 2.5 cm; female glumes muticous or mucronate; utricles 3–4 mm, 2-toothed at orifice (except in C. submollcultra).

9a. Leaf blades 2–4 mm wide; utricles ca. 5 mm, distinctly veined ........................................... 280. C. submollcultra

9b. Leaf blades 4–10 mm wide; utricles 3–4 mm, obscurely veined.

10a. Female spikes 1.5–2.5 cm; utricles oblong-ovate, slightly inflated trigonous, membranous, usually rugulose, apex abruptly contracted into a medium-sized to long beak .................. 279. C. mollcultra

10b. Female spikes 0.8–1.7 cm; utricles elliptic, inflated trigonous, thickly papery, smooth, apex abruptly contracted into a short beak.

11a. Female glumes ovate or narrowly ovate; nutlets obovate ............................................. 277. C. aphanolepis

11b. Female glumes oblong; nutlets subrhomboid .............................................................. 278. C. radicina

7b. Spikes remote, not congregate at top of culm, male spike and female spikes cylindric (C. japonica with spikes oblong), 2.5–7 cm, lower spikes long pedunculate, upper spikes shortly pedunculate.
12a. Leaf blades 5–12 mm wide; female spikes (1.5–)2–7 cm; utricles attenuate to a short beak at apex, nearly obliquely truncate or obscurely 2-toothed at orifice.

13a. Culms compressed triquetrous, one angle obscure; male spike not over 3.5 cm, with female flowers at top, male spikes 1.5–4.5 cm, without male flowers at top; female glumes ovate, muticous or sometimes mucronate at apex; utricles ovate, with a recurved beak, style deciduous, stigma short ................................................................. 288. C. planiculmis

13b. Culms triquetrous; male spike 3–7.5 cm, female spikes 2–7 cm, sometimes with several male flowers; female glumes ovate-lanceolate, mucronate at apex; utricles oblong-ovate, with a straight beak; style usually persistent, stigmas rather long.

14a. Spikes 2–6, male spike linear-cylindric, 3–7.5 cm, female spikes cylindric, 3–7 cm; female glumes pale yellow; utricles 3.5–4 mm, greenish yellow; basal leaf sheaths brownish ................................................................. 286. C. doniana

14b. Spikes 3 or 4, male spike narrowly cylindric, ca. 3 cm, female spikes cylindric, 2–3.5 cm; female glumes yellow-brown; utricles 4–4.5 mm, olivaceous; basal leaf sheaths purple-brown ................................................................. 287. C. phaenocarpa

12b. Leaf blades 2–5 mm wide; female spikes 1–3(–4) cm; utricles attenuate to medium-sized or long beak at apex, distinctly 2-toothed at orifice.

15a. Female spikes oblong or oblong-cylindric, 1–2.5 cm; utricles 4–5 mm, stramineous, slightly nitid, obscurely veined ................................................................. 281. C. japonica

15b. Female spikes cylindric, to 3 cm or more; utricles ca. 3.5 mm, yellowish green, not nitid, distinctly veined.

16a. Culms 30–60 cm tall; male spike clavate, 2–3 cm; female glumes narrowly ovate, muticous at apex; utricles ovate, slightly inflated ................................................................. 285. C. alopecuroides

16b. Culms not over 30 cm tall; male spike linear, 1–5 cm; female glumes oblong-ovate, mucronate at apex; utricles elliptic or oblong, not inflated.

17a. Utricles elliptic, 3–3.5 mm, with a medium-sized to long beak, beak ca. 1/3 length of utricle ................................................................. 283. C. subtransversa

17b. Utricles oblong, 4–5 mm, with a long beak, beak ca. 1/2 length of utricle .................. 284. C. liui


哈氏薹草 ha shi tai cao

Rhizome short, without stolons. Culms loosely tufted, 15–20 cm tall, slender, compressed triquetrous, smooth, clothed with yellowish brown and bladeless sheaths at base, sheaths usually disintegrating into fibers. Leaves shorter than culm, blades 1–2 mm wide, flat, smooth, long sheathed. Lowest involucral bracts leaflike, longer than subtending spike, not sheathed or shortly sheathed (2–3 mm), upper involucral bracts setaceous, not sheathed. Spikes 2, congregate at top of culm, androgynous, ovate or oblong, 5–10 mm, densely many flowered, with few male flowers at top of spike, shortly pedunculate or subsessile. Male glumes yellow-brown, narrowly lanceolate, ca. 3 mm, membranous, green 1-veined, apex acuminate; female glumes yellowish, narrowly ovate, 1.5–2 mm, membranous, green 1-veined, apex acuminate, mucronate or aristate. Utricles stramineous, obliquely patent, longer than glume, obovate-elliptic or narrowly elliptic, trigonous, ca. 3 mm, membranous, smooth, nerveless, base acute, apex abruptly contracted into a medium-sized to long beak, orifice truncate or emarginate, membranous, hyaline. Nutlets rather tightly enveloped, elliptic, trigonous, ca. 1.5 mm, base shortly stipitate, apex mucronate; style rather short, base slightly thickened; stigma 3. Fl. and fr. May–Jun.

- Mountain slopes; ca. 2500 m. W Sichuan.


团穗薹草 tuan sui tai cao

Carex agglomerata var. rhizomata Y. C. Yang.

Rhizome rather long, ligneous, stoloniferous. Culms 20–60 cm tall, slightly slender, acutely triquetrous, scabrous on angles, purple-brown and bladeless sheathed, sheaths eventually disintegrating into reticulate fibers. Leaves shorter than or equaling culm, blades 2–6 mm wide, scabrous and sometimes slightly revolute on margins, reddish brown sheathed. Lowest involucral bract leaflike, longer than subtending spike, upper involucral bracts awn-shaped, shorter than subtending spike, not sheathed. Spikes 3 or 4, congregate at top of culm; terminal spike gynaecandrous, clavate-oblong, ca. 1.5 cm, rarely male, narrowly oblong, subsessile; lateral spikes 2 or 3, female, oblong, 1–1.5 cm, densely many flowered, subsessile. Male glumes brownish yellow, lanceolate-ovate, ca. 4 mm, membranous, 1-veined, apex acuminate, aristate; female glumes brownish yellow, ovate, ca. 3 mm, membranous, 1-veined, scabrid on veins, apex acuminate, shortly aristate. Utricles yellowish green, obliquely patent, nearly horizontally patent at maturity, longer than glume, ovate or narrowly ovate, slightly inflated trigonous, 3.5–4 mm, membranous, glabrous, distinctly 2-toothed laterally, other veins obscure, base obtusely rounded, apex attenuate into a slightly long beak, orifice 2-toothed. Nutlets yellowish, rather loosely enveloped, obovate, trigonous, ca. 2 mm; style base not thickened; stigma 3. Fl. and fr. Apr–Jul.

- Forests on mountain slopes, wet places in valleys; 1200–3200 m. Gansu, Qinghai, Shaanxi, Sichuan.

葱状薹 cong zhuang tai cao

Rhizome short, with long stolons, stolons clothed with red-brown and bladeless sheaths. Culms loosely tufted, 25–45 cm tall, obtusely trigonous, rather thick, clothed with few bladeless sheaths. Leaves longer than culm, blades 7–14 mm wide, flat, distinctly 2-veined laterally, purple-red sheathed. Involucral bracts leaflike, lower involucral bracts longer than subtending spike, slightly long sheathed, upper involucral bracts rather narrow and shorter than subtending spike, shortly sheathed. Spikes 5–8, lower spikes remote, upper spikes approximate; terminal 1 or 2 spikes male, sublinear, 2.5–4 cm, pedunculate; remaining spikes female, sometimes with few male flowers at base, cylindric, 2.5–5.5 cm, densely many flowered, lower spikes rather long pedunculate, upper spikes shortly pedunculate. Male glumes brownish red, lanceolate, ca. 6 mm, 1-veined, apex acute; female glumes brownish red, lanceolate, ca. 4 mm, pedunculate; remaining spikes female, sometimes with few male flowers at base, cylindric, 2.5–5.5 cm, densely many flowered, lower spikes rather long pedunculate, upper spikes shortly pedunculate. Male glumes brownish red, lanceolate, ca. 6 mm, 1-veined, apex acute; female glumes brownish red, lanceolate-ovate or lanceolate, 3–4 mm, membranous, 1-veined, apex acuminate or acute, mucronate. Utricles green or yellowish green, obliquely patent, longer than glume, ovate-oblong, inflated trigonous, ca. 4 mm, herbaceous, glabrous, several veined, base cuneate, apex abruptly contracted into a rather short beak, orifice 2-toothed. Nutlets gray-green, brownish yellow on angles, rather loosely enveloped, elliptic, trigonous, ca. 2 mm; style base not thickened; stigmas 3. Fl. and fr. May–Jul.


太鲁阁薹 tai lu ge tai cao

Rhizome short, without stolons. Culms 60–90 cm tall, rather thick, triquetrous, smooth, clothed with red-brown and bladeless sheaths. Leaves shorter or slightly longer than culm, blades 7–12 mm wide, flat, slightly stiff, puberulent on lower surface, sheathed. Involucral bracts leaflike, longer than subtending spike, lower involucral bracts shortly sheathed, upper involucral bracts nearly not sheathed. Spikes 4, rather congregate at top of culm or lowermost spike slightly remote; terminal spike male, sublinear, 7–10 cm, shortly pedunculate; remaining spikes female, cylindric, 6–10 cm, slightly loosely many flowered, sometimes with few male flowers, lowest spike pedunculate, upper spikes nearly sessile. Female glumes pale, slightly purple-red laterally, ovate, ca. 3.5 mm (including ca. 2.3 mm awn), membranous, 3-veined, apex obtuse, long aristate, scabrous on margins of awn. Utricles brownish green, obliquely patent, slightly longer than glume, elliptic, subinflated trigonous, ca. 4 mm, membranous, glabrous, purple-red punctulate, many veined, base cuneate, apex abruptly attenuate into a long beak, beak scabrous on margins, truncate at orifice. Nutlets loosely enveloped, ovate, trigonous, ca. 2 mm; style base slightly thickened; stigmas 3.

Dense forests. Taiwan [Japan].


湘西薹 xiang xi tai cao

Rhizome short, indurate, thickened. Culms 40–90 cm tall, rather thick, triquetrous, smooth but scabrous on angles, clothed with dark purple and bladeless sheaths. Leaves shorter than or equaling culm, blades up to 17 mm wide, with several prominent veins, flat, slightly stiff, puberulent on veins above and generally on lower surface, sheathed. Involucral bracts leaflike, longer than subtending spike, shortly sheathed. Spikes 4 or 5, ± remote; terminal spike male, sublinear, 4–6 cm, shortly pedunculate; remaining spikes female, cylindric, 4–9 cm, densely flowered, lowest spike pedunculate, upper spikes nearly sessile. Female glumes pale, slightly purple-red laterally, ovate to oblong, ca. 5 mm (including ca. 2.3 mm awn), membranous, 3-veined, apex obtuse, mucronate at aristate. Utricles ovivaceous, reflexed, longer than glume, ovobate to elliptic, subinflated, trigonous, 3.5–4 mm, membranous, glabrous, many veined, base sessile, apex abruptly attenuate into a long beak, beak scabrous on margins, 2-toothed at orifice. Nutlets yellowish brown, loosely enveloped, rhomboid-elliptic, trigonous, ca. 2.3 mm; style base slightly thickened; stigmas 3, ± equaling beak.

● Forests in valleys; ca. 300 m. NW Hunan (Zhangjiajie).


华山薹 hua shan tai cao

Rhizome rather thick and short, long stoloniferous. Culms densely tufted, 35–55 cm tall, acutely triquetrous, slightly thick, scabrous on angles, bladeless sheathed at base. Leaves longer than culm, blades 4–6 mm wide, flat, distinctly 2-veined laterally, lower part smooth, scabrous near top, long sheathed. Involucral bracts leaflike, much longer than subtending spike, not sheathed. Spikes 3 or 4, rather congregate at top of culm; terminal spike male, narrowly cylindric, 2–5 cm, shortly pedunculate; lateral spikes female, cylindric, 3–6 cm, densely many flowered, shortly pedunculate. Male glumes stramineous, lanceolate, ca. 4 mm, membranous, 1-costate, apex aristate or mucronate, ciliate on margins of awn; female glumes stramineous, ovate, ca. 2 mm, membranous, 1-costate, apex aristate or mucronate, awn ciliate at margins. Utricles stramineous, suberect, elliptic, slightly inflated trigonous, ca. 5 mm, papery, several veined abaxially, base broadly cuneate, apex attenuate into a long beak, orifice emarginate or shortly 2-toothed. Nutlets dark brown, yellow-brown on angles, rather loosely enveloped, obovate, trigonous, ca. 2 mm, apex mucronate; style ± long; stigmas 3. Fl. and fr. Apr.–May.

● Roadside in valleys; ca. 1800 m. Shaanxi (Hua Shan, Weinan).


匝鳞薹 ni lin tai cao

Carex japonica Thunberg var. aphanolepis (Franchet & Savatier) Kükenthal; C. japonica var. humilis Franchet.

Rhizome slender and long stoloniferous. Culms 15–30 cm tall, slightly slender, triquetrous, scabridulous, brownish sheathed at base. Leaves longer than or nearly equaling culm, blades 3–8 mm wide, flat, soft, scabrous on margins, ± long
sheathed, basal sheath ± disintegrated into fibers. Involutrular bracts leaflike, longer than inflorescence, not sheathed. Spikes 3 or 4, upper spikes approximate, lower spikes rather remote; terminal spike male, linear, 1–3 cm, shortly pedunculate or nearly sessile; lateral spikes female, globose-oblong or oblong, 0.8–1.7 cm, ca. 5 mm wide, densely many flowered, upper spikes sessile, lower spikes shortly pedunculate. Male glumes brown, lanceolate-oblong, ca. 4 mm, membranous, 1-veined, apex acuminate; female glumes green at middle, pale laterally, ovate or narrowly ovate, 2.5–3 mm, membranous, 3-veined, apex acuminate, mucronate. Utricles yellowish, obliquely patent, longer than glume, elliptic, inflated trigonous, ca. 4 mm, thickly papery, slightly shiny, obscurely veined, base broadly cuneate or obtusely rounded, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets brown, rather loosely enveloped, elliptic or obovate-elliptic, trigonous, ca. 2 mm, apex mucronate; style base slightly thickened; stigmas 3, rather short.

Forests, wet places at forest margins. Anhui, Jiangsu [Japan, Korea].


细根茎薹草 xi gen jing tai cao

Rhizome short, with slender stolons. Culms 30–50 cm tall, acutely triquetrous, scabrous on angles. Leaves longer than culm, blades 6–8 mm wide, slightly stiff, distinctly 2-veined laterally on upper surface, sheathed. Involuturular bracts leaflike, longer than subtending spike, not sheathed. Spikes 3 or 4, rather congregate at top of culm, lowest spike slightly remote; terminal spike male, linear, 2–3 cm, sometimes with few female flowers at apex, shortly pedunculate; lateral spikes female, oblong or shortly cylindric, 1.5–2.5 cm, densely many flowered, nearly sessile. Male glumes pale, elliptic, ca. 3.8 mm, membranous, 1-veined, apex acuminate, mucronate; female glumes pale, green at middle, oblong or obvate-oblong, ca. 3 mm, membranous, 1-veined, apex acuminate, muticous or mucronate. Utricles stramineous, obliquely patent, nearly equaling glume, broadly obovate, obtusely trigonous, ca. 3 mm, glabrous, shiny, obscurely few veined, base obtusely rounded, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets slightly loosely enveloped, subrhomboid, trigonous, ca. 1.5 mm; style base slightly thickened; stigmas 3, slender, persistent at fruiting stage.

● Forests on mountain slopes. Jiangsu (Baohua Shan).


柔果薹草 rou guo tai cao

Rhizome short, with slender stolons. Culms 30–50 cm tall, acutely triquetrous, scabrous on angles. Leaves longer than culm, blades 6–8 mm wide, flat, rather soft, distinctly 2-veined laterally on upper surface, sheathed, sheaths brown at base of culm. Involurual bracts longer than subtending spike, upper involurual bracts sublinear, lower involurual bracts leaflike, nearly not sheathed. Spikes 3–5, usually congregate at top of culm, distances short; terminal spike male, linear or subclavate, 1–2 cm, shortly pedunculate; lateral spikes female, oblong-cylindric, 1.5–2.5 cm, densely many flowered, very shortly pedunculate or nearly sessile. Male glumes pale, narrowly oblong, ca. 4 mm, green 1-veined, apex mucronate; female glumes brownish yellow, oblong-ovate or subovate, ca. 3 mm, membranous, 1-veined, apex acuminate, sometimes mucronate. Utricles yellow-green or stramineous, oblcyly patent, eventually nearly horizontally patent, much longer than glume, oblong-ovate or lanceolate-ovate, inflated trigonous, ca. 4 mm, membranous, glabrous, obscurely veined, usually rugose, base obtusely rounded, apex attenuate into a medium-sized or rather long beak, orifice shortly 2-toothed. Nutlets rather loosely enveloped, elliptic, trigonous, ca. 2 mm, base acute or slightly obtuse, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jun.

Forests, thickets, wet areas, riversides, ditch sides. Taiwan, Zhejiang [Japan, Korea].


似柔果薹草 si rou guo tai cao

Rhizome short, long stoloniferous. Culms densely tufted, 15–20 cm tall, acutely triquetrous, scabrous on angles, bladeless sheathed at base. Leaves slightly longer than culm, blades 2–4 mm wide, distinctly 2-veined laterally, scabrous on lateral veins and margins, slightly involute on margins at dry stage, membranous part of sheaths usually splitting. Involuturular bracts leaflike, longer than subtending spike, not sheathed. Spikes 3 or 4, usually congregate at top of culm, distance short; terminal spike male, clavate, 1.5–2 cm, very shortly pedunculate; lateral spikes female, elliptic, oblong, or narrowly oblong, 1.2–2.5 cm, densely many flowered, lower spikes shortly pedunculate, upper spikes nearly sessile. Male glumes stramineous, lanceolate, ca. 4 mm, membranous, 1-veined, apex acute; female glumes stramineous, ovate, 2.5–3 mm, sometimes ferruginous punctulate, 1-veined, apex acute, mucronate. Utricles brown-yellow, obliquely patent, horizontally patent at maturity, longer than glume, ovoid, inflated trigonous, ca. 5 mm, membranous, glabrous, distinctly several veined, base rounded, estipitate, apex abruptly contracted into a short recurved beak, orifice obliquely truncate, sometimes emarginate. Nutlets loosely enveloped, obovate, trigonous, slightly concave on 3 sides, ca. 1.5 mm, base acute, apex mucronate; style ± long; stigmas 3.

● Mountain slopes, marshes. Fujian, Guangdong, Jiangxi, Zhejiang.


日本薹草 ri ben tai cao

Rhizome short, with slender stolons. Culms laxly tufted, 20–40 cm tall, rather slender, compressed triquetrous, scabrous on upper angles, clothed with few brownish and bladeless sheaths at base, sheaths usually split into reticulate fibers. Upper leaves longer than culm, basal leaves usually shorter than culm, blades 3–4 mm wide, slightly stiff, flat, distinctly 2-veined laterally, scabrous on margins, sheathed. Involulurual bracts leaflike, lower involurual bracts longer than subtending
spike, upper 1 or 2 involucral bracts shorter than subtending spike, not sheathed. Spikes 3 or 4, rather remote; terminal spike male, linear, 2–4 cm, pedunculate; lateral spikes female, oblong-cylindric or oblong, 1–2.5 cm, densely many flowered, lower ones shortly pedunculate, upper ones sessile or nearly sessile. Male glumes pale, lanceolate, ca. 5 mm, membranous, 3-veined, greenish between veins, apex acuminate; female glumes pale or brownish, narrowly ovate, 2.5–3 mm, membranous, 3-veined, greenish between veins, apex acuminate. Utricles yellowish green or stramineous, obliquely patent, longer than glume, oblong or subovate, trigonous, 4–4.5 mm, papery, glabrous, slightly shiny, obscurely veined, base broadly cuneate, apex abruptly contracted into a medium-sized to long beak, orifice hyaline-membranous on margins, shortly 2-toothed. Nutlets brownish, slightly loosely enveloped, elliptic or obovate-elliptic, trigonous, ca. 2 mm; style base slightly thickened; stigmas 3. Fl. and fr. May–Aug.

Shady and wet areas in forests, forest margins, ditch sides in valleys; 1200–2000 m. Hebei, Henan, Hubei, Jiangsu, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Yunnan [Japan, Korea].


柔囊薹  cao nang tai cao

Rhizome with long slender stolons. Culms 30–40 cm tall, sharply triquetrous, 1-leaved at middle. Leaves soft; basal sheaths slightly disintegrating into brownish fibers. Lowest involucral bract leaflike, surpassing culm, not sheathing. Spikes 3 or 4, congregate; terminal spike male, stramineous, 2–3 cm, shortly pedunculate; lateral spikes female, suberect, cylindric, 2–3 cm × 5–6 mm, subsessile. Female glumes pale, lanceolate-ovate, costa green, 3-veined, apex acuminate. Utricles opaque, longer than glume, ovate, slightly inflated, 3–5 mm, wholly scabrid with short hairs, with slender veins, apex suddenly contracted into a short beak, orifice minutely 2-toothed. Nutlets rhombic-ovoid, ca. 1.5 mm; stigmas 3.

- Jiangxi (Lushan).

Carex scabrissaca is known only from the type gathering. Owing to its scabrid pubescent utricles it is a clear-cut species in C. sect. Molliculae because all other species in this section have glabrous utricles.


细横薹  si heng guo tai cao

Carex alopecuroides D. Don ex Tilloch & Taylor subsp. subtransversa (C. B. Clarke) T. Koyama; C. hayataensis Honda; C. japonica Thunberg subsp. subtransversa (C. B. Clarke) T. Koyama; C. kawakamii Hayata; C. pseudojaponica Hayata (1911), not C. B. Clarke (1908).

Rhizome short, with slender stolons. Culms densely tufted, 15–30 cm tall, slightly slender, triquetrous, scabrous on upper angles, clothed with few brownish and bladeless sheaths at base. Leaves usually shorter than culm, blades 2–4 mm wide, flat, slightly stiff, distinctly 2-veined laterally, rather long sheathed. Lower involucral bracts leaflike, longer than subtending spike, upper involucral bracts linear, rather short, usually not sheathing. Spikes 3–5, lower 1 or 2 rather remote, upper 2 or 3 rather congregate; terminal spike male, linear, 1–5 cm, shortly pedunculate; lateral spikes female, shortly cylindric or suboblong, 1–3 cm, densely many flowered, sometimes with few male flowers, lower ones shortly pedunculate, upper ones nearly sessile. Male glumes brownish, lanceolate, 2–2.5 mm, thickly papery, 1-veined, apex acute, mucronate; female glumes brownish, oblong-ovate, 2–2.5 mm, papery, 1-veined, apex acute, mucronate. Utricles green or yellowish green, suberect, elliptic, trigonous, 3–3.5 mm, membranous, glabrous, many veined, base broadly cuneate or subrounded, apex abruptly attenuate into a slightly long beak, orifice shortly 2-toothed. Nutlets loosely enclosed, broadly ovate, trigonous, 1–1.5 mm; style base not thickened; stigmas 3. Fl. and fr. Jun–Oct.

Wet forest floors, grassy areas in forests; 1300–2500 m. Taiwan, Zhejiang [Japan, Philippines].


台中薹  tai zhong tai cao

Rhizome with slender stolons. Culms laxly tufted, 10–15 cm tall, slightly triquetrous, smooth, clothed with few bladeless sheaths at base. Leaves nearly basal, shorter than culm, blades 2–3 mm wide, soft, long sheathed; sheaths at base yellowish brown, usually ± split into brown fibers. Involucral bracts leaflike, longer than subtending spike, not sheathed. Spikes 3–5, contiguous at upper part of culm; terminal spike male, linear-cylindric, 2–4 cm, shortly pedunculate; lateral spikes female, cylindric or oblong-cylindric, 2–4 cm, densely many flowered, lower spikes with long peduncles, peduncles up to 5 cm in length, upper ones rather short. Female glumes pale brown, oblong-ovate, 3.5–4 mm, membranous, 3-veined, apex acute or obtuse and mucronate. Utricles yellowish green, obliquely patent, longer than glume, oblong or subovate, trigonous, 4–5 mm, membranous, glabrous, many veined, base broadly cuneate, apex gradually narrowed to a long beak, orifice subtruncate or emarginate. Nutlets dark brown, loosely enclosed, elliptic, trigonous, ca. 1.8 mm, apex mucronate; style base not thickened; stigmas 3.

- Forests on mountain slopes; ca. 2900 m. Taiwan, Zhejiang.


禾状薹  he zhong tai cao

Carex japonica Thunberg var. alopecuroides (D. Don ex Tilloch & Taylor) C. B. Clarke.

Rhizome short, with slender stolons. Culms tufted, 30–60 cm tall, triquetrous, scabrous on upper angles, clothed with few pale brown and bladeless sheaths. Leaves nearly equaling or slightly longer than culm, blades 2–4 mm wide, flat, slightly stiff, 3-veined on upper surface, distinctly 1-veined on lower surface, scabrous on veins and upper margins, margins usually revolute when dry, long sheathed, membranous part of sheaths usually split. Involucral bracts leaflike, lower involucral bracts
longer than subtending spike, upper 1 or 2 involucral bracts equaling or slightly shorter than subtending spike, not sheathed. Spikes 3–5, usually contiguous at top of culm; terminal spike male, sometimes with female flowers at top, subcylindric, 2–3 cm, very shortly pedunculate or nearly sessile; lateral spikes female, cylindric, 2–3 cm, densely many flowered, lowest 1 or 2 shortly pedunculate, upper ones nearly sessile. Female glumes pale straw-colored, oblong-ovate or lanceolate-ovate, 2–3 mm, membranous, 1-veined, apex attenuate or sometimes subobtuse and mucronate or muticous, mucro hispidulosa laterally. Utricles green, stramineous, horizontally patent at maturity, lower ones equaling or slightly longer than glume, upper ones shorter than glume, ovate, obtusely trigonous, slightly inflated, ca. 3 mm, membranous, glabrous, 5-veined abaxially, base obtuse, apex attenuate into a medium-sized to long beak, orifice emarginate and shortly 2-toothed. Nutlets brown, slightly tightly enveloped, broadly ovate or subelliptic, trigonous, ca. 1.5 mm, base estipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Apr–Aug.

Wet places at ditch sides or in forests on mountain slopes; 400–2700 m. Hubei, Hunan, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia (Sumatra), Japan, Nepal, New Guinea, Philippines].


草 qian cao

Carex chlorostachys D. Don ex Tilloch & Taylor, Philos. Mag. J. 62: 455. 1823, not Steven (1813); C. alopecuroides D. Don ex Tilloch & Taylor var. chlorostachya C. B. Clarke; C. japonica Thunberg subsp. chlorostachya (C. B. Clarke) T. Koyama; C. japonica var. chlorostachya (C. B. Clarke) Küchenthal; C. sasakii Hayata.

Rhizome short, with slender stolons. Culms 30–60 cm tall, rather thick, compressed triquetrous, scabrous on angles, with brownish yellow sheaths at base, sheaths sometimes disintegrating into fibers. Leaves slightly longer than or nearly equaling culm, blades 5–12 mm wide, flat, rather soft, distinctly 2-veined laterally on upper surface, scabrous on upper margins, sheathed. Involucral bracts leaflike, upper ones linear, longer than subtending spike, not sheathed. Spikes 2–6, lowest 1 or 2 spikes remote, upper ones rather congestate at top of culm; terminal spike male, linear-cylindric, 3–7.5 cm, pedunculate; lateral spikes female, sometimes with several male flowers at apex, cylindric, 3–7 cm, densely many flowered, lower ones shortly pedunculate, upper ones nearly sessile. Female glumes pale yellow or partly pale brown, ovate-lanceolate, ca. 2.5 mm, membranous, green 1-veined, apex mucronate. Utricles greenish yellow, eventually horizontally patent, longer than glume, oblong-ovate, slightly inflated trigonous, 3.5–4 mm, membranous, obscurely several veined, base broadly cuneate or subrounded, apex attenuate into a straight and short beak, orifice shortly 2-toothed. Nutlets dark yellow, loosely enveloped, obovate, trigonous, ca. 1.8 mm, apex mucronate; style base not thickened; stigmas 3, slender, persistent. Fl. and fr. Apr–Oct.

Streamsides, ditch sides, forests, among shrubs, wet places in grasslands; 500–3000 m. Fujian, Guangdong, Guangxi, Hubei, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Nepal, Philippines].


硕果薹草 shuo guo tai cao

Carex japonica Thunberg var. phaenocarpa (Franchet) Küchenthal.

Rhizome short, long stoloniferous. Culms 35–50 cm tall, ca. 1.5 mm thick, compressed trigonous. Leaves shorter than culm, upper blades rather long, lower blades short, 5–8 mm wide, flat, sheathed, lower sheaths purple-brown. Involucral bracts leaflike, longer than spike, very shortly sheathed or sheathless. Spikes 3 or 4, slightly approximate; terminal spike male, narrowly cylindric, ca. 3 cm × 4 mm, pedunculate; lateral spikes 2 or 3, female, cylindric, 2–3.5 cm × ca. 8 mm, densely many flowered, subsessile or lowermost with very short peduncle. Male glumes yellow-brown, ovate-lanceolate, green veined, apex acute; female glumes yellow-brown, ovate-lanceolate, ca. 2.5 mm, green carinate-costate, apex acute and aristulate. Utricles obovaceous, horizontally patent at maturity, ovate, slightly inflated trigonous, 4.5–8 mm, shiny, papery, 5-veined, base broadly cuneate, apex gradually attenuate into a medium-sized to long beak, orifice shortly 2-toothed. Nutlets loosely enveloped, obovate, trigonous, ca. 2 mm; stigmas 3, rather short. Fl. and fr. Apr–Jun.

● Forests, forest margins. Yunnan.


扁秆薹草 bian gan tai cao

Rhizome thick and slightly elongate, with slender stolons. Culms tufted, 30–45 cm tall, rather thick, compressed triquetrous, winged on 2 angles and 1 angle obscure, scabrous on angles, few bladeless sheathed at base. Leaves slightly shorter than culm, blades 5–10 mm wide, flat, rather soft, scabrous on veins and margins, ± long sheathed; sheaths brownish yellow, eventually split on membranous part. Lower involucral bracts leaflike, longer than subtending spike, upper involucral bracts awn-shaped, usually shorter than subtending spike, scabrous on veins and margins, not sheathed. Spikes 4–6, lowest 1 or rather remote, others contiguous at top of culm; terminal spike male, sometimes with some female flowers at apex, narrowly cylindric, 2.5–3.5 cm, shortly pedunculate; lateral spikes female, cylindric, 1.5–4.5 cm, densely many flowered and slightly loosely flowered at base, lowest one rather long pedunculate, upper spikes shortly pedunculate. Female glumes brownish yellow or yellowish, ovate or oblong-ovate, ca. 2.5 mm, membranous, 1-veined, apex acuminate, mucronate. Utricles yellowish green, obliquely patent, more divergent at maturity, longer than glume, ovate or narrowly ovate, obscurely trigonous, 3.5–4 mm, membranous, shiny, glabrous, 5-veined abaxially, base subrounded, apex attenuate into a medium-sized to long and recurved beak, orifice emarginate. Nutlets brown, slightly loosely enveloped, obovate or subelliptic, trigonous, ca. 2 mm; style base slightly thickened; stigmas 3. Fl. and fr. Apr–Aug.

Streamsides, ditch sides, wet places in forests; 1100–1900 m. Hebei, Heilongjiang, Jilin, Liaoning, Shaanxi [Japan, Korea, Russia (Far East)].

离穗薹草组 li sui tai cao zu
Dai Lunkai (戴伦凯); Tetsuo Koyama


Rhizome rather thick. Culms tufted, robust, triquetrous, leafy below middle part of culm, leaves rather stiff. Involucre bracts leaflike, longer than inflorescence, upper involucre bracts rather short, long sheathed. Spikes unisexual, upper 1–3 male, remaining spikes female, densely many flowered, with rather short peduncle. Female glumes scabrous on costa. Utricles plano-convex, 5–10 mm, leathery, glabrous or scabrous, distinctly many veined, apex attenuate into a long beak, orifice slightly long 2-toothed. Style base not thickened; stigmas 3.

Three species: N Africa, Asia, Europe; one species in China.


离穗薹草 li sui tai cao

Rhizome short. Culms tufted, 5–25 cm tall, triquetrous, smooth, clothed at base with reddish brown sheaths. Leaves longer than culm, blades 2–3 mm wide, flat, scabrous on margins, slightly long sheathed, lower sheaths usually red-brown. Involucre bracts leaflike, longer than subtending spike, lower sheaths rather long, upper sheaths rather short. Spikes 4 or 5, ± contiguous, lowermost one rather spaced; upper 1 or 2 spikes male, clavate, 0.8–1.2 cm, shortly pedunculate, suppressing contiguous female spike; remaining spikes female, oblong, 1–1.8 cm, densely many flowered, upper spikes shortly pedunculate, lower ones slightly long pedunculate, peduncles usually enclosed in involucre bracts sheaths. Female glumes pale or slightly brownish yellow, ovate or broadly ovate, ca. 3 mm, 3-veined, green between veins, scabrid on veins, margins hyaline, apex acute. Utricles yellowish green, slightly brownish at maturity, slightly obliquely patent, longer than glume, ovate-lanceolate or oblong-ovate, plano-convex-trigonous, 5–8 mm, sub-leathery, glabrous, 2–4-veined abaxially, base subrounded, margins serrulate winged, apex attenuate into a slightly broad and ± long beak, orifice membranous and deeply splitting into 2 teeth. Nutlets dark brown, slightly loosely enveloped, oblong, compressed trigonous, 3–4 mm, granular-punctate, base shortly stipitate; style tortuous, persistent, base slightly thickened; stigmas 3. Fl. and fr. May–Jul.

Moors, wet places on lakesides and riversides. Heilongjiang, Jilin, Nei Mongol [Mongolia, Russia].


菱形果薹草组 ling xing guo tai cao zu
Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker

Culms central or lateral, rarely very short. Involucre bracts shortly bladed and sheathing or leaflike and sheathless. Terminal spike male, cylindric, clavate, or linear; lateral spikes androgyneus, usually with a long or short male part at apex, rarely all female. Female glumes ovate, oblong, or ovate-lanceolate, rarely linear-lanceolate, apex mucronate, rounded or acuminate, rarely emarginate. Utricles rhomboid, elliptic, or ovate, subtropical or membranous, glabrous, rarely hirsute, many veined, base gradually attenuate, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets obovate or ovate, trigonous, with angles constricted at middle, beak erect or curved, annulate or not at orifice; style base thickened or not thickened; stigmas 3.

About 50 species: E and SE Asia; 43 species (34 endemic) in China.

1a. Culms very short.
2a. Female glumes ovate, rounded at apex ................................................................. 331. C. radiciflora
2b. Female glumes linear-lanceolate, acuminate at apex, scabrous on margins ........................................... 332. C. zunyiensis

1b. Culms long.
3a. Nutlets trigonous with angles not constricted at middle.
4a. Utricles hirsute.
5a. Female spikes usually bearing male flowers at base; utricles rhomboid or obovate .................. 290. C. chinensis
5b. Female spikes without male flowers at base; utricles ovate or lanceolate-ovate.
6a. Utricles lanceolate-ovate, 4.5–5 mm ................................................................. 291. C. diplodon
6b. Utricles ovate, 3–4 mm ............................................................................. 292. C. blinii
4b. Utricles glabrous.
7a. Nutlets with transparent grains on surfaces ......................................................... 304. C. oxyphylla
7b. Nutlets without transparent grains on surfaces.
8a. Style slender, base curved ................................................................. 293. C. qingdaoensis
8b. Style base slightly thickened, not curved.

9a. Involucral bracts leaflike, all involucral bracts or lowest one longer than inflorescence.
10a. Spikes 4 or 5, terminal spike linear, sessile .............................................. 294. C. manciformis
10b. Spikes 2–4, terminal spike linear-cylindric, linear-oblong, or linear, pedunculate.
   11a. Spikes 3 or 4, terminal spike male, linear-cylindric, lateral spikes androgynous, male part 1/3–1/2 length of female part ........................................ 297. *C. austrosinensis*
   11b. Spikes 2–4, terminal spike male, linear or linear-oblong, lateral spikes female, oblong .................................................................................. 298. *C. macrandrolepis*

9b. Involucral bracts shortly bladed, shorter than inflorescence.
   12a. Utricles hirsute.
   13a. Utricles narrowly rhomboid, 5–6 mm ................................................. 299. *C. tatsutakensis*
   13b. Utricles oblong, 7–8 mm ................................................................. 300. *C. longerostrata*

12b. Utricles glabrous.
   14a. Leaves 6–10 mm wide.
       15a. Leaves subequaling culm, 6–8 mm wide; nutlets with beak erect, base erect stipitate .............................................................. 301. *C. xiphium*
       15b. Leaves surpassing culm, 7–10 mm wide; nutlets with beak curved, base curved stipitate ....................................................... 303. *C. yangshuoensis*
   14b. Leaves 1.5–3.5 mm wide.
       16a. Spikes 2, terminal spike clavate, ca. 1 cm, lateral spikes female, ovate, ca. 1 cm, 4- or 5-flowered ................................. 302. *C. pseudolongerostrata*
       16b. Spikes 3 or 4, terminal spike cylindric, 3–6 cm, lateral spikes mostly female, ± with male flowers at apex, cylindric, 1.5–4.5 cm, slightly densely flowered.

17a. Leaves 3–5 mm wide; utricle beak 2-toothed; nutlets ovoid, ca. 5 mm ...................................................................................... 295. *C. simulans*
17b. Leaves 7–12 mm wide; utricle beak barely 2-toothed; nutlets broadly obovoid, 3.5–4.5 mm ............................................. 296. *C. austrozhejiangensis*

3b. Nutlets trigonous with angles constricted at middle.
   18a. Culms lateral.
   19a. Nutlets with curved beak.
       20a. Nutlets with longer beak, ca. 1 mm; female spikes oblong, 1.7–3 cm.
           21a. Leaf blades, involucral bracts, and sheaths scabrous; involucral bracts leaflike, longer than spike; female glumes pale brown, green 3-veined scabrous costa excurrent into a long awn at obtuse apex ........................................ 305. *C. shangchengensis*
           21b. Leaf blades, involucral bracts, and sheaths glabrous; involucral bracts shortly bladed, shorter than spike; female glumes yellow-white, green 3-veined glabrous costa excurrent into a mucro at emarginate apex ............................. 306. *C. manca*
       20b. Nutlets with shorter beak; female spikes cylindric, 3–7 cm.
           22a. Female spikes rather thick, ca. 15 mm wide; utricles subglobose ......................... 307. *C. nanchuanensis*
           22b. Female spikes rather slender, 7–11 mm wide; utricles ovate.
               23a. Lateral spikes androgynous, usually male part equaling female part, densely flowered ......................................................... 310. *C. thibetica*
               23b. Lateral spikes mostly female with male flowers at apex, male part shorter than female part.
                   24a. Female spikes sparsely flowered, horizontally patent at maturity .......... 308. *C. heudesii*
                   24b. Female spikes densely flowered, obliquely patent at maturity .......... 309. *C. taipaishanica*

19b. Nutlets with erect beak.
   25a. Female spikes only 1; female glumes ovate, costa projecting beyond apex forming a long awn ................................................................ ............................ 311. *C. finingensis*
   25b. Female spikes 3–5; female glumes ovate or ovate-oblong, obtuse or rounded at apex, green 3-veined costa projecting beyond apex forming a mucro or cusp but rarely an awn.
   26a. Female spikes cylindric; nutlets with cylindric beak annulate at orifice.
       27a. Female spikes spaced, sparsely flowered; female glumes with a mucro at apex; utricles puberulent ...................................................... 314. *C. longqishanensis*
       27b. Female spikes approximate, densely flowered; female glumes awned or cuspidate at apex; utricles glabrous.
           28a. Female glumes awned at apex; terminal spike male, linear-cylindric, 4.5–8 cm ................................................................. 312. *C. harlandii*
           28b. Female glumes cuspidate at apex; terminal spike male, linear 1.5–3 cm ................................................................................ 313. *C. hoozanensis*
26b. Female spikes ovate or oblong; beak of nutlets not thickened or slightly thickened but not annulate at orifice.

29a. Utricles puberulent

29b. Utricles glabrous.
  30a. Culms 25–40 cm tall; leaf blades 4–6 mm wide ........................................ 315. C. hastata
  30b. Culms 7–13 cm tall; leaf blades 10–15 mm wide ...................................... 316. C. kaoi

18b. Culms central.

31a. Culms, leaves, involucral bracts, female glumes, and utricles all puberulent.
  32a. Beak of nutlets erect; female spikes 3, bearing a short male part at apex; leaf blades 6–10 mm wide ................................................................. 317. C. pseudolaticeps
  32b. Beak of nutlets curved; female spikes 1 or 2; leaf blades 3–5 mm wide ................................. 318. C. laticeps

31b. Culms, leaves, involucral bracts, and female glumes all glabrous.
  33a. Female glumes linear-lanceolate or ovate-lanceolate, usually acuminate at apex, rarely awned.
  34a. Female glumes brown.
  35a. Female glumes linear-lanceolate; lateral spikes usually female, occasionally becoming androgynous, male part shorter than female part; style base not thickened ................................................................. 329. C. brevicuspis
  35b. Female glumes ovate-lanceolate; lateral spikes usually female, occasionally becoming androgynous, male part longer than or equaling female part; style base thickened ................................................................. 330. C. kuchunensis
  36a. Beak of nutlets curved; female glumes slightly longer than or equaling utricle ................................................................. 326. C. cheniana
  36b. Beak of nutlets erect; female glumes shorter than utricle.
    37a. Culms up to ca. 65 cm tall; leaf blades 8–10 mm wide; lateral spikes cylindric, ca. 6.5 × 1 cm ................................................................. 327. C. saxicola
    37b. Culms 2–10 cm tall; leaf blades 1.5–2.5 mm wide; lateral spikes oblong-cylindric, ca. 1.2 × 0.6 cm ...................................................... 328. C. lianchengensis

33b. Female glumes ovate, oblong-ovate, or oblong, obtuse, rounded, or truncate at apex, green 1- or 3-veined costa projecting beyond apex forming a mucro or long awn.
  38a. Beak of nutlets short and curved, annulate at orifice, style base thickened; leaf blades abruptly contracted into a cusp at apex ......................................................... 319. C. liqingii
  38b. Beak of nutlets long and erect, rarely short, annulate or not at orifice, style base hardly thickened; leaf blades not contracted into a cusp at apex.
    39a. Nutlets shallowly constricted on angles at middle, beak short; leaf blades papery ................................................................. 320. C. rhynchophora
    39b. Nutlets deeply constricted on angles at middle, beak ca. 1 mm or more; leaf blades leathery.
      40a. Female glumes ovate, acute or mucronate at apex, red-brown; nutlets constricted on angles and concave surfaced .............................. 321. C. calcicola
      40b. Female glumes oblong, obtuse or emarginate at apex, green 3-veined costa excurrent into an awn, brown; nutlets constricted only on angles at middle.
        41a. Spikes 2, lateral spike wholly female .............................................. 325. C. putuoensis
        41b. Spikes 3 or 4, lateral spikes female or androgynous with male part up to 1/2 length of spike.
          42a. Nutlets rhomboid ................................................................. 322. C. tenebrosa
          42b. Nutlets obovoid or ovoid-ellipsoid.
            43a. Nutlets ovoid-ellipsoid; female glumes with awn ca. 3.5 mm ................................................................. 323. C. chaofangii
            43b. Nutlets broadly obovoid; female glumes with awn ca. 5 mm ................................................................. 324. C. wahuensis

290. Carex chinensis Retzius, Observ. Bot. 3: 42. 1783.

中华薹草 zhong hua tai cao

Rhizome short, obliquely ascending, woody. Culms tufted, 20–55 cm tall, slender, obtusely trigonous, clothed at base with brown sheaths disintegrating into fibers. Leaves longer than culm, blades light green, linear, 3–9 mm wide, leathery, margins scabrous. Involucral bracts shortly bladed, long sheathing. Spikes 4 or 5, distant; terminal spike usually male, rarely androgynous, narrowly cylindric, 2.5–4.2 cm, peduncle 2.5–3.5
cm; lateral spikes female, usually with several male flowers at apex or base, subdensely flowered, peduncles erect, slender. Female glumes pale, oblong-lanceolate, rarely obovate-oblong, ca. 3 mm, green 3-veined costa excurrent into a scabrous long awn, apex truncate or sometimes emarginate or acuminate. Utricles yellow-green, longer than glume, obliquely patent, rhomboid or obovate, subinflated trigonous, 3–4 mm, membranous, sparsely puberulent, many veined, base gradually narrowed into a stipe, apex abruptly contracted into a beak of medium length, orifice 2-toothed. Nutlets tightly enveloped, rhomboid, trigonous, faces con cave at base, apex abruptly contracted into a short beak, beak annulate at orifice; style base thickened; stigmas 3. Fl. and fr. Apr–Jun.

- Shady places in valleys, rocky stream sides and grasslands; 200–1700 m. Fujian, Guangdong, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

1a. Terminal spike male; female glumes oblong-lanceolate.  
1b. Terminal spike gynaecandrous; female glumes obovate-oblong.

290a. Carex chinesis var. chinesis

中华薹草 (原变种) zhong hua tai cao (yuan bian zhong)

Terminal spike male. Female glumes oblong-lanceolate.

- Shady places in valleys, rocky stream sides and grasslands; 200–1700 m. Fujian, Guangdong, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang.

290b. Carex chinesis var. longkiensis (Franchet) Kükenthal


秦岭薹草 qin ling tai cao

Rhzizome very short. Culms 19–22 cm tall, obtusely trigonous, slightly thick, smooth, clothed at base with brown sheaths disintegrating into fibers. Leaves longer than culm, blades linear-ar, 3–5 mm wide, slightly curved or plicate, apex acuminate. Involucral bracts shortly bladed, shorter than subtending spike, long sheathing. Spikes 4 or 5, approximate, lowest one often distant; terminal spike male, brown, narrowly cylindric, 2.5–3 cm; lateral spikes female, erect, cylindric, 2.5–5 cm, densely many flowered, sessile or with short peduncles. Female glumes pale green, oblong-lanceolate, green 3-veined costa excurrent into a macro. Utricles green-brown, longer and broader than glume, obliquely patent, lanceolate-ovate, subtrigonal, 4.5–5 mm, membranous, sparsely hispid, many veined, base cuneate, apex gradually tapering into a conic long beak, orifice 2-toothed. Nutlets tightly enveloped, elliptic, trigonous, faces con cave at base, apex abruptly contracted into a short beak, beak annulate at orifice; style base thickened; stigmas 3. Fl. and fr. Apr–Jun.

- On rocks along valleys and slopes. Gansu, Shaanxi.


白里薹草 bai li tai cao

Rhzizome short. Culms lateral, tufted, 3–13 cm tall, trigonous, scabrous above, with dark brown sheaths 1–2 cm, sheaths disintegrating into fibers. Leaves basal, much surpassing culm, blades linear, 2–7 mm wide, flatish plicate, apex long acuminate. Lowest involucral bract leaflike, 1.5–2.5 cm surpassing inflorescence. Spikes 2–4, crowded; terminal spike male, linear-clavate, 3–5 mm; lateral spikes female, broadly elliptic or subglobose, 5–7 mm, slightly densely flowered, ± sessile. Female glumes dark brown or whitish, deltoid, deltoid-lanceolate, broadly ovate, or deltoid-ovate, 1.5–2.7 mm, margins hyaline, green 3-veined costa excurrent into a short mucro, apex acute or acuminate. Utricles longer than glume, patent, ovate-rhomboid, trigonous, 3–4 × 1.6–1.8 mm, glaucous, glabrous to puberulent, 10–14-veined, base shortly stipitate, apex gradually narrowed to a conic beak ca. 0.6 mm, orifice deeply 2-toothed with up to ca. 0.5 mm long teeth. Nutlets tightly enveloped, broadly ovate, trigonous, faces concave, 2.3–2.4 × ca. 1.6 mm; style base thickened; stigmas 3.

- Streamsides in evergreen forests, woods; 300–700 m. Guangxi, Guizhou, Shanghai [Thailand, Vietnam].
slender, trigonous, clothed at base with dark brown sheaths disintegrating into parallel fibers. Leaves longer than culm, blades linear, 3–5 mm wide, leathery. Involucre bracts shortly bladed, shorter than subtending spike, sheathing 2.5–4 cm. Spikes 2 or 3; terminal spike male, cylindric, ca. 40 × 7 mm; lateral spikes female, with few male flowers at apex, distant, cylindric, 4–5 × ca. 0.8 cm, densely flowered; peduncles 3–5 cm. Female glumes brown, elliptic-lanceolate, 8–10 mm, 3-veined costa excurrent into a scabrous awn ca. 5 mm, apex truncate or emarginate. Ureticles obovate-elliptic, trigonous, 5–6 mm, glabrous, faces concave at base, apex abruptly contracted into a scabrous beak ca. 3 mm, orifice deeply 2-lobed. Nutlets obovate, trigonous, 2–2.5 mm, faces concave at base; style slender, base curved; stigmas 3.

- Shandong (Qingdao).


鄂西薹草 e xi tai cao

Rhizome woody, slightly oblique, roots thick and rigid. Culms 30–40 cm tall, slender, trigonous, slightly scabrous, clothed at base with dark brown sheaths disintegrating into fibers. Leaves longer than culm, blades glaucous green, broadly linear, 5–9 mm wide, flat, leathery. Involucre bracts leaflike, much longer than subtending spike, sheathing. Spikes 4 or 5; terminal spike male, linear, 2–3 cm, sessile; lateral spikes female, cylindric, 2–3.5 cm, slightly loosely flowered, uppermost one contiguous to male spike, subsessile, remaining spikes slightly distant, shortly pedunculate. Female glumes pale green, ovoid, 5–6 mm, green 3-veined costa excurrent into a macro. Ureticles yellow-green, longer than or subequaling glume, rhomboid, inflated trigonous, 5.5–6 mm, leathery, slightly pubescent when young, later glabrous, slightly shiny, many veined, base attenuate, apex abruptly contracted into a cylindric, smooth, long beak, orifice 2-toothed. Nutlets tightly enveloped, ovate, trigonous, curved, faces concave at base, base shortly stipitate, apex abruptly contracted into a cylindric curved beak, beak annulate at orifice; style slightly thickened; stigmas 3. Fl. and fr. Mar–Apr.

- Sparse forests; ca. 1600 m. Guizhou, Hubei, Sichuan.


相仿薹草 xiang fang tai cao

Rhizome thick, woody, rigid. Culms lateral, 30–70 cm tall, slender, obtusely trigonous, smooth, clothed at base with dark brown sheaths disintegrating into fibers. Leaves shorter than culm, blades pale green, linear, 3–5 mm wide, flat, revolute, upper margins scabrous, apex acuminate. Involucre bracts shortly bladed, long sheathing. Spikes 3 or 4, distant; terminal spike male, cylindric, 3–6 cm; lateral spikes mostly female, sometimes bearing few to many male flowers at apex, cylindric, 1.5–4.5 cm, slightly or rather densely flowered; peduncles erect. Female glumes brown or white, ovate-lanceolate or oblong-lanceolate, 5–5.5 mm, green 3-veined costa excurrent into a scabrous awn at emarginate apex. Ureticles green, slightly longer than glume, obliquely patent, ovate (excluding beak), 6–8 mm (including beak), subleathery, glabrous, many veined, base contracted, apex abruptly contracted into a scabrous long beak, orifice 2-toothed. Nutlets loosely enveloped, ovate, trigonous, ca. 5 mm (including beak), not constricted on angles at middle, base shortly stipitate, apical beak erect, ca. 1 mm; style base thickened; stigmas 3. Fl. and fr. Mar–May.

- Roadside, slopes, forests, streamsides. Hubei, Sichuan, Zhejiang.


295a. Carex simulans var. simulans

女相仿薹草(原变种) xiang fang tai cao (yuan bian zhong)

Female spikes slightly densely flowered. Female glumes brown, shortly awned. Fl. and fr. Mar–May.

- Roadside, slopes, forests, streamsides. Hubei, Sichuan, Zhejiang.


密花相仿薹草 mi hua xiang fang tai cao

Female spikes rather densely flowered. Female glumes white, long awned.

- Forests; ca. 2100 m. Sichuan.


浙南薹草 zhe nan tai cao

Rhizome thick, woody, rigid. Culms lateral, 15–40 cm tall, slender, obtusely trigonous, smooth, clothed at base with dark brown sheaths. Leaves longer than culm, blades pale green, linear, 7–12 mm wide, flat, apex acuminate-caudate. Involucre bracts shortly bladed, sheath 6–12 mm. Spikes 3 or 4, distant; terminal spike male, cylindric, 1.5–2 cm; lateral spikes female, cylindric, 2–3.5 cm, densely flowered; peduncles erect. Female glumes reddish brown, broadly ovate, 3–3.5 mm (excluding awn), green 3-veined costa excurrent into a scabrous awn ca. 1 mm at subacute apex. Ureticles green, longer than glume, slightly patent, ovoid-ellipsoid, 6.5–7 mm (including beak), glabrous, many veined, base contracted, apex gradually contracted into a beak 1.5–2 mm, orifice barely 2-toothed. Nutlets loosely enveloped, broadly obovoid, trigonous, ca. 5 mm (including beak), not constricted on angles at middle, base shortly stipitate, apical beak erect, ca. 1 mm; style base thickened; stigmas 3. Fl. and fr. May–Jul.

- Roadside, slopes, forests, streamsides; ca. 600 m. Zhejiang (Longquan, Qingtian, Suichang).


华南薹草 hua nan tai cao
Rhizome woody. Culms 25–45 cm tall, slender, trigonous, smooth, clothed at base with brown sheaths often disintegrating into fibers. Leaves surpassing culm, blades dark green, linear, 1.5–3 mm wide, margins scabrous, revolute, apex acuminate. Involucral bracts leaffilike, long sheathing, lowest involucre bract longer than culm. Spikes 3 or 4, distant; terminal spike male, yellow-brown, linear-cylindric, 3–4 × 0.2–0.25 cm, with slender long peduncle; lateral spikes androgyne, male part 1/3–1/2 length of female part, cylindrical, loosely flowered. Female glumes yellow-brown, ovate, green 3-veined costa excurrent into a scabrous awn, apex truncate or sometimes emarginate. Utricles brown, longer than glume, obliquely patent, lanceolate, 5–6 mm, papery, glabrous, slender, many veined, base cuneate, apex gradually narrowed to a smooth or slightly scabrous long beak, orifice 2-toothed. Nutlets brown, tightly enveloped, obovate, trigonous, 2.5–3 mm, faces concave, base curved stipitate, apex abruptly contracted into a curved beak ca. 1 mm, beak annulate at orifice; style base thickened; stigmas 3.

- Rocky slopes; ca. 1100 m. Guangdong.


和平菱果薹 he ping ling guo tai cao

Carex sharyotensis Hayata.

Rhizome slender, horizontal, with slender stolons. Culms slender, 13–14 cm tall, 0.3–0.7 mm thick, trigonous, smooth, clothed at base with dark brown sheaths eventually disintegrating into fibers. Leaves equaling or slightly longer than culm, blades green, linear, 2–3 mm wide, flattish plicate, scabrous adaxially, apex acuminate. Involucral bracts leaffilike, sheathing. Spikes 3 or 4, distant; terminal spike male, pale brownish, linear or linear-oblong, 10–30 × 1.5–2.5 mm, much surpassing uppermost female spike; lateral spikes female, oblong, 10–15 × ca. 4 mm, subloosely 5–10-flowered; peduncles erect, upper 1 or 2 short and enclosed, lower 1 or 2 exserted. Female glumes pale, usually brownish margined, obovate-elliptic or obovate, 3.8–4 mm, membranous, green 3-veined costa excurrent into a straight short awn, apex rounded or shallowly emarginate. Utricles pale greenish, longer than glume, erect, patent, rhomboid, trigonous, 5–6 mm, thinly leathery, slightly shiny, sparsely hirsute to glabrescent, obscurely few veined or nearly nerveless except for 2 costas on edges, cuneate at both ends, apical beak conic, obliquely truncate at sharply 2-toothed orifice. Nutlets tightly enveloped, obovate, ca. 2.5 mm, trigonous with angles shallowly constricted at middle, base cuneate, shortly stipitate, apex obtuse; style base slightly thickened; stigmas 3.

Grasslands at low elevations. Taiwan [WC Japan, S Korea].


锐果薹草 rui guo tai cao

Carex taihokuensis Hayata.

Rhizome short. Culms lateral, slender, 10–30 cm tall, trigonous, erect, smooth, clothed at base with 2–4 purplish or dark brown, bladeless or shortly bladed sheaths disintegrating into parallel fibers. Leaves surpassing culm, blades broadly or narrowly linear, 2.5–8 mm wide, flattish, soft or subrigid. Spikes 2–4, all or occasionally except lowest one subfastigiate; terminal spike male, pale brownish, linear, 5–10 mm, surpassed by next female spike, few or several flowered; lateral spikes female or rarely with a few male flowers at apex, suberect, oblong, 7–12 × ca. 5 mm, subloosely 3–7-flowered, sessile or sub sessile. Female glumes pale, lanceolate to lanceolate-oblong, 3–4 mm, membranous, glaucous green 3-veined costa projecting beyond apex forming a short erect awn or cusp, apex subacute. Utricles light green, longer than glume, erect-patent, rhomboid or rhomboid-ovate, trigonous, 6–7 mm, papery, glabrous to sparsely hirsute, faintly several veined, base cuneate, shortly stipitate, apex truncate and narrowed to a slender beak ca. 2 mm, beak scabrous on edges, 2-toothed at orifice. Nutlets tightly enveloped, ovate or oblong-obovate, ca. 3 mm, trigonous with shallowly concave sides; style base slightly thickened; stigmas 3.

- Wet grasslands on mountain slopes. Taiwan.


长嘴薹草 chang zui tai cao

Rhizome short or long creeping, obliquely ascending, woody. Culms tufted, slender, 15–50 cm tall, compressed trigonous, slightly scabrous above, clothed at base with light green sheaths when young, finally becoming dark brown, disintegrating into fibers. Involucral bracts shortly bladed, shorter than inflorescence, sheathing. Spikes usually 2, rarely 3; terminal spike male, brownish, clavate, 1–2.5 cm, densely flowered; lateral spikes female, ovate or oblong, 1–1.7 cm, 6–10-flowered; peduncles scarcely exserted from sheath. Female glumes light ferruginous, narrowly elliptic or lanceolate, ca. 6.5 mm, green 3-veined costa excurrent into a scabrous long awn at truncate or obtuse apex, or apex awnless. Utricles green or pale brown, slightly longer than glume, obliquely patent, obovate, obtusely trigonous, 7–8 mm (including beak), membranous, sparsely hirsute or glabrous, many veined, base contracted, apex abruptly contracted into a scabrous long beak, orifice deeply 2-lobed with long teeth. Nutlets tightly enveloped, obovate, obtusely trigonous, ca. 3 mm, faces concave at base, base shortly stipitate; style persistent, base slightly thickened, curved or erect; stigmas 3. Fl. and fr. Apr–Jun.

Grassy slopes, mountain thickets, watersides, forests, grasslands, on cliffs: 400–2500 m. Hubei, Heilongjiang, Jilin, Liaoning, Shannxi, Shanxi, Zhejiang [Japan, Korea, Russia (Far East, Khabakha)].

1a. Rhizome short, oblique; utricles sparsely hirsute; style base curved ......................................................... 300a. var. longerostrata

1b. Rhizome long creeping.

2a. Utricles glabrous; style erect .................. 300c. var. hoii

2b. Utricles sparsely hirsute or pubescent; style curved.

3a. Female glumes aristate ............ 300b. var. pallida

3b. Female glumes acuminate ......................................................... 300d. var. exaristata
300a. Carex longerostrata var. longerostrata

"Carex longerostrata" var. "tsinlingensis" K. T. Fu.


Grassy slopes, mountain thicket, watersides, forests; 1200–2500 m. Hebei, Heilongjiang, Jilin, Liaoning, Shaanxi, Shanxi [Japan, Korea, Russia (Far East, Kamchatka)].


细穗薹草 xi sui tai cao


Rhizome long creeping. Female glumes aristate. Utricles sparsely hisrate. Style base curved.

Forests, grasslands. Jilin, Liaoning [Japan, Korea].


城弯薹草 cheng wan tai cao


● Zhejiang.


无芒长薹草 wu mang chang zui tai cao


● On cliffs; ca. 400 m. Zhejiang (Yueqing).


稗薹草 bai tai cao

Rhizome long creeping, woody. Culms lateral, 30–45 cm tall, compressed trigonous, slightly scabrous above, clothed at base with brown sheaths slightly disintegrating into fibers. Leaves subequaling culm, blades pale green, broadly linear, 6–8 mm wide, flat, margins scabrous. Involucral bracts shortly bladed, long sheathing. Spikes 2 or 3, distant; terminal spike male, clavate-oblong, 1.5–2 cm; lateral spikes female, oblong, 1–2 cm, loosely flowered; peduncles enclosed. Female glumes pale ferruginous, oblong-ovate, green scabrous 3-veined costa excurrent into an awn. Utricles yellow-green, longer than glume, obliquely patent, elliptic, 5–6 mm, membranous, slender, glabrous, many veined, base truncate, apex abruptly contracted into a compressed cylindric, scabrous, long beak, orifice deeply 2-lobed with long teeth. Nutlets dark castaneous, tightly enveloped, obovate, ca. 1 mm, trigonous with angles not constricted at middle; style erect, base slightly thickened; stigmas 3. Fl. and fr. Jul–Aug.

Alpine frozen soil, grasslands, meadows in sparse forests; 1800–2300 m. Gansu, Jilin [Korea].


阳朔薹草 yang shuo tai cao

Rhizome obliquely ascending, woody. Culms densely tufted, 15–30 cm tall, slender, compressed trigonous, scabrous above, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, ca. 1/2 as long as culm, 1.5–3.5 mm wide, flat, margins scabrous, apex acuminate. Involucral bracts shortly bladed, shortly sheathing. Spikes usually 2, rarely 3; terminal spike male, clavate, cylindric, ca. 1 cm; lateral spike female, ovate, ca. 1 cm, 4- or 5-flowered, with short peduncles. Female glumes brown, ovate, green 3-veined costa forming a scabrous awn at apex. Utricles yellow-green, longer than glume, obliquely patent, ovate (excluding beak), ca. 6 mm (including beak), glabrous, finely faintly many veined, base contracted, apex abruptly contracted into a cylindric scabrous long beak, orifice deeply 2-lobed with long teeth. Nutlets dark castaneous, tightly enveloped, obovate, ca. 1 mm, trigonous with angles not constricted at middle; style erect, base slightly thickened; stigmas 3. Fl. and fr. Jul–Aug.


尖叶薹草 jian ye tai cao

Carex jackiana Boott f. oxyphylla (Franchet) Kükenthal.

Rhizome stoloniferous. Culms 20–40 cm tall, smooth. at base, base with short stipe ca. 0.5 mm; style base slightly thickened; stigmas 3. Fl. and fr. Jun.

Forests. Jilin [Korea, Russia (Far East)].
Leaves surpassing culm, blades linear, 2–4 mm wide, flat, margins scabrous, apex long acuminate. Involucral bracts leaflike, lower involucral bracts sheathing, upper involucral bracts shortly sheathing or not. Spikes 3–5, lowest spike distant, upper spikes approximate; terminal spike male, cylindric, subacute, ca. 2 cm, shortly pedunculate; lateral spikes female, often bearing several male flowers, oblong or cylindric, shortly pedunculate. Female glumes pale white, ovate-lanceolate or ovate, green 1-veined costa excurrent into an awn. Utricles green-brown, equaling glume, ovate-trigonal, ca. 3 mm, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets not thickened; stigmas 3. Fl. and fr. May–Jun.

- Evergreen forests, forest margins; 1300–3000 m. SW Sichuan, NW Yunnan.


商城薹草 shang cheng tai cao

Rhizome short, woody. Culms lateral, 30–70 cm tall, compressed trigonous, clothed at base with dark brown sheaths eventually disintegrating into fibers. Leaves shorter than culm, blades green, linear, 4–7 mm wide, usually scabrous adaxially and on margins. Involucral bracts leaflike, scabrous, sheathing. Spikes 2; terminal spike male, elavate, ca. 3 mm; lateral spike androgynous, oblong, ca. 2.5 cm, densely flowered. Female glumes yellow-brown, oblong, 4.5–5 mm (excluding awn), green 3-veined scabrous costa excurrent into a long awn. Utricles pale brown, longer than glume, broadly ovate, ca. 6.5 mm, obliquely patent, densely hispid, many veined, apex abruptly contracted into a beak ca. 2.5 mm, orifice 2-toothed. Nutlets castaneous, tightly enveloped, ovate, ca. 3 mm, trigonous with angles constricted at middle, faces concave at base, style base not thickened; stigmas 3. Fl. and fr. May–Jun.

- Slopes; ca. 600 m. Henan.


弯柄薹草 wan bing tai cao

Rhizome thick and short, woody. Culms lateral, 30–70 cm tall, trigonous, slender, smooth, clothed at base with bladeless sheaths. Leaves longer than culm, rarely shorter, blades broadly linear, 2–10 mm wide, flat, leathery, base plicate, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, long sheathing. Spikes 2 or 3, different; terminal spike male, linear-cylindric, (1–)4–5 cm, with peduncles ca. 5 cm; lateral spikes female, oblong-cylindric, 2–3 cm, slightly densely flowered, with short peduncles. Female glumes stramineous, oblong-lanceolate or ovate-lanceolate, green 3-veined costa excurrent into a micro. Utricles yellow-green, longer than glume, obliquely patent, rhomboid-elliptic, trigonous, 6–8 mm, subleathery, sparsely pubescent, slender, many veined, base shortly stipitate, apex abruptly contracted into a smooth long beak, orifice 2-toothed. Nutlets yellow-brown, tightly enveloped, ovate, ca. 2.5 mm, trigonous with angles constricted at middle, faces concave at base, base curved stipitate, apex abruptly contracted into a cylindrical curved beak; style base thickened; stigmas 3.

- Anhui, Guangdong, Hubei, Taiwan.

1a. Leaf blades shorter than culm ........ 306d. subsp. wichurae
1b. Leaf blades longer than culm.
2a. Leaf blades 2–3 mm wide; nutlets trigonous, sometimes with 1 angle constricted at middle ......................... 306b. subsp. jiuhuaensis
2b. Leaf blades 3–8 mm wide.
3a. Nutlets with apical beak curved .................................. 306a. subsp. manca
3b. Nutlets with apical beak short and erect ........ 306c. subsp. takasagoana

306a. Carex manca subsp. manca
弯柄薹草(原亚种) wan bing tai cao (yuán yà zhǒng)

Leaves longer than culm, blades 6–8 mm wide. Nutlets with apical beak curved.

- Guangdong, Hubei (Badong).


久华薹草 jiǔ huá tài cao


Leaves longer than culm, blades 2–3 mm wide. Nutlets trigonous, sometimes with 1 angle constricted at middle.

- Roadsides, slopes. Anhui.


梦佳薹草 mèng jiā tài cao


Leaves longer than culm, blades 3–5 mm wide. Utricles 7–8 mm. Nutlets with apical beak short and erect.

- Forests at high elevations. Taiwan.


短叶薹草 duān yè tài cao


Leaves shorter than culm. Male spike 1–1.5 cm; female spikes ca. 2 cm, uppermost female spike approximate to male.

- Forested slopes, wet places, streamsides. Macao.


南川薹草 nán chuán tài cao

Rhizome obliquely ascending, thick, woody, rigid. Culms
lateral, 20–35 cm tall, compressed trigonous, smooth, clothed at base with dark brown sheaths disintegrating into fibers. Leaves surpassing culm, blades green, linear, 1.2–1.8 mm wide, flat, upper margins scabrous. Involucral bracts shortly bladed, scabrous on margins, long sheathing. Spikes 4 or 5; terminal spike male, clavate-cylindric, 2.2–3 cm; lateral spikes 3 or 4, female, occasionally with few male flowers at apex, cylindric, 4.5–5.5 cm, densely flowered; peduncles erect. Female glumes lanceolate, dark green 3-veined costa excurrent into a mucro. Urticles yellow-green, slightly longer than glume, obliquely patent, subglobose (excluding beak), 6–7 mm (including beak), membranous, sparsely pubescent, with very prominent veins, base shortly stipitate, apex abruptly contracted into a cylindric long beak, orifice 2-toothed. Nutlets yellow when young, dark brown at maturity, loosely enveloped, elliptic-ovate, ca. 2.5 mm, trigonous with angles constricted at middle, faces concave, base shortly stipitate, apex abruptly contracted into a short beak, slightly curved; style persistent, base thickened; stigmas 3. Fl. Jun.

- Grassly rocky places; 2000–2100 m. Chongqing.


长安薹草 chang an tai cao

Rhizomes obliquely ascending, thick. Culms lateral, 30–45 cm tall, slender, obtusely trigonous, smooth, clothed at base with pale brown or dark brown bladeless sheaths. Leaves longer than culm, blades light green, broadly linear, 7–18 mm wide, leathery, flat, revolute, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, shorter than subtending spike, scabrous marginated, long sheathing. Spikes 3 or 4; terminal spike male, linear-cylindric, 1.5–4 cm, loosely many flowered, long pedunculate; lateral spikes 2 or 3, mostly female, sometimes bearing a few male flowers at apex, cylindric, 3–6 cm, loosely flowered, with erect peduncles 4.5–5 mm. Female glumes yellow-white, ovate-lanceolate, 4–5 mm, green 3-veined costa ending in an awn at acuminate apex. Urticles pale brown or brown-olivaceous, longer than glume, horizontally patent at maturity, ovate-orbicular, inflated trigonous, 4.5–6 mm, papery, slightly scabrous, many veined, apex abruptly contracted into a cylindric long beak, orifice deeply 2-lobed. Nutlets dark black, loosely enveloped, obovate, ca. 2 mm, trigonous with angles constricted at middle, faces concave at base, base curved stipitate, style thickened, oblique, persistent; stigmas 3. Fl. and fr. May–Jun.

- Rock crevices, moist places in forests; 1100–2000 m. Gansu, Shaanxi, Sichuan.


太白山薹草 tai bai shan tai cao

Rhizomes thick, woody, rigid. Culms lateral, 35–50 cm tall, obtusely trigonous, smooth, clothed at base with brown bladeless sheaths. Leaves surpassing culm, blades pale green, broadly linear, 5–17 mm wide, leathery, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, shorter than subtending spike, long sheathing. Spikes 4–6; terminal spike male, narrowly cylindric, 3–6 cm, pedunculate; lateral spikes androgynous, male part usually equaling female part, cylindric, 4–7 cm, densely flowered, with slender, scabrous peduncles. Female glumes light yellow-brown, ovate-lanceolate, green 3-veined costa excurrent into a mucro. Urticles yellow-brown, longer than glume, obovate, subinflated trigonous, 5–6 mm (including beak), membranous, glabrous or sparsely hispid, many veined, base gradually narrowed, apex abruptly contracted into a cylindric long beak, beak slightly curved, deeply 2-lobed at orifice. Nutlets castaneous, tightly enveloped, obovate, ca. 2 mm (excluding beak), trigonous with angles constricted at middle, base curved stipitate, apical beak slender, slightly curved; style persistent, base hardly thickened; stigmas 3. Fl. and fr. Apr–May.

- Forested slopes, thickets along valleys; ca. 1200 m. Gansu, Shaanxi, Sichuan.


藏薹草 zang tai cao

Rhizome thick, woody, rigid. Culms lateral, 35–50 cm tall, obtusely trigonous, smooth, clothed at base with brown bladeless sheaths. Leaves surpassing culm, blades pale green, broadly linear, 5–17 mm wide, leathery, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, shorter than subtending spike, long sheathing. Spikes 4–6; terminal spike male, narrowly cylindric, 3–6 cm, pedunculate; lateral spikes androgynous, male part usually equaling female part, cylindric, 4–7 cm, densely flowered, with slender, scabrous peduncles. Female glumes light yellow-brown, ovate-lanceolate, green 3-veined costa excurrent into a mucro. Urticles yellow-brown, longer than glume, obovate, subinflated trigonous, 5–6 mm (including beak), membranous, glabrous or sparsely hispid, many veined, base gradually narrowed, apex abruptly contracted into a cylindric long beak, beak slightly curved, deeply 2-lobed at orifice. Nutlets castaneous, tightly enveloped, obovate, ca. 2 mm (excluding beak), trigonous with angles constricted at middle, base curved stipitate, apical beak slender, slightly curved; style persistent, base hardly thickened; stigmas 3. Fl. and fr. Apr–May.

- Forests, shady and moist places or rock crevices along valleys, cliffs along stream sides; 800–2200 m. Chongqing, Guangxi, Guizhou, Hunan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang.

1a. Leaf blades ca. 5 mm wide only; lateral spikes 2–3 cm .................................................. 310c. var. minor
1b. Leaf blades 6–17 mm wide; lateral spikes 4–7 cm.

2a. Lateral spikes many flowered ........... 310a. var. thibetica
2b. Lateral spikes 6- or 7-flowered

.................................................... 310b. var. pauciflora

310a. Carex thibetica var. thibetica

藏薹草(原变种) zang tai cao (yuan bian zhong)

Carex dichroa Franchet (1895), not Freyn (1890); C. tchenkeouensis E. G. Camus.

Leaf blades 6–17 mm wide. Lateral spikes many flowered.

- Forests, shady and moist places or rock crevices along valleys; 800–2200 m. Chongqing, Guangxi, Guizhou, Hunan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang.

少花藏薹草 shao hua zang tai cao

Leaf blades 6–12 mm wide. Lateral spikes 6– or 7-flowered.

- Cliffs along streamsides; ca. 2200 m. Yunnan (Yongshan).


小藏薹草 xiao zang tai cao

Leaf blades ca. 5 mm wide only. Lateral spikes 2–3 cm.

- Shaanxi.


富宁薹草 fu ning tai cao

Rhizome short, woody. Culms lateral, up to 40 cm tall, compressed trigonous, smooth, clothed at base with dark brown sheaths disintegrating into fibers. Leaves surpassing culm, blades broadly linear, 7–9 mm wide, base plicate and flattened distally, adaxial surface and upper margins scabrous, apex acuminate. Involucral bracts leaflike, almost sheathless. Spike 1, female, cylindric, ca. 5 × 1 mm, pedunculate. Female glumes yellow-white, lanceolate, 6–8 mm, green 3-veined costa excurrent into a long awn. Utricles green, longer than glume, obliquely patent, ovate (excluding beak), 7–7.5 mm (including beak), membranous, sparsely pubescent, conspicuously many veined, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets yellow-brown, tightly enveloped, rhomboid-elliptic, trigonous, ca. 7 mm, constricted on angles at middle, faces concave at base, base curved stipitate, apex abruptly contracted into a slender and erect beak, orifice annulate; style base broadly conic; stigmas 3. Fl. and fr. Apr–Jul.

Forests, thickets, moist places and on rocks along streamsides, grasslands, slopes. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hubei, Jiangxi, Zhejiang [Indonesia, Myanmar, Thailand, N Vietnam].


凤凰薹草 feng huang tai cao

Rhizome thick, obliquely ascending. Culms densely tufted, slender, 5–20 cm tall, 1.2–1.5 mm thick, smooth, suberect, clothed for most length with bladed sheaths. Leaves several times longer than culm, blades broadly linear, 5–15 mm wide, flat, leathery, 3-costate, with rather conspicuous, transverse, light yellowish brown veinlets, shortly sheathing. Involucral bracts leaflike, surpassing inflorescence, shortly sheathing. Spikes 2 or 3, sublaxly many flowered, subsessile or shortly pedunculate. Female glumes pale, ovate-elliptic to ovate-oblong, ca. 3 mm, membranous, broad, green 3-veined costa forming a cusp at subacut apex. Utricles olive-green, longer than glume, patent, ovate-fusiform, 7–8 mm, herbaceous, glabrous, finely many veined, rather gradually narrowed at both ends, apical beak narrowly conic, orifice 2-lobed. Nutlets tightly enveloped, obovate, 4–5 mm, trigonous with angles usually minutely constricted at middle, base annulate; style gradually enlarged toward base forming a persistent beaklike appendage on nutlet; stigmas 3, short.

Forests. Taiwan [Vietnam].


陇栖薹草 long qi shan tai cao

Rhizome short, woody. Culms lateral, 55–65 cm tall, trigonous, glabrous, clothed at base with bladeless sheaths. Leaves longer or shorter than culm, blades broadly linear, 7–8 mm wide, flat, leathery, apex acuminate. Involucral bracts shortly bladed, shorter than inflorescence, long sheathing. Spikes 3, distant; terminal spike male (occasionally with 1 to few female flowers at base), linear, 4–5 cm, with peduncles 5.5–6.5 cm, scabrous; lateral spikes female (or bearing a short male part at apex), cylindric, 2.7–4 cm, loosely flowered. Female glumes pale, oblong, 4.5–5 mm, green 3-veined costa forming a short macro at apex. Utricles yellow-green, longer than glume, 9–10 mm, pubescent, many veined, base cuneate, apex gradually narrowed to a long beak, orifice 2-toothed. Nutlets tightly enveloped, oblong, ca. 3 mm, obtusely trigonous, constricted at angles of middle, base stipitate, apex abruptly contracted into a

颤叶薹草 ji ye tai cao

Rhizome short, woody. Culms lateral, 25–40 cm tall, slender, trigonous, scabrous above, clothed at base with dark brown sheaths disintegrating into fibers. Leaves surpassing culm, blades gray-green, linear, 4–6 mm wide, flat, rigid, margins scabrous, pubescent. Involucral bracts shortly bladed, scabrous on margins, sheathing. Spikes 2 or 3, approximate; terminal spike male, linear, ca. 1 cm, shortly pedunculate; lateral spikes female, oblong-ovate, ca. 12 × 5–7 mm, few to 7-flowered, shortly pedunculate, uppermost female spike and terminal male spike nearly paired. Female glumes yellow-white, ovate, green 3-veined costa excurrent into a scabrous short awn, apex acute. Utricles yellow-green, longer than glume, obliquely patent, ovate-elliptic, ca. 8 mm, papery, densely pubescent, apex abruptly contracted into a cylindric beak ca. 3 mm, orifice 2-toothed. Nutlets yellow-brown, tightly enveloped, rhomboid-elliptic, ca. 5 mm, trigonous with angles constricted at middle, faces concave at base, base with short curved stipe, apex abruptly contracted into a long erect beak ca. 1.5 mm, beak expanding into an annulate orifice; style base thickened; stigmas 3. Fl. and fr. Apr–May.

- Rock crevices. Hong Kong.


弯喉薹草 wan hui tai cao

Carex cavaleriei H. Léveillé & Vaniot; C. hancei C. B. Clarke.

Rhizome short, woody, rigid, stoloniferous. Culms 30–40 cm tall, slender, trigonous, sparsely pubescent, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades gray-green, linear, 3–5 mm wide, flat, revolute, pubescent, apex acuminate. Involucral bracts shortly bladed, pubescent, long sheathing. Spikes 2 or 3, distant, peduncles pubescent; terminal spike male, clavate, 1.5–2.5 cm, with peduncles 4–9 mm; lateral spikes 1 or 2, female, oblorg or oblong-cylindric, 2–2.5 × 1–1.4 cm, densely flowered. Female glumes yellow-white, ovate-lanceolate, 5–6 mm, green 1-veined costa excurrent into an awn. Utricles brown-green, longer than glume, ovate, trigonous, 7–8 mm (including beak), with peduncles 4–9 mm; lateral spikes 1 or 2, female, oblorg or oblong-cylindric, 2–2.5 × 1–1.4 cm, densely flowered. Female glumes yellow-white, ovate-lanceolate, 5–6 mm, green 1-veined costa excurrent into an awn. Utricles brown-green, longer than glume, ovate, trigonous, 7–8 mm (including beak), pubescent, many veined, apex abruptly contracted into a cylindric beak ca. 3 mm, orifice deeply 2-lobed with long acute teeth. Nutlets black at maturity, tightly enveloped, ovate, 3–4 mm, trigonous with angles constricted at middle, faces concave at base, base with short curved stipe, apex with short curved beak; style base thickened; stigmas 3. Fl. and fr. Mar–Apr.

- Forested slopes, roadsides, stream-sides. Anhui, Fujian, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang [Japan, Korea].
leathery, glabrous, many veined, base shortly stipitate, apex gradually attenuate into a beak ca. 2 mm, orifice 2-lobed with sharp teeth. Nutlets yellow-brown, tightly enveloped, ovate, ca. 2 mm, trigonous with angles constricted at middle, faces concave at base, base shortly stipitate, apex abruptly contracted into a curved short beak, orifice annulate; style base hardly thickened; stigmas 3.

- Guizhou, Jiangsu, Zhejiang.


Rhizome short, woody, rigid. Culms 60–150 cm tall, trigonous, smooth, rigid. Leaves surpassing culm, blades brown-green, broadly linear, 5–8 mm wide, flat, leathery, base plicate, revolute margins scabrous, apex acuminate. Involucral bracts setaceous, scabrous, sheathing. Spikes 3 or 4; terminal spike male, narrowly cylindric, 5–6 cm, with long peduncle; lateral spikes 2 or 3, androgynous, male part slightly shorter than female part, cylindric, 3–7 cm, densely flowered, lowest peduncle rather long, smooth, erect, upper ones rather short. Female glumes brown, oblong, 1-veined costa projecting beyond emarginate apex forming a scabrous substraight long awn. Utricles brown-olivaceous, longer than glume, rhomboid, 9–9.5 mm, subleathery, many veined, base cuneate, margins sparsely hispid, apex gradually attenuate into a subcylindric, scabrous long beak, orifice deeply 2-lobed with long teeth. Nutlets tightly enveloped, rhomboid, 5 cm (including beak), trigonous with angles deeply constricted in middle, faces concave below, apex abruptly contracted into a cylindric beak ca. 2 mm, orifice slightly inflated; style base ± thickened; stigmas 3, rather long. Fr. Mar.

- Forests, swamplike grasslands. Hong Kong.


Rhizome obliquely ascending, woody. Culms 30–60 cm tall, slender, rigid, trigonous, scabrous above, clothed at base with dark brown sheaths disintegrating into fibers. Leaves longer than culm, blades linear, 2–5 mm wide, rigid, revolute, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, sheathing. Spikes 3–5; terminal spike male, cylindric, ca. 2.2 cm, with long peduncles; lateral spikes androgynous, with male part 1/3–1/2 length of female part, cylindric, 2.5–4 cm, subdensely flowered, with short peduncles. Female glumes ferruginous, oblong-elliptic, green 3-veined costa excurrent into a scabrous awn. Utricles green, slightly longer than glume, obliquely patent, lanceolate-ovate, 6–7 mm (including beak), subleathery, glabrous, many veined, apex gradually tapering into a long (2.5–3 mm) beak, orifice deeply 2-lobed with long teeth. Nutlets tightly enveloped, ovate-elliptic, 3.5–4 mm (including beak), trigonous with angles constricted at middle, base with a short curved stipe, apex abruptly contracted into a beak 0.5–0.8 mm, beak expanding into an annulate orifice; style base hardly thickened; stigmas 3. Fl. and fr. Mar.–May.

- Slopes, on rocks along valleys; 600–1800 m. Chongqing, Guizhou, Jiangsu, Zhejiang.


Rhizome short, woody, rigid. Culms 25–35 cm tall, tristiquetrous, smooth, rigid. Leaves surpassing culm, blades brown-green, broadly linear, 6–10 mm wide, flat, leathery, margins scabrous. Involucral bracts leaflike, shorter than spikes, smooth, sheathing. Spikes 3; terminal spike male, cylindric, 2–3 cm, with peduncle 2.5–3 cm; lateral spikes 2, female, cylindric, 3.5–5 cm × 1 cm, densely flowered, lower peduncle 3.5–5 cm, smooth, erect, upper ones shorter. Female glumes green, glaucous, ovate-elliptic, ca. 3 mm (excluding awn), 1-veined costa projecting beyond subacute apex forming a scabrous awn ca. 3.5 mm. Utricles green, glaucous, longer than glume, ellipsoid to obovoid-ellipsoid, ca. 7 mm, subleathery, glabrous, inconspicuously many veined, base cuneate, apex gradually attenuate into a subcylindric, smooth beak ca. 2 mm, orifice deeply 2-toothed. Nutlets tightly enveloped, broadly ovoid-ellipsoid, ca. 6 mm (including beak), trigonous with angles deeply constricted in middle, faces concave below, apex abruptly contracted into a cylindric beak ca. 1 mm, apex slightly swollen; style base ± thickened; stigmas 3. Fl. and fr. Apr.–Jun.

- Forests, valleys, on rocks; 700–1400 m. Zhejiang (Baishanzu, Longquan, Qingyuan).
Carex bongardii Boott var. robusta Franchet & Savatier, Enum. Pl. Jap. 2: 561. 1878; C. bongardii Boott; C. boottiana Hooker & Arnott; C. reflexistyla Hayata; C. wahuensis var. robusta (Franchet & Savatier) Franchet & Savatier.

Densely tufted with thick rhizomes; rhizome oblique, clothed with dusty brown fibers. Culms 1 or few to a clump, erect or obliquely ascending, 20–100 cm tall, 1–2 mm thick, trigonous, rigid, scabrous on upper angles. Leaves surpassing culm, blades broadly linear, 3–12 mm wide, flattish, leathery, stiff, sheaths rather short, pale with brown or purple-brown veins, eventually disintegrating into dusty brown parallel fibers. Lower involucral bracts long sheathing, blades leaflike, much surpassing subtending spike but shorter than inflorescence, upper involucral bracts shortly sheathing with short setaceous blade. Spikes 3–6, upper 2 or 3 approximate, remaining spikes distant, or all distant; terminal spike male, narrowly clavate or subcylindric, 3–7 × 3–6 mm; lateral spikes usually female, occasionally becoming androgynous with male part up to 1/2 length of spike, 2–6 × 0.6–0.8 mm, densely many flowered, with erect peduncles. Female glumes pale or slightly rusty brown, ovate or lanceolate-ovate, 4–5 mm, membranous, margins white hyaline, light green 3-veined costa excurrent into a straight awn to ca. 5 mm, apex obtuse or shallowly emarginate. Utricles equaling glume, patent, ovate-globose, swollen trigonous, 5–6 mm, herbarious, glabrous, many veined, contracted at both ends, apical beak erect, spinulose margined, orifice deep 2-lobed, with sharp curved teeth 1–2 mm. Nutlets rather tightly enveloped, broadly obovoid, trigonous with angles slightly constricted at middle, crowned with a beak subannulate at base; style base enlarged; stigmas 3, elongate, ± persistent.

Seacoasts, in stable sands and among rocks. Hong Kong, Taiwan (including Bonin Islands and Ryukyu Islands), Korea.

Carex wahuensis subspp. wahuensis occurs in the Pacific islands (Hawaiian Islands).


普陀薹草 pu tuo tai cao

Rhizome woody. Culms ca. 25 cm tall, trigonous, clothed at base with dark brown bladeless sheaths. Leaves shorter than glume, blades brown-green, linear, 2–4 mm wide, revolute, leathery. Involucral bracts shortly bladed, sheathing. Spikes 2; terminal spike male, clavate, ca. 4.5 cm, peduncles ca. 7.5 cm; lateral spike female, cylindrical, ca. 3.5 cm, densely flowered, shortly pedunculate. Female glumes brown, oblong, ca. 3.5 mm, upper margins white hyaline, 3-veined costa excurrent into a scabrous long awn at slightly emarginate apex. Utricles brown, longer than glume, obovate, trigonous, ca. 5 mm, papery, many veined, base cuneate, apex gradually narrowed into a sparsely serrulate beak, orifice deep 2-lobed with long teeth. Nutlets dark brown, tightly enveloped, obovate, ca. 2 mm, trigonous with angles constricted at middle, faces concave at base, apex abruptly contracted into a curved beak; stigmas 3.


陈氏薹草 chen shi tai cao

Rhizome short. Culms 40–57 cm tall, trigonous, smooth. Leaves surpassing culm, blades green, broadly linear, 5–9 mm wide, flat, revolute, upper margins scabrous, apex acuminate. Involucral bracts shortly bladed, sheathing. Spikes 4 or 5; terminal spike male, clavate-cylindric, 1–2.7 cm; lateral spikes 3 or 4, female except for several male flowers at apex, cylindric, 3.5–6 × 0.5–0.8 cm, densely flowered. Female glumes pale, elliptic-lanceolate, 6–6.5 cm, lustrous, glabrous, green 3-veined costa excurrent into a long awn. Utricles yellow-brown, shorter than glume, obliquely patent, rhomboid-elliptic (excluding beak), 7–7.5 mm (including beak), leathery, pubescent, many veined, base cuneate, apex abruptly contracted into a compressed long beak ca. 4 mm, orifice deep 2-lobed with long teeth. Nutlets tightly enveloped, ovate-elliptic, ca. 3 mm, trigonous with angles constricted at middle, faces concave both at apex and at base, base curved stipitate, apex abruptly contracted into a very short curved beak; style base slightly thickened; stigmas 3. Fl. and fr. Apr.–May.

- Forested slopes. Fujian, Hunan, Jiangxi, Zhejiang.

岩生薹草 yan sheng tai cao

Rhizome short, woody. Culms up to ca. 65 cm tall, rigid, trigonous, scabrous above. Leaves surpassing culm, blades broadly linear, 8–10 mm wide, upper margins scabrous, apex acuminate. Involucral bracts surpassing inflorescence, sheathing. Spikes 4, approximate; terminal spike male, linear-cylindric, 5.5–7 cm, with long peduncle; remaining 3 spikes mostly female, occasionally becoming androgynous with male part ca. 1/6 length of female part, cylindrical, 6–7.5 × ca. 1 cm, densely flowered, peduncles exserted. Female glumes pale yellow, elliptic-lanceolate or lanceolate, 5.5–6 mm, membranous, hispid, green 3-veined costa excurrent into a short awn ca. 2 mm. Utricles shorter than glume, obliquely patent, ovate-lanceolate, 7.5–8 mm, sparsely hispid, many veined, base cuneate, apex gradually narrowed into a scabrous long beak 2–3 mm, orifice 2-lobed with short teeth. Nutlets tightly enveloped, broadly elliptic-rhomboid, ca. 4 mm, trigonous with angles constricted at middle, faces concave at base, apex abruptly contracted into a narrowly cylindrical curved beak ca. 1 mm, beak expanding into a discoid-annulate orifice; style persistent, base thickened; stigmas 3. Fr. Dec.

- Dense forests. Fujian, Hainan (Dongfeng), Hunan.


岩生薹草 yan sheng tai cao

Rhizome short, woody. Culms central, 2–10 cm tall, acutely trigonous, clothed at base with black-brown sheaths disintegrating into fibers. Leaves longer than or subequalling culm, blades linear, 1.5–2.5 mm wide, revolute. Involucral bracts shortly bladed, shorter than inflorescence, sharply sheathing. Spikes 2 or 3; terminal spike male, gray-brown, narrowly cylin-
Culms very short. Leaves 25–70 cm, blades broadly linear, 1.4–2 cm wide, flat, base clothed with purple-brown sheaths disintegrating into fibers, upper margins slightly scabrous, apex acuminate. Involucral bracts sheathlike. Spikes 3–6, all basal and approximate; terminal spike male, linear-cylindric, 1.8–2 cm; remaining spikes female, oblong-cylindric, 1.8–3 cm, densely flowered, pedunculate. Female glumes light green-brown, ovate, ca. 3 mm, margins broadly white hyaline, 3-veined costa forming a short mucro at obtuse apex. Utricles brown, more than 2 × as long as glume, obliquely patent, ovate-lanceolate, inflated trigonous, 6–6.5 mm, leathery, puberulent, many veined, contracted at both ends, base shortly stipitate, apex abruptly contracted into a cylindric beak ca. 1 mm, beak slightly annulate at orifice, rarely beak absent; style base enlarged; stigmas 3. Fr. Apr–May.

- Forested slopes, streamsides; 500–700 m. Anhui, Fujian, Hunan, Jiangxi, Shaanxi, Taiwan, Zhejiang.

329a. Carex brevicuspis var. brevicuspis

1a. Culms long; nutlets with beak ....... 329a. var. brevicuspis
1b. Culms short; nutlets without beak ..... 329b. var. basiflora

329b. Carex brevicuspis var. basiflora

短尖薹草 (原变种) duan jian tai cao (yuan bian zhong)

Culms long. Nutlets without beak.

- Forested slopes, streamsides; 500–700 m. Anhui, Fujian, Hunan, Jiangxi, Shaanxi, Taiwan, Zhejiang.

330. Carex kuchunensis


根花薹草 gu hua tai cao

Culms short. Nutlets without beak. Leaves surpassing culm, blades broadly linear, 6–8 mm wide, flat, leathery, margins scabrous. Involucral bracts shortly bladed, long sheathing. Spikes 4 or 5; terminal spike male, linear-cylindric, 5–7.5 cm, with long peduncle; lateral spikes 4 or 4, androgynous, cylindric, male part linear, longer than or equaling female part, 5–7.5 cm, with long or short peduncles. Female glumes pale brown, ovate-lanceolate, green 3-veined costa ending in a cusp. Utricles slightly longer than or nearly equaling glume, slightly obliquely patent, subhorizontal at maturity, ovate (excluding beak), 6–7 mm (including beak), leathery, glabrous, many veined, base rounded, apex abruptly contracted into a slightly compressed long beak ca. 4 mm, beak sparsely serrulate, 2-toothed at orifice. Nutlets purple-black at maturity, tightly enveloped, ovate, ca. 2.5 mm, trigonous with angles constricted at middle, faces concave at base, base with curved short stipe, apex abruptly contracted into a curved beak; style base inflated conic; stigmas 3.

- Shady forests, on rocks by streamsides along valleys; ca. 900 m. Guangxi.


遵义薹草 zun yi tai cao

Culms short. Nutlets without beak. Leaves surpassing culm, blades broadly linear, 1–1.5 cm wide, flat, base clothed with dark brown sheaths disintegrating into fibers, upper margins slightly scabrous, apex acuminate. Male spikes sheathing. Spikes 4 or 5, all basal and approximate; terminal spike male, linear-cylindric, 5–7.5 cm, with long peduncle; lateral spikes 3 or 4, androgynous, cylindric, male part linear, longer than or equaling female part, 5–7.5 cm, with long or short peduncles. Female glumes pale brown, ovate-lanceolate, green 3-veined costa ending in a cusp. Utricles slightly longer than or nearly equaling glume, slightly obliquely patent, subhorizontal at maturity, ovate (excluding beak), 6–7 mm (including beak), leathery, glabrous, many veined, base rounded, apex abruptly contracted into a slightly compressed long beak ca. 4 mm, beak sparsely serrulate, 2-toothed at orifice. Nutlets purple-black at maturity, tightly enveloped, ovate, ca. 2.5 mm, trigonous with angles constricted at middle, faces concave at base, base with curved short stipe, apex abruptly contracted into a curved beak; style base inflated conic; stigmas 3.
per margins slightly scabrous, apex acute or acuminate. Involu-
cr bracts shortly bladed, sheathless. Spikes 4–7, subbasal, ap-
proximate; terminal spike male, linear-cylindric, 3.5–5 cm; re-
main ing spikes female, oblong-cylindric, 3–5 cm, densely
flowered, pedunculate. Female glumes green-yellow, lanceo-
late, ca. 4 mm, margins scabrous, 3-veined costa excurrent into
scabrous mucro at sharp apex. Utricles olivaceous-green,
longer than glume, obliquely patent, elliptic, 4–5 mm, membra-
nous, sparsely hispid, many veined, contracted at both ends,
apical beak subcylindric, 2-toothed at orifice. Nutlets yellow
when young, tightly enveloped, ovate-elliptic, trigoson with
angles constricted above, apical beak short, curved, expanding
into an annulate orifice; stigmas 3. Fl. and fr. Mar–Apr.

- Streamside along valleys, on rocks in forests; 200–1400 m.
  Anhui, Guangdong, Guangxi, Guizhou, Sichuan.


Culms central or lateral. Spikes 2–5; terminal spike male, rarely androgynous; lateral spikes female, usually few, loosely
or slightly loosely flowered. Utricles membranous, rarely subleathery, many veined, glabrous or pilose.

About 15 species: Asia, Europe, North America; 11 species (seven endemic) in China.

1a. Culms lateral.
2a. Utricles glabrous, 5.5–6.5 mm ................................................................. 342. C. arisanensis
2b. Utricles sparsely pubescent, 4–4.5 mm .................................................... 343. C. changmuensis

1b. Culms central.
3a. Terminal spike androgynous ................................................................. 341. C. yunlingensis
3b. Terminal spike male.

4a. Leaf margins and veins sparsely pilose.
5a. Female glumes obtuse at apex, not mucronate; utricles densely papillose .................................. 337. C. hypoblephara
5b. Female glumes slightly obtuse at apex, mucronate; utricles glabrous or sparsely pilose
  (but not papillose) .................................................................................. 338. C. pilosa

4b. Leaves glabrous.
6a. Utricles glabrous.
7a. Involucr al bracts leaflike ................................................................. 339. C. filipes
7b. Involucral bracts shortly bladed .......................................................... 340. C. baimaensis

6b. Utricles hirsute.
8a. Utricles obovate or obovate-lageniform, 5–6 mm.
9a. Utricles obovate, inflated trigonous, 5–6 mm, yellow-green, hirsute, many veined ........ 334. C. giral diana
9b. Utricles obovate-lageniform, compressed trigonous, ca. 5 mm, yellowish or grayish
  green, scattered setulose adaxially, nerveless, scabrous margined above ............................... 333. C. alajica
8b. Utricles oblong, 7–9 mm.
10a. Leaves shorter than culm; nutlets oblong, sessile ........................................ 335. C. wushanensis
10b. Leaves longer than culm; nutlets elliptic, canaliculate adaxially, 2 lateral faces
  slightly concave ................................................................................ 336. C. canaliculata


葱岭薹草 cong ling tai cao

Rhizome short, ascending, stoloniferous. Culms tufted, 15–25 cm tall, trigonous, scabrous above, slightly curving,
clothed at base with brown sheaths eventually disintegrating
into parallel fibers. Leaves ca. 1/2 length of culm, blades linear,
1.5–2.5 mm wide, erect, apex long acuminate. Involucral bracts
leaflike, 2 × as long as spike, sheathing 5–8 mm. Spikes 2 or 3;
terminal spike male, lanceolate to lanceolate-clavate, 1–1.5 cm,
sessile; remaining spikes female, obovate, 1–1.5 cm, loosely
slightly patent, with short peduncles 5–8 mm. Female glumes
reddish ferruginous, ovate, margins white hyaline, apex long
acuminate. Utricles yellowish or grayish green, much longer
than glume, obovate-lageniform, compressed trigonous, ca. 5
mm, thinly leathery, scattered setulose adaxially, nerveless, up-
per margins scabrous, apex abruptly tapering into a flattened
long beak, beak scabr us on margins, deeply 2-lobed at orifice.
Fr. Jun.

Meadows in valleys; 2000–3500 m. Xinjiang [C Asia].


涝峪薹草 lao yu tai cao

Rhizome creeping, woody. Culms 16–30 cm tall, com-
pressed trigonous, smooth, clothed at base with pale brown
sheaths disintegrating into fibers. Leaves shorter than or
equaling culm, blades light green, linear, 2–5 mm wide, slightly
rigid, margins scabrous, revolute. Involucral bracts shortly
bladed, sheathing. Spikes 3–5, distant; terminal spikes male,
clavate-cylindric, ca. 1 cm; lateral spikes female, often with
male flowers at apex, ovate, 3–5-flowered, 6–8 mm; pedun-
cles scabrous, upper 2 enclosed, lower 2 exserted. Female glumes yellowish white, oblong, green 3-veined costa excurpent into a scabrous mucro at subtruncate apex. Utricles yellow-green, subequaling glume, oblique patent, obtuse, inflated trigonous, 5–6 mm, hirsute, many veined, apex abruptly contracted into a cylindric beak, orifice 2-toothed. Nutlets tightly enveloped, obovate, trigonous with angles constricted at middle, faces concave at base, base shortly stipitate, apical beak expanding into a discoid-annulate orifice; style base enlarged; stigmas 3. Fl. and fr. Mar.–May.

- Roadsides along valleys; ca. 1200 m. Hebei, Shaanxi.


武山薹草 wu shan tai cao

Rhizome long, obliquely ascending, woody. Culms 28–40 cm tall, slender, clothed at base with brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 1.5–3 mm wide, flat. Involucral bracts shortly bladed, long sheathing. Spikes 2 or 3, distant; terminal spike male, cylindric, 2–3 cm, peduncles 6–10 cm; lateral spikes female, sometimes with several male flowers at apex, oblong, 1.5–1.8 cm, 2–4-flowered, peduncles 1.5–2.5 cm. Female glumes pale, oblong, green 3-veined costa excurrent into a micro. Utricles brown-green, longer than glume, obliquely patent, oblong, trigonous, ca. 9 mm, membranous, pubescent, many veined, base cuneate, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets tightly enveloped, oblong, ca. 4 mm, sessile, apical beak ca. 1.3 mm; style base thickened; stigmas 3. Fl. Jun.

- Slopes; ca. 1600 m. Gansu (Wushan, Zhangxian).


沟囊薹草 gou nang tai cao

Rhizome creeping, woody. Culms 18–30 cm tall, very slender, smooth, clothed with purple-red sheaths at base. Leaves surpassing culm, blades linear, 4–6 mm wide, flat, margins scabrous. Involucral bracts shortly bladed, long sheathing. Spikes 3, distant; terminal spike male, cylindric, 1.5–2 cm, peduncles 0.5–2 cm; remaining spikes female, ovate, 7–12 mm, densely several flowered, peduncles enclosed. Female glumes yellow-white, oblong, 5–5.5 cm, green 3-veined costa excurrent into a micro at rounded apex. Utricles green, longer than glume, oblong, trigonous, 7–7.5 mm, subleathery, upper pubescent, veined at base, base long stipitate, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets tightly enveloped, elliptic, ca. 4 mm, canaliculate adaxially, 2 lateral faces slightly concave, base long stipitate; style base thickened; stigmas 3. Fl. and fr. May.

- Forested slopes; ca. 2500 m. W Sichuan, Yunnan.


睫背薹草 jie bei tai cao

Rhizome short, indurate. Culms tufted, up to 50 cm tall, triquetrous, striate, clothed at base with bladeless sheaths. Leaves shorter than culm, blades broadly linear, ca. 10 mm wide, flat, dark green, 2-veined, sparsely pilose beneath. Involucral bracts leaflike, scarcely setaceous toward apex, base sheathing. Spikes up to 15, in groups of 1–3, lower ones distant; terminal spike male; lateral spikes female, shortly cylindric, 2–3 cm × 4–5 mm, loosely 8–12-flowered; peduncles usually smooth, unequal. Female glumes ferruginous or reddish brown, elliptic, green 3-veined costa not excurrent, apex obtuse. Utricles olive-green, spreading, ± as long as glume, ovate or sub-elliptic, swollen trigonous, ca. 2.5 mm, membranous, densely papillose, many veined, base cuneate, beak short, slightly excurved, 2-toothed. Nutlets tightly enveloped, obovate, trigonous, ca. 2 mm; style base somewhat thickened; stigmas 3, papillate.

- Jiangxi (Lushan).


毛缘薹草 mao yuan tai cao

Rhizome long stoloniferous, slender. Culms 30–60 cm tall, compressed trigonous, usually loosely pilose, clothed at base with purple-red bladeless sheaths, sparsely pilose. Leaves shorter than culm, blades broadly linear, 5–8 mm wide, sparsely pilose on veins and margins. Involucral bracts leaflike, usually pilose, shorter than inflorescence, sheathing 2–5 cm. Spikes 3 or 4, distant; terminal spike male, oblong or linear-clavate, 2–3 cm, with long peduncle much overtopping next spike; lateral spikes female, narrowly cylindric, 2–4 cm, loosely 8–12-flowered; peduncles usually smooth, lowest one up to 12 cm. Female glumes purple or ferruginous, ovate or elliptic, green 3-veined costa excurrent into a micro, apex slightly obtuse. Utricles light green, becoming yellow, longer than glume, ovate or sub-elliptic, swollen trigonous, 4–5 mm, membranous, glabrous or sparsely pilose, many veined, base contracted into a short stipe, apex abruptly contracted into a long conic beak, beak curved, obliquely truncate, emarginate, orifice purple-red, 2-toothed. Nutlets tightly enveloped, obovate, obtusely trigonous, ca. 2.5 mm; style base not thickened; stigmas 3. Fl. and fr. Apr–May. 2n = 44.

Forests. Heilongjiang, Liaoning [Japan, Korea; Europe].

1a. Utricles and peduncles glabrous .......... 338a. var. pilosa
1b. Utricles and peduncles sparsely pilose ................. 338b. var. auriculata

338a. Carex pilosa var. pilosa

毛缘薹草(原变种) mao yuan tai cao (yuan bian zhong)

Utricles and peduncles glabrous.

Forests. Heilongjiang, Liaoning [Japan, Korea; Europe].


刺毛缘薹草 ci mao yuan tai cao


Utricles and peduncles sparsely pilose.

Forests. Heilongjiang, Liaoning [Japan, Korea; Europe].

丝柄薹草  si bing tai cao

Rhizome short or slightly long. Culms 30–55 cm tall, compressed trigonous, smooth, clothed with purple-red bladeless sheaths at base. Leaves shorter than culm, blades linear, 2–8 mm wide, flat, soft, apex acuminate. Involucral bracts leaflike, shorter than inflorescence, long sheathing. Spikes 3 or 4, distant; terminal spike male, oblong-lanceolate or cylindrical, 2–3 cm, with long peduncle; lateral spikes female, loosely usually 3–6-flowered, peduncle 3–6 mm, very slender, pendent. Female glumes yellow-brown or yellow-white, ovate or ovate-lanceolate, 5–6 mm, green 3-veined costa ending at acute apex. Utricles yellow-green, longer than glume, ovate or elliptic, trigonous, 5–7 mm, glabrous, faintly many veined, base cuneate, shortly stipitate, apex abruptly contracted into a slender long beak, orifice 2-toothed. Nutlets black-brown, obovate-trigonous, ca. 3 mm, base with curved stipe, apex abruptly contracted into a curved beak; style base thickened; stigmas 3. Fl. and fr. Mar.–May.

Forest, wet places on roadsides, grasslands; 1300–2200 m. Anhui, Fujian, Guizhou, Hebei, Heilongjiang, Hubei, Jiangsu, Liaoning, Zhejiang [Japan, Korea, Russia (Far East)].

1a. Utricles ca. 5 mm; leaves 2–3 mm wide; plants loosely tufted ............ 339a. var. filipes

1b. Utricles 6–7 mm; leaves 5–8 mm wide; plants densely tufted ............ 339b. var. oligostachys

339a. Carex filipes var. filipes

丝柄薹草(原变种) si bing tai cao (yuan bian zhong)

Carex egema H. Léveillé & Vaniot; C. filipes var. sparsinux (C. B. Clarke ex Franchet) Kükenthal; C. sparsinus C. B. Clarke ex Franchet.

Plants loosely tufted. Leaves 2–3 mm wide. Utricles ca. 5 mm.

Forest, wet places on roadsides, grasslands; 1500–2200 m. Anhui, Fujian, Guizhou, Hebei, Jiangsu, Zhejiang [Japan, Korea].


少囊薹草 shao nang tai cao


Plants densely tufted. Leaves 5–8 mm wide. Utricles 6–7 mm.

Forest; 1300–1400 m. Hebei, Heilongjiang, Liaoning [Korea, Russia (Far East)].


白马薹草 bai ma tai cao

Rhizome stoloniferous. Culms 20–40 cm tall, clothed at base with pale yellow sheaths, some sheaths disintegrating into fibers. Leaves longer than or equaling culm, blades linear, 3–5 mm wide, flat. Involucral bracts shortly bladed, scabrous on margins, long sheathing. Spikes 3 or 4, distant; terminal spike male, linear-cylindrical, 3–5 × ca. 0.2 cm; lateral spikes female, long elliptic, 1.2–2 cm, 7– or 8-flowered; peduncles enclosed in involucral bract sheaths, lowest one sometimes subbasal. Female glumes stramineous or yellowish brown, ovateobovate, ca. 5 mm, margins hyaline, green 3-veined costa excurrent into a mucro at obtuse or emarginate apex. Utricles slightly longer than glume, obliquely patent, ovate, ca. 9 mm, sparsely pilose, especially on margins, later becoming glabrous, many veined, base stipitate, apex abruptly contracted into a cylindric long beak ca. 2 mm, orifice 2-toothed. Nutlets black-brown, obovate-trigonous, ca. 3 mm, base with curved stipe, apex abruptly contracted into a curved beak; style base thickened; stigmas 3. Fl. and fr. May.

• Forest margins, slopes; ca. 1000 m. Anhui.


云岭薹草 yun ling tai cao

Rhizome short. Culms tufted, 30–40 cm tall, slender, smooth, clothed with deep brown sheaths at base. Leaves sub-equaling culm, blades linear, 4–5 mm wide, flat. Involucral bracts leaflike, longer than inflorescence, sheathing. Spikes 3–5, distant, oblong, 2–2.5 × 0.6–0.7 cm, loosely flowered; terminal spike androgynous; lateral spikes female (often with male part at apex); peduncles enclosed in involucral bract sheaths. Female glumes pale, oblong-lanceolate, 4.5–5.5 mm, green 3-veined costa excurrent into a long awn. Utricles brownish olive-green, rhomboid-oblong, inflated trigonous, 8–9 mm, veined, glabrous, base shortly stipitate, apex abruptly contracted into a scabrous long beak, orifice 2-toothed. Nutlets pale, ovate or oblong, ca. 3.2 mm, faces concave at base, base shortly stipitate, apex abruptly contracted into a short beak; style base slightly thickened; stigmas 3. Fl. Jul.

• Forests, ditch sides along valleys; ca. 3400 m. Yunnan.


阿里山薹草 a li shan tai cao

Rhizome short. Culms sublateral, 15–40 cm tall, slender, compressed trigonous, smooth, clothed with pale brown (sometimes purple-red) bladeless sheaths at base. Leaves shorter or longer than culm, blades linear, 4–8 mm wide, flat, apex acuminate. Involucral bracts shortly bladed, sheathing 2–4 cm. Spikes 3 or 4; terminal spike male, lanceolate-oblong, 4–8 mm, very close to next female spike; remaining spikes female, oblong, 6–10 mm, 2- or 3-flowered; peduncles slender, erect, long exserted beyond involucral bract blade. Female glumes pale, occasionally tinged with brown, ovate-oblong, 3.5–4.5 mm, green obscurely 3-veined costa ending at muticus apex. Utricles brown-green, ca. 2 × as long as glume, fusiform, trigonous, 5.5–6.5 mm, herbaceous, glabrous, faintly many veined, base cuneate, apex gradually narrowed to a long upright beak, orifice
hyaline, 2-toothed. Nutlets pale brown, tightly enveloped in lower part of utricle, obovate or elliptic, trigonous, ca. 3 mm; style base not thickened; stigmas 3. Fl. and fr. Apr–Jun.

C. pseudocyperus

Rhizome short, with many slender, long roots. Culms lateral, densely tufted, 30–40 cm tall, compressed trigonous, less than ca. 1 mm wide, clothed at base with 3 or 4 castaneous bladeless sheaths slightly disintegrating into fibers. Leaves gray-green, conspicuously longer than culm, 3–4 mm wide, flat, stiff, scabrous adaxially. Lower involucral bracts shorter or longer than inflorescence, sheathless, upper ones glumelike. Spikes 2 or 3; terminal spike male, yellow-brown, clavate, 1–1.5 cm, sub sessile; lateral spikes female, gray-green, ovate, ca. 8 mm, several flowered, dense, sessile or only lowest one with short peduncle. Female glumes pale or light brown, ovate or oblong-ovate, 3–4 mm, green 3-veined costa excurrent into a macro, apex acute. Utricles green-brown at base, ovate-lanceolate or elliptic, obtusely trigonous, 4–4.5 mm, sparsely pubescent, faintly veined adaxially, apex abruptly contracted into a medium-sized beak, orifice 2-toothed. Nutlets obovate or broadly oblong, obtusely trigonous, with 1 face concave at base; style easily deciduous; stigmas 3.

Evergreen broad-leaved forests; ca. 1900 m. S Xizang (Nyalam).

1a. Female spikes oblong or elliptic, 2–3 cm, 1.5–2 cm wide, sub sessile; female glumes rather shorty awned, awn nearly as long as glume; utricles narrowly lanceolate, 6–8 mm, with long beak, 2-toothed at orifice, teeth ca. 2 mm, recurved toward both sides ................................................................. 344. C. capricornis

1b. Female spikes cylindric, 1.5–5 cm, less than 1 cm wide, rather long pedunculate; female glumes long awned, awn ca. 2.5 × as long as glume; utricles elliptic, 4–5 mm, with medium-sized to long beak, slightly long 2-toothed at orifice, teeth ca. 1 mm, rather straight ................................................................. 345. C. pseudocyperus

36. Carex sect. Pseudocyperae

Leaf blades distinctly 2-veined laterally, with transverse septate nodes. Involucral bracts leaflike, longer than spike, usually not sheathed. Spikes unisexual, 3–9; uppermost 1–3 male, narrowly cylindric; remaining spikes female, single in an involucral bract sheath, oblong or cylindric, densely many flowered, pedunculate, upper peduncles rather short. Female glumes awned. Utricles yellow-green at maturity, eventually horizontally divaricate or deflexed, narrowly lanceolate or elliptic, obtusely trigonous, not inflated, subleathery or leathery, distinctly several veined, base shortly stipitate, apex rather long beaked, orifice long 2-toothed, teeth subulate or awn-shaped, sometimes recurved. Nutlets rather loosely enveloped in utricle; style slender, usually tortuous, base not thickened; stigmas 3.

Fourteen species: Asia, Australia, Europe, New Guinea, North America, Pacific islands (New Zealand), S South America, West Indies; two species in China.

1a. Female spikes oblong or elliptic, 2–3 cm, 1.5–2 cm wide, sub sessile; female glumes rather shorty awned, awn nearly as long as glume; utricles narrowly lanceolate, 6–8 mm, with long beak, 2-toothed at orifice, teeth ca. 2 mm, recurved toward both sides ................................................................. 344. C. capricornis

1b. Female spikes cylindric, 1.5–5 cm, less than 1 cm wide, rather long pedunculate; female glumes long awned, awn ca. 2.5 × as long as glume; utricles elliptic, 4–5 mm, with medium-sized to long beak, slightly long 2-toothed at orifice, teeth ca. 1 mm, rather straight ................................................................. 345. C. pseudocyperus

343. Carex changmuensis

Rhizome short, with many slender, long roots. Culms lateral, densely tufted, 30–70 cm tall, stout, triquetrous, scabrous on upper part, few purple-brown and bladeless sheathed at base, rudimentary sheaths sometimes disintegrating into fibers. Leaves longer than or slightly shorter than culm, blades 3–8 mm wide, flat, slightly stiff, with 2 distinct lateral veins and with short and transverse septate nodes, sheathed. Involucral bracts leaflike, longer than spike, usually not sheathed. Spikes 3–5, congregated at top of culm, sometimes lowermost one slightly remote; terminal spike male, usually not surpassing or slightly longer than contiguous female spike, clavate or linear-cylindric, 2–3 cm, sub sessile; lateral spikes female, oblong-ovate or shortly cylindric, 2–3 × 1.5–2 cm, densely many flowered, very shortly pedunculate or sub sessile. Female glumes brownish laterally, oblong, 4–5 mm, thickly membranous, greenish 3-veined in middle abaxially, apex acuminate and aristate, awn nearly as long as glume, scab-

胀囊薹草组 zhang nang tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama, Gordon C. Tucker

Culms usually rather tall and slightly stout. Leaf blades with transverse septate nodes. Involucral bracts leaflike, longer than inflorescence, usually not sheathed, rarely shortly sheathed. Spikes unisexual, several, few species with male flowers at top of female spike or with female flowers at top of male spike; 1–4 spikes at top of culm male, narrowly cylindric; remaining spikes female, single in involucral bract axil, oblong or cylindric, densely many flowered, usually shortly pedunculate. Female glumes oblong-lanceolate or narrowly ovate, muticous. Utricles obliquely patent in maturity, oblong-ovate, apex attenuate into a rather short beak, beak straight, deeply split into 2 teeth at orifice, teeth ca. 1 mm, straight, ± rigid, not recurved toward sides. Nutlets yellowish, slightly loosely enveloped, broadly obovate, trigonous, ca. 1.2 mm; style slender, tortuous, base not thickened; stigmas 3, rather short. Fl. and fr. Sep–Nov.

Ditch sides, watersides; ca. 1300 m. Gansu [Japan, Russia; Europe, North America].

About 20 species: E and SE Asia, Europe, North America; ten species in China.

1a. Utricles obovate or broadly so, 6–12 mm.

2a. Female spikes cylindric, 3–7.5 cm; utricles 6–8 mm.

3a. Leaf blades 8–15 mm wide; male spikes usually 3–7, sometimes with few female flowers at base, with few male flowers at top of female spike; female glumes oblong-lanceolate; utricles horizontally divaricate in maturity, ovoid, apex abruptly contracted into a slightly long beak .......... 346. C. rhynchophysa

3b. Leaf blades 2–5 mm wide; male spikes 2 or 3, spikes unisexual; female glumes narrowly lanceolate; utricles obliquely patent in maturity, oblong-ovate, apex attenuate into a rather short beak ........................................................................................................... 347. C. vesicaria

2b. Female spikes oblong or ovoid, 1.5–3 cm; utricles 9–12 mm.

4a. Male spike 1; female spikes ovoid, 1.5–2 × ca. 1.5 cm, distance approximate, usually congregated at top of culm; utricles broadly ovate; nutlets broadly rhomboid, style base slightly thickened .......... 348. C. dickinsii

4b. Male spikes 1 or 2; female spikes oblong, 2–3 × 1–1.2 cm, distance remote; utricles oblong-ovate; nutlets obovate, style thickened at lower half ................................................................. 349. C. idzuroei

1b. Utricles oblong-ovate or ovoate, 4–5.5 mm.

5a. Male spike 1, terminal; utricles with recurved and slightly long stipe .................................................. 350. C. mollissima

5b. Male spikes 2 to several, inserted at top of culm; utricles estipitate.

6a. Utricles oblong-ovate, apex attenuate into a beak, emarginate at orifice, not 2-toothed.

7a. Culms 60–90 cm tall; female glumes oblong-lanceolate, slightly shorter than or nearly equaling utricle; utricles 5–5.5 mm ........................................................................................................................... 351. C. pamirensis

7b. Culms 15–50 cm tall; female glumes ovate, ca. 1/2 length of utricle or slightly longer than utricle; utricles 4–4.5 mm ............................................................................................................................ 352. C. dichroa
6b. Utricles ovate or broadly ovate, apex abruptly narrowed into a beak, slightly long or rather shortly 2-toothed at orifice.

8a. Female glumes oblong-lanceolate, slightly shorter than or nearly equaling utricle; utricles ca. 4 mm

8b. Female glumes ovate or narrowly lanceolate, shorter than utricle; utricles ca. 5 mm.

9a. Female glumes narrowly lanceolate, brown-purple ......................................................... 354. C. obscuriceps

9b. Female glumes ovate, brown-yellow ................................................................................. 355. C. vescicata


大穗薹草 da sui tai cao

Carex bullata Schkuhr subsp. laevirostris (Blytt ex Fries) Fries; C. bullata var. laevirostris Blytt ex Fries; C. laevirostris (Blytt ex Fries) Andersson.

Rhizome rather thick, stoloniferous. Culms 60–100 cm tall, stout, triquetrous, smooth on lower part, clothed with brown or reddish brown sheaths at base. Leaves longer than culm, blades 8–15 mm wide, flat, slightly stiff, with short and transverse septate nodes, sheathed. Involucral bracts leaflike, longer than culm, lowermost involucral bract shortly sheathed, upper involucral bracts not sheathed. Spikes 7–11; terminal 3–7 spikes male, rather approximate, narrowly cylindric, 1.5–4.5 cm, sometimes with few female flowers at base, sub sessile; remaining spikes female, cylindric, 3–7.5 × 1–1.5 cm, densely many flowered, sometimes with a few male flowers at apex, shortly pedunculate. Female glume brownish or yellowish brown, oblong-lanceolate, ca. 4.2 mm, membranous, costate, upper margins white hyaline, apex acute, mucituous. Utricles yellow-green, horizontally patent in maturity, longer than glume, ovoid or broadly ovate, inflated trigonous, 6.5–7 mm, membranous, slightly nitid, glabrous, several veined, base subrounded, shortly stipitate, apex abruptly narrowed to a slightly long beak, orifice 2-toothed. Nutlets loosely enveloped in utricle, obovate, trigonous, ca. 2 mm, base shortly stipitate; style slender, flexuose, base not thickened; stigmas 3, rather shorter than style. Fl. and fr. May–Jul.

Wet places in swamps, at riversides, or at lakesides. Heilongjiang, Jilin, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].


胀囊薹草 zhang nang tai cao

Carex coreana L. H. Bailey.

Rhizome with slender stolons. Culms 20–70 cm tall, shortly stout, obtusely trigonous, smooth on lower part and scabrid on top, yellow-brown sheathed at base. Leaves longer than or equaling culm, blades 4–8 mm wide, flat, ± stiff, with transverse septate nodes between veins, sheathed. Involucral bracts leaflike, surpassing inflorescence, usually without sheaths or sometimes lowermost one shortly sheathed. Spikes usually 3, rarely 2 or 4; terminal spike male, elavate, 1.5–2 cm, shortly pedunculate; lateral spikes female, rather approximate, subglbose or oblong-ovate, 1.5–2 × ca. 1.5 cm, densely many flowered, nearly sessile or shortly pedunculate. Female glumes yellowish laterally, ovate-lanceolate, ca. 5.5 mm, membranous, 3-veined, yellowish brown between veins, apex acuminate, sometimes mucronulate. Utricles stramineous or yellowish brown, obliquely patent, later horizontally patent or reflexed, much longer than glume, broadly ovate or ovate, inflated trigonous, ca. 10 mm, thinly leathery, nitid, glabrous, distinctly 5-veined abaxially, base subrounded, rather shortly stipitate, apex gradually narrowed to a stiff beak, orifice sharply 2-toothed. Nutlets fuscos, rather pale on angles, very loosely enveloped, broadly rhomboid, trigonous, ca. 3 mm, base shortly stipitate; style flexuose, persistent, base slightly thickened; stigmas 3. Fl. and fr. Jul–Sep.

Wet places in swamps, at riversides, or at lakesides. Fujian [Japan, Korea].


朝鲜薹草 chao xian tai cao

Carex corvina L. H. Bailey.

Rhizome with slender stolons. Culms 30–100 cm tall, ± stiff, triquetrous, scabrous on upper part, with red-brown and bladeless sheaths at base, rudimentary sheaths usually disintegrating into reticulate fibers. Leaves slightly shorter than culm, blades 2–5 mm wide, flat, ± stiff, with transverse septate nodes between veins, sheathed. Involucral bracts leaflike, lowermost shortly sheathed, upper not sheathed. Spikes 4–6, remote; terminal 2 or 3 spikes male, approximate, linear-cylindric, 2–3.5 mm, sub sessile; remaining spikes female, oblong or oblong-cylindric, 3–7 × 1–1.5 cm, densely many flowered, shortly pedunculate. Female glumes pale ferruginous or ferruginous, narrowly ovate or ovate-lanceolate, ca. 3.2 mm, membranous, 3-veined, yellow-green between veins, margins white hyaline, apex acuminate and muticous. Utricles yellowish green, obliquely patent, longer than glume, ovate or conic-ovate, inflated trigonous, 6–8 mm, subleathery, slightly nitid, glabrous, several veined, base rounded, shortly pedunculate, apex attenuate into a short beak, orifice 2-toothed. Nutlets rather loosely enveloped, obovate, trigonous, 1.7–2 mm, base stipitate; style slender, usually flexuose, base not thickened; stigmas 3, rather short. Fl. and fr. May–Jul.

Wet places at riversides, at lakesides, in swamps, or in meadows. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia; Europe, North America].

This plant is used as forage and for making paper.


马菅 ma jian

Carex pseudovesicaria H. Léveillé & Vaniot.

Rhizome with slender and branched stolons. Culms laxly tufted, 30–60 cm tall, triquetrous, smooth, clothed with long sheaths at base. Leaves usually shorter than culm at lower part and longer than culm at upper part, blades 4–9 mm wide, flat, 2
lateral veins distinct, with shortly transverse septate nodes between veins, purple-brown long sheathed at base. Involucral bracts leaflike, longer than spike, usually not sheathed. Spikes 4 or 5; terminal 1 or 2 spikes male, linear-cylindric, 2–4 cm, pedunculate; remaining spikes female, oblong, 2–3 × 1–1.2 cm, subdensely many flowered, sessile at upper spikes, shortly pedunculate at lowest spike. Female glumes dark yellow, lanceolate-ovate, 5–6 mm, membranous, green 3-veined, apex acuminate, mucronate. Utricles yellow-brown, obliquely patent, much longer than glume, oblong-ovate, inflated trigonous, 9–12 mm, thinly leathery, glabrous, several veined, base rounded, shortly stipitate, apex gradually narrowed to a long beak, orifice slightly long 2-toothed. Nutlets yellowish brown, rather loosely enveloped, obovate, trigonous, ca. 4 mm, base shortly stipitate; style thickened at lower part, persistent, slightly stiff; stigmas 3, rather short. Fl. and fr. Apr–May.

Riversides, lakesides, wet places. Fujian, Jiangsu, Zhejiang [Japan].


柄茅草 bing tai cao
Carex divaricata Kükenthal; C. yingkiensis A. I. Baranov & Skvortsov.

Rhzome short, with long and branched stolons. Culms 30–40 cm tall, slightly slender, compressed triquetrous, scabrid on upper part, yellowish brown and bladeless sheathed at base, sheaths sometimes disintegrating into fibers. Leaves longer than culm, blades 2–4 mm wide, flat, soft, scabrid on margins and veins, long sheathed. Involucral bracts leaflike, longer than spike, nearly not sheathed, lowermost sometimes shortly sheathed. Spikes 3 or 4, lowermost spike remote, upper spikes approximate; terminal 1 or 2 spikes male, linear or clavate, 1–1.8 cm, shortly pedunculate; remaining spikes female, oblong-cylindric or cylindric, 1–3.5 × 0.7–0.8 cm, densely many flowered, upper spikes shortly pedunculate, lowermost spike pedunculate, peduncle up to 5 cm. Female glumes pale ferrugineous or pale, ovate-oblong, ca. 3 mm, membranous, 3-veined, margins white hyaline, apex obtuse. Utricles yellowish green, horizontally patent or reflexed, longer than glume, ovate, inflated trigonous, 4–5 mm, papery, glabrous, slightly nitid, several veined, base subrounded, with short and bent stipe, apex abruptly contracted into a long beak, 1–1.5 mm, orifice slightly slitting into 2 teeth or emarginate. Nutlets rather loosely enveloped, elliptic or obovate, trigonous, ca. 1.5 mm, base shortly stipitate; style slender, base bent, not thickened; stigmas 3, rather short. Fl. and fr. Jul–Aug.

Swamps in high mountain regions. Heilongjiang, Nei Mongol (Da Hinggan Ling) [Korea, Russia].


帕米尔茅草 pa mi er tai cao

Leaf blades 5–10 mm wide; female spikes 1.2–1.5 cm wide .......... 351a. subsp. pamirensis
Leaf blades 3–4 mm wide; female spikes 0.6–0.8 cm wide .......... 351b. subsp. angustispicata

351a. Carex pamirensis subsp. pamirensis

帕米尔茅草(原亚种) pa mi er tai cao (yuan ya zhong)

Leaf blades 5–10 mm wide. Female spikes 1.2–1.5 cm wide. Utricles stramineous, usually with brownish streaks. Fl. and fr. Jul–Aug.

Alpine wetlands; 2400–3700 m. Gansu, N Sichuan, Xinjiang [Afghanistan, India (Sikkim), Kazakhstan, Russia].

351b. Carex pamirensis subsp. angustispicata (Y. C. Yang) G. C. Tucker, stat. nov.

狭狭帕米尔茅草 xia sui pa mi er tai cao

Leaf blades 3–4 mm wide. Female spikes 0.6–0.8 cm wide. Utricles dark chestnut-brown. Fl. and fr. Jul.

* Damp alpine grasslands; ca. 3400 m. Gansu (Maqu).


小狭茅草 xia sui tai cao

Rhzome with slender stolons. Culms 15–50 cm, triquetrous, rather thin, scabrous on upper part, clothed with yellowish brown and bladeless sheaths at base. Leaves equaling or slightly longer than culm, blades 2–4 mm wide, flat, sheathed. Involucral bracts leaflike, longer than spike, nearly not sheathed. Spikes 2–5; terminal 1–3 spikes male, approximate,
linear or clavate, 1–3 cm, subsessile; remaining spikes female, remote, oblong, 1.5–2.5 × 0.7–0.8 cm, densely many flowered, pedunculate, lowest peduncle 2–3 cm. Female glumes brown, ovate, 2.5–3 mm, membranous, costate, white hyaline on margin of apex, apex subacute. Utricles stramineous, slightly brown on upper part, obliquely patent, longer than glume, oblong-ovate, inflated trigonous, 4–4.5 mm, glabrous, slightly shiny, few veined, base rounded, apex gradually narrowed to a medium-sized beak, orifice emarginate. Nutlets rather loosely enveloped; style slender; stigmas 3, rather short. Fl. and fr. Jun–Aug.

Swamps, wet places at lakesides and riversides. Nei Mongol [Mongolia, Russia].


356. Carex riparia Curtis, Fl. Londin. 4: t. 60. 1783.

泽生薹草 ze sheng tai cao

Rhizome stout. Culms 60–150 cm tall, triquetrous, scabrous on upper part, clothed with brown or reddish brown sheaths at base. Leaves equaling or longer than culm, blades 10–15 mm wide, flat, ± stiff, with distinct and transverse septate nodes between veins, rather long sheathed. Involucral bracts leafy, lowermost involucral bract longer than inflorescence, nearly not sheathed or lower involucral bract shortly sheathed. Spikes 5–10, lower spikes remote and upper spikes approximate; terminal 3–6 spikes male, oblong-cylindric or cylindric, 2–6 cm, sub sessile; remaining spires female, cylindric, 3–6 × 0.5 cm, densely many flored, sometimes with male flowers at top, upper spikes sub sessile, lower spikes slightly long pedunculate. Female glumes brown, lanceolate, ca. 6 mm, 3–veined, apical margins hispidulous, apex acuminate, mucronate. Utricles fuscous-green, obliquely patent, nearly equaling glume, elliptic-ovate, obtusely trigonous, 5–6 mm, leathery or slightly corky, glabrous, several veined, base cuneate, apex gradually narrowed to a slightly broad and short beak, orifice slightly divergent and 2-toothed. Nutlets rather loosely enveloped, obovate, trigonous, slightly concave on 3 sides; style stiff, persistent, base not thickened; stigmas 3. Fl. and fr. May–Jun.

Damp places at riversides, at lakesides, or in swamps. Xinjiang [Russia (W Siberia); SW Asia (Iran)].


阿齐薹草 a qi tai cao

Rhizome with rather thick stolons. Culms 30–60 cm tall, stiff, triquetrous, smooth, clothed with dark red or red-brown bladeless sheaths at base, remnant sheaths usually disintegrating into reticulate fibers. Leaves shorter than culm, blades 3–4 mm wide, flat, stiff, with distinct transverse septate nodes between veins, sheathed. Involucral bracts leafy, lower ones longer than inflorescence, upper ones nearly not sheathed, lowermost involucral bract shortly sheathed. Spikes 5–7; terminal 2–4 spikes male, distance between spikes short, linear-cylindric, 2–5 cm, nearly sessile; remaining spikes female, remote, cylindric, 2.5–5 × 0.8–1 cm, densely many flored, upper ones shortly pedunculate, lower one long pedunculate. Female glumes pale, lanceolate, ca. 5 mm, membranous, 3-veined, apex acuminate, shortly aristate. Utricles stramineous, usually dark red

About 35 species: Africa, temperate Asia, North and South America; 12 species (three endemic) in China.

1a. Female spikes oblong, not surpassing 2.5 cm; utricles subcorky, thick, with slightly concave or indistinct veins.

2a. Female glumes orbicular-ovate, apex mucronate; utricles ovoid, 3–4 mm, indistinctly veined; nutlets broadly obovate or broadly elliptic ........................................ 363. C. heterostachya

2b. Female glumes broadly ovate or ovate, apex muticous (only C. melanostachya and C. subpumila with aristate or mucronate apex); utricles oblong or ovate, 5–8.5 mm, distinctly or slightly concave veined; nutlets oblong or obovate.

3a. Female glumes broadly ovate, 5.5–6 mm; utricles 6–8.5 mm, with distinct veins, not concave.

4a. Utricles oblong-elliptic, 6–8.5 mm; nutlets oblong, 4–5.5 mm .................................................. 364. C. scabrifolia

4b. Utricles ovate, 6–6.5 mm; nutlets obvate ca. 3 mm ................................................................. 365. C. pumila

3b. Female glumes ovate, 3.5–4.5 mm; utricles ca. 5 mm, with slightly concave veins.

5a. Female glumes mucronate at apex; utricles narrowly elliptic or oblong; nutlets narrowly elliptic, ca. 4 mm ............................................................. 366. C. subpumila

5b. Female glumes aristate at apex; utricles ovate; nutlets obovate, ca. 2 mm ................................. 367. C. melanostachya

1b. Female spikes cylindric; utricles subleathery or leathery, with convex veins.

6a. Male spikes 3–6, sometimes lower male spike with few female flowers at base .............................................................. 356. C. riparia

6b. Male spikes 1 or 2, rarely 3, without female flowers at base.

7a. Female glumes lanceolate, apex mucronate; utricles oblong or oblong-lanceolate, 6–7 mm.

8a. Utricles oblong, stramineous, usually dark red flecked, veins indistinct ...................................... 357. C. argyi

8b. Utricles lanceolate or oblong-lanceolate, olivaceous or brownish green, veins distinct .................. 358. C. kirgiana

7b. Female glumes ovate or broadly ovate, apex muticous or mucronate; utricles oblong-ovate, ovate, or broadly ovate, 4–5(–5.5) mm.

9a. Female glumes broadly ovate, apex obtuse, mucronate; utricles elliptic or ovate-elliptic, 5–6 mm, brownish green, emarginate at orifice ............................................................ 359. C. rugulosa

9b. Female glumes ovate, apex acuminate or acute, mucronate or mucronate; utricles broadly ovate or ovate, ca. 4 mm, stramineous, brown or brown-red flecked, 2-toothed at orifice.

10a. Female glumes acute at apex, mucronate; utricles ovate, obtusely trigonous, teeth divergent at orifice ................................................................. 360. C. gotoi

10b. Female glumes acuminate at apex, muticous; utricles broadly ovate, inflated trigonous, teeth strict at orifice.

11a. Utricles orange or stramineous, usually brown flecked, with distinct veins ............................ 361. C. songorica

11b. Utricles stramineous, without brown flecks, veins indistinct .................................................. 362. C. tangiana
flecked, obliquely patent, longer than glume, oblong-ovate, inflated trigonous, 5–6.5 mm, leathery, glabrous, several veined, base rounded, apex gradually narrowed to a slightly broad and medium-sized beak, orifice 2-toothed. Nutlets slightly loosely enveloped, obovate or ovate, trigonous, ca. 3 mm, base stipitate; style slightly thick, stiff; stigmas 3. Fl. and fr. Apr–Jun.

- Damp places at riversides or ditch sides. Anhui, Hubei, Jiangsu.

显脉薹草 xian mai tai cao

Carex graciliculmis Ohwi; C. kirganica var. mukdensis (Kitagawa) Kitagawa; C. mukdensis Kitagawa; C. rugulosa Kükenthal var. graciliculmis (Ohwi) Kitagawa.

Rhizome stoloniferous. Culms laxly tufted, 40–70 cm tall, triquetrous, smooth, clothed with red-brown and bladdeless sheaths at base. Involutural bracts leafy, slightly shorter than inflorescence, sheathed, upper ones slightly sheathed or nearly not sheathed, lowermost one slightly sheathed, usually 5–10 mm. Spikes 4–7; terminal 2 or 3 spikes male, approximate, cylindric, 3–4 cm, nearly sessile; remaining spikes female, remote, cylindric, 2–5.5 × ca. 1 cm, densely many flowered, shortly pedunculate. Female glumes ferruginaris, green at middle, lanceolate, ca. 5 mm, membranous, 1–3-veined, apex acuminate, aristate. Utricles olivaceous or brownish green, obliquely patent, longer than glume, lanceolate or oblong-lanceolate, obtusely trigonous, 6–7 mm, corky, glabrous, several veined, base subrounded, apex gradually narrowed to a slightly broad and short beak, orifice shortly 2-toothed. Nutlets slightly tightly enveloped in utricle, elliptic, trigonous, 2–3 mm, base stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Swamps, meadows. Heilongjiang, Nei Mongol [Korea, Russia (Far East, E Siberia)].

粗脉薹草 cu mai tai cao

Carex riparia Curtis var. rugulosa (Kükenthal) Kükenthal; C. smirnovii V. I. Kreczetowicz.

Rhizome with rather thick stolons. Culms 50–80 cm tall, obtusely trigonous, smooth on lower part, scabrous on upper part, clothed with red-brown and bladeless sheaths at base, remnant sheaths usually disintegrating into reticulate fibers. Leaves nearly equaling culm, blades 3–5 mm wide, flat, stiff, sheathed. Involutural bracts leafy, lowermost involucral bract equaling or slightly longer than inflorescence, upper involucral bracts rather short, shortly sheathed. Spikes 4–6; terminal 2 or 3 spikes male, distance between spikes short, narrowly lanceolate, 1–3.5 cm, nearly sessile; remaining spikes female, remote, cylindric or oblong-cylindric, 2–4 × ca. 1 cm, densely many flowered, laxly flowered at base, with ca. 1 cm peduncle. Female glumes pale ferruginaris laterally, ovate, 3.5–4 mm, membranous, 3-veined, apex acute. Utricles brown-green or brown-yellow, obliquely patent, longer than glume, elliptic or ovate-elliptic, obtusely trigonous, 5–6 mm, corky, glabrous, several veined abaxially, base rounded, apex abruptly contracted into a slightly broad and short beak, orifice half-rounded concave and shortly 2-toothed. Nutlets slightly tightly enveloped, elliptic or ovate-elliptic, trigonous, ca. 3 mm, base shortly stipitate; style slightly long, flexuoso, persistent, base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Riversides, grasslands at lakesides, strands. Hebei, Heilongjiang, Jilin, Nei Mongol [N Japan, Russia (Far East)].

叉齿薹草 cha chi tai cao

Carex sukaczovii V. I. Kreczetowicz.

Rhizome with long stolons. Culms laxly tufted, 20–70 cm tall, triquetrous, smooth or ± smooth, clothed with red-brown and bladeless sheaths at base, rudimentary sheaths usually disintegrating into reticulate fibers. Leaves shorter than culm, blades 2–3 mm wide, flat or plicate, ± stiff, scabrous on margins, rather long sheathed. Involutural bracts leafy, lowermost involucral bract nearly equaling inflorescence, shortly sheathed, upper ones rather short, nearly not sheathed. Spikes 3–5, usually 4; terminal 1–3 spikes male, slightly approximate, cylindric or lanceolate, uppermost one 2.5–3 cm, lower 1 or 2 usually rather short, nearly sessile; remaining spikes female, remote, cylindric or suboblong, 1.5–3.5 × 0.5–0.6 cm, densely many flowered, shortly pedunculate. Female glumes fuscous, ovate or narrowly ovate, ca. 3.5 mm, membranous, 3-veined, pale fuscous on margins and between veins, apex acuminate, mucronate or aristate, scabrous on margins of mucro or awn. Utricles dark red-brown, sometimes stramineous, obliquely patent, longer than glume, ovate, obtusely trigonous, ca. 4 mm, leathery, glabrous, several veined, base cuneate, apex abruptly contracted into a slightly broad and short beak, orifice 2-toothed, teeth rather long and divergent. Nutlets rather loosely enveloped, broadly obovate or obovate, trigonous, 1.5–2 mm, base shortly stipitate, apex mucronate; style base not thickened, slightly recurved; stigmas 3. Fl. and fr. May–Jun.

Damp places at riversides, meadows; 1000–1300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi [N Korea, Mongolia, Russia (Far East, E Siberia)].

准噶爾薹草 zhun ga er tai cao

Rhizome with long and rather thick stolons. Culms 30–50 cm tall, triquetrous, scabrous on upper part, clothed with red-brown and bladeless sheaths at base, remnant sheaths usually disintegrating into reticulate fibers. Leaves shorter than culm, blades 3–5 mm wide, flat or slightly plicate, with distinctly transverse septate nodes between veins, sheathed. Involutural bracts leafy, longer than inflorescence, lowermost involucral bract shortly sheathed, upper involucral bracts not sheathed. Spikes 3 or 4; terminal 1 or 2 spikes male, approximate, narrowly clavate, 1.5–2 cm, nearly sessile; remaining spikes fe-
male, remote, cylindric, 2–4 × 0.5–0.6 cm, densely many flowered and laxly flowered at base, shortly pedunculate, lowermost peduncle cm. Female glumes brown laterally, brownish at middle, ovate, ca. 3 mm, 3-veined, apex acuminate. Utricles orange or ferruginous, usually brown flecked, obliquely patent, longer than glume, ovoid or broadly ovoid, biconvex, 3–4 mm, leathery, shiny, thinly several veined abaxially, base rounded, apex abruptly contracted into a slightly broad and short beak, orifice shortly 2-toothed. Nutlets elliptic or ovate-elliptic, trigonous, ca. 2 mm, base shortly stipitate, apex mucronate; style base flexuose, not thickened; stigmas 3. Fl. and fr. Apr–Jun.

Salt grasslands; below 100–3000 m. Xinjiang [Afghanistan, India, NW Mongolia, Russia; SW Asia (Iran)].


唐逆薹草 tang jin tai cao

Rhizome with rather thick, stiff stolons. Culms 30–40 cm tall, triquetrous, smooth, scabrid on upper part, clothed with red-brown and bladeless sheaths at base. Leaves slightly longer than or equaling culm, blades 2–3 mm wide, flat, stiff, scabrous on margins, rather long sheathed. Involucral bracts leafy, lowermost involucral bract longer than inflorescence, upper involucral bracts shorter than inflorescence, nearly not sheathed. Spikes 3 or 4; terminal 1 or 2 spikes male, approximate, narrowly cylindric or lanceolate, 1.2–2.5 cm, sessile; remaining spikes female, remote, cylindric, 2.5–3.5 × 0.5–0.6 cm, densely many flowered, lowermost one slightly pedunculate, upper ones nearly sessile. Female glumes brown-yellow, ovate, ca. 3 mm, membranous, 3-veined, brownish yellow between veins, apex acuminate, slightly aristate, scabrous on margins of awn. Utricles stramineous, obliquely patent, slightly longer than glume, elliptic or broadly ovate, subplano-convex, slightly inflated, 3.5–4 mm, leathery, glabrous, slightly shiny, indistinctly veined, base subrounded or broadly cuneate, apex abruptly narrowed to a short beak, orifice shortly 2-toothed, teeth straight. Nutlets rather loosely enveloped, subobovate, trigonous, ca. 2 mm, base stipitate; style rather long, base not thickened, slightly recurved; stigmas 3, rather short. Fl. and fr. May–Jul.

- Damp places in valleys, ditch sides, roadsides; 500–1000 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Shanxi.

Based on its original description, Carex purpureovaginalis Q. S. Wang (J. Wuhan Bot. Res. 5: 343. 1987, “purplevaginalis”) is very difficult to distinguish from C. tangiana. We have not seen the type specimen and so cannot make a provisional determination here.


异穗薹草 yi sui tai cao

Rhizome with long stolons. Culms 20–40 cm tall, triquetrous, smooth on lower part, scabrid on upper part, clothed with red-brown and bladeless sheaths at base, rudimentary sheaths usually disintegrating into fibers. Leaves shorter than culm, blades 2–3 mm wide, flat, ± stiff, scabrous on margins, slightly long sheathed. Involucral bracts awn-shaped, usually shorter than spike, sometimes lowermost slightly longer than spike, not sheathed or lowermost one slightly sheathed. Spikes 3 or 4, congregate on top of culm; terminal 1 or 2 spikes male, oblong or clavate, 1–3 cm, sessile; remaining spikes female, ovate or oblong, 0.8–1.8 cm, densely many flowered, nearly sessile, sometimes lowermost one very shortly pedunculate. Female glumes brown laterally, yellowish brown at middle, orbicular-ovate or ovate, ca. 3.5 mm, membranous, 3-veined, green costate, margins white hyaline, sometimes upper margin erose, apex acute, mucronate. Utricles brown, obliquely patent, slightly longer than glume, broadly ovate or ovoid, obtusely trigonous, 3–4 mm, leathery, glabrous, slightly shiny, indistinctly veined, base subrounded, apex abruptly narrowed to a slightly broad and short beak, orifice shortly 2-toothed. Nutlets rather tightly enveloped in utricle, broadly obovate or broadly elliptic, trigonous, ca. 2.8 mm, base shortly stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Apr–Jun.

Dry mountains, grasslands, roadsides; 300–1000 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Shandong, Shanxi [N Korea].


秸秆薹草 cao ye tai cao

Carex pierotti Miquel.

Rhizome stoloniferous. Culms 2 or 3 tufted at nodes of stolon, 30–60 cm tall, rather thin, trigonous, smooth, scabrid on upper part, clothed with red-brown and bladeless sheaths at base, rudimentary sheaths ± disintegrating into reticulate fibers. Leaves shorter than or upper ones slightly longer than culm, blades 2–3 mm wide, stiff, longitudinally furrowed on middle of upper surface, scabrous and slightly involute on margins, rather long sheathed. Lower involucral bracts leafy, longer than inflorescence, not sheathed, upper involucral bracts scalelike. Spikes 3–5; terminal 2 or 3 spikes male, approximate, narrowly cylindric, 1–3.5 cm, shortly pedunculate or nearly sessile; remaining spikes female, slightly remote, oblong or subovate, 1.5–2 × ca. 1 cm, densely 10–15-flowered, shortly pedunculate or upper ones nearly sessile. Female glumes brown, pale at middle, broadly ovate, 5–6 mm, membranous, 3-veined, apex acuminate, mucronate. Utricles brown, obliquely patent, longer than glume, oblong-elliptic, inflated trigonous, 6–8.5 mm, sub-corky, glabrous, slightly concave, several veined, base obtuse, apex abruptly narrowed to a slightly broad and short beak, orifice half-moon-shaped concave and shortly 2-toothed. Nutlets brown, tightly enveloped, oblong or narrowly oblong, obtusely trigonous, 4–5.5 mm; style base slightly thickened; stigmas 3. Fl. and fr. Apr–Jun.

Beaches or wet places in maritime regions or fields. Fujian, Hebei, Jiangsu, Liaoning, Shandong, Taiwan, Zhejiang [Japan, N Korea, Russia (Far East)].

This species is used for making rope.


矮生薹草 ai sheng tai cao

Rhizome with slender stolons. Culms laxly tufted, 10–30 cm tall, triquetrous, nearly all clothed with sheaths, lower part clothed with several reddish brown and bladeless sheaths, one side of sheath usually disintegrating into reticulate fibers.
Leaves longer than or equaling culm, blades 3–4 mm wide, flat or sometimes plicate, stiff, scabrous on veins and margins, sheathed. Involucral bracts leafy, longer than culm, shortly sheathed. Spikes 3–6, slightly approximate; terminal 2 or 3 spikes male, clavate or narrowly cylindric, 1.5–3.5 cm, shortly pedunculate; remaining spikes female, oblong or oblong-cylindric, 1.5–2.5 × ca. 0.8 cm, slightly laxly many flowered, usually shortly pedunculate. Female glumes brownish, sometimes ferruginous and shortly striate, green at middle, broadly ovate, ca. 5.5 mm, membranous, 3-veined, margins white hyaline, apex acuminately mucronate or aristate. Utricles yellowish or yellowish brown, obliquely patent, longer than glume (excluding awn), ovate, slightly inflated trigonous, distinctly many veined, base broadly cuneate, apex gradually indistinct toward apex, base abruptly narrowed to a slightly broad and short beak, orifice half-moon-shaped concave and sharply 2-toothed. Nutlets tightly enveloped in utricle, narrowly elliptic, trigonous, ca. 3 mm; style base not thickened, late deciduous; stigmas 3. Fl. and fr. Apr–Jun.

- Sandbanks at seashores. Fujian, Hebei.


凹脉薹草 ao mai tai cao

Rhizome with lagineous and slender stolons. Culms 20–50 cm tall, triquetrous, rather slender, smooth on lower part and scabrid near top, clothed with red-brown and bladeless sheaths at base, one side of sheaths disintegrating into reticulate fibers. Leaves slightly longer than or equaling culm, blades 2–3 mm wide, stiff, longitudinally furrowed on costa, involute on margins, mid-sheathed. Involucral bracts leafy, lower involucral bracts longer than inflorescence, slightly sheathed, upper involucral bracts rather short, nearly not sheathed. Spikes 3–6; terminal 1–3 male, slightly contiguous, clavate, 1–2.5 cm, nearly sessile; remaining spikes female, remote, ovate or oblong, 1–3 × ca. 1 cm, slightly densely many flowered, pedunculate, peduncle less than 1 cm. Female glumes fuscous laterally, pale at middle, ovate or narrowly ovate, 4.5–5 mm, membranous, costate, apex acuminately aristate. Utricles brown-green, obliquely patent, longer than glume (excluding awn), ovoid, slightly inflated trigonous, ca. 5 mm, leathery, glabrous, with several rather concave veins, base broadly cuneate, apex abruptly contracted into a slightly broad and short beak, orifice shortly 2-toothed, teeth straight, smooth. Nutlets broadly obovate or subelliptic, trigonous, ca. 2 mm, base stipitate, apex slightly long mucronate; style base not thickened; stigmas 3. Fl. and fr. Apr–Jun.

Solonchak or solonetz soil in grasslands, damp places in valleys; ca. 1300 m. Xinjiang [Russia; C Asia, C Europe].


硬毛果薹草组 ying mao guo tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Leaves with transverse septate nodes between longitudinal veins. Involucral bracts leafy, rather long sheathed. Spikes 3–8; male spike single, terminal, linear-cylindric; lateral spikes female, single in an involucral bract axil, oblong or oblong-cylindric, densely many flowered, thinly pedunculate. Female glumes ovate or broadly ovate, usually red-brown punctate, apex acute and mucronate. Utricles obliquely patent, ovate or obovate, trigonous, not inflated, densely hispidulous, rarely laxly hirtellous or glabrous, distinctly 2-veined laterally or indistinctly veined abaxially, apex abruptly contracted to a medium-sized or short beak, orifice shortly 2-toothed. Nutlets tightly enveloped; style base not thickened or slightly thickened; stigmas 3.

Eight species: E, S, and SE Asia; seven species (three endemic) in China.

1a. Spikes approximate, usually congregated at top of culm, subcapitately disposed.

2a. Culms 12–15 cm tall; leaf blades 2–5 mm wide; female spikes 0.7–1.5 cm; utricles ca. 2.5 mm, ciliate only on margins of beak ................................................................. 368. C. pseudophyllocephala

2b. Culms 20–60 cm tall; leaf blades 8–15 mm wide; female spikes 2–3 cm; utricles 2.8–3.5 mm, densely hispidulous ................................................................. 369. C. phyllocephala
1b. Spikes remote; not congregated at top of culm, racemously disposed.

3a. Female spikes with lax utricles; utricles subrhombic, distinctly trigonous, ca. 5 mm, dark gray-green, several veined abaxially, glabrous, sometimes ciliate on margins, brown, dark brown glandular punctate; female glumes connate at base, funnelform ................................................................. 370. C. poculisquama

3b. Female spikes with dense utricles; utricles ovoid or obovoid, indistinctly trigonous, 3–4 mm (ca. 4.8 mm in C. ligulata), brownish green, with 2 lateral veins abaxially, densely hispidulous, rarely ciliate on margins or veins; female glumes not connate at base, not funnelform.

4a. Culms rather slender; leaf blades less than 5 mm wide; female spikes 3–4 mm wide; utricles subdistichous, laxly disposed, ca. 3 mm, densely hispidulous .................................................. 371. C. hebecarpa

4b. Culms stout; leaf blades (5–)7–15 mm wide; female spikes 5–6 mm wide; utricles multiserrate, densely or rather densely disposed, 3–5 mm, densely hispidulose or only on veins and upper margins.

5a. Utricles 3–3.5 mm, hispidulous only on veins and upper margins ......................................... 372. C. pseudoligulata

5b. Utricles 3–5 mm, densely hispidulous.

6a. Leaf sheaths not overlapping, sheaths rather loosely enveloping culm; female glumes ca. 3 mm; utricles obovate, 4–5 mm ........................................................................................................... 373. C. ligulata

6b. Leaf sheaths overlapping, sheaths rather tightly enveloping culm; female glumes ca. 1.8 mm; utricles broadly obovate, ca. 3 mm ............................................................................................... 374. C. maubertiana


假头序薹草 jia tou xu tai cao

Rhizome short, without stolons. Culms tufted, 12–15 cm tall, slender, triquetrous, clothed with brown and shortly bladed sheaths at base. Upper leaves longer than culm, lower leaves shorter than culm, blades 2–5 mm wide, flat, scabrous on veins and margins, slightly shortly sheathed, upper and lower sheaths ± overlapping. Involucral bracts leaflike, conglomerated at top of culm, longer than inflorescence, scabrous on veins of adaxial surface and margins, smooth on abaxial surface, rather shortly sheathed. Spikes 4 or 5, congregated at top of culm; terminal spike male, linear-cylindric, 1–2.5 cm, shortly pedunculate; lateral spikes female, sometimes with few male flowers at apex, narrowly cylindric, 2–3 cm, densely many flowered, pedunculate. Female glumes green at middle, pale laterally, very shortly ferruginous striate, broadly obovate, ca. 1.8 mm, membranous, 3-veined, apex acute, mucronate. Utricles grass-green, very shortly ferruginous striate, obliquely patent, longer than glume, broadly obovate, trigonous, 2.8–3.5 mm, membranous, densely white hispidulous, distinctly 2-veined laterally, base cuneate, apex abruptly contracted into a rather short beak, orifice shortly 2-toothed. Nutlets obovate, trigonous, ca. 2 mm, sessile; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Sep.

Damp places in forests, roadsides, valleys; 500–1000 m. Fujian [Japan].


杯鳞薹草 bei lin tai cao

Rhizome short. Culms densely tufted, 30–50 cm tall, triquetrous, rather slender, stiff, scabrous on upper part, clothed with bladeless or shortly bladed sheaths at lower part. Upper leaves longer than culm and lower leaves shorter than culm, blades 3–4 mm wide, furrowed on midrib of adaxial surface, revolute on margins, scabrous on margins and abaxial surface, rather long sheathed. Involucral bracts leafy, nearly equaling or longer than inflorescence, rather shortly sheathed. Spikes 3 or 4, upper spikes approximately, lower spikes slightly remote; terminal spike male, linear, 1–2 cm, shortly pedunculate; lateral spikes female, narrowly cylindric, 1–3 cm, laxly 10- or more flowered, rather slenderly pedunculate. Female glumes yellowish and ferruginous punctate, broadly obovate, ca. 4 mm, membranous, 1-costate, base connate and clasping rachilla, apex acute, shortly aristate. Utricles gray-green, obliquely patent, longer than glume, rhombic-elliptic, trigonous, ca. 5 mm, papery, glabrous, thinly several veined, base gradually narrowed and stipitate, margins hispidulous, apex gradually narrowed to a slightly broad and short beak, orifice 2-toothed.

密苞叶苔草 mi bao ye tai cao

Rhizome short and slightly thick, ligneous, without stolons. Culms 20–60 cm tall, rather stout, obtusely trigonous, clothed with reddish brown and bladeless sheaths at lower part. Leaves contiguously disposed, longer than culm, blades 8–15 mm wide, ± stiff, revolute on margins with distinctly transverse septate nodes between veins on abaxial surface, slightly long sheathed; sheaths ± overlapping, distinctly ligulate, reddish. Involucral bracts leaflike, congregated at top of culm, longer than inflorescence, rather shortly sheathed. Spikes 6–10, congregated at top of culm; terminal spike male, linear-cylindric, 1–2.5 cm, shortly pedunculate; lateral spikes female, sometimes with few male flowers at apex, narrowly cylindric, 2–3 cm, densely many flowered, pedunculate. Female glumes green at middle, pale laterally, very shortly ferruginous striate, broadly obovate, ca. 1.8 mm, membranous, 3-veined, apex acute, mucronate. Utricles grass-green, very shortly ferruginous striate, obliquely patent, longer than glume, broadly obovate, trigonous, 2.8–3.5 mm, membranous, densely white hispidulous, distinctly 2-veined laterally, base cuneate, apex abruptly contracted into a rather short beak, orifice shortly 2-toothed. Nutlets obovate, trigonous, ca. 2 mm, sessile; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Sep.

Damp places in forests, roadsides, valleys; 500–1000 m. Fujian [Japan].


密苞叶苔草 mi bao ye tai cao

Rhizome short, without stolons. Culms tufted, 12–15 cm tall, slender, triquetrous, clothed with brown and shortly bladed sheaths at base. Upper leaves longer than culm, lower leaves shorter than culm, blades 2–5 mm wide, flat, scabrous on veins and margins, slightly shortly sheathed, upper and lower sheaths ± overlapping. Involucral bracts leaflike, congregated at top of culm, longer than inflorescence, scabrous on veins of adaxial surface and margins, smooth on abaxial surface, rather shortly sheathed. Spikes 4 or 5, congregated at top of culm; terminal spike male, linear-cylindric, 1–2.5 cm, shortly pedunculate; lateral spikes female, sometimes with few male flowers at apex, narrowly cylindric, 2–3 cm, densely many flowered, pedunculate. Female glumes green at middle, pale laterally, very shortly ferruginous striate, broadly obovate, ca. 1.8 mm, membranous, 3-veined, apex acute, mucronate. Utricles grass-green, very shortly ferruginous striate, obliquely patent, longer than glume, broadly obovate, trigonous, 2.8–3.5 mm, membranous, densely white hispidulous, distinctly 2-veined laterally, base cuneate, apex abruptly contracted into a rather short beak, orifice shortly 2-toothed. Nutlets obovate, trigonous, ca. 2 mm, sessile; style base slightly thickened; stigmas 3. Fl. and fr. Jun–Sep.

Damp places in forests, roadsides, valleys; 500–1000 m. Fujian [Japan].
Nutlets tightly enveloped, elliptic, trigonous, ca. 3 mm, sessile, apex with slightly long acumen; style short, base slightly thickened; stigmas 3. Fl. and fr. May–Oct.

- Damp places at ditch sides and lakesides. Anhui, S Jiangsu, Zhejiang.


Carex hebecarpa shu guo tai cao

Rhizome stoloniferous. Culms 30–50 cm tall, triquetrous, slender, scabrous on upper part, clothed with reddish brown and bladeless sheaths. Upper leaves longer than culm, blades 2–5 mm wide, flat, scabrous on veins of adaxial surface, rather long sheathed; sheaths often overlapping, laxly pubescent on surface. Involucral bracts leafy, longer than inflorescence, rather long sheathed, pubescent on outside. Spikes 5 or 6, upper spikes approximate, lower spikes rather remote; terminal spike male, linear, ca. 2 cm, shortly pedunculate; lateral spikes female, narrowly cylindric, 1.5–4 cm, laxly many flowered, lower spikes long pedunculate, upper spikes rather shortly pedunculate; peduncles scabrous. Female glumes pale, shortly ferruginous striate, broadly ovate, 1.8–2 mm, membranous, 3-veined, apex acute, mucronate. Utricles red-brown, obliquely patent, subdistichous, easily deciduous in maturity, longer than glume, obovate-elliptic, obtusely trigonous, ca. 3 mm, submembranous, densely white hispidulous, distinctly 2-veined laterally, base cuneate, apex abruptly contracted into a medium-sized beak, orifice shortly 2-toothed. Nutlets tightly enveloped in utricle, elliptic, trigonous, ca. 2 mm; style short, early deciduous; stigmas 3. Fl. and fr. May–Oct.

Damp places in valleys of mountain regions, in forests, or at roadsides. Fujian, Guangdong, Hunan, Taiwan [Bhutan, India, Nepal].


Carex pseudoligulata var. ligulata shi she ye tai cao

Rhizome stoloniferous. Culms 30–50 cm tall, triquetrous, slender, scabrous on upper part, clothed with reddish brown and bladeless sheaths. Upper leaves longer than culm, blades 2–5 mm wide, flat, scabrous on veins of adaxial surface, rather long sheathed; sheaths often overlapping, laxly pubescent on surface. Involucral bracts leafy, longer than inflorescence, rather long sheathed, pubescent on outside. Spikes 5 or 6, upper spikes approximate, lower spikes rather remote; terminal spike male, linear, ca. 2 cm, shortly pedunculate; lateral spikes female, narrowly cylindric, 1.5–4 cm, laxly many flowered, lower spikes long pedunculate, upper spikes rather shortly pedunculate; peduncles scabrous. Female glumes pale, shortly ferruginous striate, broadly ovate, 1.8–2 mm, membranous, 3-veined, apex acute, mucronate. Utricles red-brown, obliquely patent, subdistichous, easily deciduous in maturity, longer than glume, obovate-elliptic, obtusely trigonous, ca. 3 mm, submembranous, densely white hispidulous, distinctly 2-veined laterally, base cuneate, apex abruptly contracted into a medium-sized beak, orifice shortly 2-toothed. Nutlets tightly enveloped in utricle, elliptic, trigonous, ca. 2 mm; style short, early deciduous; stigmas 3. Fl. and fr. May–Oct.

Rhyzome stout and short, ligneous, without stolons, with rather many rootlets. Culms laxly tufted, 35–70 cm tall, triquetrous, rather stout, scabrous on upper angles, clothed with red-brown and bladeless sheaths. Upper leaves longer than culm, lower leaves shorter than culm, blades 6–12 mm wide, sometimes up to 15 mm wide, flat, sometimes involute on margins, slightly soft, with distinctly transverse septate nodes between veins on abaxial surface; sheaths ferruginous, ligulate, up to 6 cm. Involucral bracts leaflike, longer than inflorescence, lower involucral bracts slightly long sheathed, upper involucral bracts shortly sheathed or not sheathed. Spikes 6–8, remote in lower part, approximate in upper part; terminal spike male, line-ar-cylindric, 1–2 cm, shortly pedunculate or subsessile; lateral spikes female, cylindric or oblong-cylindric, 2.5–4 cm, 5–6 mm thick, densely many flowered, pedunculate, upper peduncles rather short. Female glumes brownish yellow, shortly ferruginous striate, ovate or broadly ovate, ca. 3 mm, membranous, glabrous, green 1-costate, apex acute, usually mucronate. Utricles green-brown, shortly ferruginous striate, suberect, longer than glume, obovate, obtusely trigonous, 4–5 mm, densely white hispidulous, 2-veined laterally, base cuneate, apex abruptly narrowed to a slightly short beak, orifice shortly 2-toothed. Nutlets brown, tightly enveloped, elliptic, trigonous, 2.5–3 mm, smooth; style short, base slightly thickened; stigmas 3. Fl. and fr. May–Jul.

Forests on mountain slopes, grasslands, ditch sides in valleys, damp places at riversides; 600–2000 m. Fujian, Guizhou, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [NE and S India, Japan, Nepal, Sri Lanka].

Carex ligulata var. glabriutriculata Q. S. Wang (J. Wuhan Bot. Res. 5: 344. 1987) differs from C. ligulata and C. pseudoligulata in having utricles glabrous. Because the original description of C. ligulata var. glabriutriculata is very simple and we have not seen the type specimen, we cannot compare them in detail and take time to make any determination.


Carex maubertiana var. maubertiana (Boott) Franchet.

Rhizome thick and short, ligneous, without stolons. Culms tufted, 60–80 cm tall, slightly slender, stiff, obtusely trigonous, with brown and bladeless sheaths at base. Leaves rather dense, upper leaves longer than culm, lower ones rather short, blades 5–6 mm wide, revolute on margins, with transverse septate nodes between veins on abaxial surface; sheaths rather long, overlapping, purple-red and ligulate at sheath mouth. Involucral bracts leaflike, longer than inflorescence, sheathed. Spikes 6–9,
upper spikes approximate, lower spikes rather remote; terminal spike male, narrowly cylindric, 2–3 cm, shortly pedunculate; lateral spikes female, cylindric, 2–3 cm, densely many flowered, shortly pedunculate. Female glumes pale yellow, shortly ferruginous striate, broadly ovate, ca. 1.8 mm, membranous, green 1-veined, apex acute. Utricles yellowish green, shortly ferruginous striate, suberect, longer than glume, broadly obovate, obtusely trigonous, ca. 3 mm, membranous, densely white hispidulous, distinctly 2-veined laterally, base abruptly narrowed to a short stipe, apex abruptly narrowed to a rather short beak, orifice slightly 2-toothed. Nutlets tightly enveloped in utricle, broadly elliptic, trigonous, ca. 2 mm, base abruptly narrowed to a short stipe, apex acute; style short, base slightly thickened; stigmas 3. Fl. and fr. Jun–Sep.

Forests on mountain slopes, wet places at roadsides; 400–1000 m. Fujian, Hubei, Sichuan, Yunnan, Zhejiang [NE and S India, Nepal, Vietnam].

40. Carex sect. Carex

豪草组 tai cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Leaves with transverse septate nodes between veins. Involucral bracts leafy, sheathed, rarely shortly sheathed or not sheathed. Spikes 3–8; male spikes 1–4, rarely up to 7, borne at top of culm; remaining spikes female, single in an involucral bract axil, cylindric, densely many flowered, pedunculate. Female glumes lanceolate, narrowly ovate, or oblong-ovate, usually 3-veined, apex acuminate, mucronate or aristate. Utricles obliquely patent, ovate or oblong-ovate, slightly inflated or inflated trigonous, laxly or densely pubescent or hispidulous, rarely glabrous, distinctly several veined, apex gradually narrowed to a medium-sized beak, orifice rather long 2-toothed. Nutlets rather loosely or tightly enveloped in utricle, apex slightly long mucronate; style base not thickened; stigmas 3 (Carex humida with stigmas 2).

About 30 species: Asia, Europe, North America; 13 species (four endemic) in China.

1a. Involucral bracts usually not sheathed or lowermost very shortly sheathed; utricles 3–4 mm, densely hispidulous (C. glabrescens with utricles up to 6 mm, laxly pilose), with 2 short to medium-sized teeth; nutlets tightly enveloped in utricle.

2a. Male spike single, terminal, distanced from uppermost female spike by up to 15 cm, upper female spikes subsessile, lower ones very shortly pedunculate; female glumes ovate, mucronate .......................... 375. C. filipedunculata

2b. Male spikes 2 or 3, sometimes 4, borne at top of culm, rather shortly pedunculate, female spikes usually pedunculate, rarely upper ones subsessile; female glumes ovate-lanceolate, narrowly ovate, or lanceolate, aristate or mucronate.

3a. Leaf blades 1–2 mm wide, slightly involute on margins; female glumes lanceolate or oblong-ovate, acuminate at apex, longer than or equalling utricle; utricles with short beak, veins indistinct .................. 376. C. lasiocarpa

3b. Leaf blades 3–5 mm wide, flat; female glumes ovate-lanceolate or narrowly ovate, mucronate or aristate at apex, usually shorter than (excluding awn) utricle; utricles with medium-sized beak, several veins distinct.

4a. Female glumes narrowly ovate; utricles broadly ovate or ovate, 5–6 mm, laxly hispidulous ........ 377. C. glabrescens

4b. Female glumes ovate-lanceolate; utricles oblong-ovate, 3–4 mm, densely hispidulous.

5a. Culms stout; leaves stiff; female spikes densely many flowered; utricles with short beak, long 2-toothed at orifice .......................................................... 378. C. fedia

5b. Culms slender; leaves soft; female spikes graduated from laxly at base to densely many flowered above; utricles with rather long beak, shortly 2-toothed at orifice ......................... 379. C. miyabei

1b. Involucral bracts usually sheathed; utricles 5–10 mm, laxly pubescent or glabrous (C. wui with utricles densely hisrute), long 2-toothed; nutlets rather loosely enveloped in utricle.

6a. Male spike single and terminal, distant uppermost female spike near; lowestmost involucral bract slightly sheathed, sheath not exceeding 1 cm.

7a. Female glumes ovate-lanceolate, long aristate at apex, dark purple-red laterally, laxly hisrute; utricles broadly ovate, red-brown, densely hisrute, with 2 medium-sized teeth at orifice ........................................ 380. C. wui

7b. Female glumes broadly ovate, mucronate at apex, stramineous laterally, glabrous or ciliate only at apex; utricles oblong-ovate, yellow-green, glabrous, with 2 short teeth at orifice ........................................ 381. C. latisquamea

6b. Male spikes 2–5, distant uppermost female spike far; lowestmost involucral bract rather long sheathed, sheath usually exceeding 1 cm.

8a. Utricles laxly hispidulous or ciliate on beak margins.

9a. Leaves 4–6 mm wide, glabrous; lower involucral bracts longer than inflorescence, upper involucral bracts shorter than inflorescence; spikes 5–7, female spikes 3–5 cm; utricles 5–7 mm, ciliate on beak margins .......................................................... 386. C. drymophila

9b. Leaves 2–3 mm wide, laxly hispidulous on both surfaces; involucral bracts shorter than inflorescence; spikes usually 4, female spikes 2–2.8 cm; utricles 4–5.6 mm, hispidulous .......... 387. C. hirticaulis

**Carex filipedunculata**

Rhizome with slightly thick stolons. Culms 45–60 cm tall, slightly thick, acutely triquetrous, scabrous on upper part, dark red-brown and bladeless sheathed at base, sheaths later usually splitting into reticulate fibers. Leaves longer than or equaling culm, blades 3–7 mm wide, flat, scabrous on adaxial surface and margins, with indistinctly transverse septate nodes between veins, long sheathed. Involucral bracts leafy, nearly equalling culm, not sheathed, sometimes lowermost involucral bract shortly sheathed. Spikes 4 or 5; terminal spike male, rarely male culm, not sheathed, sometimes lowermost involucral bract nearly not sheathed. Spikes 2, 3–4.5 cm, 2–3 mm thick; lateral spikes female, remote, distance between uppermost female spike and male spike 3.5–15 cm, female spikes 1.5–4.5 cm, 4–5 mm thick, densely many flowered, upper spike subsessile, lowermost spike shortly pedunculate. Female glumes brownish laterally, greenish at middle, slightly red-brown on upper part, ovate or ovate-lanceolate, 4–6 mm (including awn), membranous, 1–3-veined, margins white hyaline, apex acuminate, aristate or mucronate, scabrous on margins of awn or mucro. Utricles gray-brown, obliquely patent, equaling or slightly shorter than glume, oblong-ovate, slightly inflated trigonous, 4.5–5 mm, leathery, densely brownish gray tomentose, indistinctly veined, base obtusely rounded, apex gradually narrowed to a slightly broad and short beak, orifice slightly recurved 2-toothed. Nutlets rather tightly enveloped, obovate, trigonous, ca. 2 mm, base shortly stipitate; style short, usually curved, base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Swamps or meadow moors. Heilongjiang, Nei Mongol [Korea, Mongolia, Russia; Europe, North America].

The stems and leaves are used for making paper and rope.


**Carex glabrescens**

The stems and leaves are used for making paper and rope.

- Anhui (Xuning).


**Carex lasiocarpa**

Rhzome stoloniferous. Culms laxly tufted, 50–100 cm tall, obtusely trigonous, stiff, slightly scabrous on upper part, with red-brown and bladeless sheaths at base, sheaths later usually splitting into reticulate fibers. Leaves shorter than or nearly equaling culm, blades 1–2 mm wide, involute on margins, slightly plicate, stiff, with transverse septate nodes between veins, rather long sheathed. Involucral bracts leafy, linear, nearly equally or slightly longer than inflorescence, lower involucral bracts up to 5 mm sheathed, upper involucral bracts nearly not sheathed. Spikes 3–5; terminal 1–3 spikes male, approximate, linear-cylindric, 2–3 cm, subsessile; remaining spikes female, remote, ovate or oblong-cylindric, 1.5–3 cm, 5–6 mm thick, densely many flowered, shortly pedunculate, upper ones subsessile. Female glumes brown or red-brown laterally, green at middle, oblong-ovate or lanceolate, 4.5–5 mm, membranous, 3-veined, apex acuminate, mucronate. Utricles yellow-green, obliquely patent, slightly shorter than or nearly equally glume, ovate or oblong-ovate, slightly inflated trigonous, 4–5 mm, leathery, densely brownish gray tomentose, indistinctly veined, base obtusely rounded, apex gradually narrowed to a slightly broad and short beak, orifice slightly recurved 2-toothed. Nutlets rather tightly enveloped, obovate, trigonous, ca. 2 mm, base shortly stipitate; style short, usually curved, base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Swamps or meadow moors. Heilongjiang, Nei Mongol [Korea, Mongolia, Russia; Europe, North America].

Carex lasiocarpa

- Anhui (Xuning).

Carex lasiocarpa var. fuscata (Ohwi) Ohwi; Carex lasiocarpa var. fuscata Ohwi.

**Carex lasiocarpa**

Rhzome stoloniferous. Culms laxly tufted, 50–100 cm tall, obtusely trigonous, stiff, slightly scabrous on upper part, with red-brown and bladeless sheaths at base, sheaths later usually splitting into reticulate fibers at lateral side. Leaves longer than culm, blades 3–4 mm wide, flat, stiff, scabrous on adaxial surface and margins, smooth on abaxial surface, sheathed, with transverse septate nodes between veins. Involucral bracts leafy, lower involucral bracts shortly sheathed, upper ones nearly not sheathed, setaceous at base of male spikes. Spikes 5 or 6; terminal 2 or 3 (or 4) spikes male, approximate, linear, 2–4 cm, subsessile; remaining spikes female, rather remote, cylindric, 4–5 cm, densely many flowered, rather lax at base, upper spikes subsessile, lower ones shortly pedunculate. Female glumes red-brown laterally, green at middle, narrowly ovate, ca. 5 mm, 3-veined, margins white hyaline, apex acuminate, mucronate or aristate, scabrous on margins of awn or mucro. Utricles stramineous, obliquely patent, longer than glumes, broadly ovate or ovate, slightly inflated trigonous, 4.5–5 mm, thickly membranous, laxly hispidulous, distinctly several veined, base subrounded, short stipitate, apex abruptly narrowed to a medium-sized beak, ciliate on bead margins, orifice

Spikes 3–5; terminal 1–3 spikes male, approximate, linear-cylindric, 2–3 cm, subsessile; remaining
slightly long 2-toothed. Nutlets loosely enveloped, elliptic, trigonous, ca. 2.5 mm; style usually curved, base not thickened; stigmas 3.

Wet places at forest margins on mountain slopes. Liaoning [Japan, Korea].


Rhizome short, stoloniferous. Culms tufted, 30–75 cm tall, triquetrous, rather thick, smooth on lower part, scabrous on upper part, ferruginous and bladeless sheathed at base, sheaths later usually splitting into reticulate fibers. Leaves longer than culm, blades 3–4 mm wide, flat, stiff, sheathed. Involucral bracts leafy, longer than inflorescence, lowermost involucral bract shortly sheathed, upper ones nearly not sheathed. Spikes 5–7; terminal 2–4 spikes male, approximate, linear-cylindric, 2–3 cm, subsessile; remaining spikes female, rather remote, lowermost distance up to 12 cm, densely many flowered, lowermost spike rather long pedunculate, upper ones shortly pedunculate, peduncles glabrous. Female glumes red-brown laterally, yellow-green at middle, lanceolate, 3–3.5 mm, membranous, 3-veined, apex acuminate, aristate, awn up to 3 mm at base of spike, scabrous on margins. Utricles brown, obliquely patent, horizontally patent in maturity, longer than or equaling glume, shorter than glume at base of spike (including awn), oblong-ovate, trigonous, 4–5 mm, leathery, densely pubescent, 5-veined abaxially, base abruptly contracted into a short stipe, apex gradually narrowed to a short beak, orifice long 2-toothed. Nutlets stramineous, tightly enveloped, obovate or subelliptic, trigonous, ca. 2 mm, apex mucronate; style of medium length, base not thickened; stigmas 3.

Mountain slopes; [400–]3000–3400 m. Yunnan [Afghanistan, India, Myanmar, Nepal, Pakistan, N Thailand, Vietnam].


Rhizome long stoloniferous, rather thick. Culms 30–60 cm tall, triquetrous, scabrous on upper part, with reddish brown and bladeless sheaths at base, sheaths later splitting into reticulate fibers adaxially. Leaves longer than culm, blades 3–5 mm wide, flat, rather stiff, scabrous on margins and adaxial surface. Lower involucral bracts leaflike, longer than inflorescence, not sheathed, sometimes lowermost one shortly sheathed. Spikes 5 or 6; terminal 2–4 spikes male, approximate, linear, 1.5–3 cm, ca. 2 mm thick, usually with 1–3 female flowers; remaining spikes female, distance 4–6 cm between 2 spikes, cylindric, 2–6 cm, 4–5 mm thick, densely many flowered, lax at base of spike, upper spikes shortly pedunculate, lower ones long pedunculate, slightly scabrous. Female glumes dark red-brown laterally, brownish at middle, lanceolate, 3.5–5 mm, membranous, 3-veined, margins white hyaline, apex mucronate or aristate. Utricles obliquely patent, broadly obovate, trigonous, 3–4 mm, membranous, white pubescent, pubescence rather dense on upper part, indistinctly veined, base cuneate, apex abruptly contracted into a rather long beak, orifice 2-toothed. Nutlets tightly enveloped, broadly obovate, trigonous, ca. 2 mm, apex curved mucronate; style base slightly thickened; stigmas 3, ± long.

Wet places at roadsides. Anhui.

Carex miyabei var. miyabei occurs in Japan and Korea. It has male spikes usually without 1–3 female flowers; upper female spikes nearly sessile; female glumes oblong-ovate, without mucro or muticous at apex; and utricles hispidulous.


Rhizome slender stoloniferous. Culms 50–100 cm tall, rather thick, triquetrous, densely hispidulous, dark red-brown and bladeless sheathed at base. Leaves longer than culm, 4–8 mm wide, flat, densely hisrate, rather long sheathed. Involucral bracts leaflike, longer than inflorescence, shortly sheathed, densely hisrate. Spikes 4 or 5, approximate; terminal spike male, linear-cylindric, 5–7 cm, nearly sessile; remaining spikes female, cylindric, 2.5–5 cm, densely many flowered, shortly pedunculate. Female glumes red-brown laterally, green at middle, ovate-lanceolate, 4–6 mm, membranous, laxly hisrate, 3-veined, apex acuminate, aristate. Utricles dark red-brown, obliquely patent, elliptic or broadly ovate, slightly inflated trigonous, 6–7 mm, thinly leathery, hisrate, distinctly several veined, base rounded, apex gradually narrowed to a medium-sized beak, orifice 2-toothed, teeth slightly long and strict. Nutlets elliptic or obovate, ca. 3 mm, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jul.

Wet places on mountain slopes, ditch sides, watersides; 1900–2900 m. Guizhou, Sichuan.


Carex villosa Boott var. latisquamea (Komarov) Küchenthaler.

Rhizome short, shortly stoloniferous. Culms laxly tufted, 30–75 cm tall, triquetrous, laxly pubescent, with brown, pubescent, and bladeless sheaths at base. Leaves equalling culm, blades 3–6 mm, flat, with transverse septate nodes between veins, laxly pubescent, lower ones long sheathed. Involucral bracts leafy, lowermost one nearly equaling inflorescence, upper ones shorter than inflorescence, shortly sheathed. Spikes 3 or 4, slightly remote; terminal spike male, narrowly lanceolate or linear, 1–2 cm, shortly pedunculate; lateral spikes female, oblong or oblong-ovate, 1–2.5 cm, slightly densely more than 10-flowered, lower spikes shortly pedunculate, upper one sub sessile. Female glumes yellowish brown laterally, green at middle, broadly ovate, ca. 3 mm, membranous, 3-veined, apex acuminate, mucronate. Utricles green-brown, obliquely patent, longer than glume, ovate, obtusely trigonous, 5–6 mm, subleathery, raised several veined, base broadly cuneate, shortly stipitate, apex gradually narrowed to a short beak, orifice long and recurved 2-toothed. Nutlets slightly tightly enveloped, obovate, trigonous, 2.5–3 mm, apex recurved mucronate; style base not thickened; stigmas 3. Fl. and fr. Apr–May.
Wet places in lax forests or in meadows. Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia (Far East)].


锥囊薹草 zhuì náng tái cáo

Carex aristata R. Brown subsp. raddei (Kükenthal) Kükenthal.

Rhizome long and thick. Culms laxly tufted, 35–100 cm tall, acutely triquetrous, rather stout, stiff, smooth, clothed with red-brown and bladeless sheaths at base, sheaths later usually splitting into reticulate fibers. Leaves shorter than culm, blades 3–4 mm wide, flat, slightly involute and scabrous on margins, with transverse septate nodes between veins, rather long sheathed, lower sheaths laxly pubescent, upper ones glabrous or very laxly pubescent. Lower involucral bracts leafy, slightly shorter than or equaling inflorescence, slightly long sheathed, upper involucral bracts setaceous, very shortly sheathed. Spikes 4–6, upper ones approximate, lower ones rather remote; terminal 2 or 3 spikes male, narrowly lanceolate, 2–4 cm, sub sessile; remaining spikes female, oblong-cylindric, 3–5 cm, slightly laxly many flowered, shortly pedunculate. Female glumes pale ferruginous laterally, ovate-lanceolate or lanceolate, 6–8 mm (including awn), membranous, pale 3-veined, apex acuminate, aristate. Utricles greenish, stramineous at maturity, obliquely patent, longer than glume, rarely 6–7 mm, thinly leathery, glabrous, distinctly several veined, base subrounded, shortly stipitate, apex gradually narrowed to a medium-sized to long beak, orifice rather long and strict 2-toothed. Nutlets loosely enveloped in utricle, elliptic-obovate, trigonous, ca. 2.5 mm, base shortly stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jul.

Swamps, riversides, wet places. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang [Mongolia, Russia].


毛叶薹草 mào yè tái cáo


Rhizome stoloniferous. Culms densely tufted, 70–100 cm tall, obtusely trigonous, smooth, clothed with red-brown and bladeless sheaths at base. Leaves shorter than culm, blades 5–8 mm wide, flat, slightly revolute on margins, glabrous on adaxial surface, pubescent on abaxial surface and sheath, lower leaves rather long sheathed. Involucral bracts leafy, lowermost involucral bracts longer than inflorescence, medium to long sheathed, sheath pubescent, upper involucral bracts rather short. Spikes 6–8, remote; terminal 3 or 4 spikes male, narrowly cylindric, 3–5 cm, usually sessile; remaining spikes female, oblong-cylindric or cylindric, 2.5–5 cm, rarely rather long, laxly many flowered, very lax at base, lowermost peduncle ca. 2 cm, upper peduncles rather short. Female glumes brownish, yellow-brown at middle, oblong-ovate or lanceolate, 5–8 mm, up to 11 mm (including awn) at base of spike, membranous, 3-veined, sometimes scabrous on midrib, apex acuminate, aristate, scabrous on awn margins. Utricles green, obliquely patent, longer than glume, rarely shorter than glume at base of spike, broadly ovate, inflated trigonous, 7–8(–10) mm, herbaceous, glabrous or only ciliate on margins, distinctly several veined, base subrounded, shortly stipitate, apex gradually narrowed to a long beak, orifice rather long 2-toothed, teeth divergent. Nutlets loosely enveloped in utricle, obovate, trigonous, ca. 2.2 mm, base shortly stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Wet places at riversides, lakesides, swamps. Heilongjiang, Jilin [Korea, Russia (Far East)].


湿薹草 shī tái cáo


Rhizome stoloniferous. Culms densely tufted, 40–70 cm tall, acutely triquetrous, rather thick, smooth or slightly scabrous on upper part, clothed with red-brown and bladeless sheaths at base, sheaths later splitting into fibers or reticulate fibers. Leaves shorter than culm, blades 3–5 mm wide, flat, revolute on margins, glabrous, with transverse septate nodes between veins on abaxial surface, sheathed, lower sheaths rather long. Involucral bracts leafy, slightly longer than or equaling inflorescence, slightly long sheathed, upper involucral bracts setaceous, very long sheathed. Spikes 5–7, upper ones approximate, lowermost one remote; terminal 2 or 3 spikes male, narrowly lanceolate or narrowly cylindric, 2–4 cm, sub sessile; remaining spikes female, oblong-cylindric or cylindric, 3–6 cm, pedunculate, lower peduncles rather long, upper ones short. Female glumes pale ferruginous, brownish at middle, oblong-ovate or lanceolate, ca. 5 mm, membranous, 3-veined, apex acuminate, aristate, scabrous on margins of awn. Utricles stramineous, obliquely patent, longer than glume, ovate, inflated trigonous, 6–7 mm, thinly leathery, glabrous, distinctly several veined, base subrounded, shortly stipitate, apex gradually narrowed to a medium-sized to long beak, orifice rather long and strict 2-toothed. Nutlets loosely enveloped in utricle, elliptic-obovate, trigonous, ca. 2.5 mm, base shortly stipitate, apex mucronate; style base not thickened; stigmas 3. Fl. and fr. May–Jul.

Wet places in sandy riversides, swampy meadows. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, Russia (Far East)].
1a. Culms 60–70 cm tall; leaf blades 4–6 mm wide, glabrous or only pubescent on membranous part of sheaths; utricle hispid on margins of beak ........................................... 386a. var. drymophila

1b. Culms up to 100 cm tall; leaf blades 5–8(–10) mm wide, usually laxly pubescent on abaxial surface; utricle hispid on upper part and margins of beak ........................................... 386b. var. abbreviata

386a. Carex drymophila var. drymophila

野笠薹草(原变种) ye li tai cao (yuan bian zhong)

Carex orthostachys C. A. Meyer var. drymophila (Turczaninow ex Steudel) Maximowicz.

Culms 60–70 cm tall. Leaf blades 4–6 mm wide, glabrous or only pubescent on membranous part of sheaths. Utricles hispid on margins of beak. Fl. and fr. Jun–Aug.

Wet grasslands in forest regions. Heilongjiang, Jilin, Nei Mongol [Korea, Mongolia, Russia (Far East, E Siberia)].

The culms and leaves are used as animal feed.


毛果野笠薹草 mao guo ye li tai cao

Carex amurensis Kükenthal var. abbreviata Kükenthal, Bot. Centralbl. 77: 94. 1899; C. akanensis Franchet; C. drymophila var. akanensis (Franchet) Kükenthal.

Culms up to 100 cm tall, stout. Leaf blades 5–8(–10) mm wide, usually laxly pubescent on abaxial surface. Utricles hispid on upper part and margins of beak. Fl. and fr. Jun–Aug.

Wet places at lakesides or riversides, in swamps or meadows. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia (Far East)].


密毛薹草 mi mao tai cao

Rhizome short. Culms tufted, 35–45 cm tall, slender, triquetrous, hispid, clothed with brownish and glabrous sheaths at base. Leaves shorter than culm, blades 2–3 cm wide, flat, hispid on both surfaces, long sheathed, sheaths hispid. Involucral bracts leaflike, shorter than inflorescence, hispid, lowermost involucral bract long sheathed, upper ones nearly not sheathed. Spikes usually 4; terminal 2 spikes male, approximate, cylindrical, 2–4 cm; remaining spikes female, slightly remote, obleng-cylindric, 2–2.8 cm, densely many flowered, uppermost one subsessile, lower spikes pedunculate, usually clothed in involucral bract sheaths. Female glumes brownish, ovate, ca. 4 mm, membranous, glabrous, midrib green, margins hyaline, apex acute, shortly aristate. Utricles yellowish green, suberect, longer than glume, elliptic, obtusely trigonous, 4–5.6 mm, membranous, hispid, several veined, base cuneate, very shortly stipitate, apex gradually narrowed to a rather long beak, orifice deeply split into 2 teeth, teeth slightly recurved. Nutlets immature; style base not thickened; stigmas 3. Fl. and fr. Jun–Aug.

Grasslands on high mountains; ca. 3200 m NW Yunnan (Zhongdian).

急尖薹草组  ji jian tai cao zu
Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker

Rhizome short or stoloniferous. Culms trigonous, stiff or slender. Involutcal bracts setaceous or leaflike, sheathless or shortly sheathing. Inflorescence racemose, with 2–8 spikes; upper 1 or 2 spikes male, or terminal spike gynaecandrous; remaining spikes female (with few male flowers at apex), oblong or cylindric, densely many flowered, sessile or with short peduncles. Female glumes dark purple or brown, apex obtuse to acuminate. Utricles suborbicular, broadly obovate, or elliptic, plano-convex or biconvex, densely minutely papillose, apex abruptly contracted into a short beak, orifice truncate or subentire, rarely 2-toothed. Nutlets obovate or oblong; style base not thickened; stigmas 2.

Between 70 and 90 species: Asia, Australia, Europe, North America, Pacific islands (New Zealand), austral South America; 27 species (12 endemic) in three subsections China.

1a. Terminal spike gynaecandrous ................................................................. 1. C. subsect. Gynaecandrae
1b. Terminal spike male.

2a. Female glumes 1-veined ........................................................................... 2. C. subsect. Rigidae
2b. Female glumes 3-veined ........................................................................... 3. C. subsect. Caespitosae


雌雄序薹草亚组  ci xiong xu tai cao ya zu

One species: E Asia, NW North America.

蟋蟀薹草  xi shuai tai cao

Rhizome short. Culms tufted, 30–40 cm tall, slender, compressed trigonous, slightly scabrous above, clothed at base with purple-red or brown bladeless sheaths eventually disintegrating into parallel fibers. Leaves shorter than or subequaling culm, blades gray-green, linear, 2.5–4 mm wide, flat, papillose, margins scabrous. Lower 1 or 2 involucral bracts leaflike, surpassing inflorescence, sheathless, upper glumelike. Spikes 3–5, approximate, cylindric, 10–25 × ca. 0.5 mm, densely many flowered; terminal spike gynaecandrous or with male flowers at apex or base, female in middle; lateral spikes female, upper 2 or 3 sessile or subsessile, lower 1 or 2 with peduncles up to ca. 1.5 mm. Female glumes dark purple-black, oblong-elliptic, ca. 2.5 × 1.2–2 mm, with a light midrib, margins narrowly white hyaline, apex obtuse. Utricles light brown or light green, sometimes red or purple spotted above, longer than glume, suberect, elliptic or obovate-elliptic, plano-convex, (2–)2.5–3 mm, membranous, indistinctly veined, base shortly stipitate, apex abruptly contracted into a short cylindric reddish brown beak, orifice entire or slightly emarginate. Nutlets tightly enveloped, broadly obovate, 1.5–1.7 × ca. 1.3 mm, base very shortly stipitate; style base not thickened; stigmas 2. 2n = 84.

Alpine frozen soil, wet places; 1700–2500 m. Jilin [Japan, Korea, Mongolia, Russia (Far East, E Siberia); North America (Alaska, NW Canada)].


坚挺薹草亚组  jian ting tai cao ya zu

Rhizome short, stoloniferous. Culms rigid. Terminal spike male; lateral spikes female, oblong-ovate or oblong-cylindric, approximate, with short peduncles at base, upper subsessile. Female glumes light black, 1-veined, apex obtuse or acute, without awn. Utricles suborbicular, obovate-orbicular, or oblong, membranous, faintly veined. Stigmas 2.

About 20 species: Asia, North America; 15 species (eight endemic) in China.

1a. Lower involucral bracts leaflike.

2a. Upper 1–3 spikes male.

3a. Utricles 4–5 mm, slightly longer than subtending glume; basal sheaths rather long, yellow-brown .................................................................................................................. 402. C. middendorfii

3b. Utricles ca. 3 mm, ca. 1/2 as long as subtending glume; basal sheaths rather short, red-brown or red-purple .......................................................................................................................... 403. C. cryptocarpa

2b. Terminal spike male.

4a. Utricles shorter than glume.

5a. Female glumes oblong or ovate-lanceolate, 3.5–4 mm; utricles oblong, ca. 3 × 1.2 mm ........ 397. C. zhonghaiensis

5b. Female glumes ovate-oblung or elliptic, ca. 2.5 mm; utricles elliptic, 2–2.5 mm ......................... 398. C. minxianica

4b. Utricles longer than glume.
6a. Utricles broadly obovate or suborbicular; female glumes 1.5–1.7 mm ........................................ 399. Carex platysperma
6b. Utricles broadly ovate, broadly elliptic, or ovate; female glumes 2–3 mm.
7a. Utricles broadly ovate or broadly elliptic, 2.5–3 mm; female glumes ca. 2.5 mm, rounded
   at apex ................................................................. 400. Carex miliensis
7b. Utricles ovate, 2.2–2.5 mm; female glumes ca. 2 mm, truncate at mucronate apex .................. 401. Carex kiotensis
1b. Lower involucral bracts setaceous.
8a. Utricles suborbicular, ovate-orbicular, or obovate-orbicular.
9a. Female spikes ovate to oblong, sessile or lower with peduncles 1.5–3 mm.
10a. Rhizome with stolons; utricles suborbicular or subglobose, beak very short, orifice entire or
    emarginate with small teeth ........................................ 389. Carex orbicularis
10b. Rhizome without stolons; utricles broadly ovate or suborbicular, beak short, orifice irregular
    truncate .............................................................. 390. Carex satakeana
9b. Female spikes cylindric, lower with peduncles 5–20 mm.
11a. Female glumes narrowly oblong, purple-brown, margins narrowly white hyaline ...................... 391. Carex arcatica
11b. Female glumes ovate, blackish purple-red, margins broadly white hyaline .................. 392. Carex borealithinganica
8b. Utricles ovate or elliptic.
12a. Culms 5.5–8 cm tall; basal leaves gray-green ................................................................. 393. Carex taldycola
12b. Culms 20–60 cm tall; basal leaves green.
13a. Basal sheaths purple or blackish purple ............................................................... 394. Carex altaica
13b. Basal sheaths castaneous-brown.
14a. Utricles ca. 2.5 mm; nutlets obovate, sessile .......................................................... 395. Carex ensifolia
14b. Utricles 4–4.5 mm; nutlets oblong, stipitate .............................................................. 396. Carex shandanica


圆囊薹草 yuan nang tai cao

Rhizome stoloniferous. Culms tufted, 10–25 cm tall, slender, trigonous, scabrous, clothed at base with castaneous sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 1.5–3 mm wide, flat, margins rather stiffly scabrous. Basal involucral bracts setaceous, shorter than inflorescence, sheathless, upper ones glumelike. Spikes 2 or 3(or 4); terminal spike male, cylindric, 1.2–2 cm, with peduncle 3–9 mm; lateral spikes female, ovate or oblong, 0.5–1.5 cm, densely many flowered, lowest with peduncle 2–3 mm, upper sessile. Female glumes blackish brown or red-brown, oblong or oblong-lanceolate, 1.8–2.5 × 1–1.2 mm, with light midrib, margins white hyaline, apex slightly oblique. Utricles light brown below, blackish brown above, longer than glume and 1/3–1/2 as broad, broadly ovate or subglobose, plano-convex, 2.5–2.8 × 1.5 mm, glabrous, ± nerveless, base shortly stipitate, apex rounded, with erect beak, orifice irregular truncate. Nutlets red-brown, tightly enveloped, obovate-orbicular, ca. 1.5 mm; style base not thickened; stigmas 2. Fl. and fr. Jul–Aug.

Meadows, wet places; 2000–5000 m. Gansu, Ningxia, Xinjiang, Xizang [Afghanistan, NW India, Kashmir, Nepal, Pakistan, Russia].


北疆薹草 bei jiang tai cao

Rhizome short, subwoody. Culms 5–30 cm tall, erect, slender, rigid, acutely trigonous, smooth, ± curving above, clothed at base with brown sheaths disintegrating into parallel fibers. Leaves shorter than culm, blades linear, 2–3 mm wide, flat or plicate, margins scabrous, apex acuminate. Lowest involucral bracts setaceous, sheathless, upper glumelike, dark brown. Spikes 2–5; erect, approximate; terminal spike (rarely 2) male, narrowly oblong or oblanceolate, 20–25 × ca. 3.5 mm; lateral spikes female, sometimes bearing several male flowers at apex, narrowly oblong or shortly cylindric, 15–25 × 4–5 mm, densely many flowered, lowest spike with peduncle, upper sub-sessile. Female glumes dark brown or castaneous, ovate-oblong, ca. 2.5 mm, with yellowish green midrib, apex obtuse. Utricles dark brown above, pale below, broader and slightly longer than glume, broadly ovate or suborbicular, plano-convex, 2.5–2.8 × 1.5 mm, glabrous, ± nerveless, base shortly stipitate, apex rounded, with erect beak, orifice irregular truncate. Nutlets red-brown, tightly enveloped, obovate-orbicular, ca. 1.5 mm; style base not thickened; stigmas 2. Fl. Jun.

● Xizang (Xigazê).


北疆薹草 bei jiang tai cao

Rhizome creeping. Culms 20–50 cm tall, slender, trigonous, scabrous, clothed at base with reddish brown to castaneous sheaths usually disintegrating into fibers. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, margins scabrous. Lowest involucral bract setaceous, shorter than inflorescence, sheathless, upper ones glumelike. Spikes 2–4, distant; terminal spike male, cylindric, 2–3.5 cm, with peduncle 1.5–2 cm; lateral spikes female, cylindric or oblong, (10–)17–30 × 4–6 mm, densely many flowered, lower peduncles 10–18 mm. Female glumes dark brown, narrowly oblong, ca. 2.5 × 0.7–0.9 mm, with light midrib, margins narrowly white hyaline, apex obtuse or acute. Utricles brownish green to ferruginous-green, slightly longer than glume and 2–3 × as broad, broadly ovate or obovate, plano-convex, 2.5 × 1.8 mm, densely minutely papillose, faintly veined, base shortly stipitate, apex with cylindric short beak, orifice weakly emarginate. Nutlets brown, obovate, ca. 2 mm; style base not thickened; stigmas 2. Fl. and fr. Apr–Jul.

Marshes, riversides, moist places; 100–3300 m. Gansu, Ningxia, Qinghai, Xinjiang [Russia].

北兴安薹草 bei xing an tai cao

Rhizome short, obliquely ascending with curving stolons. Culms 40–50 cm tall, trigonous, smooth, rigid, clothed at base with bladed sheaths but sterile culm with purple-red bladeless sheaths. Leaves shorter than culm, blades gray-green, linear, 2–4 mm wide, margins revolute. Involucral bracts glumelike, lowest one setaceous, sheathless. Spikes 3–5; terminal spike 2–4 mm wide, margins revolute. Involucral bracts glumelike, sheaths. Leaves shorter than culm, blades gray-green, linear, 2–3 mm wide, flat, margins scabrous, apex acuminate. Lower involucral bracts setaceous, shorter than inflorescence, sheathless, upper ones glumelike. Spikes 3 or 4, approximate; terminal spike male, clavate, 1–1.5 cm; lateral spikes female, ovate or oblong, 5–15 × 5–6 mm, densely many flowered, lowest with peduncle 2–5 mm, others sub sessile. Female glumes black-purple, elliptic, 2.5–2.8 × ca. 1.1 mm, with faint midrib, apex acuminate. Utricles black-purple above, light brown below, longer than glume, elliptic to ovate, plano-convex, ca. 3 × 2.2 mm, densely minutely papillose, faintly veined, apex with short beak, orifice entire, without small teeth. Stigmas 2. Fl. and fr. Jun–Aug.

Alpine grasslands, boggy valleys; 2000–2600 m. Xinjiang [Russia (Siberia)].


纤叶薹草 jian ye tai cao

Rhizome stoloniferous. Culms 15–60 cm tall, slender, trigonous, scabrous, clothed at base with castaneous-brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, ca. 2–3 mm wide, flat, margins scabrous. Involucral bracts setaceous, shorter than inflorescence. Spikes 3 or 4; terminal spike male, oblong-cylindric to cylindric, 1–2 cm, with peduncle 3–6 mm; lateral spikes female, oblong or oblong-cylindric to cylindric, 8–20 × 4–5 mm, densely many flowered, lowest with peduncle 3–7 mm, others sub sessile. Female glumes blackish purple, oblong, ca. 2.5 mm, with light midrib, margins narrowly white hyaline, apex obtuse. Utricles light brown below, blackish above, equaling glume, elliptic or ovate-elliptic, plano-convex, ca. 2.5 mm, densely minutely papillose, nerveless, apex abruptly contracted into a short beak, orifice truncate. Nutlets yellowish, tightly enveloped, broadly ovate, ca. 1.5 mm; style base not thickened; stigmas 2. Fl. and fr. Jul–Aug.

Slopes, grasslands, moist places; 2000–3500 m. Gansu, Ningxia, Qinghai, Xinjiang, Xizang [Mongolia, Russia].


山中海薹 zhong hai tai cao

Rhizome short. Culms tufted, 25–40 cm tall, acutely trigonous, scabrous, clothed at base with blackish castaneous sheaths disintegrating into fibers. Leaves shorter than culms, blades linear, 2–3 mm wide, flat, margins scabrous. Involucral bracts setaceous, shorter than spike, sheathless. Spikes 4 or 5; terminal spike male, blackish brown, oblong, 1.5–1.8 cm, densely many flowered; lateral spikes female, oblong or ovoid, 1–2 cm; lowest peduncle ca. 1 cm, upper spikes sessile. Female glumes blackish brown, oblong, ca. 3 × 1 mm, with light brown midrib, apex obtuse and rounded. Utricles light brown, longer than glume, plano-convex, 4–4.5 mm, base stipitate, apex abruptly contracted into a short beak, orifice truncate. Nutlets loosely enveloped, oblong, base stipitate; stigmas 2. Fl. and fr. Aug–Sep.

Riversides along valleys; ca. 3100 m. Gansu (Shandan).
less sheaths. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, margins scabrous. Basal involucral bracts leaflike, shorter than inflorescence, sheathless, remaining bracts setaceous. Spikes 3–5; terminal spike male, occasionally some becoming androgynous bearing several male flowers at apex, cylindrical, 20–40 × 4–5 mm, densely many flowered, subsessile. Female glumes blackish purple, oblong or ovate-lanceolate, 3.5–4 × 0.8–1 mm, with light midrib, apex acuminate. Nutlets castaneous, slightly loosely enveloped, obovate, ca. 1.5 × 1 mm; style base not thickened; stigmas 2. Fl. and fr. Jul–Aug.

- In water; ca. 2400 m. N Xinjiang (Qinghe: Zhonghaizhi).


岷县薹草 min xian tai cao

Rhzizome short, stoloniferous, slender, woody. Culms tufted, 40–60 cm tall, ca. 1 mm thick, trigonous, glabrous, scabrous above, clothed at base with dark purple sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, ca. 2 mm wide, flat, margins scabrous. Involucral bracts leaflike, shorter than inflorescence, sheathless. Spikes 3–5; terminal spike male, linear or narrowly cylindrical, 20–23 × 2–4 mm, pallid; remaining spikes female, only upper one androgynous, linear-cylindrical, 20–25 × 2.5–3 mm, sessile, lower spikes with peduncles. Female glumes blackish brown, ovate-oblong or elliptic, ca. 2.5 mm, with light midrib, apex obtuse or acute. Utricles shorter than or equaling glume, elliptic, plano-convex, 2–2.5 mm, faintly veined, apex gradually attenuate into a beak, orifice entire or shortly 2-toothed. Nutlets ovate, ca. 2 mm, base shortly stipitate; stigmas 2. Fl. and fr. Jul–Aug.

- S Gansu (Minxian).


雙邁薹草 shuang liao tai cao

Rhzizome short, stoloniferous. Culms 40–50 cm tall, slender, smooth, clothed at base with brown, bladeless, lustrous sheaths. Leaf blades 2–2.5 mm wide, flat, margins scabrous. Involucral bracts leaflike, equaling or slightly longer than inflorescence, sheathless. Spikes 3 or 4; terminal spike male, linear, 1–2.5 cm; remaining spikes female, slightly overlapping, cylindrical, 1–2 cm, densely many flowered, subsessile. Female glumes brownish-purple-red, light green abaxially, oblong-ovate, 1.5–1.7 mm, 1-veined, apex obtuse, sometimes with micro. Utricles longer than glume, broadly obovate or suborbicular, rarely ovate or elliptic, plano-convex, 2–2.5 mm, thinly membranous, 3–5-veined, base very shortly stipitate, apex abruptly contracted into a short beak, orifice emarginate or 2-toothed, rarely apex beakless. Nutlets tightly enveloped, obovate, ± biconvex; style base not thickened; stigmas 2.

- Alpine meadows, boggy meadows; 3000–4600 m. W Sichuan.

401. Carex phaeopoda Ohwi.

Carex phaeopoda Ohwi.

Rhzizome short, without stolons. Culms densely tufted, 30–60 cm tall, erect, trigonous, scabrous above. Leaves many, 6–13 mm wide, basal sheaths rusty brown or somewhat purplish brown. Involucral bracts leaflike, much surpassing inflorescence, sheathless at base. Spikes 5–7, subfastigate, sessile or pedunculate; terminal spike male, or with a few female flowers, linear, 4–8 cm; lateral spikes female, cylindrical, rarely with a few male flowers, 5–9 × 0.4–0.5 cm, densely many flowered. Female glumes pale and flecked with dark purple-brown, ovate or elliptic, ca. 2 mm, greenish 1-veined costa excurrent into a mucro at truncate apex. Utricles light brownish green, suberect,
ovate, biconvex, 2.2–2.5 mm, nerveless, base shortly stipitate, apical beak rather short, truncate. Nutlets loosely enveloped, broadly obovoid, biconvex, ca. 1.5 mm, contracted at both ends; stigmas 2.

Grassy places at middle elevations. Taiwan [Japan].

No specimens from China have been seen by the present authors.


高鞘薹草 gao qiao tai cao

Rhizome with stout stolons. Culms 30–60 cm tall, slightly scabrous or smooth above, clothed at base with yellowish brown bladeless long sheaths disintegrating into reticulate fibers. Leaves shorter than culm, blades linear, 2–4 mm wide, slightly rigid. Involucral bracts leaflike, ± equaling inflorescence, sheathless. Spikes 3–5; upper 1 (or 2) or spikes male, oblong, up to ca. 2.5 cm; remaining spikes androgynous, distant, ovate or oblong-ovate, 1.2–2.5 cm, densely many flowered. Female glumes ferruginous, brown, or dark brown, light at mid costa excurrent into a mucro. Utricles gray-green, becoming light brown, ca. 1/2 as long as glume, ovate, biconvex, ca. 3 mm, 3–5-veined, base stipitate, apex gradually attenuate into a smooth or slightly scabrous short beak, orifice truncate. Nutlets broadly obovate; style stout; stigmas 2.

Moss marshes. Heilongjiang [Japan, Russia (Far East)].


丛薹草亚组 cong tai cao ya zu

Rhizome short or stoloniferous. Culms slender, acutely trigonous, clothed at base with bladeless sheaths. Leaves flat or plicate, margins revolute. Involucral bracts leaflike or setaceous. Spikes 1–3; male; remaining spikes female, usually with male flowers at apex, cylindric, 2–8 × 0.8–1.2 cm, many flowered, with peduncles up to ca. 10 cm, smooth, pendent. Female glumes dark brown-purple, lanceolate or oblong-lanceolate, pale 1-veined costa excurrent into a mucro. Utricles gray-green, becoming light brown, ca. 1/2 as long as glume, ovate, biconvex, ca. 3 mm, slender, 6–8-veined, base shortly stipitate, apex gradually attenuate into a beak, orifice truncate. Nutlets brown, tightly enveloped, elliptic; style base not thickened; stigmas 2.

Marshes, meadows, riversides [Japan, Russia (Far East); North America (Alaska)].

No specimens from China have been seen by the present authors. Standley et al. (Fl. N. Amer. 23: 383–384. 2002) suggested that Asian populations are a different species from North American Carex lynghyei and are appropriately given species status.


嶸果薹草 yin guo tai cao

Carex lynghyei Hornemann subsp. cryptocarpa (C. A. Meyer) Hultén; C. lynghyei subsp. prionocarpa (Franchet) Kitagawa; C. prionocarpa Franchet.

Rhizome with stout stolons. Culms 30–120 cm tall, stout, slightly smooth, clothed at base with reddish purple, lustrous, bladeless sheaths. Leaves shorter than culm, blades broadly linear, 5–10 mm wide, flat, margins slightly involute. Involucral bracts leaflike, lower 2 or 3 surpassing inflorescence. Spikes 5–7, remote; upper 2 or 3 spikes male, fusiform or clavate, 6–7 cm; remaining spikes female, usually with male flowers at apex, cylindric, 2–8 × 0.8–1.2 cm, many flowered, with peduncles up to ca. 10 cm, smooth, pendent. Female glumes dark brown-purple, lanceolate or oblong-lanceolate, pale 1-veined costa excurrent into a mucro. Utricles gray-green, becoming light brown, ca. 1/2 as long as glume, ovate, biconvex, ca. 3 mm, slender, 6–8-veined, base shortly stipitate, apex gradually attenuate into a beak, orifice truncate. Nutlets brown, tightly enveloped, elliptic; style base not thickened; stigmas 2.

No specimens from China have been seen by the present authors.


elliptic or ovate-elliptic, inflated, 2.5–2.8 × ca. 1.8 mm, densely minutely papillose, nerveless except for 2 marginal veins, base rounded, apex abruptly contracted into a short smooth beak, orifice emarginate. Nutlets loosely enveloped; style base not thickened; stigmas 2.

Meadows. Heilongjiang [Russia (Far East); North America].


延長薹草 yan chang tai cao

Rhizome short. Culms ca. 30 cm tall, slender, compressed, scabrous. Leaves shorter than culm, blades linear, 2–4 mm wide, flat, apex acuminate. Involutral bracts leaflike, shorter than inflorescence, sheathless. Spikes 5, disposed in fastigiate inflorescence; terminal spike male, narrowly cylindric, ca. 1.5 cm; lateral spikes usually female, but with several male flowers at apex, cylindric, 2–3 cm, erect, lower 2 slightly distant, densely many flowered, with short peduncles, upper 2 sessile. Female glumes dark brown or dark purple-blackish, oblong-ovate, with green midrib, margins narrowly white hyaline, apex rounded. Utricles longer than glume, oblong-fusiform, compressed, ca. 3.5 mm, densely minutely papillose, few and faintly veined, base narrowly white hyaline, apex obtuse or truncate. Nutlets tightly enveloped, ovate, ca. 1.6 mm; style base not thickened; stigmas 2. Fl. and fr. Jul.

- Moist grasslands; ca. 3600 m. NW Yunnan.


灰化薹草 hui hua tai cao

Rhizome short, long stoloniferous. Culms 25–60 cm tall, tufted, acutely trigonous, smooth, scabrous in lower part of inflorescence, clothed at base with yellow-brown or brown bladeless sheaths disintegrating into reticulate fibers. Leaves shorter than or equaling culm, flat, 2–4 mm wide. Lowest involucral bract leaflike, longer than or equaling inflorescence, sheathless, remaining ones setaceous. Spikes 3–5; upper 1 or 2 spikes male, narrowly cylindric, 2–5 cm; remaining spikes female, occasionally some becoming androgynous and bearing several male flowers at apex, narrowly cylindric, 15–30 × 2–4 mm, densely many flowered, lower spikes with peduncles, upper sessile. Female glumes dark brown or purplish, oblong-lanceolate, ca. 2.5 mm, margins narrowly white hyaline, yellow-green 3-veined costa excurrent into a mucro, apex acute, rarely obtuse. Utricles gray, light green, or yellow-green, longer than glume, ovate, ca. 3 mm, membranous, ferruginous punctate, obliquely veined, base contracted into a short stipe, apex gradually attenuate into an obscure beak, orifice entire. Nutlets slightly tightly enveloped, obovate-oblong, ca. 1.5 mm; style base slightly thickened; stigmas 2. Fl. and fr. Apr–May.

Lakesides, marshes, wet places. Anhui, Heilongjiang, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi [Japan].


滑茎薹草 hua jing tai cao

Rhizome short, long stoloniferous. Culms 40–50 cm tall, slender, acutely trigonous, smooth, clothed at base with brown or purple-red bladeless sheaths. Leaves equaling culm, blades linear, 2–3 mm wide, flat or plicate, upper margins scabrous. Involucral bracts leaflike, lower ones surpassing inflorescence, sheathless. Spikes 3–5; terminal spike male, linear, 15–25 mm, with peduncle 8–35 mm, slender; lateral spikes female, narrowly cylindric, 15–40 × 2–3 mm, densely many flowered, lowest with peduncle, others sub sessile. Female glumes brown, ovate or lanceolate, ca. 1.8 mm, midrib green, 3-veined, margins white hyaline, apex obtuse or truncate. Utricles light yellow-green, longer than glume, elliptic or obovate-elliptic, plano-convex, 2–2.5 mm, membranous, densely minutely papillose, nerveless except for 2 costs on edges, subsessile, apex abruptly contracted into a very short beak, orifice emarginate. Nutlets tightly enveloped, ovate, ca. 1.6 mm; style base not thickened; stigmas 2. Fl. and fr. May–Jun.

Wet places, marshes; 400–500 m. Heilongjiang [Korea].


丛生薹草 cong sheng tai cao

Rhizome long. Culms 15–20 cm tall, acutely trigonous, slender, scabrous above. Leaves shorter than culm, blades linear, 3–4 mm wide, flat, margins scabrous. Involucral bracts leaflike, shorter than inflorescence, sheathless. Spikes 3 or 4, approximate; terminal spike male, light brown, cylindric, 20–22 × ca. 4 mm, with peduncle 5–10 mm; lateral spikes female, oblong or cylindrical, 12–20 × 6–7 mm, with peduncles 4–5 mm, upper subsessile. Female glumes dark purple-red, oblong or lanceolate, ca. 2 mm, green 3-veined costa excurrent into a mucro. Utricles longer than glume, broadly oblong or obovate, plano-convex, 2.5–3 mm, veined, base shortly stipitate, apex abruptly contracted into a very short beak, orifice emarginate or entire. Nutlets loosely enveloped, broadly elliptic, plano-convex, ca. 1.5 mm; style base not thickened; stigmas 2. Fl. and fr. Jun.

Watersides; 2000–3200 m. SW Sichuan, Xizang, NW Yunnan [Nepal].


缩囊薹草 liu nang tai cao

Rhizome short. Culms densely tufted, 30–80 cm tall, slender, trigonous, scabrous, clothed at base with castaneous-brown bladeless sheaths slightly disintegrating into reticulate fibers. Leaves shorter than culm, blades 2–3 mm wide, flat, margins revolute. Lowest involucral bract leaflike, subequaling inflorescence, sheathless. Spikes 3–5; upper 1–3 spikes male, approximate, linear or narrowly cylindric, 1–3 cm; remaining spikes female, cylindric, 12–30 × 4–6 mm, lower spikes with short peduncles, upper subsessile. Female glumes castaneous-brown, lanceolate, ca. 3 mm, margins narrowly white hyaline, 3-veined costa excurrent into a mucro, apex acute. Utricles brown-green or castaneous-brown, slightly shorter than or equaling glume and 2 × as broad as glume, broadly obovate or suborbicular, inflated, 2–3 mm, densely minutely papillose, nerveless except for 2 marginal veins, base shortly stipitate, upper margins

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slightly scabrous, rarely smooth, apex abruptly contracted into a short beak, orifice entire. Nutlets brown, tightly enveloped, obovate-oricular, biconvex, ca. 1.8 mm wide; style base not thickened; stigmas 2. Fl. and fr. Jun-Jul.

Marshes, streamsides, forest margins. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Mongolia, Russia (Far East, E Siberia)].


**丛薹**

*C. rubrobrunnea* C. B. Clarke in J. D. Hooker, Fl. Brit. India 6: 710. 1894 ['rubro-brunnea'].

Rhizome short. Culms tufted, 40–90 cm tall, slender, trigonous, clothed at base with purple-brown or red-brown bladeless sheaths disintegrating into reticulate fibers. Leaves shorter than culm, blades linear, 2–3.5 mm wide, flat, margins slightly revolute. Involucral bracts setaceous, ± equaling spike, sheathless. Spikes 3 or 4, approximately equal; terminal spike male, linear or oblong, 20–30 mm; remaining spikes female, occasionally some becoming androgynous and bearing several male flowers at apex, oblong or cylindric, 5–25 × 3–5 mm, with short peduncles. Female glumes purple-brown or ferruginous-brown, narrowly ovate, ca. 2 mm, green and 1-veined medially, margins white hyaline, apex obtuse. Utricles gray-green or light green-brown, ovate to elliptic, ± biconvex or plano-convex, not thickened; stigmas 2. Fl. and fr. Jun-Jul.

- Marshes, wet places. Heilongjiang, Jilin.


玛曲薹草 ma qu tai cao

Rhizome short. Culms tufted, 20–35 cm tall, ca. 1 mm thick, slender, acutely trigonous, slightly scabrous, clothed at base with blackish brown sheaths. Leaves shorter than culm, blades linear, ca. 1.2 mm wide, flat, margins scabrous, apex acuminate. Basal involucral bract setaceous, brown, sheathless. Spikes 2 or 3; terminal spike male, red-brown, oblong, 1–1.2 cm; lateral spikes female, blackish brown, broadly ovate, ca. 7 mm, sessile. Female glumes blackish brown, broadly ovate, 3-veined medially, apex acute. Utricles light brown, subequaling glume, broadly elliptic, ca. 3 mm, glabrous, base shortly stipitate, apex ± beakless, truncate and entire. Nutlets enveloped, broadly obovate or obovate, biconvex, ca. 1.5 mm, base shortly stipitate; style base not thickened; stigmas 2. Fl. Jul.

- Alpine marshes; ca. 3500 m. Gansu.


溪水薹草组 xi shui tai cao zu

Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker

*C. rubrobrunnea* (Franchet ex Kükenthal) Raymond in Engler, Pflanzenr. 38(IV . 20): 334. 1909 ['*Forsiculae*'].

Rhizome often stoloniferous. Culms densely tufted, 40–90 cm tall, slender, trigonous, clothed at base with bladeless sheaths disintegrating into reticulate fibers. Leaves flat, margins revolute. Involucral bracts leaflike, sheathless. Spikes 3–6; upper 1 or 2 spikes male; remaining spikes female, cylindric, densely many flowered, upper ones approximate, sessile, lowest spike distant from next, with erect short peduncle. Female glumes brown or pale, with mucro or not. Utricles membranous, plano-convex or biconvex, nerveless or obscurely veined, with beak.

About seven species: E and SE Asia; seven species (one endemic) in China.

1a. Stigmas persistent, ca. 2 × as long as utricle.

2a. Utricles oblong or oblong-lanceolate, abruptly contracted above to a smooth long beak .................. 415. *C. rubrobrunnea*

2b. Utricles ovate or obovate, abruptly contracted above to an often scabrous medium-sized beak ................ 416. *C. sadoensis*

1b. Stigmas deciduous.

3a. Utricles shorter than or equaling glume ................................................................. 421. *C. luctuosa*

3b. Utricles longer than glume.

4a. Utricles scabrous on upper margins ................................................................................. 417. *C. forficula*

4b. Utricles smooth on upper margins.

5a. Utricles nerveless except for 2 costas on edges, usually with purple-black flecks ................. 420. *C. otaruensis*

5b. Utricles veined, uniformly yellowish to brown.

6a. Utricles 2-toothed at orifice; female glumes purple-red, green at middle, apex acuminate ...... 418. *C. heterolepis*

6b. Utricles entire or emarginate at orifice; female glumes dark purple-black, green

3-veined costa excurrent into a scabrous awn at emarginate apex ............................................... 419. *C. tores*


点囊薹草 dian nang tai cao

Rhizome short. Culms tufted, 20–60 cm tall, acutely trigonous, slightly stiff, smooth, slightly scabrous, clothed at base with brown sheaths disintegrating into fibers. Leaves longer than culm, blades linear, 3–4 mm wide, flat, leathery, margins scabrous. Lower involucral bracts leaflike, longer than inflorescence, rarely shorter, upper ones setaceous, sheathless. Spikes 4–6, approximate, disposed in fastigiate inflorescence; terminal spike male or gynaecandrous, linear-cylindric, 40–55 × 2–4 mm, densely many flowered, with peduncle or sessile; lateral spikes female (occasionally some of these becoming...
androgynous and bearing several male flowers apically), cylindrical, 35–70 × 3–4 mm, densely many flowered, lowest with peduncle 1–1.5 cm, others gradually becoming sub sessile to sessile. Female glumes castaneous, lanceolate, margins narrowly white hyaline, yellow-green 3 -veined costa excurrent into a mucro, apex acuminate. Utricles brown to olivaceous, slightly shorter than glume, oblong or oblong-lanceolate, plano-convex, 2.5–4 mm, lustrous, densely minutely papillose, nerveless except for 2 marginal costs, apex abruptly contracted into a long beak, orifice 2-toothed. Nutlets tightly enveloped, broadly obovoid, ca. 1.5 mm; stigmas 2, 0.5–2 × as long as utricle. Fl. and fr. (May–)Jun.

Grassland slopes, wet places in forests, rock crevices along valleys or streamsides, moist places; 1000–3900 m. Anhui, Gansu, Guangdong, Guangxi, Hubei, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang [Bhutan, India, Myanmar, N Vietnam].

1a. Involucral bracts shorter than inflorescence ............................... 415c. var. brevibracteata
1b. Involucral bracts longer than inflorescence.
2a. Utricles ca. 2.5 mm; stigmas ca. 1/2 length of utricle .......... 415a. var. rubrobrunnea
2b. Utricles 3–4 mm; stigmas ca. 2 × as long as utricle ............... 415b. var. taliensis

415a. Carex rubrobrunnea var. rubrobrunnea

点囊薹草 (原变种) diān náng tái cao (yuán biān zhòng)

Involucral bracts longer than inflorescence. Utricles ca. 2.5 mm. Stigmas ca. 1/2 length of utricle.

Grassland slopes, wet places in forests; 2000–3900 m. Guangdong, Xizang, Yunnan [India].


大理薹草 dà lì tái cao


Involucral bracts longer than inflorescence. Utricles 3–4 mm. Stigmas ca. 2 × as long as utricle.

- Rock crevices along valleys in forests; 1000–2800 m. Anhui, Gansu, Guangdong, Guangxi, Hubei, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang.


短苞薹草 duǎn bāo tái cao


- Rock crevices along streamsides, moist places; ca. 1500 m. Jiangxi, Sichuan.


美麗薹草 méi lì tái cao

Rhizome short, stoloniferous. Culms tufted, 30–60 cm tall, acutely trigonous, smooth or scabrous, clothed at base with yellow-brown, lustrous, bladeless sheaths slightly disintegrating into fibers. Leaves ± equaling or slightly shorter than culm, blades gray-green, linear, 2–4 mm wide, flat, slightly soft, densely minutely papillose, margins involute. Involucral bracts leaflike, equaling inflorescence, sheathless. Spikes 4 or 5; terminal spike male, linear-cylindric, 20–40 × 3–4 mm, with peduncle; lateral spikes female, cylindric, 20–70 × 3–5 mm, densely many flowered, with short peduncles or sessile. Female glumes red-brown, narrowly ovate-lanceolate, ca. 3 mm, lustrous, green 3 -veined costa excurrent into a mucro at truncate or emarginate apex. Utricles light green or stramineous, usually with minute flecks, shorter but broader than glume, oblong-ovate or obovate, biconvex, ca. 3 mm, membranous, nerveless except for 2 marginal costs, base contracted into a short stipe, apex abruptly contracted into an often scabrous-margined beak, orifice 2-toothed. Nutlets tightly enveloped, oblong-ovate or obovate, biconvex, 1.5–1.8 mm; style very short, ca. 0.2 mm, base not thickened; stigmas 2, long and slender, persistent.

Streamsides along valleys. Anhui [Japan, Russia (Far East)].


溪水薹草 xī shuǐ tái cao

Rhizome short. Culms densely tufted, 40–90 cm tall, trigonous, scabrous, clothed at base with yellow-brown, slightly lustrous, bladeless sheaths disintegrating into reticulate fibers. Leaves equaling or slightly longer than culm, blades green, linear, 2.5–4 mm wide, flat, margins revolute. Involucral bracts leaflike, shorter than inflorescence, sheathless. Spikes 3–5; terminal spike male, linear, 3–4 cm, with peduncle; lateral spikes female, narrowly cylindric, 1.5–5 cm, densely many flowered, sometimes slightly laxly flowered at base, lower spikes with short peduncles, others sessile. Female glumes dark ferruginous or purple-brown, lanceolate or oblong, ca. 3 mm, green 3 -veined costa forming a scabrous mucro. Utricles yellow-green, longer than glume, obovate or ovate, compressed biconvex, 3–4 mm, hardly veined, sometimes finely few veined, base truncate, upper margins scabrous, apical beak deeply 2-lobed at orifice. Nutlets tightly enveloped, ovoid or broadly obovoid, sub-biconvex, 2–2.5 mm, base broadly truncate; style base not thickened; stigmas 2, Fl. and fr. Jul–Aug.

Forests, streamsides, moist places; 700–900 m. Anhui, Hebei, Jilin, Liaoning, Shaanxi [Japan, Korea, Russia (Far East)].


异鳞薹草 yì lín tái cao

Rhizome short, long stoloniferous. Culms 40–70 cm tall, trigonous, scabrous above, clothed at base with yellow-brown sheaths disintegrating into reticulate fibers. Leaves subequaling culm, blades linear, 3–6 mm wide, flat, margins scabrous. Involucral bracts leaflike, lowest one surpassing inflorescence, sheathless. Spikes 3–6; terminal spike male, cylindric, 20–40 × ca. 4 mm, with peduncle 0.8–2 cm; lateral spikes female, cylindric, erect, 10–45 × ca. 6 mm, often sessile, only lowest one with short peduncle. Female glumes light brown, narrowly

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lanceolate or narrowly oblong, 2–3 mm, green 1–3-veined costa excurrent into a mucro. Utricles light brown, slightly longer than glume, obovate or elliptic, compressed biconvex, 2.5–3 mm, densely minutely papillose, base truncate, apex abruptly contracted into a beak ca. 0.5 mm, orifice 2-toothed. Nutlets dark brown, tightly enveloped, broadly obovoid or obovate, ca. 1–2 mm, densely minutely papillose, base truncate, apex abruptly contracted into a beak ca. 0.5 mm, orifice 2-toothed. Nutlets dark brown, tightly enveloped, broadly obovoid or obovate, 2–2.2 mm; style base not thickened; stigmas 2. Fl. and fr. Apr–Jul.

Marshes, watersides; 500–1900 m. Hebei, Heilongjiang, Hubei, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Japan, Korea].


稿芒薹草 cao mang tai cao

Rhizome creeping. Culms 40–90 cm tall, acutely trigonous, smooth, scabrous above, clothed at base with dark purple-red or brown bladeless sheaths. Leaves shorter or slightly longer than culm, blades linear, 4–6 mm wide, flat, margins revolute, scabrous, apex acuminate. Involutural bracts leaflike, equaling or slightly longer than inflorescence, sheathless. Spikes 4–7, subfasciculate, narrowly cylindrical, 5–6 cm; upper 1–4 spikes male, sometimes androgyrous; remaining spikes usually female, sometimes upper spikes male, lower female, lowest spike with peduncle up to ca. 1 cm. Female glumes dark purple-black, ovate or oblong-lanceolate, ca. 3 mm, green 3-veined costa excurrent into a scabrous awn at entire or emarginate apex. Utricles yellow-brown, ± equaling glume, elliptic, ca. 3 mm, glabrous, veined, apex abruptly contracted into a conic short beak, orifice entire or emarginate. Nutlets laxly enveloped, ovoid, ca. 2 mm; stigmas 2. Fl. and fr. Jun.

Moist places in forests; ca. 3100 m. Xizang [Bhutan, India, Nepal].


鸽落薹草 yao luo tai cao

Rhizome elongate, stoloniferous. Culms tufted, 30–60 cm tall, acutely trigonous, scabrous, clothed at base with reddish brown, lustrous, bladeless sheaths disintegrating into reticulate fibers. Leaves equaling culm, blades gray-green below, linear, 3–5 mm wide, flat, rigid, margins revolute. Lowest involucral bract leaflike, equaling or sometimes longer than inflorescence, upper ones setaceous, sheathless. Spikes 4 or 5; terminal spike male, linear, 30–80 × ca. 2.5 mm, with short peduncle; lateral spikes usually female, rarely with several male flowers at apex, linear-cylindric, 30–80 × ca. 3 mm, densely many flowered, upper spikes approximate, with short peduncles, lower ones slightly distant, with scabrous, slender, erect peduncles. Female glumes pale, ovate-lanceolate, 2–2.5 mm, 1–3-veined costa forming a slightly scabrous mucro at apex. Utricles light green, often purple-brown, longer than glume, ovate or elliptic, biconvex, 2.5–3 mm, membranous, minutely papillose, nerveless except for 2 marginal costas, base truncate, shortly stigitate, apex contracted into a slightly scabrous columnar short beak, orifice pale, emarginate. Nutlets tightly enveloped, narrowly obovate, 1.5–2 mm; style base slightly thickened; stigmas 2. Fl. and fr. Jul.

Wet places on roadsides, slopes. Anhui [Japan].


城口薹草 cheng kou tai cao

Carex luctuosa f. brevisquama K. T. Fu; C. luctuosa f. mucronata K. T. Fu.

Rhizome short. Culms 30–100 cm tall, acutely trigonous, erect, rather stiff, scabrous, clothed at base with dark brown sheaths disintegrating into reticulate fibers. Leaves shorter than culm, blades linear, 3–5 mm wide, margins scabrous. Lower involucral bracts leaflike, surpassing inflorescence, sheathless, upper setaceous, shorter than inflorescence, sheathless. Spikes 4–6; terminal spike male or gynaecandrous, narrowly cylindrical, 3–3.5 cm; lateral spikes female, cylindric, 20–30 × 4–5 mm, densely many flowered, upper spikes approximate, sessile, lowest spike remote, with short peduncle. Female glumes dark reddish, oblong, 2.5–2.8 mm, pale yellow 3-veined costa forming a mucro at apex or apex obtuse. Utricles light brown-green, slightly shorter than or equaling glume, obovate, slightly biconvex, 2.3–2.8 mm, nerveless except for 2 marginal costas, apex abruptly contracted into a smooth short beak, orifice 2-toothed. Nutlets obovate, slightly biconvex, ca. 1.6 mm; stigmas 2. Fl. and fr. Jul.

● Watersides, wet places, slopes, roadsides, grasslands; 1000–2600 m. Gansu, Shaanxi, Sichuan.


帚状薹草组 zhou zhuang tai cao zu

Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker


Rhizome short or stoloniferous. Culms acutely trigonous, clothed at base with bladeless sheaths ± disintegrating into reticulate fibers. Leaves flat, margins revolute. Involutural bracts leaflike, sheathless. Terminal spike male or gynaecandrous; lateral spikes female, long cylindric, ± pedunculate, often pendent. Female glumes ferrugineous, glandular or not, green 3-veined costa excurrent into a mucro or awn at apex. Utricles plano-convex, biconvex, or inflated at maturity, usually densely minutely papillose or with purple-red flocculent, apex with short beak or not, orifice entire or 2-toothed. Style erect or curved; stigmas 2.

About 29 species: mainly in E Asia, also in tropical and S Africa, SE Asia, W Himalayas, Madagascar, and Sri Lanka; 17 species (ten endemic) in China.
1a. Utricles densely minutely papillose.

2a. Female glumes with scabrous awn at truncate or emarginate apex.

3a. Terminal spike gynaecandrous, female part ca. 5 mm wide, male part ca. 3 mm wide, lateral female spikes rather thick, 5–6 mm wide ........................................................................ 437. C. dimorpholepis

3b. Terminal spike male, narrowly cylindric, 1.5–2 mm wide, lateral female spikes rather slender, 3–4 mm wide ............................................................ 438. C. phacota

2b. Female glumes with mucro at acuminate or subrounded apex.

4a. Female spikes 25–30 × 8–9 mm ............................................................... 434. C. maximowiczii

4b. Female spikes 40–50 × 3–6 mm.

5a. Female glumes obovate, subrounded at apex ...................................................... 435. C. subcernua

5b. Female glumes oblong-lanceolate or lanceolate, acuminate at apex .............................. 436. C. pruinosa

1b. Utricles with purple-red flecks or faintly minutely papillose.

6a. Utricles not inflated at maturity.

7a. Terminal spike male, lateral spikes female; utricles elliptic ........................................ 422. C. melinacra

7b. Upper 1–5 spikes gynaecandrous, remaining spikes female; utricles ovate or obovate.

8a. Female glumes obovate, 2-lobed at apex; style erect; spikes narrowly cylindric, 5–10 cm ........ 423. C. praeflora

8b. Female glumes lanceolate, acuminate at apex; style base curved; spikes cylindric, 1.5–3 cm .................................................................................. 424. C. goligongshanensis

6b. Utricles inflated at maturity.

9a. Female glumes dark brown.

10a. Plants 150–160 cm tall; spikes up to ca. 17 cm, branched at base .............................. 431. C. lancangensis

10b. Plants 65–100 cm tall.

11a. Spikes 5.5–12 cm, terminal spikes male; utricles without purple-red flecks .............. 432. C. jinfoshanensis

11b. Spikes 1.5–5 cm, terminal spike gynaecandrous; utricles with purple-red flecks .......... 433. C. longisetaensis

9b. Female glumes light brown or light red.

12a. Female glumes much longer than utricle ............................................................... 425. C. cremostachys

12b. Female glumes short than or equaling utricle.

13a. Utricles hardly beaked.

14a. Leaves 8–12 mm wide; female spikes long cylindric, 50–90 × 5–6 mm .................. 426. C. fargesii

14b. Leaves 4–5 mm wide; female spikes cylindric, 25–40 × 3.5–4 mm .......................... 427. C. makuensis

13b. Utricles with short and erect beak.

15a. Spikes 3 or 4, terminal spike male ........................................................................... 428. C. aequialta

15b. Spikes 5–8, upper 2 or 3 male.

16a. Female glumes broadly obovate, 1.8–2 mm; female spikes 70–85 × ca. 3 mm .... 429. C. wawuensis

16b. Female glumes lanceolate, 2.5–3 mm; female spikes 60–130 × 4–6 mm ... 430. C. longispiculata


扭薹囊草 niu hui tai cao

Rhizome indurate. Culms 50–95 cm tall, ca. 2 mm thick, acutely trigonous, smooth, scabrous above, clothed at base with dark purple-red bladeless sheaths disintegrating into fibers. Leaves subequareal or shorter than culm, blades linear, 3–5 mm wide, flat, apex acuminate. Involucral bracts subulate, shorter than inflorescence, sheathless. Spikes 4 or 5, long cylindric, 5.5–11 × 0.3–0.6 cm; terminal spike male, with peduncle 2–5 mm; lateral spikes female, uppermost one approximate to male spike, lowest spike with peduncle 1.5–3.5(–11) cm. Female glumes blackish purple, ovoid-lanceolate or oblong-lanceolate, ca. 3 mm, green 1-veined costa excurrent into a mucro, apex rounded. Utricles green, shorter or slightly longer than or equaling glume, elliptic, 2.5–3 mm, smooth or slightly scabrous, purple-red flecked or minutely papillose, apex abruptly contracted into a smooth or scabrous short beak, orifice with 2 divergent teeth; style base not thickened; stigmas 2. Fl. and fr. May.

- Moist grasslands along valleys; 2000–3500 m. SW Sichuan, W Yunnan.

1a. Lowest peduncle 1.5–3.5 cm; utricles shorter than or equaling female glumes .................................................. 422a. var. melinacra

1b. Lowest peduncle 5–11 cm; utricles longer than female glumes ........ 422b. var. changningensis

422a. Carex melinacra var. melinacra

扭薹囊草(原变种) niu hui tai cao (yuan bian zhong)

Carex forficia Franchet & Savatier var. melinacra (Franchet) Kükenenthal.

Lowest peduncle 1.5–3.5 cm. Utricles shorter than or equaling female glumes. Fl. and fr. May.

- Moist grasslands along valleys; 2000–3500 m. SW Sichuan, NW Yunnan.


昌宁薹囊 chang ning tai cao


- Streams; 2000–3000 m. W Yunnan (Changning).

帚薹草 周章桃

Rhizome stoloniferous. Culms 60–90 cm tall, acutely trigonous, smooth, clothed at base with brown, lustrous sheaths. Leaves shorter than culm, blades broadly linear, 6–8 mm wide, flat, stiff. Involutural bracts leaflike, surpassing inflorescence, sheathless. Spikes 4–9, narrowly cylindric, 5–10 cm, densely many flowered, upper spikes approximate, lower 1 or 2 slightly distant, with peduncles, pendent; upper 1–4 spikes gynaecandrous (rarely male at apex); remaining spikes female. Female glumes dark sanguineous, subovate, green 3-veined costa excurrent into a scabrous awn at truncate or 2-lobed apex. Utricles yellow-green, more than glume, ovate or lanceolate-oblong, 2.8–3 mm, membranous, faintly ferruginous glandular, conspicuously veined, beakless, emarginate at orifice. Nutlets castaneous, slightly loosely enveloped, ovate, biconvex, ca. 1.8 mm; style base not thickened; stigmas 2.

● Thicket slopes; 3000–3300 m. W Sichuan, NW Yunnan.


高黎贡山薹草 高黎贡山薹草

Rhizome short. Culms tufted, 40–60 cm tall, slender, acutely trigonous, clothed at base with brown bladeless sheaths. Leaves shorter or longer than culm, blades linear, 3–5 mm wide, flat. Lowest involucral bract leaflike, surpassing involucrcence, sheathless, remaining bracts setaceous. Spikes 4 or 5, gynaecandrous, oblong or oblong-cylindric, 15–30 × 5–6 mm, densely many flowered, upper 3 or 4 approximate, lowest one distant, with long and slender peduncle, pendent. Female glumes dark purple, lanceolate, 2.8–3 mm, green 3-veined costa excurrent into a scabrous awn at truncate or emarginate apex. Utricles yellow-green, longer than glume, ovate, 3–3.5 mm, membranous, biconvex, sub-papillose, nerveless except for 2 costas on edges, base subrounded, slightly loosely enveloped, ovate or obovate, plano-convex, ca. 1.8–1.9 mm; style curved, base not thickened; stigmas 2. Fl. and fr. Jul.

● Thicket slopes; 3000–3600 m. NW Yunnan (Gaoligong Shan).


燕子薹草 燕子薹草

Carex prescottiana Boott var. cremostachys (Franchet) Kükenthal.

Rhizome short. Culms up to 90 cm tall, acutely trigonous, smooth, clothed at base with dark purple-red bladeless sheaths disintegrating into reticulate fibers. Leaves subequaling culm, blades linear, 4–6 mm wide, upper shortly sheathing. Involutural bracts leaflike, very long, surpassing inflorescence, sheathless. Spikes 7–12, cylindric, 6–10 cm, densely many flowered, upper 1 or 2 spikes gynaecandrous, remaining spikes female, lower spikes with long peduncles, others subsessile. Female glumes pale red or pale brown, lanceolate, ca. 4 × 1 mm, ferruginous glandular, green 3-veined costa excurrent into a long awn. Utricles yellow-green, much shorter than glume, ovate, 2.5–3 mm, papery, ferruginous glandular, apex abruptly contracted into a short beak, orifice shortly 2-toothed. Nutlets castaneous, slightly loosely enveloped, ovate, biconvex, ca. 1.8 mm; style base not thickened; stigmas 2.

● Forests in valleys, shady and moist places; 3000–3300 m. W Sichuan, NW Yunnan.


马库薹草 马库薹草

Carex immannis C. B. Clarke; C. prescottiana Boott var. fargesii (Franchet) Kükenthal.

Rhizome indurate. Culms 45–95 cm tall, 3–5 mm thick, acutely trigonous, scabrous, clothed at base with dark reddish bladeless sheaths disintegrating into reticulate fibers. Leaves basal or cauline, longer or shorter than culm, blades broadly linear, 0.8–1.2 cm wide, flat, margins scabrous, revolute, apex acuminate. Lowest involucral bract leaflike, surpassing inflorescence, sheathless, remaining bracts setaceous. Spikes 5–8; terminal spike male, sometimes with a few female flowers at apex or in middle, linear, 65–80 × ca. 2 mm, with peduncle 2–3 mm; lateral spikes female, long cylindric, 50–90 × 5–6 mm, lowest peduncle 2–5 mm. Female glumes light reddish or light yellow pale, obovate, 1.8–2.7 mm, green 1-veined costa excurrent into a macro at truncate or emarginate apex. Utricles light reddish, slightly longer than glume, ovate or lanceolate-oblong, 2.8–3 mm, membranous, faintly ferruginous glandular, conspicuously veined, beakless, emarginate at orifice. Nutlets castaneous, slightly loosely enveloped, ovate or obovate, plano-convex, ca. 2 mm; style base not thickened; stigmas 2. Fl. and fr. May–Jul.

● Shady places, streamsides; 900–2300 m. Guizhou, Hubei, Hunan, Sichuan.


马库薹草 马库薹草

Carex prescottiana Boott var. xanthostachys (Franchet) Kükenthal.

Rhizome indurate. Culms 30–40 cm tall, slender, acutely trigonous, stiff. Leaves subequaling culm, clothed at base with brown-red bladeless sheaths. Involutural bracts leaflike, much longer than inflorescence, sheathless. Spikes 5, upper approximate, lowest one distant; terminal spike gynaecandrous, linear-cylindric, 4–4.6 cm; lateral spikes female, cylindric, 25–40 × 3.5–4 mm, densely many flowered. Female glumes brown, oblong, 1.7–2.2 mm, green 3-veined costa excurrent into an awn, apex subrounded or emarginate. Utricles light brown, dark purple-brown flecked, longer than glume, narrowly oblong, biconvex, later inflated, 2.7–3.5 mm, papery, veined, base rounded, shortly stipitate, apex abruptly contracted into a very short beak, orifice entire. Nutlets elliptic or obovate-elliptic, 1.7–2.3 mm; style base not thickened; stigmas 2. Fl. and fr. Aug.

● Sandy soil of riversides; ca. 1400 m. Yunnan.

等高薹草  deng gao tai cao

Rhizome short. Culms tufted, 30–60 cm tall, trigonous, smooth, clothed at base with dark brown bladeless sheaths disintegrating into reticulate fibers. Leaves subequalling culm, blades linear, 3–4 mm wide, flat, stiff. Involutural bracts leaflike, surpassing inflorescence, sheathless. Spikes 3 or 4; terminal spike male, linear, 2–3 cm, subsessile; lateral spikes female, cylindric, 3–5 cm, slightly loosely flowered, with erect short peduncles. Female glumes ferruginous, oblong-ovate, 3-veined costa excurrent into a mucro at obtuse apex. Utricles ferruginous, orbicular, 2.5–3 mm, membranous, many costae excurrent into a mucro at obtuse apex. Utricles ferruginous, membranous. Many costae excurrent into a mucro.


瓦屋薹草  wa wu tai cao

Rhizome short. Culms up to ca. 50 cm tall, ca. 2 mm thick, acutely trigonous, smooth, clothed with purple-red sheaths at base. Leaves shorter than culm, blades linear, 5–6 mm wide, flat, margins scabrous. Upper involucral bracts setaceous, lower leaflike, sheathless. Spikes 8; upper 3 spikes male, occasionally with a few female flowers at base, linear, 20–60 × 1.5–2 mm, sessile or with very short peduncles; remaining spikes female, linear-cylindric, 70–85 × ca. 3 mm, slightly densely flowered, lowest spike sometimes branched, with peduncle ca. 1 cm. Female glumes yellowish brown, broadly ovate, 1.8–2 mm, green 3-veined costa excurrent into a micro. Utricles brown, ferruginous, longer than glume, ovate, 2.2–2.5 mm, veined, apex abruptly contracted into a short beak, orifice entire. Nutlets stramineous, oblong-ovate, 3-veined costa excurrent into a micro. Utricles ferruginous, long, 2.5–3 mm, base cuneate, apex abruptly contracted into a beak, orifice 2-toothed. Style base not thickened; stigmas 2.


长密花穗薹草  chang mi hua sui tai cao

Rhizome short. Culms tufted, 48–100 cm tall, acutely trigonous, smooth, clothed with dark brown bladeless sheaths. Leaves shorter than culm, blades linear, 3–5 mm wide, flat, margins scabrous, apex long acuminate; side of sheaths ferruginous, membranous. Lower involucral bracts leaflike, surpassing inflorescence, sheathless. Spikes 5–7; upper 2 or 3 spikes male, ferruginous, linear, 50–100 × ca. 2 mm, with short peduncles; remaining spikes female, long cylindric, 60–130 × 4–6 mm, densely many flowered, with slender peduncles 1–3 cm, pendent. Female glumes light brown, lanceolate, 2.5–3 mm, green 3-veined costa excurrent into a micro. Utricles green, equaling glume, ovate or ovate-lanceolate, inflated, 2.5–3 mm, horizontally patent at maturity, membranous, base cuneate, apex gradually attenuate into an erect or curved, conic short beak, orifice shortly 2-toothed or entire. Nutlets castaneous, loosely enveloped, ovoid to broadly ovoid, biconvex, ca. 1.5 × 1.2 mm; style base not thickened; stigmas 2.


澜沧薹草  lan cang tai cao

Rhizome indurate. Culms 150–160 cm tall, stout, 3–4 mm thick, acutely trigonous, smooth, slightly scabrous above, clothed at base with dark purple-red bladeless sheaths disintegrating into fibers. Leaves surpassing culm, blades broadly linear, 5–7 mm wide, flat, scabrous adaxially, revolute, stiff. Involutural bracts leaflike, lowest one surpassing inflorescence, sheathless, upper involucral bracts setaceous. Spikes 8 or 9, linear-cylindric, 10–17 cm, lower 1 or 2 spikes branched, with peduncles 1–5 cm. Female glumes dark brown, oblong-lanceolate, 2.5–2.8 × ca. 1 mm, green 3-veined costa excurrent into a scabrous awn. Utricles yellow-brown, sparsely purple-red flecked, slightly longer than glume, ovate, ca. 3 mm, apex abruptly contracted into a beak, orifice 2-toothed. Nutlets dark brown, slightly loosely enveloped, ovoid to obovate, plano-convex, 1.8–2 mm; style base not thickened; stigmas 2.


金佛山薹草  jin fo shan tai cao

Rhizome short, indurate. Culms 80–100 cm tall, 1.5–2 mm thick, acutely trigonous, smooth, clothed at base with purple-red sheaths disintegrating into reticulate fibers. Leaves shorter than culm, blades pale green, linear, 3.5–5 mm wide, flat, margins scabrous. Involutural bracts leaflike, surpassing inflorescence, sheathless. Spikes 5 or 6; upper 1 or 2 spikes male, linear, with peduncles; remaining spikes female, long cylindric, 55–120 × 4–5 mm, lowest one with peduncle 1–3 cm. Female glumes dark brown, oblong-ovate, 2.5–3 mm, green 3-veined costa excurrent into a scabrous short awn. Utricles yellow-brown, sparsely equaling glume, ovate, ca. 3 mm, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets dark brown, slightly loosely enveloped, ovoid to obovate, plano-convex, 1.8–2 mm; style base not thickened; stigmas 2.


龙盘拉薹草  long pan la tai cao

Rhizome short. Culms 65–90 cm tall, 2–3 mm thick, acutely trigonous, smooth, scabrous above, clothed at base with purple-brown bladeless sheaths. Leaves shorter than culm, blades broadly linear, 5–8 mm wide, upper margins scabrous,
apex acuminated. Lower 2 involucral bracts leaflike, surpassing inflorescence, sheathless, remaining bracts setaceous. Spikes 7–9; terminal spike gynaecandrous, 3.5–5 cm, with peduncle 7–10 mm; lateral spikes female, occasionally with male flowers at base, 18–50 × 4–6 mm, with peduncles 2–3 mm, slender, pendent. Female glumes dark brown, oblong, 1.5–2 mm, green 3-veined costa exerting into a scabrous short awn. Utricles stramineous with purple-red flecks, longer than glume, ovate, 2.8–3 mm, apex contracted into a short beak, orifice entire or emarginate. Nutlets brown, rather loosely enveloped, oblong, biconvex, 1.3–1.5 mm; style base not thickened; stigmas 2. Fl. and fr. Jul–Oct.

- Forests; ca. 3000 m. Yunnan.


乳突薹草 *ru tu tai cao*

*Carex pruinosa* var. *maximowiczii* (Miquel) Kükenthal.

Rhizome short, rarely creeping. Culms tufted, 30–75 cm tall, acutely trigonous, slightly rigid, clothed at base with brown or red-brown bladeless sheaths usually disintegrating into fibers. Leaves shorter than or subequaling culm, blades linear, 3–4 mm wide, flat, margins revolute. Lowest involucral bract leaflike, surpassing inflorescence, upper ones setaceous or glumelike. Spikes 2 or 3; terminal spike male, narrowly cylindrical, with peduncle 2–4 cm; lateral spikes female, oblong-cylindric or oblong, 2.5–3 × 0.8–0.9 cm, lowest one with slender peduncle 1–5 cm, pendent, upper peduncles much shorter, erect or pendent. Female glumes red-brown, oblong-lanceolate, 4–4.5 mm, green 3-veined costa forming a short awn at acuminated apex. Utricles red-brown, shorter than or equaling glume, broadly obovoid to broadly ovoid, biconvex, 4–4.2 × 3–3.5 mm, densely papillose and red-brown glandular, nearly nerveless except for 2 costas on edges, base broadly cuneate, shortly stipitate, apex abruptly contracted into a short beak, orifice entire. Nutlets brown, loosely enveloped, compressed orbicular, 2–2.2 mm; style long, base not thickened; stigmas 2. Fl. and fr. Jun–Jul.

Sunny slopes, moist places at watersides; 300–800 m. Liaoning, Shandong [Japan, Korea].


武夷薹草 *wu yi tai cao*

Rhizome short. Culms tufted, 40–65 cm tall, acutely trigonous, smooth, scabrous above, clothed at base with dark brown bladeless sheaths, some sheaths disintegrating into reticulate fibers. Leaves longer than culm, blades linear, 3–5 mm wide, flat. Involucre bracts leaflike, lowest one surpassing inflorescence. Spikes 4; terminal spike male, narrowly cylindrical, ca. 50 × 2 mm; lateral spikes female, rarely with male flowers at base or apex, cylindrical, 45–50 × 4–5 mm. Female glumes ferruginous, oblong, ca. 2.8 mm, green 3-veined costa forming a short awn at subrounded apex. Utricles slightly longer or broader than glume, elliptic, ca. 3 × 2 mm, densely papillose, conspicuously veined, base broadly cuneate, apex abruptly contracted into a short beak, orifice entire. Nutlets brown, slightly loosely enveloped, obovate, ca. 2 × 1.5 mm; stigmas 2. Fl. and fr. Apr.

- Pond margins, slopes. Zhejiang [Japan].


粉被薹草 *fen bei tai cao*

Rhizome short. Culms tufted, 30–80 cm tall, slightly stiff, smooth, with red-brown sheaths at base. Leaves subequaling or shorter than culm, blades linear, 3–5 mm wide, flat, margins revolute. Involucre bracts leaflike, surpassing inflorescence. Spikes 3–5; terminal spike male, occasionally with several female flowers at apex, narrowly cylindric, 20–30 mm, with slender peduncle; lateral spikes female, sometimes with male flowers at apex, cylindric, 20–40 × 5–6 mm, with slender peduncles 1.5–3 cm, pendent. Female glumes densely ferruginous flecked, oblong-lanceolate or lanceolate, 2.8–3 mm, membranous, green 3-veined costa exerting into a mucro. Utricles equalizing or slightly longer than glume, oblong-ovate, ca. 2.5 × 2 mm, densely papillose and red-brown glandular, veined, base broadly cuneate, apex abruptly contracted into a short beak, orifice emarginate. Nutlets yellowish brown, slightly loosely enveloped, broadly ovate, biconvex, ca. 2 × 1.5 mm; stigmas 2. Fl. and fr. Mar–Jun.

Moist streambanks and grasslands in valleys; 100–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Yunnan, Zhejiang [Bhutan, India, Indonesia, N Thailand].


二形鳞薹草 *er xing lin tai cao*

*Carex cernua* Boott.

Rhizome short. Culms tufted, 35–80 cm tall, acutely trigonous, scabrous above, clothed at base with red-brown to blackish brown bladeless sheaths. Leaves shorter than or equaling culm, blades linear, 4–7 mm wide, flat, margins slightly revolute. Lower 2 involucral bracts leaflike, surpassing inflorescence, upper ones setaceous. Spikes 5 or 6, approximate; terminal spike gynaecandrous, 40–60 mm; lateral spikes female, upper 3 with male flowers at base, cylindric, 45–55 × 5–6 mm, with slender peduncles 1.5–6 cm, pendent. Female glumes pale, sparsely ferruginous flecked, obovate-oblong, 4–4.5 mm, membranous, green 3-veined costa exerting into a scabrous awn ca. 2.2 mm at emarginate or truncate apex. Utricles red-brown, ferruginous flecked, longer than glume, elliptic or elliptic-lanceolate, 3 mm, slightly compressed, densely papillose, base cuneate, apex abruptly contracted into a short beak, orifice entire; stigmas 2. Fl. and fr. Apr–Jun.


镜子薹草 jìng zì tái cao

Carex shichiseitensis Hayata.

Rhizome short. Culms tufted, 20–75 cm tall, acutely trigonous, clothed at base with yellowish brown or dark yellow-brown sheaths disintegrating into reticulate fibers. Leaves sub-equaling culm, blades linear, 3–5 mm wide, flat, margins revolute. Lower involucral bracts leaflike, conspicuously surpassing inflorescence, sheathless, upper ones setaceous. Spikes 3–5, approximate; terminal spike male, rarely with a few female flowers at apex, narrowly cylindric, 45–65 × 1.5–2 mm, with peduncle; lateral spikes female, rarely a few male flowers at flowers at apex, cylindric or clavate, 1.5–5.5 cm, densely many-flowered, with slender, slightly scabrous peduncles, lowest one 2–3 cm, pendent. Female glumes pale, ferruginous flecked, oblong, ca. 2 mm (excluding awn), green 3-veined costa excurrent into a scabrous awn at truncate or emarginate apex. Uricles dark brown, longer than glume, broadly ovate or elliptic, biconvex, 2.5–3 × ca. 1.8 mm, densely papilllose, nerveless except for 2 costas on edges, broadly convex, apex abruptly contracted into a short beak, orifice entire or emarginate. Nutlets brown, slightly loosely enveloped, suborbicular or broadly ovate, ca. 1.5 mm, densely papilllose; style long, base not thickened; stigmas 2. Fl. and fr. Mar.–May.

 Moist soil of grasslands, ditches, streambanks, roadsides. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Sri Lanka, N Thailand, Vietnam].


图们薹草组 tu men tai cao zu

Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama

Rhizome creeping. Culms stout, trigonous, 60–100 cm tall. Leaves shorter than culm, blades widely linear, 6–10 mm wide, flat, margins slightly revolute. Involucral bracts leaflike, lower 3 surpassing inflorescence. Spikes numerous, usually 10–30, 2–4 from axil of involucral bract; upper 3–6 spikes male, sometimes some becoming androecious and bearing several female flowers at base, cylindric or clavate, 1.5–5.5 cm, with slender, scabrous peduncles 1–12 cm, pendent. Female glumes pale brown or ferruginous, elliptic-lanceolate or lanceolate, 3–3.8 mm, green 3-veined costa excurrent into a mucro. Uricles brown-green with brown-purple flecks, shorter than glume, elliptic or ovate, biconvex, 2.5–3 mm, 4–6-veined, base stipitate, apex abruptly contracted into a short beak, orifice entire. Nutlets obovate or oblong; stigmas 2.

Eight species: E Asia, Pacific islands (New Zealand), South America; one species in China.


图们薹草 tu men tai cao

Rhizome creeping. Culms stout, trigonous, scabrous above, clothed at base with purple-red bladeless sheaths disintegrating into reticulate fibers. Leaves flat, blades broadly linear, 6–10 mm wide, flat, margins slightly revolute. Involucral bracts leaflike, lower 3 surpassing inflorescence. Spikes numerous; upper 1–6 spikes male; remaining spikes female, rather often with male flowers at apex, cylindric, densely many flowered, with long peduncles, pendent. Female glumes lanceolate, green 1-veined costa excurrent into a mucro. Uricles plano-convex or biconvex, membranous, veined, apex shortly beaked, orifice entire. Nutlets obovate or oblong; stigmas 2.

Eight species: E Asia, Pacific islands (New Zealand), South America; one species in China.


细柄薹草组 xi bǐng tái cao zu

Dai Lunkai (戴伦凯); Tetsuo Koyama

Plants perennial, with short rhizome, rarely with long, slender rhizome, without stolons. Involucral bracts sheathed. Spikes few to numerous, single or several fasciculate in an involucral bract sheath or arranged in a raceme or panicle, usually bisexual, rarely unisexual or bisexual and unisexual, bisexual spikes androecious, laxly or densely many flowered, rarely few flowered; peduncle slender. Uricles lenticular or plano-convex; style base slightly thickened; nutlets 2. Fl. and fr. Jun.–Sep.

About 30 species: E, S, and SE Asia, Australia, Pacific islands; 21 species (13 endemic) in China.

1a. Utricles 4–7.5 mm (only ca. 3 mm in C. lushanensis), yellow-green or stramineous in maturity, glabrous or only scabrous on beak margins.

2a. Spikes oblong or oblong-cylindric, 12–15(–18) mm; uricles densely disposed, orbicular or broadly elliptic (except beak), 3–4 mm; nutlets orbicular or broadly obovate.

3a. Female glumes lanceolate-ovate; uricles broadly elliptic (except beak), ca. 3 mm; nutlets puncticulate ........................................................................................................... 456. C. lushanensis

3b. Female glumes ovate or narrowly ovate; uricles orbicular (except beak), ca. 4 mm; nutlets not puncticulate ........................................................................................................... 457. C. orbicularinuicis
2b. Spikes cylindric, 2–6.5 cm; utricles laxly disposed, elliptic, oblong, or lanceolate-oblong (except beak), 5–7.5 mm; nutlets elliptic or oblong.

4a. Spikes (4–)5–6.5 cm; utricles very laxly disposed, oblong-lanceolate, 6–7.5 mm; nutlets oblong, ca. 3 mm, yellowish in maturity ................................................................. 458. C. sinodissitiflora

4b. Spikes (1.5–)2–3(–4) cm; utricles slightly laxly disposed, elliptic, 5–6 mm; nutlets elliptic, 2–2.5 mm, brown in maturity.

5a. Leaf blades 2–4 mm wide; spikes single in an involucral bract sheath, sometimes branched at lower spikes; utricles ca. 6 mm; nutlets compressed plano-convex ........................................ 459. C. longipes

5b. Leaf blades 5–8 mm wide; spikes 1–3 borne in an involucral bract sheath, usually branched; utricles ca. 5 mm; nutlets biconvex ................................................................. 460. C. erica

1b. Utricles usually not exceeding 4 mm in length, sometimes up to 4.5 mm in few species, yellow-brown or reddish brown in maturity, hispidulous on both surfaces or only on margins, glabrous in few species.

6a. Utricles (except beak) oblong or narrowly oblong, 4–4.5 mm; stigmas longer than or equaling utricle; female glumes slightly longer than or equaling utricle.

7a. Female glumes narrowly ovate or lanceolate, awned or mucronate at apex, longer than utricle ............ 440. C. teinogyga

7b. Female glumes oblong-ovate or narrowly oblong, muticous and without mucro at apex, nearly equaling or slightly shorter than utricle.

8a. Leaves ca. 1/3 length of culm; spikes laxly with female flowers; female glumes nearly equaling or slightly longer than utricle; stigmas persistent ........................................ 441. C. bilateralis

8b. Leaves longer than or equaling culm; spikes densely with female flowers; female glumes equaling or slightly shorter than utricle; stigmas late deciduous ................................. 442. C. hattoriana

6b. Utricles (except beak) broadly ovate, elliptic, or suborbicular, not exceeding 4 mm; stigmas usually shorter than utricle, rarely slightly longer than utricle; female glumes shorter than utricle.

9a. Terminal spike male, lateral spikes bisexual and androgynous or unisexual and female.

10a. Lateral spikes bisexual, androgynous.

11a. Culms stout, 60–100 cm tall, clothed with dark brown bladeless sheaths on lowermost 30–50 cm; utricles dense ................................................................. 451. C. stipitinux

11b. Culms rather thin, 50–60(–70) cm tall, clothed with brown bladeless sheaths on lowermost ca. 10 cm; utricles lax ................................................................. 452. C. autumnalis

10b. Lateral spikes unisexual, female or 3–8 spikes fascicled in an involucral bract sheath, one of them male and others female.

12a. Culms rather stout; leaf blades 4–12 mm wide; 3–8 spikes fascicled in an involucral bract sheath, one of them male, occasionally with few female flowers at apex, remaining spikes female, peduncles hispidulous ................................................................. 453. C. omeiensis

12b. Culms rather thin; leaf blades 1–1.5 mm wide; spikes single, rarely 2-nate in an involucral bract sheath, terminal spike male, remaining spikes female, peduncles glabrous.

13a. Utricles hispidulous on both surfaces ................................................................. 454. C. chui

13b. Utricles glabrous ................................................................. 455. C. pergracilis

9b. Spikes numerous, bisexual, androgynous.

14a. Spikes arranged in a panicle or raceme; utricles 2–3(–4) mm, usually glabrous.

15a. Culms stout, 80–140 cm tall; spikes linear-cylindric and arranged in a panicle; female glumes ovate or narrowly ovate, apex acute ................................................................. 443. C. henryi

15b. Culms somewhat slender, 40–70 cm tall; spikes narrowly oblong or lanceolate, single or 3–6-nate in an involucral bract sheath, spikes or only lower spikes usually branched, arranged in a raceme; female glumes broadly ovate, apex obtuse or rounded.

16a. Utricles ca. 2.5 mm, oval in outline, apex abruptly contracted into a beak; female glumes ca. 1 mm, apex ending below beak ................................................................. 445. C. gentilis

16b. Utricles 3–4.5 mm, ovate-elliptic or broadly ovate, apex rather gradually narrowed to beak; female glumes 2–3.5 mm, apex reaching beak.

17a. Utricles ca. 3 mm, ovate-elliptic; spikes 1–2 cm ................................................................. 444. C. mosoyensis

17b. Utricles 3.5–4 mm, broadly ovate; spikes 1.5–3 cm ................................................................. 446. C. nachiana

14b. Spikes single or several fasciculate in an involucral bract sheath, not branched and not arranged in a panicle or raceme; utricles exceeding 3 mm, hispidulous on both surfaces, on veins and margins, or only on margins.

18a. Spikes more than 5 to many, usually 1–4 in an involucral bract sheath, 15–30 mm; utricles white hispidulous on both surfaces or on veins and margins.

19a. Spikes usually 1 or 2 in an involucral bract sheath, densely flowered; utricles broadly elliptic or orbicular (except beak), beak short, ca. 1/4 length of utricle, white hispidulous on both surfaces ................................................................. 447. C. brunnea
19b. Spikes usually 3 or 4 in an involucral bract sheath, laxly flowered; utricles elliptic (except beak), beak medium sized, ca. 1/3 length of utricle, hispidulous on veins and margins ................................................................. 448. C. gongshanensis

18b. Spikes 3–5, single in an involucral bract sheath, 8–15 mm; utricles only hispidulous on margins.

20a. Culms 10–35 cm tall, with slender stolons; utricles 3–3.5 mm, only hispidulous on margins of beak ................................................................. 449. C. sendaiica

20b. Culms 35–100 cm tall, without stolons; utricles 4–4.5 mm, hispidulous on margins .... 450. C. bodinieri


长柱头薹草  chăng zhòu tóu tái cáo

Carex scabriculmis (Kükenthal) Ohwi; C. teinogyna var. scabriculmis Kükenthal.

Rhizome short. Culms densely tufted, 25–60(–90) cm tall, slender, triquetrous, slightly scabrous, clothed with few bladeless sheaths. Leaves shorter than or equaling culms, blades 2.5–3 mm wide, conduplicate at base, canaliculate on midrib surface, flattened at upper part, scabrous on veins and margins, basal sheaths usually disintegrating into fibers. Involucral bracts shorter than or equaling inflorescence, lower ones leaflike, upper ones setaceous, scabrous on margins, sheathed; sheaths 5–30 mm. Spikes numerous, 1–3 in an involucral bract sheath, androgynous, linear, 1–5 cm, male part shorter than female part, lower spikes sometimes branched, laxly flowered, slender or rather shortly pedunculate. Female glumes brown-yellow or brownish yellow, oblong-ovate, 4–5 mm, membranous, green 3-veined, apex acute or obtuse, scabrous on margins, sometimes mucorous, hispidulous on margins of awn. Utricles dark brown, shorter than glume, oblong or narrowly elliptic, plano-convex, ca. 4.5 mm, membranous, hispidulous, several veined, base abruptly contracted into a short stipe, apex gradually narrowed to a rather long beak, orifice minutely 2-toothed. Nutlets yellowish, tightly enveloped, elliptic, compressed biconvex, ca. 2 mm, sessile; style base rather thickened; stigmas 2, slender, persistent.

Lax forests in valleys, riversides, wet places at ditch sides or on rocks, sand; 500–2000 m. Anhui, Guangdong, Guangxi, Hunan, Jiangxi, Yunnan, Zhejiang [India, Japan, Korea, Myanmar, Vietnam].


台湾薹草  tài wán tái cáo

Carex asperinervis T. Koyama; C. kotoensis Hayata; C. subteinogyna Ohwi.

Rhizome short, without stolons. Culms densely tufted, 40–60 cm tall, triquetrous, scabrous on upper part of angles, clothed with dark brown sheaths at base, rudimentary sheaths usually disintegrating into fibers. Leaves basal, much shorter than culm, blades 2–3 mm wide, flat, ± stiff, scabrous on upper surface, rather shortly sheathed. Involucral bracts shorter than spike, lower ones shortly leaflike, upper ones setaceous, sheathed, lower sheaths slightly long. Spikes 5–8, 1–3 in an involucral bract sheath, upper spikes contiguous, lower spikes rather spaced, androgy nous, narrowly lanceolate, 10–15 mm, male part shorter than female part, female part somewhat laxly flowered; peduncles mostly long and slender, upper peduncles rather short.

Female glumes yellow-brown, narrowly oblong, costate, margins white hyaline, apex acute or obtuse, mucous. Utricles brown, suberect, equaling or slightly shorter than glume, elliptic, compressed trigonous, ca. 4 mm, membranous, thinly several veined, base abruptly contracted into a short stipe, margins hispidulous, apex gradually narrowed to a medium-sized beak, orifice 2-toothed. Nutlets tightly enveloped, elliptic, compressed biconvex, ca. 2 mm; style slightly short, base thickened; stigmas 2, rather long, persistent.

● Forests, wet places on mountain slopes; 1800–2000 m. Taiwan.


长叶薹草  chăng yè tái cáo

Rhizome short. Culms tufted, 60–100 cm tall, triquetrous, scabrous on upper part of angles. Leaves basal, longer than culm, blades 3–5 mm wide, conduplicate proximally and distally gradually flattened, sheathed at base; sheaths dark brown, usually split. Involucral bracts sheathing, blades of lowest involucral bract leaflike, surpassing its subtending spike, upper blades setaceous, uppermost involucral bract sheathlike and shorter than spike. Spikes more than 10, 1–3 in an involucral bract sheath, sometimes branched on lower spikes, remote and upward rather congregate, androgy nous, male part longer than female part, narrowly lanceolate, 1.5–3 cm, rather densely with female flowers; lower spikes with slender peduncles, upper spikes with rather short peduncles. Female glumes ferrugineous-brown, oblong-ovate, ca. 4 mm, membranous, thinly several veined, apex acuminate. Utricles reddish brown, suberect, equaling or slightly longer than glume, elliptic, compressed trigonous, 4–4.5 mm, membranous, thinly several veined abaxially, base abruptly contracted into a short stipe, apex gradually narrowed to a slightly long beak, orifice 2-toothed. Nutlets tightly enveloped, elliptic, lenticular; style base slightly thickened; stigmas 2, ± long.

Forests or forest margins at ± low elevations. Taiwan [Japan].


亨氏薹草  hèng shì tái cáo


Rhizome short, ligneous, without stolons. Culms densely tufted, 80–140 cm tall, slightly stout, obtusely trigonous, smooth. Leaves basal and cauline, shorter than culm, blades 3–4 mm wide, conduplicate at base and distally gradually flattened, scabrous on both surfaces and margins, long sheathed; sheaths near base black-brown. Involucral bracts sheathed,
lower involucral bract blades leafy, upper blades setaceous; sheaths 0.5–6 cm. Spikes numerous, loosely arranged in a panicle, androgynous, male part shorter than female part, linear-cylindric, 10–25 mm, with few male flowers at apex, loosely with female flowers at lower part, slender and rather long pedunculate. Female glumes brown-yellow, ovate, ca. 2 mm, membranous, green costate, apex acute, muticous. Utricles yellow-green, suberect, longer than glume, elliptic, plano-convex, ca. 3 mm, 5–7-veined abaxially, base abruptly contracted into a short stipe, apex gradually narrowed to a medium-sized beak, beak laxyorate on margins, ca. 1/3 length of utricle, orifice shortly 2-toothed, usually purple-brown on margins. Nutlets lightly enveloped, elliptic, compressed biconvex, ca. 1.7 mm; style equaling or longer than utricle, base slightly thickened; stigmas 2. Fl. and fr. Aug–Oct.

- Ditch sides, riversides, paddy field margins, roadsides on mountain slopes, wet places in forests; 500–3000 m. Anhui, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan, Zhejiang.


滇西薹草  dian xi tai cao

Rhizome elongate, creeping. Culms loosely tufted, 30–40 cm tall, slender, triquetrous, smooth. Leaves shorter than or sub-equaling culm, blades ca. 2 mm wide, slightly revolute on lower margins, upward gradually flattened, scabrous on both surfaces and margins; sheaths less than 5 cm, black-brown, membranous part usually splitting to base. Involucral bracts scabrous, lower involucral bract blades linear, upper blades setaceous, sheaths 5–20 mm. Spikes few, remote, distance between 2 spikes up to 8 cm, single in an involucral bract sheath, androgynous, narrowly lanceolate, 1–2 cm, laxy few flowered. Female glumes yellowish brown, broadly ovate, ca. 2 mm, membranous, 1–3-veined, apex obdurate or rounded. Utricles yellow-brown, suberect, longer than glume, elliptic-ovate or ovate, compressed plano-convex, ca. 3 mm, membranous, glabrous, thinly 7-veined abaxially, base abruptly contracted into a short stipe, apex abruptly narrowed to a short beak ca. 1 mm, orifice shortly 2-toothed. Nutlets yellowish, tightly enveloped, elliptic, compressed plano-convex, ca. 1.5 mm; style base slightly thickened; stigmas 2, short. Fl. and fr. Aug–Oct.

- Forests, ditch sides, riversides, mountain slopes, rock crevices, grasslands; 1300–2200 m. Chongqing, Guizhou, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan.


亲族薹草  qin zu tai cao

Rhizome short. Culms densely tufted, 25–70 cm tall, slender, trigonous, smooth. Leaves shorter than culm blades (1.5–)2–3(–4.5) mm wide, flat, scabrous on both surfaces and margins, sheathed; sheaths usually split. Involucral bracts sheathed, lower 1 or 2 leaflike, upper blade setaceous, slightly scabrous; sheaths 5–20 mm, membranous part brown, slightly split. Spikes numerous, 3–6 in an involucral bract sheath, lower spikes usually branched, androgynous, male part shorter than female part, male part of terminal spike longer, narrowly oblong, 8–12 mm, female part loosely few flowered. Female glumes brown, broadly ovate or oblong-lanceolate, 1–2 mm, membranous, 1-costate, margins white hyaline and ± erose, apex acute or obtuse, muticous. Utricles reddish brown, suberect, longer than glume, elliptic, plano-convex, 2.5–3(–4) mm, membranous, glabrous, thinly 5–7-veined, base cuneate, shortly stipitate, apex abruptly narrowed to a medium-sized beak, orifice shortly 2-toothed. Nutlets yellowish, tightly enveloped, elliptic, plano-convex, ca. 1.5 mm; style base slightly thickened; stigmas 2, short. Fl. and fr. Aug–Oct.

- Forests, ditch sides, riversides, mountain slopes, rock crevices, grasslands; 1300–2200 m. Chongqing, Guizhou, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan.

444a. var. gentilis

亲族薹草(原变种)  qin zu tai cao (yuan bian zhong)

Leaf blades 2–3 mm wide. Female glumes broadly ovate, ca. 1 mm. Utricles ca. 2.5 mm. Fl. and fr. Aug–Oct.

- Forests, ditch sides, riversides; ca. 1500 m. Jiangxi, Sichuan, Yunnan (Qingfeng Shan).


宽叶亲族薹草  kuan ye qin zu tai cao

Leaf blades ca. 4.5 mm wide. Female glumes broadly ovate, ca. 1 mm. Utricles ca. 3 mm, beak ca. 1/3 length of utricle. Fl. and fr. Aug–Oct.

- Mountain slopes, ditch sides, rock crevices; 1300–2000 m. Chongqing (Chengkou), Guizhou, Shaanxi, Xizang (Bomi), Yunnan.


大果亲族薹草  da guo qin zu tai cao

Leaf blades ca. 4.5 mm wide. Female glumes broadly ovate, ca. 1 mm. Utricles ca. 3 mm, beak ca. 1/3 length of utricle. Fl. and fr. Aug–Oct.

- Mountain slopes, ditch sides, rock crevices, grasslands; 1300–1800 m. Chongqing (Chengkou).


短喙亲族薹草  duan hui qin zu tai cao

Leaf blades 2–3 mm wide. Female glumes oblong-lanceolate, ca. 2 mm. Utricles ca. 3 mm, beak short, less than 1/3 length of utricle. Fl. and fr. Aug–Oct.

- Mountain slopes; ca. 2200 m. Taiwan.


日南薹草 ri nan tai cao

Rhzomie short, without stolons. Culms slightly loosely tufted, ca. 70 cm tall, stiff; triquetrous, scabrid on upper part or smooth, 1- or 2-leaved. Leaves ± stiff; blades 2.5–4 mm wide, flat, sheaths at base dusky brown, usually not split. Involucral bracts long sheathed, lower involucral bract blades leaflike. Spikes numerous, 1–3 borne in an involucral bract sheath, androgyneous, cylindrical, 1.5–3 cm, loosely many flowered; peduncle slightly exserted or included in involucral bract sheath. Female glumes brownish, ovate-oblong, ca. 3.5 mm, thinly 1-costate, apex acute but muticous. Utricles brown, suberect, subequaling or slightly longer than glume, broadly ovate or elliptic, compressed biconvex, 3.5–4 mm, membranous, glabrous except scabrous on margins, several veined, base abruptly contracted into a short stipe, apex gradually narrowed to a medium-sized beak, orifice 2-toothed. Nutlets tightly enveloped, orbicular-ovate, compressed biconvex, ca. 2 mm; style strict and short, base thickened; stigmas 2, ± long.

Forests on mountain slopes. Jiangsu, Taiwan, Zhejiang [Japan].


褐果薹草 he guo tai cao

Carex brunnea var. nakiri Ohwi; C. sendaica Franchet var. nakiri (Ohwi) Koyama.

Rhzomie short, without stolons. Culms densely tufted, slender, 40–70 cm tall, triquetrous, scabrid near apex. Leaves basal and cauline, basal leaves much shorter than culm, cauline leaves rather long, blades 2–3 mm wide, flat, scabrous on veins and margins; sheaths up to 4 cm. Involucral bracts sheathed, lower involucral bract blades leaflike, upper blades setaceous, uppermost bract nearly bladeless; sheaths 0.5–1 cm. Spikes numerous, usually 3 or 4 in an involucral bract sheath, androgyneous, male part shorter than female part, with few male flowers at upper part, loosely more than 10-flowered at lower part, linear, 12–25 mm, thinly pedunculate. Female glumes brown, ovate, ca. 2.8 mm, membranous, 1-costate, apex acute, muticous or sometimes mucronate. Utricles brown, suberect, longer than glume, elliptic or narrowly elliptic, plano-convex, 3–3.5 mm, membranous, thinly several veined, loosely white hispidulous on veins and margins, base gradually narrowed to a short stipe, apex attenuate into a slightly long beak ca. 1.5 mm, orifice 2-toothed. Nutlets yellowish, tightly enveloped, elliptic, compressed biconvex, ca. 1.5 mm; style shorter than utricle, base slightly thickened; stigmas 2. Fl. and fr. Aug–Sep.

- Mountain slopes, forests; ca. 2500 m. Xizang (Bomi), Yunnan (Gongshan).


仙台薹草 xian tai tai cao

Rhzomie slender, stoloniferous. Culms densely tufted, 10–35 cm tall or more, slender, triquetrous, smooth, scabrid near apex. Leaves basal, shorter than or equaling culm, blades 2–3 mm wide, flat or sometimes slightly conduplicate, scabrous on margins, sheathed; sheaths 2–3 cm, usually splitting. Involucral bracts sheathed, lower blades linear, upper blades setaceous; sheaths 5–10 mm, lateral part of sheath membranous, brown. Spikes 3 or 4(–8), single in an involucral bract sheath, space up to 5.5 cm, uppermost 2 ± contiguous, androgyneous, terminal spike with male part longer than female part, lateral spikes with female part longer than male part, oblong, 8–15 mm, female part slightly densely few to more than 10-flowered; peduncles thin. Female glumes reddish brown, ovate, 2–2.5 mm, membranous, 3-veined, apex acute, muticous. Utricles reddish brown, suberect, longer than glume, broadly elliptic or broadly ovate, plano-convex, ca. 3 mm, membranous, thinly several veined abaxially, base abruptly contracted into a short stipe, apex abruptly narrowed to a short beak, beak less than 1 mm, hispidulous on margins, orifice shortly 2-toothed. Nutlets yellowish, tightly enveloped, suborbicular, compressed plano-convex, base estipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jun–Oct.

Mountain slopes, forests or among shrubs in valleys, riversides, shady places at roadsides, sunny places at watersides; 200–1800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Korea, Nepal, Philippines, Vietnam; Australia].


贡山薹草 gong shan tai cao

Rhzomie short and thick, ligneous. Culms tufted, 70–80 cm tall, slender, obtusely trigonous, smooth. Leaves basal and cauline, basal leaves much shorter than culm, cauline leaves rather long, blades 2–3 mm wide, flat, scabrous on veins and margins; sheaths up to 4 cm. Involucral bracts sheathed, lower involucral bract blades leaflike, upper blades setaceous, uppermost bract nearly bladeless; sheaths 0.5–1 cm. Spikes numerous, usually 3 or 4 in an involucral bract sheath, androgyneous, male part shorter than female part, with few male flowers at upper part, loosely more than 10-flowered at lower part, linear, 12–25 mm, thinly pedunculate. Female glumes brown, ovate, ca. 2.8 mm, membranous, 1-costate, apex acute, muticous or sometimes mucronate. Utricles brown, suberect, longer than glume, elliptic or narrowly elliptic, plano-convex, 3–3.5 mm, membranous, thinly several veined, loosely white hispidulous on veins and margins, base gradually narrowed to a short stipe, apex attenuate into a slightly long beak ca. 1.5 mm, orifice 2-toothed. Nutlets yellowish, tightly enveloped, elliptic, compressed biconvex, ca. 1.5 mm; style shorter than utricle, base slightly thickened; stigmas 2. Fl. and fr. Aug–Sep.
vex, ca. 2 mm, base stipitate; style base slightly thickened; stigmas 2, exerted part longer than utricle. Fl. and fr. Aug–Oct.

Thickets, grasslands, wet places on mountain slopes, ditch sides in valleys, rock crevices, field banks; 100–1900 m. Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Zhejiang [Japan].

1a. Culms 10–35 cm tall; spikes 3 or 4, oblong-cylindric. 449a. var. pseudosendaica

1b. Culms more than 35 cm tall; spikes up to 8, shortly cylindric. 449b. var. pseudosendaica

**449a. Carex sendaica var. pseudosendaica**

仙台薹草(原变种) xian tai tai cao (yuann bian zhong)

Carex brunnea Thunberg var. sendaica (Franchet) Kükenthal; C. lenta D. Don var. sendaica (Franchet) T. Koyama; C. longistolon C. B. Clarke ex Franchet.


Thickets, grasslands, wet places on mountain slopes, ditch sides in valleys, rock crevices; 100–1900 m. Guizhou, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Sichuan, Zhejiang [Japan (Sendai)].


多穗薹草 duo sui xian tai tai cao

Culms more than 35 cm tall. Spikes up to 8, shortly cylindric. Fl. and fr. Aug–Sep.

Field banks, thickets; 1000–1700 m. Guizhou, Henan, Hunan, Jiangsu, Sichuan [Japan].


滨海薹草 bin hai tai cao

Rhzione short, ligneous, without stolons. Culms tufted, slightly slender, 60–100 cm tall, triquetrous, smooth, clothed with dark brown and bladeless sheaths at base, most up to 15 cm. Leaves shorter than or nearly equaling culm, blades 4–5 mm wide, ± stiff, scabrous on midrib of abaxial surface and margins, long sheathed; sheaths most up to 11 cm, membranous part of sheaths eventually disintegrating into reticulate fibers. Involucral bracts sheathed, low involucral bract blade leaf-like, upper blades needle-shaped or setaceous, shorter than inflorescence, scabrous near apex. Spike numerous, 1–3 in an involucral bract sheath, usually 2 or 3 racemes composed of several spikes borne in lower involucral bract sheaths, terminal spike male, remaining spikes androgynous, male part much shorter than female part, densely many flowered, linear-cylindric, 10–28 mm, thinly pedunculate. Female glumes yellowish brown, broadly ovate, ca. 2.5 mm, membranous, green 1-costate, white hyaline on apex, apex obtuse or acute, muticous. Utricles green-yellow, suberect, longer than glume, elliptic, plano-convex, ca. 3 mm, white hispidulous on upper part, thinly 9–11-veined, base abruptly contracted into a short stipe, apex abruptly contracted into a short beak less than 1 mm, orifice slightly splitting into 2 teeth. Nutlets brown, tightly enveloped, elliptic, compressed biconvex, ca. 2 mm, base stipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jun–Sep.

- Lax or dense forests or thickets on mountain slopes or valleys, shady places at roadsides; 200–1500 m. Anhui, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Zhejiang.


柄果薹草 bing guo tai cao

Carex brunnea Thunberg var. stipitinux (C. B. Clarke ex Franchet) Kükenthal.

Rhzione short, ligneous, without stolons. Culms tufted, slightly slender, 60–100 cm tall, triquetrous, smooth, clothed with dark brown and bladeless sheaths at base, most up to 15 cm. Leaves shorter than or nearly equaling culm, blades 4–5 mm wide, ± stiff, scabrous on midrib of abaxial surface and margins, long sheathed; sheaths most up to 11 cm, membranous part of sheaths eventually disintegrating into reticulate fibers. Involucral bracts sheathed, low involucral bract blade leaf-like, upper blades needle-shaped or setaceous, shorter than inflorescence, scabrous near apex. Spike numerous, 1–3 in an involucral bract sheath, usually 2 or 3 racemes composed of several spikes borne in lower involucral bract sheaths, terminal spike male, remaining spikes androgynous, male part much shorter than female part, densely many flowered, linear-cylindric, 10–28 mm, thinly pedunculate. Female glumes yellowish brown, broadly ovate, ca. 2.5 mm, membranous, green 1-costate, white hyaline on apex, apex obtuse or acute, muticous. Utricles green-yellow, suberect, longer than glume, elliptic, plano-convex, ca. 3 mm, white hispidulous on upper part, thinly 9–11-veined, base abruptly contracted into a short stipe, apex abruptly contracted into a short beak less than 1 mm, orifice slightly splitting into 2 teeth. Nutlets brown, tightly enveloped, elliptic, compressed biconvex, ca. 2 mm, base stipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jun–Sep.

- Lax or dense forests or thickets on mountain slopes or valleys, shady places at roadsides; 200–1500 m. Anhui, Gansu, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Zhejiang.


秋生薹草 qiu sheng tai cao

Rhzione short. Culms tufted, slender, 50–60(–70) cm tall, triquetrous, smooth. Leaves basal, many, shorter than culm, blades 2–3 mm wide, ± stiff, conduplicate proximally, distally flattened, scabrous on margins, with sheaths 4–5 cm, membranous part usually splitting, few dark brown and bladeless sheathed at base. Involucral bracts sheathed, lower involucral bract blades linear or setaceous, upper bracts bladeless. Spike 3–6 or more; terminal spike male, linear, 2–3 cm; remaining spikes androgynous, male part very short, sometimes only with 1 or 2 male flowers, rarely without male flower, loosely with female flowers, cylindric, 1–2.5 cm, thinly pedunculate. Female glumes yellowish brown, ovate, ca. 2.5 mm, membranous, 1-costate, apex obtuse or acute, sometimes mucronate. Utricles chestnut-brown, obliquely patent, longer than glume, broadly elliptic, plano-convex, ca. 3.5 mm, membranous, thinly several veined, sparsely hispidulous on veins, base cuneate, shortly stipitate, apex gradually narrowed into a medium-sized beak, orifice emarginate. Nutlets elliptic, compressed plano-convex,
ca. 1.8 mm; style short, base thickened; stigmas 2, medium sized. Fl. and fr. Sep–Oct.

Shady places in ravines. Fujian, Zhejiang [Japan].


峨眉薹草 e mei tai cao

Carex omiensis var. multifascula Q. S. Wang.

Rhizome rather long, ligneous, horizontal. Culms laxly tufted, 40–65 cm tall, triquetrous, smooth, scabrid nearly apex, clothed at base with dark brown and bladeless sheaths. Leaves slightly short, equaling or slightly longer than culm, blades 0.4–1.2 cm wide, flat, ± stiff, smooth on adaxial surface, scabrous on abaxial surface and margins; sheaths 5–10 cm, dark brown, membranous part of sheaths usually splitting to base. Involucral bracts sheathed, lower involucral bract blades leaflike or setaceous, usually shorter than spike, upper bracts bladeless, sheaths 5–7 mm, brownish, white hyaline on margins of mouth. Spikes numerous, 3–8 spikes fascicled in an involucral bract sheath; terminal spike male; remaining spikes female, densely arranged in a raceme near apex, cylindric, 10–20 mm, sparsely few to more than 10-flowered, thinly pedunculate. Female glumes brownish yellow, ovate, ca. 2 mm, membranous, 1-costate. Utricles reddish brown, suberect, longer than glume, elliptic, plano-convex, 2.5–3 mm, membranous, glabrous, 7–9-veined abaxially, base abruptly contracted into a short stipe, apex gradually narrowed into a short beak less than 1 mm, orifice shortly 2-toothed. Nutlets yellowish-brown, tightly enveloped, obvate-elliptic, compressed biconvex, ca. 1.8 mm; style medium sized in length, base slightly thickened; stigmas 2, rather short. Fl. and fr. Jun–Aug.

● Watersides in valleys, roadsides on mountain slopes, wet places in forests; ca. 1800 m. Hubei, NW Hunan, Shaanxi, Sichuan (Emei Shan).

454. Carex chui Nelmes, Kew Bull. 3: 108. 1948 ["chuii"].

曲氏薹草 qu shi tai cao

Rhizome short. Culms densely tufted, 10–25 cm tall, slender, triquetrous, smooth. Leaves usually basal, much shorter than culm, blades 1–2 mm wide, smooth on both surfaces, only scabrid on upper margins, sheathed; sheaths less than 2 cm, brown, eventually membranous part usually disintegrating into fibers. Involucral bracts sheathed, lower blades linear, upper blades setaceous; sheaths 5–8 mm, brownish, membranous at margin of mouth. Spikes few, remote, spaced up to 5 cm, usually singular in an involucral bract sheath; terminal spike male, linear, 7–8 mm; lateral spikes female, oblong, ca. 5 mm, sparsely few flowered. Female glumes yellowish brown and with brown striae, ovate, ca. 2 mm, membranous, 1-costate, apex acute and muticous. Utricles dark brown, suberect, longer than glume, elliptic, compressed plano-convex, ca. 2.8 mm, membranous, thinly 7-veined abaxially, base cuneate, shortly stipitate, apex gradually narrowed into a medium-sized to long beak, orifice shortly 2-toothed. Nutlets brown, tightly enveloped, ovate-elliptic, compressed biconvex, ca. 1.8 mm; style medium sized in length, base slightly thickened; stigmas 2, rather short. Fl. and fr. Jun–Aug.

● Forest margins, roadsides; ca. 2500 m. Sichuan (Tianquan), Yunnan.


芦山薹草 lu shan tai cao

Rhizome short. Culms densely tufted, 30 cm tall, triniquitous, smooth, clothed with dark brown and remnant sheaths at base. Leaves shorter than culm, blades ca. 3 mm wide, flat. Involucral bracts long sheathed, lower blades leaflike, upper blades setaceous, shorter than spike. Spikes 4 or 5, singular in an involucral bract sheath, lower spikes remote, upper spikes ± contiguous, androgynous, male part short, ob-long-cylindric, 12–15 mm, densely many flowered; lower spikes long pedunculate, upper spikes shortly pedunculate. Female glumes pallid, lanceolate-ovate, greenish 3-veined, apex acuminated. Utricles greenish, suberect, longer than glume, broadly elliptic, plano-convex, ca. 3 mm, membranous, glabrous, several veined, base abruptly contracted, apex abruptly narrowed into a long beak, beak sparsely hispidulous on margins or subsmooth, 2-toothed at orifice. Nutlets tightly enveloped, subobovate, punctate; style base slightly thickened; stigmas 2, short.

● About 1700 m. C and S Sichuan (Lushan, Xichang).

No specimens have been seen by the present authors. The description is written according to the photograph of the isotype and the original description.


圆坚果薹草 yuan jian guo tai cao

Rhizome short. Culms densely tufted, 40–65 cm tall, triquetrous, smooth. Leaves usually basal, much shorter than culm, blades 0.4–1.2 cm wide, flat, ± stiff, smooth on adaxial surface, scabrous on abaxial surface and margins; sheaths 5–10 cm, dark brown, membranous part of sheaths usually splitting to base. Involucral bracts sheathed, lower involucral bract blades leaflike or setaceous, usually shorter than spike, upper bracts bladeless, sheaths 5–7 mm, brownish, white hyaline on margins of mouth. Spikes numerous, 3–8 spikes fascicled in an involucral bract sheath; terminal spike male; remaining spikes female, densely arranged in a raceme near apex, cylindric, 10–20 mm, sparsely few to more than 10-flowered, thinly pedunculate. Female glumes brownish yellow, ovate, ca. 2 mm, membranous, 1-costate. Utricles reddish brown, suberect, longer than glume, elliptic, plano-convex, 2.5–3 mm, membranous, glabrous, 7–9-veined abaxially, base abruptly contracted into a short stipe, apex gradually narrowed into a short beak less than 1 mm, orifice shortly 2-toothed. Nutlets yellowish brown, tightly enveloped, ovate-elliptic, compressed biconvex, ca. 1.8 mm; style medium sized in length, base slightly thickened; stigmas 2, rather short. Fl. and fr. Jun–Aug.
Rhizome slightly elongate. Culms loosely tufted, 35–55 cm tall, medium thick, obtusely trigonous, smooth, several brown and bladless sheaths at base, sheaths eventually disintegrating into fibers. Leaves sheathed, lower blades shorter than culm, upper blades nearly equaling culm, blades 3–4 mm wide, flat, ± stiff, scabrous on veins and margins; sheaths 3–4 cm. Involucral bracts sheathed or upper 2 or 3 nearly not sheathed, longer than spikes. Spikes 3–5, androgynous, with few male flowers at upper part, densely with many female flowers at lower part, oblong or broadly ovate, 0.8–1.5 cm; lowermost spike with a ca. 7 cm peduncle, upper 2 or 3 spikes almost sessile. Female glumes pallid or pale cinnamon-colored, ovate or broadly elliptic, plano-acuminate, mucronate or aristate. Utricles yellowish green or lowish green, ovate-lanceolate, 3.5–5 mm, membranous, several veined axially, base broadly cuneate, apex abruptly contracted into a medium-sized to long beak, orifice shortly 2-toothed. Nutlets stramineous, tightly enveloped, broadly obovate or suborbicular, plano-convex, ca. 2 mm, base broadly cuneate; style persistent, base thickened; stigmas 2. Fl. and fr. Jun–Sep.

- Thickets on mountain slopes or in ravines, dry places in grasslands, rarely atwatersides, in ditches; 1700–1900 m. S Sichuan, C Yunnan (Kunming).


华疏花薹 hua shu hua tai cao

Rhizome short, ligneous. Culms densely tufted, 20–55 cm tall, rather slender, triquetrous, smooth, clothed with few bladeless sheaths eventually disintegrating into fibers. Leaves shorter than culm, blades 3–6 mm wide, rather soft, smooth on both surfaces, denticulate on veins and margins; sheaths 3–4 cm, brownish. Involucral bracts leaflike, much longer than spike, sheaths 2–2.5 cm. Spikes 4 or 5, androgynous, male part shorter than female part, narrowly cylindric, (4–)5–6 cm, sparsely more than 10-flowered; lower spikes remote, peduncle slender, up to 5 cm, slightly pendent; upper spikes rather contiguous, shortly pedunculate or nearly sessile. Female glumes yellow at middle, pale stramineous laterally, oblong-lanceolate or ovate-lanceolate, 3.5–4 mm, 1-costate, apex acuminate, aristate or mucronate. Utricles yellowish green, longer than glume, suberect, oblong-lanceolate, plano-convex, 6–7.5 mm, membranous, glabrous, several veined abaxially, blade gradually narrowed into a slightly long stipe, apex gradually narrowed into a long beak, beak smooth on margins, rather long 2-toothed at orifice. Nutlets yellowish, tightly enveloped, oblong, compressed plano-convex, ca. 3 mm, base shortly stipitate, apex mucronate; style medium sized to long, base slightly thickened; stigmas 2. Fl. and fr. Apr–Jun.

- Wet places on mountain slopes; ca. 1900 m. C Yunnan (Kunming).


长穗柄薹 chang sui bing tai cao

Rhizome slightly elongate, ligneous, clothed with dark brown sheaths eventually disintegrating into fibers. Culms tufted or loosely tufted, 10–70 cm tall, rather thin, triquetrous, smooth on lower part, scabrous on upper part. Leaves basal, much shorter than culm, blades 2–4 mm wide, flat, scabrous on both surfaces and margins; sheaths less than 2 cm, usually splitting. Involucral bracts sheathed, lower involucral bracts leaf-like, upper ones setaceous, uppermost 1 or 2 nearly bladeless; sheaths 0.5–4.5 cm. Spikes 3–5, single in an involucral bract sheath, remote, spaced up to 18 cm, upper spikes rather contiguous, usually not branched, androgyous, cylindric, 2–4 cm, with few male flowers on upper part, sparsely with more than 10 female flowers on lower part; lower spikes long pedunculate, upper spikes shortly pedunculate. Female glumes yellowish green, ovate-lanceolate, 3.5–5 mm, membranous, several veined, midrib slightly thick, apex acuminate, aristate, scabrous on awn. Utricles greenish, obliquely patent, longer than glume, elliptic or broadly elliptic, plano-convex, 5–6 mm, membranous, glabrous, 5–9-veined abaxially, base cuneate, apex gradually narrowed into a slightly long beak, beak ca. 2.5 mm, scabrid on margins, 2-toothed at orifice. Nutlets stramineous, tightly enveloped, broadly elliptic, compressed plano-convex, ca. 2.5 mm, base shortly stipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jun–Aug.

Grasslands or dry places on mountain slopes, riversides; 1200–2600 m. Hubei, Sichuan, Yunnan [Bhutan, India, Indonesia, Kashmir, Nepal].

1a. Culms 40–70 cm tall; lower spikes with slender peduncle, upper spikes with short peduncle ............................................. 459a. var. longipes

1b. Culms 10–28 cm tall; spikes without peduncle or with very short peduncle .... 459b. var. sessilis

459a. Carex longipes var. longipes

长穗柄薹(原变种) chang sui bing tai cao (yuan bian zhong)


Grasslands on mountain slopes, riversides; 1200–1300 m. Hubei, Sichuan, Yunnan [India, Indonesia, Nepal].


短穗柄薹 duan sui bing tai cao

Culms 10–28 cm tall. Spikes without peduncle or with very short peduncle.

- Dry places on mountain slopes; ca. 2600 m. Yunnan [Jingdong: Wuliang Shan].


二峨薹 er e tai cao

Rhizome thick and short, ligneous. Culms densely tufted, up to 85 cm tall, rather thin, trigonous, smooth, clothed with sheaths eventually disintegrating into fibers. Leaves basal, shorter than culm, blades 5–8 mm wide, smooth on both surfaces, scabrous on upper margins; sheaths brown, usually splitting. Involucral bracts sheathed, lower involucral bracts leaf-
like, upper involucral bracts sublinear, longer than spike. Spikes 6 or 7, remote at lower part and ± contiguous at upper part, androgynous, male part shorter than female part, narrowly cylindric, (2.5–3.5 cm, sparsely many flowered; peduncle clothed in involucral bract sheath. Female glumes stramineous, lanceolate, 3–4 mm, membranous, 1-costate, apex acuminate, sometimes mucronate. Utricles stramineous, longer than glume, suberect, oblong-lanceolate, plano-convex, ca. 5 mm, membranous, gla-

brous, several veined, base gradually narrowed into a short stipe, apex gradually narrowed into a long beak, beak smooth on margins, rather long 2-toothed at orifice. Nutlets dark brown, tightly enveloped, elliptic, biconvex, ca. 2.5 mm, base shortly stipitate, apex mucronate; style base slightly thickened; stigmas 2. Fl. and fr. Jun–Jul.

- Roadsides. Sichuan (Er’er Shan).


尖苞薹草组 jian bao tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama

Carex sect. Orthoceras W. D. J. Koch; Leucoglochin (Dumortier) Heuffel.

Inflorescence 1-spiked, terminal, androgynous, elliptic, densely few flowered, bractless. Female glumes caducous. Utricles suberect first, reflexed at maturity, papery, faintly many veined, spongy at base, with rachilla adaxially. Stigmas 3.

About six species: Asia, Europe, North and South America; two species in China.

1a. Two lowermost female glumes with a mucro to short awn; utricles 6–8 mm; rachilla not exserted

1b. All female glumes obtuse at apex; utricles 3.5–4.5 mm; rachilla distinctly exserted


小苞薹草 xiao tai cao

Carex unifoliate Kükenthal & Handel-Mazzetti; Kobresia lomatum Handel-Mazzetti.

Rhizome rather stout, usually elongate. Culms loosely tufted, 10–35 cm tall, rather soft, often flattened, smooth, with brown bladeless basal sheaths, old sheath not splitting into fibers. Basal leaf 1, cauline leaves shorter than culm, blades flat or involute, 1–1.2 mm wide, smooth. Inflorescence 1-spiked, terminal, androgynous (very rarely completely male); male part many flowered, longer than female part; female part 2–4(–6)-flowered. Female glumes dark brown to brown, caducous, oblong-lanceolate, 5–6.5 mm, 3-veined costa of 2 lowest glumes excurrent into a mucro or a short awn up to 7 mm in length, apex acute to slightly obtuse. Utricles suberect first, reflexed at maturity, lanceolate-rhombic, nearly half globose in transverse section, 6–8 mm (including ca. 1.5 mm spongy base), papery, many veined, apex gradually attenuate into a rather long beak, orifice adaxially obliquely truncate. Nutlet shortly cylindric, trigonous, 3.5–4.5 mm, with stipe ca. 1.5 mm and embraced in spongy base of utricle; rachilla soft, flat, slightly longer than nutlet, not exserted; stigmas 3. Fl. May–Aug.

Forest margins, wet places along riverbanks; 2300–4400 m. Gansu, Qinghai, Shaanxi, Xizang, Yunnan [Bhutan, India (Sikkim), Nepal; C Asia].


石苞薹草组 shi tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama


Inflorescence 1-spiked, terminal, androgynous, densely or sparsely flowered. Utricles broadly ovate to broadly elliptic, faintly veined, apex abruptly contracted into a short beak. Nutlet often with reduced rachilla at base; stigmas 3.

Twelve species: NW Africa, Asia, Europe, North America; two species in China.
1a. Utricles submembranous; female glumes obtuse at apex ................................................. 463. Carex argunensis
1b. Utricles leathery; female glumes acute at apex ...................................................... 464. Carex obtusata


北蒙古薹 er na tai cao

Rhizome elongate, woody, covered with dark brown fibrous remains of old scales and leaf sheaths. Culms 10–25 cm tall, erect or slightly curved, slightly rough, with pale to dark brown fibrous remains of leaf sheaths at base. Leaves nearly equaling culm, blades 2–3 mm wide, flat, slightly rough. Inflorescence 1-spiked, terminal, androgynous; male part clavate, ca. 4 mm wide, densely flowered; female part densely 6–15-flowered. Female glumes pale brown on margins, white membranous at middle, elliptic-orbicular, ca. 3 mm, with slightly distinct midvein, apex obtusely rounded. Utricles ellipsoid to broadly ellipsoid, ca. 3 mm, submembranous, faintly veined, base shortly stipitate, apex subrounded, shortly beaked, orifice slightly emarginate. Nutlet tightly enveloped, elliptic, trigonous, crowned with short, cylindrical, persistent style base; rachilla slender, not 1/2 as long as nutlet; stigmas 3. Fr. Jun.

Sandy places of steppes, dunes in Pinus forests; ca. 500 m. Heilongjiang [Mongolia, Russia (Far East, E Siberia)].

7b. Utricles shortly beaked.

1b. Male part of spike less developed, much shorter than female part, not overtopping next lower utricle at maturity.


北蒙古薹 bei tai cao

Rhizome elongate, creeping. Culms loosely tufted, with purple-red sheaths at base, 10–20 cm tall, trigonous, often scabrid above. Leaves shorter than culm, blades flat or involute, 1–1.5 mm wide. Inflorescence 1-spiked, terminal, androgynous; male part linear-cylindric, 5–8 mm; female part 3–8-flowered, subspHERical at maturity. Female glumes pale brown, broadly ovate, ca. 3 mm, 3-veined, margins broadly membranous, apex acute. Utricles chestnut-colored to dark brown, broadly ovate, convex abaxially, with 2 shallow grooves at slightly flat adaxial side, ca. 3 mm, leathery, faintly veined, apex abruptly contracted into a short beak, orifice membranous, obliquely truncate. Nutlet loosely enveloped, elliptic, trigonous, ca. 2 mm, with a linear rachilla or rarely a not fully developed utricle at base; rachilla as long as nutlet; stigmas 3. Fr. Aug.

Forests, forest margins; ca. 2500 m (in Xinjiang). Heilongjiang, Jilin, Xinjiang [Kazakhstan, Mongolia, Russia; SW Asia (Caucasus), C and N Europe, North America].


単穗薹组 dan sui tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张桐仁), Tetsuo Koyama

Inflorescence 1-spiked, terminal, androgynous, rather densely flowered, spherical to oblong, rarely slightly cylindric, bractless at base. Utricles broadly ovate, oblong-lanceolate, or elliptic to ovate-oblong, membranous, estipitate, rarely shortly stipitate, nearly beakless to shortly beaked (rarely up to 1 mm), orifice toothless or minutely 2-toothed. Stigmas 3.

Seventeen species: Asia, Australia, Pacific islands (New Zealand); nine species (four endemic) in China.

1a. Male part of spike developed, longer than to equaling female part, sometimes a little shorter than female part at flowering, but overtopping next lower utricle at maturity.

2a. Female glumes mucronate at apex; utricles ovate-elliptic, ca. 3 mm, tapering above to a beak ca. 1 mm .............................................................. 465. Carex litorhyncha

2b. Female glumes obtuse at apex; utricles broadly ovate, elliptic-ovate, or lanceolate-ovate, 1.5–3 mm, tapering above to a beak less than 1 mm.

3a. Utricles broadly ovate to elliptic-ovate, 1.5–2.5 mm ............................................... 466. Carex rara

3b. Utricles lanceolate-ovate, 2.5–3 mm ................................................................. 467. Carex capillacea


坚喙薹 jian hui tai cao

Rhizome short. Culms tufted, 15–40 cm tall, slender, smooth, with leaves at base. Leaves shorter than culm, blades convolute, threadlike, rather hard, slightly smooth. Inflorescence 1-spiked, terminal, androgynous; male part linear, dis-
tinct; female part as long as male part, slightly loosely many flowered. Female glumes ovate-lanceolate, apex mucronate. Utricles olive-green, longer than glume, obliquely patent at maturity, ovate-elliptic, trigonous, ca. 3 mm, membranous, glabrous, base contracted, apex tapering to a beak ca. 1 mm, orifice 2-toothed. Nutlet brown-red, small, ovate, trigonous; stigmas 3.

- Yunnan.


松叶薹草 song ye tai cao

*Carex bisensis* Franchet; *C. pseudobiwensis* Kitagawa; *C. rara* var. *biwensis* (Franchet) Kükenthal ex Matsumura.

Rhizome short. Culms densely tufted, 20–30 cm tall, smooth to slightly scabrous above. Leaves shorter to slightly longer than culm, blades 0.5–1 mm wide, flat or involute, smooth or slightly scabrous on upper margins; basal sheaths split into gray-brown fibers. Inflorescence 1-spiked, terminal, androgynous; male part distinct, linear, 4–12 mm, 5–17-flowered; female part oblong to shortly cylindric, 4–10 mm, densely 6–18-flowered. Female glumes brown but dilated on upper margins, oblong-ovate, 1.5–2 mm, 3-veined, apex rounded-obtuse. Utricles horizontally patent at maturity, equaling to slightly longer than glume, broadly ovate to elliptic-ovate, slightly swollen, trigonous, 1.5–2.5 mm, faintly veined or distinctly veined near base, sometimes with rusty spots, base rounded-obtuse, apex gradually attenuate into a short beak, orifice subtruncate. Nutlet tightly enveloped, elliptic to ovate, trigonous, 1–2 mm; style base not thickened, persistent; stigmas 3. Fl. and fr. Apr–May.

*Carex rara* var. *rara* var. *rara* var. *linzensis* Y. C. Yang; *C. capillacea* var. *yunnanensis* Franchet; *C. rara* Boott var. *capillacea* (Boott) Kükenthal; *C. rara* f. *yunnanensis* (Franchet) Kükenthal.

Rhizome short. Culms tufted, 15–40 cm tall, slightly scabrous above. Leaves shorter than culm, blades threadlike, 0.5–1 mm wide, flat or involute, smooth; basal sheaths split into brown fibers. Inflorescence 1-spiked, terminal, androgynous; male part distinct, linear, 4–7 mm, 3–7-flowered; female part ovate-orbicular, 3–6 mm, densely 4–10-flowered. Female glumes brown laterally and dilated on upper margins, oblong-ovate, 1.5–2 mm, 3-veined, apex rounded-obtuse. Utricles horizontally patent at maturity, distinctly longer than glume, lanceolate-ovate, swollen, trigonous, 2.5–3 mm, with distinct marginal veins and faint veins at middle, sometimes with rusty spots, base rounded-obtuse, apex gradually attenuate into a short beak, orifice slightly emarginate or minutely 2-toothed. Nutlet loosely enveloped, elliptic, trigonous, ca. 1.8 mm; style base not thickened, persistent; stigmas 3. Fl. and fr. Apr–May.

Wet grasslands on mountain slopes, streambanks. Anhui, Fujian, Jiangxi, Taiwan, Yunnan, Zhejiang [Indonesia, Japan, Myanmar, Philippines, Thailand].


柄囊薹草  bing nang tai cao

Rhizome short. Culms tufted, 5–8 cm tall, slender, smooth, leafy in lower 1/3. Cauline leaves shorter than culm; blades needlelike, ca. 0.5 mm wide, smooth; sheaths pale brown. Inflorescence 1-spiked, terminal, androgynous, oblong, 5–8 mm; male part 2-flowered, short, indistinct; female part 3- or 4-flowered. Female glumes brown laterally, green at middle, oblong-lanceolate, 3.5–4.2 mm, 3-veined, apex attenuate. Utricles green, slightly tinged with pale brown, erect, lanceolate-oblong, 4.5–5 mm (including stipe ca. 0.8 mm), membranous, not distinctly veined, apex gradually attenuate into a beak ca. 1.5 mm, orifice obliquely truncate, indistinctly toothed. Nutlet oblong, trigonous, ca. 2 mm; style base slightly thickened; stigmas 3.

- Alpine meadows; ca. 3600 m. Yunnan.


大针薹草 da zhen tai cao

Rhizome short. Culms tufted, soft, smooth, leafy at lower 1/3. Cauline leaves shorter than culm; blades 2–3 mm wide, flat, smooth. Inflorescence 1-spiked, terminal, androgynous, elliptic-ovate, 6–12 mm; male part very short, 3–5-flowered; female part longer than male part, 7–15(–23)-flowered. Female glumes pale brown, oblong-lanceolate to elliptic-lanceolate, ca. 3 mm, faintly 3-veined, apex acute to slightly obtuse. Utricles horizontally patent or reflexed at maturity, oblong-lanceolate, trigonous, 3.5–4 mm, membranous, with many distinct slender veins on both sides, base rounded, with very short stipe, apex gradually attenuate into a beak, orifice subtruncate. Nutlet loosely enclosed, oblong, trigonous, ca. 2 mm; style base not thickened; stigmas 3. Fl. and fr. Jun–Jul.

Damp places in broad-leaved and *Pinus koraiensis* mixed forests. Heilongjiang, Jilin [Japan, Korea, Russia (Far East)].


西南薹草 xi nan tai cao

Rhizome slender, elongate, covered with pale brown split scales. Culms loosely tufted, 10–25 cm tall, slender, soft, slightly scabrid on angles, leafy in lower 1/4. Cauline leaves shorter than culm; blades hairlike, ca. 0.3 mm wide, flat, smooth, soft; basal sheath pale brown. Inflorescence 1-spiked, terminal, ovate, 6–8 mm; male part very short, 1–3-flowered; female part 4–6-flowered, longer than male part. Female glumes red-brown to dark brown laterally, green at middle, elliptic-ovate, ca. 2.5 mm, 1-veined, apex acute. Utricles erect at maturity, oblong-lanceolate, trigonous, ca. 3.5 mm, membranous with rather distinct slender veins on both sides, base rounded, apex gradually attenuate into a beak, orifice minutely 2-toothed. Nutlet loosely enveloped, elliptic, trigonous, ca. 2 mm; style base not thickened, persistent; stigmas 3. Fl. and fr. May–Jul.

- Forests, wet grasslands along waysides; ca. 2400 m. Sichuan.


Carex meyeriana bogs in forest regions. Jilin [Russia (Far East, E Siberia)].


Grasslands, forest margins. Taiwan [Japan].
50. Carex sect. Rhizopodae


Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama, Gordon C. Tucker

Inflorescence 1-spiked, terminal, androgynous, long cylindric, sparsely or rather densely flowered, bractless. Utricles green, herbaceous, trigonous, glabrous, many veined, apex attenuate or abruptly contracted into a rather long beak, orifice subentire or acutely 2-toothed.

Three species: China, Japan; three species (two endemic) in China.

1a. Utricles abruptly contracted above to a subcylindric beak 2–3 mm, acutely 2-toothed at orifice .............................. 475. Carex rhizopoda

1b. Utricles attenuate above to a beak 1–1.5 mm, emarginate at orifice.

2a. Utricles compressed trigonous, obovoid, apex abruptly constricted into a beak; nutlet stipitate, broadly obovoid, trigonous or quadrangular, lateral surface excavated ................................................................. 477. Carex yunyiana

2b. Utricles trigonous, lanceolate, apex gradually constricted into a beak; nutlet estipitate, ellipsoid, trigonous, lateral surface not excavated ........................................................................................................ 476. Carex densicaespitosa

475. Carex rhizopoda


根足薹草 gen zui tai cao

Rhzizome thick, elongate, covered with fibrous, brown remains of leaf sheath. Culms 30–60 cm tall, soft, trigonous, scabrid on angles. Leaves herbaceous, soft, shorter than culm, blades 2–4 mm wide, flat, margins scabrid. Inflorescence 1-spiked, terminal, androgynous, erect, linear-cylindric, 40–70 × 2–3 mm, bractless; male part very short, 3–5-flowered; female part loosely flowered, sometimes lowermost 2 flowers 1–2 cm apart from each other. Female glumes pale brown laterally, ovate-lanceolate to oblong-lanceolate, 4–5 mm, green costa 3-veined, apex acute to mucronate, or lower glumes shortly awned. Utricles longer than glume, erect, lanceolate, trigonous, ca. 6 mm (including beak), herbaceous, glabrous, abaxially distinctly slenderly many veined, apex abruptly contracted into a subcylindric beak 2–3 mm, orifice distinctly shortly 2-toothed, teeth acute. Nutlet obovate, ca. 2.5 mm, crowned with slightly recurved beak; stigmas 3.

Wet places along waysides. Anhui [Japan].

476. Carex densicaespitosa


密丛薹草 mi cong tai cao

Rhzizome short. Culms densely tufted, 20–40 cm tall, slender, trigonous, scabrous, clothed at base with bladeless sheaths. Basal leaves shorter than culm, scabrid on both surfaces. Inflorescence 1-spiked, terminal, androgynous, long cylindric, 2.5–3 cm; male part shorter than female part, 5–7-flowered; female part loosely 8–12-flowered. Female glumes pale yellow, ovate or lanceolate, ca. 4 mm, costa green, apex mucronate to shortly awned. Utricles obliquely patent, longer than glume, lanceolate, trigonous, ca. 6 mm, herbaceous, glabrous, abaxially distinctly slenderly many veined, apex gradually attenuate into a short beak ca. 1 mm, orifice slightly emarginate. Nutlet ellipsoid, trigonous, ca. 2.5 mm; stigmas 3. Fr. Jun.

● Forests; ca. 1500 m. Guangxi.

477. Carex yunyiana


云亿薹草 yun yi tai cao

Rhzizome short, woody. Culms densely tufted, 20–40 cm tall, slender, trigonous, scabrous, clothed at base with bladeless sheaths. Basal leaves shorter to slightly longer than culm, scabrid on margin. Inflorescence 1-spiked, terminal, androgynous, narrowly cylindric, 2–2.5 cm; male part shorter than female part, 6–11-flowered; female part loosely 9–14-flowered. Female glumes pale green, obovate, 4–4.5 mm, costa green, apex acuminate. Utricles pale green, erect to obliquely patent, slightly longer than glume, obovoid, compressed trigonous, 5–6 mm, herbaceous, glabrous, abaxially distinctly many veined, apex abruptly constricted into a short beak ca. 1.5 mm, orifice slightly bidentate. Nutlet broadly obovoid, trigonous or quadrangular, ca. 2.5 mm, lateral surface excavated, base stipitate; stigmas 3. Fl. and fr. Apr.–May.

● Cryptomeria forests; ca. 1000 m. E Zhejiang (Tiantai).

51. Carex sect. Capituligerae


头穗薹草组 tou sui tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama

Inflorescence 1-spiked, terminal, androgynous, ovate to elliptic, densely flowered, male part rather short. Utricles ovate to elliptic, faintly veined on both surfaces, apex gradually attenuate into a short beak. Nutlet lenticular, without or with a very short rachilla at base; stigmas 2.

About three species: Asia, Europe, North America, austral South America; one species (endemic) in China.

墨脱薹草 mo tuo tai cao

Rhizome short. Culms densely tufted, 5–20 cm tall, slender, smooth, compressed trigonous, 2-leaved in lower 1/3. Basal sheaths with blades, pale brown, not split into fibers; blades slightly shorter to slightly longer than culm, linear, flat, ca. 1 mm wide, smooth, margins scabrid. Inflorescence 1-spiked, terminal, androgynous, pale brown, ovate-elliptic, 1–1.3 × ca. 0.5 cm; male part short, 3–6-flowered; female part longer than male part, densely many flowered, bractless at base. Female glumes pale brown, oblong, ca. 3.5 mm, 1-veined. Utricles ovate-elliptic, ca. 4 mm (including stipe ca. 1 mm), membranous, not distinctly veined on both surfaces, apex gradually attenuate into a short beak, orifice subtruncate. Nutlet elliptic-orbicular, ca. 1.5 mm, lenticular, without or with a very short rachilla at base; stigmas 2.

- About 4000 m. Xizang.


异株薹草组 yi zhu tai cao zu

Tang Yancheng (汤彦承 Tang Yen-cheng), Zhang Shuren (张树仁); Tetsuo Koyama

Inflorescence 1-spiked, terminal, often unisexual and plants dioecious, rarely male spike with female flowers at base. Utricles ovate to lanceolate, subleathery, base spongy, apex shortly beaked. Nutlet lenticular; stigmas 2.

Between four and six species: circumboreal in Asia, Europe, and North America; one species in China.


异株薹草 yi zhu tai cao

Carex cobresiiformis A. I. Baranov & Skvortsov; C. dioica Linnaeus subsp. gynocrates (Wormskjöld ex Drejer) Hultén; C. dioica var. gynocrates (Wormskjöld ex Drejer) Ostenfeld.

Rhizome slender, creeping. Culms loosely tufted, 20–30 cm tall, smooth, leafy on lower 1/4. Basal leaf sheaths rusty brown, eventually pale brown, split into fibers. Blades shorter than culm, ca. 0.5 mm wide, smooth. Plants dioecious, male plant not seen; inflorescence 1-spiked, terminal; female spike brown, narrowly cylindric, 1.5–1.8 × ca. 0.2 cm. Female glumes rusty brown, broadly ovate, apex acute. Utricles nearly equally to slightly longer than glume (ripe specimens not seen), 2–2.5 mm, slenderly veined on both surfaces, apex gradually attenuate into a short beak, orifice minutely 2-toothed; stigmas 2.

Bogs in forests; ca. 900 m. Jilin [Japan, Russia (Far East, E Siberia); North America].


二柱薹草亚属 er zhu tai cao ya shu

Liang Songyun (梁松筠 Liang Song-jun); Tetsuo Koyama, Gordon C. Tucker

Vignea P. Beauvois ex T. Lestibouidois, Essai Cyp. 22. 1819.

Rhizome short or creeping. Flowers unisexual; plants monoecious, rarely dioecious. Spikes usually numerous, bisexual, androgynous or gynaecandrous, rarely spikes entirely male or female, ovate, oblong, or orbicular, sessile, arranged in spicate, paniculate, or capitate inflorescence, rarely capitulate or spicate-paniculate, not prophyllate at base. Utricles plano-convex or biconvex, globose or elliptic, rarely inflated. Nutlets plano-convex or biconvex; stigmas 2, rarely 3.

About 350 species: ± worldwide, mostly temperate; 48 species (nine endemic) in 17 sections (one endemic) in China.

1a. Spikes gynaecandrous.

2a. Stigmas 3 ......................................................................................................................................................... 63. C. sect. Gibbae

2b. Stigmas 2.

3a. Involucral bracts leaflike, conspicuously longer than inflorescence.

4a. Spikes distantly alternate on an elongate rachis, forming loosely spicate inflorescence .......... 64. C. sect. Remotae

4b. Spikes forming a densely capitate inflorescence .............................................................................. 65. C. sect. Cyperoideae

3b. Involucral bracts glumelike or setaceous.

5a. Utricles usually minutely papillose or minutely tuberculate, beakless or with short beak subentire or emarginate at orifice .................................................................................................. 69. C. sect. Glareosae

5b. Utricles neither minutely papillose nor minutely tuberculate, with long beak 2-toothed at orifice.

6a. Utricles patent at maturity, not winged on margins ................................................................. 68. C. sect. Stellulatae

6b. Utricles erect at maturity, winged on margins.

7a. Lower involucral bracts setaceous (rarely leaflike, not more than 5 cm, not more than 2 × as long as inflorescence) ........................................................................................................ 66. C. sect. Ovales
7b. Lower involucral bracts leaflike, exceeding inflorescence .............................................. 67. C. sect. Planatae

1b. Spikes androgynous (rarely entirely male or female), plants rarely dioecious.

8a. Stigmas 3; plants monoecious, rarely dioecious; female glumes 10–15 mm; spikes unisexual (very rarely androgynous), numerous, densely crowded into a larger inflorescence ........................ 62. C. sect. Macrocephalae

8b. Stigmas 2; plants monoecious; female glumes less than 5 mm.

9a. Utricles strongly inflated bulbiform to globe or elliptic at maturity, 10–15 mm .......................... 60. C. sect. Physodeae

9b. Utricles not inflated at maturity, less than 6 mm.

10a. Rhizome long creeping.

11a. Utricles winged on margins or narrowly winged on distal margins, beak scabrous, more than 0.25 mm, usually 2-toothed at apex (suture abaxial); leaf sheath opposite blade herbaceous and membranous only near orifice ................................. 58. C. sect. Holarrhenae

11b. Utricles not winged on margins, beak less than 0.25 mm, margins smooth or serrulate.


12b. Utricles biconvex, margins rounded, beak smooth .......................................................... 61. C. sect. Dispermae

10b. Rhizome short; culms tufted.

13a. Utricles spongy at base.

14a. Leaf sheaths red-brown or yellow punctate, not rugulose ........................................... 56. C. sect. Heleoglochin

14b. Leaf sheaths transversely rugulose, not punctate .......................................................... 57. C. sect. Vulpinae

13b. Utricles not spongy at base.

15a. Utricles nerveless ................................................................. 53. C. sect. Echinochloomorphae

15b. Utricles veined

16a. Culms with nodes, thickened to bulbous at base .................................................... 54. C. sect. Thomsonianae

16b. Culms without nodes, not thickened at base ............................................................. 55. C. sect. Phleoideae


类稗薹草组 lei bai tai cao zu


- One species: China.

480. Carex echinochloiformis Y. L. Chang ex Y. C. Yang, Fl. Xizang. 5: 436. 1987 ["echinochloaeformis"].

类稗薹草 lei bai tai cao

Rhizome short, indurate. Culms tufted, 35–90 cm tall, sharply trigonous, scabrous above, with bladeless sheaths at base. Leaves usually longer than culm, blades linear, 4–5 mm wide, margins slightly scabrous, apex long acuminate. Involucral bracts glumelike. Spikes numerous, androgynous, ovate or oblong-ovate, 4–5 mm, inflorescence branched, paniculate, 8–13 cm. Female glumes broadly ovate, margins white hyaline, green 3-veined costa excurrent into a mucro. Utricles light green, nearly equaling glume, ovate or ovate-elliptic, plano-convex, 2.2–3.5 mm, membranous, nerveless, base not spongy, margins winglike and thickened, apex gradually narrowed into a beak, scabrous on margins, orifice deeply 2-lobed. Nutlets loosely enveloped, ovate or broadly elliptic, plano-convex, 1.3–2 mm, base abruptly contracted into a short stipe; style base slightly thickened; stigmas 2. Fl. and fr. May–Jun.

- Forests; ca. 2500 m. Xizang, NW Yunnan.


高节薹草组 gao jie tai cao zu

Rhizome indurate, oblique. Culms tall, stiff, with nodes, thickened to bulbous at base, clothed with black-brown sheaths disintegrating into fibers. Spikes numerous, bisexual, androgynous, inflorescence spicate, cylindric. Female glumes ovate. Utricles ovate or suborbicular. Style base not thickened; stigmas 2.


高节薹草 gao jie tai cao

Rhizome short, indurate. Culms loosely tufted, 15–30 cm tall, obtusely trigonous, smooth, stiff, with nodes, thickened to bulbous at base, clothed with dark brown sheaths disintegrating into fibers. Leaves longer than culm, blades narrowly linear, 2.5–3 mm wide, flattish plicate, rather stiff, slightly scabrous on margins, long sheathing. Lowest involucral bract leaflike, much surpassing inflorescence. Inflorescence long cylindric, 5–9.5 cm; spikes numerous, androgynous, ovate, 5–7 × 3–4 mm. Female glumes pale ferruginous, with brownish spots, ovate, 2.5–2.8 mm, margins white hyaline, green 3-veined costa forming a short mucro at acute apex. Utricles pale brown with
dark spots, equaling or slightly longer than glume, ovate or ovate-elliptic, plano-convex, 2–2.5 × 1.8–2.5 mm, subleathery, narrowly winged, serrulate above, finely many veined abaxially, apex gradually narrowed into a beak ca. 0.3 mm, serrulate on upper margins, orifice 2-toothed. Nutlets brown, tightly enveloped, oblong-ovate, plano-convex, ca. 1.2 mm; stigmas 2. Fl. and fr. Apr–Aug.

Sandy and wet places along rivers, grassland slopes; 200–1700 m.


多花薹草组 duo hua tai cao zu

Rhizome short. Culms tufted. Involucral bracts leaflike, setaceous, or glumelike. Spicate inflorescence long cylindric, lower spikes sometimes shortly branched; spikes numerous, androgynous. Female glumes ovate or ovate-oblong. Utricles winged or wingless and thickened on margins, membranous, veined, orifice 2-toothed. Stigmas 2.

Ten species: E, S, and SE Asia; six species in China.

1a. Utricles winged on margins.
   2a. Spikes disposed in a pyramidal-cylindric, dense inflorescence, 2.5–8 cm; utricles on margins from middle to apex with broad serrulate wings, densely brown puncticate above ........................................... 482. C. neurocarpa
   2b. Spikes disposed in a long cylindric or ovate-elliptic inflorescence dense at apex, 1.5–3.5 cm; utricles on margins from middle to apex with narrow serrulate wings, not or sparsely brown puncticate ............... 483. C. fluviatilis

1b. Utricles thickened on margins or narrowly winged on upper part of margins.
   3a. Utricles with several large tubercles abaxially ................................................................. 484. C. paxii
   3b. Utricles without large tubercles abaxially.
      4a. Involucral bracts glumelike .......................................................................................... 487. C. laevissima
      4b. Lowest involucral bracts leaflike or setaceous.
         5a. Utricles densely ferruginous puncticate ................................................................. 486. C. leiorrhyncha
         5b. Utricles not ferruginous puncticate ................................................................. 485. C. nubigena


异果薹草 yi guo tai cao

Rhizome short, indurate. Plant wholly ferruginous puncticate. Culms tufted, flattened, smooth, clothed with pinkish ferruginous bladeless sheaths at base. Leaves shorter or longer than culm, blades linear, 2–3 mm wide, flat, margins ± involute, scabrous, apex acuminate; membranous side of leaf sheath ferruginous. Lower involucral bracts leaflike, much surpassing inflorescence, sheathless, upper involucral bracts setaceous. Spicate inflorescence dense, pyramidal-cylindric, 2.5–8 × 1–1.8 mm; spikes numerous, androgynous, ovate, 5–8 mm. Female glumes ferruginous-yellow, ferruginous spotted, ovate to oblong-elliptic, 2–4 × ca. 1.5 mm, apex acute, shortly awned. Utricles ferruginous spotted, longer than glume, suberect, ovate or broadly ovate, plano-convex, 2.5–4 mm, membranous, many veined on both faces, densely ferruginous puncticate above, margins from middle to apex with broad serrulate wings, apex gradually contracted into a beak, orifice 2-toothed. Nutlets pale brown, loosely enveloped, ovate or elliptic, plano-convex, ca. 1 mm, smooth, lustrous; stigmas 2. Fl. and fr. Jun–Aug. 2n = 108.

Wet places along ponds and riversides, grasslands; (below 100–)100–1700 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi (Japan, Korea, Russia (Far East)).


溪生薹草 xi sheng tai cao

Carex yungningensis Handel-Mazzetti & Kükenthal.

Rhizome short, indurate. Culms tufted, 10–70 cm tall, trigonous, erect, stiff, clothed with brown-reddish sheaths at base. Lower involucral bracts leaflike, much surpassing inflorescence. Spicate inflorescence long cylindric or ovate-elliptic, 1.5–3.5 × 0.8–1.3 cm, dense at apex, lower 1 or 2 usually dist; spikes numerous, androgynous, ovate, 5–7 mm. Female glumes pale, light green at middle, ovate-lanceolate, 2.5–3 × 1.2–1.5 mm; membranous, apex acuminate, awned. Utricles pale green, longer than glume, ovate-lanceolate or oblong-elliptic, plano-convex, 3–3.5 × ca. 1.5 mm, membranous, glabrous, many veined on both faces, margins from middle to apex with narrow serrulate wings, apex gradually narrowed into a medium-sized beak, orifice 2-toothed. Nutlets pale brown, loosely enveloped, ovate or suborbicular, plano-convex, 1.3–1.5 mm, lustrous; stigmas 2. Fl. and fr. Jun–Sep.

Wet places in forests and streambeds along valleys; 1300–3200 m. Guizhou, Sichuan, Xizang, Yunnan [India, Myanmar].


紫疣薹草 zi you tai cao

Rhizome short, oblique, indurate. Culms tufted, 12–55 cm...
tall, trigonous, scabrous above, clothed at base with dark brown sheaths disintegrating into fibers. Leaves shorter or longer than culms, blades linear, 1.5–2.5 mm wide, flat, margins scabrous, apex long acuminate. Lower involucral bracts setaceous, upper glumelike. Spicate inflorescence long cylindric, 3–6.5 × 5–10 mm; spikes numerous, androgynous, ovate, 5–7 mm. Female glumes yellowish brown, ovate, 2.2–3 × 1.5–2.2 mm, membranous, green 3-veined at middle. Utricles yellowish brown, slightly longer than glume, ovate-conic, plano-convex, 2.5–3.2 mm, subleathery, many veined on both faces, with several purple-red tubercles abaxially, base subrounded, spongy, shortly stipitate, margins from middle to apex with narrow denticulate wings, apex gradually narrowed into a beak, orifice 2-toothed. Nutlets loosely enveloped, ovate or suborbicular, plano-convex, ca. 1.2 mm, base shortly stipitate; stigmas 2. Fl. and fr. Jun–Aug.

Wet places on slopes or grasslands. Jiangsu, Jiangxi [Japan, Korea].


云雾薹草 yun wu tai cao

Rhizome short, indurate. Culms tufted, 10–70 cm tall, trigonous, scabrous above, clothed with brown bladeless sheaths at base. Leaves shorter than culm, blades linear, 1–2 mm wide, flat or plicate, apex acuminate; membranous side of leaf sheaths not transversely wrinkled, with purple-red spots. Lower involucral bracts 1 or 2 leaflike, green, much surpassing inflorescence, upper involucral bracts setaceous. Spicate inflorescence long cylindric, 2.5–50 × 0.7–1 cm, dense at apex, lower ones distant; spikes numerous, androgynous, ovate-elliptic, plano-convex, 2.5–3.2 mm, subleathery, many veined on both faces, with several purple-red tubercles abaxially, base subrounded, spongy, shortly stipitate, margins from middle to apex with narrow denticulate wings, apex gradually narrowed into a beak, orifice 2-toothed. Nutlets loosely enveloped, ovate or subelliptic, biconvex, 1–1.2 × ca. 1 mm wide, lustrous, base shortly stipitate; stigmas 2. Fl. and fr. Jun–Sep.

Wet places on slopes. Jiangsu, Jiangxi [Japan, Korea].

485c. subsp. pseudoarenicola

Spikes many, ca. 5 mm wide. Utricles light green, lanceolate-ovate, ca. 3 × 1 mm.


Grassy slopes; ca. 1900 m. Chongqing (Chengkou, Wuxi), Hubei (Badong, Shennongjia) [Japan, Russia (Kuril Islands)].


稀缺薹草 he hong mai tai cao


Spikes 3–5, densely congested without space.

Wet places at high elevations. Taiwan [Malaysia, Philippines].


尖嘴薹草 jia jian zui tai cao

Rhizome short, indurate. Plants wholly ferruginous puncticulate. Culms tufted, 20–80 cm tall, trigonous, scabrous above, clothed with ferruginous-brown sheaths at base. Leaves shorter than culm, loosely subtending culm, blades linear, 3–5 mm wide, flat, apex long acuminate; membranous side of leaf sheaths transversely wrinkled, truncate at apex. Lower 1 or 2 involucral bracts leaflike, upper ones setaceous. Spicate inflorescence cylindric, 5–8 cm; spikes numerous, dense, androgynous, ovate, 5–12 × 4–6 mm. Female glumes pale ferruginous, ovate, 2.2–3 mm, ferruginous puncticulate, apex subacute, awned. Utricles pale yellow or pale green, longer than glume, lanceolate-ovate or oblong-ovate, plano-convex, 3.5–4 × ca. 1 mm, membranous, ferruginous puncticulate, many veined on both faces, base rounded, not spongy, slightly stipitate, margins wingless, apex gradually narrowed into a smooth long beak, orifice 2-toothed. Nutlets loosely enveloped, elliptic or ovate-elliptic, plano-convex, 1–1.2 mm; style long, base not thickened. Fl. and fr. Jun–July 2n = 76–80.

Grassy roadsides and trailsides in mountains; 400–1000 m. Hebei, Heilongjiang, Shanxi [Korea, Russia (Far East, E Siberia)].


假尖嘴薹草 jia jian zui tai cao
Rhizome short, indurate. Culms tufted, 25–50 cm tall, slightly scabrous, clothed with pale brown bladeless sheaths at base. Leaves shorter than culm, blades linear, ca. 2 mm wide, flat, margins scabrous, apex long acuminate; membranous side of leaf sheath transversely wrinkled. Involutural bracts glume-like, ovate or oblong, awned at apex. Spicate inflorescence cylindrical, 3–4.5 × 1–1.3 cm, densely flowered above, sparsely below. Female glumes brownish ferruginous, ovate or ovate-oblong, ca. 3 mm, green 3-veined at middle, margins pale hyaline, apex acuminate. Utricles light green-yellow, longer than glume, narrowly ovate or lanceolate-ovate, plano-convex, 3–3.5 × ca. 1 mm, membranous, not ferruginous puncticate, many veined on both faces, base subrounded, margins not winged, thickened, apex gradually narrowed into a long beak, sharp margins usually subsmooth, sometimes slightly scabrous, orifice 2-toothed. Nutlets brown, loosely enveloped, elliptic, plano-convex, 1–1.2 mm, lustrous, base shortly stipitate; style brown, slender, base not thickened; stigmas 2 Fl. and fr. Jun–Jul.

Meadows, forest margins; 500–1800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Russia (Far East)].


海绵基 tai cao zu

Rhizome elongate, shortly creeping. Culms loosely tufted; sheaths red-brown or yellow punctate. Inflorescence ± branched; spikes androgy nous, lower spikes forming a spicate-paniculate inflorescence. Utricles leathery, unequally biconvex.

About 15 species: N and W Africa, Asia, Australia, Europe, North America, Pacific islands; one species in China.


海绵基 tai cao

Rhizome shortly creeping, indurate. Culms loosely tufted, 30–45[–90] cm tall, compressed trigonous, scabrous above, clothed with brown or dark brown bladeless sheaths at base. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, margins scabrous, apex acuminate. Involutural bracts setaceous, shorter than inflorescence. Inflorescence spicate-paniculate, 2–3.5 cm; sometimes lowest spike ± branched; spikes androgy nous, broadly ovate, 5–7 mm. Female glumes ferruginous-brown, broadly ovate, ca. 3 × 2 mm, 3-veined, margins pale hyaline, apex acuminate. Utricles ferruginous-brown, greenish above, subequalling glume, broadly ovate, plano-convex, ca. 3 × 2 mm, leathery, with 4 or 5 short veins at base abaxially, nerve less adaxially, base broadly subcordate, spongy, shortly stipitate, distal margins denticulate, apex gradually contracted into a sessulate-margined and narrowly winged beak ca. 1 mm. Nutlets tightly enveloped, obovate, plano-convex, ca. 1.4 × 1.2 mm, base broadly cuneate, shortly stipitate; style base slightly thickened; stigmas 2 Fl. and fr. Jul. 2n = 48, 50, 54, 60.

Alpine lakes, marshes, boggy meadows. Nei Mongol [Russia (Far East, Siberia)] C and SW Asia, C and N Europe, North America, Pacific islands (New Zealand).


海绵基 tai cao


Rhizome short or absent. Culms tufted; sheaths transversely rugulose. Involutural bracts glume-like, lower ones sometimes setaceous or narrow, leaflike. Spikes numerous, androgy nous (lower ones sometimes female), many flowered, several aggregated on abbreviated branches, forming large, usually dense spicate-paniculate inflorescence. Utricles plano-convex, leathery or membranous, ± strongly patent at maturity, veined, base spongy, beak orifice 2-toothed.

About 15 species: mainly in North America, some species in E, N, and S Africa, temperate zone of Asia, S Australia, and Europe; four species (one endemic) in China.

1a. Female glumes without awn at apex ......................................................................................................................... 492. C. earistata

1b. Female glumes with scabrous awn at apex.

2a. Utricles lanceolate (i.e., broadest at base), membranous, beak slightly 2-toothed, deeply cuneate cleft abaxially .................................................................................................................................................. 489. C. stipata

2b. Utricles ovate, ovate-lanceolate, or oblong-lanceolate (i.e., broadest at lower 1/4 or 1/3).

3a. Culms narrowly winged; female glumes with brown, slightly scabrous, 1–1.5 mm long awn; utricles leathery, with very small tubercles, at maturity reddish or ferruginous-brown, with thickened veins, beak deeply cleft abaxially, slightly cuneate-cleft adaxially ................................................................. 490. C. vulpina

3b. Culms wingless; female glumes with green strongly scabrous shorter awn; utricles membranous, shining, without tubercles, at maturity greenish yellow or slightly brownish, thinly veined, beak equally cleft abaxially and adaxially ......................................................................................................................... 491. C. otrubae


海绵基 tai cao

Rhizome short. Culms tufted, 40–70 cm tall, compressed trigonous, scabrous above, leafy in middle or lower, clothed at base with black-brown bladeless sheaths disintegrating into fibers. Leaves shorter or longer than culm, blades pale green, 6–
7 mm wide, flat, soft, margins serrulate, apex acuminate; membranous side of leaf sheath usually transversely wrinkled. Lower involucral bracts setaceous, upper ones glumelike. Inflorescence cylindric, sometimes slightly branching, 3.5–5 × 1–1.5 cm; spikes androgynous, slightly stellate patent, simple above, branched below. Female glumes pale green, ovate, 3–4 × ca. 1.8 mm, green 1-veined costa excurrent into an awn 0.5–1.2 mm. Utricles pale ferruginous, longer than glume, cuneate-lanceolate, plano-convex, 4–5 mm, membranous, lustrous, many veined abaxially, base spongy, shortly stipitate, upper margins narrowly serrate winged, apex gradually narrowed into a serrate-margined long beak, beak cleft abaxially, narrowly serrate winged, apex gradually narrowed into a serrate-margined long beak, beak cleft abaxially, cuneate-cleft adaxially, 2-toothed at orifice. Nutlets tightly enveloped, broadly ovate, plano-convex or slightly biconvex, 1.5–1.7 mm, base shortly stipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jul. 2n = 48, 52.

Mixed forests, swampy meadows; 700–1700 m. Hubei, Jilin [Japan, Korea, Russia (Far East); North America].

狐狸薹 hu lì tài cao

Rhizome short, indurate. Culms tufted, 40–70 cm tall, slightly stiffer, compressed trigonous, scabrous narrowly winged above, clothed at base with pale brown sheaths disintegrating into fibers. Leaves longer than culm, blades pale green, linear, 5–7 mm wide, flat, margins scabrous, apex acuminate; membranous side of leaf sheaths ferruginous puncticate. Involucral bracts setaceous. Inflorescence cylindric, 3–4.5 × 1.5–2 cm; spikes numerous, androgynous, ovate, 7–10 mm. Female glumes pale green, ovate, 2.5–3.5 mm, ferruginous punctulate, green 1-veined costa excurrent into a slightly scabrous awn. Utricles ferruginous-brown, longer than glume, ovate-lanceolate, plano-convex, 3.5–4 mm, leathery, distinctly veined abaxially, nerveless or veined only at base adaxially, base subrounded, spongy, shortly stipitate, upper margins narrowly winged, spinulose-serrate, apex gradually attenuate into a long beak, beak deeply cleft abaxially, cuneate-cleft adaxially, 2-toothed at orifice. Nutlets brown, oblong, biconvex, ca. 2 mm, lustrous; style base thickened; stigmas 2. Fl. and fr. Aug. 2n = 68.

Wet grassy riverbanks; ca. 1200 m. Xinjiang [Russia (Siberia); C Asia, SW Asia (Caucasus), Europe].

捷克薹 jié ke tài cao

Rhizome short. Culms 40–70 cm tall, compressed trigonous, scabrous above. Leaves cauline, shorter than culm, blades pale green, linear, 3–7 mm wide, flat, margins serrate, apex acuminate, clothed with orange sheaths at base. Involucral bracts glumelike, lowest setaceous or leaflike, shorter than or equaling inflorescence. Inflorescence cylindric, ca. 5 cm, interrupted below. Female glumes pale orange-brown, ovate, ca. 3 mm, 1-veined costa excurrent into an awn. Utricles pale green or orange-brown or dark gray, longer than glume, ovate or ovate-lanceolate, ca. 5 mm, lustrous, smooth, without conspicuous veins on both faces, apex gradually attenuate into a serrate beak, orifice 2-toothed, orange-brown. Nutlets elliptic, ca. 2.5 × 2 mm, base shortly stipitate; style base slightly thickened; stigmas 2. Fl. and fr. Jul. 2n = 58, 62, 64.

Ravines, forest margins, moist places; ca. 1800 m. Xinjiang [Russia (W Siberia); C Asia, Europe].

无芒薹 wú máng tài cao

Rhizome absent. Culms 20–55 cm tall, trigonous, smooth, clothed with dark brown bladeless sheaths. Leaves shorter than culm, blades green, linear, 3–5 mm wide, flat, margins scabrous, apex acuminate; leaf sheath at mouth membranous. Involucral bracts glumelike, lowest setaceous. Spicate inflorescence cylindric, 2.5–4.5 × 1–1.5 cm; upper spikes dense, lower ones interrupted; spikes 8–14, androgynous, ovate, 5–8 mm. Female glumes ferruginous, ovate, 2–2.5 mm, membranous, 1-veined, margins sometimes pale hyaline, apex without awn. Utricles ferruginous-brown, longer than glume, ovate-lanceolate, plano-convex, 3–3.5 mm, many veined abaxially, 3- or 4-veined adaxially, scabrous in distal half, base rounded, spongy, margins thickened, apex gradually attenuate into a long beak, beak deeply cleft abaxially, subentire adaxially. Nutlets oblong, plano-convex, ca. 1.5 × 1 mm, base contracted into a short stipe; style base thickened; stigmas 2.

● Streambanks; ca. 2000 m. Gansu.


二柱薹组 èr zhú tài cao zu


Plants usually with long creeping rhizome. Leaves: side of sheath opposite blade herbaceous and membranous only near orifice. Involucral bracts usually glumelike. Inflorescence dense, spicate; spikes androgynous (or unisexual). Utricles plano-convex, papery or membranous, veined, in upper half with very narrow denticulate winglike margins, beak scarcely 2-toothed. Nutlets loosely enveloped, shorter than utricle bodies.

About 11 species: temperate zone of Asia, Europe, North America; 11 species (five endemic) in China.

1a. Utricles leathery, with winglike thickened margins, scabrous above, veins numerous on both faces, conspicuously raised ............................................................................................................................................................................ 503. C. curaica

1b. Utricles membranous, with winged margins (at least above), veins not conspicuously raised.

2a. Utricles winged on margins above.
3a. Utricles ovate or oblong-ovate, sparsely pilose on both faces, rather densely so above, and usually verruculose ................................................................. 493. Carex pallida

3b. Utricles obovate-oblong, distally verruculose and sparsely hirsute on both faces ................................................. 494. Carex maorshanica

2b. Utricles narrowly winged on margins.

4a. Utricles pubescent and verruculose, ovate-lanceolate or lanceolate.

5a. Leaf blades 2.5–3.5 mm wide; utricles 3.5–4.5 mm, pubescent on both faces, sometimes sparsely long puberulent at base ................................................................. 495. Carex daltingensis

5b. Leaf blades 1.5–2 mm wide; utricles 5.5–6.5 mm, verruculose and sparsely hirsute on both faces above ................................................................. 496. Carex laricetorum

4b. Utricles glabrous, not verruculose, ovate or elliptic-ovate.

6a. Utricles ovate to broadly ovate, spongy ................................................................. 497. Carex lithophila

6b. Utricles elliptic-ovate or ovate-lanceolate, not spongy.

7a. Spikes usually unisexual; plants dioecious (rarely monoecious); utricles usually sparsely fergusinoid dotted ................................................................. 498. Carex unisexualis

7b. Spikes usually androgynous, rarely unisexual; plants monoecious; utricles not fergusinoid dotted.

8a. Utricles 2-toothed at orifice.

9a. Utricles gradually attenuate into a long beak; creeping rhizome subterete; plants of forests or sandy beaches ................................................................. 499. Carex yamatsutana

9b. Utricles abruptly constricted into a short beak; creeping rhizome trignonous; plants of swamps ....................................................................................................... 500. Carex pseudocuraica

8b. Utricles obliquely truncate at orifice, deeply cleft to 2-toothed abaxially.

10a. Female glumes truncate at orifice, deeply cleft to 2-toothed abaxially. 501. Carex jiaodongensis

10b. Female glumes abruptly attenuate into a long beak, orifice 2-toothed .... 502. Carex paracuraica


疣囊薹 you nang tai cao

Rhizome long creeping, stout, indurate, clothed at base with brown glumelike sheaths disintegrating into fibers. Culms 6–100 cm tall, stout or slender, acutely trigonous, scabrous, with bladeless sheaths at base. Leaves shorter than culm, blades linear, 1–5 mm wide, flat, apex acuminate. Involucral bracts glumelike. Spicate inflorescence cylindric, usually interrupted, 1.8–7.5 × 0.7–1.3 cm; spikes ovate or oblong, 5–12 × 4–6 mm, upper and lower spikes usually androgynous, middle ones male, lower spikes entirely female. Female glumes pale yellow-brown, ovate, 2.2–3 × 1–1.5 mm, green 1-veined, margins broadly white hyaline. Utricles pale yellow-green, longer than glume, obovate-oblong, plano-convex, 5.5–6.5 mm, distally verruculose and sparsely hirsute on both faces, rather densely so above, and usually verruculose, abaxially conspicuously 8–10-veined, adaxially 3–5-veined toward base, base rounded, shortly stipitate, margins broadly serrulate winged, apex gradually narrowed into a beak, beak compressed, deeply 2-toothed at orifice. Nutlets tightly enveloped, ovate or elliptic, plano-convex, 1.5–2 mm, base brown, cuneate or rounded, shortly stipitate; stigmas 2. Fl. and fr. Jun–Aug.

Forested slopes, meadows, forests, grasslands on forest margins. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Russia (Far East, E Siberia)].

1a. Culms rather stout; leaf blades 3–5 mm wide; inflorescence 3–7.5 cm .......... 493a. var. pallida

1b. Culms slender; leaf blades 1–2 mm wide; inflorescence 1.8–2.5 cm ....... 493b. var. angustifolia

493a. Carex pallida var. pallida

疣囊薹(原变种) you nang tai cao (yuan bian zhong)

Carex accrescens Ohwi.


Forested slopes, meadows. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Russia (Far East, E Siberia)].


狭叶疣囊薹 xia ye you nang tai cao

Culms slender. Leaf blades 1–2 mm wide. Inflorescence 1.8–2.5 cm. Fl. and fr. Jun–Jul.

Forests, grasslands on forest margins. Nei Mongol.


㓗儿山囊薹 mao er shan tai cao

Plants gray-green. Rhizome very long. Culms 30–50 cm tall, acutely trigonous, scabrous, clothed with dark purple bladeless sheaths at base. Leaves equaling or longer than culm, blades linear, 2.5–5 mm wide, flat, scabrous. Involucral bracts glumelike. Spicate inflorescence cylindric, 3.5–4.5 cm; spikes 8–14, ovate or oblong, 5–10 mm, male spike in middle, upper and lower spikes androgynous or spikes entirely androgynous (rarely lowest female). Female glumes pale brown, oblong-ovate, greenish costa 1-veined. Utricles pale yellowish brown-green, longer than glume, obovate-oblong, plano-convex, 5–5.5 mm, distally verruculose and sparsely hirsute on both faces, abaxially 7–9-veined, adaxially faintly veined or nerveless, base cuneate, shortly stipitate, upper margins narrowly serrate winged, apex gradually attenuate into a long beak, orifice 2-toothed. Stigmas 2. Fl. and fr. Jun.

Forest with trees. Heilongjiang.

带岭薹草 dai ling tai cao

Plant gray-green. Rhizome long and creeping. Culms 35–58 cm tall, acutely trigonous, scabrous, clothed at base with brown bladeless sheaths. Leaves longer than or equaling culm, blades linear, 2.5–3.5 mm wide, flat. Involucral bracts glume-like. Spicate inflorescence rather small, 1–1.8 cm; spikes 5–9, ovate-lanceolate, 3–4 mm, upper and lower spikes female, male in middle, rarely mixed spikes, oblong-ovate, 4–5(–6) mm. Female glumes yellowish brown, oblong-ovate, margins pale hyaline, apex acute. Urticles brown, longer than glume, ovate-lanceolate or lanceolate, plano-convex, 3.5–4.5 mm, subleathery, pubescent on both faces, sometimes sparsely puberulent at base, faintly 3–6-veined abaxially, nearly nerveless adaxially, base cuneate, shortly stipitate, margins narrowly serrulate winged, apex gradually attenuate into a long beak, orifice 2-toothed. Style base curved; stigmas 2. Fl. and fr. May–Jun.

Style base curved; stigmas 2. Fr. Jul–Aug.

— Slopes; ca. 1100 m. Heilongjiang.


落叶松薹草 luo ye song tai cao

Rhizome slender. Culms 20–60 cm tall, slender, trigonous, scabrous above, clothed at base with pale brown bladeless sheaths. Leaves shorter than culm, blades linear, 1.5–2 mm wide, flat, scabrous. Involucral bracts glumelike. Spicate inflorescence oblong or oblong-ovate, 1.8–2.7 cm; spikes 6–10, androgy nous or mixed gynaecandrous, rarely female, ovate or oblong-ovate, 5–7 mm. Female glumes oblong-ovate, margins pale hyaline, apex acute. Urticles pale ferruginous-yellow, slightly greenish above, longer than glume, ovate-lanceolate, plano-convex, (5–)5.5–6.5 mm, subleathery, sparsely verruculose and hisrite above adaxially, 3–5-veined adaxially, base subrounded, sessile, upper margins narrowly serrate winged, apex gradually attenuate into a conic long beak, orifice 2-toothed. Stigmas 2.

— Sparse forests; ca. 1300 m. S Jilin (Changbei Shan).


二柱薹草 er zhu tai cao

Rhizome long creeping, subcylindric. Culms 10–60 cm tall, acutely trigonous, scabrous above, clothed with bladeless sheaths at base. Leaves shorter than culm, blades linear, 2–4 mm wide, flat, margins scabrous, apex acuminate. Involucral bracts glume-like. Spicate inflorescence cylin dric or subconic, 2–5.5 × 0.7–1.5 cm, usually interrupted below; spikes 10–20, terminal and lower spikes female, middle and upper ones male or androgy nous (or entirely female), ovate, 5–9 × 2–3 mm; male spikes broadly ovate, 7–10 × 5–7 mm. Female glumes pale ferruginous-brown, ovate-lanceolate or oblong-ovate, ca. 3.5 mm, margins white hyaline, apex acute. Urticles stramineous, longer than glume, broadly ovate, plano-convex, 3.5–4 × 1.8–2 mm, thinly membranous, spongy, slender, several veined on both faces, base rounded, upper margins serrulate winged, apex abruptly contracted into a beak, orifice 2-toothed. Nutlets yellow-brown, loosely enveloped, elliptic or oblong, plano-convex, 1.5–1.8 mm, base shortly stipitate; style base slightly thickened; stigmas 2. Fl. and fr. May-Jun.

Rhizome long creeping, slender, clothed with brown sheaths disintegrating into fibers. Culms (10–)15–50 cm tall, compressed trigonous, with pale brown sheaths at base. Leaves shorter than culm, blades linear, 1–2.5 mm wide, flat or plicate, apex acuminate. Involucral bracts setaceous or glumelike. Plants dioecious (rarely monoecious); female spicate inflorescence cylin dric, 2.5–5 × 0.7–1 cm; male inflorescence rather narrow, 5–6 mm wide; spikes 15–30, unisexual, rarely androgy nous; female spikes oblong-ovate, 5–8 × ca. 4 mm wide; male spikes oblong, ca. 6 × 2–3 mm. Female glumes pale green, ovate, 2–3 mm, sparsely ferruginous punctulate, margins white hyaline, green 1-veined costa excurrent into an awn at acute apex. Urticles greenish or pale, ferruginous dotted, longer than glume, ovate, plano-convex, 2–3 × 1–1.5 mm, membranous, many veined on both faces, base subrounded, spongy, shortly stipitate, upper margins serrulate winged, apex gradually narrowed into a scabrous beak, orifice 2-toothed. Nutlets dark brown, loosely enveloped, ovate or elliptic, plano-convex, ca. 1.2 mm, lustrous, base shortly stipitate, apex rounded; stigmas 2. Fl. and fr. Apr–Jun.

Lakesides, ponds, swamps, grasslands. Anhui, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Japan].


单性薹草 dan xing tai cao

Carex fluvialitis Boot var. unisexualis (C. B. Clarke) Küchenthal.

Rhizome long creeping, slender, clothed with brown sheaths disintegrating into fibers. Culms (10–)15–50 cm tall, compressed trigonous, with pale brown sheaths at base. Leaves shorter than culm, blades linear, 1–2.5 mm wide, flat or plicate, apex acuminate. Involucral bracts setaceous or glumelike. Plants dioecious (rarely monoecious); female spicate inflorescence cylindrical, 2.5–5 × 0.7–1 cm; male inflorescence rather narrow, 5–6 mm wide; spikes 15–30, unisexual, rarely androgy nous; female spikes oblong-ovate, 5–8 × ca. 4 mm wide; male spikes oblong, ca. 6 × 2–3 mm. Female glumes pale green, ovate, 2–3 mm, sparsely ferruginous punctulate, margins white hyaline, green 1-veined costa excurrent into an awn at acute apex. Urticles greenish or pale, ferruginous dotted, longer than glume, ovate, plano-convex, 2–3 × 1–1.5 mm, membranous, many veined on both faces, base subrounded, spongy, shortly stipitate, upper margins serrulate winged, apex gradually narrowed into a scabrous beak, orifice 2-toothed. Nutlets dark brown, loosely enveloped, ovate or elliptic, plano-convex, ca. 1.2 mm, lustrous, base shortly stipitate, apex rounded; stigmas 2. Fl. and fr. Apr–Jun.

Lakesides, ponds, swamps, grasslands. Anhui, Hubei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [Japan].


山林薹草 shan lin tai cao

Carex diplasiocarpa V. I. Kreczetowicz.

Rhizome long creeping, subterete, clothed with brown scales. Culms ca. 20 cm tall, slender, trigonous, slightly scabrous above, clothed with brown or pale brown sheaths at base. Leaves ± equaling culm, blades linear, 2–3 mm wide, flat, margins slightly scabrous, apex acuminate. Involucral bracts glume-like. Spicate inflorescence oblong, 1–2 cm, sometimes interrupted below; spikes androgy nous or gynaecandrous, sometimes lower ones female, ovate. Female glumes pale or slightly ferruginous, green at middle, lanceolate, ca. 2.3 mm, margins white hyaline, apex acute. Urticles yellowish green, longer than glume, ovate, plano-convex, 3–4 mm, membranous, many veined abaxially, faintly 3–5-veined adaxially, base subrounded, shortly stipitate, upper margins narrowly serrulate winged, apex gradually attenuate into a conic long beak, orifice truncate, 2-toothed. Nutlets somewhat tightly enveloped, oblong, ca. 1.3 mm; stigmas 2. Fl. and fr. Jun–Jul.
Rhizome rather thick, short, with long, trigonous, horizontal, rather thickened stolons. Culms 15–40 cm tall, compressed trigonous, scabrous above, clothed with gray-brown bladed sheaths. Leaves shorter than culm, blades greenish, linear, 1.5–3 mm wide, flat. Involucral bracts glumelike. Inflorescence slightly loose, oblong-cylindric, 1.5–3 cm; spikes 5–10, usually androgynous, rarely unisexual, rarely entirely female, elliptic-ovate, 4–10 mm. Female glumes ferruginous-yellow, glumelike, ovate or elliptic-ovate, 2.5–4 × ca. 1.5 mm, margins white hyaline, apex acute. Utricles pale brown or stramineous, equaling or longer than glume, ovate or elliptic, plano-convex, 2.5–4 mm, membranous, spongy, 6- or 7-veined or more abaxially, rarely faintly veined adaxially, base rounded or cuneate, shortly stipitate, upper margins narrowly winged, apex abruptly truncated into a short compressed beak, orifice pale hyaline, obliquely truncate, slightly 2-toothed adaxially. Nutlets slightly loosely enveloped, ovate or elliptic, plano-convex, 1.2–1.7 mm, base shortly stipitate; style base slightly thickened; stigmas 2. Fl. and fr. May–Jun.

Swamps, lakesides. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia (Far East, E Siberia)].

This species is sometimes placed in its own section, Carex sect. Chordorrhizae (Heuffel) Meinshausen.


胶东薹草 jiao dong tai cao

Rhizome creeping, elongate, 50–100 cm, dark brown, clothed with sheaths disintegrating into fibers. Culms 15–20 cm tall, trigonous, scabrous above, clothed with brown bladeless sheaths at base. Leaves shorter than culm, blades linear, 2–3 mm wide, margins scabrous, apex acuminate. Involucral bracts glumelike. Spicate inflorescence oblong or cylindrical, ca. 2 cm; spikes 6–10, androgynous, sometimes female spikes at base and male spikes at middle, ovate, ca. 5 mm. Female glumes chestnut-brown, oblong, ca. 4 mm, margins pale hyaline, apex acuminate. Utricles pale green, ferruginous above, equaling or slightly shorter than glume, plano-convex, 3.5–4 mm, many veined on both faces, base contracted, upper margins serrulate, apex gradually narrowed into a ferruginous, obliquely truncate, long beak 2-toothed abaxially. Nutlets oblong, ca. 1.8 mm; style base slightly thickened; stigmas 2. Fl. and fr. May.

Sandy coastal beaches. E Shandong (Muping).


陇县薹草 long xian tai cao

Rhizome long creeping, stout. Culms 10–20 cm tall, trigonous, scabrous, clothed with pale brown bladeless sheaths at base. Leaves subequaling or shorter than culm, blades linear, 3–5 mm wide, flat, rarely plicate, margins scabrous, apex acuminate. Involucral bracts glumelike. Spicate inflorescence cylindric, 3–4.5 cm; spikes 6–20, androgynous, ovate or oblong-ovate, 5–7 × 3–5 mm. Female glumes pale ferruginous, broadly ovate or suborbicular, 2–2.2 × 1.5–1.8 mm, membranous, 1-veined, margins white hyaline, apex obtuse. Utricles pale ferruginous-yellow, longer than glume, ovate-lanceolate, plano-convex, 3–3.5 mm, many veined abaxially, 2–4-veined adaxially, base subrounded, shortly stipitate, margins narrowly serrulate winged, apex gradually attenuate into a long beak, beak ferruginous, deeply cleft to middle abaxially, membranous, 2-toothed at orifice. Nutlets rather loosely enveloped, elliptic, plano-convex, ca. 1.5 mm, base substipitate, apex subrounded; stigmas 2. Fl. and fr. May–Jun.

Ravines; ca. 1900 m. Shaanxi (Longxian).


库地薹草 ku di tai cao

Rhizome stout, long creeping, indurate. Culms 20–38 cm tall, trigonous, scabrous above, clothed with brown bladeless sheaths at base. Leaves shorter than culm, blades linear, 3.5–3.5 mm wide, flat, stiff, margins scabrous. Involucral bracts glumelike. Spicate inflorescence oblong or ovate, 1.5–2 cm, dense; spikes numerous, androgynous, ovate, 5–7 × ca. 4 mm. Female glumes ferruginous, ovate, ca. 2.5 × 1.5 mm, 1-veined, margins pale hyaline, apex acute. Utricles stramineous, longer than glume, ovate or ovate-lanceolate, plano-convex, 2.8–3.5 × ca. 1.2 mm, leathery, glabrous, scabrous above, many veined on both faces, veins conspicuously raised, base subrounded, shortly stipitate, margins winglike, thickened, apex abruptly contracted into a ferruginous, scabrous beak, orifice white hyaline, deeply cleft abaxially, shallowly cleft adaxially, 2-toothed. Nutlets brown, tightly enveloped, elliptic or ovate, plano-convex or compressed trigonous; style slightly thickened; stigmas 2. Fl. and fr. Jul–Aug.

Shallow water of rivers, swamps, forest margins; 1900–2500 m. Xinjiang [N Mongolia, Russia (Siberia)].


烈味薹草组 lie wei tai cao zu


Plants colonial or loosely caespitose, rhizomatous. Involucral bracts glumelike. Spikes androgynous, ovate, congested in densely capitate or spicate inflorescence, inflorescence ovate or oblong. Female glumes ovate or lanceolate, apex acute. Urticles erect to patent, ovate or lanceolate, biconvex or plano-convex, subleathery or membranous, ± conspicuously veined, beak obliquely truncate at orifice. Nutlets loosely enveloped; stigmas 2.
### 504. Carex duriuscula


**Plants** with slender, long creeping rhizomes and bunches of shoots forming loose tufts. Culms 5–20 cm tall, slender, smooth, clothed at base with gray-brown sheaths disintegrating into fibers. Leaves shorter than culm, blades linear, 1–1.5 mm wide, involute, stiff, margins slightly scabrous. Involuval bracts glumelike. Inflorescence ovate or globose, 5–15 × ca. 5 mm; spikes 3–6, androgynous, ovate, dense, 4–6 mm. Female glumes ferruginous-brown, broadly ovate or elliptic, 3–3.2 mm, white hyaline on margins and apex, apex abruptly contracted into a short scabrous beak, orifice white hyaline, obliquely truncate, shallowly cleft abaxially. Nutlets slightly loosely enveloped, suborbicular or broadly elliptic, 1.5–2 × 1.5–1.7 mm; style base thickened; stigmas 2. Fl. and fr. Apr–Jun.

Grasslands, slopes, wet places on riverbanks, roadsides; (below 100–)200–700 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang, Xizang [Afghanistan, Kazakhstan, Korea, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, North America].

### 504a. Carex duriuscula subsp. duriuscula

**叶草 (原亚种) cun cao (yuán yà zhòng)**

**Leaf blades** linear-involute ....... 504a. subsp. _duriuscula_

1b. **Leaf blades** flat.

2a. Female glumes usually longer than or equaling utricles, broadly white hyaline on margins and at apex, apex subobtuse; inflorescence white ......... 504b. subsp. _rigescens_

2b. Female glumes usually shorter than utricles, rarely as long, brown-castaneous, with narrower hyaline margins, apex acute; inflorescence brownish .......... 504c. subsp. _stenophylloides_

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**Leaf blades** flat. Inflorescence white. Female glumes usually longer than or equaling utricles, broadly white hyaline on margins and at apex, apex subobtuse.

Slopes, semidry regions, meadows. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Russia (Far East)].


**细叶薰草 xi ye tai cao**


**Leaf blades** flat. Inflorescence white. Female glumes usually longer than or equaling utricles, broadly white hyaline on margins and at apex, apex subobtuse.

Slopes, semidry regions, meadows. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Russia (Far East)].

### 505. Carex reptabunda


**走茎薰草 zou jìng tai cao**

_Carex duriusculiformis_ V. I. Kreczetowicz in B. Fedtschenko et al., Fl. Turkmen. 1: 230. 1932; _C. duriusculiformis_ V. I. Kreczetowicz; _C. longepedicellata_ Boeckeler; _C. stenophylla var. longepedicellata_ (Boeckeler) Küchenthal; _C. stenophylla subsp. stenophylloides_ (V. I. Kreczetowicz) T. V. Egorova.

**Leaf blades** flat. Inflorescence brownish. Female glumes brown-castaneous, usually shorter than utricles, rarely as long, with narrower hyaline margins, apex acute.

Meadows, rocky and sandy areas on riverbanks. Gansu, Nei Mongol, Shaanxi, Xingjiang, Xizang [Afghanistan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

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Rhizome long creeping. Culms 10–60 cm tall, slender, subflexuose, smooth or slightly scabrous above. Leaves shorter than culm, blades linear, 1–1.5 mm wide, involute on margins, rarely plicate, scabrous above. Involucral bracts glume-like. Spicate inflorescence ovate or oblong, somewhat lax, 8–12 × 4–10 mm; spikes 2–5, androgynous, ovate. Female glumes ferruginous, broadly ovate or oblong-ovate, 3–3.5 × ca. 1.5 mm, 1-veined, margins broadly white hyaline, apex acute. Utricles pale brown to ferruginous, oblong or broadly ovate, 3.5–1.8–2 mm, margins narrowly white hyaline, 1-veined costa forming a murco, apex acute or acuminate. Utricles striamineous to ferruginous, ± equaling glume, oblong-ovate or elliptic, plano-convex, ca. 3 × 1.2 mm, papery, usually nerveless or several veined at base abaxially, nerveless adaxially, base subrounded or cuneate, margins thickened, apex gradually tapering into a scabrous-margined beak, orifice pale hyaline, 2-toothed. Nutlets pale gray, tightly enveloped, elliptic-ovobovate, 1.2–1.5 × ca. 1 mm, lustrous; stigmas 2. Fl. and fr. Jun.–Aug.

Wet places, roadsides, meadows; 2500–4500 m. Gansu, Heilongjiang, Jilin, Nei Mongol, Qinghai, Shanxi, Sichuan, Xinjiang, Yunnan [Mongolia, Russia (Siberia)].


无味薹草 wu wei tai cao

Carex curaica Kunth subsp. pseudofoetachya (Carexil & Kirilov) T. V. Egorova; (Karelin & Kirilov) Y. L. Chou.

Rhizome slender, long creeping. Culms 3–10 cm tall, acutely trigonous, smooth, clothed with brown sheaths at base. Leaves shorter than or subequalling culm, blades linear, 1–2 mm wide, flat, or involute on margins, stiff, apex acute. Involucral bracts glume-like. Inflorescence capitate, globe or ovate-oblong, 6–12 × 6–8 mm; spikes 3–5, androgynous, oblong, 5–6 mm, sessile. Female glumes castaneous-brown, ovate or elliptic, 3–4 mm, membranous, 1-veined, apex acute. Utricles subequalling glume, lanceolate, plano-convex, 3.5–4.5 mm, base subrounded, stipitate, faintly veined, apex gradually tapering into a slightly scabrous beak, orifice 2-toothed. Stigmas 2. Fl. and fr. Apr.–Jul. 2n = 62.

Slopes, moist places, meadows; 3700–5200 m. Qinghai, Xizang [Afghanistan, Bhutan, India, Kashmir, Mongolia, Nepal, Russia (W Siberia); C Asia, SW Asia (Iran)].


萨嘎薹草 sa ga tai cao

Rhizome short. Culms densely tufted, ca. 2 cm tall, trigonous, smooth. Leaves longer or shorter than culm, blades needlelike, less than ca. 1 mm wide. Involucral bracts glume-like, broadly obovate, sheathless, awned at apex. Inflorescence capitate, broadly elliptic or ovate, 6–8 mm; spikes 2 or 3, androgynous, elliptic, 5–6 mm. Female glumes pale brown, lanceolate, ca. 4.5 mm, membranous, 1-veined. Utricles subequalling glume, lanceolate, membranous, base cuneate, apex gradually attenuate into a slightly scabrous beak, orifice 2-toothed. Nutlets broadly oblong, compressed trigonous, ca. 2 mm, base shortly stipitate; stigmas 2. Fl. and fr. Aug.

● Meadows; ca. 5000 m. Xizang (Saga).


囊果薹草组 nang guo tai cao zu

Rhizome slender, long creeping. Involucral bracts glume-like. Spikes androgynous, congested in capitate inflorescence, oblom-
ovate. Utricles thinly membranous, finally becoming strongly inflated bulliform, ca. 1 cm, veined, base rounded, apex with very short, obliquely truncate beak. Nutlets loosely enveloped; stigmas 2.

Three species: Europe (between lower Volga and lower Ural rivers) and arid and subarid areas of Asia; one species in China.


囊果薹草 nang guo tai cao

Rhizome slender, long creeping. Culms 20–25 cm tall, erect, obtusely trigonous, slender, smooth, clothed with pale brown sheaths at base. Leaves shorter than culm, blades gray-green, linear, 1–2 mm wide, plicate or involute, slightly curved, margins scabrous. Involutal bracts glumelike, setaceous at base. Inflorescence capitate, dense, oblong-ovate or subglobose, 2–3 × 1.2–2 cm; spikes 3–6, androgynous. Female glumes brown, broadly ovate-lanceolate, 3–4 × ca. 2 mm, 1-veined, margins broadly white hyaline, apex acute. Utricles yellowish ferruginous, much longer and broader than glume, ovate when young, strongly inflated bulliform to globose or elliptic at maturity, 1–1.5 × 0.5–1 cm, membranous, yellowish orange or reddish brownish veined, base rounded, slightly shortly stipite, apex abruptly contracted into a short beak, orifice white hyaline, 2-toothed. Nutlets yellowish, very loosely enveloped, elliptic or suborbicular, flat, ca. 3 × 2 mm, sometimes with rudimentary rachis at base; style base thickened; stigmas 2. Fl. and fr. Apr–May.

Sandy deserts; ca. 600 m. Xinjiang [Afghanistan, Russia; Europe].


二籽薹草组 er zi tai cao zu


One species: NE Asia (NE China, E Russia), N Europe (Scandinavia), North America.


二籽薹草 er zi tai cao

Rhizome slender, creeping, branching. Culms 30–50 cm tall, acutely trigonous, weak, scabrous above. Leaves shorter than culm, blades bright green, linear, 1–1.5 mm wide, flat, soft. Involutal bracts setaceous at base, glumelike above. Spikes 2–5, androgynous, distant, globose, with 1 or 2 male flowers above and 2 or 3 female flowers below. Female glumes pale, ovate, 2–2.5 mm, 3-veined costa forming a short mucro. Utricles brown, slightly longer than glume, elliptic, biconvex, 2.5–3 × 1.3–1.5 mm, leathery, lustrous, many veined on both faces, base subrounded, spongy, shortly stipite, apex abruptly contracted into a smooth beak up to 0.25 mm, orifice emarginate. Nutlets reddish brown, tightly enveloped, elliptic, biconvex, 1.5–1.8 mm, lustrous; style base not thickened; stigmas 2. Fl. and fr. Jun–Jul. 2n = 70.

Swamps, wet places in forests. Heilongjiang, Jilin, Nei Mongol [Russia (Far East, Siberia); N Europe (Scandinavia), North America].


薹草组 shai cao zu

Rhizome long creeping, indurate. Plants monoecious or dioecious. Involutal bracts glumelike or narrowly leaflike, sometimes surpassing inflorescence. Inflorescence oblong-ovate; spikes numerous, male or female, rarely androgynous, ovate. Female glumes larger, ferruginous. Utricles lanceolate-ovate, plano-convex, 10–15 mm, thickly leathery, many veined, serrulate winged, apex with long beak, orifice deeply 2-toothed. Stigmas 3, rarely 2.

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


薹草 shai cao

Carex macrocephala Willdenow ex Sprengel var. kobomugi (Ohwi) Miyabe & Kudô; C. macrocephala var. longibracteata Oliver.

Rhizome long creeping, clothed with dark brown fibrous remnants of old glumes. Culms 10–20 cm tall, 3–4 mm thick, erect, rigid, obtusely trigonous, subsMOOTH, clothed at base with dark brown sheaths disintegrating into parallel fibers. Leaves longer than culm, blades yellow-green, broadly linear, 3–8 mm wide, flat, ± curved, leathery, serrulate margined. Lowest involu-}

CYPARISACEAE 455

lar bracts narrowly leaflike. Plants dioecious, rarely monoecious; male inflorescence oblong, 4–5 × 1.2–1.3 cm; female inflorescence ovate to oblong, 4–6 × ca. 3 cm; spikes numerous, ovate, 10–15 mm. Female glumes yellow-green, ovate to narrowly ovate, 12–16 × 4–5 mm, leathery, many veined, margins broadly hyaline, broad costa excurrent into a long scabrous awn, apex acute, usually toothed. Utricles yellow-greenish, slightly shorter than or ± equaling glume, lanceolate or ovate-lanceolate, plano-convex, 10–15 × ca. 4 mm, leathery, lustrous, finely many veined on both faces, narrowly winged margins irregu-
CAREX


One species: China, Japan, Korea.


One species: China, Japan, Korea.


Involucral bracts leaflike, rather long, surpassing inflorescence. Spikes gynaecandrous, distantly alternate on an elongate rachis, forming loosely spicate inflorescence. Utricles plano-convex, thinly membranous, rather narrowly winged above, not spongy.

Five species: N Africa, Asia, Europe; three species (one endemic) in China.

1a. Utricles ovate to broadly ovate, nerveless or faintly 1- or 2-veined abaxially .................................................. 514. C. ovatispiculata
1b. Utricles lanceolate-ovate, veined.

2a. Spikes ovate-globose, 4-6 mm ..................................................................................................................... 515. C. remotiuscula
2b. Spikes oblong, 5-15 mm .............................................................................................................................. 516. C. rochebrunii


卵穗薹草 iuan sui tai cao

Rhizome short. Culms 25-50 cm tall, smooth, clothed at base with brown sheaths usually disintegrating into fibers. Leaves shorter than or equaling culm, blades linear, 1-2.5 mm wide, flat, soft, margins slightly scabrous, apex acuminate; membranous side of leaf sheaths emarginate. Lower involucral bracts leaflike, surpassing inflorescence, upper ones setaceous or glumelike. Spikes 5-11, gynaecandrous, ovate, 3-6 x 3-4 mm, upper spikes approximate, lower ones remote. Female glumes pale, ovate, 2-2.2 mm wide, green 1-veined costa forming a mucro, apex acuminate or acute. Utricles yellowish green, longer than glume, ovate or broadly ovate, ca. 2.5 x 1 mm, membranous, usually nerveless or rarely faintly 1- or 2-veined, base cuneate, upper margins narrowly serrulate winged and gray-green, apex abruptly contracted into a short beak, green 3-veined costa excurrent into an awn 0.7-1 mm, apex subcuneate. Utricles greenish, longer than glume, suborbicular or broadly ovate, plano-convex, 3.2-3.5 x ca. 2 mm, membranous, smooth, nerveless, base contracted, cuneate, margins winged, scabrous above, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets greenish, tightly enveloped, broadly ovoid, biconvex, ca. 2.2 x 1.5 mm, apex with a discoid appendage; stigmas 3. Fl. and fr. Apr-Aug.

Wet places along valleys, grassland slopes or forests; 200-1300 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shanxi, Sichuan, Zhejiang [Japan, Korea].


丝引薹草 si yin tai cao

Carex remotula Linnaeus var. remotiformis (Komarov) Kükenthal; C. remotiformis Komarov; C. rochebrunii Franchet & Savatier var. remotiformis (Komarov) Akiyama.

Rhizome short. Culms tufted, 30-50 cm tall, slender, usually weak, slightly scabrous. Leaves shorter than culm, blades pale green, linear, 1-2 mm wide, flat, soft. Lower involucral bracts leaflike, surpassing inflorescence, upper involucral bracts setaceous or glumelike. Spikes 4-10, gynaecandrous, ovate, 4-
6 × 4–5 mm, upper 3–5 spikes congested, remaining spikes remote. Female glumes light ferrugineous, narrowly ovate, ca. 2.5 mm, green 1-veined, margins broadly white hyaline. Utricles green, yellow-green at maturity, longer than glume, lanceolate or ovate-lanceolate, ca. 3 mm, membranous, distinctly many veined on both faces, upper margins finely serrulate winged, apex gradually narrowed into a beak, beak rather deeply cleft abaxially, 2-toothed at orifice. Nutlets tightly enveloped, elliptic-ovate, plano-convex, ca. 1.5 mm, base shortly stipitate, apex subrounded; style base thickened; stigmas 2. Fl. and fr. Jun–Jul.

Wet grasslands on slopes, meadows; 900–3700 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan, Yunnan [Japan, Korea, Russia (Far East)].


CDF shudai tai cao

Rhizome short, stout, indurate. Culms tufted, 25–50 cm tall, slender, trigonous, smooth, clothed at base with brown or pale brown bladeless sheaths disintegrating into fibers. Leaves shorter or longer than culm, blades linear, 2–3 mm wide, flat, soft; membranous side of leaf sheaths at mouth projected forming a tonguelike appendage or not. Lower involucral bracts leaflike, surpassing inflorescence. Spikes 5–10, gynaecandrous, oblong, 5–15 × 4–4 mm, upper spikes approximate, lower ones remote. Female glumes pale, oblong, 2.5–3 mm, green 3-veined costa excurrent into a scabrous short awn, apex acute. Utricles green or green-yellow, longer than glume, lanceolate or ovate-lanceolate, 3–4 mm, conspicuously veined on both faces, many veined abaxially and hardly veined adaxially, or nerveless, base cuneate, shortly stipitate, upper half of margins narrowly scabrous winged, apex gradually attenuate into a long beak, orifice 2-toothed. Nutlets tightly enveloped, plano-convex, 1.5–2 mm, base contracted and shortly stipitate, apex subrounded; style base thickened; stigmas 2. Fl. and fr. May–Aug.

Forests, wet grasslands, swamps, grasslands and thickets at high elevations. Anhui, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan [Bhutan, India, Indonesia, Japan, Nepal, Sri Lanka].

1a. Utricles nerveless; membranous side of leaf sheaths at mouth projected forming a tonguelike appendage ...... 516b. subsp. reptans 1b. Utricles conspicuously veined; membranous side of leaf sheaths at mouth not projected forming a tonguelike appendage.

2a. Utricles veined on both faces ........................................ 516a. subsp. rochebrunii 2b. Utricles several veined abaxially, hardly veined adaxially ................................ 516c. subsp. remotispicula

516a. Carex rochebrunii subsp. rochebrunii C. remota (Franchet & Savatier) C. B. Clarke.

Leaves: membranous side of leaf sheaths at mouth not projected forming a tonguelike appendage. Utricles veined on both faces.

Forests, wet grasslands, swamps; 1600–3700 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan.


匍匐薹草 pu fu tai cao


● Wet grasslands, swamps; 1600–3700 m. Gansu, Hubei, Shanxi, Sichuan, Yunnan.


高山薹序薹草 gao shan sui xu tai cao

Carex remotispicula Hayata, Icon. Pl. Formosan. 10: 57. 1921; C. remota var. remotispicula (Hayata) Ohwi.


● Grasslands and thickets at high elevations. Gansu, Guangxi, Guizhou, Hubei, Hunan, Shanxi, Sichuan, Taiwan.


莎薹草组 suo tai cao zu

Schelhammeria Moench (1802), not Schelhammeria Heister ex Fabricius (1759), nor Schelhammera R. Brown (1810, nom. cons.).

Involucral bracts leaflike, several times surpassing inflorescence. Spikes gynaecandrous, many flowered, disposed in close capitate inflorescence. Utricles flattened-plano-convex, narrowly lanceolate, membranous, with a narrow scabrous wing extending nearly to base, with a very long and narrow, deeply 2-lobed beak.

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


C. bohemica (Schreber) C. B. Clarke.
trigonal, smooth. Leaves shorter than culm, blades pale green, linear, 2–4 mm wide, flat, soft. Involucral bracts leaflike, much longer than inflorescence. Inflorescence capitate, orbicular or ovate, 1.5–2 × 1.5–2 cm; spikes 4–15, gynaecandrous, ovate-oblong, 1–1.5 cm. Female glumes pale brown, narrowly lanceolate, 5–7 mm, 1-veined, apex acuminate. Utricles pale green or ferruginous-yellow, much longer than glume, narrowly lanceolate, plano-convex, 7–10 mm, membranous, many veined on both faces, base long stipitate, upper margins narrowly scabrous winged, apex gradually narrowed into a flat, deeply 2-lobed, long beak. Nutlets tightly enveloped, oblong, plano-convex, ca. 1.3 × 0.8 mm, base shortly stipitate, ca. 2 mm; style base slightly thickened; stigmas 2. Fl. and fr. Jul. 2n = 60.

Wet sandy soils, swamps; 400–700 m. Heilongjiang, Jilin, Nei Mongol [Japan, N Korea, Russia (Siberia); Europe].


卵果薹草组 luan guo tai cao zu

Rhizome short. Involucral bracts glumelike, lowest ones sometimes narrowly leaflike. Spikes 4–16(–20), gynaecandrous, disposed in densely spicate or capitately inflorescence. Female glumes ovate or oblong-ovate. Utricles ovate or ovate-lanceolate, plano-convex, 3–4 × 1–1.5 mm, membranous, veined or nerveless, margins with a narrow or broad wing, beak ± elongate, shortly 2-toothed, deeply bifid abaxially. Nutlets brown, obovoid-oblong or oblong, flatly biconvex, smooth, shortly beaked and stipitate; stigmas 2.

About 80 species: N Africa, temperate zone of Asia, Europe, North and South America; two species in China.

1a. Inflorescence 2.5–6 cm; spikes pale green, 10–16, lower ones distant ................................................................. 518. C. maackii

1b. Inflorescence 2–2.5 cm; spikes brown, 4–7, contiguous ................................................................. 519. C. leporina


卵果薹草 luan guo tai cao

Rhizome short, indurate. Culms tufted, 20–70 cm tall, erect, acutely trigonous, scabrous above, clothed with brown bladeless sheaths at base. Leaves shorter than or subequalling culm, blades linear, 2–4 mm wide, flat, soft, margins serrulate. Involucral bracts setaceous at base, other bracts glumelike. Spicate inflorescence cylindric, 2.5–6 cm; spikes 4–16(–20), gynaecandrous, pale green, ovate or oblong, 5–10 × 4–6 mm, densely flowered, upper spikes contiguous, lower ones distant. Female glumes pale brown, ovate or oblong-ovate, 2.2–2.8 mm, green 1-veined, apex acute. Utricles longer than glume, ovate or ovate-lanceolate, plano-convex, curved, 3.4–3.7 mm, membranous, spongy, 5–7-veined abaxially, 4–5-veined adaxially, base rounded, margins very narrowly scabrous winged, apex gradually narrowed into a ± long beak, orifice 2-toothed. Nutlets pale brown, loosely enveloped, oblong or oblong-ovate, slightly biconvex, ca. 1.5 mm, base cuneate, shortly stipitate; style base not thickened; stigmas 2. Fl. and fr. May–Jun. 2n = 68.


卵形薹草 luang xing tai cao

Rhizome not seen. Culms slender, 50–80 cm tall, 0.8–1 mm thick, trigonous, smooth below, scabrous above, leaflike near base. Leaves 3 or 4, flat, ca. 1.5 mm wide, much shorter than culm, margins scabrous. Involucral bracts glumelike, lowest long awned. Inflorescence 2–2.5 × 0.8–1.3 cm; spikes 4–7, gynaecandrous, brown, ovate to oblong, 5–10 × 3–6 mm, contiguous, sessile. Female glumes yellowish [or reddish] brown, ovate, ca. 3 × 1.5 mm, 1-veined, with pale yellow midrib and broadly hyaline margins, apex acute. Utricles light brown, ovate, plano-convex, 3.5–4 × 1–1.5 mm, smooth, 4–6-veined abaxially; rather broadly winged from shoulder to top, margins scabrous near top, spongy-thickened below, beak ca. 1 mm, deeply bifid abaxially. Nutlets brown, obovoid-oblong, compressed biconvex, ca. 2 × 1 mm, smooth, slightly shiny, shortly beaked and stipitate; stigmas 2. Fl. Aug. 2n = 66, 74.

Lakesides; ca. 1400 m. Xinjiang (Burqin) [Russia; N Europe].


高秆薹草组 gao gan tai cao zu

Rhizome short. Lower involucral bracts leaflike, longer than inflorescence. Inflorescence with upper spikes approximate, middle and lower ones remote; spikes gynaecandrous (sometimes terminal spike all female), ovate, densely flowered. Utricles ovate or elliptic, spongy. Nutlets loosely enveloped.

Four species: E and SE Asia; two species in China.

1a. Utricles smaller, ca. 2.5 mm; nutlet elliptic .................................................................................................................. 520. C. alta

1b. Utricles larger, 3–3.5 mm; nutlet oblong or oblong-ovate ........................................................................................................... 521. C. craspedotricha


高秆薹草 gao gan tai cao

Carex alta var. latialata Kükenthal; C. remota Linnaeus

Rhizome short, indurate. Culms densely tufted, 40–80 cm tall, obtusely trigonous, scabrous, clothed at base with several
pale brown bladeless sheaths sometimes slightly disintegrating into fibers. Leaves shorter than culm, blades linear, 2–3 mm wide, flat, margins slightly scabrous. Lower involucral bracts leaflike, surpassing inflorescence, upper setaceous or glumelike. Spikes 9–22, gynaecandrous, ovate to oblong-ovate, 5–12 × ca. 3 mm, upper spikes approximate, lower ones remote. Female glumes pale green, ovate or narrowly ovate to lanceolate, ca. 2.5 × 1–1.5 mm, membranous, 1-veined at middle. Utricles pale green, slightly longer than glume, elliptic or elliptic-ovate, plano-convex, ca. 2.5 mm, membranous, spongy, many veined on both faces, base subrounded, upper margins slightly serrulate winged, apex abruptly contracted into a short beak, orifice 2-toothed. Nutlets rather loosely enveloped, elliptic, base subcuneate; style base slightly thickened; stigmas 2. Fl. and fr. May–Jul.

Grassland slopes, wet places in dense forests; 1500–2500 m. Guangxi, Guizhou, Sichuan, Xizang, Yunnan [India, Indonesia, N Vietnam].


线毛薹草 yuan mao tai cao


星穗薹草组 xing sui tai cao zu


About 20 species: mostly in North America, also in Asia, Australia, Europe, New Guinea, and Pacific islands (Hawaiian Islands, New Zealand); two species in China.

1a. Utricles small, 3–3.5 mm, nerveless on both faces (rarely 1- or 2-veined abaxially); nutlets narrowly ovate .............. 522. C. basilata

1b. Utricles longer, 4.5–5 mm, conspicuously veined abaxially, few veined adaxially; nutlets ovate-elliptic ............... 523. C. omiana


小星穗薹草 xiao xing sui tai cao

Carex muricata Linnaeus var. basilata (Ohwi) Y. L. Chou.

Rhizome short, oblique. Culms densely tufted, 20–40 cm tall, slender, trigonous, scabrous above, clothed at base with pale brown bladeless sheaths. Leaves shorter than culm, blades linear, 1–2 mm wide, flat. Basal involucral bracts setaceous, remaining bracts glumelike. Spicate inflorescence with upper spikes approximate, lower ones remote; terminal spike clavate, female flower part thick above, male flower part narrower below, remaining spikes mostly female; spikes 3–5, gynaecandrous, sometimes all female, ovate or oblong-ovate, stellate patent, 4–6 mm. Female glumes ferruginous or pale green, broadly ovate or subdeltoid, 1.5–2 mm wide, margins white hyaline, green 1–3-veined costa forming a macro, apex acute. Utricles yellow-brown or pale green, longer than glume, ovate-trigonal, plano-convex, 3–3.5 mm, nerveless on both faces, rarely 1- or 2-veined abaxially, base broadly rounded, spongy, apex gradually tapering into a long beak, orifice 2-toothed, abaxially deeply cleft. Nutlets narrowly ovate; style base not thickened; stigmas 2. Fl. Jul.

Alpine meadows, wet places along streamsides; ca. 1700 m. Jilin [Japan, Korea, Russia (Far East); North America].

In FRPS (12: 514. 2000), the name Carex angustior Mackenzie was misapplied to this species. True C. angustior is restricted to North America.


星穗薹草 xing sui tai cao

Carex stellulata Goodenough var. omiana (Franchet & Savatier) Kükenthal.

Rhizome short. Culms tufted, 20–50 cm tall, obtusely trigonous, scabrous above, clothed at base with pale brown sheaths. Leaves shorter than culm, blades linear, 2–2.5 mm wide, flat, rarely plicate, slightly stiff. Involutcal bracts glumelike. Spicate inflorescence ca. 2 cm; spikes 3 or 4, gynaecandrous, globose, terminal spike with a slightly longer male portion than in those of lateral ones. Female glumes ferruginous,
ovate or broadly ovate, 3.5–4 × ca. 1.8 mm, green 1-veined at middle, margins white hyaline, apex acute. Urticles greenish brown or yellow-ferruginous, longer than glume, ovate-lanceolate, strongly patent to somewhat deflexed, 4.5–5 mm, submembranous, many veined abaxially, few veined adaxially, base rounded, spongy, margins slightly thickened, apex abruptly contracted into a smooth or scabrous long beak, orifice 2-toothed. Nutlets somewhat tightly enveloped, ovate-elliptic, biconvex, base shortly stipitate, apex rounded; style base slightly thickened; stigmas 2. Fl. and fr. Apr.

Wet places. Liaoning [Japan].


白山薹草属 bai shan tai cao zu

Rhizome short or rarely creeping. Culms loosely to densely caespitose. Involucral bracts glumelike. Spikes numerous, gynae- candrous or lateral spikes sometimes female, ovate or subglobose, denselyflowered; inflorescence interrupted or capitulate. Urticles ovate, plano-convex, thinly leathery or membranous, papillose or minutely tuberculate, many veined, usually with a short beak, orifice entire or scarcely emarginate, sometimes deeply cleft adaxially.

About 23 species: temperate zone of Asia, Australia, Europe, New Guinea, North and South America, Pacific islands (New Zealand); four species in China.

1a. Female glumes brown; utricles deeply cleft adaxially at orifice ................................................. 524. C. lachenalii
1b. Female glumes pale or pale yellow; utricles emarginate at orifice.

2a. Urticles with a slightly cuneate-emarginate scabrous short beak ............................................... 525. C. canescens
2b. Urticles beakless.

3a. Urticles with prominent veins, shortly stipitate; spikes distant .................................................. 526. C. loliacea
3b. Urticles with obscure veins, estipitate; spikes congested in ovoid or suborbicular head .................. 527. C. teuiflora


二裂薹草 二裂薹草 er lie tai cao

Carex tripartita Allioni.

Rhizome oblique. Culms loosely tufted, 8–20 cm tall, obtusely trigonous, smooth, slightly scabrous above, clothed at base with pale brown sheaths. Leaves shorter than culm, blades linear, 1–2 mm wide, flat or slightly involute. Involucral bracts glumelike. Spikes usually 3, upper 2 gynaecandrous, lower spikes female or gynaecandrous, terminal spike clavate, 0.8–1.2 cm, remaining spikes rather small, elliptic, rarely ovate, 4–8 mm. Female glumes brown, elliptic or ovate, with green midrib. Urticles yellow-brown below, dark brown above, longer than glume, ovate or obovate, plano-convex, ca. 3 × 1 mm, obscurely finely veined, base broadly cuneate, stipitate, apex gradually tapering into a smooth blackish beak, beak deeply cleft abaxially at orifice. Nutlets rather tightly enveloped, ovate-elliptic or elliptic; style base not thickened; stigmas 2. 2n = 64.

Alpine frozen soil. S Jilin (Changbai Shan) [Japan, Korea, Russia (Far East, Siberia); Europe].


白山薹草 白山薹草 bai shan tai cao

Carex curta Goodenough.

Rhizome short. Culms tufted, 25–50 cm tall, erect, trigonous, scabrous above, clothed at base with brown bladeless sheaths. Leaves shorter than culm, blades 2–3 mm wide, flat, margins scabrous. Involucral bracts glumelike, proximal ones sometimes setaceous. Spikes 4–7, gynaecandrous, ovate-oblong, 6–10 × 3–4 mm; upper spikes congested, lower ones remote. Female glumes pale, ovate, ca. 2 mm, membranous, 1-veined, apex acute. Urticles green-brown, slightly longer than glume, ovate or elliptic, plano-convex, 2–2.2 × ca. 1.2 mm, membranous, glabrous, minutely tuberculate, brown-purple 5–12-veined on both faces, base subrounded, spongy, shortly stipitate, apex abruptly contracted into a slightly scabrous short beak, orifice emarginate. Nutlets tightly enveloped, elliptic or ovate, plano-convex, ca. 1.5 mm, base shortly stipitate; style base not thickened; stigmas 2. Fl. and fr. Jun–Aug. 2n = 56.

Swamps, wet places along stream-sides; 900–1100 m. Heilongjiang, Jilin, NEi Mongol, Xinjiang [temperate Asia, Europe, North and South America].


间穗薹草 间穗薹草 jian sui tai cao

Rhizome slender and creeping. Culms loosely tufted, 15–25 cm tall, slender, trigonous above, clothed at base with pale brown bladeless sheaths. Leaves shorter than culm, blades linear, 1–2 mm wide, flat, margins scabrous. Involucral bracts glumelike. Inflorescence with upper 2 spikes approximate, lowermost 2 distant by at least 1 cm; spikes 3 or 4, gynaecandrous, ovate, 3–5 × 2–5 mm, few flowered. Female glumes pale, broadly ovate or ovate, ca. 2 mm, membranous, with green midrib. Urticles pale green-brown, longer than glume, oblance or ovate, plano-convex, 2.5–3 mm, subleathery, many veined on both faces, base rounded, spongy, shortly stipitate, apex nearly beakless, orifice entire or emarginate. Nutlets tightly enveloped, broadly elliptic, ca. 1.5 × 1.2 mm, sub-rounded at both ends; style base not thickened; stigmas 2. Fr. May. 2n = 54.

Forests. Heilongjiang [Japan, Kazakhstan, Korea, N Mongolia, Russia (Far East, Siberia); EC and N Europe, North America].


细花薹草 细花薹草 xi hua tai cao
Rhizome short, with short stolons. Culms loosely tufted, 20–50 cm tall, slender, trigonous, slightly stiff, smooth or sub-smooth. Leaves shorter than culm, blades linear, 1–1.5 mm wide, flat or involute, slightly scabrous. Involucral bracts glume-like. Spikes 2–4, gynaecandrous, globose, 3–4 mm, few flowered, disposed in a capitate or spicate inflorescence. Female glumes pale yellow, ovate, 2–2.5 mm, with pale brown midrib, margins hyaline. Utricles yellowish green, subequaling glume, ovate or elliptic, plano-convex, 2–2.5 × ca. 1.1 mm, subleathery, minutely white tuberculate, brown-purple 5–9-veined on both faces, base rounded, nearly estipitate, apex beakless, orifice emarginate. Nutlets tightly enveloped, elliptic or broadly elliptic, biconvex, ca. 1.2 mm, base rounded to cuneate; style base not thickened; stigmas 2. Fl. and fr. Jul. 2n = 58.

Swamps; ca. 900 m. Jilin, Nei Mongol [Japan, Korea, N Mongolia, Russia (Far East, Siberia); Europe, North America].

**Taxa incertae sedis**


No specimens were seen by the present authors. The type is from NW Yunnan.


No specimens were seen by the present authors. The plant, a member of *Carex* subg. *Vignea*, cannot be confidently associated with any known species based on the description. The type is from Guizhou.

**Carex polycephala** Boott var. *simplex* Kükenhal in Handel-Mazzetti, Symb. Sin. 7: 1268. 1936.

No specimens were seen by the present authors. The type is from Yunnan.