

189. IMPERATA Cirillo, Pl. Rar. Neapol. 2: 26. 1792.

白茅属 bai mao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials, strongly rhizomatous. Culms erect, unbranched. Leaf blades mainly basal, linear, flat or rolled; ligule membranous. Inflorescence a terminal, silky-white, spikelike panicle, branches bearing numerous very short racemes; racemes with tough rachis, spikelets of a pair both pedicelled with one pedicel longer than the other, deciduous at maturity within a plumose involucre of hairs; rachis internodes and pedicels persistent, densely silky hairy, tips expanded. Spikelets small, delicate, ± terete, enveloped in hairs; callus very small, pilose with long hairs usually exceeding the spikelet; glumes subequal, lanceolate, membranous or lower glume herbaceous, back long-pilose; lower floret reduced to an empty hyaline veinless lemma, shorter than spikelet; upper lemma similar to lower, apex obtuse, denticulate, ciliate; awnless; palea short, broad. Lodicules absent. Stamens 1 or 2. $x = 10$.

About ten species: throughout the tropics, extending to warm-temperate regions; three species (one endemic) in China.

Imperata conferta (Presl) Ohwi has been reported in the literature from Taiwan, but its presence has not been confirmed. It is native to Indo-china, Indonesia, and the Philippines. Distinguishing characters are given in the key below.

- 1a. Callus hairs equal to or slightly shorter than spikelet; stigmas yellowish brown 3. *I. flava*
- 1b. Callus hairs 3 times longer than spikelet; stigmas purplish black.
 - 2a. Panicle narrowly conical, loose, branches spreading; stamen 1 *I. conferta* (see note above)
 - 2b. Panicle cylindrical, dense, branches appressed; stamens 2.
 - 3a. Culms up to 1.2 m tall; leaf blades 0.2–2 cm wide; panicle 6–20 cm 1. *I. cylindrica*
 - 3b. Culms up to 2.8 m tall; leaf blades 1.2–2.8 cm wide; panicle 40–50 cm 2. *I. latifolia*

1. Imperata cylindrica (Linnaeus) Raeuschel, Nomencl. Bot., ed. 3, 3: 10. 1797.

白茅 bai mao

Perennial, basal sheaths becoming fibrous; rhizomes widely spreading, tough, scaly. Culms solitary or tufted, 25–120 cm tall, 1.5–3 mm in diam., 1–4-noded, nodes glabrous or bearded. Leaf sheaths glabrous or pilose at margin and mouth; leaf blades flat or rolled, stiffly erect, 20–100 × 0.8–2 cm, culm blades 1–3 cm, adaxial surface puberulous, margins scabrid, base straight or narrowed, apex long acuminate; ligule 1–2 mm. Panicle cylindrical, copiously hairy, 6–20 cm, lowermost branches sometimes loose. Spikelets 2.5–6 mm; callus with 12–16 mm silky hairs; glumes 5–9-veined, back with long silky hairs ca. 3 times glume length, apex slightly obtuse or acuminate; lower lemma ovate-lanceolate, 2/3 length of glumes, ciliate, acute or denticulate; upper lemma ovate, 1/2 length of glumes, denticulate, ciliate, palea equal to lemma. Anthers 2, 2–4 mm. Stigmas purplish black. Fl. and fr. Apr–Aug. $2n = 20$.

River and seashore sands, disturbed grassy places, cultivations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shanxi, Shaanxi, Shandong, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Kazakhstan, Korea, Kyrgyzstan, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Russia, Sri Lanka, Thailand, Turkmenistan, Uzbekistan, Vietnam; Africa, SW Asia, Australia, S Europe].

This species is extremely polymorphic, but nevertheless easily recognizable by its dense, narrowly cylindrical, silky white inflorescence. The blackish stigmas are persistent and very obvious among the white hairs. The species has been classified into three varieties, which show some geographic separation. Two occur in China and a third is found in Africa. However, there is a great deal of intergradation and also variation within the varieties.

This widespread, noxious weed of disturbed ground and cultivation spreads vigorously by its rhizomes, which are almost impossible to eradicate, and may cover large areas of ground. It flourishes in grasslands that are frequently burned, and the young shoots provide good fodder. It is also used for medicine and fiber.

- 1a. Leaf blades rolled; spikelets 4.5–6 mm;
anthers 3–4 mm 1a. var. *cylindrica*
- 1b. Leaf blades flat; spikelets 2.5–4(–4.5)
mm; anthers 2–3 mm 1b. var. *major*

1a. *Imperata cylindrica* var. *cylindrica*

白茅(原变种) bai mao (yuan bian zhong)

Lagurus cylindricus Linnaeus, Syst. Nat., ed. 2, 2: 878. 1759; *Imperata arundinacea* Cirillo; *I. arundinacea* var. *europaea* Andersson; *I. cylindrica* var. *europaea* (Andersson) Ascherson & Graebner; *Saccharum cylindricum* (Linnaeus) Lamarck.

Culm nodes usually glabrous. Leaf blades rolled, apex hard, spiny. Panicle very dense. Spikelets 4.5–6 mm; anthers 3–4 mm.

River and seashore sands, dry grassy places on lower mountain slopes. Xizang [Afghanistan, Kazakhstan, Kyrgyzstan, Russia, Turkmenistan, Uzbekistan; N Africa, SW Asia, S Europe].

This variety has been reported in the literature from Xizang, but no specimens have been seen.

- 1b. ***Imperata cylindrica* var. *major*** (Nees) C. E. Hubbard in C. E. Hubbard & R. E. Vaughan, Grasses Mauritius Rodriguez, 96. 1940.

大白茅 da bai mao

Imperata koenigii var. *major* Nees, Fl. Afr. Austral. Ill. 90.1841; *Imperata arundinacea* var. *koenigii* (Retzius) Ben-

tham; *I. cylindrica* subsp. *koenigii* (Retz) Tzvelev; *I. cylindrica* var. *koenigii* (Retz) Pilger; *I. koenigii* (Retz) P. Beauvois; *Saccharum koenigii* Retz.

Culm nodes often bearded, sometimes sparsely or occasionally glabrous. Leaf blades flat. Panicle slightly loose below. Spikelets 2.5–4(–4.5) mm; anthers 2–3 mm.

Open grassy places, cultivations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Nei Mongol, Shanxi, Shaanxi, Shandong, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Afghanistan, India, Indonesia, Japan, Korea, Malaysia, Myanmar, New Guinea, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; SW Asia (Iran), Australia].

2. Imperata latifolia (J. D. Hooker) L. Liu, Vasc. Pl. Hengduan Mts. 2: 2299. 1994.

宽叶白茅 kuan ye bai mao

Imperata arundinacea var. *latifolia* J. D. Hooker, Fl. Brit. India 7: 106. 1896 [“1897”]; *I. cylindrica* var. *latifolia* (J. D. Hooker) C. E. Hubbard.

Perennial, basal sheaths becoming fibrous; rhizomes widely spreading. Culms up to 2.8 m tall, 6–10 mm in diam., 3–8-noded, nodes glabrous. Leaf sheaths usually longer than internodes, crowded below, glabrous, bearded at mouth; leaf blades flat, up to 120 × 1.2–2.8 cm, adaxial surface with yellowish long soft hairs at base, otherwise glabrous, margins scabrid, base narrowed to midrib, apex long acuminate; ligule ca. 2 mm. Panicle cylindrical, copiously hairy with slight pinkish tinge, 40–50 cm. Spikelets 3–4.5 mm; callus with ca. 12 mm silky hairs; lower glume 5–7-veined, back pilose below middle with long silky hairs ca. 3 times glume length, apex ciliate; upper glume 3-veined in lower part, scabrid, margin ciliate; lower lemma ca. 2.5 mm, margin ciliate; upper lemma resembling lower, palea broadly ovate, subequal to lemma. Anthers 2, 2–2.5 mm. Stigmas red. Fl. and fr. summer to autumn.

Swampy grasslands; ca. 800 m. SW Sichuan [N India].

3. Imperata flava Keng ex S. M. Phillips & S. L. Chen, Novon 15: 469. 2005.

黄穗白茅 huang sui bai mao

Perennial, basal sheaths becoming fibrous; rhizomes spreading, internodes very short. Culms solitary or tufted, 70–125 cm tall, 3–7 mm in diam., 3- or more-noded, nodes glabrous. Leaf sheaths longer than internodes, crowded below, glabrous except for silky hairs at mouth; leaf blades flat, 20–

60 × 0.5–1 cm, culm blades 1–7 cm, glabrous or adaxial surface puberulous, margins smooth, base narrowed to midrib, apex long acuminate; ligule 0.5–1 mm. Panicle cylindrical, silky hairy, 12–17 cm, branches short, erect or ascending, discrete below. Spikelets 3–4 mm; callus hairs ca. 4 mm, equal to spikelet; glumes 4–5(–7)-veined, back pilose in lower 1/3 with silky hairs about as long as spikelet, upper margins ciliate, apex obtuse or erose; lower lemma broadly oblong, ca. 1/2 length of glumes, ciliate, irregularly denticulate; upper lemma oblong, 1/3 length of glumes, 2–3-denticulate, ciliate, palea similar to lemma. Anthers 2, 2.5–2.8 mm. Stigmas yellowish brown. Fl. and fr. summer to autumn.

• Mixed forests, along rivers, valleys. Hainan.

This species, which appears to be confined to Hainan, can be readily distinguished from the more common *Imperata cylindrica* by its much shorter spikelet hairs and yellow-brown (vs. purple-black) stigmas.

