hairs, midvein scabrous, apex obtuse, clearly demarcated from awn; awn 1–1.5 cm; lemma 0.5–1 mm. Anthers ca. 0.3 mm.

Caryopsis terete, narrowly ellipsoid, 1–1.8 mm.

Stream banks, roadsides, other weedy places, on sandy soil. Guangdong, Hainan, Shandong, Taiwan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa (probably introduced), Australia (Queensland)].


麦穗茅根 mai sui mao gen

Perotis chinensis Gandoger.

Annual or short-lived perennial. Culms loosely tufted, erect or decumbent at base, 25–40 cm tall. Leaf sheaths glabrous; leaf blades lanceolate to narrowly ovate, 2–4 cm wide, glabrous, margins spiny-scabrous or loosely ciliate near base; ligule ca. 0.5 mm. Inflorescence up to 20 cm; spikelets usually densely arranged, ascending or horizontally spreading; rachis scabrous. Spikelets 1.5–2.5 mm (excluding awns); basal callus 0.1–0.2 mm, obtuse; glumes narrowly lanceolate, back scaberulous-hirtellous in rather indistinct close rows (most obvious toward lemma base), midvein pectinate-ciliolate, apex abruptly acute, clearly demarcated from awn; awn 0.5–1.5 cm. Anthers ca. 0.3 mm. Caryopsis terete, narrowly ellipsoid, ca. 1.5 mm. Fl. and fr. summer and autumn. 2n = 40.

Sandy places, along seashores. Guangdong, Hebei, Jiangsu, Yunnan [India, Indonesia, Malaysia, Nepal, Myanmar, Pakistan, Sri Lanka, Thailand].

This species is very close to Perotis indica and is sometimes included within it. No single character by itself is reliable for separating the two, but the combination of characters given in the key will usually suffice.

24. Tribe PANICEAE

黍族 shu zu

Chen Shouliang (陈守良); Sylvia M. Phillips, Stephen A. Renvoize

Perennial or annual. Leaf blades usually linear or lanceolate; ligule membranous, a line of hairs, or a short membrane with ciliate fringe (rarely absent in some Echinochloa). Inflorescence variable, an open to spike-like panicle or composed of unilateral racemes, these digitate or spread along a central axis; spikelets single, paired or clustered, sometimes supported by spines or bristles. Spikelets all alike (sexes separate in American; 27 genera (one endemic, two introduced) and 145 species (16 endemic, 12 introduced) in China.

About 100 genera and ca. 2000 species: tropical and subtropical regions of the world, extending into temperate regions especially in North America; 27 genera (one endemic, two introduced) and 145 species (16 endemic, 12 introduced) in China.

The Paniceae are a distinctive tribe on account of the uniform pattern of deciduous, 2-flowered spikelets with a staminate or barren lower floret and an indurated, fertile upper floret enclosing the Caryopsis.

1a. Plants dioecious; female inflorescence a large globose spiny head ................................................................. 179. Spinifex
1b. Plants bisexual; inflorescence not as above.

2a. Spikelets of 2 kinds, the upper staminate portion of the raceme folding over 1–2 bisexual spikelets ..................... 168. Thauarea
2b. Spikelets all alike.

3a. Spikelets (at least some of them) subtended by bristles or a spiny involucre; or raceme rachis prolonged into a bristle or short point beyond the uppermost spikelet.

4a. Inflorescence of racemes, only the uppermost spikelet of each raceme subtended by a bristle or short (often inconspicuous) point.
5a. Racemes ending in a long bristle; upper glume acuminate-aristate ............................................. 176. Pseudoraphis
5b. Racemes ending in an inconspicuous point; upper glume not awned.

6a. Racemes very short, sunk in pockets on the broad or thick inflorescence axis; upper lemma smooth ...................................................... 173. Stenotaphrum
6b. Racemes not sunk in pockets, inflorescence axis slender; upper lemma rugose or granulate ........................................................................ 172. Paspalidium

4b. Inflorescence paniculate, often spike-like, all or many of the spikelets subtended by bristles or a spiny involucre.
7a. Bristles persisting on the axis after the spikelets have fallen .............................................................. 171. Setaria
7b. Bristles or spines falling as involucres around the spikelets.
8a. Involutral bristles slender, free to the base ...................................................... 177. Pennisetum
8b. Involutral bristles and spines flattened and connate below, forming a cup .......................... 178. Cenchrus

3b. Spikelets not subtended by bristles; or raceme rachis terminating in a spikelet.

9a. Inflorescence an open, contracted or spike-like panicle; pedicels usually all slender and distinct.
10a. Spikelets laterally compressed.
   11a. Glumes keeled; upper floret with wings or scars at the base .................................................. 155. *Ichnanthus*
   11b. Glumes not keeled; upper floret without basal wings or scars.
      12a. Lower lemma entire, awnless; upper lemma gibbously semi-orbicular with a little greenish crest near the apex .................................................. 160. *Cyrtococcum*
      12b. Lower lemma bilobed or shortly awned; upper lemma elliptic, not crested .................. 174. *Melinis*

10b. Spikelets dorsally compressed.
   13a. Panicle spikelike.
      14a. Upper glume gibbous; culms hollow .................................................. 158. *Sacciolepis*
      14b. Upper glume not gibbous; culms filled with aerenchyma .......................... 157. *Hymenachne*
   13b. Panicle open, the spikelets evenly spaced or appressed along the primary branches.
      15a. Upper glume as long as or only slightly shorter than the spikelet. 
         16a. Margins of upper palea free toward apex; trailing semi-aquatic perennial .... 157. *Hymenachne*
         16b. Margins of upper palea clasped by upper lemma along whole length .......... 156. *Panicum*
      15b. Upper glume 2/3 spikelet length or less.
         17a. Upper glume 1/2–2/3 spikelet length, 3–5-veined; spikelets on short appressed secondary racemelets .................................................. 159. *Ottochloa*
         17b. Upper glume very small, usually veinless; spikelets on long capillary pedicels .......................... 175. *Digitaria*

9b. Inflorescence of unilateral racemes; spikelets usually single or paired; pedicels often very short, at least for one spikelet of a pair.
   18a. Apex of upper lemma awned, crested or with a tuft of setae.
      19a. Upper lemma awned; upper glume ciliate on the margins .................................. 164. *Alloteropsis*
      19b. Upper lemma apex crested or with a tuft of setae; upper glume glabrous.
         20a. Apex of upper lemma with a tuft of short setae ........................................... 161. *Setiacis*
         20b. Apex of upper lemma with a little green crest ........................................... 162. *Acroceras*
   18b. Apex of upper lemma not as above.
      21a. Spikelets laterally compressed or glumes awned; leaf blades lanceolate to ovate; trailing forest grasses.
         22a. Glumes not awned, upper glume armed with hooked bristles at maturity .... 153. *Pseudechinolaena*
         22b. Glumes awned, the awns often sticky .................................................. 154. *Oplismenus*
      21b. Spikelets dorsally compressed; lower glume awnless.
         23a. Spikelets densely packed in 4 rows or congested into clusters; apex of upper palea reflexed .................................................. 163. *Echinochoa*
         23b. Spikelets mostly in 1 or 2 rows; apex of upper palea tucked in.
            24a. Spikelets supported on a basal globular beadlike swelling; lower glume vestigial .................................................. 167. *Eriochloa*
            24b. Spikelets without a basal beadlike swelling (rarely with a barrel-shaped basal stipe, but then lower glume well developed).
               25a. Upper lemma cartilaginous to papery, the margins broad, flat and hyaline, covering much of the palea .................................................. 175. *Digitaria*
               25b. Upper lemma coriaceous to bony with inrolled or flat margins exposing much of the palea (if texture thinner then margins inrolled).
                  26a. Lower glume present.
                     27a. Upper lemma acute, obtuse or briefly mucronulate, subequalling spikelet; spikelets plumply elliptic, acute or obtuse; back of upper lemma facing away from rachis .................................. 165. *Brachiaria*
                     27b. Upper glume clearly mucronate, shorter than spikelet; spikelets plano-convex, acuminate; back of upper lemma lying against rachis .................................................. 166. *Urochloa*
                  26b. Lower glume absent.
                     28a. Back of upper lemma lying against rachis; spikelets strongly plano-convex, often orbicular .................................................. 169. *Paspalum*
                     28b. Back of upper lemma facing away from rachis; spikelets thinly biconvex, oblong-elliptic .................................................. 170. *Axonopus*

 钩毛草属 gou mao cao shu

Chen Shouliang (陈守良); Sylvia M. Phillips
Annuals. Culms trailing. Leaf blades lanceolate; ligule membranous. Inflorescence composed of several slender, loosely spiculate racemes spaced along a central axis, spikelets paired but the sessile spikelet often reduced. Spikelets laterally compressed, florets 2; glumes equaling the spikelet or slightly shorter, lower glume acute to awned, upper glume gibbous, armed at maturity with coarse, tubercle-based hooklike bristles, apex acute or rarely awned; lower lemma equaling the spikelet, papery to subcoriaceous but membranous on the margins with and a median hyaline patch at the base; upper lemma laterally compressed, obliquely elliptoid, cartilaginous to coriaceous, margins flat or inrolled.

Six species: one species throughout the tropics (including China), five endemic to Madagascar, in forest shade.


Culms slender, stoloniferous, rooting and forming a loose mat, up to 50 cm tall. Leaf sheaths usually shorter than the internodes; leaf blades lanceolate, thin, 2–8 × 0.6–1.2 cm, glabrous or hispidulous, apex acute or acuminate; ligule 1–2 mm.

Inflorescence narrow, 5–15 cm, bearing 3–5 loosely ascending racemes with distant spikelet pairs, lowest raceme 1–4 cm; pedicels 1–2 mm. Spikelets 4–5 mm; glumes papery, the lower lanceolate, 3-veined, acuminate, the upper thicker, navicular, 7-veined, with tubercle-based hooks between the veins; lower lemma 7-veined; upper lemma subcoriaceous, ca. 3 mm, pale, glossy. Caryopsis fusiform, ca. 2.5 mm, acute. Fl. and fr. Sep–Oct. 2n = 36.

Forest shade. Fujian, Guangdong, Guangxi, Hainan, Xizang, Yunnan [throughout the tropics].

**154. OPLISMEENUS**


**Oplismenus** R. Brown, nom. rej.

Chen Shouliang (陈守良); Sylvia M. Phillips

*Orthopogon* R. Brown, nom. rej.

Perennials or annuals. Culms trailing, ascending from a decumbent base, the internodes mostly with a villous line adaxial to the subtending leaf. Leaf blades ovate, lanceolate or linear-lanceolate, often with cross veins; ligule a ciliate membrane. Inflorescence composed of several unilateral racemes spaced along a central axis; racemes elongate or reduced to fascicles of a few spikelets, spikelets usually paired on short pedicels, the lowermost often reduced. Spikelets lanceolate to oblong, weakly dorsally or laterally shiny, acute, indistinctly crested.

Five to nine species: throughout the tropics and subtropics; four species (one endemic) in China.

This is a genus of closely related, intergrading species where the number of taxa meriting recognition is still open to doubt.

1a. Racemes reduced to dense cuneate fascicles less than 2 cm long ................................................................. 1. *O. undulatifolius*

1b. Racemes elongate, 2–10 cm long.

2a. Spikelets single; fertile lemma mucronate at apex ................................. 4. *O. patens*

2b. Spikelets paired or 3 at the base; fertile lemma acute at apex.

3a. Awn of lower glume 2–3 times longer than glume body ................................. 2. *O. compositus*

3b. Awn of lower glume equal or slightly longer than glume body ................................. 3. *O. fujianensis*


**求米草** qiu mi cao

Perennial. Culms slender, straggling, ascending from a prostrate base, 20–50 cm tall. Leaf sheaths usually densely tuberculate-hairy, less often glabrous; leaf blades lanceolate to narrowly ovate, 1–15 × 0.3–3 cm, glabrous or variously hairy, base subrounded and usually suboblique, apex acute; ligule ca. 1 mm. Inflorescence axis 9–15 cm, glabrous or hispidulous; racemes 4–9, reduced to dense cuneate fascicles less than 2 cm long, the rachis often setose. Spikelets in 3–5 clustered pairs, lanceolate, hispidulous; glumes herbaceous, awned, the awns stout, purple, viscid; lower glume 3–5-veined, awn 5–10(–15) mm; upper glume 5-veined, awn 2–5 mm; lower lemma herbaceous, 5–9-veined, apex with a stout 1–2 mm mucro, palea absent; upper lemma subcoriaceous, smooth. Fl. and fr. Jul–Nov. 2n = 54.

Light shade in forests, moist places. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shaxi, Sichuan, Taiwan, Yunnan, Zhejiang [warm-temperate and subtropical regions of the N hemisphere, uplands of India and Africa].

*Oplismenus undulatifolius* is sometimes considered synonymous with *O. hirtellus* (Linnaeus) P. Beauvois. Although the two taxa intergrade, *O. hirtellus* (R. Brown) Roemer & Schultes generally has longer racemes (to 3 cm) of contiguous spikelets, at least in the lower part of the inflorescence. It has a more tropical distribution than *O. undulatifolius* and has recently been reported from Taiwan and Yunnan.

1a. Inflorescence with short branches.

2a. Leaves and inflorescence axis
hispidulous, or leaf blades densely tuberculate-hairy .................. 1a. var. undulatifolius

2b. Leaves and inflorescence axis glabrous or scabrous, or rarely leaf blades puberulous.

3a. Leaf blades broadly lanceolate to narrowly ovate-elliptic, 5–15 × 1.2–3 cm, glabrous or scabrous ......................... 1b. var. japonicus

3b. Leaf blades linear-lanceolate to narrowly lanceolate, 4–9 × 0.5–1 cm, glabrous or puberulous ... 1c. imbecillis

1b. Inflorescence with spikelets practically sessile on main axis.

4a. Leaves and inflorescence axis hispidulous or with tubercle-based hairs ............. 1d. var. binatus

4b. Leaves and inflorescence axis glabrous or scabrous.

5a. Leaf blades 1–3 × 0.3–0.5 cm .................................. 1e. var. microphyllus

5b. Leaf blades 5–10 × 1–2 cm ........... 1f. var. glaber

1a. Oplismenus undulatifolius var. undulatifolius

求米草 (原变种) qiu mi cao (yuán biàn zhòng)


Leaf blades densely hairy with tubercle-based hairs. Inflorescence with short branches, the axis hispidulous. Fl. and fr. Jul–Nov. 2n = 54.

Light shade in forests, moist places, common. Anhui, Fujian, Guangdong, Guangxi, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shanxi, Shandong, Sichuan, Shannxi, Sichuan, Taiwan, Yunnan, Zhejiang [warm-temperate and subtropical regions of the N hemisphere, uplands of India and Africa].


日本求米草 ri ben qiu mi cao

Panicum japonicum Steudel, Flora 29: 18. 1846; Oplismenus japonicus (Steudel) Honda.

Leaf blades broadly lanceolate to narrowly ovate-elliptic, 5–15 × 1.2–3 cm, glabrous or scabrous. Inflorescence axis up to 15 cm, glabrous. Fl. and fr. Aug–Nov.

Roadsides, moist grasslands. Anhui, Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan].


狭叶求米草 xia ye qiu mi cao

Orthopogon imbecillis R. Brown, Prodr. 194. 1810; Oplismenus imbecillis (R. Brown) Roemer & Schultes; O. imbecillis var. morrisonensis Honda; Panicum imbecille (R. Brown) Tri- nius.

Leaf sheaths glabrous and smooth, or ciliate along the margins; leaf blades narrowly lanceolate or linear-lanceolate, 4–9 × 0.5–1 cm, glabrous or puberulous. Inflorescence axis glabrous. Spikelets usually pilose. Fl. and fr. Aug–Nov.

Hill slopes, moist grasslands. Anhui, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Taiwan, Yunnan, Zhejiang [Japan].


双穗求米草 shuang sui qiu mi cao

Leaf blades and inflorescence axis hispidulous or with tubercle-based hairs. Spikelets 2 per node.

- Moist places in forests. Anhui, Hebei, Jiangsu, Zhejiang.


小叶求米草 xiao ye qiu mi cao


Leaf blades 1–3 × 0.3–0.5 cm, glabrous or scabrous. Spikelets 2 per node, or 3 per node at base, one spikelet usually sterile.

Moist grassy places in forests. Taiwan [Philippines].


光叶求米草 guang ye qiu mi cao

Plant glabrous except for ciliate margins of leaf sheaths; leaf blades 5–10 × 1–2 cm, glabrous. Spikelets 2 per node.


2. Oplismenus compositus (Linnaeus) P. Beauvois, Ess. Agrostogr. 54. 1812.

竹叶草 zhu ye cao

Perennial. Culms stoloniferous, straggling, ascending to 20–80 cm. Leaf sheaths glabrous, pilose or tuberculate-hairy; leaf blades lanceolate to ovate-lanceolate, 3–20 × 0.5–3 cm, subglabrous to tuberculate-hairy, base usually oblique. Inflorescence axis 5–15 cm, glabrous to tuberculate-hairy; racemes 3–6, 2–6 cm, ascending to erect. Spikelets in 7–14 widely spaced, sometimes patent pairs, lanceolate, glabrous to thinly pilose; glumes herbaceous, awned, the awns stout, green or purple, viscid; lower glume awn 5–10 mm; upper glume awn to 3 mm or occasionally absent; lower lemma subcoriaceous, 7–9-veined, acute or with a stout 0.3–1 mm mucro; upper lemma subcoriaceous, ca. 2.5 mm, smooth. Fl. and fr. Sep–Nov. 2n = 54, 72*.

- Moist places in forests and along forest margins, hill slopes. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan, Philippines, Thailand, and elsewhere in tropical Asia extending westward through India to E Africa; Australia, Pacific Islands (Polynesia)].
blades pilose, hispid or tuberculate-hairy; upper glume awned.
1a. Leaf blades 5–10 × 0.5–1.8 cm
2a. var. intermedius
2b. Leaf blades 10–20 × 2–3 cm ........... 2e. var. ovataarii
1b. Panicle axis, rachis, leaf sheaths, and leaf blades glabrous, or puberulous or only ciliate at the mouth of the leaf sheath; or if panicle axis pilose, then upper glume aunnel.
3a. Leaf blades 9–13 × 1.2–2.5 cm; spikelets 3.5–4 mm ................ 2c. var. formosanu
3b. Leaf blades 3–8 × 0.8–1.4 cm; spikelets 2.5–3.5 mm.
4a. Upper glume with 1–2 mm awn .......................... 2a. var. compositu
4b. Upper glume awnless ............ 2b. var. submuticu

2a. Oplismenus compositus var. compositu

竹叶草(原变种) zhu ye cao (yuan bian zhong)


Leaf sheaths subglabrous or puberulous; leaf blades 3–8 × 0.8–1.4 cm, glabrous or margins ciliate. Inflorescence axis glabrous or puberulous. Spikelets ca. 3 mm; lower glume awn 7–20 mm, upper glume awn 1–2 mm. Fl. and fr. Sep–Nov. 2n = 54, 72*.

Moist places in forests. Guangdong, Guizhou, Jiangxi, Sichuan, Taiwan, Yunnan [Japan, Thailand].


无芒竹叶草 wu mang zhu ye cao

Leaf sheaths glabrous except for ciliate margins; leaf blades 3–8 × 0.8–1.4 cm. Inflorescence axis scabrous or pilose. Spikelets ca. 3 mm; lower glume awn 5–10 mm; upper glume without awn. Fl. and fr. autumn.

- Moist places along forest margins. Sichuan, Yunnan.


台湾竹叶草 tai wan zhu ye cao


Leaf blades lanceolate, 9–13 × 1.2–2.5 cm, usually glabrous. Inflorescence axis usually glabrous. Spikelets 3.5–4 mm; upper glume awn to 3 mm. Fl. and fr. autumn.

- Moist places in forests. Guangdong, Guangxi, Guizhou, Sichuan, Taiwan, Yunnan.


中间型竹叶草 zhong jian xing zhu ye cao

Oplismenus burmannii var. intermedius Honda, Bot. Mag. (Tokyo) 38: 191. 1924.

Leaf sheaths densely tuberculate-hairy, margins ciliate; leaf blades 5–10 × 0.5–1.8 cm, base cordate. Inflorescence axis pilose or hispid. Spikelets 3–3.5 mm; lower glume awn 5–10 mm; upper glume awn shorter. Fl. and fr. autumn.

Moist places in forests, hill slopes. Guangdong, Guangxi, Sichuan, Taiwan, Yunnan, S Zhejiang [Japan, Philippines].


大叶竹叶草 da ye zhu ye cao


Leaf sheaths, leaf blades, and inflorescence axis densely hairy with long, soft or tubercle-based hairs; leaf blades 10–20 × 2–3 cm. Spikelets ca. 4 mm; lower glume awn ca. 8 mm; upper glume awn ca. 1 mm. Fl. and fr. autumn.

Undergrowth in moist forests on hill slopes. Guangdong, Guizhou, Taiwan, Yunnan [Japan, Thailand].


福建竹叶草 fu jian zhu ye cao

Culms decumbent at the base, 40–80 cm tall. Leaf sheaths densely hairy with tubercle-based hairs; leaf blades lanceolate or ovate-lanceolate, 5–10 × 1.5–2.5 cm, densely pubescent on both surfaces, base oblique, apex acute; ligule a ciliate membrane. Inflorescence axis 10–15 cm, densely tuberculate-hairy; racemes 2–5 cm. Spikelets secund, paired or 3 at the base of raceme, closely spaced, ovate-lanceolate, 2.5–3 mm, pilose; glumes herbaceous, lower glume 3–5-veined, awn 2–4 mm, equaling or only slightly longer than the glume body; upper glume acute or with a ca. 0.5 mm mucro; lower lemma 7–9-veined, lower palea membranous, short and narrow; upper lemma smooth. Fl. and fr. Jul–Oct.

- Moist places in thickets. Fujian.


疏穗竹叶草 shu sui zhu ye cao

Culms slender, 30–60 cm tall, glabrous. Leaf sheaths glabrous except for ciliate margins; leaf blades linear-lanceolate to ovate-lanceolate, 5–15 × 0.4–3.5 cm, glabrous on both surfaces; ligule membranous, ciliolate. Inflorescence axis 20–25 cm, glabrous or puberulous; racemes 5–8, 6–10 cm. Spikelets borne singly, ovate-lanceolate; glumes both awned; lower glume awn ca. 10 mm, upper glume awn 1/5–1/2 length of awn of lower glume; lower lemma equaling spikelet, 7–9-veined, dorsally puberulous, margins ciliate, awn 1–2.5 mm, lower palea absent; upper lemma papery or coriaceous, smooth, mucro 0.5–1 mm. Fl. and fr. Sep–Nov.

Undergrowth in moist forests on hillsides, moist places in open forests. Fujian, Guangdong, Hainan, Taiwan, Yunnan [Japan].

This species is sometimes regarded as a variant of Oplismenus compositus.
1a. Awn of upper glume 1/5 length of awn of lower glume; leaf blades linear-lanceolate to lanceolate, 0.4–0.7 cm wide. 4c. var. angustifolius

1b. Awn of upper glume 1/3–1/2 length of awn of lower glume; leaf blades lanceolate to lanceolate-ovate, 0.7–3.5 cm wide.

2a. Leaf blades 10–15 × 2–3.5 cm. 4a. var. patens

2b. Leaf blades 5–9 × 0.7–1.8 cm. 4b. var. yunnanensis

4a. Oplismenus patens var. patens

疏穗竹叶草(原变种) shu sui zhu ye cao (yuan bian zhong)

Oplismenus compositus (Linnaeus) P. Beauvois subsp. patens (Honda) T. Koyama; O. compositus var. patens (Honda) Ohwi.

Leaf blades oblong-lanceolate to ovate-lanceolate, 10–15 × 2–3.5 cm, glabrous on both surfaces. Upper glume awn 1/2 length of awn of lower glume. Lower lemma 7–9-veined, awn 2–2.5 mm. Fl. and fr. Sep–Nov.

● Moist places in open forests. Hainan, Yunnan.


云南竹叶草 yun nan zhu ye cao

Leaf blades lanceolate to narrowly lanceolate, 5–9 × 0.7–1.8 cm. Upper glume awn 1/3–1/2 length of awn of lower glume. Lower lemma awn ca. 1 mm. Fl. and fr. autumn–winter.

● Moist places in open forests. Hainan, Yunnan.


狭叶竹叶草 xia ye zhu ye cao


Leaf blades lanceolate to linear-lanceolate, 5–9 × 0.4–0.7 cm. Upper glume awn 1/5 length of awn of lower glume. Lower lemma 7-veined. Fl. and fr. autumn–winter.

● Moist places in open forests. Hainan, Yunnan.

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155. ICHNANTHUS P. Beauvois, Ess. Agrostogr. 56. 1812.

距花黍属 ju hua shu shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Navicularia Raddi (1823), not Heister ex Fabricius (1759).

Perennial or rarely annual. Culms varying from tall and canelike to rambling and decumbent. Leaf blades linear to ovate but usually lanceolate and asymmetrically narrowed at the base. Inflorescence a panicle or the primary branches simple and racemelike. Spikelets lanceolate, laterally compressed, florets 2; glumes prominently keeled, 3–7-veined, acuminate; lower glume usually more than half spikelet length; upper glume equaling or longer than lower glume; upper floret with a semicircular to oblong callus, this laterally expanded into 2 membranous wings adnate to the lemma base, these often represented in dried material by scars, upper lemma dorsally compressed, smooth and shiny, the margins flat or inrolled.

About 30 species: New World tropics and subtropics, one species pantropical including China.

1. Ichnanthus pallens (Swartz) Munro ex Bentham var. major (Nees) Stieber, Syst. Bot. 12: 207. 1987 [“majus”].

大距花黍 da ju hua shu


Rambling perennial. Culms long, slender, decumbent and rooting at the lower nodes, ascending to 15–50 cm. Leaf sheaths pubescent or only margins ciliate; leaf blades ovate-lanceolate to ovate, tessellate, 3–8 × 1–2.5 cm, glabrous or puberulous on both surfaces, apex sharply acuminate; ligule ca. 1 mm, a ciliate membrane. Panicles terminal and axillary from upper nodes, 5–10 cm, usually with soft hairs in the axils, the branches spaced, loosely ascending, subracemose with laxly arranged spikelets. Spikelets 4–5 mm; glumes with obvious veins, lower glume 3–3.5 mm, 3-veined, apex usually long attenuate; upper glume 5-veined, acuminate; lower lemma herbaceous, 5-veined; upper floret much shorter than lower lemma, 2–2.5 mm, shiny white to light brown, oblong, obtuse, scars at base ca. 1 mm. Fl. and fr. Aug–Nov. 2n = 40.

Damp places in forests, along shady streamides. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, Yunnan [India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; W Africa, Australia (Queensland), Pacific Islands (Polynesia), South America].

Ichnanthus pallens var. pallens is distinguished by its smaller (2.5–4 mm), plumper spikelets, lower glume without a long attenuate apex, and more compact panicle. It mostly occurs in America, from Mexico to Argentina, and in the Caribbean, but a few specimens with these spikelet dimensions are known from W Africa and Malaysia.


黍属 shu shu

Chen Shouliang (陈守良); Stephen A. Renvoize
Annuals or perennials. Culms erect, geniculately ascending or decumbent. Leaves basal or cauline; leaf blades filiform or linear to lanceolate or ovate, usually flat. Inflorescence usually a terminal open panicle, variously condensed or occasionally spicate rarely racemose. Spikelets usually symmetrical and dorsally compressed, disarticulating below the glumes; 2-flowered, the lower floret staminate or barren, the upper bisexual. Glumes herbaceous to membranous, ovate or oblong, obtuse to acute, acuminate or cuspidate; lower usually shorter than the spikelet, rarely equal, an internode between the glumes sometimes present, upper glume as long as spikelet, or slightly shorter; lower lemma similar to upper glume, with or without a palea; upper floret coriaceous, bony or cartilaginous, the margins of the lemma inrolled and clasping the palea, apex obtuse to acute or apiculate, crested or excavated. Hilum rounded to oval. \[x = 9, 10.\]

About 500 species; pantropical, extending into temperate regions of North America; 21 species (four introduced) in China.

\[Panicum miliaceum\] (Proso Millet) is grown in China as a cereal crop. \[Panicum coloratum\] (Buffalo Grass), \[P. maximum\] (Guinea Grass), and \[P. virgatum\] (Switch Grass) have been introduced to China and are widely grown for fodder.

1a. Upper floret rugose ....................................................................................................................................................... 1. \[P. maximum\]
1b. Upper floret papillate or smooth.

2a. Glumes or at least the lower, acuminate to cuspidate.

3a. Plant perennial.
   4a. Panicle effuse, spikelets 3.5–4 mm ..................................................................................................................... 11. \[P. elegantissimum\]
   4b. Panicle moderately branched, spikelets 2–3 mm.
   5a. Lower glume 1/4–1/3 length of spikelet ............................................................................................... 7. \[P. coloratum\]
   5b. Lower glume 2/3–3/4 length of spikelet ............................................................................................... 13. \[P. virgatum\]
3b. Plant annual.
   6a. Spikelets 1.5–2 mm ...................................................................................................................................... 12. \[P. humile\]
   6b. Spikelets 3–5 mm.
   7a. Panicle dense, branches drooping; spikelets 4–5 mm; cultivated ............................................................... 14. \[P. miliaceum\]
   7b. Panicle open, branches spreading or ascending; spikelets 3–3.5 mm; wild .................................. 15. \[P. curviflorum\]
2b. Glumes obtuse or acute.

8a. Leaf-leaf blades ovate to lanceolate.

9a. Culms herbaceous.
   10a. Spikelets ca. 1.3 mm ..................................................................................................................................................... 16. \[P. trichoides\]
   10b. Spikelets 1.5–2 mm ..................................................................................................................................................... 17. \[P. brevifolium\]
9b. Culms terete, woody.
   11a. Lower glume separated by an internode; upper lemma glabrous at the apex ........................................... 18. \[P. notatum\]
   11b. Lower glume not separated by an internode; upper lemma ciliolate at the apex.
   12a. Lower glume 1/4–1/3 length of spikelet ............................................................................................... 21. \[P. khasianum\]
   12b. Lower glume 1/2–3/4 length of spikelet.
   13a. Panicle branches not tangled ............................................................................................................................ 19. \[P. sarmentosum\]
   13b. Panicle branches tangled ............................................................................................................................. 20. \[P. incomtum\]
8b. Leaf-leaf blades linear to narrowly lanceolate.

14a. Panicle spikelike or if primary branches well developed then ascending or appressed and the secondary branches very short ................................................................................................................. 10. \[P. auritum\]
14b. Panicle open, primary branches spreading.
   15a. Plant annual.
   16a. Lower glume cufflike, 1/6–1/3 length of spikelet, obtuse to bluntly acute.
   17a. All panicle branches spreading .............................................................................................................................. 9. \[P. sumatrense\]
   17b. Secondary or tertiary panicle branches appressed, lower lemma 7–9-veined
   18a. Lower glume not separated by an internode; spikelets in pairs and clustered toward the ends of the branches ................................................................................................................................. 5. \[P. bisulcatum\]
   18b. Lower glume separated by an internode; spikelets not in pairs, evenly spread throughout the panicle ................................................................................................................................................. 8. \[P. luzonense\]
15b. Plant perennial.
   19a. Lower glume acute.
   20a. Culms scrambling, woody below ............................................................................................................................ 6. \[P. amoenum\]
   20b. Culms erect, herbaceous ..................................................................................................................................................... 7. \[P. coloratum\]
19b. Lower glume obtuse, cufflike.
   21a. Secondary branches well developed, spreading; lower glume separated by an internode ............................................................................................................................................................................ 4. \[P. decompositum\]
   21b. Secondary or tertiary branches short, appressed; lower glume not separated by an internode.
22a. Plant with wiry culms ................................................................. 2. *P. repens*
22b. Plant with soft, herbaceous culms ........................................ 3. *P. dichotomiflorum*


大黍 *da shu*

*Megathyrsus maximus* (Jacquin) B. K. Simon & S. W. L. Jacobs; *Panicum hirsutissimum* Steudel; *P. jumentorum* Persoon; *P. maximum* var. *hirsutissimum* (Steudel) Oliver; *P. polygamum* Swartz.

Perennial, rhizomatous; rhizome stout. Culms robust, erect, 1–3 m tall, nodes glabrous or pilose. Leaves basal and cauline; leaf sheaths glabrous, striate, puberulous to ciliate on margins, especially toward throat; pale yellow, shiny. Fl. and fr. Jun–Nov.


铺地黍 *pu di shu*

Perennial, rhizomatous. Culms tough, erect or decumbent, 30–125 cm tall. Leaves cauleine; leaf sheaths glabrous, striate, puberulous to ciliate on margins, especially toward throat; leaf blades linear, flat or convolute, often stiff and pungent, markedly distichous, ascending close to the culm, 7–25 × 0.2–0.8 cm, apex acute or acuminiate; ligule 0.5–1.5 mm, a ciliolate membrane. Panicle terminal, narrowly oblong in outline, 5–20 cm, sparsely to moderately branched; branches glabrous, scabrid, ascending. Spikelets ovate, 2.5–3 mm, acute; lower glume broadly ovate, 1/3 length of spikelet, hyaline, 1(–3)-veined, clasping at the base of the spikelet, obtuse or acute; upper glume as long as spikelet, membranous, 7–9-veined, acute; lower floret staminate, lemma similar to upper glume, palea well developed; upper floret almost as long as spikelet, pale yellow, shiny. Fl. and fr. Aug–Oct.

Widely cultivated for forage. Guangdong, Taiwan [native to tropical Africa and America].


洋野黍 *yang ye shu*

*Panicum paludostum* Roxburgh.

Aquatic annual or rhizomatous perennial. Culms geniculately ascending, rooting at lower nodes, branching, succulent, 30–110 cm tall, upper nodes glabrous, often conspicuous. Leaves cauleine; leaf sheaths striate, glabrous, lower sheaths often inflated; leaf blades linear, flat, 7–35 × 0.5–1 cm, glabrous, scabrid, base straight or subcordate, apex acute; ligule 1–2 mm, a ciliate membrane. Panicle terminal or axillary, pyramidal when fully exserted, 10–20 cm, much branched; branches glabrous, scabrid, secondary and tertiary branches often oppressed. Spikelets lanceolate to narrowly ovate, 3–4 mm, glabrous, acuminate; lower glume broadly ovate, 1/6–1/3 length of spikelet, clasping at the base of the spikelet, membranous, 0–1-veined, obtuse to acute; upper glume as long as spikelet, 7–9-veined; lower lemma similar to upper glume, palea absent or present and well developed; upper floret 2/3 length of spikelet, green or pale yellow, smooth, shiny. Fl. and fr. Jun–Oct.

Shallow waters, swampy places. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [India, Malaysia; tropics of the New World].


多子黍 *duo zi shu*


Perennial, caespitose. Culms erect, 60–100 cm tall, nodes glabrous. Leaves basal; leaf sheaths striate, glabrous; leaf blades linear, flat, 15–30 × 0.5–0.8 cm, glabrous, tough, base straight, apex tapering to a fine point; ligule ca. 1 mm, a ciliolate membrane. Panicle broadly ovate in outline when fully exserted, terminal, 20–40 cm, much branched; branches rigid, ascending and spreading, scabrid or smooth. Spikelets elliptic, 2–3 mm, glabrous, acuminate; lower glume broadly ovate, 1/5–1/3 length of spikelet, clasping the base of the spikelet, 0–1-veined, obtuse or acute, separated by an internode; upper glume as long as spikelet, 7-veined; lower lemma similar to upper glume, palea poorly developed; upper floret slightly shorter than spikelet, pale yellow, smooth, shiny.

Taiwan [Australia, Pacific Islands].


糠稷 *kang ji*

*Panicum acroanathum* Steudel; *P. acroanathum* var. *brevipedicellatum* Hackel.

Annual. Culms erect or ascending, sometimes rooting at lower nodes, 30–180 cm tall, nodes glabrous. Leaves cauleine; leaf sheaths striate, glabrous, ciliate on the margins, especially toward the throat; leaf blades linear, 5–20 × 0.5–1.5 cm, subglabrous, base rounded, apex acuminiate; ligule ca. 0.5 mm, a ciliolate membrane. Panicle ovate or orbicular in outline, 10–40 cm, loose, much branched; branches slender, flexuous, scabrid, with the spikelets in pairs and clustered toward the ends of the branches. Spikelets elliptic, 2–2.5 mm, sparsely puberulous; lower glume ovate, 1/2 length of spikelet, 1–3-veined, acute or acuminate; upper as long as spikelet, 5-veined; lower lemma similar to upper glume, palea absent; upper floret as long as
spikelet, pale yellow, smooth, shiny. Fl. and fr. Sep–Nov. 2n = 36.

Moist places. Anhui, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Philippines; Australia, Pacific Islands].


Perennial. Culms woody, scrambling 1–3 m long. Leaves cauline; leaf sheaths striate, glabrous, the margins ciliate toward the throat; leaf blades linear, flat, 10–28 × 0.5–1.5 cm, glabrous, scabrid or smooth, base truncate or rounded, apex acuminate; ligule ca. 0.2 mm, membranous. Panicle broadly ovate to oblong in outline, 15–40 cm, much branched; branches slender, scabrid, spreading at maturity. Spikelets elliptic-oblong, 1.2–1.5 mm, glabrous; lower glume ovate, 1/2 length of spikelet, 3-veined; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea absent; upper floret coriaceous, veined; upper glume as long as spikelet, 9–13-veined; lower glume broadly ovate, 1/4–1/3 length of spikelet, 3-veined, bluntly acute; upper glume as long as spikelet, 9–13-veined; lower lemma similar to upper glume, palea present or absent; upper floret brown or yellow, smooth, shiny. Fl. and fr. Jul–Dec.

Grasslands. S Yunnan [Borneo, NE India, Malaysia, Myanmar, Thailand, Vietnam].


Perennial, tufted. Culms erect or ascending from a knotty base, 15–100 cm tall. Leaves basal and cauline; leaf sheaths glabrous, pilose or hispid; ligule 0.5–1 mm, a ciliolate membrane. Panicle ovate in outline, 4–30 cm, much branched; branches ascending or spreading, the spikelets evenly spread or clustered on the branches. Spikelets ovate-elliptic, 2–3 mm, glabrous, acute; lower glume broadly ovate, 1/4–1/3 length of spikelet, 1–3-veined, acute to acuminate; upper glume ovate, as long as spikelet, 7–9-veined, acute; lower floret staminate, lemma similar to upper glume, palea well developed; upper floret pale yellow or brown, smooth, shiny.

Introduced for pasture [native to tropical and subtropical Africa; introduced elsewhere].


Annual, tufted, hispid. Culms erect or decumbent, 20–60(–150) cm tall, nodes dark in color, glabrous. Leaves cauline; leaf sheaths loose, glabrous; leaf blades linear, flat, 8–40 × 0.4–0.8 cm, glabrous, base cordate to straight, apex acute or tapering; ligule ca. 1 mm, a ciliolate membrane. Panicle terminal, oblong or ovate in outline, 10–40 cm, densely branched and drooping or sparingly branched and erect; branches slender, scaberulous. Spikelets oblong in outline, 2.5–3.5 mm, glabrous; lower glume broadly ovate or ciliiform, 1/4–1/3 length of spikelet, 3-veined, bluntly acute; upper glume as long as spikelet, 9–13-veined; lower lemma similar to upper glume, palea present or absent; upper floret brown or yellow, smooth, shiny. Fl. and fr. Jul–Oct. 2n = 54.

Rather dry situations. Guizhou, Taiwan, Xizang, Yunnan [India, Malaysia, Philippines, Sri Lanka].

Special forms of this variable species have been selected for cultivation. Plants with a denser and more profuse panicle, which droops at maturity under the weight of the spikelets, are grown as a cereal crop. Wild plants with more lightly branched, erect panicles and sparse spikelets may be distinguished as Panicum psilopodium. Although the cultivated types are readily identifiable, there are sufficient intermediates to make a clear boundary with the wild types impossible to define.


Annual. Culms erect or decumbent, 20–60(–150) cm tall, nodes dark in color, glabrous. Leaves cauline; leaf sheaths loose, glabrous; leaf blades linear, flat, 8–40 × 0.4–0.8 cm, glabrous, base cordate to straight, apex acute or tapering; ligule ca. 1 mm, a ciliolate membrane. Panicle terminal, oblong or ovate in outline, 10–40 cm, densely branched and drooping or sparingly branched and erect; branches slender, scaberulous. Spikelets oblong in outline, 2.5–3.5 mm, glabrous; lower glume broadly ovate or ciliiform, 1/4–1/3 length of spikelet, 3-veined, bluntly acute; upper glume as long as spikelet, 9–13-veined; lower lemma similar to upper glume, palea present or absent; upper floret brown or yellow, smooth, shiny. Fl. and fr. Aug–Oct. 2n = 18.

Fields, forest margins. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Indonesia, Myanmar, Philippines, Sri Lanka; Australia].


Annual. Culms erect or geniculately ascending, branched, up to 4 m long, nodes glabrous. Leaves cauline; leaf sheaths shorter than internodes, glabrous, sometimes ciliate on margins and at throat, striate; leaf blades linear, 10–60 × 0.5–2.5(–3.5) cm, glabrous, base cordate, apex acuminate; ligule short, membranous, ca. 0.5 mm. Panicle contracted to spike-like, 10–45 cm; branches appressed, glabrous, scabrid. Spikelets lanceolate or elliptic, 2–3 mm, glabrous, acute; lower glume ovate, 1/3 length of spikelet, membranous, 3-veined; upper glume as long as spikelet, 5–7-veined; lower lemma similar to upper glume, palea poorly developed; upper floret as long as spikelet, pale yellow, smooth, shiny. Fl. and fr. Aug–Oct.

Streams, lakesides, forest margins. Fujian, Guangdong, Hainan,
Perennial with scaly rhizomes. Culms tough, erect, 60–200 cm tall, usually unbranched, nodes glabrous or pubescent. Leaves basal and caudine; leaf sheaths rounded, glabrous; leaf blades linear, flat, 20–40 × 0.3–1.5 cm, glabrous, apex acuminate; ligule 1.5–7 mm, a ciliate fringe, membranous at the base. Panicle open, oblong or rhomboid in outline, 15–55 cm, the spikelets often clustered on the secondary branches. Spikelets ovate, 3–5 mm, glabrous; glumes ovate, acuminate; lower glume 2/3–3/4 length of spikelet, 5-veined; upper glume as long as spikelet, 5-veined; lower floret staminate, lemma similar to upper glume, 5–7-veined, palea well developed; upper floret pale, shiny. Fl. and fr. Jul.–Oct. 2n = 21, 25, 30, 32, 36, 72.

Commonly cultivated for forage [native to North America].


Annual. Culms robust, 20–150 cm tall, glabrous or lower nodes and internodes pubescent or hispid. Leaves cauline; leaf sheaths hispid; leaf blades linear or narrowly lanceolate, 15–40 × 1–2.5 cm, glabrous to pilose or hispid, base cordate to amplexicaul, apex finely tapering; ligule 1.5–3 mm, a fringe of hairs from a membranous base. Panicle oblong to ovate in outline, 15–35 cm, drooping at maturity with the weight of the dense spikelets which are clustered toward the ends of the branches. Spikelets ovate to ovate-oblong, 4–5 mm, glabrous, acute to acuminate; lower glume ovate, 1/2–3/4 length of spikelet, 5-veined, acute or acuminate, separated by a short internode; upper glume equal to spikelet, 9–13-veined, acute or acuminate; lower floret barren, lemma similar to upper glume, palea reduced or absent; upper floret orange or yellow, smooth, shiny, usually persistent. Fl. and fr. Jul.–Oct. 2n = 36, 40.

Commonly cultivated, especially in mountainous regions [cultivated in Bhutan, India, Japan, and widely elsewhere].


Annual, loosely tufted. Culms erect or geniculately ascending, (15–)30–90 cm tall, nodes glabrous. Leaves mostly basal; leaf sheaths strigate, hispid with tubercle-based hairs; leaf blades linear or lanceolate, flat, 7–30 × 0.2–0.9 cm, hispid, base straight, apex acute or acuminate; ligule 0.3–1 mm, a fringe of hairs. Panicle open, oblong in outline, 10–35 cm, axis smooth, moderately branched; branches ascending or spreading, scabrid. Spikelets lanceolate, 3–3.5 mm, glabrous, acuminate; glumes broadly ovate, scaberulous on veins, acuminate to cuspidate; lower glume 1/2–2/3 length of spikelet, 5-veined, clasping at the base, separated by an internode; upper glume as long as spikelet, 7–9-veined; lower floret staminate, lemma similar to upper glume, finely tapering; ligule 1.5–3 mm, a fringe of hairs. Fl. and fr. Aug.–Dec. 2n = 18.

Fields on rather dry soils, mountain slopes. Guangdong, Guangxi, Hainan, Taiwan, Xizang [India, Malaysia, Philippines, Sri Lanka, Thailand, Vietnam; tropical Africa].
Annual, delicate. Culms geniculately ascending, rooting from lower nodes, 10–80 cm tall, branched, nodes puberulous. Leaves cauline; leaf sheaths striate, pilose or hirsute; leaf blades lanceolate, membranous, 3–8 × 0.5–2 cm, pilose, base asymmetrically cordate or narrowed, apex acuminate; ligule ca. 0.2 mm, a ciliolate membrane. Panicle ovate or oblong in outline, 4–20 cm, much branched; branches fine and bearing the spikelets on long pedicels. Spikelets asymmetrically ovate, 1–1.5 cm, pubescent; lower glume ovate, 1/2 length of spikelet, 1–3-veined, separated by an internode; upper glume as long as spikelet, 3–5-veined; lower lemma similar to upper glume, palea 1/2 as long as lemma; upper floret as long as spikelet, thinly coriaceous, glabrous, white, granulose. Fl. and fr. May–Nov. 2n = 36.

Roadsides, waste places. Guangdong, Hainan [tropical America; introduced in tropical Africa and Asia].


短叶黍 duan ye shu

Panicum arborescens Linnaeus; P. brevifolium var. hirtifolium (Ridley) Jansen; P. hirtifolium Ridley; P. longiglume H. Peng & L. H. Zhou; P. ovalifolium Poiret.

Annual. Culms rambling, often rooting at lower nodes, 15–100 cm tall, nodes glabrous or pubescent. Leaves cauline; leaf sheaths puberulous or glabrous, ciliate on margins; ligule ca. 0.2 mm, a ciliolate membrane; leaf blades narrowly ovate to ovate, 5–10 × 1–3 cm, membranous, glabrous or pilose, cross veins present, base amplexicaul, apex finely acute to acuminate. Panicle oblong or ovate in outline, 5–15 cm, much branched; branches delicate, often tangled, glabrous or pilose, glandular patches present. Spikelets asymmetrically borne on the pedicels; ovate or elliptic in outline, 1.5–2 mm, sparsely puberulous to pubescent; lower glume ovate as long as spikelet, hyaline, 1–3-veined, separated by an internode; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea well developed; upper floret white, scaberulous, shiny. Fl. and fr. May–Dec. 2n = 36.

Humid places, forest margins. Fujian, Guangdong, Guangxi, Guizhou, Jiangxi, Taiwan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam; tropical Africa].


心叶黍 xin ye ji

Panicum montanum Roxburgh.

Perennial. Culms scrambling, often rooting at lower nodes, 1–2 m long, branched, terete, glabrous, nodes glabrous to puberulous. Leaves cauline; leaf sheaths striate, puberulous to subglabrous, ciliate on margins toward throat; leaf blades lanceolate, 5–20 × 1–3 cm, subglabrous to pubescent, cross veins present, margins scabrid, base cordate, apex finely pointed to acuminate; ligule scarcely developed, ca. 0.5 mm, a ciliolate membrane. Panicle broadly ovate in outline, 10–40 cm, much branched; branches slender, spreading, glabrous, smooth or scabrid, bearing spikelets toward the extremities. Spikelets elliptic, 2–2.5 mm, puberulous; lower glume ovate or oblong, 3/4 as long to equaling the spikelet, 3–5-veined, separated by an internode; upper glume as long as spikelet, 3–5-veined; lower lemma similar to upper glume, palea absent; upper floret as long as spikelet, pale yellow or green, smooth, shiny. Fl. and fr. May–Nov. 2n = 36.

Forest margins. Fujian, Guangdong, Guangxi, Taiwan, Xizang, Yunnan [Bhutan, Borneo, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].


卵花黍 luan hua shu

Perennial. Culms rambling or climbing, up to 15 m long, branched, glabrous to puberulous or hirsute, terete, solid. Leaves cauline; leaf sheaths striate, puberulous; ligule ca. 0.5 mm, a ciliolate membrane; leaf blades narrowly lanceolate, 10–35 × 1–3 cm, puberulous, margins scabrid, base abruptly narrowed, apex acuminate. Panicle oblong to ovate in outline, 15–30 cm, axis glabrous or pilose, much branched; branches viscid or smooth. Spikelets ovate, 1.5–2 mm, sparsely puberulous to glabrous; lower glume ovate, 2/3–3/4 length of spikelet, 3–5-veined; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea well developed; upper floret as long as spikelet, pale brown, smooth, shiny, apex apiculate. Fl. and fr. May–Nov. 2n = 36.

Forest shade. Hainan, Taiwan [India, Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand; Australia].


藤竹草 teng zhu cao

Panicum submontanum Hayata.

Perennial. Culms rambling, often rooting at lower nodes, 1–2 m long, branched, terete, subglabrous to puberulous, nodes glabrous or puberulous. Leaves cauline; leaf sheaths loose, striate, puberulous; leaf blades narrowly lanceolate, 10–25 × 1–2 cm, pilose, base abruptly narrowed, apex acuminate; ligule ca. 1 mm, ciliate. Panicle oblong to ovate in outline, 10–23 cm, the axis glabrous, much branched; branches tangled, viscid. Spikelets ovate, 1.5–2 mm, sparsely puberulous to glabrous; lower glume ovate, 2/3–3/4 length of spikelet, 3–5-veined; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea well developed; upper floret as long as spikelet, pale brown, smooth, shiny. Fl. and fr. Jul–Mar. 2n = 36.

Forest shade. Fujian, Guangdong, Guangxi, Jiangxi, Taiwan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, New Guinea, Philippines, Thailand, Vietnam; Australia].


滇西黍 dian xi shu

Perennial. Culms rambling, often rooting at lower nodes, 1–2 m long, branched, terete, nodes glabrous. Leaves cauline; leaf sheaths striate, loose, glabrous, hirsute or sparsely ciliate on margins and toward throat; leaf blades narrowly lanceolate, 10–30 × 1–3 cm, subglabrous to pilose or hirsute, base abruptly narrowed, apex acuminate; ligule 0.5–1 mm, a ciliolate membrane. Panicle broadly oblong to orbicular in outline, 15–35 cm, much
branched; branches spreading, scabrid, bearing spikelets mostly in the upper half. Spikelets elliptic-oblond, glabrous; lower glume ovate, 1/4–1/3 length of spikelet, 0–5-veined, acute or obtuse, not separated by an internode; upper glume as long as spikelet, 5-veined; lower lemma similar to upper glume, palea absent; upper floret as long as spikelet, pale yellow, smooth, shiny, minutely ciliolate at the apex. Fl. and fr. Jul–Dec.

Humid grasslands, valley slopes; 1000–2500 m. W Yunnan [Bhutan, NE India].


Aquatic perennials. Culms long, decumbent, spongy, rooting at lower nodes, internodes solid, filled with aerenchyma. Leaf blades linear or broadly linear. Inflorescence usually a cylindrical spike-like panicle, rarely with spreading primary branches. Spikelets lanceolate, dorsally compressed, veins prominent, florets 2; lower glume usually about 1/3 spikelet length, base clasping; upper glume shorter than or subequaling spikelet, 5-veined; lower lemma as long as spikelet, 5-veined, apex acute to shortly awned; lower palea absent or much reduced; upper lemma membranous, rarely thinly cartilaginous, smooth, margins hyaline, gripping edges of palea below but free toward apex, apex acute.

Five species: tropics of the Old World and New World; three species (one endemic) in China.

_Hymenachne_ is a genus of swamp grasses similar to _Sacciolepis_, and both are segregates from the large genus _Panicum_. The culms of _Sacciolepis_ are hollow, but in _Hymenachne_ they are filled with aerenchyma.

1a. Panicle open, up to 9 cm wide; spikelets loose; culm nodes villous .......................................................... 1. _H. patens_
1b. Panicle spike-like, 1–2 cm wide; spikelets dense; culm nodes glabrous.

2a. Spikelets 4–6 mm; upper glume and lower lemma cuspidate-acuminate or extended into mucro up to 2 mm .................................................................................................................................................. 2. _H. amplexicaulis_
2b. Spikelets 2–3.2 mm; upper glume and lower lemma acute to acuminate.

3a. Spikelets 3–3.2 mm, lanceolate, acuminate .......................................................................................................................... 3. _H. assamica_
3b. Spikelets 2–2.5 mm, ovate-lanceolate, acute .............................................................................. 10. _Panicum auritum_ (see p. 507)


展穗膜稃草 _zhan sui mo fu cao_

Culms decumbent, ascending to ca. 50 cm, nodes 4 or 5, villous. Leaf blades linear-lanceolate, 10–20 × 0.5–1 cm, glabrous on both surfaces, base rounded and clasping, apex acuminate. Panicale 15–20 × 4–9 cm, open; branches 5–12 cm, distant, laxly ascending, spikelets on side branchlets, 2 or 3 per node; pedicels 1–2 mm, smooth. Spikelets green or brownish green, 3.2–4 × ca. 1 mm, acute; lower glume 1/3–1/2 as long as spikelet, 3–5-veined; upper glume subequal to spikelet, herbaceous with membranous margins, 5-veined, acute; lower lemma similar to upper glume but slightly longer; upper lemma slightly shorter than spikelet, thinly cartilaginous, smooth, margins flat below middle, apex acute. Anthers ca. 1 mm. Fl. and fr. Jun–Oct.

- Wet field margins; ca. 100 m. Anhui, Fujian, Jiangxi.

The open panicle and villous nodes are very unusual in _Hymenachne_, but the spikelets are typical of the genus.


膜稃草 _mo fu cao_


Culms decumbent, up to 1 m tall, 6–10 mm in diam.; nodes many, brown, glabrous. Leaf blades broadly linear, thick, 30–40 × ca. 2 cm, glabrous or the adaxial surface and margins loosely tuberculate-hairy, base rounded and slightly clasping, apex acuminate. Ligule membranous, 1–2 mm. Panicle 20–40 × 1–2 cm; spike-like, branches 0.5–2 cm, erect, appressed; rachis winged; pedicels scabrous. Spikelets narrowly lanceolate, 4.5–6 × ca. 1 mm, veins smooth at base, otherwise scabrous; both glumes and lower lemma separated by a short stipe; lower glume ovate, ca. 1.2 mm, 1-veined, acuminate; upper glume and lower lemma lanceolate, 3–4 mm, apex with 0.5–2 mm awn; upper lemma ca. 3 mm, margins flat, apex acuminate. Anthers 0.75–1 mm. Caryopsis ca. 1.5 mm, apex rounded. Fl. and fr. summer to autumn.

Streams in shallow water, ricefields; below 1000 m. Hainan, Taiwan, Yunnan [India, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

3. _Hymenachne assamica_ (J. D. Hooker) Hitchcock, Lingnan Sci. J. 7: 222. 1931 [“1929”].

弊草 _bi cao_

_Panicum assamicum_ J. D. Hooker, Fl. Brit. India 7: 40. 1896 [“1897”].

Culms decumbent, 50–70 cm tall, ca. 5 mm in diam., nodes many, brown, glabrous. Leaf sheaths with one margin tuberculate-ciliate; leaf blades linear-lanceolate, 10–20 × 0.4–1.2 cm, a few setae at base above ligule, base rounded, apex acuminate; ligule 0.3–0.5 mm. Panicale narrow, dense, pale
green, 8–18 × 1–3 cm; branches 1–4 cm, appressed to rachis with tightly clustered spikelets; rachis scabrous, narrowly winged; pedicels 0.2–0.8 mm, scabrous. Spikelets lanceolate, 3–3.2 × ca. 1 mm, veins scabrous toward apex, otherwise smooth, glumes and lower lemma not separated; lower glume broadly ovate, 1/3 spikelet length, 1–5-veined, acute; upper glume slightly shorter or as long as lower lemma, 5-veined, nearly smooth, sharply acute; lower lemma as long as spikelet, sharply acute; upper lemma ca. 2.5 mm, margins flat for most of their length or only toward apex, apex acute. Fl. and fr. Jul–Oct.

Streams. Guangdong, Guangxi, Hainan, Yunnan [NE India, Thailand].

158. SACCIOLEPIS Nash, Man. Fl. N. States 89. 1901.

囊颖草属 nang ying cao shu
Chen Shouliang (陈守良); Sylvia M. Phillips

Annuals or perennials. Leaf blades linear to convolute; ligule membranous. Inflorescence a narrowly cylindrical, densely spike-like panicle. Spikelets asymmetrical, lanceolate-oblong to ovate, usually laterally or rarely dorsally compressed, plump, florets 2; glumes prominently ribbed, lower glume 1/4–3/4 spikelet length, broad, loose and slightly inflated, upper glume equaling spikelet, deeply concave and gibbous on the back; lower lemma resembling upper glume but less gibbous, staminate or neuter, its palea often much reduced; upper floret readily deciduous, the lemma dorsally compressed, often much shorter than spikelet, thinly coriaceous to cartilaginous, smooth, shiny, margins rolled or flat but never hyaline. x = 9.

About 30 species: tropics, predominantly in Africa; three species in China.

This is a genus of aquatic and marshland grasses, recognized by the spike-like panicle of asymmetrical, ribbed spikelets.

1a. Perennial with spongy, often floating stems; spikelets dorsally compressed, 3–5 mm .............................................. 1b. Annuals with firm stems, not floating; spikelets laterally compressed, 1.5–2.8 mm.

1b. Spikelets 2–2.8 mm, lanceolate ................................................................................................................................... 2.

2b. Spikelets 1.5–2 mm, lanceolate ................................................................................................................................... 3.


囊颖草 nang ying cao


Vigorous aquatic perennial. Culms rooting and floating in water, spongy, succulent, hollow, smooth, glabrous, 20–50 cm tall or more, up to 1 cm in diam. Leaf sheaths loose, papery; leaf blades linear, flat, soft, 4–12 × 0.3–0.6 cm, base abruptly rounded, apex acuminate; ligule truncate. Panicle spike-like, 10–30 cm. Spikelets light green, asymmetrically oblong, lightly dorsally compressed, 3.3–5 mm, glabrous, acute to subacute; lower glume broadly ovate, 1/4–1/3 spikelet length, 3–5-veined; upper glume ovate, slightly gibbous, 9-veined, acute; lower floret neuter or infrequently staminate, lemma as long as upper glume, ovate, 7-veined; lower palea present, often much reduced; upper lemma yellowish, narrowly ovate, 2/3–3/4 spikelet length, acute. Fl. and fr. Jun–Dec. 2n = 18.

Swamps, shallow water, rice fields. SW Yunnan [India, Indonesia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; Africa].

Sacciolepis interrupta has a mainly Asian distribution. Sacciolepis africana C. E. Hubbard & Snowden is its counterpart in Africa, but has on average somewhat shorter (2.5–4 mm), more obtuse spikelets. However, the division between the two species is not clear-cut, and there is some overlap in individual characters.


Sacciolepis indica has a mainly Asian distribution. This species differs from Sacciolepis interrupta in having smaller spikelets, more obtuse spikelets, and a mostly Asian distribution.
Annual. Culms slender, tufted, erect or slightly decumbent at the base, 15–100 cm tall. Leaf sheaths smooth; leaf blades linear, flat, 3–20 × 0.1–0.5 cm, adaxial surface papillose, apex acuminate; ligule ca. 0.5 mm. Panicle very slender, densely spikelet, 2–20 × 0.2–0.5 cm, axis glabrous. Spikelets purple, ovate-elliptic, slightly curved, laterally compressed, 1.5–2 mm, glabrous or pilose, acute or subobtuse; lower glume 1/2–2/3 spikelet length, 3–5-veined; upper glume 7–9-veined; lower lemma with a small palea; upper lemma slightly shorter than spikelet. Fl. and fr. winter. 2n = 36.

Moist places and shallow water, rice fields. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific Islands].

1a. Culms 30–100 cm tall; leaf blades 10–20 cm; panicle 6–20 cm ……………… 3a. var. myosuroides
1b. Culms 15–30 cm tall; leaf blades 3–5 cm; panicle 2–4 cm ………………….. 3b. var. nana

3a. Sacciolepis myosuroides var. myosuroides


Perennial. Culms slender, decumbent, rooting and branch ing at the nodes, ascending up to 60 cm. Leaf sheaths conspicuously ciliate along one margin; leaf blades narrowly lanceolate, 4–11 × 0.5–1 cm, smooth, glabrous, base rounded or cordate, margins scabrous, apex acuminate; ligule ca. 0.3 mm. Panicle 10–15 cm, branches 3–8 cm, stiffly spreading, subverticillate in the lower part, the spikelets grouped in clusters or short racemelets, or sometimes loosely spaced. Spikelets elliptic to elliptic-oblong, 2–3.2 mm, acute; glumes lanceolate, lower glume 1/2 spikelet length, 3–5-veined; upper glume 1/2–2/3 spikelet length, 5–7-veined; lower lemma 7-veined; upper lemma smooth, apex laterally compressed to a very small crest. Fl. and fr. Jul–Sep. 2n = 18. Fl. and fr. Jul–Sep. 2n = 18.

Forests (not in deep shade), forest margins, clearings, often scrambling over other plants; 100–1700 m. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Africa, NE Australia, Pacific Islands (Polynesia)].

The name Ottochloa malabarica (Linnaeus) Dandy (based on Poa malabarica Linnaeus) has been applied to this grass. The identity of P. malabarica is unclear from the protologue, which probably includes more than one species, but the name has more frequently been applied to the completely different species Leptochloa fusca. Poa malabarica, a name of uncertain application, has been formally rejected.

1a. Spikelets 2.8–3.2 mm ………………………. 1a. var. noda
1b. Spikelets 2–2.5 mm ……………………… 1b. var. micrantha
1c. Ottochloa nodosa var. noda

1b. Spikelets 2.8–3.2 mm; upper glume 1/2–2/3 spikelet length; lower lemma 7-veined.


霉小囊颖草


矮小囊颖草

Hemigynnia arnottiana Stapf var. micrantha Balansa ex A. Camus in Lecomte, Fl. Indo-Chine 7: 455. 1922.

1a. Pedicels mostly shorter than the spikelet, stout; panicle contracted; spikelets reddish brown .............................. 1. C. oxyphyllum
1b. Pedicels much longer than the spikelet, filiform; panicle open, often diffuse; spikelets purplish .............................. 2. C. patens

1. Cyrtococcum oxyphyllum (Hochstetter ex Steudel) Stapf, Hooker’s Icon. Pl. 31: t. 3096. 1922.

弓果黍属 gong guo shu shu

Annual or perennial. Culms decumbent, rooting at the nodes, much branched and leafy. Leaf blades linear-lanceolate to narrowly ovate; ligule membranous. Inflorescence an open or contracted panicle. Spikelets asymmetrical, obovate, laterally compressed, florets 2, lower floret sterile, upper fertile; glumes both shorter than spikelet, unequal, membranous to herbaceous, 3–5-veined; lower glume smaller, ovate, clasping, subacute; upper glume boat-shaped, obtuse; lower lemma usually equal to spikelet, 5-veined, nearly straight on the back, its palea small or absent; upper lemma laterally compressed, gibbously semi-oblanceolate to cristaecous, smooth or minutely pitted, a little greenish crest near the apex which swells at maturity, upper palea dorsally slightly convex. x = 9.

Eleven species: Old World tropics, in shady places; two species in China.

This genus is a segregate from Panicum distinguished by its laterally compressed, gibbous spikelets with short glumes and a crested upper lemma.

1a. Spikelets 2–2.5 mm; upper glume ovate, ca. 1/2 spikelet length, 7-veined; lower lemma 5–7-veined. Fl. and fr. Jul–Nov.

Valleys, moist forest margins. Guangdong, Hainan [Vietnam].

The name “Panicum nodosum var. micrantha Balansa” (J. Bot. (Morot) 4: 142. 1890) is a nomen nudum and was therefore not validly published. The combination Ottocloa nodosa var. micrantha was not previously validly published by P. C. Keng (Iconogr. Cormophyt. Sin. 5: 160. 1976) because no reference to the basionym was provided.


弓果黍属 gong guo shu shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Culms creeping, smooth and glabrous, 15–60 cm tall. Leaf sheaths glabrous to pubescent, ciliate on one margin; leaf blades narrowly lanceolate, 5–8.5 × 0.5–1 cm, glabrous to pilose; midvein abaxially distinct, apex acuminate; ligule 1–1.5 mm. Panicle 3–12 × 1–2 cm, contracted, branches ascending, up to 3 cm, pilose with long scattered hairs or hairs mostly confined to the axis; pedicels stout, short. Spikelets reddish brown at maturity, ca. 2 mm, glabrous except for some hairs at the base (hairs up to 2/3 length of lower glume); glumes 3-veined, acute, the lower 1.2–1.5 mm, the upper slightly shorter than spikelet; lower lemma obtuse or truncate; upper lemma yellowish or yellowish brown, smooth and shining. Anthers ca. 1 mm. Fl. and fr. Oct–Mar. 2n = 36.

Damp places in shade, Guangdong, Guangxi, Hainan, Yunnan [Bhutan, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Philipines, Sri Lanka, Thailand, Vietnam; Pacific Islands (Polynesia)].

Culms rambling, smooth and glabrous, 15–50 cm tall. Leaf sheaths glabrous to pubescent, ciliate on one margin; leaf blades linear-lanceolate to narrowly ovate; ligule membranous. Inflorescence an open or contracted panicle. Spikelets asymmetrical, obovate, laterally compressed, florets 2, lower floret sterile, upper floret bisexual; glumes both shorter than spikelet, unequal, membranous to herbaceous, 3–5-veined; lower glume smaller, ovate, clasping, subacute; upper glume boat-shaped, obtuse; lower lemma usually equal to spikelet, 5-veined, nearly straight on the back, its palea small or absent; upper lemma laterally compressed, gibbously semi-oblanceolate, subcoriaceous to crustaceous, smooth or minutely pitted, a little greenish crest near the apex which swells at maturity, upper palea dorsally slightly convex. x = 9.

Eleven species: Old World tropics, in shady places; two species in China.

This genus is a segregate from Panicum distinguished by its laterally compressed, gibbous spikelets with short glumes and a crested upper lemma.

1b. Ottochloa nodosa

Var. Ottochloa nodosa var. micrantha

Annual or perennial. Culms decumbent, rooting at the nodes, much branched and leafy. Leaf blades linear-lanceolate to narrowly ovate; ligule membranous. Inflorescence an open or contracted panicle. Spikelets asymmetrical, obovate, laterally compressed, florets 2, lower floret sterile, upper floret bisexual; glumes both shorter than spikelet, unequal, membranous to herbaceous, 3–5-veined; lower glume smaller, ovate, clasping, subacute; upper glume boat-shaped, obtuse; lower lemma usually equal to spikelet, 5-veined, nearly straight on the back, its palea small or absent; upper lemma laterally compressed, gibbously semi-oblanceolate, subcoriaceous to crustaceous, smooth or minutely pitted, a little greenish crest near the apex which swells at maturity, upper palea dorsally slightly convex. x = 9.

Eleven species: Old World tropics, in shady places; two species in China.

This genus is a segregate from Panicum distinguished by its laterally compressed, gibbous spikelets with short glumes and a crested upper lemma.

1a. Spikelets 2–2.5 mm; upper glume ovate, ca. 1/2 spikelet length, 7-veined; lower lemma 5–7-veined. Fl. and fr. Jul–Nov.

Valleys, moist forest margins. Guangdong, Hainan [Vietnam].

The name “Panicum nodosum var. micrantha Balansa” (J. Bot. (Morot) 4: 142. 1890) is a nomen nudum and was therefore not validly published. The combination Ottochloa nodosa var. micrantha was not previously validly published by P. C. Keng (Iconogr. Cormophyt. Sin. 5: 160. 1976) because no reference to the basionym was provided.


弓果黍属 gong guo shu shu

This species is a very variable species, and specimens with large, diffuse panicles have a different habit from small- or narrowly panicled forms. This difference is acknowledged here at varietal rank, but it should be realized that variation is continuous and intermediates will be encountered.

Spikelets pubescence varies from completely glabrous, through forms with sparse to dense, short, appressed hairs, to forms with some or all of the basal hair tubercles enlarged and prominent. This last-mentioned form has been separated as var. schmidtii (Hackel) A. Cam-
us. It is found throughout the entire size range of the species, and also over the whole geographic range, and is not taxonomically significant.

1a. Panicle up to 17 cm; leaf blades 3–8 × 0.3–1 cm ....................................................... 2a. var. *patens*
1b. Panicle large and diffuse, 16–30 cm; leaf blades 7–15 × 1–2 cm ..................... 2b. var. *latifolium*

2a. *Cyrtococcum patens* var. *patens*
弓果黍 (原变种) gong guo shu (yuan bian zhong)

*Panicum patens* Linnaeus, Sp. Pl. 1: 58. 1753; *Cyrtococcus muricatum* (Retzius) Bor; *C. patens* var. *schmidtii* (Hackel) A. Camus; *C. patens* var. *warburgii* (Mez) Reeder; *C. radicans* (Retzius) Stapf; *C. warburgii* (Mez) Stapf; *Panicum carinatum* J. Presl & C. Presl; *P. muricatum* Retzius; *P. obliquum* Roth ex Roemer & Schultes; *P. radicans* Retzius; *P. schmidtii* Hackel; *P. warburgii* Mez.

Culms 15–30 cm tall. Leaf blades 3–8 × 0.3–1 cm; ligule 0.5–1 mm. Panicle 5–15 cm. Fl. and fr. Sep–Feb. 2n = 18.

Moist places in grasslands and forests. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Jiangxi, Sichuan, Taiwan, Yunnan [Bangladesh, Bhutan, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, Philippines, S Lanka, Thailand, Vietnam; Pacific Islands (Polynesia)].


散穗弓果黍 san sui gong guo shu


Culms up to 60 cm tall. Leaf blades 7–15 × 1.2–2 cm; ligule 1–2 mm. Panicle 16–30 cm. Fl. and fr. autumn–winter. 2n = 36.

Moist places in shade, sometimes forming an undercover. Guangdong, Guangxi, Guizhou, Hunan, Taiwan, Xizang, Yunnan [India, Japan (Ryukyu Islands), Malaysia, Thailand, Vietnam].


刺毛头黍属 ci mao tou shu shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials. Culms decumbent at the base, usually rooting at the nodes. Leaf blades flat, linear-lanceolate. Inflorescence a terminal panicle, spikelets solitary or paired near the base. Spikelets dorsally compressed, florets 2; glumes herbaceous; lower glume shorter than spikelet, 5–7-veined; upper glume subequaling spikelet, 9–11-veined, its apex never thickened; lower lemma similar to upper glume, 11-veined; lower palea oblong, keels ciliate; upper lemma slightly convex on back, cartilaginous, apex obtuse, slightly thickened with several hairs; upper palea cartilaginous, apex pubescent. Caryopsis ellipsoid.

● One species: S China (Hainan).

This genus is similar to *Acroceras* and *Lasiacis* (Grisebach) Hitchcock, but differs in the upper glume apex lacking a thickened crest or woolly hairs, the ciliate keels of the lower palea, and the cartilaginous upper floret bearing several hairs at its apex. The leaf epidermis has similar long cells on both surfaces, dumb-bell-shaped or nodular silica bodies, and parallel-sided stomatal subsidiary cells, confirming the separation of this genus from *Acroceras*.


刺毛头黍 ci mao tou shu shu


Culms 0.6–1 m tall. Leaf sheaths shorter than internodes, compressed, keeled, one margin ciliate; leaf blades 10–15 × 1–1.3 cm, both surfaces glabrous, base slightly rounded, margins thickened and repand, midvein obscure with transverse veins.

● Moist places in forests. Hainan.


风头黍属 feng tou shu shu

Chen Shouliang (陈守良); Sylvia M. Phillips

*Neohusnotia* A. Camus.

Annuals or perennials. Culms decumbent, often rooting near the base. Leaf blades flat, lanceolate or linear-lanceolate, usually with obscure transverse veins; ligule a narrow membrane. Inflorescence of lax racemes along a central axis, sometimes panicle-like due to irregular secondary branching; spikelets paired or rarely single, pedicels of each pair connate at base. Spikelets lanceolate to oblone, plump, dorsally or weakly laterally compressed, glabrous, florets 2; glumes subequal or lower glume shorter, papery; upper
glume and lower lemma thickened and laterally compressed at apex to form a green crest; upper lemma dorsally compressed, crustaceous, smooth or finely striate, apex glabrous with a little green crest; upper palea with reflexed apex slightly protruding from lemma. \(x = 9\).

Nineteen species: throughout the tropics (12 species endemic to Madagascar); two species in China.

*Acroceras* species are grasses of damp, shady situations, recognized by the thickened, green crests at the tips of the spikelet scales. The leaf anatomy contrasts with that of the closely related genus *Setiactis*, with long cells differing in shape on the abaxial and adaxial surfaces, silica bodies short and dumbbell-shaped to cross-shaped, and stomatal subsidiary cells dome-shaped.

1a. Spikelets ca. 4 mm; nodes glabrous; inflorescence with simple racemes ........................................................ 1. *A. munroanum*

1b. Spikelets 5–5.5 mm; nodes pubescent; inflorescence with compound racemes ........................................................ 2. *A. tonkinense*


凤头黍 feng tou shu

*Panicum munroanum* Balansa, J. Bot. (Morot) 4: 140. 1890; *Acroceras crassiapiculatum* (Merrill) Alston; *Panicum crassiapiculatum* Merrill.

Perennial. Culms slender, long, creeping and rooting, the erect tips 15–40 cm tall. Leaf sheaths glabrous or one margin ciliate; leaf blades lanceolate, 3–7 × 0.4–0.9 cm, glabrous or sparsely pilose, base subcordate, margins glabrous, apex acuminate; ligule ca. 0.4 mm. Panicle 4–6 × 2–3 cm; racemes 3–6, short, erect, unbranched; spikelets on short pedicels along racemes and upper part of main axis, usually paired or single toward raceme apex. Spikelets ca. 4 mm, elliptic, stramineous when mature, subglabrous; lower glume broadly ovate, ca. 3.5 mm; upper glume and lower lemma similar, as long as spikelet, 5–7-veined, apex crested, slightly protruding; lower palea hyaline, narrow; upper lemma smooth, shining, 3–3.5 mm. Fl. and fr. Sep–Oct. 2n = 18.

Grassland on hill slopes, light shade of forest margins. Hainan [Cambodia, India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].


山鸡谷草 shan ji gu cao

*Panicum tonkinense* Balansa, J. Bot. (Morot) 4: 140. 1890; *Neohusnotia tonkinensis* (Balansa) A. Camus.

Perennial. Culms up to 100 cm tall, nodes densely pubescent with soft white hairs. Leaf sheaths glabrous or with tuber- cle-based hairs, one margin tuberculate-ciliate; leaf blades lanceolate, 10–20 × 1–3 cm, glabrous or abaxial surface pilose, margins thickened, pectinate-ciliate at base, scabrous, midvein prominent abaxially, apex narrowly acuminate; ligule ca. 1 mm, obtuse. Panicle open, 15–25 × 5–10 cm, axis and branches stiff, scabrous; racemes ascending, with secondary branching; spikelets widely spaced, paired or single in upper part. Spikelets 5–5.5 mm; lower glume broadly elliptic, 3/4 spikelet length, 5-veined; upper glume and lower lemma as long as spikelet, 5-veined, apex slightly thickened; lower palea hyaline, narrow; upper lemma smooth, shining, slightly shorter than spikelet, apex thickened and protruding. Fl. and fr. Aug–Oct.

Moist places in forest shade. Hainan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

This is a more robust species than *Acroceras munroanum*, with larger leaves and harshly scabrous leaf margins and inflorescence.

### 163. ECHINOCHLOA P. Beauvois, Ess. Agrostogr. 53. 1812, nom. cons.

稗属 bai shu

Chen Shouliang (陈守良); Sylvia M. Phillips

*Temia* Adanson, nom. rej.

Annual or perennial. Culms often coarse and robust. Leaf blades flat, linear or broadly linear; ligule absent (ciliate in some species outside China). Inflorescence composed of racemes along a central axis; racemes simple or compound, densely spicate, spikelets paired in 4 rows, or congested on secondary racemes. Spikelets narrowly elliptic to subround, plump, plano-convex, often hispidulous or spinulose, acute to awned; lower glume triangular, 1/3–1/2(–3/5) spikelet length, sheathing; upper glume and lower lemma equaling the spikelet or upper glume somewhat shorter in cultivated forms, prominently 5–7-veined, acute to rostrate or lower lemma extended into a stout awn; upper lemma coriaceous, smooth, shining, terminating in a short, laterally compressed, incurving beak; upper palea acute, apex briefly reflexed. \(x = 9\).

About 35 species: tropical and warm-temperate regions of the world; eight species (at least one introduced) in China.

The reflexed upper palea tip, although a very tiny character, is nevertheless important for distinguishing *Echinochloa* from neighboring genera, especially *Brachiaria*. The absence of a ligule is also a good spot character for recognition of the genus in China.

Species of *Echinochloa* typically grow in aquatic or moist situations. Several have become widespread weeds, especially of irrigated crops, and two are sometimes cultivated as minor cereals.

1a. Grain persisting at maturity; spikelets plumply ovate; branches of inflorescence incurving; cultivated plants.

2a. Spikelets dark greenish when mature, awnless; racemes rather spaced, simple .............................................. 1. *E. frumentacea*
2b. Spikelets purplish brown when mature, acute to awned, awn 0.5–2 cm; racemes very dense, closely branched, usually branched .......................................................... 2. E. esculenta

1b. Grain readily deciduous at maturity; spikelets ovate, ovate-lanceolate or ovate-elliptic; branches of inflorescence not incurving; wild plants.

3a. Lower lemma convex, hard and shining ................................................................. 6. E. glabrescens
3b. Lower lemma flat on the back, herbaceous.

4a. Spikelets ovate, 3.8–6 mm; culms erect, forming narrow tuft ........................................ 3. E. oryzaoides
4b. Spikelets elliptic-ovate, mostly 2–4 mm; culms spreading, forming loose tuft.

5a. Racemes neatly 4-rowed, simple, openly spaced, often erect; spikelets awnless, acute, 2–3 mm .......... 4. E. colona
5b. Racemes unduly 2–to several-rowed, at least the longer often with short branchlets; spikelets acuminate to shortly awned, 2–4 mm.

6a. Racemes distinctly compound with many short branchlets; spikelets 2–3 mm; awn of lower lemma 1–1.5 cm .......................................................... 5. E. crusgalli
6b. Racemes simple or only inconspicuously branched; spikelets 2.5–4 mm; lower lemma acute to long-awned.

7a. Inflorescence green or purple-tinged, moderately dense; spikelets 3–4 mm; lower lemma acuminate or awned ............................................................. 7. E. crusgalli
7b. Inflorescence dark purple, very dense; spikelets 2.5–3 mm; lower lemma awned, awn 3–5 cm ........................................................................................................ 8. E. caudata


Annual. Culms robust, erect, 1–1.5 m tall. Leaf sheaths smooth and glabrous; leaf blades linear, soft, 15–40 × 1–2.4 cm, glabrous, margins thickened and wavy. Inflorescence erect, lanceolate, 10–20 cm, axis robust, scabrous along edges and with tubercle-based hairs; racemes 2–6 cm, robust, usually branched, closely spaced and overlapping. Spikelets purplish, tardily deciduous, plump, ovate or ovate-elliptic, 3.5–4 mm, hispid along veins with tubercle-based hairs; lower glume 1/3 as long as spikelet, acute; upper glume slightly shorter than spikelet; lower lemma herbaceous, sterile, acute or with a 0.5–2 cm awn; upper lemma 2.8–3.5 mm. Caryopsis long persistent, eventually falling. Fl. and fr. Aug.–Oct. 2n = 54, 56, 72.

A crop plant. Guizhou, Hubei, Yunnan [cultivated in warm-temperate regions of Asia and Africa; introduced in America].

Echinochloa esculenta is cultivated both for grain and forage, like E. frumentacea, and the two are most easily distinguished by the color of the seed heads. Echinochloa esculenta is thought to be a cultivated derivative of E. crusgalli that arose in China, Japan, and Korea.


Annual. Culms erect, 1–1.5 m tall. Leaf sheaths smooth and glabrous; leaf blades linear, soft, 20–50 × 1.2–2.5 cm, glabrous, margins thickened and wavy. Inflorescence erect, lanceolate, 10–30 cm, axis robust, scabrous along edges and with tubercle-based hairs; racemes 2–6 cm, robust, usually branched, closely spaced and overlapping. Spikelets purplish, tardily deciduous, plump, ovate or ovate-elliptic, 3.5–4 mm, hispid along veins with tubercle-based hairs; lower glume 1/3 as long as spikelet, acute; upper glume slightly shorter than spikelet; lower lemma herbaceous, sterile, acute or with a 0.5–2 cm awn; upper lemma 2.8–3.5 mm. Caryopsis long persistent, eventually falling. Fl. and fr. Aug.–Oct. 2n = 54.
A weed of rice fields. Anhui, Guangdong, Guizhou, Hainan, Hebei, Henan, Hunan, Jiangsu, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan [India, Indonesia, Japan, Kazakhstan, Korea, Kyrgyzstan, Pakistan, Russia, Turkmenistan, Uzbekistan; Europe, America].

*Echinochloa oryzoides* is adapted as a weed of rice (*Oryza*), which it resembles in habit. A variant from ricefields in Italy has a dense band of hairs on the outer side of the leaf sheath and blade junction, particularly on the lower leaves. This is the basis of the name *E. phyllopoagan*.


光头稗 *guang tou bai*


Annual. Culms erect or ascending, up to 60 cm or more tall. Leaf sheaths compressed and keeled; leaf blades linear, flat, 3–20 × 0.3–0.7 cm, glabrous, sometimes with transverse purple bands, margins slightly scabrous, apex acute. Inflorescence narrow, 5–10 cm; racemes 1–2 cm, erect or sometimes stiffly diverging, simple, separated or overlapping by up to half their length or more, rachis usually without long, tubercle-based hairs, spikelets tightly congested in 4 neat rows. Spikelets plumply ovate-oblong, 2–3 mm, hirtellous, sharply acute; lower glume ca. 1/2 as long as spikelet; lower lemma狭窄 sterile, herbaceous, acuminate or extended into an awn to 3 cm; branches mostly compound, spikelets loosely to densely crowded. Spikelets purple-tinged, ovate-lanceolate, 2–3 mm, hispid on veins, the hairs not tubercle-based; lower glume 1/3–2/5 as long as spikelet; upper glume rostrate; lower lemma sterile, herbaceous, 5–7-veined, with a stout, 1–1.5 cm awn; upper lemma 2–2.5 mm. Fl. and fr. summer-autumn. 2n = 36.

A weed of damp places and irrigated fields. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [warm regions throughout the world].

*Echinochloa colona* is a widespread, weedy species, distinguished by its short, neat, usually rather openly spaced racemes of rounded, awnless spikelets.


孔雀稗 *kong que bai*

donis* (Kunth) Nees.

Perennial or rarely annual. Culms robust, usually decumbent at base and forming a large clump, 1.2–1.8 m tall. Leaf sheaths loose, smooth and glabrous; leaf blades linear, lush, 10–40 × 1–1.5 cm, glabrous, midrib broad and white, margins harshly scabrous. Inflorescence nodding, large, loose, 15–25 cm; branches mostly compound, spikelets many, crowded on secondary branchlets. Spikelets purple-tinged, ovate-lanceolate, 2–3 mm, hispid on veins, the hairs not tubercle-based; lower glume 1/3–2/5 as long as spikelet; upper glume rostrate; lower lemma sterile, herbaceous, 5–7-veined, with a stout, 1–1.5 cm awn; upper lemma 2–2.5 mm. Fl. and fr. summer-autumn. 2n = 36, 54.

Streamsides and other damp places. Anhui, Fujian, Guangdong, Guizhou, Hainan, Shaanxi, Sichuan [throughout the tropics].

This is a segregate from *Echinochloa crusgalli* with a larger, more branched inflorescence and smaller spikelets.


硬稃稗 *ying fu bai*

*Echinochloa crusgalli* (Linnaeus) P. Beauvois var. *formosaensis* Ohwi; *E. glabrescens* var. *barbata* Kossenko; *E. glabrescens* var. *glabra* Kossenko; *E. glabrescens* var. *pilosa* Kossenko; *E. micans* Kossenko; *E. pachychloa* Kossenko.

Culms erect or slightly decumbent at base, 50–120 cm tall. Leaf sheaths smooth and glabrous; leaf blades stiffly erect, linear, flat, 10–30 × 0.6–1.2 cm, glabrous, margins thickened, apex acuminate. Inflorescence narrow, 8–15 × 1–2(–3) cm; racemes 1–4 cm, simple. Spikelets light green, 3.5–5 mm, awnless orawned; glumes 5-veined; lower glume 1/3–1/2 as long as spikelet, acute; upper glume equal to spikelet, inconspicuously scabrous to shortly hispid along veins, cuspidate to awn-tipped; both lemmas coriaceous, hard and shining, especially down the center, the lower cuspidate to awned. Fl. and fr. summer-autumn. 2n = 54.

Damp places, streams. Guangdong, Guangxi, Guizhou, Jiangsu, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, NE India, Japan, Korea, Nepal; Africa].

This is an extreme variant from the *Echinochloa crusgalli* gene pool distinguished by the hard, glossy lower floret.


稗 *bai*

Annual. Culms coarse, erect or geniculately ascending, 20–150 cm tall. Leaf blades linear, 5–40 × 0.2–1.2 cm, usually glabrous, smooth except for scabrous margins, apex acute. Inflorescence erect, lanceolate to ovate or pyramidal, 6–22 cm; racemes 2–10 cm, usually ascending, simple or the longest with inconspicuous branchlets near the base, rachis usually with tubercle-based setae, spikelets loosely to densely crowded. Spikelets green or purplish, ovate, 2.5–4 mm, spinulose along veins; lower glume ca. 1/3 as long as spikelet, acute; lower lemma sterile, herbaceous, acuminate or extended into an awn to 3 cm; upper lemma pale brownish at maturity, elliptic. Fl. and fr. summer-autumn. 2n = 36, 48, 54, 72.

Damp weedy places, stream sides, rice fields. Throughout China [warm-temperate and subtropical regions of the world].

*Echinochloa crusgalli* is a widespread, polymorphic weed with many intergrading variants. The following varieties may be recognized in China:

1a. Racemes with some secondary branching.

2a. Racemes soft; awn of lower lemma

5–15(–30) mm ...................... 7a. var. *cruspavonis*

2b. Racemes stiff; awn of lower lemma

absent or less than 5 mm .................. 7b. var. *mitis*

1b. Racemes all simple.
3a. Spikelets 3–4 mm, awnless........ 7c. var. zelayensis
3b. Spikelets 2.5–3 mm, awnless or with awn less than 5 mm.
4a. Leaf blades 2–5 mm broad; racemes erect, appressed to axis ..........  7d. var. austrojaponensis
4b. Leaf blades 4–10 mm broad; racemes ascending.
5a. Spikelets green ............ 7e. var. breviseta
5b. Spikelets purplish ..........  7f. var. praticola

7a. Echinochloa crusgalli var. crusgalli

无芒稗 wu mang bai

Panicum crusgalli Linnaeus, Sp. Pl. 1: 56. 1753; Echinochloa hispidula (Retzius) Nees; Milium crusgalli (Linnaeus) Moench; Panicum hispidulum Retzius; Pennisetum crusgalli (Linnaeus) Baumgarten.

Culms 50–150 cm tall. Leaf blades 10–40 × 0.5–2 cm. Inflorescence pyramidal, 6–20 cm; axis scabrous or with tubercle-based setae; racemes ascending, soft. Spikelets 3–4 mm, veins with tubercle-based setae; lower lemma with 5–15(–30) mm awn.

Damp weedy places, streamsides, rice fields. Throughout China [warm-temperate and subtropical regions of the world].

7b. Echinochloa crusgalli var. mites (Pursh) Petermann, Fl. Lips. Excurs. 82. 1838.

无芒稗 xi ye han bai

Panicum crusgalli var. mite Pursh, Fl. Amer. Sept. 66. 1813 ["1814"]; Echinochloa crusgalli subsp. spiralis (Vasinger) Tzvelev; E. spiralis Vasinger.

Culms robust, erect, 50–120 cm tall. Leaf blades 20–30 × 0.6–1.2 cm. Inflorescence 10–20 cm; racemes ascending or spreading, stiff, usually branched. Spikelets ca. 3 mm, awnless or with an awn less than 5 mm.

Roadsides, streamsides. Throughout China [warm-temperate and subtropical regions of the world].


西来稗 xi lai bai


Culms 50–75 cm tall. Leaf blades 5–20 × 0.4–1.2 cm. Inflorescence 11–19 cm. Spikelets 3–4 mm, hispid along veins but without tubercle-based setae; lower lemma usually awnless.

Streams, rice fields. Throughout China [America].


小旱稗 xiao han bai

Culms 20–40 cm tall. Leaf blades often involute, 0.2–0.5 cm broad. Inflorescence narrow; racemes short, erect, appressed to axis. Spikelets purplish, 2.5–3 mm, hispid along veins; lower lemma awnless or with a short awn.

Streams, damp grasslands. Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Taiwan, Yunnan, Zhejiang [Japan (Ryukyu Islands), Philippines].

7e. Echinochloa crusgalli var. breviseta (Döll) Podpéra, Kvetena Moravy 6: 475. 1926.

短芒稗 duan mang bai


Culms 30–70 cm tall. Leaf blades 8–15 × 0.4–0.6 cm. Inflorescence narrow, 8–10 cm. Spikelets green, ca. 3 mm, hispid along veins; lower lemma awnless or with a short awn less than 5 mm.

Grasslands. Guangdong, Taiwan [India, Malaysia, Sri Lanka; Africa].


细叶旱稗 xi ye han bai

Echinochloa crusgalli subsp. submutica (Meyer) Honda; Panicum crusgalli var. submuticum Meyer.

Culms usually purplish at base, 20–70 cm tall. Leaf blades 0.4–1 cm broad. Racemes simple, short, loose. Spikelets purplish, 2.5–3 mm, hispid along veins or with tubercle-based setae; lower lemma awnless.

Roadsides and other disturbed places. Anhui, Guangxi, Guizhou, Hebei, Hubei, Jiangsu, Taiwan, Yunnan [Japan].

This variety grows in rather drier conditions than the other varieties.


长芒稗 chang mang bai

Echinochloa crusgalli (Linnaeus) P. Beauvois subsp. caudata (Roshevitz) Tzvelev; E. crusgalli var. caudata (Roshevitz) Kitagawa.

Annual. Culms forming small dense tufts, 1–2 m tall. Leaf sheaths glabrous to tuberculate-hairy; leaf blades broadly linear, 10–40 × 1–2 cm, glabrous, margins thickened and scabrous. Inflorescence slightly nodding, spikelets dense, 10–25 × 1.5–4 cm, axis scabrous and bearing long tubercle-based setae. Spikelets purplish, ovate-elliptic, 2.5–4 mm; lower glume 1/3–2/5 as long as spikelet, acuminate; upper glume equaling spikelet, 5-veined, with a stout 0.1–0.2 mm macro; lower lemma herbaceous, loosely hispid along veins, awn 3–5 cm; upper lemma coriaceous. Fl. and fr. summer–autumn.

Streams, fields, roadsides. Anhui, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Nei Mongol, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East)].

This is a segregate from Echinochloa crusgalli with a very dense, purple inflorescence and long awns.

**毛颖草属** **mao ying cao shu**

**Chen Shouliang** (陈守良); **Sylvia M. Phillips**

Annuals or perennials. Culms erect or decumbent. Leaf blades convolute, linear or lanceolate. Inflorescence composed of slender racemes, these digitate or in whorls on a short common axis, each raceme with a weakly unilateral, narrowly trigramous rachis, spikelets in pairs or clusters. Spikelets ovate to elliptic, dorsally compressed, florets 2; glumes unequal, acute to briefly awned; lower glume 1/2 spikelet length, membranous, 3-veined; upper glume as long as spikelet, herbaceous, 5–7-veined, ciliate along margins; lower floret staminate, lemma herbaceous, glabrous; lower palea much shorter than the anthers, bifid; upper lemma cartilaginous, margins inrolled, shortly awned; upper palea acute, the flaps basally auriculate. Caryopsis ellipsoid.

Five species: tropical and S Africa, India, SE Asia, Australia; two species in China.

*Allotropis* is best distinguished from other panicle genera by its avned spikelets and ciliate upper glume.

1a. Tussocky perennial; leaf blades linear, base narrow, margins smooth; raceme rachis pilose .......................... 1. *A. semialata*  
1b. Annual; leaf blades lanceolate, base cordate, margins pectinate; raceme rachis glabrous ........................................... 2. *A. cimicina*  


**毛颖草** **mao ying cao**

Perennial, tussocky from a short rhizome. Culms slender, erect, 30–70 cm, nodes bearded. Basal leaf sheaths persistent, densely and conspicuously silky hairy; leaf blades linear, flat or convolute, stiff, 10–50 × 0.1–1 cm, abaxial surface glabrous, adaxial surface sparsely to densely hairy, base narrow; ligule ca. 1 mm. Inflorescence digitate; racemes 2–4, 4–12 cm, narrowly ascending, racis pilose, spikelets grouped on pedicels of varying length. Spikelets lanceolate, 5–6 mm, pale to dark brown, sometimes with transverse banding; glumes sharply acute to shortly awned; lower glume ovate; upper glume margins ciliate, occasionally winged; lower lemma with a small palea corresponding to a thin triangular basal patch on the lemma; upper lemma ovate-lanceolate, ca. 4 mm, smooth, with a rigid 2–3 mm awn-point. Anthers orange, ca. 3 mm. Fl. and fr. Feb–Aug. 2n = 18.

Hill slopes. Fujian, Guangdong, Guangxi, Sichuan, Taiwan, Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Thailand, Vietnam; Africa, Pacific Islands].

*Allotropis semialata* is a polymorphic species, and is unique among grasses in possessing leaf anatomy corresponding to both C$_3$ and C$_4$ photosynthetic types. These physiological variants correspond very approximately to the color variants recognized below, which have been raised to subspecific rank for that reason. However, other morphological characters that have been used to separate the subspecies in South Africa do not result in a division into two taxa in China, so the subspecies are not upheld here. Investigations in South Africa have shown var. *eckloniana* to be diploid (2n = 18), whereas var. *semialata* comprises a polyploid series from tetraploid to octoploid.

1a. Lower lemma pale; racemes with loosely arranged spikelets ................................. 1a. var. *semialata*  
1b. Lower lemma purplish brown or with dark transverse bands; racemes with congested spikelets .......................... 1b. var. *eckloniana*  

1a. **Allotropis semialata** var. *semialata*  

**毛颖草** **mao ying cao** (原变种) **yuan bian zhong**


**紫纹毛颖草** **zi wen mao ying cao**


Hill slopes. Guangdong, Guangxi, Yunnan [India, Indonesia; Malaysia; Africa, Pacific Islands].


**臭虫草** **chou chong cao**

*Miliarium cimicinum* Linnaeus, Mant. Pl. 184. 1771; *Axonopus cimicinus* (Linnaeus) P. Beauvois; *Panicum cimicinum* (Linnaeus) Retzjus; *Urochloa cimicina* (Linnaeus) Kunth.

Annual. Culms tufted, ascending, up to 60 cm tall. Leaf sheaths tuberculate-hispid; leaf blades lanceolate, cordate, 3–10 × 1–2 cm, abaxial surface pectinate-setose along margins and veins, adaxial surface glabrous; ligule ca. 1 mm, ciliate. Inflorescence digitate; racemes 4–6, 10–15 cm, narrowly ascending, rachis glabrous, bare of spikelets in the lower part, spikelets paired or single. Spikelets elliptic, 3.5–5.5 mm, pale green; low-
er glume ovate-lanceolate, ca. 2 mm, acuminate; upper glume papery, elliptic, shiny, margins ciliate with silvery white or pinkish hairs, apex caudate; lower lemma similar to upper glume but thicker and glabrous; upper lemma ovate-elliptic, 3/5 spikelet length, obtuse with a fine scabrous 2–3 mm awn; upper palea papillose with swollen lacrimiform hairs. Anthers purple, ca. 1 mm. Fl. Sep. 2n = 36.

Weedy places, dry open forest. Hainan [Cambodia, India, Indonesia, Malaysia, Myanmar, New Guinea, Sri Lanka, Thailand; Africa, Australia, Pacific Islands].

165. BRACHIARIA (Trinius) Grisebach, Ledebour, Fl. Ross. 4: 469. 1853.

臂形草属 bi xing cao shu

Chen Shouliang (陈守良), Sylvia M. Phillips

*Brachiaria* is sometimes included within *Urochloa*, but usually they can be distinguished without difficulty.

1a. Culms robust, up to 2 m tall; inflorescence with 10–20 racemes ................................................................. 1. *B. mutica*
1b. Culms slender, up to 60 cm tall; inflorescence with less than 10 racemes.

2a. Inflorescence with erect appressed racemes; fertile floret smooth and shiny, obtuse, readily falling from spikelet ................................................................. 2. *B. cruciformis*
2b. Inflorescence with spreading racemes; fertile floret rugulose, acute to mucronate, persistent within the spikelet.

3a. Spikelets 1.5–2.7 mm; leaf blades broadly lanceolate, 1–4 cm long.
3b. Spikelets 2.5–4 mm; leaf blades lanceolate or linear-lanceolate, 4–15 cm long.

4a. Spikelets elliptic, 2–2.7 mm .................................................................................................................. 4. *B. villosa*
4b. Spikelets ovate, gibbous, 1.5–2 mm .................................................................................................. 4. *B. semiundulata*

5a. Spikelets paired, one subsessile and one pedicelled ...................................................................... 5. *B. ramosa*
5b. Spikelets single (except sometimes at raceme base).

6a. Rachis of racemes triquetrous, 0.2–0.4 mm wide; spikelets herbaceous, pubescent or glabrous.
6b. Rachis of racemes flat on back, 0.4–0.5 mm wide; spikelets cartilaginous, glabrous or almost so.

7a. Spikelets contiguous, 3.8–4 mm, pubescent ............................................................................. 6. *B. fusiformis*
7b. Spikelets distant, 2.5–3.5 mm, glabrous .............................................................................. 7. *B. kurzii*

8a. Lower glume 1/3–1/2 spikelet length, separated from upper glume by a short internode; upper lemma subacute .............................................................. 8. *B. subquadripura*
8b. Lower glume 1/2–3/5 spikelet length, not separated from upper glume; upper lemma mucronate ................................................................. 9. *B. urchoiooides*


巴拉草 ba la cao

*Panicum muticum* Forsskål, Fl. Aegypt.-Arab. 20. 1775; *Brachiaria purpurascens* (Raddi) Henrard; *P. barbinode* Trinius; *P. purpurascens* Raddi; *Urochloa mutica* (Forsskål) T. G. Nguyen.

Robust perennial. Culms stout, trailing and rooting freely from lower nodes, ascending to 2 m, 5–8 mm in diam., nodes densely villous. Leaf sheaths villous or glabrous; leaf blades broadly linear, 10–30 × 1–2 cm, thinly pilose or subglabrous; ligule membranous, 1–1.3 mm. Inflorescence axis 7–20 cm; racemes 10–20, 5–15 cm, single, paired or grouped; rachis narrow, winged, scabrous; spikelets paired or single in upper part of raceme, in untidy rows or sometimes on short secondary branchlets in lower part of raceme; pedicels usually setose. Spikelets elliptic, green or purplish, 2.5–3.5 mm, glabrous, acute; lower glume triangular, 1/4–1/3 spikelet length, 1-veined; upper glume 5-veined; upper lemma rugulose, apex obtuse. Fl. and fr. Aug.–Nov.

Forming a dense cover along streams and in other wet places, sometimes forming floating rafts. Fujian, Hong Kong, cultivated in Taiwan [tropical Africa and America].

This is a forage grass (Para Grass) widely cultivated in tropical regions of the world and often found as a naturalized escape. Its country of origin is unknown.


臂形草 bi xing cao

*Panicum cruciforme* Smith in Sibthorp & Smith, Fl. Gra-
is clearly synonymous and has statutory priority.


无毛臂形草 wu mao bi xing cao

Culms ca. 50 cm. Leaf sheaths and blades glabrous except for ciliolate sheath margins. Spikelets glabrous, apex without white beard (but pedicels loosely hirsute).

- Roadsides, grassy places; ca. 800 m. Yunnan.


短颖臂形草 duan ying bi xing cao


Annual. Culms loosely tufted, slender, decumbent at base, rooting at lower nodes, 20–50 cm tall. Leaf sheaths pubescent; leaf blades ovate-lanceolate, 1–3 × 0.1–0.8 cm, both surfaces densely pubescent, margins ciliato-serrate; ligule ciliate. Inflorescence axis 2–7 cm; racemes 5–8, 0.5–2 cm, ascending; rachis tritiquetrous, setose; spikelets single, in neat 2 rows, overlapping. Spikelets ovate, plump, strongly gibbous on abaxial side, flat on adaxial side, 1.5–2 mm, glabrous to pubescent, subacutate; lower glume 1/3–2/5 spikelet length, 3-veined; upper glume 4/5 spikelet length, 5-veined; upper lemma swollen, striate, transversely rugulose, apex acute. Fl. and fr. Jul–Oct.

Mountain slopes, fields. Hainan, Yunnan [tropical Africa, S Asia].


多枝臂形草 duo zhi bi xing cao


Annual. Culms tufted, loosely ascending, 30–60 cm tall. Leaf sheaths glabrous to pubescent; leaf blades narrowly lanceolate, 4–12 × 0.4–0.8 cm, velvety-pubescent, margins thickened and slightly wavy, scaberulous, apex acuminate; ligule

Annual. Culms loosely tufted, slender, much branched, generically ascending, 30–40 cm tall, nodes softly hairy. Leaf sheaths glabrous or loosely puberulous-hairy; leaf blades linear-lanceolate, 1.5–10.5 × 0.3–0.6 cm, glabrous or pilose; ligule ciliate. Inflorescence axis 3–6 cm; racemes 4–10, 1–3 cm, erect or narrowly ascending; rachis narrow, tritiquetrous, ciliate or scabrous; spikelets single, in 2 rows, overlapping. Spikelets elliptic, 1.8–3 mm, pilose, subacute; lower glume 0.2–0.3 mm, membranous, glabrous; upper glume and lower lemma as long as spikelet, 5-veined; upper floret readily deciduous, oblong, membranous, glabrous; lower glume and lower lemma as long as spikelet, 5-veined; upper floret readily deciduous, oblong, membranous, glabrous; lower glume and lower lemma as long as spikelet, 5-veined; upper floret readily deciduous, oblong, membranous, glabrous.

This is the only species of _Brachiaria_ occurring in China with a fertile floret which is shed from the mature spikelet. The fertile floret is also distinctive due to its smooth, glossy texture and obtuse apex.

This species and two close relatives in Africa have been placed in the separate genus _Moorochloa_ Veldkamp.


毛臂形草 mao bi xing cao

Annual. Culms loosely tufted, slender, usually decumbent and branching below, 10–40(–50) cm tall. Leaf sheaths glabrous or pubescent, especially along margins and mouth; leaf blades broadly lanceolate, 1–4 × 0.3–1 cm, both surfaces glabrous to densely pubescent, base rounded or subcordate, margins cartilaginous, scabrous, apex acute; ligule ciliate. Inflorescence axis 3–7 cm; racemes 4–10, (1–)3–6 cm, secund, ascending; rachis triquetrous, ± villous; spikelets mostly single. Spikelets elliptic, 2–2.7 mm, without a stipe, glabrous or pubescent, sometimes transversely bearded below apex, acute or subacute; lower glume 1/3–1/2 spikelet length, clasping, 3-veined, acute; upper glume separated from lower by a slight internode, 5-veined; upper lemma striate and transversely rugulose, apex acute to minutely mucronate. Fl. and fr. Jul–Oct. 2n = 18.

Open and disturbed situations on hill slopes and in dry fields as an arable weed. Fujian, Hainan, Yunnan [India, Malaysia, Thailand; N Africa, Mediterranean region].

this is a weedy species recognizable by its short, broad, usually softly hairy leaf blades and secund racemes of rather small spikelets.
short, ciliate. Inflorescence axis 6–13 cm; racemes 3–6, 2–5 cm, loosely erect to ascending; rachis triquetrous, hispid; spikelets mostly borne in loosely contiguous pairs, one spikelet subsesile, the other shortly pedicelled, single toward raceme apex, lightly appressed to axis. Spikelets elliptic, 2.5–3.5 mm, with a 0.1–0.5 mm basal stipe, glabrous, pubescent or hispidulous, acute to cuspidate; lower glume broadly ovate, 1/3–1/2 spikelet length, 5-veined; upper glume 5–7-veined; upper lemma distinctly rugose, apex acute. Fl. and fr. summer–autumn. 2n = 32, 36.

Grasslands, hill slopes, weedy places. Hainan, Yunnan [Bhutan, Cambodia, India, Malaysia, Nepal, Pakistan, Thailand, Taiwan, Vietnam; Africa].


细毛臂形草  xi mao bi xing cao

Brachiaria subquadripara var. setulosa S. L. Chen & Y. X. Jin; Urochloa fusiformis (Reeder) Veldkamp.

Annual. Culms loosely tufted, branching, 30–50 cm tall, basal internodes purplish, pubescent, upper internodes glabrescent. Leaf sheaths densely pilose; leaf blades lanceolate, 4–5.5 × 0.7–0.9 cm, densely pilose, base rounded, margins cartilaginous, scaberulous and spinulose, apex acute; ligule 0.5–1.5 mm. Inflorescence axis 6–8 cm, pubescent; racemes 4–5, 3–5 cm, narrowly ascending to suberect, lowestmost with basal racemelets; rachis triquetrous, 0.3–0.4 mm wide; spikelets single, their own length apart or overlapping; pedicels setose. Spikelets narrowly obovate, 3.8–4 mm, with a 0.3–0.5 mm basal stipe, herbaceous, softly pubescent, strongly veined, apex sharply contracted; lower glume 1/2 spikelet length, clasper, 3–5-veined, obtuse; upper glume as long as spikelet, 5-veined, cross veinlets toward apex; lower lemma similar to upper glume, back flat to slightly sulcate; upper lemma shorter than spikelet, inconspicuously punctate–rugulose, apex acute, minutely scabrous-pubescent, slightly crested.

Mountain slopes. Yunnan (Yongsheng) [Indonesia, New Guinea, Philippines].

The Chinese population of this little-known species has larger spikelets than specimens from tropical SE Asia, but is otherwise typical. In the Philippines the spikelets have an apical fringe of longer hairs, but is otherwise typical. The Chinese population has larger spikelets than specimens from tropical SE Asia, but is otherwise typical.

The Chinese population of this little-known species has larger spikelets than specimens from tropical SE Asia, but is otherwise typical. In the Philippines the spikelets have an apical fringe of longer hairs, but is otherwise typical.


无名臂形草  wu ming bi xing cao


Annual. Culms decumbent or short stoloniferous, rooting at lower nodes, 15–60 cm long, nodes pubescent. Leaf sheaths glabrous, outer margin ciliate; leaf blades lanceolate, 5–8 × 0.8–1.8 cm, sparsely pilose, base cordate, margins thickened, setose near base, apex acuminated. Inflorescence axis 5–8 cm; racemes 3–7, 5–7.5 cm, divergent, the lower with short racemelets bearing 2 (or infrequently more) spikelets; rachis triquetrous, 0.2–0.4 mm wide, with scattered bristles; spikelets single, distinct; pedicels scabrid. Spikelets elliptic, 2.5–3.5 mm, glabrous, apex acute; lower glume ovate, 1/3 spikelet length, clasp, 3–5-veined, obtuse; upper glume 1/2 spikelet length, 7-veined, acuminate; lower lemma similar to upper glume, as long as spikelet, 5–7-veined, acute; upper lemma shorter than spikelet, rugose, apex briefly apiculate.

Thickets; ca. 1400 m. Yunnan (Jianshui) [India, Indonesia, Thailand; Australia (Queensland)].


四生臂形草 si sheng bi xing cao

Annual or short-lived perennial. Culms slender, straggling, rooting at lower nodes, 20–60 cm tall, nodes pubescent. Leaf sheaths loose, glabrous or with tubercle-based hairs or ciliate margins; leaf blades lanceolate or linear-lanceolate, 4–15 × 0.4–1 cm, glabrous or pubescent, base subrounded, margins thicker and scabrous, apex acute or acuminate. Inflorescence axis 3–10 cm; racemes 3–6, 2–4 cm, divergent to reflexed; rachis flat, 0.7–1 mm wide, narrowly winged, nearly glabrous; spikelets single, in 2 rows; pedicels glabrous. Spikelets elliptic to narrowly obovate, (3–)3.5–4 mm, glabrous, acute; lower glume broadly ovate, 1/3–1/2 spikelet length, 5–7-veined; upper glume separated from lower glume by a short internode, 5–7-veined; upper lemma finely rugose, apex subacute. Fl. and fr. Sep–Nov. 2n = 72.

Hill slopes, grassy places, fields, open forests. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, Yunnan [tropical Asia, Australia, Pacific Islands].

This species is a troublesome weed.

8a. Brachiaria subquadripara var. subquadripara

四生臂形草(原变种) si sheng bi xing cao (yuan bian zhong)

Panicum subquadriparum Trinius, Gram. Panic. 145. 1826; P. pseudodistachyum Hayata; Urochloa subquadripara (Trinius) R. D. Webster.

Leaf sheaths and blades usually glabrous, rarely with tubercle-based hairs on sheaths or pubescent on both surfaces of blades. Petioles glabrous. Spikelets elliptic, broadest in middle, glabrous. Fl. and fr. Sep–Nov.

Mountain slopes, grassy places, fields, open forests. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan [tropical Asia, Pacific Islands].

8b. Brachiaria subquadripara var. miliiformis

四生臂形草 si sheng bi xing cao

Panicum miliiforme (Presl) Reliq. Haenk. 1: 300. 1830; Brachiaria miliiformis (Presl) A. Chase.
Leaf sheaths glabrous or loosely tuberculate-hairy or margins ciliate. Pedicels glabrous. Spikelets narrowly obovate, broadest above middle, 3–3.5 mm, acute. Fl. and fr. autumn. 2n = 54–56, 72.

Roadsides, grassy places. Hong Kong, Yunnan [India, Malaysia, Sri Lanka].


Annual. Culms slender, decumbent and rooting at base, branching, 40–60 cm tall. Leaf sheaths glabrous or with tubercle-based hairs, ciliate along one margin; leaf blades linear-lanceolate, 5–9 × 0.3–0.5 cm, both surfaces with tubercle-based hairs, margins cartilaginous, scabrous, apex acute; ligule ciliate, hairs ca. 1 mm. Inflorescence axis 1–2.5 cm; racemes 2–4, 1.5–3 cm, secund, ascending; rachis scarcely winged, 0.5–0.6 mm wide, scabrous on edges; spikelets single or paired in the lower part. Spikelets lanceolate, 3.5–4 mm, without a stipe, subglabrous, abruptly acuminate; lower glume ovate, 1/2–3/5 spikelet length, clasping, 3–5-veined, acute; upper glume 5-veined, thinly pubescent near margins; upper lemma clearly shorter than spikelet, ca. 2.5 mm, rugulose, apex mucronate. Fl. and fr. May–Oct.

- Grassy places. S Yunnan.

This species resembles Urochloa in its mucronate upper lemma, but the lower glume is adaxial and characters of the leaf epidermis show it to be better placed in Brachiaria.

166. UROCHLOA P. Beauvois, Ess. Agrostogr. 52. 1812.

尾稃草属 wei fu cao shu
Chen Shouliang (陈守良); Sylvia M. Phillips

Annuals or perennials, often coarse and weedy. Leaf blades linear to broadly lanceolate; ligule a ciliate membrane. Inflorescence composed of racemes along a central axis; spikelets single or paired on a flattened or triquetrous rachis. Spikelets lanceolate or elliptic, plano-convex, cuspidate to acuminate, florets 2; lower glume abaxial, variable in length; upper glume and lower lemma similar, as long as spikelet, membranous to firmly papery; upper lemma coriaceous, rugulose or granular, margins inrolled, shorter than spikelet with a slender mucro lying within the cuspidate spikelet tip. x = 7, 10, 16.

Twelve species: tropics of the Old World; four species in China.

Urochloa is closely related to Brachiaria, and the two are united by some authors. They are distinguished mainly by habit, Urochloa having rather more flattened, cuspitate spikelets enclosing a pronounced mucro from the upper lemma. The different spikelet orientation is also characteristic, though not obvious when the spikelets are paired. In Urochloa the lower glume faces outward, whereas in Brachiaria it lies against the rachis.

1a. Lower glume 2/3–3/4 spikelet length .......................................................................................................................................................... 1. U. paspaloides
1b. Lower glume less than 1/3 spikelet length.

2a. Spikelets 2–2.5 mm ....................................................................................................................................................... 2. U. reptans
2b. Spikelets 3.5–5 mm.

3a. Perennial from a knotty rootstock; spikelets paired; fertile floret with a tiny mucro ca. 0.1 mm ........... 3. U. setigera
3b. Annual, spikelets usually single or paired only at base; fertile floret with a pronounced mucro 0.3–1 mm ....................................................................................................................................................... 4. U. panicoides


雀稗尾稃草 que bai wei fu cao

Brachiaria ambiguа (Trinius) A. Camus; B. paspaloides (J. Presl) C. E. Hubbard; Panicum ambiguа Trinius; Urochloa ambiguа (Trinius) Pilger.

Annual. Culms slender, spreading, branching and rooting at lower nodes, 20–60 cm or more tall, nodes pubescent. Leaf sheaths glabrous or loosely pilose; leaf blades linear, 5–20 × 0.3–0.8 cm, thinly pilose on both surfaces with tubercle-based hairs, apex acuminate; ligule ca. 1 mm. Inflorescence axis 1.5–4 cm; racemes 2–4, 2–5 cm, rather stiffly ascending; rachis narrow, triquetrous, scabrous; spikelets usually paired, loosely overlapping. Spikelets lanceolate, 3.5–4 mm, glabrous, sharply acute; lower glume lanceolate, 2/3–3/4 spikelet length, 5–7-veined, acute and apiculate; upper glume 5–7-veined, sharply acute; lower lemma obscurely 5-veined, palea very small; upper lemma elliptic-oblong, only slightly shorter than spikelet, finely rugulose, mucro 0.4–0.5 mm. Fl. and fr. May–Oct. 2n = 36.

Mountain slopes, forests. Hainan, Yunnan [India, Japan (Ryukyu Islands), Malaysia, Philippines, Sri Lanka].

This is the only species of Urochloa in China with a long lower glume.


尾稃草 wei fu cao

Annual. Culms slender, creeping, rooting at lower nodes, ascending to 10–50 cm tall. Leaf sheaths glabrous, one margin densely ciliate; leaf blades lanceolate, 2–6 × 0.3–1.2 cm, glabrous or loosely hispidulous, base subcordate, margins scabrous, pectinate-ciliate at base; ligule ca. 1 mm, ciliate. Inflorescence pyramidal, axis 1–8 cm; racemes 3–6(–12), 0.5–4 cm, spreading; rachis triquetrous, scabrous; spikelets paired, crowded, pedicels setose. Spikelets ovate or ovate-elliptic, 2–2.5 mm, usually glabrous, acute; lower glume ciliate, 1/8–1/4 spikelet length, thinly membranous, veinless or obscurely 3-veined, truncate or rounded; upper glume (5–7)–9-veined; lower lemma 5-veined, palea well developed; upper lemma broadly elliptic, 1.8–2 mm, finely rugose, apiculate. Fl. and fr. summer–autumn. 2n = 14, 18.
Grassy places, fields. Guangdong, Guangxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan [tropics throughout the world].

This weedy species is widely distributed in the Old World and introduced in America. It is a borderline species in the genus: the small, plump spikelets are reminiscent of Brachiaria, where it is placed by some authors.

1a. Rachis and pedicels with long tubercle-based setae .......................................................... 2a. var. reptans
1b. Rachis and pedicels glabrous .............. 2b. var. glabra

2a. Urochloa reptans var. reptans

尾稃草（原变种）wei fu cao (yuan bian zhong)

Panicum reptans Linnaeus, Syst. Nat., ed. 10, 2: 870. 1759; Brachiaria prostrata (Lamarck) Grisebach; B. reptans (Linnaeus) C. A. Gardner & C. E. Hubbard; Panicum prostratum Lamark.

Rachis of raceme and pedicels with long tubercle-based setae.

Grassy places, fields. Guangdong, Guangxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan [tropics throughout the world].

2b. Urochloa reptans var. glabra

光尾稃草 guang wei fu cao

Rachis of raceme and pedicels glabrous.

Grassy and waste places. Yunnan.


刺毛尾稃草 ci mao wei fu cao

Panicum setigerum Retzius, Observ. Bot. 4: 15. 1786; Brachiaria setigera (Retzius) C. E. Hubbard; Urochloa cordata Keng ex S. L. Chen & Y. X. Jin.

Perennial from a knotty base. Culms rigid, decumbent, ascending to 1 m, nodes densely bearded. Leaf sheaths puberulous and with tubercle-based hairs, one margin ciliate; leaf blades lanceolate, 8–15 × 1.8–2.5 cm, pubescent, base cordate-amplexicaul, margins scabrous, pectinate-ciliate usually at least to the middle, apex acuminate; ligule ca. 2 mm, ciliate. Inflorescence axis 6–13 cm; racemes 6–12, 2–5 cm, ascending; spikelets usually paired, setose especially on pedicels. Spikelet ovate-lanceolate, 4–5 mm, densely pubescent, acuminate-cuspidate; lower glume ovate, ca. 1/5 spikelet length, triangular, subacute; upper glume (5–)7–9-veined; lower lemma slightly shorter than upper glume, staminate or sterile, 5–7-veined, palea well developed, keels very narrowly winged upward; upper lemma broadly elliptic, coriaceous, rugulose, mucro ca. 0.1 mm. Fl. and fr. Jul–Sep.

Forests. Guangdong, Hainan [India, Myanmar, Nepal, Sri Lanka, Thailand].


类黍尾稃草 lei shu wei fu cao


Annual. Culms loosely tufted, g行政执法 ascending. 20–80 cm tall, nodes bearded. Leaf sheaths loose, with tubercle-based setae, one margin densely ciliate; leaf blades linear-lanceolate, 5–15(–20) × 0.5–1.5 cm, glabrous to thinly pilose, margins pectinate-ciliate at least toward amplexicaul base, apex acuminate; ligule 1.5–2 mm. Inflorescence axis 3–6 cm; racemes 3–10, 2–6 cm, stiff, diverging; rachis flattened, setose mainly from the short stout pedicels; spikelets usually borne singly or in pairs at base, occasionally mostly paired, overlapping by ca. 1/3 their length. Spikelets ovate-elliptic, 4–5 mm, glabrous or pubescent, cuspidate; lower glume ovate, 1/4–1/3 spikelet length, 3–5-veined, obtuse; upper glume 5–9-veined with evident cross veins; upper lemma rugose, mucro 0.4–1 mm. Fl. and fr. Sep–Oct.

Moist grasslands, lakesides. Sichuan, Yunnan [Bhutan, India; E and S Africa].

Urochloa setigera can be confused with forms of U. panicoides with pubescent, paired spikelets, especially when the base is missing. Urochloa panicoides has less abruptly cuspidate spikelets, a more coarsely rugose fertile floret, and a much longer mucro on the upper lemma.


野黍属 ye shu shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Annuals or perennials. Leaf blades linear, flat; ligule ciliate. Inflorescence of racemes along a central axis, spikelets pedicellate, single, paired or clustered on a narrow rachis, adaxial. Spikelets lanceolate to elliptic, thinly biconvex, subcartilaginous, acute to aristate, a little globose swelling at spikelet base, florets 2; lower glume vestigial; upper glume equaling spikelet, facing outward, often awn-pointed; lower lemma similar but usually slightly shorter, neuter or staminate, with or without palea; upper lemma crustaceous, papillose, margins inrolled, apex obtuse and often mucronate. x = 9.

About 30 species: tropical and warm-temperate regions of the world, especially tropical Africa and America; two species in China.

The main diagnostic feature of Eriochloa is the beadlike swelling at the spikelet base. This is formed by the swollen lowest rachilla internode and adnate lower glume. The lanceolate, pointed spikelets are also characteristic.

1a. Racemes densely pilose; spikelets single, 4.5–5 mm; upper lemma subacute to acute ........................................ 1. E. villosa

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1b. Racemes glabrous or almost so; spikelets paired or in threes, 3–4 mm; upper lemma with ca. 0.5 mm mucro ........... 2. E. procera


POACEAE


Chen Shouliang (陈守良); Sylvia M. Phillips

POACEAE

Perennials. Culms creeping. Leaf blades linear-lanceolate, stiff; ligule ciliate. Inflorescence monoeocious, composed of a single deciduous raceme with foliaceous rachis bearing 1–2 persistent bisexual or female spikelets at the base and several deciduous staminate spikelets above, spikelets secund in one row; staminate portion of the rachis shedding the spikelets after fertilization and folding onto the fertile spikelets, thus enclosing them in a capsule-like fruit-case. Bisexual spikelets adaxial, biconvex, florets 2; lower glume small or suppressed; upper glume equal to spikelet, 5-veined; lower floret neuter or staminate, its lemma resembling upper glume, palea often deeply split; upper floret fertile, thinly papery, its lemma with flat margins and hairy apex. Stamine spikelets similar but both florets staminate, smaller than the bisexual florets, with thinner scales. x = 9.

Two species: Madagascar to Polynesia, on sandy seashores; one species in China.

1. Thuarea involuta (G. Forster) R. Brown ex Smith, Cyclo. 35. 1817 [“1819”].

Chu lei cao


Culms long and creeping, much branched, rooting at nodes, flowering culms up to 20 cm tall. Leaf sheaths loose, imbricate on the short erect shoots, pilose or only ciliate along margins; leaf blades 2–5 × 0.3–0.8 cm, usually puberulous on both surfaces; ligule 0.5–1 mm. Inflorescence a terminal raceme, not exserted from the uppermost spathelike leaf sheath; rachis broad and winglike in lower fertile part, narrow above in staminate part. Spikelets pubescent; staminate spikelet oblong-lanceolate, 3–4 mm; fertile spikelet ovate-lanceolate, 3.5–4.5 mm. Fl. and fr. Apr–Dec.

Sandy seashores. Guangdong, Hainan, Taiwan [Indonesia, Malaysia, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Australia; introduced in Africa, tropical America].

The short flowering shoots bend down as the seed ripens, and the seed may become buried in the sand. The plant is an efficient sand binder, and the prostrate stems form widely spreading mats. With its curious, watertight, buoyant fruit-case, this grass is also adapted to long-distance dispersal by sea.

The combination Thuarea involuta has often been attributed to Roemer & Schultes (Syst. Veg. 2: 808. 1817), but this was not published until November 1817, whereas Smith published in May of that year.

Perennials or annuals. Culms tufted, or with creeping rhizomes and stolons. Leaf blades linear or narrowly lanceolate, flat; ligule membranous. Inflorescence composed of single, digitate or scattered racemes; rachis flat, often winged; spikelets single or paired, pedicellate in 2–4 rows, densely crowded, lower lemma abaxial. Spikelets orbicular, ovate or elliptic plano-convex; lower glume absent or rarely present as a small scale; upper glume as long as spikelet or nearly so, rarely absent, convex, membranous to subpapery, 3–7-veined; lower lemma resembling upper glume, flat, neuter without palea; upper lemma usually coriaceous to crustaceous, rarely softer, margins inrolled, apex obtuse to apiculate. \( x = 10 \).

About 330 species: tropical and warm-temperate regions, especially in the New World; 16 species (two endemic, eight introduced) in China.

This genus includes a number of good forage grasses and also some widespread weeds.

1a. Spikelets with a marginal ciliate fringe of silky hairs; hairs 1–2 mm.
   2a. Racemes 2, paired; stoloniferous perennial .......................................................... 1. *P. conjugatum*
   2b. Racemes usually more than 2, spread along an axis.
       3a. Spikelets 3–4 mm; upper floret equal to 2/3 length of spikelet ................................ 2. *P. dilatatum*
       3b. Spikelets 2–3 mm; upper floret equal to or only slightly shorter than spikelet.
           4a. Spikelets light green or purplish, ovate; upper glume pubescent, fringed along whole length ........ 3. *P. urvillei*
           4b. Spikelets brown, obvolute; upper glume puberulous, fringed only above middle ...................... 4. *P. virgatum*

1b. Spikelets glabrous or pubescent, without a marginal fringe of silky hairs.
   5a. Upper glume and lower lemma broadly winged along margins ........................................... 5. *P. fimbriatum*
   5b. Upper glume and lower lemma not winged.

6a. Both glumes absent; upper lemma papery, with conspicuous riblelike veins. .................. 6. *P. malacophyllum*
6b. Upper glume present; upper lemma cartilaginous or coriaceous, with obscure veins.
   7a. Plants with long stolons and/or rhizomes; racemes 2(–3), paired, the spikelets borne singly; spikelets lanceolate to ovate or obovate.
       8a. Plant with robust woody rhizomes; upper glume and lower lemma cartilaginous and shiny, obtuse ................................................................. 7. *P. notatum*
       8b. Plant with slender stolons; upper glume and lower lemma papery, acute.
           9a. Upper glume pubescent; spikelets plano-convex, obovate-oblong ............................... 8. *P. distichum*
           9b. Upper glume glabrous; spikelets strongly flattened, lanceolate-oblong ....................... 9. *P. vaginatum*

7b. Plants tufted; racemes up to 20 along a common axis, the spikelets single or paired; spikelets broadly elliptic, obvolute or suborbicular.
   10a. Fertile floret dark glossy brown at maturity; spikelets usually glabrous.
       11a. Lower lemma conspicuously rugose inside margins; spikelets paired ......................... 10. *P. plicatum*
       11b. Lower lemma usually smooth, occasionally slightly rugose; spikelets usually single, occasionally paired.
           12a. Pedicels glabrous; nodes, culm apex and leaf blades often glabrous .................. 11. *P. scrobiculatum*
           12b. Pedicels pilose; nodes, culm apex and leaf blades densely hairy ....................... 12. *P. hirsutum*

10b. Fertile floret yellowish green to pale brown at maturity; spikelets pubescent or glabrous.
   13a. Spikelets 1–1.5 mm ........................................................................................................ 13. *P. paniculatum*
   13b. Spikelets 2–3 mm.
       14a. Rachis 2–4 mm wide; spikelets 2–2.5 mm, paired, pubescent .............................. 14. *P. longifolium*
       14b. Rachis 1–1.5 mm wide; spikelets 2.5–3 mm, single or loosely paired.
           15a. Upper glume pubescent especially along the margins; leaf blades hirsute, 5–8 mm wide ............................................................ 15. *P. thunbergii*
           15b. Upper glume glabrous; leaf blades glabrous, 3–4 mm wide ............................ 16. *P. delavayi*


两耳草 liang er cao

Perennial with long stolons. Culms in small tufts along the stolons, compressed, nearly solid, 30–60 cm tall. Leaf sheaths keeled, glabrous or pilose along upper margins and mouth, a line of hairs abaxially at junction with blade; leaf blades lanceolate-linear, thin, 5–20 × 0.5–1 cm, glabrous or papillose-pilose along margins, apex acute. Inflorescence digitate; racemes 2, divaricate, very slender, 6–12 cm; spikelets single, in 2 rows; rachis 0.5–1 mm wide. Spikelets pale yellowish, ovate to suborbicular, 1.5–1.8 mm, abruptly acute; upper glume hyaline, 2-veined with the veins marginal, ciliate along margins with long silky hairs; lower lemma pallid at maturity, ovate, as long as spikelet, crustaceous, obscurely striate. Fl. and fr. May–Aug. 2n = 40, 80.

Open places in forests, forest margins, mostly on moist soils, sometimes forming a sward. Fujian, Guangxi, Hainan, Hong Kong, Taiwan, Yunnan [tropics and subtropics throughout the world].
This is a distinctive species, easily recognized by the combination of a stoloniferous habit and an inflorescence composed of a pair of widely spreading racemes with small, pale, fringed spikelets.

2. *Paspalum dilatatum* Poiret, Encycl. 5: 35. 1804.

毛花雀稗 mao hua que bai

*Digitaria dilatata* (Poiret) H. J. Coste.

Perennial from a short rhizome. Culms forming a coarse, spreading tuft, 50–150 cm tall, ca. 5 mm in diam., glabrous. Leaf sheaths glabrous or pilose in the lower part; leaf blades linear, 10–45 × 0.3–1.2 cm, glabrous, apex attenuate; ligule 2–4 mm. Inflorescence axis 2–20 cm; racemes 2–10, 5–12 cm, spaced, diverging, axes pilose; spikelets paired; rachis 1–1.5 mm wide, glabrous. Spikelets green or purplish, broadly ovate, 3–4 mm, sharply acute; upper lemma membranous, 5–9-veined, sparsely pubescent to almost glabrous on back, margins fringed with long white hairs; lower lemma similar but not hairy; upper lemma pallid at maturity, orbicular, ca. 2 mm, clearly shorter than spikelet, papillosopistrate, apex rounded. Fl. and fr. May–Jul. 2n = 40, 50–63.

Roadsides, waste places, naturalized. Fujian, Guangxi, Guizhou, Hong Kong, Hubei, Shanghai, Taiwan, Yunnan, Zhejiang [native to South America].

This native of South America is now widely distributed throughout the tropics as a forage grass and also occurs as a weed of cultivation.


丝毛雀稗 si mao que bai

Perennial from a short rootstock. Culms robust, up to 2 m tall, glabrous. Leaf sheaths densely hispid, long hairs at the mouth; leaf blades linear, 15–50 × 0.5–1.5 cm, glabrous or pilose at the base, apex attenuate; ligule 3–5 mm. Inflorescence axis 10–30 cm; racemes 10–25, 8–15 cm, narrowly ascending or suberect; spikelets paired; rachis ca. 0.5 mm wide. Spikelets light green or purplish, ovate, 2–3 mm, sharply acute; upper glume membranous, 3-veined with laterals marginal, appressed-pubescent on back, margins fringed with long white hairs; lower lemma similar but glabrous on back; upper lemma elliptic, striate, obtuse. Fl. and fr. May–Oct. 2n = 40, 60.

Roadsides, waste places, introduced. Fujian, Hong Kong, Taiwan [native to South America].

This is a native of South America related to *Paspalum dilatatum* and likewise introduced widely in the tropics as a forage grass and weed.


粗秆雀稗 cu gan que bai

Perennial from short rootstock. Culms robust, forming a dense tussock, erect, 1–2 m tall. Leaf sheaths compressed, usually papilllose-hirsute at margins and summit; leaf blades linear-acuminate, flat, stiff, 30–75 × 1–2.5 cm, margins serrate, apex acuminate; ligule 2–3 mm. Inflorescence axis 10–30 cm; racemes up to 20, 5–15 cm, ascending or drooping; spikelets paired, in 4 dense rows; rachis 0.5–1.5 mm wide, scabrous, glabrous or with a few setae. Spikelet brownish, obovate, 2.2–3 mm, acute; upper glume membranous, 3–5-veined, dorsally puberulous, margins fringed with short silky hairs above middle; lower lemma resembling upper glume but glabrous; upper lemma brownish, as long as spikelet, coriaceous, finely punctulate-striate, subacute. Fl. and fr. summer–autumn. 2n = 40, 80.

Moist or swampy ground, naturalized. N Taiwan [native to America from the United States to Brazil].


裂颖雀稗 lie ying que bai

Annual. Culms tufted, erect, 30–100 cm tall. Leaf sheaths thinly hispid; leaf blades linear-lanceolate, 10–30 × 0.3–1 cm, both surfaces coarsely asperpid hispid especially toward base, margins pectinate-ciliate, apex acuminate; ligule ca. 2 mm. Inflorescence axis 6–10 cm; racemes 3–5, 3–7 cm, loosely ascending, axils with long stiff hairs; spikelets usually paired but one of the pair often reduced; rachis flat, 1.2–1.5 mm wide, serrate-margined. Spikelets often purplish, circular in outline, 2.5–3.5 mm, acute; upper glume ovate, 3-veined, with stiff marginal wings ca. 1 mm wide, wings lacerate, wing margin ciliate with short stout hairs; lower lemma similar to upper glume but wing less developed; upper lemma ovate-elliptic, slightly shorter than spikelet, smooth, shining. Fl. and fr. summer–autumn. 2n = 40.

Recently naturalized. Taiwan [native to Central and South America and the West Indies].

*Paspalum fimbriatum* is easily separable from other species of *Paspalum* in China by its distinctive, winged spikelets.


稜稃雀稗 leng fu que bai

Perennial with short rhizomes. Culms slender to robust, 1–2 m tall. Leaf sheaths papillospilose-pilose in upper part and mouth; leaf blades linear-lanceolate, flat, 10–40 × 0.6–3 cm, glabrous or pilose, the lower narrowed to a slender base, apex long acuminate; ligule ca. 2 mm. Inflorescence axis 4–20 cm; racemes up to 30, 3–6 cm, ascending, axils long pilose; spikelets paired, in 4 dense rows; rachis winged, 0.5–1.5 mm wide, margins scabrous, sometimes setose. Spikelets often purplish, oblong-elliptic, 1.5–2.5 cm, glabrous; both glumes absent; lower lemma as long as spikelet, concave, membranous, 3-veined with laterals marginal; upper lemma dorsally convex, papery, 5-veined, veins prominent and forming ribs, apex acute. Fl. and fr. summer–autumn. 2n = 20, 40.

Cultivated. Gansu [native to South America].

This is the only species of *Paspalum* in China lacking both glumes.

The species is cultivated for hay and sometimes used in soil conservation work.


百喜草 bai xi cao

Perennial with stout, woody, many-noded rhizomes and stolons forming a mat. Culms 15–80 cm tall. Leaf sheaths...
keeled, compressed, glabrous; leaf blades broadly linear, flat or folded, stiffly spreading, 5–30 × 0.3–1 cm, glabrous, apex acuminate; ligule very short. Inflorescence of 2(–3) racemes at culm apex; racemes 4–9(–16) cm, recurved-ascending; spikelets single, in 2 rows; racis 1–1.8 mm wide, scabrous. Spikelets green, ovate to obovate, plumply plano-convex, 2.5–3.5 mm, smooth, shining, obtuse; upper glume cartilaginous, 3-veined, glabrous; lower lemma resembling upper glume but slightly shorter; upper lemma pale green, slightly shorter than spikelet, finely striate, obtuse. Fl. and fr. Sep. 2n = 40, 30.

Cultivated. Fujian, Gansu, Hebei, Yunnan [native to tropical and subtropical America].

This species is widely introduced in tropical and warm-temperate regions as a forage grass and also sometimes for erosion control.


双穗雀稗 shuang sui que bai

*Digitaria paspalodes* Michaux; *Paspalum paspalodes* (Michaux) Scribner.

Perennial with rhizomes and stolons. Culms 20–50 cm tall, nodes usually pubescent. Leaf sheaths keeled, glabrous, margins ciliate; leaf blades linear, 5–10 × 0.3–0.7 cm, glabrous, apex acute; ligule 2–3 mm. Inflorescence of 2(–3) racemes arising together or separated by a short axis; racemes 3–7 cm; spikelets single, in 2 rows; racis straplike, 1.5–2 mm wide. Spikelets papillate, obovate-oblong, plano-convex, 3–3.5 mm, acute; lower glume vestigial or a narrow triangular scale up to 1/2 spikelet length or more; upper glume papery, 3–5-veined with distinct middle vein, loosely appressed pubescent; lower lemma 3–5-veined, usually glabrous; upper lemma pale green, almost equal to spikelet, cartilaginous, apex apiculate and minutely pubescent. Fl. and fr. May–Sep. 2n = 40, 48, 60.

Fields, roadsides, ditches and other disturbed places, mostly on moist fertile soils. Anhui, Fujian, Guangxi, Guizhou, Hainan, Henan, Hong Kong, Hebei, Hunan, Jiangsu, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [tropical and warm-temperate regions of the world].

The length of the lower glume is very variable, even within a single raceme. The spikelets are not obviously hairy because the pubescent upper glume faces inward, but the creeping habit together with paired racemes of pampum spikelets are distinctive. Rarely the upper glume is glabrous, but such specimens can be separated from the closely related *Paspalum vaginatum* by spikelet shape and by the longer, apiculate fertile floret.


海雀稗 hai que bai

*Digitaria vaginata* (Swartz) Magnier ex Debeaux; *Paspalum distichum* subsp. vaginatum (Swartz) Maire; *Paspalum distichum* var. vaginatum (Swartz) Grisebach; *Sanguinaria vaginata* (Swartz) Bubani.

Perennial with short rhizome and long stolons. Culms solitary or tufted, many-noded, 10–50 cm tall. Leaf sheaths imbricate, often keeled, margins membranous; leaf blades distichous, linear, rather stiffly ascending, 2.5–15 × 0.3–0.8 cm, apex acute; ligule 0.5–1 mm. Inflorescence of (1–)2(–3) racemes arising together at culm apex; racemes 2–5 cm, usually closely approximate when young, later spreading; spikelets single, in 2 rows; racis 1–2 mm wide. Spikelets pale brownish green, narrowly lanceolate-oblong, strongly flattened, 3.5–4 mm, acute; lower glume absent or rarely a tiny vestige; upper glume thinly papery, weakly 5-veined, midvein often suppressed, glabrous; lower lemma resembling upper glume; upper lemma pale green, 2.5–3 mm, shorter than spikelet, cartilaginous, apex minutely pubescent. Fl. and fr. Jun–Sep.

Sandy seashores, swamps, along the margins of slow-moving streams. Hainan, Hong Kong, Taiwan, Yunnan [tropics and subtropics throughout the world].

This is one of the first plants to colonize the seashore. It is an efficient sand binder and a common saltmarsh plant, where it may form pure stands. It is sometimes also found in inland saline marshes.


皱稃雀稗 zhou fu que bai

*Panicum plicatum* (Michaux) Kuntze.

Perennial. Culms tufted, erect or ascending, usually compressed, 30–150 cm tall. Leaf sheaths longer than internodes, keeled, glabrous or pubescent at base; leaf blades linear, usually folded at base, flat above, 10–50 × 0.3–1 cm, adaxial surface pilose at base and mouth, apex acuminate; ligule 1–2 mm. Inflorescence axis 3–15 cm; racemes 3–10, 5–8 cm, laxly ascending to spreading, axils pilose; spikelets paired; racis 0.75–1 mm wide. Spikelets brown at maturity, obovate, 2–3 mm, subacute to obtuse; upper glume membranous, 5-veined, glabrous or sometimes appressed-pubescent; lower lemma membranous, 3–5-veined, glabrous, with short transverse wrinkles just inside the slightly raised margin; upper lemma deep brown, strongly convex dorsally, subequalling spikelet, smooth, shiny. Fl. and fr. summer–autumn. 2n = 20, 40, 60.

Cultivated in Gansu [native to tropical and subtropical America].

"*Paspalum plicatum Persoon*" (Syn. Pl. 1: 86. 1805) is merely an orthographical variant of *P. plicatum*.

This species is used for fodder.


鸭毑草 ya jie cao

Perennial or annual. Culms tufted, slender to robust, erect or decumbent and rooting at lower nodes, 30–90(–150) cm tall. Leaf sheaths compressed, keeled, usually glabrous; leaf blades linear or linear-lanceolate, 10–40 × 0.4–1.2 cm, usually glabrous, base subrounded, margins scabrous, apex acuminate; ligule 0.5–1 mm. Inflorescence of 2–5(–8) racemes, subdigate or on a short axis; racemes 3–10 cm, ascending to widely spreading; spikelets usually single, overlapping in 2 rows, sometimes paired especially in middle of raceme; racis 1–3 mm, ascending to widely spreading; spikelets green becoming brown, suborbicular, ovate or broadly elliptic, 2–3 mm, glabrous, obtuse to apiculate; upper glume membranous, 3–7-veined; lower lemma membranous or sometimes indurate, 3–5(–7)-veined; upper lemma brown at maturity, subequalling spikelet, coriaceous, finely striate, obtuse. Fl. and fr. May–Nov. 2n = 20, 40 or 60.
Roadsides, weedy places, often on damp soils. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [tropics and subtropics of the Old World; introduced in America].

This polymorphic species complex is thought to comprise an apomorphic swarm. Some of its components have been described as separate species, but variation is continuous throughout. Robust forms are sometimes separated as *Paspalum auriculatum* var. *P. commersonii* Hackel, Allg. Bot. Z. Syst. 20: 146. 1914.

11a. *Paspalum scrobiculatum* var. *scrobiculatum*


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11a. *Paspalum scrobiculatum* var. *scrobiculatum*


Perennial. Culms tufted, erect, 30–90 cm tall. Leaf blades 10–20 × 0.5–1 cm, usually glabrous. Spikelets often paired, at least in middle part of raceme, broadly obovate, 2–2.2 mm; upper glume and lower lemma 3–5-veined, veins green, back pallid; upper lemma yellow-brown or mid-brown at maturity. Fl. and fr. Jun–Nov. 2n = 20, 40, 54, 60.

Hill slopes, roadsides, fields. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [SE Asia; Australia, Pacific Islands (Polynesia)].

This variety is unusual in *Paspalum scrobiculatum* in frequently having paired spikelets, although often the inner spikelet of the pair is reduced. There is also a less well-defined difference from var. *bispicatum* in shape of the spikelet and color of the spikelet veins, and for this reason this variety is sometimes treated as a separate species. However, when the inner spikelets are vestigial or absent, the racemes are 2-rowed and then the two varieties are very difficult to separate.


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Perennial. Culms tufted, slender, 20–40 cm tall, pilose-tomentose on nodes and below inflorescence. Leaf sheaths compressed, hirsute; leaf blades lanceolate, 5–18 × 0.3–0.5 cm, both surfaces densely hirsute, apex acuminate; ligule ca. 2 mm. Racemes 2–4, 2–3 cm; spikelets single, in 2 rows; rachis flattened, winged, ca. 1.5 mm wide; pedicels pilose with soft white hairs. Spikelets broadly elliptic, 2–2.3 mm, usually glabrous, subacute; upper glume membranous, 3–5-veined, occasionally minutely pubescent on margins; lower lemma 5–7-veined, glabrous, subacute; upper lemma brown, as long as spikelet, cartilaginous, finely punctulate-sтратiate, obtuse. Fl. and fr. May–Oct.

- Hill slopes. Guangdong, Guangxi, Taiwan.

*Paspalum hirsutum* is a local segregate from the *P. scrobiculatum* complex distinguished by its slender facies coupled with hirsute leaves, and particularly by its hairy nodes, culm apex, and pedicels. The hirsute leaves are very similar to those of *P. thunbergii*, but that species has puberulous spikelets and a pallid fertile floret.

This species may have a wider distribution if specimens from SE Asia referred to *Paspalum scrobiculatum* var. *horneri* (Henrard) Koning & Sosef are conspecific.


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Perennial, forming coarse tussocks. Culms erect or geniculately ascending, 30–120 cm tall, nodes pubescent. Leaf sheaths often hispid; leaf blades linear-lanceolate, flat, 9–50 × 0.6–2.5 cm, scabrid or hispid, margins usually undulate, apex acuminate; ligule 0.2–0.5 mm. Inflorescence axis 5–20 cm; racemes 7–60, fascicled, 4–12 cm, ascending or spreading; spikelets paired; rachis ca. 0.5 mm wide. Spikelets brown at maturity, orbicular or obovate, 1–1.5 mm; upper glume membranous, subequaling spikelet, 3-veined, pubescent; lower lemma resembling upper glume, subglabrous on central portion of back; upper lemma as long as spikelet, pallid at maturity.

Moist places along roadsides, naturalized. Taiwan [native to Afri-

*Paspalum scrobiculatum* Linnaeus var. *longifolium* (Roxburgh) Domin.

Perennial. Culms tufted, fairly robust, usually erect, 80–130 cm tall, many-noded, glabrous. Leaf sheaths broad, papery, overlapping and concealing the nodes, keeled, papillose-pilose along margins; leaf blades linear, 10–20 × 0.5–1 cm, glabrous, apex acuminate; ligule 1–2 mm, usually with tawny hairs on back. Inflorescence axis 4–10 cm; racemes 5–20, 4–8 cm, ascending; spikelets normally paired, occasionally single but 2nd vestigial spikelet present; densely overlapping; rachis broadly winged, (1.5–)2–4 mm wide, purplish, margins scabrous with conspicuous close-set teeth; pedicels scabrous. Spikelets purple or pale green, broadly obovate, ca. 2.5 mm, apiculate; upper glume and lower lemma membranous, 3-veined with laterals marginal, minutely crisped-pubescent; upper lemma pallid, as long as spikelet, punctulate-striate, obtuse. Fl. and fr. Jul–Oct. 2n = 40, 50.

Mountain slopes, field margins, in moist and swampy places. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam; N Australia, Pacific Islands].

This is a rather lush, leafy species. The broad, purplish rachis bearing very closely packed, paired, shortly hairy spikelets is characteristic.


雀稗 *que bai*

*Paspalum dissectum* Thunberg, Fl. Jap. 45. 1784, not (Linnaeus) Linnaeus (1762); *P. scrobiculatum* Linnaeus var. *thunbergii* (Kunth ex Steudel) Makino.

Perennial from short knotty rootstock. Culms tufted, erect, 50–70 cm tall, 4–6-noded, lower nodes glabrous or puberulous. Leaf sheaths compressed, keeled, lowest hirsute, upper glabrous; leaf blades flat, fairly rigid, 10–15 × 0.3–0.4 cm but upper blades much shorter, glabrous, apex acuminate; ligule 3–4 mm. Inflorescence axis 3–6 cm; racemes 2–3, 2.5–4 cm, axis glabrous or bearded; pedicels paired but lateral spikelets poorly developed except sometimes in middle of raceme, spikelets in 2–3 irregular rows; rachis ca. 1 mm wide. Spikelets pale green, elliptic to obovate, 2.8–3 mm, glabrous, acute; upper glume and lower lemma 3-veined with laterals marginal; upper lemma yellowish green, ovate, ca. 2.5 mm, slightly shorter than spikelet, minutely punctate, obtuse. Fl. and fr. May–Sep.

- Dry mountain slopes, along moist roadsides; 1200–1900 m. Yunnan.


地毯草属 *di tan cao shu*

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials, rarely annuals. Culms tufted or stoloniferous. Leaf blades flat or involute, often obtuse; ligule short, membranous-ciliolate. Inflorescence composed of 2 to many slender racemes, mostly subdigitate but sometimes along a short central axis; spikelets borne singly, subsessile, alternating in 2 rows along the narrow triquetrous rachis, lower lemma adaxial. Spikelets lanceolate to oblong, flatly biconvex, florets 2 (but apparently 1); lower glume absent; upper glume membranous, as long as spikelet, obscurely 4- or 5-veined; lower floret sterile, reduced to an empty lemma similar to upper glume, its palea absent; upper floret cristaaceous, lemma margins involuted, apex obtuse. n = 9, 10.

About 110 species: tropical and subtropical America, one species in Africa; two species (both introduced) in China.

Many species of *Axonopus* are good forage or lawn grasses. The two species found in China have been widely introduced in the humid tropics of the world.

1a. Nodes of culm bearded; spikelets 2–2.7 mm; upper floret shorter than spikelet; leaf blades 6–12 mm wide 
1b. Nodes of culm glabrous; spikelets 1.6–2 mm; upper floret equaling spikelet; leaf blades 3–6 mm wide

1. *A. compressus* 
2. *A. fissifolius*

地毯草 di tan cao

**Milium compressum** Swartz, Prodr. 24. 1788; **Paspalum compressum** (Swartz) Raspail (1825), not Rafinesque (1817); **P. guadaloupense** Steudel.

Perennial with vigorous creeping stolons, forming sward. Culms 15–60 cm tall, nodes bearded. Leaf sheaths loose, strongly compressed, keeled; basal leaf sheaths imbricate; leaf blades broadly linear to lanceolate, flat or folded, 5–20 × 0.6–1.2 cm, glabrous or adaxial surface pilose, apex obtuse; ligule 0.3–0.5 mm. Racemes 2–5, digitate or subdigitate, 4–10 cm, only slightly diverging; rachis glabrous. Spikelets oblong-lanceolate, 2–2.7 mm, pilose or glabrous, apex acute; upper glume and lower lemma 2–4-veined, midvein absent, laterals marginal; upper lemma pale, oblong-elliptic, shorter than spikelet, obtuse with an apical tuft of hairs; stigmas pale. Fl. and fr. summer–autumn. 2n = 40, 50, 60, 80.

Roadsides, weedy places on moist ground, naturalized. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [native to tropical America; widely introduced elsewhere].

This is a good lawn and fodder grass.


类地毯草 lei di tan cao

**Paspalum fissifolium** Raddi, Agrostogr. Bras. 26. 1823; **Axonopus affinis** Chase; **A. compressus** var. **affinis** (Chase) M. R. Henderson; **Paspalum xizangense** B. S. Sun & H. Sun.

Perennial with creeping stolons. Culms compressed, 15–50 cm tall, nodes glabrous. Leaf sheaths compressed, strongly keeled; leaf blades broadly linear, folded, 5–20 × 0.3–0.6 cm, apex obtuse; ligule ca. 0.2 mm. Racemes 2–4, 2-paired, any others spaced slightly below, 3–8 cm, only slightly diverging; rachis glabrous. Spikelets oblong-elliptic, 1.5–2 mm, pilose near margins and apex or subglabrous, apex subacute; upper glume and lower lemma 2–4-veined, midvein absent; upper lemma pale, ovate, as long as spikelet, obtuse with a short apical tuft of hairs; stigmas purple. Fl. and fr. summer–autumn. 2n = 54, 80.

Moist muddy or sandy meadows, naturalized. Taiwan, Xizang [native to tropical America].

This species is similar to **Axonopus compressus**, but tends to favor rather cooler and more waterlogged situations. It is naturalized in Taiwan and has also been found in Xizang.


狗尾草属 gou wei cao shu

**Chaetochloa** Scribner, nom. rej.

Annuals or perennials. Culms usually tufted, slender to robust or canelike. Leaf blades linear to lanceolate, sometimes plicate or narrowed to a false petiole; ligule ciliate from a membranous base. Inflorescence a panicle, dense and spikelike or open with the branches after the spikelets fall. Spikelets elliptic, plano-convex, sometimes gibbous, awnless, florets 2; glumes and lower lemma lacking a bristle, or rarely with up to 3). About 130 species: tropics and subtropics, extending to warm-temperate regions of the world; 14 species (three endemic, one introduced) in China.

The bristles in the inflorescence represent modified branchlets. The genus includes pasture grasses, a cereal crop, and a few noxious weeds.

1a. Panicle open to contracted with obvious, spaced branches; spikelets usually subtended by a solitary bristle (some lacking a bristle, or rarely with up to 3).

2a. Leaf blades plicate, fusiform-lanceolate to linear-lanceolate, narrowed toward base.

3a. Leaf blades 2–7 cm wide; panicle branches up to 20 cm long; lower glume 1/3–1/2 spikelet length, usually acute to obtuse; lower lemma with narrow falcate apex, longer than upper lemma .......................... 1. **S. palmifolia**

3b. Leaf blades 1–3 cm wide; panicle branches up to 8 cm long; lower glume 1/4–1/3 spikelet length, usually broadly obtuse to truncate; lower lemma equaling upper lemma ................................................................. 2. **S. plicata**

2b. Leaf blades flat, not plicate, linear or linear-lanceolate, straight or rounded at base.

4a. Upper glume subequaling spikelet; only branch or branchlet tips extending into a bristle, rarely a solitary bristle below a few spikelets ........................................................................................................ 3. **S. yunnanensis**

4b. Upper glume distinctly shorter than spikelet; most spikelets subtended by one or more bristles.

5a. Tufted annual; upper lemma coarsely rugose ......................................................... 4. **S. intermedia**

5b. Perennials, sometimes rhizomatous; upper lemma smooth or finely punctate-rugose.

6a. Plant tufted; bristles stiff, stout; lower floret usually staminate with well-developed palea ............ 5. **S. forbesiana**

6b. Plant with long scaly rhizomes; bristles slender; lower floret neuter with reduced palea.
7a. Spikelets elliptic; lower lemma equal to spikelet; upper lemma smooth, shiny ................. 6. *S. chondrachne*

7b. Spikelets lanceolate; lower lemma slightly shorter than spikelet; upper lemma punctate-rugose ................................................................. 7. *S. guizhouensis*

1b. Panicle densely spikelike with congested branchlets, sometimes lobed; spikelets subtended by several to many bristles.

8a. Each branchlet from the main axis with only one mature spikelet; upper glume up to 1/2 as long as spikelet, upper floret clearly exposed.

9a. Spikelets (2.2–)2.5–3.5 mm; lower floret often staminate, its palea ovate, as wide as upper floret; upper lemma coarsely rugose ................................................................. 8. *S. pumila*

9b. Spikelets 1.8–2.3(–2.5) mm; lower floret neuter, its palea lanceolate, much narrower than upper floret; upper lemma finely rugose ................................................................. 9. *S. parviflora*

8b. Each branchlet from the main axis with several mature spikelets; upper glume 2/3 as long as equaling spikelet.

10a. Upper glume 2/3–3/4 length of fertile floret, upper lemma exposed above it; spikelets 2.8–3 mm, acute ..... 10. *S. faberi*

10b. Upper glume subequalling fertile floret, almost completely covering upper lemma; spikelets 2–2.5(–3) mm, usually obtuse.

11a. Upper floret falling free from the glumes and lower lemma at maturity; cultivated plant ..................... 11. *S. italica*

11b. Upper floret retained within spikelet, this falling whole; wild plants.

12a. Bristles retrorsely scabrous .............................................................................................................. 14. *S. verticillata*

12b. Bristles antrorsely scabrous.

13a. Spikelets 2–2.5 mm; lower glume 1/4–1/3 as long as the spikelet, usually obtuse .......... 12. *S. viridis*

13b. Spikelets 2.5–3 mm; lower glume ca. 1/2 as long as the spikelet, acuminate .......... 13. *S. arenaria*


### Panicum palmifolium

Panicum palmifolium J. König, Naturforscher 23: 208. 1788 ["palmaefolium"]; *Chamaeraphis palmifolia* Kuntze; *Chaetochloa palmifolia* Hitchcock & Chase; *Panicum neo-rodes* Schultes; *P. palmifolium* Willdenow ex Poiret (1816), not J. König (1788); *P. plicatum* Willdenow (1809), not Lamarck (1791).

Perennial from a short knotty rhizome. Culms erect or decumbent, 45–130 cm tall, up to 6 mm in diam. Leaf sheaths usually sparsely hispid, margins tuberculate-ciliate near ligule, otherwise glabrous; leaf blades fusiform-lanceolate, plicate, 20–60 × 0.7–2 cm, glabrous or hispid, narrowed toward base, acute at apex; ligule 2–3 mm, ciliate. Panicle 20–60 × 10–20 cm, branches up to 20 cm, laxly spreading, flexuous, some spikelets subtended by a single 5–15 mm bristle. Spikelets broadly lanceolate, 3–4 mm, acute; lower glume triangular-ovate, 1/3–1/2 as long as spikelet, obtuse to acute; upper glume ovate, 1/2–3/4 as long as spikelet, 5–7–veined, acute; lower lemma neuter, often distinctly longer than upper floret, 5–veined, tipped with a short incurved beak; lower palea narrow, hyaline, 1/3 as long as lemma; upper lemma indistinctly rugose to almost smooth, slightly shiny, apiculate, green and compressed. Fl. and fr. Aug–Dec. 2n = 36, 54.

Open forests, thicket margins, shady pathsides. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Indochina, Japan, Malaysia, Nepal, Thailand].

*Setaria palmifolia* is a more slender species than *S. palmifolia*, with a narrower panicle of shorter branches. However, the two species intergrade and must be separated by a combination of characters, as none is reliable on its own. Besides the key characters, *S. plicata* usually has a more distinctly rugose upper floret and shows a greater tendency to develop antlers in the lower floret.

1a. Upper lemma distinctly rugose ..................... 2a. var. *plicata*

1b. Upper lemma nearly smooth, shiny ........... 2b. var. *leviflora*

2a. *Setaria plicata* var. *plicata*

### Panicum plicatum

Panicum plicatum Lamarck, Tab. Encycl. 1: 171, no. 892.
Annual. Culms slender, geniculate at base and rooting from nodes, up to 60 cm tall, glabrous. Leaf sheaths usually loose, lower glabrous and smooth, upper papillose-pilose, margins densely ciliolate especially at mouth; leaf blades broadly linear, thin, 10–35 × 0.6–1 cm, papillose-hispid along the main veins, apex acuminate; ligule densely ciliate. Panicle contracted, narrowly lanceolate, 10–17 × 1–1.5 cm, lowest branches 1.5–2 cm, spikelets subtended by 1–2(–3 or more) bristles; axis scabrous to puberulous; bristles 3–10 mm, stiff. Spikelets elliptic-ovate, 1.5–2 mm, acute; glumes thin, submembranous; lower glume broadly ovate, 1/3–1/2 as long as spikelet, obtuse or acute; upper glume 1/2–2/3 as long as spikelet, 5-veined; lower floret neuter; lower palea almost as long as lemma; upper lemma orange-brown at maturity, dorsally strongly convex, rugose. Fl. and fr. Jul.

Roadsides, fields. Yunnan [Bhutan, India, Japan, Myanmar, Russia, Sri Lanka; E Africa].

This weedy annual is recognized by its sprawling, tufted habit and coarsely rugose, orange-brown fertile floret. The spikelets are usually subtended only by a single bristle, but there are many aborted spikelets in the panicle, giving the appearance of more bristles below each fully developed spikelet.


Annual. Culms slender, geniculate at base and rooting from nodes, up to 60 cm tall, glabrous. Leaf sheaths usually loose, lower glabrous and smooth, upper papillose-pilose, margins densely ciliolate especially at mouth; leaf blades broadly linear, thin, 10–35 × 0.6–1 cm, papillose-hispid along the main veins, apex acuminate; ligule densely ciliate. Panicle contracted, narrowly lanceolate, 10–17 × 1–1.5 cm, lowest branches 1.5–2 cm, spikelets subtended by 1–2(–3 or more) bristles; axis scabrous to puberulous; bristles 3–10 mm, stiff. Spikelets elliptic-ovate, 1.5–2 mm, acute; glumes thin, submembranous; lower glume broadly ovate, 1/3–1/2 as long as spikelet, obtuse or acute; upper glume 1/2–2/3 as long as spikelet, 5-veined; lower floret neuter; lower palea almost as long as lemma; upper lemma orange-brown at maturity, dorsally strongly convex, rugose. Fl. and fr. Jul.

Mountains, slopes, roadsides, streams; 300–2000 m. Anhui, Gansu, Guangdong, Guangxi, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang [Bhutan, N India, Myanmar, Nepal].

1a. Bristles 3–4 times length of spikelet;
lower floret usually stamineate .......... 5a. var. breviseta
1b. Bristles equal to spikelet or slightly longer; lower floret neuter .......... 5b. var. forbesiana

5a. Setaria forbesiana var. breviseta

5b. Setaria forbesiana var. forbesiana
Lower floret usually staminate. Lower palea as long as lower lemma, as broad as upper floret. Fl. and fr. Jul–Oct.

Mountain slopes, valleys, roadsides, streams; 300–2000 m. Gansu, Guangdong, Guangxi, Guizhou, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang [Bhutan, N India, Myanmar, Nepal].


短刺西南莩草 duan ci xi nan fu cao


- Roadsides. Guizhou.


莩草 fu cao

*Panicum chondrachne* Steudel, Syn. Pl. Glumac. 1: 51. 1853; *Chaetochloa chondrachne* (Steudel) Honda; *C. matsumurae* (Matsumura) Keng; *Panicum matsumurae* Hackel; *Setaria matsumurae* Hackel ex Matsumura.

Perennial with slender rhizomes clothed in imbricate, ovate, appressed-pubescent scales. Culms slender, ascending, 60–170 cm tall, glabrous. Leaf sheaths glabrous, long ciliate along margins and at mouth; leaf blades linear-lanceolate, thin, 5–38 × 0.5–2 cm, glabrous or rarely pappillose-pilose, base rounded, margins scabrous, apex attenuate; ligule ca. 0.5 mm, densely ciliate. Panicle open, linear to narrowly pyramidal, 12–30 cm, slightly nodding, branches spaced, stiffly spreading, lowest 1–2.5(–5) cm, most spikelets subtended by a single bristle; axis scabrous, sometimes also hispid; bristles 4–10 mm. Spikelets plumply elliptic, ca. 3 mm, acute; lower glume ovate, 1/3–1/2 as long as spikelet, acute; upper glume 3/4 as long as spikelet, 5–7-veined; lower floret neuter, as long as upper floret; lower lemma 5-veined; lower palea narrowly lanceolate, shorter than its lemma; upper lemma finally light brown, smooth, shiny, acute. Fl. and fr. Aug–Oct. 2n = 36.

Woodlands, moist mountain slopes, roadsides. Anhui, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan, Korea].

This is a distinctive species on account of its long, scaly rhizomes, elongate, narrow panicle, and smooth, shiny fertile floret.


贵州狗尾草 gui zhou gou wei cao

Perennial with scaly rhizomes. Culms erect, 37 cm or more tall, nodes usually hairy. Leaf sheaths glabrous, pilose dorsally and along margins, but nearly glabrous toward ligule; leaf blades linear-lanceolate, 10–15 × 0.4–0.6 cm, scabrous on both surfaces, base subrounded, apex acuminate; ligule ca. 1.5 mm. Panicle linear, 11–35 cm, branches spaced, very short, pressed to axis, spikelets subtended by 1 or 2 slightly flexuous bristles; axis pubescent to pilose. Spikelets elliptic-lanceolate, ca. 2.5 mm, acute; lower glume triangular-ovate, 1/3 as long as spikelet, acute; upper glume 1/2–2/3 as long as spikelet, 5-veined, acute; lower floret neuter, shorter than upper floret, with or without palea; upper lemma finely rugose-punctate, apex purplish, acute. Fl. and fr. Sep.

- Mountain slopes, thickets, roadsides; 1300–1600 m. Guizhou, Yunnan.

1a. Culms ca. 37 cm tall; lower floret without palea ........................................... 7a. var. *guizhouensis*

1b. Culms more than 37 cm tall; lower floret with palea ........................................... 7b. var. *paleata*

7a. *Setaria guizhouensis* var. *guizhouensis*


具稃贵州狗尾草 ju fu gui zhou gou wei cao

Culms ca. 37 cm tall. Panicle ca. 11 cm. Lower floret without palea. Fl. and fr. autumn.

- Thickets; ca. 1300 m. Guizhou.


金色狗尾草 jin se gou wei cao


Annual. Culms erect or geniculate, 20–90 cm tall, smooth or scabrous just below inflorescence, nodes glabrous. Leaf sheaths keeled, glabrous; leaf blades linear, 5–40 × 0.2–1 cm, abaxial surface smooth, adaxial surface scabrous or pilose at base; ligule ca. 1 mm. Panicle densely cylindrical, 3–17 × 0.4–0.8 cm; branches reduced to a single mature spikelet subtended by 5–10 or more bristles (sometimes an aborted spikelet also present); axis pubescent; bristles gold, brownish gold or sometimes purple, 2–3 times spikelet length. Spikelets broadly ovate, (2.2–)2.5–3.5 mm; glumes ovate; lower glume 1/3–1/2 as long as spikelet; upper glume 1/2–2/3 as long as spikelet; lower floret usually staminate; lower palea hyaline, ovate, matching the upper floret in size and shape, keels narrowly winged; upper lemma broadly ovate, coarsely rugose. Fl. and fr. Jun–Oct. 2n = 18, 36.

Waste places, mountain slopes, roadsides, forest margins. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Ningxia, Shaanxi, Shandong, Shanghai, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [originally from temperate and subtropical Asia and Europe, but now widespread].

The name *Setaria glauca* (Linnaeus) P. Beauvois has been misapplied to this species.
Setaria pumila and S. parviflora are different facets of the same polymorphic complex, and are sometimes regarded as a single, variable species. No character taken on its own is reliable for separating the two species, but the combination of all characters listed in the key will enable most specimens to be assigned to one or the other.

The name Setaria lutescens var. dura refers to a form with the lower lemma hardened and rugose like the upper lemma. This is a rare variant, known from Fujian and Yunnan and also from Korea. Hardening of the lower floret is known to occur occasionally in other genera of Paniceae.

This species is cultivated for forage.


Annual or short-lived perennial with basal buds or a short knotty rhizome. Culms erect or geniculate, 20–90 cm tall. Leaf sheaths keeled, glabrous; leaf blades stiff, flat or involute, 5–30 × 0.2–0.8 cm, glabrous or adaxial surface pilose at base, apex acuminulate; ligule ca. 1 mm. Panicle densely cylindric, 2–15 × 0.5–1.2 cm; branches reduced to a single mature spikelet subtended by 8–12 bristles; axis pubescent; bristles golden or purplish brown when mature, 2–3 times spikelet length. Spikelets elliptic, 1.8–2.5 mm; lower glume ovate, 1/3 as long as spikelet, acute; upper glume broadly ovate, ca. 1/2 as long as spikelet, obtuse; lower floret neuter; lower palea firmly membranous, lanceolate, about as long as the upper floret but narrower, keels wingless, minutely papillose; upper lemma ovate-elliptic, finely rugose. Fl. and fr. Oct–Dec. 2n = 72.

Mountain slopes, roadsides, waste places. Anhui, Fujian, Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Nei Mongol, Ningxia, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea; introduced in North America].

This robust, annual species is frequently confused with large forms of Setaria viridis, but has broader, acute spikelets and a shorter upper glume clearly exposing the tip of the upper lemma.


Annual. Culms robust, erect, up to 150 cm, nodes glabrous. Leaf sheaths glabrous or pubescent, ciliate; leaf blades linear-lanceolate, 15–45 × 0.6–2 cm, usually glabrous; ligule 1–3 mm. Panicle dense, lobed, 6–40 × 0.5–5 cm, very variable, erect or pendent when mature; spikelets subtended by several bristles 1–5 times spikelet length; axis villous. Spikelets elliptic to ovate or subglobose, 2–3 mm, yellow, brown, orange or purple; lower glume 1/3–1/2 as long as spikelet; upper glume about as long as spikelet, 5–7(–9)-veined, obtuse; lower lemma equal to spikelet, 5–7-veined; lower palea absent or narrow, up to 1/2 as long as lemma; upper floret yellow or orange-yellow, oblong or ovate-oblong, cartilaginous, deciduous at maturity, finely rugose to smooth and shiny. Fl. and fr. summer to autumn. 2n = 18.

Cultivated. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Jiangxi, Nei Mongol, Ningxia, Shannxi, Shangdong, Shanxi, Sichuan, Taiwan, Xianjiang, Xizang, Yunnan, Zhejiang [origin uncertain; now introduced and cultivated sporadically worldwide].

This grass (Foxtail Millet) has been cultivated as a cereal in China since ancient times and exists in many races differing in size, shape, and hairiness of the panicle, color of the grain, and length of the bristles. It is also a useful forage grass. It is thought to be derived from Setaria viridis.

**狗尾草** gou wei cao

Annual. Culms tufted, erect or geniculate, up to 70(–150) cm tall, 3–7 mm in diam. Leaf sheaths glabrous to papilllose-pilose, margins densely ciliate; leaf blades linear to linear-lanceolate, flat, glabrous or papilllose-pilose on both surfaces, base subrounded or subtruncate, margins scabrous, apex acuminate; ligule 1–2 mm. Panicle dense, usually cylindrical, usually tapering upward, 1–24 cm, erect or slightly nodding, branchlets bearing several spikelets each subtended by 3–7(–25) bristles; axis pilose or pubescent; bristles green, brown or purple, 4–12 mm. Spikelets elliptic-oblong, 2–2.5(–3) mm, obtuse; lower glume elliptic, as long as spikelet, lower lemma equal to spikelet, 5-veined; lower palea about 1/3 as long as lemma; upper lemma palea about 1/3 as long as lemma; upper lemma pale green, oblong, finely punctate-rugose, obtuse. Fl. and fr. May–Oct. 2n = 18.

Hill slopes, roadsides, grassy waste places. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [temperate and subtropical regions of the Old World; introduced elsewhere].

1a. Culms 5–25 cm tall; panicle ovate or elliptic, 1–4 cm ..........................  1c. subsp. pachystachys

1b. Culms usually more than 25 cm tall; panicle cylindrical, up to 24 cm.

2a. Culms up to 70 cm, much branched at base; panicle to 12 cm, not lobed; spikelets 2–2.5 mm ..........................  12a. subsp. viridis

2b. Culms 60–150 cm, little branched; panicle to 24 cm, sometimes lobed; spikelets 2.5–3 mm ..........................  12b. subsp. pycnocoma

12a. Setaria viridis subsp. viridis

**断穗狗尾草** duan sui gou wei cao

*Panicum pycnocomum* Steudel, Syn. Pl. Glumac. 1: 462. 1854; *P. viride var. giganteum* Franchet & Savatier; *P. viride var. majus* Gaudin; *Setaria gigantea* (Franchet & Savatier) Makino; *S. pycnocoma* (Steudel) Henrard ex Nakai; *S. viridis var. major* (Gaudin) Petermann (1838), not Gray (1821).

Culms little branched at base, 60–150 cm tall. Leaf blades 15–40 × 1–2.5 cm, glabrous on both surfaces. Panicle sometimes lobed, 7–24 × 1.5–2.5 cm; bristles green, brownish or purplish, 7–12 mm. Spikelets 2.5–3 mm. Fl. and fr. Jun–Oct.

Roadsides, forest margins, a crop weed, especially in *Setaria italica* fields; below 2700 m. Gansu, Guizhou, Hebei, Heilongjiang, Hong Kong, Hubei, Hunan, Jilin, Nei Mongol, Shanxi, Shandong, Sichuan, Xinjiang [Japan, Russia; C and SW Asia, C and S Europe, North America].

This robust form of *Setaria viridis* may be of hybrid origin, resulting from crossing with *S. italica*. Unlike *Setaria italica*, the spikelets are shed whole.


**厚穗狗尾草** hou sui gou wei cao


Culms usually decumbent at base, much branched, 5–25 cm tall. Leaf sheaths densely tuberculate-pilose in the lower part; leaf blades narrowly lanceolate, stiff, 1.5–5 × 0.2–0.4 cm, glabrous but scabrous on both surfaces. Panicle ovate or elliptic, 1–4 cm; bristles below spikelet 10–25, very dense, green, yellow, or purple, 6–8 mm. Spikelets 2–2.5 mm.

Sand and pebbles of the seashore. Guangdong, Taiwan [Japan, Korea].

This is a maritime form characterized by its low, branching habit and short, broad, densely bristly panicle.


**断穗狗尾草** duan sui gou wei cao

*Setaria italica* var. *sinica* Ohwi.

Annual. Culms densely tufted, geniculate at base, slender, 20–100 cm tall, smooth, glabrous. Leaf sheaths loose, lower papilllose-pubescent, upper glabrous, margins and mouth ciliate; leaf blades narrowly lanceolate, thin, 5–15 × 0.2–0.7 cm, glabrous, scabrous on both surfaces, base subrounded, apex long acuminate. Panicle narrowly cylindrical, commonly interrupted below, 2–9 × 0.5–0.8 cm; branchlets with several spikelets, these subtended by 1–4 bristles; axis pilose, rarely glabrous; bristles green or purple, 2–8 mm. Spikelets narrowly elliptic, 2.5–3 mm, acute; lower glume ovate, thinly papery, ca. 1/2 as long as spikelet, acuminate; upper glume as long as spikelet or slightly shorter; lower floret neuter, lemma equal to spikelet, 5-veined; lower palea small, narrowly lanceolate; upper lemma...
pale green or yellowish, finely rugose, acuminate. Fl. and fr. Jul.–Sep.  
- Sandy places; 1000–1300 m. Hebei, Heilongjiang, Nei Mongol, Shanxi.


倒刺狗尾草 dao ci gou wei cao

Panicum verticillatum Linnaeus, Sp. Pl., ed. 2, 1: 82; Chaetochloa brevisspica Scribner & Merrill; C. verticillata (Linnaeus) Scribner; Chaetochloa leptocaula (Linnaeus) Kuntze var. verticillata (Linnaeus) Kuntze; C. verticillata (Linnaeus) Porter; Panicum asperum Lamarck; Pennisetum verticillatum (Linnaeus) R. Brown; Setaria brevisspica (Scribner & Merrill) K. Schumann.

Annual. Culms tufted, much branched, ascending, 20–100 cm tall, glabrous. Leaf sheaths thin, glabrous or papillos-puberulous, margins ciliolate; leaf blades broadly linear, flaccid, 5–20 × 0.4–1.8 cm, usually glabrous, base subrounded, margins scabrous, apex long acuminate; ligule 0.5–1 mm. Panicle densely spikelike, or lobed with short lateral branches on vigorous specimens, 4–15 cm, spikelets subtended by 1–4 bristles; axis shortly hispidulous; bristles green or brownish, 3–8 mm, retrorsely barbed and often becoming entangled. Spikelets elliptic, 1.8–2.4 mm, green with obvious darker veins, obtuse; lower glume 1/3–1/2 as long as spikelet, obtuse; upper glume boat-shaped, as long as spikelet, 7-veined; lower floret staminate or neuter; lower palea much reduced; upper lemma dorsally compressed, finely rugose. Fl. and fr. Jun–Sep. 2n = 18, 36.

Roadsides, open weedy places; 300–1000 m. Nei Mongol, Taiwan, Yunnan [tropical and warm-temperate regions of the Old World; introduced in America].

This is an easy species to recognize because of its clinging, retrorsely barbed bristles.


类雀稗属 lei que shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials. Culms usually thick, often rooting from the lower nodes. Leaf blades flat or involute; ligule a ciliate rim. Inflorescence of short erect racemes; racemes imbricate or distant along the central axis, spikelets borne singly, usually imbricate in 2 point or bristle. Spikelets dorsally compressed or often strongly convex, florets 2; glumes membranous to herbaceous, rounded, neat rows, sometimes also on short basal branchlets; rachis (and branchlet when spikelets clustered) terminating in an inconspicuous glume, lower palea present or absent; upper lemma coriaceous to bony, margins inrolled or only narrowly hyaline; upper palea apex often briefly reflexed. x = 9.

About 40 species: throughout the tropics, especially Australia; two species in China.

Most species of Paspalidium are clearly distinct from Setaria, with a completely different appearance, so for that reason the two genera are maintained here. However, some species of Setaria with very few bristles (especially in Australia) are intermediate, and Paspalidium is included within Setaria by some authors. Setaria yunnanensis is the only intermediate species in China.

1a. Racemes distant; upper glume 2/3–3/4 length of spikelet; upper lemma granulate  
1b. Racemes overlapping; upper glume 1/4–1/2 length of spikelet; upper lemma finely rugose

1. Paspalidium flavidum (Retzius) A. Camus in Lecomte, Fl. Indo-Chine 7: 419. 1922.

尖头类雀稗 jian tou lei que bai

Panicum flavidum Retzius, Observ. Bot. 4: 15. 1786; P. floridum Royle; P. granulare Lamarck; Setaria flava (Retzius) Veldkamp.

Perennial. Culms tufted, slightly compressed, 30–100 cm tall from a decumbent base. Leaf sheaths strongly keeled, smooth; leaf blades linear-lanceolate, flat or folded, 5–30 × 0.5–1 cm, base subcordate and tuberculate-setose, apex abruptly acute; ligule ca. 0.5 mm. Inflorescence axis 5–20 cm; racemes 6–9, 1.5–2.5 cm, widely spaced; rachis ca. 0.5 mm wide, slightly winged, prolonged into a point. Spikelets plumply ovate, gibbous, 1.5–2.5 mm, milk-white or purplish; lower glume broadly ovate, ca. 1/2 as long as spikelet; upper glume 2/3–3/4 as long as spikelet, 7-veined; lower lemma as long as spikelet, 5-veined; upper lemma bony, granulate. Fl. and fr. Jul–Oct.
at lanceolate, 10–25 × 0.3–0.8 cm, scabrous, adaxial surface papillose, apex acuminate; ligule 1–2 mm. Inflorescence axis 10–30 cm; racemes 8–15, 1–5 cm, overlapping at least in upper part of inflorescence; rachis 0.5–1.5 mm wide, undulate, apex aciculate. Spikelets ovate-oblong, 2–3 mm; lower glume ciliate, 1/4 as long as spikelet, truncate; upper glume suborbicular, 1/4–1/2 as long as spikelet, 3–5-veined, rounded or truncate; lower floret neuter, lemma ovate, as long as or slightly shorter than upper floret, prominently 3–5-veined, acute, palea absent; upper lemma ovate, finely rugose, cuspidate-acuminate. Fl. and fr. Jul–Oct.

Floating in fresh water, rooting along marshy stream sides, in wet soil; 100–500 m. Fujian, Guangdong, Hainan, Taiwan [Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; E Africa].

173. STENOTAPHRUM Trinianus, Fund. Agrost. 175. 1822 ["1820"]

钝叶草属 dun ye cao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Diastemenanthe Steudel; Ophiurinella Desvauaix.

Annuals or perennials, stoloniferous. Leaf blades linear to narrowly lanceolate; ligule ciliate. Inflorescence of very short racemes bearing a few sessile spikelets; racemes arranged singly and sunk in pockets on one or both sides of a foliaceous or corky axis, variously disarticulating at maturity, raceme rachis ending in a point. Spikelets ovate-lanceolate to lanceolate; glumes both short or upper equal to spikelet, membranous; lower floret staminate or neuter, lemma as long as the spikelet, usually coriaceous, rarely papery, smooth, acute; upper lemma slightly shorter than lower lemma, papery, rarely coriaceous, margins flat. x = 9.

Seven species: tropics and subtropics, mostly on seashores or near the coast from the Indian Ocean to SE Asia and the Pacific Ocean, one species pantropical; three species (one introduced) in China.

1a. Inflorescence with broad foliaceous axis, spikelets not sunk in axis cavities; lower lemma herbaceous, upper lemma coriaceous................................................................. 1. S. helferi

1b. Inflorescence with thick, non-foliaceous axis, spikelets sunk in axis cavities; lower lemma cartilaginous, upper lemma papery.

2a. Spikelets on opposite sides of a cylindrical axis, 2.5–3.5 mm, in short racemes; leaf blades sharply acuminate ........................................................................................................ 2. S. micranthum

2b. Spikelets on one face of a flattened axis, 4–5 mm, solitary; leaf blades obtuse .......................... 3. S. secundatum

1. Stenotaphrum helferi Munro ex J. D. Hooker, Fl. Brit. India 7: 91. 1896 ["1897"]

Stenotaphrum helferi

Perennial. Culms stoloniferous, flowering shoots 10–40 cm tall. Leaf sheaths loose, laterally compressed, keeled, glabrous; leaf blades broadly linear, 5–17 × 0.5–1.1 cm, glabrous, base truncate, apex abruptly acute; ligule ca. 0.3 mm. Inflorescence 10–15 cm; axis with foliaceous wing, 3–5 mm wide, midrib sharply triquetrous with scabrous margins; racemes 7–18 mm, appressed within the curves of the midrib, bearing 3–7 spikelets, lowest racemes free; raceme rachis triquetrous, margins spiny. Spikelets ovate-lanceolate, dorsally flattened, 4–4.5 mm, strongly veined, acuminate; glumes herbaceous, acute; lower glume broadly ovate, 1/2–2/3 as long as spikelet, 3–5–7-veined; upper glume as long as spikelet, 9–11-veined; lower floret staminate or neuter, lemma firmly herbaceous, 7-veined, palea well developed; upper lemma coriaceous, smooth, cuspidate-mucronate, tardily deciduous. Fl. and fr. autumn.

Moist lawns, forest edges, open forests; below 1100 m. Fujian, Guangdong, Hainan, Yunnan [Malaysia, Myanmar, Thailand, Vietnam].

2. Stenotaphrum micranthum (Desvaux) C. E. Hubbard in C. E. Hubbard & R. E. Vaughan, Grasses Mauritius Rodriguez, 73. 1940.

Stenotaphrum micranthum

侧钝叶草 ce dun ye cao

Ophiurinella micrantha Desvaux, Mém. Soc. Agric. Angers 1: 179. 1831; Stenotaphrum diplolapathum Pilger; S. lepturoides Henslow; S. subulatum Trinianus.

Annual. Culms decumbent at base, up to 35 cm tall. Leaf sheaths rounded, ciliate along one margin; leaf blades lanceolate, 4–8 × 0.5–1 cm, glabrous or pubescent, apex sharply acuminate; ligule ca. 1 mm. Inflorescence 6–14 cm, slender, cylindrical; axis 1.5–2.5 cm wide; racemes 5–10 mm, sunk in depressions on opposite sides of the axis, bearing (1–)3–6 spikelets; raceme rachis stoutly triquetrous, ciliate along margins. Spikelets oblong-lanceolate, 2.5–3.5 mm, obtuse to subacute, falling entire; glumes membranous, 1/5–1/4 as long as spikelet or upper glume slightly longer, truncate; lower floret neuter, lemma cartilaginous, flat, enclosing fertile floret in inflorescence axis, 3-veined, grooved on either side of midvein, margins inflexed at lateral veins, lower palea absent; upper lemma papery, subequal to spikelet, smooth, acute. Fl. and fr. spring.

Coral islands on coastal sands, understorey of littoral woodlands. South China Sea Islands (Xisha Qundao) [small islands around New Guinea; Australia (Great Barrier Reef Islands), Coral Sea Islands, Indian Ocean Islands, Pacific Islands (Polynesia); probably introduced to E Africa (Tanzania)].


侧钝叶草 ce dun ye cao

Iscaumum secundatum Walter, Fl. Carol. 249. 1788.

Perennial, stoloniferous and forming a dense sward. Culms much branched, flowering shoots 10–30 cm tall. Leaf sheaths strongly keeled, often grouped in flabellate clusters; leaf blades
174. MELINIS P. Beauvois, Ess. Agrostogr. 54. 1812.

**Rhynchelytrum** Nees.

Annuals or perennials. Culms tufted, often decumbent at the base. Leaf sheaths usually loose; leaf blades linear; ligule a ciliate rim. Inflorescence a panicle; pedicels slender, glabrous or with a few long hairs at the tip. Spikelets elliptic or oblong, laterally compressed, hairy or glabrous; lower glume small or absent; upper glume as long as spikelet, membranous to papery, 5–9-veined, acute, emarginate or 2-lobed, awned or awnless, sometimes gibbous on the back and tapering to a beak; lower floret staminate or neuter, lemma resembling the upper glume, 3–7-veined, palea with ciliate or scaberulous keels or absent; upper floret laterally compressed, membranous to thinly cartilaginous, readily deciduous. 

Twenty-two species: mainly in tropical and S Africa; two species introduced throughout the tropics, including China.

1a. Leaf blades densely tomentose, sticky; panicle dark purple; spikelets 1.7–2.2 mm, usually glabrous ................. 1. *M. minutiflora*

1b. Leaf blades glabrous; panicle silvery-pink; spikelets 2–12 mm, conspicuously villous with fluffy spreading hairs ... 2. *M. repens*


**糖蜜草**


**Muhlenbergia brasiliensis** Steudel; *Panicum melinis* Tri- nius, nom illeg. superfl.; *P. minutiflorum* (P. Beauvois) Raspail; *Saurdia picta* Schrank; *Tristegis glutinosa* Nees.

Perennial. Culms tufted, geniculately ascending, rooting at lower nodes, 50–150 cm tall. Leaf sheaths and blades densely tomentose with glandular hairs, slightly sticky with a strong smell; leaf blades linear, 5–20 × 0.5–1.5 cm. Panicle purplish, narrowly ovate, 10–20 cm; pedicels glabrous, scaberulous, rarely with a few hairs toward the apex. Spikelets narrowly ovate-oblong, 1.7–2.2 mm; lower glume ovate, 0.1–0.4 mm, veinless; upper glume prominently 7-veined, obtusely 2-lobed, awnless or with a mucro to 1 mm from the sinus; lower floret neuter without a palea, lemma similar to upper glume but narrower, prominently 5-veined, acutely 2-lobed, awnless or with a slender awn to 15 mm from the sinus; upper floret whitish, thinly cartilaginous, smooth, shining, slightly shorter than lower lemma. Fl. and fr. Jul–Oct. 2n = 36.

Introduced into S China as a fodder grass, locally naturalized. Hong Kong, Taiwan, Yunnan [native to Africa].

This species has been introduced into many tropical countries for fodder (Molasses Grass).


**红毛草**

*Saccharum repens* Willdenow, Sp. Pl., ed. 4, 1: 322. 1797; *Rhynchelytrum repens* (Willdenow) C. E. Hubbard; *R. roseum* (Nees) Stapf & C. E. Hubbard; *Tricholaena rosea* Nees.

Annual or loosely tufted short-lived perennial. Culms geniculately ascending, often rooting at lower nodes, up to 150 cm tall. Leaf sheaths loose, usually with tubercle-based hairs; leaf blades linear, up to 20 × 0.2–1.4 cm. Panicle silvery-pink or purple, ovate to oblong, 8–20 cm, fluffy; branches capillary; pedicels with a few long hairs. Spikelets ovate, 2–4.5 mm, densely villous, hairs up to 6 mm; lower glume narrowly oblong, 0.3–1.5 mm, 1-veined, with stiff short hairs, separated from the upper by a short internode; upper glume 5-veined, gibbous below middle, tapering upward into a glabrous membranous beak 1/4–1/2 its length, emarginate, mucronate or with short awn up to 1 mm; lower floret staminate, lemma similar to upper glume but narrower and less gibbous, palea keels ciliate; upper floret whitish, thinly cartilaginous, smooth, shining, ca. 2 mm. Fl. and fr. Jun–Nov. 2n = 36.

Grasslands, open or disturbed places, naturalized. Fujian, Guangdong, Taiwan [native to Africa].

This is a polymorphic, pantropical weed, recognizable by its pink, fluffy panicles.

175. DIGITARIA Haller, Hist. Stirp. Helv. 2: 244. 1768, nom. cons., not Heister ex Fabricius (1759), nom. rej.

**马唐属**

*Digitaria* (Willdenow) C. E. Hubbard; *D. sanguinalis* (L.) Scop.; *R. roseum* (Nees) Stapf & C. E. Hubbard; *T. rosea* Nees.

Annual or loosely tufted short-lived perennial. Culms geniculately ascending, often rooting at lower nodes, up to 150 cm tall. Leaf sheaths loose, usually with tubercle-based hairs; leaf blades linear, up to 20 × 0.2–1.4 cm. Panicle silvery-pink or purple, ovate to oblong, 8–20 cm, fluffy; branches capillary; pedicels with a few long hairs. Spikelets ovate, 2–4.5 mm, densely villous, hairs up to 6 mm; lower glume narrowly oblong, 0.3–1.5 mm, 1-veined, with stiff short hairs, separated from the upper by a short internode; upper glume 5-veined, gibbous below middle, tapering upward into a glabrous membranous beak 1/4–1/2 its length, emarginate, mucronate or with short awn up to 1 mm; lower floret staminate, lemma similar to upper glume but narrower and less gibbous, palea keels ciliate; upper floret whitish, thinly cartilaginous, smooth, shining, ca. 2 mm. Fl. and fr. Jun–Nov. 2n = 36.

Grasslands, open or disturbed places, naturalized. Fujian, Guangdong, Taiwan [native to Africa].

This is a polymorphic, pantropical weed, recognizable by its pink, fluffy panicles.
**Leptoloma** Chase; *Syntherisma* Walter.

Annual or perennial. Culms erect or decumbent, occasionally stoloniferous. Leaf blades linear or linear-lanceolate; ligule membranous. Inflorescence of digitately arranged racemes, sometimes on a short axis or with secondary branchlets, very rarely paniculate; spikelets usually in groups of 2–3(–4), imbricate to effuse, the latter often on notably long and unequal pedicels. Spikelets puberulous to villous, typically in stripes between the well-defined veins, rarely glabrous; lower glume absent or reduced to a little scale up to 1/4 spikelet length; upper glume variable; lower lemma usually ± equal to spikelet; upper floret pallid to black, apex subacute to acuminate, rarely apiculate. x = 9.

About 250 species: tropical and warm-temperate regions of the world; 22 species (three endemic) in China.

*Digitaria* has been traditionally divided on the nature of the spikelet hairs, which may be clavate, capiticate, verrucose (warty, appearing beaded), or with crooked tips. As good magnification is required to see these features, the grouping of the spikelets on the raceme is a more practical aid to identification. Many species have regularly paired spikelets, which present no difficulty. In those species where the spikelets are grouped in clusters of 3 or more, care must be taken, as often the longest pedicel of a group is partially fused to the rachis so that the spikelets appear alternately paired and single, or sometimes one spikelet may be vestigial, or the spikelets may be paired toward the raceme tips.

Many species are very variable in spikelet pubescence and lemma nervation, even within a single race. Additionally, there are a number of complexes of intergrading species, so intermediates may occasionally be encountered. This has led to the publication of many superfluous names.

1a. Inflorescence an open panicle with long capillary branches ................................................................. 1. *D. fujianensis*

1b. Inflorescence composed of racemes.

2a. Spikelets of a pair heteromorphic, lower spikelet glabrous or almost so, upper spikelet conspicuously hairy.

3a. Annual; midrib of rachis narrow, clearly winged; lower lemma with 7 slender veins ......................... 10. *D. ciliaris*

3b. Perennial and stoloniferous or annual; midrib of rachis thick, scarcely winged; lower lemma with 7–11 thick, prominent veins.

4a. Perennial, stoloniferous; spikelets 4–4.5 mm, spaced on rachis ......................................................... 3. *D. heterantha*

4b. Annual; spikelets ca. 3 mm, imbricate on rachis ................................................................................. 4. *D. bicorinis*

2b. Spikelets all similar.

5a. Tussocky perennial; leaf sheaths breaking up into fibers at base ........................................................ 2. *D. fibrosa*

5b. Annuals or short-lived perennials; leaf sheaths not forming fibrous tussock.

6a. Spikelets paired; pedicels with truncate tips.

7a. Lower glume absent or almost so ........................................................................................................ 5. *D. setigera*

7b. Lower glume small but clearly present.

8a. Raceme rachis with smooth margins; racemes 2–3 ........................................................................ 6. *D. radicosa*

8b. Raceme rachis with scabrous margins; racemes often more than 3.

9a. Upper glume 1/3–1/2 length of spikelet.

10a. Lateral veins of lower lemma scabrous toward apex; upper glume subacute; upper lemma acuminate, equaling lower lemma .............................................................. 7. *D. sanguinalis*

10b. Lateral veins of lower lemma smooth; upper glume rounded; upper lemma apiculate, exceeding lower lemma ............................................................................. 8. *D. cruciata*

9b. Upper glume 1/2–3/4 length of spikelet; lateral veins of lower lemma smooth; upper lemma not exceeding lower lemma.

11a. Racemes erect, forming a narrow fascicle; spikelets 2.2–2.8 mm ........................................... 9. *D. henryi*

11b. Racemes widely spreading at maturity; spikelets 2.5–3.5 mm ................................................... 10. *D. ciliaris*

6b. Spikelets in groups of 3 or more, at least in middle part of raceme (sometimes a pedicel fused to the rachis, or the spikelet abortive, or if paired pedicels long and flexuous); pedicels usually with discoid tips.

12a. Spikelets with capitate or glabrous hairs (if glabrous, pedicel tips hairy).

13a. Tips of pedicels with a circle of stiff, overtopping hairs or spicules up to 1 mm.

14a. Spikelets 1.8–2.5 mm; upper glume 2/3–4/5 spikelet length ......................................................... 11. *D. ternata*

14b. Spikelets 1.2–1.5 mm; upper glume 1/4–1/2 spikelet length ................................................................. 12. *D. stricta*

13b. Tips of pedicels without overtopping hairs or spicules.

15a. Rachis of raceme flat, winged; spikelets 2–2.2 mm ........................................................................... 20. *D. ischaemum*

15b. Rachis of raceme slenderly triquetrous, not or scarcely winged; spikelets 1.3–2 mm.

16a. Spikelets 1.8–2 mm; leaves conspicuously hirsute ...................................................................... 13. *D. hengduanensis*

16b. Spikelets 1.3–1.7 mm; leaves glabrous to pilose.

17a. Racemes 2–5, 3–8 cm; culms 30–90 cm; spikelets pubescent; apex of fertile floret protruding above lower lemma ........................................... 14. *D. abludens*

17b. Racemes 5–8, 10–17 cm; culms 80–110 cm; spikelets coarsely villous; apex of fertile floret not protruding ........................................... 15. *D. jubata*

12b. Spikelets with smooth or verrucose hairs (tips sometimes coiled), or glabrous; pedicel tips glabrous.

Annual. Culms tufted, erect, 30–50 cm tall, 4–5-noded. Leaf sheaths papillose-pilose; leaf blades linear or linear-lanceolate, 6–20 × 0.3–0.6 cm, thinly pilose, margins thickened, smooth, apex acuminate; ligule brown, 2–3 mm. Inflorescence panicle, open, 12–18 cm; branches capillary, 5–10 cm, spreading; spikelets toward the panicle periphery; pedicels long, capillary, scaberulous. Spikelets lanceolate-elliptic, 3.3–4 mm, acute; lower glume ca. 0.5 mm, veinless, obtuse or emarginate; upper glume 3/4–4/5 as long as spikelet, 3–5-veined, appressed silky pubescent between lateral veins and along margins; lower lemma as long as spikelet, 7-veined, margins and intervein spaces appressed silky pubescent; upper lemma yellowish, apiculate. Anthers purplish, ca. 2 mm. Fl. and fr. Jul.

- Between rocks. Fujian.


Spikelets 1.7–2.3 mm; lower lemma with equidistant veins ........................................ 16. D. mollicoma

Spikelets 1.2–1.5 mm; lower lemma with broader intervein spaces flanking midvein ........................................ 17. D. longiflora

- Upper lemma dark brown to blackish purple at maturity; plant usually tufted.

20a. Spikelets glabrous ........................................ 19. D. stewartiana

20b. Spikelets pilose.

21a. Racemes 2–4, divaricate; spikelets elliptic, 2–2.2 mm ........................................ 20. D. ischaemum

21b. Racemes (2–)3–10, ascending; spikelets elliptic-oblong, 1.2–1.9 mm.

22a. Upper glume 1/4–1/2 spikelet length ........................................ 22. D. fauriei

22b. Upper glume subequaling spikelet.

23a. Rachis 0.5–0.8 mm broad; spikelets 1.4–1.9 mm ......................... 21. D.violascens

23b. Rachis 0.3–0.5 mm broad; spikelets 1.2–1.5 mm ......................... 18. D. leptalea

Spikelets oblong-lanceolate, 2.8–3.3 mm, pilose with white or brownish, minutely capitate hairs; lower glume very small, sub-rounded; upper glume ca. 4/5 as long as spikelet but narrow, 3-veined, pilose; lower lemma as long as spikelet, 7-veined, hairiness variable, usually glabrous and purple-tinged on either side of midvein, 2nd intervein space and margins usually pilose, rarely pilose throughout; upper lemma dark brown to purplish black. Fl. and fr. May–Aug.

Mountain grasslands, Fujian, Guangdong, Guangxi, Sichuan, Yunnan [Laos, Myanmar, Thailand].

Digitaria fibrosa is sometimes included in D. setifolia Stapf. Both have an identical habit, inflorescence, and spikelet structure, but D. setifolia has narrower, inrolled, filiform leaves and is confined to South Africa. Digitaria fibrosa is maintained here on account of this difference and the disjunct distribution.

This is the only species in China with a tussocky, fibrous base. Hairiness of the leaves and spikelets is variable, but the loose, narrowly ascending racemes of rather large spikelets with dark fertile florets are easily recognizable.


二型马唐 二型马唐

Paspalum heteranthum J. D. Hooker, Fl. Brit. India 7: 16. 1896 ["1897"], based on Panicum heteranthum Nees & Meyen (1841), not Link (1827); Digitaria baliensis Ohwi; D. bantamensis Ohwi; D. dispar Henrard, nom. illeg. superfl.; D. heterantha var. hirtella L. C. Chia; D. shimadana Ohwi.

Perennial, stoloniferous. Culms branching and rooting at lower nodes, 50–100 cm tall. Leaf sheaths glabrous to papillose-pilose; leaf blades broadly linear, 5–15 × 0.3–0.6 cm, glabrous to papillose-pilose on both surfaces; ligule 1–2 mm. Inflorescence digitate; racemes 2–4, stiffly ascending to divaricate, 5–15(–20) cm, the longer sparsely spiculate at base; spikelets paired, not imbricate, appressed and appearing slightly sunken; rachis triquetrous, thick, scarcely winged. Spikelets lanceolate, 3.5–4.5(–6) mm, those of a pair different, lower spikelet glabrous, upper spikelet villous; lower glume very small, veinless; upper glume lanceolate, 1/2 as long as to equaling spikelet, 3–5-veined; lower lemma as long as spikelet, closely 7–11-veined, veins equidistant, thick, prominent, interspaces slitlike; upper spikelet with rows of silky hairs, usually also setose, the hairs spreading halo-like at maturity; upper lemma pallid, acuminate. Fl. and fr. Jun.–Oct. 2n = 36, 72.
Coastal sands. Fujian, Guangdong, Hainan, Taiwan [Indonesia, Malaysia, Palau Islands, Philippines, Thailand, Vietnam].


Paspalum bicornne Lamarck, Tabl. Encycl. 1: 176. 1791; Digitaria biflora Willdenow; Panicum bicornne (Lamarck) Kunth; P. biflora (Willdenow) Kunth.

Annual. Culms decumbent, rooting at lower nodes, 30–60 cm tall. Leaf sheaths glabrous or lower sheaths papillose-pilose; leaf blades linear, 2.5–15 × 0.2–0.9 mm, usually scabrid on both surfaces, rarely sparsely pilose; ligule 1–3.5 mm. Inflorescence digitate or subdigitate; racemes 2–5, 4–14 cm; spikelets paired, imbricate; rachis triquetrous, usually 1 mm wide, winged. Spikelets lanceolate, ca. 3 mm, those of a pair usually different; lower spikelet glabrous, upper spikelet pubescent; lower glume very small, almost absent or up to 0.4 mm, triangular or bifid, veinless; upper glume lanceolate, ca. 2/3 length of spikelet, 3-veined, pilose; lower lemma as long as spikelet, 1–3-veined, veinless or with a wider interspace flanking the midvein, lateral veins crowded near margins, rows of silky hairs between lateral veins, usually also setose, the hairs spreading halo-like at maturity; upper lemma yellowish, slightly shorter than spikelet. Fl. and fr. May–Sep. 2n = 54, 72.

Waste ground, often on sand, including seashore sand; below 2000 m. Fujian, Hainan, Yunnan [India, Indonesia, Malaysia, Myanmar, New Guinea, Sri Lanka, Thailand; Africa, Australia; introduced in America].

5. Digitaria setigera Roth ex Roemer & Schultes, Syst. Veg. 2: 474. 1817.

海南马唐 hai nan ma tang

Digitaria hainanensis Hitchcock ex Keng; Digitaria microbacthe (J. Presl) Henrard; D. microstachya Henrard; D. pruriens (Fischer ex Trinius) Buse; D. sanguinalis (Linnaeus) Scopoli var. pruriens (Fischer ex Trinius) Prain; Panicum microbacthe J. Presl; P. pruriens Fischer ex Trinius; P. sanguinale Linnaeus var. microbacthe (J. Presl) Hackel; Syntherisma microbacthe (J. Presl) Hitchcock.

Annual. Culms tufted, decumbent, branching and rooting at lower nodes, 30–100 cm tall. Leaf sheaths glabrous or papillose-pilose; leaf blades linear-lanceolate, 5–20 × 0.3–1 cm, glabrous on both surfaces, papillo-pilose at base, base sub-rounded, apex acuminate; ligule 1–2 mm. Inflorescence digitate or subdigitate, axis 1–4 cm; racemes 5–12, stiff, 5–15 cm; spikelets paired, imbricate by about 2/3 their length; rachis triquetrous, narrowly winged, ca. 0.6 mm broad, margins scabrous. Spikelets narrowly lanceolate-oblong, 2–2.5(–3) mm, acute; lower glume absent or a minute rim; upper glume up to 1/3 as long as spikelet, 1–3-veined, margins ciliate, apex villous with overtopping hairs; lower lemma as long as spikelet, 5–7-veined, veins evenly spaced or with a wider interspace flanking the midvein, lateral intervein spaces and margins appressed pubescent to villous, rarely ciliate or setose; upper lemma yellowish to gray, subequaling lower lemma, acuminate. Fl. and fr. Jun–Nov. 2n = 27, 36, 54, 72.

Moist slopes, stream banks, roadsides and weedy places. Fujian, Guangdong, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Thailand, Vietnam; E Africa (Tanzania), Australia, Indian Ocean Islands (Seychelles), Madagascar, Pacific Islands].

This coarse, weedy species is widespread in warm parts of Asia. Spikelet pubescence is very variable, as in most members of the complex around Digitaria cilariis, but the species can be readily distinguished by the lack of a lower glume and the presence of only a very short upper glume.

Specimens have sometimes been misidentified as Digitaria corymbosa. True D. corymbosa is a synonym of D. compacta (Roemer & Schultes) Veldkamp from India.


红尾草 hong wei ling

Panicum radicosum J. Presl, Reliq. Haenk. 1: 297. 1830; Digitaria chinensis Hornemman var. hirsuta (Honda) Ohwi; D. formosana Rendle; D. formosana var. hirsuta (Honda) Henrard; D. radicosa var. hirsuta (Honda) C. C. Hsu; D. tenispica Rendle; D. timorense (Kunth) Balansa; Panicum formosanum (Rendle) Makino & Nemoto; P. timorense Kunth; Syntherisma formosana (Rendle) Honda; S. formosana var. hirsuta Honda.

Annual. Culms slender, trailing, branching, 30–50 cm tall, glabrous. Leaf sheaths usually glabrous; leaf blades linear-lanceolate, 2–6 × 0.3–0.7 mm, abaxial surface scabrous, adaxial surface glabrous, pubescent or papillo-pilose at base; ligule 0.75–2 mm. Inflorescence digitate; racemes 2–3(–4), slender, 4–10 cm; spikelets paired, loosely imbricate by about half their length; rachis triquetrous, narrowly winged, ca. 0.6 mm broad, margins smooth or almost so. Spikelets narrowly lanceolate, 2.8–3 mm; lower glume triangular, 0.2–0.3 mm; upper glume narrow, long triangular, 1/3–2/3 as long as spikelet, 1–3-veined, villous throughout; lower lemma as long as spikelet, 5–7-veined, a broad intervein space on either side of midvein, lateral veins very close together near margin, appressed silky pubescent, very rarely with a ciliate fringe, never setose; upper lemma yellowish at maturity, narrowly lanceolate. Anthers 0.5–1 mm. Fl. and fr. summer–autumn. 2n = 18.

Moist grasslands, roadsides, weedy places. Anhui, Fujian, Guangdong, Hainan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Philippines, Thailand; Australia, Indian Ocean Islands, Madagascar, Pacific Islands; introduced in Pakistan, Tanzania, and a few other places].

This species is related to Digitaria cilariis, but differs in its slender, trailing habit, fewer digitate racemes with smooth-edged rachis, and narrow spikelets with contiguous lateral veins in the lower lemma, which thereby appears 3-veined.

This species is used for forage.


马唐 ma tang

Panicum sanguinale Linnaeus, Sp. Pl. 1: 57. 1753; Paspa- lum sanguinale (Linnaeus) Lamarck.

Annual. Culms erect or decumbent at base, 10–80 cm tall,
glabrous or nodes bearded. Leaf sheaths glabrous or sparsely papillose-pilose; leaf blades linear-lanceolate, 5–20 × 0.4–1.2 cm, glabrous or pilose, margins thickened, scabrous; ligule 1–3 mm. Inflorescence digitate or subdigitate, axis 1–2 cm; racemes 4–12, stiff, 5–18 cm; spikelets paired, overlapping by about 2/3 their length; rachis winged, midrib triquetrous, margins scabrous. Spikelets elliptic-lanceolate, 3–3.5 mm, acute; lower glume small, ca. 0.2 mm, triangular; upper glume lanceolate, 1/3–1/2 spikelet length, 3-veined, pubescent, subacute; lower lemma as long as spikelet, 7-veined, veins evenly spaced or a broader interspace flanking the midvein, midvein smooth, lateral veins setiform-scabrous especially toward the apex, apressed-pubescent on lateral intervein spaces and margins, rarely also setose; upper lemma greenish gray or light brown, lanceolate, as long as spikelet, apex acuminated. Anthers ca. 1 mm. Fl. and fr. Jun–Sep. 2n = 28, 36.

Fields, roadsides, weedy places. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang [warm-temperate and upland subtropical regions throughout the world].

The scabrous veins of the lower lemma, although a small character requiring a good lens, are the best means of distinguishing this species from Digitaria ciliaris.

This species is a good forage grass.


十字马唐  shi zi ma tang


Annual. Culms decumbent at base, branching and rooting at lower nodes, 30–100 cm tall, nodes thinly hispid. Leaf sheaths glabrous or hispid; leaf blades linear-lanceolate, 5–20 × 0.3–1 cm, papillose-hispid on both surfaces or adaxial surface glabrous, margins thickened, undulate, scabrous; ligule 1–2.5 mm. Inflorescence subdigitate, axis 1–5 cm; racemes 5–8, 3–15 cm; spikelets paired, imbricate; rachis winged, ca. 1 mm broad, midrib triquetrous, margins scabrous. Spikelets plumly elliptic-oblong, 2.5–3 mm; lower glume minute, veinless; upper glume broadly ovate, 1/3 as long as spikelet, 3-veined, subglabrous, margins membranous, apex broadly obtuse; lower lemma slightly shorter than upper lemma, 7-veined with intervein spaces nearly equidistant, glabrous or margins pilose; upper lemma pale purplish gray at maturity, apex abruptly apiculate, exserted from spikelet. Fl. and fr. Jun–Oct. 2n = 18, 36, 72.

Upland grasslands; 1000–2700 m. Guizhou, Hubei, Sichuan, Xi-zang, Yunnan [Bhutan, N India, Myanmar, Nepal].

This species is a common weed in the Himalayan region, generally occurring at higher altitudes than other members of the Digitaria ciliaris complex. It is usually clearly distinguished by its relatively broad spikelets with a short, rounded upper glume and apiculate apex to the fertile floret.

Digitaria cruciata var. escuenda Bor is a minor cereal cultivated in the Khasi hills of NE India. It has longer racemes than the wild form, and a turigin, persistent grain. The name has been misapplied to wild-growing plants in Xizang (Lhasa).


亨利马唐  heng li ma tang

Digitaria sasakii (Honda) Tuyama; Panicum henryi (Rendle) Makino & Nemoto; Syntherisma henryi (Rendle) Newbold; S. sasakii Honda.

Perennial. Culms tufted, slender, prostrate, often rooting at lower nodes, 20–50 cm tall. Leaf sheaths glabrous; leaf blades narrowly lanceolate, 3–8 × 0.2–0.5 cm, glabrous or sparingly hispid near base, apex acute; ligule 1–2 mm. Inflorescence subdigitate, axis short; racemes 3–9, erect and clustered, never divergent, 4–8 cm; spikelets paired; rachis flat, winged ca. 0.5 mm broad, margins scabrous. Spikelets lanceolate, 2.2–2.8 mm, acuminate; lower glume ca. 0.2 mm; upper glume lanceolate, 1/2 as long as spikelet, 3-veined, pilose; lower lemma slightly longer than upper lemma, 7-veined with broader intervein spaces flanking the midvein, pilose along lateral intervein spaces and margins; upper lemma yellowish green to gray, apex acute. Fl. and fr. summer–autumn. 2n = 36.

Sandy seashores, grasslands near the sea. Fujian, Guangdong, Guangxi, Hainan, Shanghai, Taiwan [S Japan, Vietnam; naturalized in Hawaii].

The spikelets of Digitaria henryi resemble those of D. ciliaris, to which it is closely related, but D. henryi is a rather smaller, more slender plant of different habit, most obviously distinguishable by its cluster of erect racemes.

10. Digitaria ciliaris (Retz.) Koeler, Descr. Gram. 27. 1802.

纤毛马唐  xian mao ma tang

Annual. Culms decumbent at base, branching and rooting at lower nodes, 30–100 cm tall. Leaf sheaths ± pilose; leaf blades linear to linear-lanceolate, 5–20 × 0.3–1 cm, adaxial surface usually pilose, margins thickened and scabrous; ligule 1–2 mm. Inflorescence digitate or subdigitate, axis short; racemes 3–10, 5–17 cm; spikelets paired, imbricate by about 2/3 their length; rachis winged, ca. 1 mm broad, midrib triquetrous, margins scabrous. Spikelets ellipsoid-oblong, 2.5–3 mm; lower glume minute, veinless; upper glume broadly ovate, 1/3 as long as spikelet, 3-veined, subglabrous, margins membranous, apex broadly obtuse; lower lemma slightly shorter than upper lemma, 7-veined with intervein spaces nearly equidistant, glabrous or margins pilose; upper lemma pale purplish gray at maturity, apex abruptly apiculate, exserted from spikelet. Fl. and fr. May–Oct. 2n = 36, 54, 72.

Roadsides, weedy places. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [throughout the tropics and subtropics, but rare in Africa].

Digitaria ciliaris is a pantropical, weedy annual very variable in spikelet pubescence and nervation. It lies at the center of a complex of similar and somewhat intergrading, weedy species including D. bicorns, D. cruciata, D. henryi, D. radiosa, D. sanguinale, and D. setigera. Occasionally intermediate specimens will be encountered that are difficult to place.
Most species in this complex include forms with or without stiff, glassy bristles near the margins of the lower lemma. These lie flat along the lemma when young, coloring yellow and spreading as a conspicuous pectinate fringe at maturity. The pectinate form of *Digitaria ciliaris* is sometimes distinguished at varietal rank.

1a. Lower lemma pubescent to villous, but not setose ............................................. 10a. var. *ciliaris*

1b. Lower lemma pubescent to villous and also setose, bristles spreading at maturity ....................................... 10b. var. *chrysoblephara*

10a. *Digitaria ciliaris* var. *ciliaris*

纤毛马唐(原变种) xian mao ma tang (yuian zhonghong)

*Panicum ciliare* Retzius, Observ. Bot. 4: 16. 1786; *Digitaria adscendens* (Kunth) Henrard; *D. chinensis* Hornemann; *D. sanguinalis* (Linnaeus) Scopoli var. *ciliaris* (Retzius) Parlato; *D. sericea* (Honda) Honda ex Ohwi; *Panicum adscendens* Kunth; *Syntherisma ciliaris* (Retzius) Schrader; *S. sericea* Honda.

Lower lemma pubescent to villous, but lacking glassy bristles. $2n = 36, 54$.

Roadside, weedy places. Beijing, Fujian, Guangdong, Guizhou, Hainan, Hebei, Jiangxi, Nei Mongol, Ningxia, Shandong, Shanghai, Shanxi, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [throughout the tropics and subtropics].


毛马唐 mao ma tang


Lower lemma pilose and also setose with hard glassy bristles, these spreading and yellowing at maturity; sometimes bristles only present on upper spikelet of a pair. $2n = 72$.

Roadside, fields, weedy places. Anhui, Fujian, Gansu, Guangdong, Hainan, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan [tropical and warm-temperate regions of the world].

This variety is sometimes included in *Digitaria bicornis*, and there is some similarity, especially when the spikelets are heteromorphic. However, *D. bicornis* is a distinct species with only 2 or 3 racemes, a thick midrib, appressed spikelets, which appear slightly sunken, and thick, prominent veins on the lower lemma, with the intervein spaces forming slitlike furrows.


三数马唐 san shu ma tang


Annual. Culms loosely tufted, ascending, up to 100 cm tall, glabrous or pilose with long fine hairs below inflorescence. Leaf sheaths puberulous or glabrous; leaf blades linear, 10–30 × 0.6–1 cm, adaxial surface papillose-pilose, base subrounded, apex acuminate; ligule 1–2 mm. Inflorescence subdigitate, axis villous; racemes 3–8, 10–20 cm; spikelets ternate; rachis broadly winged, ca. 1 mm broad, midrib low, margins scabrous; pedicels tips hispid with 0.2–0.8 mm setae. Spikelets oblong-lanceolate or elliptic-lanceolate, 1.8–2.5 mm, pale grayish green, hairs clavate; lower glume absent; upper glume 2/3–3/4 as long as spikelet, narrower than spikelet, intervein spaces and margins appressed-pilose to hirsute; lower lemma as long as spikelet, 5–veined with a central group of 3 and 2 marginal veins, intervein spaces and margins hairy; upper lemma blackish brown at maturity, as long as spikelet. Anthers 0.4–0.8 mm. Fl. and fr. Jun–Sep. $2n = 36$.

Grassy, weedy places. Guangxi, Guizhou, Hong Kong, Sichuan, Yunnan [Bhutan, India, Indonesia, Malaysia, Nepal, Philippines, Thailand, Africa; introduced in America and Australia].

This species is a good forage grass.


竖毛马唐 shu mao ma tang

Annual. Culms loosely tufted, ascending, up to 100 cm tall, glabrous or pilose with long fine hairs below inflorescence. Leaf sheaths puberulous or glabrous; leaf blades linear, 10–30 × 0.6–1 cm, adaxial surface papillose-pilose, base subrounded, apex acuminate; ligule 1–2 mm. Inflorescence subdigitate, axis villous; racemes 3–8, 10–20 cm; spikelets ternate; rachis broad-winged, ca. 1 mm broad, midrib low, margins scabrous; pedicels tips hispid with 0.2–0.8 mm setae. Spikelets oblong-lanceolate or elliptic-lanceolate, 1.8–2.5 mm, pale grayish green, hairs clavate; lower glume absent; upper glume 2/3–3/4 as long as spikelet, narrower than spikelet, intervein spaces and margins appressed-pilose to hirsute; lower lemma as long as spikelet, 5–veined with a central group of 3 and 2 marginal veins, intervein spaces and margins hairy; upper lemma blackish brown at maturity, as long as spikelet. Anthers 0.4–0.8 mm. Fl. and fr. Jun–Sep.

Grasslands; below 1800 m. Fujian, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, Sri Lanka].

This species is allied to *Digitaria ternata*, which has bigger spikelets with a longer upper glume.

*Digitaria stricta* is a fairly uniform species, recognizable by its slender, tufted habit and small spikelets with exposed, dark upper floret ringed by setae from the pedicle apex. However, the spikelet pubescence is variable, ranging from subglabrous to conspicuously villous forms, and the small upper glume may sometimes be only vestigial or even occasionally completely absent. Two extreme variants from the typical plant have been given varietal status, as follows.

1a. Spikelets glabrous or almost so .......... 12b. var. *glabrescens*

1b. Spikelets sparsely to densely hairy

with clavate hairs.

2a. Upper glume distinct ....................... 12a. var. *stricta*

2b. Upper glume absent .......................... 12c. var. *denuda*
12a. *Digitaria stricta* var. *stricta*

**Vertical MaTang (Yuan Bian Zhong)**

*Agrostis pilosa* Retzius; *Digitaria puberula* Link; *D. roy-leana* (Nees ex J. D. Hooker) Prain; *Paspalum royleanum* Nees ex J. D. Hooker; *Setaria stricta* (Roeth ex Roemer & Schultes) Kunth.

Spikelets obviously hairy with clavate hairs, pubescence varying from short and appressed to longer, dense and spreading; upper glume 1/4–1/2 as long as spikelet.

Grasslands; ca. 1800 m. Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, Sri Lanka].


**Smooth MaTang**

*Digitaria glabrescens* (Bor) L. Liu.

Spikelets glabrous or nearly so; otherwise like var. *stricta*.

Hill slopes, fields; ca. 200 m. Fujian [N India].


**Original MaTang**

*Digitaria denudata* Link, Hort. Berol. 1: 222. 1827; *Panicum denudatum* (Link) Kunth.

Upper glume absent; otherwise like var. *stricta*.

Streams, grasslands; 1000–1800 m. Sichuan, Xizang, Yunnan [Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Thailand].


**Hengduan MaTang**

*Digitaria hengduanensis* L. Liu.

Annual. Culms loosely tufted, slender, 30–60 cm tall. Leaf sheaths pilose-hispid; leaf blades linear-lanceolate, 3–8 × 0.2–0.6 cm, pilose-hispid on both surfaces, apex acute; ligule 0.5–2 mm. Inflorescence axis 2–5 cm; racemes 2–7, loosely ascending, 3–10 cm; spikelets mostly in lax pairs, distant, lower sometimes on short branchlets; rachis slender, triquetrose, narrowly winged, angles scabrous; pedicels of a pair very unequal, one flexuous, up to 8 mm, the other about as long as spikelet, tips discoide. Spikelets elliptic, 1.8–2 mm, hairs clavate; lower glume minute; upper glume as long as spikelet, 3–veined, intervein spaces and margins densely hairy; lower lemma similar to upper glume, 5–7–veined; upper lemma yellowish brown, finally chestnut brown, ca. 1.6 mm, apex apiculate. Fl. and fr. Aug–Oct.

- Forest margins, riverside sands, mountain grasslands; 1200–3000 m. Sichuan, Yunnan.


**Abtludens MaTang**

*Panicum abtludens* Roemer & Schultes, Syst. Veg. 2: 457. 1817; *Digitaria granularis* (Trinius ex Sprengel) Henrard; *D. pedicellaris* (Trinius ex J. D. Hooker) Prain, nom. illeg. superf.; *Paspalum granulare* Trinius ex Sprengel; *P. pedicellar* Trinius ex J. D. Hooker.

Annual. Culms erect or ascending, 30–90 cm tall. Leaf sheaths usually glabrous; leaf blades linear or linear-lanceolate, 2–15 × 0.2–0.4 cm, scabrous or papillose-pilose; ligule 1–3 mm. Inflorescence axis 1–4 cm; racemes 2–5, loosely spicate, divaricate, 3–8 cm; spikelets paired or ternate, or the clusters grading into short branchlets; rachis slenderly triquetrose, not winged, ca. 0.5 mm broad, margins scabrous; pedicels very unequal, smoothly terete, spreading out from rachis, tips disklike. Spikelets elliptic, 1.3–1.7 mm, hairs clavate; lower glume absent; upper glume narrower than spikelet and 1/2–2/3 as long, 3–5–veined, intervein spaces and margins pubescent; lower lemma slightly shorter than spikelet, 5–7–veined, interveins and margins pubescent, tip subrounded; upper lemma slightly protruding, yellowish brown becoming chestnut at maturity with a pale apiculate apex. Anthers 0.4–0.65 mm. Fl. and fr. Jun–Oct. 2n = 36.

Hill slopes, forest margins; below 1000 m. Hainan, S Henan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Thailand].

15. *Digitaria jubata* (Grisebach) Henrard, Blumea 1: 100. 1934.

**Jubata MaTang**


Annual. Culms solitary, erect, 80–110 cm tall. Leaf sheaths shortly pilose to glabrescent; leaf blades linear, 10–20 × 0.3–0.5 cm, scabrous, base subrounded, apex acuminate; ligule 1–2 mm. Inflorescence axis 9–13 cm; racemes 5–8, verticillate at base, slender, ascending, slightly flexuous, often compound; spikelets several in clusters or on short ascending racemelets; rachis very slender, tiquetrose, not winged, margins scabrous; pedicels up to 1 cm, scabrous, tips slightly expanded with longer spicules below. Spikelets elliptic, 1.5–1.7 mm, often purple-tinted, hairs capitulate; lower glume absent; upper glume slightly shorter than spikelet, 3–5–veined, villous, acute; lower lemma as long as spikelet or slightly shorter, 3–5–veined, villous; upper lemma yellowish brown or purplish brown, as long as spikelet, narrowly acute, apex usually extended. Anthers ca. 0.5 mm. Fl. and fr. Jun–Sep.

Mountain grasslands. Guizhou, Yunnan [NE India].

*Digitaria jubata* appears to be a species of rather restricted distribution. It is similar to *D. abludens*, but has taller, solitary (vs. tufted) culms, and longer racemes with the branchlets and pedicels lying closer to the rachis (vs. widely spreading). The spikelet pubescence is denser, with more obviously pin-headed hairs.


**Mollicoma MaTang**

*Paspalum mollicomum* Kunth, Enum. Pl. 1: 47. 1833; *Digitaria hayatae* (Honda) Honda ex Ohwi; *P. magn* (Honda) Tuya; *Panicum hayatae* (Honda) Makino & Nemoto (1925), not A. Camus (1923); *P. hayatae* var. *magnum* (Honda) Makino & Nemoto; *Syntherisma hayatae* Honda; *S. hayatae* var. *magn* Honda; *S. magna* (Honda) Honda.
Digitaria leptalea var. recticum Ohwi.

Perennial, tufted or stoloniferous. Culms ascending, leafy, up to 40 cm tall. Leaf sheaths pubescent or glabrescent; leaf blades linear, 2–5 × 0.3–0.4 cm, glabrous or margins papillose-pilosous at base, apex acute; ligule 1–1.5 mm. Inflorescence digitate; racemes 2–3; ascending, slightly arching at maturity, 2–7 cm; spikelets ternate; rachis ribonlike, narrowly winged, 0.3–0.5 mm broad, midrib low; pedicels almost smooth, with discoid tips. Spikelets elliptic, 1.2–1.5 mm, apex acuminate, hairs verrucose; lower glume an obscure rim; upper glume subequaling spikelet, 5-veined, densely appressed-pubescent; lower lemma as long as spikelet, 7-veined, similar to upper glume; upper lemma purplish black when fully mature. Anthers ca. 0.4 mm. Fl. and fr. Apr–Oct. 2n = 18.

Dry banks and hillsides. Taiwan [Japan (Ryukyu Islands)].

Digitaria leptalea closely resembles D. longiflora, but has a very slender rachis and its dark purplish fertile floret is like that of the closely related D. violascens.


Digitaria ischaemum (Schreber) Muhlenberg subsp. стewartiana (Bor) Tzvelev.

Annual. Culms tufted, slender, decumbent at base, ascending, 15–30 cm tall. Leaf sheaths glabrous; leaf blades up to 6 × 0.5 cm, glabrous, base subrounded, margins scabrous, apex acuminate; ligule 1–1.5 mm. Inflorescence subdigitate; racemes 2–3, 4–5 cm; spikelets ternate; rachis ribonlike, broadly winged, midrib triquetrous; pedicels terete, scabrous, tips cupuliform. Spikelets elliptic, 1.8–2 mm, glabrous; lower glume usually absent; upper glume ca. 4/5 as long as spikelet, hyaline, translucent, glabrous, 3-veined, broadly obtuse; lower lemma purplish, as long as spikelet, 5-veined with 3 central veins close together and outer 2 marginal, veins connected at tip; upper lemma purplish brown at maturity. Anthers ca. 0.5 mm. Fl. and fr. summer–autumn.

Mountains; 2000–3000 m. Xinjiang, Xizang [Kashmir].

This seldom collected species is allied to Digitaria ischaemum, but differs in its glabrous spikelets and delicate, rounded upper glume. It may prove to be a high-altitude variant of D. ischaemum when better known.

This species is used for forage.


止血马唐 zhí xuè mǎ táng

Panicum ischaemum Schreber in Schweiggcr, Spec. Fl. Erlang. 16. 1804; Digitaria asiatica (Ohwi) Tzvelev; D. humifusa Persoon; D. ischaemum subsp. asiatica (Ohwi) Tzvelev; D. ischaemum var. asiatica Ohwi; Panicum humifusum (Persoon) Kunth; Paspalum humifusum (Persoon) Poiret; Syntherisma humifusa (Persoon) Rydberg.

Annual, whole plant often purple-tinged. Culms loosely tufted, erect or ascending, 15–40 cm tall. Leaf sheaths loose, usually keeled, glabrous or pilose; leaf blades linear-lanceolate,
5–12 × 0.4–0.8 cm, pilose, base subrounded, apex acuminate; ligule ca. 0.6 mm. Inflorescence digitate or on a short axis; racemes 2–4, divaricate, 2–9 cm; spikelets ternate; rachis ribbons-like, winged, 0.8–1.1 mm broad, midrib white, rounded or triquetrous, narrower than the green or purple wings, margins serrulate; pedicels angular, scabrous, tips discoid. Spikelets elliptic, 2–2.2 mm, pilose with verrucose hairs, some with curled tips; lower glume absent or a tiny hyaline rim; upper glume as long as spikelet or slightly shorter, 3–5-veined, intervein spaces and margins appressed-pilose; lower lemma as long as spikelet, 5–7-veined, interveins and margins appressed-pilose; upper lemma purplish brown to blackish at maturity. Fl. and fr. Jun–Nov. 2n = 36.

Open grassy places. Anhui, Fujian, Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang [Japan, Pakistan, Russia; Europe, North America].

Digitaria ischaemum is very close to D. violascens, but has a slightly stouter habit with broader leaves, a few short, widely spreading racemes, and larger, plumper spikelets. It also has a more temperate distribution.

Digitaria ischaemum, D. fauriei, D. longiflora, and D. violascens belong to a group of Digitaria known as the Verrucilae because of their warty spikelet hairs. A compound microscope is required to see this, but the hairs have a beadlike appearance under moderate magnification. These spikelet hairs also have curled tips in D. ischaemum (and sometimes in D. violascens), which led to the hairs being described as capitate or clavate in the past.


紫马唐 zi ma tang

Digitaria chinensis (Nees) A. Camus (1923), not Home

Digitaria chinensis (Nees) A. Camus (1923), not Home

Digitaria chinensis (Nees) A. Camus (1923), not Home

POACEAE


伪针茅属 wei zhen mao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Aquatic or semi-aquatic perennials. Culms decumbent to stoloniferous, many-noded, rooting at lower nodes or floating. Leaf sheaths compressed; leaf blades linear to lanceolate; ligule membranous or ciliate. Inflorescence open or contracted, composed of racemes on all sides of a common axis; racemes solitary or grouped, rachis slender, bearing 1 to several alternate shortly pedicelled spikelets, terminating in a bristle. Spikelets lanceolate, terete or slightly dorsally compressed, florets 2; lower glume very small, veinless; upper glume equaling the spikelet, firmly herbaceous, scabrous to setose, long-acuminate or briefly awned; lower lemma resembling upper glume but usually slightly shorter, enclosing a shorter hyaline palea; upper floret 1/2 as long, shortly stipitate, membranous, smooth, shiny. Caryopsis eventually much larger than upper floret and filling spikelet when mature. x = 7, 9.

Six species: India to Japan and throughout SE Asia to Australia; three species in China.
Poaceae

1a. Inflorescence open, lanceolate to ovate; racemes spreading, 2–3-spicate ................................................................. 1. P. brunoniana

1b. Inflorescence contracted, linear to oblong; racemes erect, usually 1-spicate.

2a. Spikelets numerous; upper glume longer than lower lemma, narrowly acuminate; lower lemma 7-veined; 2
stamens in lower floret .................................................................................................................................................. 2. P. sordida

2b. Spikelets 10 or less; upper glume slightly shorter than lower lemma, acute; lower lemma 13-veined; 3 stamens
in lower floret .................................................................................................................................................. 3. P. balansae


Panicum brunoniana Wallach & Griffith, J. Asiat. Soc. Bengal 5: 574. 1836; Chamaeraphis brunoniana (Wallich & Griffith) A. Camus; C. spinescens (R. Brown) Poiret var. brunoniana (Wallich & Griffith) J. D. Hooker.

Culms soft, compressed, usually floating, emergent flowering shoots 20–40 cm, nodes pubescent. Leaf sheaths usually longer than internodes, mouth with lanceolate auricles adnate to the ligule; leaf blades linear-lanceolate, 3–9 × 0.3–0.6 cm, base contracted, apex acute; ligule membranous, lacerate, ciliolate. Inflorescence open, lanceolate to ovate in outline, 5–10 cm; racemes stiff, ascending to patent, bearing (1–)2–3 distant spikelets on a slender scabrous rachis, terminal bristle (7–)15–20 cm, nodes pubescent to subglabrous. Leaf sheaths loose, auricled, lacerate, ciliolate. Inflorescence contracted, linear to oblong, 2–8 cm, enclosed at the base by the uppermost leaf sheath or only slightly exserted; racemes erect, bearing a single spikelet (rarely 2), terminal bristle 8–12 mm. Spikelets 4–6 mm; lower glume 0.6–0.8 mm; upper glume as long as the spikelet, 7 main veins near margins, sharply acuminate; lower lemma subequal to upper glume, 7–10-veined; anthers 2, 0.6–1.1 mm; upper lemma 1.3–1.4 mm. Fl. and fr. Jul.–Aug.

Rooting in shallow water, floating in deep water. Anhui, Guangdong, Taiwan [Bangladesh, NE India, Myanmar, Philippines, Thailand, Vietnam].

This species is closely related to Pseudoraphis spinescens (R. Brown) Vickery, with which it has often been confused. Pseudoraphis spinescens has a widespread distribution from India and Sri Lanka through Malaysia and Indonesia to Australia. It differs in its densely hairy nodes with shiny, white, appressed, silky hairs; longer racemes bearing 5–10 approximate spikelets, usually with a shorter terminal bristle; and by its ciliate upper glume slightly exceeding the lower lemma.


Panicum sordidum Thwaites, Enum. Pl. Zeyl. 443. 1864; Chamaeraphis sordida (Thwaites) J. D. Hooker; Pseudoraphis sordida (Nees ex J. D. Hooker) Keng; P. spinescens (R. Brown) Vickery var. depauperata (Nees ex J. D. Hooker) Bor; P. ukishiba Ohwi.

Culms tufted, slender, 20–50 cm, internodes often purplish, nodes pubescent to subglabrous. Leaf sheaths loose, auricles variable, often inconspicuous; leaf blades linear; 2–5 × 0.2–0.4 cm, base contracted, apex acute; ligule a ciliate membrane. Inflorescence contracted, almost spikelike, oblong, 2–8 cm, enclosed at the base by the uppermost leaf sheath or only slightly exserted; racemes erect, bearing a single spikelet (rarely 2), terminal bristle 8–12 mm. Spikelets 4–6 mm; lower glume 0.6–0.8 mm; upper glume as long as the spikelet, 7 main veins with thinner intermediaries, sparsely strigose on lower back and near margins, sharply acuminate; lower lemma subequal to upper glume, 7–10-veined; anthers 2, 0.6–1.1 mm; upper lemma 1.3–1.4 mm. Fl. and fr. Jul.–Aug.

Shallow lakes, streams; 100–500 m. Fujian, Hunan, Jiangsu, Shandong, Yunnan, Zhejiang [India, Japan, Korea, Sri Lanka].

The name “Chamaeraphis depauperata Nees ex Steudel” (Syn. Pl. Glumac. 1: 49. 1853) was not validly published because it was merely cited as a synonym of Panicum asperum Wight ex Steudel (1853), not Lamarcq (1779).


Pseudoraphis longipalacea C. L. Chia.

Perennial, with rhizomes. Culms slender, floating, 20–70 cm long when flowering, smooth, nodes glabrous. Leaf sheaths loose, keeled, glabrous, mouth with lanceolate auricles adnate to the ligule; leaf blades linear, soft, 3–5 × 0.2–0.4 cm, abaxial surface smooth, adaxial surface scabrous, base rounded, apex subacute; ligule membranous, white, glabrous, subtruncate. Inflorescence linear, 4–5 cm, composed of few spikelets; racemes erect, alternate, bearing a single spikelet (rarely 2), terminal bristle 8–24 mm. Spikelets 4.5–6.5 mm, acute; lower glume 0.5–0.7 mm, obtuse or subacute; upper glume as long as or slightly shorter than lower lemma; 7–9-veined, acute; lower lemma 13-veined; anthers 3, ca. 3 mm; upper lemma 2.5 mm. Fl. and fr. Sep.–Oct.

Ponds, lakes. Hainan [Thailand, Vietnam].

Pseudoraphis balansae is distinctive in the genus because its spikelets are merely acute, lacking the drawn-out, narrow tip on the upper glume found in most species. The short, subacute leaves, white, truncate ligule, and few-spiculate inflorescence are also characteristic.


狼尾草属 lang wei cao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Gymnotrix P. Beauvois.

Annuals or perennials. Culms tufted or rhizomatous, prostrate to over 3 m tall. Leaf blades flat, folded or convolute; ligule a
ciliate membrane. Inflorescence a spikelike panicle, cylindrical to subglobose; branches numerous, contracted into short clusters of one or more spikelets subtended by an involucre of bristles; involucres sessile or with a short basal stipe, deciduous with the spikelets at maturity leaving peduncle stumps or scars on the main axis; bristles slender, scabrous, sometimes plumose, simple or very rarely branched, very unequal, outer shorter, often innermost stouter and conspicuously exceeding the rest. Spikelets usually lanceolate, dorsally compressed, herbaceous, acute or obtuse, florets 2, glumes and lower lemma variable; glumes often small and not exceeding 1/2 spikelet length; lower lemma stamine or neuter, equaling spikelet or reduced; upper lemma equaling spikelet, herbaceous or indurated, obtuse to acute; x = 9.

About 80 species: throughout the tropics; 11 species (four endemic, four introduced) in China.

Pennisetum is a large and variable genus, but the bristly, spikelike inflorescence is always readily recognizable. The only other panicoid genus with a similar bristly inflorescence is Setaria, but in that genus the bristles are not deciduous with the spikelets, instead remaining on the rachis at maturity. The bristles are derived from reduced panicle branches.

Many species provide good forage. Several species, including Pennisetum glaucum in China, are used for food.

1a. Inflorescence reduced to 2–4 spikelets within the uppermost leaf sheath; low sward-forming perennial .......... 1. P. clandestinum
1b. Inflorescence spikelike, clearly exserted above the leaves.

2a. Bristles of involucre obviously branched above base .......................................................................................... 2. P. lanatum
2b. Bristles of involucre unbranched or branched only at extreme base.

3a. Inflorescence axis with sharp decurrent wings below each involucre; upper floret deciduous; bristles densely woolly with crinkled hairs .......... 3. P. polystachion
3b. Inflorescence axis not winged; upper floret persistent; bristles glabrous or hairs not crinkled, often tubercle-based.

4a. Culms robust, often 2 m or more; upper lemma indurated in lower half, membranous toward apex; anthers with apical tuft of hairs.
4b. Culms usually less than 1.5 m; upper lemma of uniform texture; anthers without apical tuft of hairs.

5a. Perennial; bristles longer than spikelets ............................................................................................................ 5. P. glaucum
5b. Annual; bristles shorter than spikelets ............................................................... 6. P. alopecuroides

6a. Involucres with a basal 2–3 mm stipe; bristles glabrous ................................................................. 6. P. alopecuroides
6b. Involucres subsessile or basal stipe less than 1 mm; bristles glabrous or plumose.

7a. Inflorescence axis glabrous; plant with long spreading rhizomes.
7b. Inflorescence axis puberulous to hirtellous; plant loosely tufted or base decumbent.

8a. Bristles equaling or longer than spikelets ......................................................................................... 7. P. flaccidum
8b. Bristles shorter than spikelets (except longest) ................................................................................ 8. P. sichuanense

9a. Bristles soft, numerous, plumose; leaf sheaths glabrous ................................................................. 9. P. quinlingense
9b. Bristles stiff, mostly in a single whorl, glabrous or thinly plumose; lower leaf sheaths papillose-pilose.

10a. Leaf blades 1.2–2 cm wide; inflorescence 20–30 cm .................................................. 10. P. longissimum
10b. Leaf blades 0.2–1.2 cm wide; inflorescence less than 20 cm ........................................ 11. P. shaanxiense


铺地狼尾草 pu di lang wei cao

Perennial, low, sward forming with slender rhizomes and extensive, stouter, much branched stolons. Vegetative shoots up to 20 cm tall, flowering shoots compact, 2–4 cm tall. Leaf sheaths loose, imbricate, subinflated; leaf blades linear, up to 15 × 0.2–0.5 cm on vegetative shoots, 1–4 cm on flowering shoots; ligule ca. 1.2 mm. Inflorescence reduced to 2–4 spikelets enclosed within the uppermost leaf sheath, only spikelet tips protruding; bristles very delicate, 1/2–3/4 as long as spikelet, scabrous to ciliolate. Spikelets linear-lanceolate, 13–20 mm, acuminate; lower glume absent; upper glume ciliate, 1–3 mm or sometimes absent; lower floret neuter, lower lemma as long as spikelet, 10–13-veined, palea absent; upper lemma similar; anthers long exserted on threadlike filaments up to 5 cm; stigma simple or slightly bifid, up to 3 cm. Fl. and fr. summer–autumn. 2n = 36.

Naturalized. Taiwan, Yunnan [native to E Africa].

This is a most unusual species of Pennisetum with a highly reduced inflorescence. The bristles must be searched for within the uppermost leaf sheaths. The anthers emerge at night on their long filaments and are visible in the morning as a grayish white haze over the sward.

This species is widely introduced in upland areas of the tropics and subtropics on fertile soils as a pasture and lawn grass (Kikuyu Grass). It has now become an invasive, difficult to eradicate weed in some parts of the world.


西藏狼尾草 xi zang lang wei cao

Perennial with extensive branching rhizomes clothed in cataphylls. Culms erect, 25–150 cm tall. Leaf sheaths usually pubescent; leaf blades linear, 10–45 × 0.4–1.3 cm, pubescent to villous or occasionally glabrous; ligule 1–2 mm. Inflorescence linear, 5–15 × 1.5–2.5 cm; axis loosely pubescent, with shallow angular ribs below the cupular involucre-scars; involucre enclosing 2–4 shortly pedicelled spikelets; bristles greenish, softly plumose, rarely almost glabrous, branched (often several times)
above the base. Spikelets ovate-lanceolate, 4–5.5 mm; lower glume 1/3–2/5 as long as spikelet, 3-veined, subacute to rotund, rarely apiculate; upper glume 1/2 as long as spikelet, obtuse to apiculate; lower floret staminate, lemma as long as spikelet, acuminate; upper lemma slightly shorter than lower, acute; anthers without hairs at tip. Fl. and fr. Aug–Oct.

Dry mountain slopes; above 1500 m. W Xizang [Afghanistan, NW India, Kashmir, Nepal, Pakistan].

This is a distinctive species on account of its long, scaly rhizomes and branched bristles in the inflorescence.

3. Pennisetum polystachion (Linnaeus) Schultes, Mant. 2: 146. 1824.

牧地狼尾草 mu di lang wei cao

Panicum polystachion Linnaeus, Syst. Nat., ed. 10, 2: 870. 1759; Cenchrus setosus Swartz; Panicum cenchroides Richard; P. erubescens Wildenow; Pennisetum purpurascens Kunth; P. setosum (Swartz) Richard.

Short-lived perennial or annual. Culms much branched, 50–150 cm tall. Leaf blades linear, 10–20 × 0.3–1.5 cm, hispid. Inflorescence linear, 10–25 × 0.8–1 cm, yellow or purplish; axis angular with sharp, recurved wings below the involucres, densely ciliate in the inflorescence; involucres with numerous bristles obscuring the single spikelet, densely ciliate in lower half with crinkled, matted hairs, longest bristle 1–2 cm. Spikelet narrowly lanceolate, 3–4.5 mm; lower glume absent or a small triangular scale; upper glume as long as spikelet, 5-veined, obtuse, ciliate, apiculate; lower floret staminate or neuter, lemma similar but slightly shorter, obtusely 3-lobed; upper floret 2/3 spikelet length, cartilaginous, smooth, shiny, readily deciduous at maturity; anthers with tufts of short hairs at tip. 2n = 54.

Naturalized. Hainan, Hong Kong, Taiwan [throughout the tropics].

This is a widespread and polymorphic species, sometimes cultivated for pasture or fodder. The soft, crinkled hairs around the spikelet and the deciduous upper floret are clear-cut characters for recognition.


象草 xiang cao

Gymnotrix nitens Andersson; Pennisetum benthamii Steudel; P. flexisipica K. Schumann; P. hainanense H. R. Zhao & A. T. Liu; P. macrostachyum Bentham (1849), not (Brongnart) Trinius (1834); P. nitens (Andersson) Hackel.

Perennial forming large tussocks, often with short rhizomes. Culms robust, decumbent and rooting at the base, ascending to 2–4 m tall. Leaf sheaths glabrous or hispid; leaf blades linear, up to 120 × 5 cm, abaxial surface glabrous, adaxial surface hispid or papillate-pilose at base, midrib prominent, margins scabrous; ligule 1.5–5 cm. Inflorescence linear, 10–30 × 1–3 cm, golden, brownish or purplish; axis densely pilose, closely beset with small peduncle stumps; involucres comprising many slender bristles, enclosing 1–5 spikelets, terminal spikelet fertile, subsessile, laterals when present staminate with 1–2 mm pedicels; inner bristles thinly plumose, longest 1–4 cm. Spikelets 5–7 mm; lower glume vestigial or absent; upper glume 1/3–1/2 as long as spikelet, acute; lower floret staminate or neuter, lemma 1/2–3/4 spikelet length, 5–7-veined, minutely hispidulous, acuminate; upper lemma membranous and obviously 5-veined toward narrowly acuminate tip, lower half cartilaginous, smooth and shiny; anthers with a tuft of short hairs at tip. Fl. and fr. Aug–Oct. 2n = 27, 28.

Cultivated. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan [native to Africa].

This is an excellent forage grass, native in Africa, but now introduced to many tropical countries (Elephant Grass, Napier Grass).


御谷 yu gu

Panicum glaucum Linnaeus, Sp. Pl. 1: 56. 1753; Alopecurus typhoideus N. L. Burman; Panicum americanum Linnaeus; Pennisetum americanum (Linnaeus) Leeke; P. americanum subsp. typhoideum Maire & Weiller; P. spicatum (Linnaeus) Körnike var. typhoideum T. Durand & Schinz; P. typhoideus (N. L. Burman) Stapf & C. E. Hubbard; P. typhoideum Richard, nom. illeg. superfl.

Annual. Culms robust, up to 3 m tall, densely pubescent at nodes and below inflorescence. Leaf sheaths loose, smooth; leaf blades 20–100 × 2–5 cm, both surfaces and margins scabrous; base subcordate; ligule 2–3 mm. Inflorescence linear to broadly elliptic, dense, 40–50 × 1.5–2.5 cm; axis densely pubescent; involucres persistent, enclosing 1–9 spikelets, basal stipe pubescent, 1–25 mm; bristles usually shorter than spikelets, almost glabrous to densely plumose. Spikelets obovate, 3.5–4.5 mm; lower glume minute, ca. 1 mm; upper glume 1.5–2.2 mm, 3-veined; lower floret staminate, lemma ca. 2.5 mm, 5-veined, margins membranous and ciliate, palea thinly papery, puberulous; upper lemma 5–7-veined, thinly papery, puberulous, margins ciliate, tip obtuse; anthers with a tuft of short hairs at tip. Fl. and fr. Sep–Oct. 2n = 14.

Cultivated. N and E China [native to Africa; widely introduced elsewhere].

This is a cultivated species grown for both grain and forage, and is especially suited to regions with a short growing season (Bulrush Millet, Pearl Millet).


狼尾草 lang wei cao

Panicum alopecuroides Linnaeus, Sp. Pl. 1: 55. 1753; Cenchrus purpurascens Thunberg; Gymnotrix japonica (Trinias) Kunth var. viridescens Miquel; Pennisetum alopecoides var. erythrocaetum Ohwi; P. chinense Steudel; P. compressum R. Brown; P. dispiculatum L. C. Chia; P. japonicum Trinias; P. purpurascens (Thunberg) Kunze (1891), not Kunth (1816).

Perennial forming dense tussocks. Culms stout, 30–120 cm tall, hispid below inflorescence. Leaf sheaths papery, keeled, imbricate at culm base; leaf blades linear, flat or often
POACEAE

involute, 10–80 × 0.3–1 cm, base papillose-hispid, apex long acuminate; ligule 0.5–2.5 mm. Inflorescence linear, 5–25 × 1.5–3.5 cm; axis hispid, peduncles stumps short with crateriform tips; involucre usually enclosing one spikelet, rarely 2, basal stipe (1–)2–3 mm; bristles greenish or purple, longest 2–3 cm but not conspicuously longer than the others, all slender, hispid. Spikelet lanceolate, 5–8 mm; lower glume 0.6–3 mm, 0–1-veined, obtuse; upper glume ovate-lanceolate, 1/3–2/3 as long as spikelet, 3–5-veined; lower lemma as long as spikelet, 7–11-veined; upper lemma lanceolate, as long as spikelet, papery, acuminate; anthers usually glabrous, occasionally with 1 or 2 hairs at tip. Fl. and fr. summer and autumn. 2n = 18.

Grassy hillsides, roadsides, field margins; sea level to 3200 m. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Tianjin, Xizang, Yunnan, Zhejiang [NE India, Indonesia, Japan, Korea, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan; Malaysia, Myanmar, Philippines; Australia, Pacific Islands (Polynesia)].

This species is used for forage.


百草 bai cao

*Pennisetum centrasiacicum* Tzvelev; *P. centrasiacicum* var. *lapingense* S. L. Chen & Y. X. Jin; *P. centrasiacicum* var. *qinghaiense* Y. H. Wu; *P. flaccidum* var. *interruptum* Grisebach; *P. longissimum* S. L. Chen & Y. X. Jin var. *axiglabrum* B. S. Sun & X. Yang; *P. mongolicum* Franchet; *P. sichuanense* S. L. Chen & Y. X. Jin var. *equidistans* B. S. Sun & X. Yang; *P. sinense* Mez.

Perennial with tough spreading rhizomes. Culms tufted, up to 1 m tall. Leaf sheaths loose, subglabrous, rounded, imbricate at base; leaf blades linear with a broad white midrib, 3–25 × 0.2–1.2 cm, glabrous, acuminate; ligule 1–2 mm. Inflorescences terminal and also sometimes axillary from upper leaf sheaths, linear, straight or slightly flexuous, loose to moderately dense, 5–18 cm; axis glabrous, smooth or scaberulous, beset with short peduncle stumps or scars; involucres enclosing 1 spikelet (rarely 2); bristles many, usually pale green, occasionally purplish, soft, slender, longest 0.9–2 cm, rarely inner thinly plumose. Spikelet narrowly ovate-oblong, 4–7 mm; lower glume usually 1/4 spikelet length or less, obtuse, acute or erose; upper glume 1/3–3/4 spikelet length, 1–3-veined, acuminate; lower floret staminate, lemma as long as spikelet, 3–5–(7)-veined, concave along midline, acuminate-rostrate, palea fully developed; upper lemma acuminate-rostrate, 5-veined; anthers without hairs at tip. Fl. and fr. Jul.–Oct.

Hillsides, field margins, roadsides on dry sandy soils, sometimes also on slightly saline alluvial soils on flood plains; 500–2000 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Bhutan, NW India, Kashmir, Nepal, Pakistan, Tajikistan; SW Asia (Iran)].

This is a widespread and rather variable species, but it always has tough, spreading rhizomes, a glabrous inflorescence axis, and involucres of soft bristles. The bristles are usually glabrous, but occasionally a few hairs are present on some of the inner bristles. Specimens with axillary inflorescences (the basis of *Pennisetum centrasiacicum* var. *qinghaiense*) occur throughout the range of the species and do not merit separate status.

This species is a good forage grass.


四川狼尾草 si chuan lang wei cao

Perennial, rhizomatous. Culms tufted, erect, 40–60 cm tall. Leaf sheaths loose, usually shorter than internodes, hispidulous throughout, pilose at mouth; leaf blades linear, 3–12 × 0.2–0.5 cm, both surfaces papillose-pilose when young; ligule 1.5–2 mm. Inflorescence narrowly linear, dense, erect or slightly curved, 5–12 × 0.6–1 cm; axis pubescent; involucre enclosing one spikelet; bristles glaucous, sparse, 0.3–0.5 cm, usually shorter than spikelet. Spikelet ovate-lanceolate, 4–6 mm; lower glume ovate, membranous, 1/3–1/2 as long as spikelet, 0–3-veined, acute; upper glume thickly membranous, slightly shorter than spikelet, 3–5-veined, acute or acuminate; lower floret usually staminate, lemma as long as spikelet, thickly membranous; upper lemma slightly shorter than spikelet, papery, acute; anthers without hairs at tip. Fl. and fr. Aug.–Nov.

- Mountainsides, stream banks; 2000–3000 m. Sichuan, Yunnan.

This species is close to *Pennisetum flaccidum*.


乾宁狼尾草 qian ning lang wei cao

Perennial forming loose tussocks. Culms ascending, 50–130 cm tall, nodes pilose. Leaf sheaths glabrous but pilose at mouth; leaf blades linear, flat with broad white midrib, 10–40 × 0.4–1 cm, glabrous, apex acuminate; ligule 1–2 mm. Inflorescence linear, 10–17 × 1.5–2 cm; axis puberulous, ribbed, peduncle stumps ca. 1 mm; involucre enclosing 1–3 spikelets, basal stipe ca. 0.5 mm; bristles purplish brown, soft, numerous, plumose in the lower part, mostly about as long as the spikelet, longest twice as long, up to 2 cm. Spikelets lanceolate, 5–6.5 mm; lower glume ovate, membranous, 1–1.5 mm, veinless; upper glume lanceolate, 1/2–2/3 as long as spikelet, 5-veined; lower floret staminate or neuter, lemma as long as spikelet; upper lemma herbaceous; anthers without hairs at tip. Fl. and fr. May–Sep.

- Dry mountain slopes, valleys, roadsides; 1500–3200 m. Sichuan, Yunnan.

*Pennisetum qianningense* is very similar to *P. orientale* Richard, but that species has a pubescent inflorescence axis and definitely plumose bristles, which often enclose more than one spikelet. *Pennisetum orientale* is a widespread species extending from N India, Nepal, and Pakistan to C and SW Asia and N Africa. It is to be expected in neighboring parts of China.


长序狼尾草 chang xu lang wei cao

*Pennisetum baqiiense* W. X. Tong.

Perennial forming loose tussocks. Culms decumbent, rooting at base, up to 1.8 m tall, 8–14-noded. Leaf sheaths usually...
longer than internodes, glabrous or pillose-pilose; leaf blades linear, 50–90 × 0.5–2 cm; ligule 2.5–3 mm. Inflorescence up to 30 cm, usually pendulous; axis densely hispidulous with angular ribs, peduncle stumps crowded, very short with a tuft of spiculae; involucre enclosing 1–3 spikelets, basal stipe ca. 0.5 mm; bristles glaucous or purple, stiff, glabrous, unequal, one conspicuously longer and stouter, up to 4 cm. Spikelets lanceolate, 6–8 mm; lower glume ovate, ca. 1/4 as long as spikelet, 0–1-veined, obtuse, acute or erose; upper glume 1/3–1/2 as long as spikelet, 1–3(–5)-veined, acuminate; lower floret usually neuter, lemma as long as spikelet, 5–7-veined, scaberulous, acuminate-rostrate; upper lemma similar but usually slightly shorter; anthers without hairs at tip. Fl. and fr. Jul.–Oct.

**1. Cenchrus ciliaris**

Annuals or perennials. Culms usually branched near the base. Leaf blades usually flat; ligule a ciliate rim. Inflorescence spikelike, cylindrical, composed of spiny or bristly deciduous burrs arranged along an angular, often sinuous rachis; burrs sessile or with an obconical basal stipe, each composed of 1 or more sessile spikelets surrounded by an involucre of spines and bristles; bristles flexuous or more often spinous, ± flattened, grooved on the outer face, united below, the degree of union varying from a small basal disk to a deep cupule, inner spines or bristles often ciliate around spikelets. Spikelets lanceolate, acute; glumes unequal, shorter than spikelet, lower sometimes suppressed; lower floret membranous, staminate or neuter; upper floret firmer, protogynous. Lodicules absent.

Twenty-three species: tropical and warm-temperate regions of the world; four species (all introduced) in China.

1a. Inner spines of burr extended beyond spikelets as long, slender bristles, connate only at base; outer bristles often longer than spikelets, numerous .................................................. 1. *C. ciliaris*

1b. Inner spines of burr stiff, flattened, connate to form a deep cupule; outer bristles shorter than inner spines or absent.

2a. Burr consisting of several whorls of connate, flattened spines, free tips emerging at irregular intervals over body of burr ........................................................................................................... 2. *C. incertus*

2b. Burr consisting of 1 whorl of connate, flattened spines, usually surrounded by whorls of smaller, finer bristles.

3a. Spines of burr retrorsely barbed, tenaciously prickly; outer bristles many .................................................. 3. *C. echinatus*

3b. Spines of burr antrosely barbed; outer bristles few or absent ................................................................. 4. *C. setigerus*


水牛草 水牛草 水牛草 1771.

**Pennisetum ciliare** (Linnaeus) Link.

Perennial, tufted or shortly rhizomatous. Culms erect or ascending from a decumbent or stoloniferous base, slender to moderately stout, sometimes much branched, up to 1 m tall. Leaf sheaths glabrous or pubescent; leaf blades linear, green or grayish, 10–50 × 0.4–0.8 cm, with scattered, tubercle-based hairs; ligule 0.5–3 mm. Inflorescence 3–15 cm, densely bristly, burrs contiguous, rachis puberulous. Burrs composed of many bristles; bristles antrosely barbed; inner bristles 7–14 mm (one stouter and slightly longer), connate at extreme base to form a shallow disc 0.5–1.5 mm wide, somewhat flattened around spikelets, grooved on outer face, ciliate on inner margins, tips extended into flexuous bristles clearly exceeding spikelets; outer bristles numerous, shorter, slender. Spikelets 1–4 in burr, 3–5 mm; lower glume 1/3–1/2 spikelet length; upper glume ca. 1/2 spikelet length. 2n = 36.
Pastures and weedy places, introduced. Taiwan [native to India, Pakistan; Africa, SW Asia; introduced in America and Australia].

This is a polymorphic species occurring naturally from Africa to India. Some superior strains have been selected and distributed in warm parts of the world for pasture and fodder in dry areas (Buffel Grass), and the grass has become a widespread weed. It was introduced to Taiwan as a pasture grass, and is now naturalized in the south of that island.

*Cenchrus ciliaris* may easily be mistaken for a species of *Pennisetum*, as the basal fusion of the bristles is rather slight. However, the flattening and grooving of the bristles around the spikelets is a characteristic feature of *Cenchrus* and is not found in *Pennisetum*.


光梗蒺藜草 guang geng ji li cao

Annual or short-lived perennial. Culms geniculate, decumbent or erect, 40–100 cm tall. Leaf sheaths keeled, loose, glabrous or pilose near margins; leaf blades linear or narrowly lanceolate, 3–20 × 0.2–0.6 cm, glabrous on both surfaces; ligule 0.5–1.5 mm. Inflorescence 1.5–6.5 × ca. 1 cm, open or compact, rachis scabrous. Burrs variable, globose or ovoid, ca. 1 cm, stipe glabrous, spines retrorsely barbed, connate for much of their length, spiny tips diverging irregularly throughout body of burr, involucral cupule cleft on 2 sides, pubescent, spines rigid, long and slender to short and broad. Spikelets 2–3 in burr, 3.5–6 mm; lower glume 1/3–1/2 spikelet length; upper glume 3/4 spikelet length. Fl. and fr. autumn.

Seashore sand dunes. Liaoning [native to America].

This native of America is now widespread as a weed.


蒺藜草 ji li cao

Annual. Culms geniculate, usually rooting at basal nodes, 15–90 cm tall. Leaf sheaths keeled, usually imbricate at base; leaf blades linear or linear-lanceolate, 5–20(–40) × 0.4–1 cm, glabrous to pubescent; ligule ca. 1 mm. Inflorescence 3–10 × ca. 1 cm, burrs contiguous, rachis scabrous. Burrs globose, 0.4–1 cm, truncate, stipule pubescent, all spines and bristles retrorsely barbed; inner spines connate for 1/3–1/2 their length forming a globose cupule, the flattened free tips triangular, erect or bent inward, cupule and tips pubescent, outer spines in 2 divergent whorls, a median whorl of stout rigid spines equaling the inner teeth, and an outermost whorl of relatively few short, slender bristles. Spikelets 2–4 in burr, 4.5–7 mm; lower glume 1/2 spikelet length; upper glume 2/3–3/4 spikelet length. Fl. and fr. summer. 2n = 34, 68.

Seashore sand dunes, roadsides, waste places. Fujian, Guangdong, Hainan, Taiwan, Yunnan [native to America; now a widespread weed of the tropics and subtropics].

The name *Cenchrus caliculatus* Cavanilles has been misapplied to this species in China. *Cenchrus caliculatus* is a larger species with culms to 2 m tall and an inflorescence to 24 cm. It is further distinguished by its burrs, which have only a shallow basal cupule. It occurs in Indonesia, Australia, and the S Pacific Islands.


倒刺蒺藜草 dao ci ji li cao

Perennial. Culms somewhat bulbous at base, geniculately ascending, 20–60 cm tall. Leaf sheaths keeled, scabrous; leaf blades linear, 2–20 × 0.4–0.8 cm, adaxial surface pilose with long scattered hairs; ligule ca. 0.5 mm. Inflorescence rather stiff, 4–12 × 0.6–0.7 cm, burrs overlapping by about half their length, rachis scabro-puberulous. Burrs broadly oblong with rounded base, 0.3–0.7 cm, sub sessile; inner spines connate for 1/4–1/2 their length forming a tough cupule, flattened free tips narrowly triangular, erect, antrosely scaberulous with a broad green groove on outer face, inner face shortly ciliate; outer spines very short or almost suppressed, reduced to bristles around periphery of cupule. Spikelets 1–4 in burr, 3.5–5 mm; lower glume 1/2 spikelet length; upper glume 4/5 spikelet length. 2n = 34, 36.

Introduced and cultivated for fodder. Yunnan (Honghe) [native to NW India, Pakistan; E and NE Africa, SW Asia].


鬣刺属 lie ci shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials, rhizomatous; dioecious or sometimes androdioecious. Leaf blades hard, linear to subulate-involute; ligule a line of hairs. Inflorescence terminal, compound, composed of many single racemes subtended by prophylls and spathate sheaths and condensed into a compact fascicle. Staminate inflorescence with exerted racemes bearing several spikelets and ending in a short point. Female or bisexual inflorescence stellately globose, falling entire, composed of numerous racemes reduced to a single basal spikelet hidden among subtending spathes, its rachis prolonged into a long needle-like spine. Spikelets dorsally compressed, staminate spikelets herbaceous, female spikelets papery. Staminate spikelet with shorter glumes and both florets staminate. Female spikelet with glumes equal to spikelet and lower floret sometimes paleate and staminate. Upper lemma in both slightly indurate with flat hyaline margins. x = 9.

Four species: seashores from India to Japan, SE Asia, and Australia; one species in China.


老鼠刺 lao shu li

*S. littoreus* N. L. Burman, Fl. Indica 29. 1767; *Spinifex squarrosus* Linnaeus; *Stipa spinifex* Linnaeus.

Culms stoloniferous, hard, stout, many-noded, rooting and copiously branching at nodes, flowering shoots ascending to 30–100 cm, internodes farinose. Leaf sheaths broad, rounded on back, imbricate; leaf blades distichous, very tough, involute-
subulate, curved, 5–20 × 0.2–0.3 cm, margins scabrous, apex spiny; ligule densely ciliate. Staminate inflorescence of 2–5 clustered turbinicate heads 5–10 × 6–8 cm; racemes 3–6 cm, bearing 5–10 loosely imbricate spikelets. Staminate spikelets lanceolate, 8–12 mm; glumes oblong-lanceolate, 7–9-veined, lower glume 1/2 spikelet length, upper glume 2/3 spikelet length; lower lemma 5-veined, 8–10 mm, palea with winged ciliate keels; upper lemma with unkeeled palea. Female inflorescence globose, 20–35 cm in diam.; racemes unispiculate with needle-like 10–18 cm rachis. Female spikelets lanceolate-oblong, 10–20 mm, acuminate; glumes oblong-lanceolate, lower glume many-veined, upper glume 7–9-veined; lower lemma ovate-lanceolate, 5-veined, palea absent; upper lemma lanceolate, yellowish. Fl. and fr. summer-autumn.

This species is an efficient sand binder, forming large colonies and stabilizing dunes. The female inflorescences act as tumbleweeds. The seeds within are dispersed as the spiky head is transported along the coast by wind and sea.

25. Tribe ISACHNEAE

柳叶箬属

Chen Shouliang (陈守良); Sylvia M. Phillips

Annuals or perennials. Leaf blades narrowly lanceolate to ovate; ligule a line of hairs, rarely absent. Inflorescence an open or contracted panicle. Spikelets all alike, florets 1 or 2, when 2 lower florets bisexual or male, upper floret bisexual or female, dorsally compressed, awnless, disarticulating above glumes and sometimes tardily between florets; glumes shorter than or equaling spikelet, membranous, deciduous or persistent; lemmas rounded on back, membranous to leathery, obscurely 0–7-veined, glabrous or pubescent, margins inrolled and clasping edges of palea. Caryopsis ellipsoid to plano-convex; hilum round to oval. Leaf anatomy: non-membranous, deciduous or persistent; lemmas rounded on back, membranous to leathery, obscurely 0–7-veined, glabrous or pubescent.

Five genera and ca. 100 species: throughout the tropics, but mainly in Asia; three genera and 20 species (four endemic) in China.

1a. Upper lemma indurate ................................................................. 180. Isachne
1b. Upper lemma membranous.

2a. Spikelets with 2 florets; glumes persistent .................................................. 181. Coelachne
2b. Spikelets with 1 floret; glumes deciduous ................................................ 182. Sphaerocaryum

180. ISACHNE R. Brown, Prodr. 196. 1810.

柳叶箬属

Annual or perennial. Culms erect or decumbent or creeping, many-noded. Leaf blades narrowly lanceolate to ovate, margin frequently white and thickened; ligule a line of stiff hairs. Inflorescence an open or contracted panicle, branches and pedicels sometimes spotted with yellow glandular patches. Spikelets with 2 florets, florets both bisexual or lower floret bisexual or male and upper floret male or female, separated by a short internode or contiguous, disarticulating below each floret; glumes falling soon after florets, subequal, 3/4 to as long as spikelet, 5–9-veined; lower lemma variable, resembling the upper or of different size and texture; upper lemma orbicular to broadly elliptic, papery to leathery, glabrous or pubescent with short curved hairs, 5–7-veined, obtuse. Stamina 3. Caryopsis ellipsoid or subglobose.

About 90 species: throughout the tropics, but mainly in Asia; 18 species (four endemic) in China.

1a. Florets unequal in size and of different texture; lower floret longer, flatter and more delicate.

2a. Upper floret 1/2 length of lower floret; panicle eglandular .......................... 1. I. hainanensis
2b. Upper floret slightly shorter and broader than lower floret; panicle glandular.

3a. Perennial; culms to 80 cm tall, nodes pubescent; leaf blades narrowly lanceolate, 3–11 cm .................. 2. I. globosa
3b. Annual; culms to 25 cm tall, nodes hispid; leaf blades ovate-amplexicaul, 2–3 cm ...................... 3. I. pulchella

1b. Florets equal in size or nearly so and of similar texture.

4a. Spikelets 2 mm or more.

5a. Panicle branches and pedicels glandular.

6a. Leaf sheaths longer than internodes; nodes pubescent; glumes truncate .............................. 4. I. truncata
6b. Leaf sheaths shorter than internodes; nodes glabrous; glumes obtuse to rounded.

7a. Leaf blades linear, 0.3–1 cm wide, suberect; panicle 5–14 cm; spikelets globose .................. 5. I. himalaica
7b. Leaf blades lanceolate, 0.8–1.8 cm wide, ascending; panicle 17–25 cm; spikelets elliptic to obovate ....... 6. I. hoi

5b. Panicle branches and pedicels eglandular.

8a. Lemmas densely ciliate along margins, otherwise glabrous; culms 30–60 cm tall .............. 7. I. ciliatiflora
8b. Lemmas not above; culms 5–25 cm tall.

9a. Leaf blades ovate-lanceolate or lanceolate 1–1.8 cm wide; glumes densely scabrid-hispidulous, obtuse or subrounded .............................................. 8. I. repens
9b. Leaf blades narrowly lanceolate, 0.4–0.8 cm wide; glumes glabrous, subacute .................. 9. I. sikkimensis