

213. THEMEDA Forsskål, Fl. Aegypt.-Arab. 178. 1775.

菅属 jian shu

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Anthistiria Linnaeus f.

Perennial or annual, often coarse. Culms tufted. Leaf sheaths keeled; leaf blades linear; ligule short, membranous or papery. Inflorescence a leafy compound panicle composed of short racemes; each raceme on a short peduncle subtended by a sheathing spatheole, loosely arranged or gathered into fan-shaped spathate fascicles. Raceme comprising 2 pairs of large sessile homogamous spikelets at base forming an involucre, with 1–2(–5) fertile pairs above and a terminal triad, these usually deciduous, rarely raceme shed as a whole; internodes and pedicels linear. Sessile spikelet subterete or dorsally compressed; callus mostly acute to pungent, sometimes obtuse, bearded; lower glume usually leathery, margins rounded, incurving, keeled only near apex, obtuse; upper glume awnless; lower floret reduced to a hyaline lemma; upper lemma stipitiform, entire, passing into a geniculate awn with pubescent column, occasionally awnless. Pedicelled spikelet mostly larger than sessile, narrowly lanceolate, resembling homogamous; callus slender, pedicel-like; true pedicel reduced. $x = 10$.

Twenty-seven species: tropical and subtropical regions of the Old World, mainly in Asia; 13 species (four endemic) in China.

The number of spikelets in a raceme refers to the total of homogamous, sessile, and pedicelled spikelets. Hence racemes with seven spikelets (division 1a of the key) have only one fertile sessile spikelet and one awn. Racemes with more than one awn have more than seven spikelets.

Most species of this genus are used for forage when young.

- 1a. Raceme with 7 spikelets; homogamous spikelets all at same level; racemes congested in dense fascicles.
 - 2a. Homogamous spikelets 7–14 mm 1. *T. triandra*
 - 2b. Homogamous spikelets 4–6 mm.
 - 3a. Involucral spikelets densely hairy with soft hairs; awn poorly developed, ca. 4 mm 2. *T. minor*
 - 3b. Involucral spikelets conspicuously setose with a few long bristles from large tubercles; awn well developed, 3–4.5 cm.
 - 4a. Fascicles of racemes from upper leaf axils; sessile spikelet pubescent toward apex 3. *T. quadrivalvis*
 - 4b. Fascicles of racemes from all leaf axils; sessile spikelet pubescent throughout 4. *T. helferi*
- 1b. Raceme with (7 or)9–17 spikelets; homogamous spikelets at slightly different levels; racemes loosely arranged.
 - 5a. Homogamous spikelets pubescent, thinly hispid or glabrous.
 - 6a. Culms slender, 20–60 cm; racemes few 5. *T. hookeri*
 - 6b. Culms robust, 1–3.5 m; racemes numerous.
 - 7a. Sessile spikelet awnless or with awn less than 1 cm 7. *T. villosa*
 - 7b. Sessile spikelet with 2–8 cm awn.
 - 8a. Culms and leaves hirsute 8. *T. trichiata*
 - 8b. Culms and leaves glabrous 9. *T. caudata*
 - 5b. Homogamous spikelets setose with tubercle-based bristles.
 - 9a. Sessile spikelet awnless or with awn less than 1 cm.
 - 10a. Homogamous spikelets 0.5–0.8 cm; culms slender 6. *T. anathera*
 - 10b. Homogamous spikelets 1–4 cm; culms robust 10. *T. intermedia*
 - 9b. Sessile spikelet awned.
 - 11a. Raceme with 13–17 spikelets; homogamous spikelets 2.5–4 cm 11. *T. unica*
 - 11b. Raceme with 7–9 spikelets; homogamous spikelets 1–1.5 cm.
 - 12a. Glumes of homogamous and pedicelled spikelets with golden hairs; lower glume of sessile spikelet convex 12. *T. arundinacea*
 - 12b. Glumes of homogamous and pedicelled spikelets with long soft white hairs; lower glume of sessile spikelet with shallow median groove 13. *T. yunnanensis*

1. Themeda triandra Forsskål, Fl. Aegypt.-Arab. 178. 1775.

黄背草 huang bei cao

Anthistiria japonica Willdenow; *Themeda barbinodis* B. S. Sun & S. Wang; *T. japonica* (Willdenow) Tanaka; *T. triandra* var. *japonica* (Willdenow) Makino.

Perennial from a knotty rootstock. Culms tussocky, yellowish, usually farinose near nodes, 0.5–1.5 m tall. Leaf sheaths usually hispid with tubercle-based hairs; leaf blades 10–50 ×

0.4–0.8 cm, glabrous or pilose, finely acuminate; ligule 1–2 mm, truncate, ciliate. Compound panicle lax, open, with spaced, often nodding spathate fascicles; spathes and spatheoles narrowly lanceolate, glabrous or thinly to densely tuberculate-hispid, innermost 2–3.5 cm. Raceme composed of a triad of 1 sessile and 2 pedicelled spikelets above the involucre of 2 homogamous pairs. Homogamous spikelets all sessile, arising at same level, staminate, both glumes present, 7–14 mm, oblong-lanceolate with lateral scarios wings, glabrous or hispid with

tubercle-based hairs. Sessile spikelet 5–7 mm; callus 1.5–3 mm, pungent, brown bearded; lower glume dorsally rounded, dark brown, glossy, hispidulous in upper 1/3, smooth below; awn 3.7–7 cm. Pedicelled spikelet 7–12 mm, male or barren. Fl. and fr. Jun–Dec. $2n = 20, 40, 50, 60, 70, 80$.

Dry mountain slopes, roadsides, forest margins; 100–3000 m. Anhui, Fujian, Guizhou, Hainan, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; Africa, SW Asia, Australia].

This is a highly polymorphic, predominantly apomictic species with a wide range of chromosome numbers.

The name *Themeda arguens* (Linnaeus) Hackel has been misapplied to this species in Yunnan. True *T. arguens* is not yet known from China. It occurs from Thailand and Vietnam to Australia, and can be distinguished by its reddish culms, very large, spathate fascicles with awns 7–9 cm, and longer callus 3–4 mm. It also differs from *T. triandra* by its glabrous leaf sheaths, blunter leaf blades, and homogamous spikelets consisting only of the lower glume.

2. Themeda minor L. Liu, Fl. Xizang. 5: 343. 1987.

小菅草 xiao jian cao

Perennial, with short scaly rhizomes. Culms slender, stiff, 30–50 cm, many-noded, branching. Leaf sheaths softly pilose on margins; leaf blades 3–8 × 0.1–0.2 cm, pilose with tubercle-based hairs, densely long-pilose at narrowed base, margins scabrid; ligule ca. 1 mm, ciliate. Compound panicle narrow, erect, spathate fascicles arising singly on 1.5–2 cm branches from upper leaf axils; spathes ca. 1.5 cm. Raceme composed of a triad of 1 sessile and 2 pedicelled spikelets above the involucre of 2 homogamous pairs. Homogamous spikelets 4–5 mm, densely hirsute with whitish, tubercle-based soft hairs. Sessile spikelet ca. 4 mm; callus bearded; lower glume dorsally compressed, pallid, puberulous, acute; awn poorly developed, ca. 4 mm. Pedicelled spikelet ca. 5 mm, staminate, densely white-hirsute, hairs ca. 3 mm. Fl. and fr. Jun–Sep.

• Mountain slopes, under rather open thickets; ca. 2000 m. SE Xizang (Zayü).

3. Themeda quadrivalvis (Linnaeus) Kuntze, Revis. Gen. Pl. 793. 1891.

中华菅 zhong hua jian

Andropogon quadrivalvis Linnaeus in Murray, Syst. Veg., ed. 13, 758. 1774; *Themeda chinensis* (A. Camus) S. L. Chen & T. D. Zhuang; *T. ciliata* (Linnaeus f.) Hackel subsp. *chinensis* A. Camus; *T. echinata* Keng; *T. yuanmounensis* S. L. Chen & T. D. Zhuang.

Annual. Culms moderately robust, erect or geniculate at base, ca. 1 m tall. Leaf sheaths glabrous or with tubercle-based bristles at mouth; leaf blades flat or folded, up to 30 × 0.3–0.9 cm, glabrous, abruptly acute to acuminate; ligule ca. 3 mm. Compound panicle large, dense; spathes and spatheoles lanceolate-caudate, glabrous, innermost 1.3–1.7 cm. Raceme composed of a triad of 1 sessile and 2 pedicelled spikelets above the involucre of 2 homogamous pairs. Homogamous spikelets all sessile, arising at same level, barren, both glumes present, 4.5–6

mm, lanceolate, stiffly setose in upper half with 3–4 mm, tubercle-based bristles. Sessile spikelet 4–4.5 mm; callus 0.8–1 mm, subacute, brown bearded; lower glume dorsally rounded, dark brown at maturity, pubescent, often thinly or glabrous on lower back; awn 3.5–4 cm. Pedicelled spikelet 4–6 mm, barren. Fl. and fr. Jun–Dec.

Dry hill slopes; 400–2000 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [India, Indonesia, Myanmar, Nepal, Thailand, Vietnam; Australia].

This species has dense fascicles of racemes similar to those of *Themeda triandra*, but with smaller spikelet parts and conspicuously setose homogamous spikelets with long, patent bristles from very large tubercles. It can also generally be separated by its annual habit.

4. Themeda helferi Munro ex Hackel in A. Candolle & C. Candolle, Monogr. Phan. 6: 665. 1889.

无茎菅 wu jing jian

Themeda acaulis B. S. Sun & S. Wang; *T. ciliata* (Linnaeus f.) Hackel subsp. *helferi* (Munro ex Hackel) A. Camus; *T. quadrivalvis* (Linnaeus) Kuntze var. *helferi* (Munro ex Hackel) Bor.

Annual. Culms very slender, solitary or in small loose tufts, up to 30 cm tall. Leaf sheaths shorter than internodes, glabrous; leaf blades flat or folded, 5–10 × 0.2–0.4 cm, a few tubercle-based bristles on lower margins, otherwise glabrous, acute; ligule ca. 1 mm, truncate, ciliolate. Spathate fascicles arising from all leaf axils from base to apex of culm, fascicles congregated on slender 1–3-noded branches; spathes and spatheoles narrowly lanceolate-caudate, glabrous, innermost ca. 2 cm. Raceme composed of a triad of 1 sessile and 2 pedicelled spikelets above the involucre of 2 homogamous pairs. Homogamous spikelets all sessile, arising at same level, male with both glumes present, 4–5 mm, narrowly lanceolate, stiffly setose in upper half with ca. 3 mm, tubercle-based bristles, upper keels scabrid. Sessile spikelet ca. 4 mm; callus 0.5–1 mm, obtuse, brown bearded; lower glume dorsally slightly flattened, pubescent throughout; awn 3.5–4.5 cm. Pedicelled spikelet 5–6 mm, barren.

Stream banks; ca. 600 m. Yunnan (Longling, Zhenkang) [Myanmar (Tenasserim)].

This slender, annual species is remarkable in that fascicles of racemes are borne all the way down to the base of the plant, so that the whole culm in effect forms the compound inflorescence. It appears to be rare and fairly localized in its distribution.

5. Themeda hookeri (Grisebach) A. Camus, Bull. Mus. Natl. Hist. Nat. 26: 425. 1920.

西南菅草 xi nan jian cao

Anthistiria hookeri Grisebach, Nachr. Königl. Ges. Wiss. Georg-Augusts-Univ. 3: 91. 1868.

Perennial, with slender rhizomes. Culms very slender, decumbent at base, 20–60 cm tall. Leaf sheaths glabrous; leaf blades 3–13 × 0.2–0.5 cm, scabrid, glabrous or thinly hispid with long, fine, tubercle-based hairs, apex filiform; ligule ca. 0.5 mm, ciliolate. Compound panicle sparse, composed of single racemes arising from upper leaf axils, usually subtended

only by a spatheole without accompanying spathes; spatheoles linear, 3–6 cm, glabrous; peduncle glabrous. Raceme composed of 1–2 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at different levels, staminate, 12–18 mm, lanceolate with narrow lateral wings, glabrous or thinly hispid. Sessile spikelet 4.5–5.5 mm; callus ca. 1.5 mm, narrowly cuneate; lower glume pallid, dorsally compressed, shortly pubescent especially near apex or subglabrous; awn 2.5–4 cm, weakly geniculate. Pedicelled spikelet 10–11 mm. Fl. and fr. Jun–Nov.

Mountain slopes, rocky places, in the open or in shade; 1100–3400 m. Guizhou, Sichuan, Xizang, Yunnan [India (Sikkim), Nepal].

This slender, upland species is recognizable by its few racemes, which usually arise singly from the upper leaf axils instead of being gathered into spathe clusters.

6. *Themeda anathera* (Nees ex Steudel) Hackel in A. Candolle & C. Candolle, *Monogr. Phan.* 6: 669. 1889.

瘤菅 liu jian

Anthistiria anathera Nees ex Steudel, *Syn. Pl. Glumac.* 1: 402. 1854; *Androscepia anathera* (Nees ex Steudel) Andersson; *A. anathera* var. *glabrescens* Andersson; *A. anathera* var. *hirsuta* Andersson; *Themeda anathera* var. *glabrescens* (Andersson) Hackel; *T. anathera* var. *hirsuta* (Andersson) Hackel.

Perennial, with rhizomes. Culms densely tufted, slender, erect or ascending, 30–120 cm tall. Leaf sheaths glabrous or loosely hairy; leaf blades narrow, 4–20 × 0.2–0.4 cm, scabrid, setose with scattered, long, tubercle-based hairs, apex filiform; ligule ca. 2 mm, margin ciliate. Compound panicle loose, open, branches ascending, bearing up to 5 small spathe racemes; spatheoles linear, 1–2 cm, glabrous; peduncle glabrous. Raceme composed of 1–3 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at different levels, male or barren, 5–8 mm, lanceolate, sparsely to densely setose with tubercle-based bristles or sometimes glabrous. Sessile spikelet 5–7 mm; callus ca. 1 mm, obtuse; lower glume firmly herbaceous to subleathery, lightly dorsally compressed, puberulous or subglabrous to tuberculate-hairy; upper lemma narrowly lanceolate, awnless (rarely with reduced ca. 1 cm awn). Pedicelled spikelet 6–8 mm. Fl. and fr. Aug–Oct.

Mountain slopes, usually in forests; 1500–3000 m. Xizang [Afghanistan, N India, Nepal, Pakistan].

This is a slender, Himalayan species similar to *Themeda hookeri*, but with a more western distribution. It has a more densely tufted habit than *T. hookeri* and can easily be distinguished by its more numerous, awnless, usually setose racemes of smaller spikelets.

7. *Themeda villosa* (Poiret) A. Camus in Lecomte, *Fl. Indo-Chine* 7: 364. 1922.

菅 jian

Anthistiria villosa Poiret, *Encycl. Suppl.* 1: 396. 1812 [“1810”]; *A. gigantea* Cavanilles subsp. *villosa* (Poiret) J. D. Hooker; *A. mutica* Steudel; *Pseudanthistiria emeinica* S. L. Chen & T. D. Zhuang; *Themeda gigantea* (Cavanilles) Hackel subsp. *villosa* (Poiret) Hackel; *T. gigantea* var. *villosa* (Poiret)

Hackel.

Perennial. Culms tufted, stout, 2–3.5 m tall, 1–2 cm in diam. Leaf sheaths glabrous, basal sheaths strongly compressed; leaf blades ca. 100 × 0.7–1.5 cm, scabrid, gradually narrowed to the thick white midrib toward base, acuminate; ligule ca. 1 mm, ciliate. Compound panicle up to 1 m with many drooping branches, branches bearing several spathes, each spathe subtending a further spathe and usually a single spatheole with raceme; spatheoles 2–3.5 cm, minutely hispidulous; peduncle pilose at apex. Raceme composed of (1–)2 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, male or barren, 10–15 mm, narrowly lanceolate, wingless, shortly pubescent. Sessile spikelet 7–8 mm; callus 1–2 mm, acute; lower glume oblong-lanceolate, dorsally compressed with shallow central groove, densely brown strigose; upper lemma lanceolate, midvein produced into mucro or poorly developed short awn. Pedicelled spikelet 10–15 mm. Fl. and fr. Aug–Jan.

Hill slopes, forest margins, disturbed moist grassy places; 300–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, NE India, Indonesia, Malaysia, Nepal, Philippines, Sri Lanka (introduced), Thailand].

This is a giant grass with stout culms and a large, spathe panicle lacking prominent, geniculate awns. The name *Pseudanthistiria emeinica* is based on a few anomalous specimens from Sichuan (Emei Shan) in which one or both of the homogamous spikelet pairs have been replaced by a normal spikelet pair.

8. *Themeda trichiata* S. L. Chen & T. D. Zhuang, *Bull. Bot. Res.*, Harbin 9(2): 58. 1989.

毛菅 mao jian

Perennial. Culms tufted, stout, ca. 1.5 m tall, 0.7 mm or more in diam., loosely hirsute especially below nodes. Leaf sheaths glabrous or hirsute along margins, hirsute on back near blade; leaf blades 40–80 × 0.4–0.6 cm, abaxial surface hirsute, contracted at base, acuminate; ligule ca. 1.5 mm, margin lacinate. Compound panicle open, branches pilose, spathes hirsute at least on margins, each subtending a further spathe and up to 3 spatheoles with racemes; spatheoles 2.5–3 cm, glabrous; peduncle villous at apex. Raceme composed of 1 spikelet pair and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, one pair subsessile, barren, the other pair staminate, 12–15 mm, narrowly lanceolate, minutely puberulous. Sessile spikelet dorsally compressed, 7–7.5 mm; callus ca. 2 mm, acute; lower glume oblong-lanceolate, slightly flattened, densely brown strigose; upper lemma stipitiform; awn 2–4.5 cm. Pedicelled spikelet 12–15 mm. Fl. and fr. Aug–Dec.

• Dry mountain slopes. Guangxi, Hainan, Yunnan.

This species is very close to *Themeda caudata*, but has hairs on the leaves and culms, and shorter, more slender awns.

9. *Themeda caudata* (Nees) A. Camus in Lecomte, *Fl. Indo-Chine* 7: 364. 1922.

苞子草 bao zi cao

Anthistiria caudata Nees in Hooker & Arnott, Bot. Beechey Voy. 245. 1838; *A. gigantea* Cavanilles subsp. *caudata* (Nees) J. D. Hooker; *Themeda gigantea* (Cavanilles) Hackel subsp. *caudata* (Nees) Hackel.

Perennial. Culms tufted, robust, 1–3 m tall, 0.5–1 cm in diam. Leaf sheaths glabrous, basal sheaths strongly compressed; leaf blades 20–80 × 0.5–1 cm, scabrid, midvein distinct, narrowed to subrounded at base, acuminate; ligule subrounded, ca. 1 mm, ciliate. Compound panicle large, much branched, branches bearing several spathes, each spathe subtending a further spathe and up to 3 spatheoles with racemes; spatheoles 2.5–5 cm, minutely scaberulous-puberulous; peduncle pilose at apex. Raceme composed of 1(–2) spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, 12–15 mm, linear-lanceolate, wingless, minutely scaberulous-puberulous. Sessile spikelet 6–7.5 mm; callus 2–3 mm, acuminate; lower glume dorsally compressed, oblong-lanceolate, densely golden strigose; upper lemma stipitiform; awn 4–8 cm. Pedicelled spikelet 12–15 mm, male or barren. Fl. and fr. Jul–Dec.

Dry hillsides, forest margins; 400–2500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].

The name “*Themeda gigantea* var. *caudata* (Nees) Keng” (Fl. III. Pl. Prim. Sin. Gram. 845. 1959) belongs here, but was not validly published because no Latin description was provided.

10. *Themeda intermedia* (Hackel) Bor, Indian Forest Rec., Bot. 1: 96. 1938.

居中菅 ju zhong jian

Themeda gigantea (Cavanilles) Hackel subsp. *intermedia* Hackel in A. Candolle & C. Candolle, Monogr. Phan. 6: 675. 1889.

Perennial. Culms tufted, stout, 1.5–5 m tall, 0.8–1.5 cm in diam. Leaf sheaths glabrous; leaf blades up to 100 × 0.6–1.5 cm, narrowed toward base, scabrid, acuminate; ligule ca. 1 mm. Compound panicle large with many drooping branches, each branch bearing several spathes subtending 1–3 spatheoles; spatheoles 2–3 cm, glabrous; peduncle villous at apex. Raceme composed of 0–2 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, male or barren, 11–14 mm, narrowly oblong-lanceolate, hirsute with long, golden or pallid tubercle-based hairs, acuminate. Sessile spikelet ca. 7 mm; callus 1.5–2 mm, narrowly cuneate; lower glume oblong-lanceolate, dorsally compressed, densely strigose with brown hairs; upper lemma lanceolate, awn absent or less than 1 cm. Pedicelled spikelet 10.5–14 mm.

Light forest shade; ca. 700 m. SW Yunnan (Gengma) [Bhutan, N India, Myanmar].

This is probably just an awnless, small-spiculate form from the *Themeda arundinacea* gene pool or a product of introgression from *T. villosa*.

11. *Themeda unica* S. L. Chen & T. D. Zhuang, Bull. Bot. Res., Harbin 9(2): 56. 1989.

浙皖菅 zhe wan jian

Perennial. Culms erect or geniculate at base, 1–2.5 m tall, 4–10 mm in diam., farinaceous near nodes when young. Leaf sheaths loosely hispid with tubercle-based hairs; leaf blades 30–60 × 0.4–1 cm, glabrous or adaxial surface with tubercle-based setae near base; ligule 2–7 mm. Compound panicle elongate, 3–4-noded, 1–3 solitary spathate racemes arising directly from nodes; spatheoles 4–9 cm, glabrous; peduncle 4–7 cm, glabrous. Raceme composed of 3–5 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, staminate, 25–40 cm, lanceolate, margins with stiff white tubercle-based hairs, acuminate. Sessile spikelet 7–10 mm; callus ca. 2.5 mm, acute; lower glume elliptic-oblong, densely strigose with brown hairs, awn 2–4 cm. Pedicelled spikelet ca. 20 mm. Fl. and fr. Aug–Oct.

• Hill slopes, roadsides; 200–1000 m. Anhui, Zhejiang.

12. *Themeda arundinacea* (Roxburgh) A. Camus in Lecomte, Fl. Indo-Chine 17: 363. 1922.

韦菅 wei jian

Anthistiria arundinacea Roxburgh, Fl. Ind. 1: 256. 1820; *A. subsericans* Nees ex Steudel; *Cymbopogon arundinaceus* (Roxburgh) Schultes; *Themeda gigantea* (Cavanilles) Hackel subsp. *arundinacea* (Roxburgh) Hackel; *T. gigantea* var. *subsericans* (Nees ex Steudel) Hackel; *T. subsericans* (Nees ex Steudel) Ridley.

Perennial. Culms tufted, reedlike, stout, up to 6 m tall, 1–1.5 cm in diam. Leaf sheaths glabrous; leaf blades 50–100 × 1–1.5 cm, scabrid, gradually narrowed to the thick white midrib toward base, acuminate; ligule 1–2 mm. Compound panicle large with many drooping branches, each branch bearing spathes subtending 2–3 spatheoles; spatheoles 2–3.5 cm, glabrous; peduncle pubescent at apex. Raceme composed of 0–2 spikelet pairs and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at slightly different levels, male or barren, 12–20 mm, linear-lanceolate, densely hispid with long, golden, tubercle-based hairs, finely acuminate. Sessile spikelet 7–9.5 mm; callus 2–3.5 mm, narrowly cuneate; lower glume oblong-lanceolate, densely strigose with golden or brown hairs, hairs usually deciduous; awn 4–9 cm. Pedicelled spikelet 13–20 mm. Fl. and fr. Sep–Apr.

Mountain slopes, valley grasslands; 700–2000 m. Guangxi, Gui-

zhou, Yunnan [Bangladesh, Bhutan, N India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

Themeda arundinacea belongs to a group of giant *Themeda* species with stout, solid, reedlike culms and large, drooping panicles, also including *T. caudata*, *T. intermedia*, *T. trichiata*, and *T. villosa*. Most were treated in old literature at infraspecific rank under *T. gigantea* (Cavanilles) Hackel, which name is now applied only to a form endemic in the Philippines with awnless racemes of small, hairy spikelets. The species of this complex probably intergrade, and variation is not well understood.

Smaller forms of *Themeda arundinacea* with culms to 3 m tall, shorter spikelets, and shorter, weaker awns (3–4.5 cm) are sometimes separated as *T. subsericans*.

13. *Themeda yunnanensis* S. L. Chen & T. D. Zhuang, Bull. Bot. Res., Harbin 9(2): 58. 1989.

云南菅 yun nan jian

Perennial. Culms slender, erect, up to 1 m tall. Leaf sheaths glabrous; leaf blades 15–30 × 0.3–0.5 cm, glabrous, margins scabrid, acuminate; ligule lacerate. Compound panicle loose, each branch bearing a few spathes subtending 1 or more spatheoles; spatheoles 3–6 cm, glabrous; peduncles glabrous. Raceme composed of 1 spikelet pair and a terminal triad above the involucre of 2 homogamous pairs. Homogamous spikelets arising at different levels, staminate, ca. 15 mm, lanceolate, villous with white long soft tubercle-based hairs, acuminate. Sessile spikelet ca. 7 mm, pallid; callus ca. 2.5 mm, narrowly cuneate; lower glume subleathery, densely pubescent with yellowish white soft hairs, back with shallow median groove; awn 3–6 cm. Pedicelled spikelet ca. 15 mm, villous. Fl. and fr. Sep–Nov.

- Dry mountain slopes; 600–1900 m. Yunnan.

Themeda yunnanensis resembles the Indian species *T. mooneyi* Bor in its slender habit and softly white-hairy homogamous spikelets, but the latter species has glabrous sessile spikelets (except for short prickles at the apex) and glabrous pedicelled spikelets.

Flora of China 22: 633–637. 2006.