

- 1a. Glumes obscurely keeled proximally, indistinctly so distally; spike rachis usually tough and not disarticulating ..... 4a. subsp. *aestivum*
- 1b. Glumes distinctly keeled; spike rachis disarticulating.
- 2a. Glumes adnate to floret, very hard ..... 4b. subsp. *yunnanense*
- 2b. Glumes laxly appressed to floret ..... 4c. subsp. *tibeticum*

**4a. *Triticum aestivum* subsp. *aestivum***

小麦(原亚种) xiao mai (yuan ya zhong)

*Triticum aestivum* var. *hybernum* (Linnaeus) Fiori, nom. rej.; *T. compactum* Host; *T. hybernum* Linnaeus, nom. rej.; *T. sativum* Lamarck, nom. illeg. superfl.; *T. sativum* var. *aestivum* (Linnaeus) Alph. Wood; *T. sativum* var. *vulgare* Hackel, nom. illeg. superfl.; *T. segetale* Salisbury, nom. illeg. superfl.; *T. vulgare* Villars (1787), nom. illeg. superfl., not (Linnaeus) Salisbury (1796); *T. vulgare* var. *aestivum* (Linnaeus) Spenner; *Zeia vulgaris* Lunell, nom. illeg. superfl.; *Z. vulgaris* var. *aestiva* (Linnaeus) Lunell.

Spike rachis usually tough and not disarticulating. Glumes obscurely keeled proximally, indistinctly so distally; keel prolonged at apex into shortish tooth; tooth apex subobtuse, acute, or tapering into short awn. Fl. and fr. Jun–Aug.  $2n = 42^*$ .

Commonly cultivated throughout China [cultivated worldwide].

**4b. *Triticum aestivum* subsp. *yunnanense* King ex S. L. Chen, Novon 7: 230. 1997.**

云南小麦 yun nan xiao mai

Spike rachis easily disarticulating. Glumes adnate to floret, very hard, distinctly keeled. Fl. and fr. Apr–Aug.  $2n = 42^*$ .

• Cultivated for food in SW Yunnan; 1500–3000 m.

**4c. *Triticum aestivum* subsp. *tibeticum* J. Z. Shao, Acta Genet. Sin. 7(2): 155. 1980.**

西藏小麦 xi zang xiao mai

Spike rachis disarticulating. Glumes laxly appressed to floret, distinctly keeled.  $2n = 42^*$ .

• Fields of *Hordeum* and *Triticum*; 1700–3500 m. Xizang.

## 110. AEGILOPS Linnaeus, Sp. Pl. 2: 1050. 1753.

山羊草属 shan yang cao shu

*Aegilops* subg. *Gastropyrum* Jaubert & Spach; *Gastropyrum* (Jaubert & Spach) Á. Löve; *Patropyrum* Á. Löve.

Plants annual. Culms usually erect. Leaf sheath split almost to base; auricles crescent-shaped; leaf blade usually flat. Spike cylindric, lanceolate, or ovoid, dense; rachis disarticulating below each spikelet into segments. Spikelets 1 per node, sessile and fitting into rachis, cylindric or turgid, with 2–8 florets; rachilla not jointed, shortly pilose. Glumes rounded abaxially, leathery or cartilaginous, many veined, not keeled, apex truncate or toothed; teeth usually prolonged into longish awns. Lemma oblong or lanceolate, rounded abaxially, leathery-membranous to leathery, 5–7-veined, not keeled, apex usually 1–3-toothed or -awned; callus very short, obtuse. Palea equaling or subequaling lemma, ciliate along keels. Caryopsis free or adherent to lemma and palea, oblong-ovate, furrowed, apex hairy.  $x = 7$ .

About 21 species: mainly in the Mediterranean region, extending into N Africa and eastward to C Asia; one species in China.

In addition, the following mainly Mediterranean species have been recorded as cultivated in China (FRPS 9(3): 39–43. 1987): *Aegilops biuncialis* Visiani, *A. cylindrica* Host, *Aegilops ovata* Linnaeus, *A. triaristata* Willdenow, *A. triuncialis* Linnaeus, *A. umbellulata* Zhukovsky, and *A. ventricosa* Tausch. It is not clear in which sense the ambiguous name *A. ovata* was used: that of *A. geniculata* Roth, which has been its traditional application, or that of *A. neglecta* Requien ex Bertoloni, where its lectotype illustration is said to belong.

**1. *Aegilops tauschii* Cosson, Notes Pl. Crit. 69. 1850.**

山羊草 shan yang cao

*Patropyrum tauschii* (Cosson) Á. Löve; *Triticum tauschii* (Cosson) Schmalhausen.

Culms 20–40 cm tall. Leaf sheath glabrous but margin ciliate; ligule 0.5–1 mm, membranous; leaf blade 4–6 × ca. 0.3 cm, scabrous, adaxial surface pilose. Spike cylindric, with (5–) 7–10(–13) spikelets. Spikelets cylindric, ca. 9 mm, with 3 or

4(or 5) florets. Glumes 4–6 mm, leathery, 7–9(–10)-veined, apex truncate or slightly toothed. Lemma lanceolate, 5-veined; first lemma ca. 7 mm; awn 1–4 cm. Palea equaling lemma. Fl. and fr. May–Jun.  $2n = 14$ .

Stony slopes, fields of *Triticum*, weedy places. Henan, Shaanxi, Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Turkmenistan, Uzbekistan; SW Asia].

The name *Aegilops squarrosa* Linnaeus has been misapplied to this species by some authors.

## 16. Tribe CENTOTHECEAE

假淡竹叶族 jia dan zhu ye zu

Liu Liang (刘亮); Sylvia M. Phillips

Annuals or perennials. Leaf blades broad with cross veins and sometimes a pseudopetiole; ligule a short scarious rim, sometimes ciliolate. Inflorescence a panicle or composed of racemes. Spikelets all alike, laterally compressed, florets 1 to many, upper

florets ± reduced, disarticulating below each floret or falling entire; glumes herbaceous, shorter than lemmas, 3–7-veined, apex usually entire; lemmas herbaceous, similar to glumes, 5–9-veined, awnless or shortly awned from apex. Caryopsis ellipsoid or trigonous.  $x = 12$ .

Ten genera and ca. 30 species: mainly in the tropics, in shady places; two genera and three species in China.

- 1a. Lemmas awnless; spikelets breaking up above glumes ..... 111. *Centotheca*
- 1b. Lemmas awned; spikelets falling entire ..... 112. *Lophatherum*

### 111. CENTOTHECA Desvaux, Nouv. Bull. Sci. Soc. Philom. Paris 2: 189. 1810 [“*Centosteca*”], nom. et orth. cons.

假淡竹叶属 jia dan zhu ye shu

Annual or perennial. Leaf blades broadly linear to lanceolate, narrowed at base. Inflorescence a panicle or the primary branches reduced to racemes. Spikelets breaking up above glumes, florets 1–4, rachilla extension usually bearing a rudimentary floret, upper florets decreasing in size and often with reflexed bristles; glumes unequal, separated by a short internode, 3–5-veined, dorsally keeled, apex acute or acuminate; lemmas dorsally rounded, 5–7-veined, apex acute or apiculate; palea narrower, equal to or shorter than its lemma, keels ciliate or glabrous. Stamens 2 or 3.

Three or four species: W Africa, tropical Asia, Australia (Queensland), Pacific islands; one species in China.

- 1. Centotheca lappacea** (Linnaeus) Desvaux, Nouv. Bull. Sci. Soc. Philom. Paris 2: 189. 1810.

假淡竹叶 jia dan zhu ye

*Cenchrus lappaceus* Linnaeus, Sp. Pl., ed. 2, 2: 1488. 1763; *Centotheca lappacea* subsp. *inermis* (Rendle) T. Koyama; *C. lappacea* var. *inermis* Rendle; *C. lappacea* var. *longilamina* (Ohwi) Bor; *C. latifolia* Trinius, nom. illeg. superfl.; *C. longilamina* Ohwi; *Festuca latifolia* Roth (1821), not Candolle (1813); *Holcus latifolius* Osbeck; *Melica lappacea* (Linnaeus) Raspail; *Poa latifolia* G. Forster; *Uniola lappacea* (Linnaeus) Trinius.

Perennial from a knotty base. Culms solitary or loosely tufted, erect, smooth, 40–100 cm tall, 4–7-noded. Leaf sheaths smooth or ciliate along one margin; leaf blades broadly lanceolate, 5–15 × 1–2.5 cm, abaxial surface glabrous with cross veins, adaxial surface glabrous or loosely hispidulous, apex long-attenuate; ligule 1–1.5 mm. Panicle open, 12–25 cm, primary branches up to 15 cm, the spikelets clustered around them; pedicels 2.5–3 mm, slender, pubescent. Spikelets ca. 5 mm, florets 2–3; glumes 3–5-veined; lower glume 2–2.5 mm, acute; upper glume 3–3.5 mm, mucronate; lowest lemma ca. 4 mm, 7-

veined, glabrous, apex apiculate; second and third lemmas 3–3.5 mm, coarsely setose with tubercle-based, reflexing bristles near upper margins; paleas firm, ciliolate along keels. Caryopsis ellipsoid, 1–1.2 mm. Fl. and fr. Jun–Oct.  $2n = 24$ .

Forest margins, shady roadsides and other moist shady places. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Taiwan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; W tropical Africa, Australia (Queensland), Pacific Islands (Polynesia)].

This is an excellent fodder grass. The stiff bristles on the spikelets, which reflex at maturity, aid dispersal by catching in the fur of passing animals.

In 1820 Trinius published the name *Centotheca latifolia*, but not as a new combination based on *Holcus latifolius* Osbeck (1757), which should have been the basionym as the earliest legitimate name for the species, but as a replacement name for *Cenchrus lappaceus* Linnaeus (1763). The well-known combination *Centotheca latifolia* is therefore illegitimate, because it was nomenclaturally superfluous when published, and the epithet of *H. latifolius* cannot be transferred to *Centotheca* without creating a later homonym, which would be illegitimate. The earliest legitimate name with an epithet available in *Centotheca* is *Cenchrus lappaceus*, and hence Desvaux's combination is the correct name for this species.

### 112. LOPHATHERUM Brongniart in Duperrey, Voy. Monde 2: 49. 1831.

淡竹叶属 dan zhu ye shu

Perennials with spindle-shaped root tubers. Culms unbranched. Leaf blades all caudine, narrowly lanceolate, strongly many-veined with obvious cross veinlets, pseudopetiolate. Inflorescence of loose or dense unilateral racemes spaced on a central axis. Spikelets falling entire, floret 1, rachilla extension bearing a bunch of up to 9 smaller sterile lemmas, cross veinlets evident on glumes and lemmas; glumes unequal, 5–7-veined, apex obtuse; fertile lemma 7-veined, all lemmas with a retrorsely scaberulous awn, those of the sterile lemmas developing into a fan of recurved hooks at maturity. Stamens 2 or 3.

Two species: warm-temperate and tropical Asia: two species in China.

- 1a. Spikelets narrowly lanceolate, subterete, 1.5–2.5 mm broad, patent at maturity; lowest lemma with straight back ..... 1. *L. gracile*
- 1b. Spikelets ovate, lightly flattened, 3–4 mm broad, imbricate at maturity; lowest lemma with gibbous back ..... 2. *L. sinense*

- 1. Lophatherum gracile** Brongniart in Duperrey, Voy. Monde 2: 50. 1831.

淡竹叶 dan zhu ye

*Acroelytrum japonicum* Steudel; *Lophatherum annulatum* Franchet & Savatier; *L. elatum* Zollinger & Moritz; *L. gracile* var. *elatum* (Zollinger & Moritz) Hackel; *L. gracile* var. *pilosulum* (Steudel) Hackel; *L. humile* Miquel; *L. japonicum* (Steudel)

del) Steudel; *L. lemannii* Nees ex Steudel; *L. multiflorum* Steudel; *L. pilosulum* Steudel; *L. zeylanicum* J. D. Hooker.

Culms tufted from a knotty rootstock, slender, stiffly erect, 60–150 cm tall. Leaf sheaths glabrous or pilose; leaf blades lanceolate, 5–30 × 2–5 cm, glabrous or with long hairs on both surfaces, base rounded to a 8–12 mm pseudopetiole; ligule brown, hispid on backside. Inflorescence 10–25 cm; racemes few, 5–10 cm, loosely spiculate, erect at first with appressed spikelets, later obliquely spreading and spikelets patent; pedicels short, thick. Spikelets narrowly lanceolate, subterete, 7–12 mm, base glabrous or hairy; glumes ovate, rounded on back, subleathery with membranous margins; lower glume 3–4.5 mm, 5-veined, glabrous or stiffly hairy near margins and apex; upper glume ca. 5 mm, 5–7-veined, glabrous; lemma of fertile floret oblong with straight back, not keeled, 6–7 mm; palea lanceolate, hyaline; awn of fertile and sterile lemmas 1.5–2 mm. Fl. and fr. Jun–Sep.  $2n = 48^*$ .

Shady slopes, roadsides and in moist forests. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, India, Indonesia, Japan, S Korea, Malaysia, Myanmar, Nepal, New Guinea, Philippines,

Sri Lanka, Thailand, Vietnam; Australia (Queensland), Pacific Islands (Polynesia)].

This species is used for medicinal purposes. The leaves are reminiscent of those of bamboos. The barbed awns catch in the fur of passing animals, effecting dispersal of the spikelet.

**2. *Lophatherum sinense*** Rendle, J. Linn. Soc., Bot. 36: 421. 1904.

中华淡竹叶 zhong hua dan zhu ye

Culms tufted, stiffly erect, up to 110 cm tall. Leaf sheaths usually glabrous; leaf blades lanceolate, 15–20 × 3–5 cm, base rounded to a pseudopetiole; ligule very small. Inflorescence 15–25 cm, racemes few, distant, up to 5 cm, closely spiculate with subsessile imbricate spikelets. Spikelets obliquely ovate, flattened, 7–10 mm; glumes broadly ovate, weakly keeled, 5(–7)-veined; lower glume ca. 4 mm; upper glume ca. 5 mm; lemma of fertile floret broadly ovate with gibbous back, keeled, ca. 6 mm, palea shorter than lemma; awn of fertile and sterile lemmas ca. 1 mm. Fl. and fr. Aug–Oct.  $2n = 48^*$ .

Shady hillsides by streams. Hunan, Jiangsu, Jiangxi, Zhejiang [Japan, S Korea].

This species is very similar to *Lophatherum gracile* vegetatively, but has different spikelets.

## 17. Tribe THYSANOLAENEAE

粽叶芦族 zong ye lu zu

Liu Liang (刘亮); Sylvia M. Phillips

Perennials. Culms tufted, tall, bamboo-like, solid. Leaf blades broad, flat, many-veined, cross veinlets present, base rounded, contracted to sheath, apex acuminate; ligule scarious. Inflorescence a large panicle, the numerous tiny spikelets on branchlets contracted around the primary branches, immature at emergence. Spikelets with 2 florets and a rachilla extension, a 3rd reduced floret sometimes present, laterally compressed, falling entire with pedicel attached, subsequently disarticulating between florets; rachilla glabrous, internode very short; glumes much shorter than spikelet, hyaline, 0–1-veined, rounded on back, obtuse; lower lemma barren without palea, oblong-lanceolate, membranous, rounded on back, 1–3-veined, glabrous, narrowly acuminate; upper floret bisexual, becoming firm, its lemma lanceolate, finely 3-veined, ciliate on margins, apex acuminate-rostrate; palea small, hyaline. Stamens 2–3. Caryopsis subglobose, hilum punctiform.  $x = 12$ .

One species: tropical Asia, including China, Indian Ocean Islands.

## 113. THYSANOLAENA Nees, Edinburgh New Philos. J. 18: 180. 1835.

粽叶芦属 zong ye lu shu

Description and distribution as for tribe.

**1. *Thysanolaena latifolia*** (Roxburgh ex Hornemann) Honda, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 312. 1930.

粽叶芦 zong ye lu

*Melica latifolia* Roxburgh ex Hornemann, Suppl. Hort. Bot. Hafn. 117. 1819; *Agrostis maxima* Roxburgh; *Thysanolaena maxima* (Roxburgh) O. Kuntze.

Culms 1–3 m tall, hard, unbranched, often arching. Leaf sheaths smooth; leaf blades broadly lanceolate-oblong, leathery, up to 40 × 3–7 cm; ligule truncate, 1–2 mm. Panicle up to 60 cm, open or contracted; main branches 1–3 per node, pilose in axils, bare of spikelets in lower part, lowest branch up to 30 cm; pedicels ca. 2 mm. Spikelets 1.5–1.8 mm; glumes 1/5–1/4 spikelet length, ovate-lanceolate; lower lemma as long as spikelet;

upper lemma slightly shorter than lower lemma, marginal hairs rigid, to 1 mm, spreading at maturity, apex slightly recurved. Anthers brown, 0.5–1 mm. Caryopsis oblong, ca. 0.5 mm. Fl. and fr. summer to autumn.  $2n = 24$ .

Hillsides and valleys, among rocks, in thickets, forest margins, open grasslands, river banks. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Thailand, Vietnam; Indian Ocean Islands].

This tall, broad-leaved grass is easily recognized by its large, purplish brown panicle of tiny spikelets, which fall entire with the pedicel attached. It provides a source of fiber, the heads can be used as brooms, and it is also planted as an ornamental.