
香茅属 xiang mao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennial, rarely annual. Culms often tall, robust. Leaf blades aromatic, filiform to broadly linear; ligule scarious. Inflorescence a dense spathate compound panicle, each ultimate spathole subtending a pair of short racemes on a short peduncle; spatheoles boat-shaped; each raceme borne on a short, flattened raceme base, often deflexed at maturity, lower raceme with one basal pair of homogamous spikelets below the fertile pairs; rachis internodes and pedicels linear, white-ciliate on margins, sometimes pedicel of homogamous pair swollen and fused to adjacent internode. Sessile spikelet dorsally compressed; callus obtuse, shortly bearded, inserted into internode apex; lower glume papery, flat or concave, sometimes grooved or wrinkled, 2-keeled, keels lateral, often winged above middle, with or without intercarinal veins; upper glume boat-shaped, awnless; lower floret reduced to a hyaline lemma; upper lemma narrowly oblong, usually 2-lobed to near middle, lobes slender, ciliate, awned from sinus, occasionally subtientire and awnless; awn geniculate, sometimes weakly, short, glabrous. Pedicelled spikelet male or sterile, narrowly lanceolate, awnless. $x = 10, 20, 40, 60$.

About 70 species: tropics and subtropics of Africa, Asia, and Australia, predominantly in Asia; introduced in tropical America; 24 species (seven endemic, up to five introduced) in China.

Cymbopogon, with its inserted callus but frequently deflexed raceme bases, provides a link between Andropogon and Hyparrhenia, although its aromatic leaves distinguish it from both these genera. Many of the species are both variable and intergrading, based on inconstant characters, leading to much taxonomic difficulty. Specimens showing intermediate or extreme characteristics are common.

Several species are cultivated commercially for the aromatic oils that are distilled from their leaves. The oils are often lemon scented and are used as perfume. Some species are also used medicinally and in cooking. Oil of citronella is used as an insect repellent.

1a. Rachis internodes and pedicels villous on margins and back with long silky hairs surrounding and obscuring spikelets ................................................................. 1. C. jwarancusa

1b. Rachis internodes and pedicels ciliate on margins, back glabrous or pubescent, hairs shorter than spikelets.

2a. Lower glume of sessile spikelet flat with a slitlike median groove below middle (appearing as a line or keel on inside).

3a. Pedicel of homogamous spikelet pair linear to slightly cuneate, not fused to adjacent rachis internode ................................................................. 2. C. mekongensis

3b. Pedicel of homogamous spikelet pair swollen, barrel-shaped, fused to adjacent rachis internode at base.

4a. Culms up to 1 m; leaf blades 0.5–1 cm wide, base rounded ......................................................... 3. C. annamensis

4b. Culms up to 3 m; leaf blades 1–3 cm wide, base cordate, often amplexicaul ........................................ 4. C. martini

2b. Lower glume of sessile spikelet almost flat to deeply concave, the depression uniformly rounded.

5a. Homogamous spikelet pair reduced or absent; pedicelled spikelet small, reduced to barren glumes.

6a. Racemes not deflexing at maturity; spatheoles narrowly lanceolate, 2–2.5 cm ............................... 5. C. liangshanensis

6b. Racemes deflexing at maturity; spatheoles linear, 1.2–1.5 cm ................................................................ 6. C. minor

5b. Homogamous spikelet pair well developed; pedicelled spikelet well developed, often staminate.

7a. Lower glume of sessile spikelet with keels rounded in lower half, wingless or almost so.

8a. Raceme bases slender, unequal; racemes often more than 2 per spathole .. 2. Andropogon murrovi (see p. 623)

8b. Raceme bases flat, subequal; racemes always paired.

9a. Lower glume of sessile spikelet deeply concave, depression with a prominent swelling at base .................................................................................................................. 7. C. gidarba

9b. Lower glume of sessile spikelet shallowly concave to almost flat, without a swelling at base ............................................................................................................................. 8. C. pospischilli

7b. Lower glume of sessile spikelet with keels sharp throughout, narrowly to broadly winged.

10a. Sessile spikelet awnless or with short awn included within spikelet; cultivated plants.

11a. Sessile spikelet 5–6 mm; lower glume linear-lanceolate, ca. 0.7 mm wide ....................... 9. C. citratus

11b. Sessile spikelet 3–5 mm; lower glume elliptic-oblong, 1–1.2 mm wide.

12a. Inflorescence densely congested; leaf blades tough, scabrid, drooping for 1/3 of their length ................................................................................................. 10. C. nardus

12b. Inflorescence lax, branches spreading; leaf blades softer, smooth, drooping for 2/3 of their length ................................................................................................. 11. C. winterianus

10b. Sessile spikelet with exserted geniculate awn; wild plants (C. flexuosus also cultivated).

13a. Culms slender to moderately robust, up to 1.5 m tall, 2–5 mm in diam.; spathate panicle 1–3-times branched.

14a. Sessile spikelet 6–7 mm; leaf blades filiform, 1.5–3 mm wide ............................ 12. C. distans

14b. Sessile spikelet 3.5–6.3 mm; leaf blades linear, 2–7 mm wide.

15a. Lower glume of sessile spikelet 5–7-veined between keels, obviously transversely wrinkled ...................................................................................... 13. C. nervosus
15b. Lower glume of sessile spikelet 2–5-veined between keels; smooth or slightly wrinkled.

16a. Old basal leaf sheaths curling, reddish brown or orange inside; racemes 1–2 cm.
   17a. Racemes 1–1.5 cm; sessile spikelet narrowly lanceolate-oblong, 3.5–4.5 mm, wings on keels 0.15–0.25 mm; awn 7–10 mm .......... 14. C. tortilis
   17b. Racemes 1.5–2 cm; sessile spikelet narrowly obovate, 4.5–6 mm, wings on keels 0.25–0.45 mm wide; awn 10–12 mm ............ 15. C. goeringii

16b. Old basal leaf sheaths neither noticeably curling nor reddish inside; racemes 1.7–3 cm.
   18a. Racemes 1–1.5 cm; sessile spikelet narrowly lanceolate-oblong, 3.5–4.5 mm, wings on keels 0.15–0.25 mm; awn 7–10 mm ............. 14. C. tortilis
   18b. Racemes 1.5–2 cm; sessile spikelet narrowly obovate, 4.5–6 mm, wings on keels 0.25–0.45 mm wide; awn 10–12 mm .................... 15. C. goeringii

13b. Culms robust, up to 3 m tall, 5–10 mm in diam.; spathate panicle repeatedly branched.

19a. Sessile spikelet 5–9 mm (if less than 5.5 mm, lower glume clearly concave).
   20a. Sessile spikelet 5–6 mm; lower glume clearly concave in lower 2/3, not wrinkled; wings on keels 0.15–0.25 mm ........................................................... 18. C. pendulus
   20b. Sessile spikelet 5.5–9 mm; lower glume flat or slightly concave, transversely wrinkled; wings on keels 0.25–0.35 mm.

21a. Compound panicle very large, open, drooping; racemes 3–4 cm, yellow-green; sessile spikelet 7–9 mm ......................... 19. C. xichangensis
   21b. Compound panicle narrow, erect, subdense; racemes 2–2.5 cm, purple; sessile spikelet 5.5–7 mm .............................................. 20. C. traninhensis

1a. Culms up to 150 cm tall; ligule 0.5–1 mm ................................. 1a. subsp. jwarancusa

1b. Culms 20–40 cm tall; ligule (1–)2–4 mm .............................. 1b. subsp. olivieri


1a. Cymbopogon jwarancusa (Jones) Schultes, Mant. 2: 458. 1824.

辣薄荷草 la bo he cao

Perennial, shortly rhizomatous; old basal sheaths papery, ribbonlike, often spirally curling. Culms densely tufted, moderately robust to wiry, 0.2–1.5 cm tall, lower internodes short, crowded. Leaf sheaths smooth, glabrous, congested and overlapping at base; leaf blades glaucous, involute or flat, 20–50 × 0.1–0.5 cm, glabrous, apex filiform; ligule 0.5–4 mm. Spathate compound panicle narrow, 10–40 cm; spatheoles in dense woolly clusters, straw-colored or becoming purplish, 1–2 cm; racemes 1–1.8(–2.2) cm; rachis internodes and pedicels ca. 2 mm, densely white-villose, hairs as long as spikelets; pedicel of homogamous pair not swollen. Sessile spikelet narrowly lanceolate, 4.5–5.5 mm; lower glume thin, concave, glabrous, sharply 2-keeled, keels scabrid upward, not winged, 0(–3)-veined between keels; upper lemma 2-lobed; awn almost straight, column and limb weakly differentiated, 0.5–1 cm. Pedicelled spikelet 5–6 mm. Fl. and fr. Mar–May and Jul–Aug. 2n = 20.

Mountain slopes, dry valleys. SW Sichuan, Xizang, Yunnan (Yuanmou) [Afghanistan, Bhutan, N India, Nepal, Pakistan; SW Asia (Iran, Iraq, Oman)].

Culms up to 150 cm tall; ligule 0.5–1 mm ................................. 1a. subsp. jwarancusa

Culms 20–40 cm tall; ligule (1–)2–4 mm .............................. 1b. subsp. olivieri


Grassy slopes, dry valleys; below 1400 m. SW Sichuan, Xizang, Yunnan (Yuanmou) [Afghanistan, Bhutan, N India, Nepal, Pakistan; SW Asia (Iran)].

This subspecies is used medicinally.


Culms up to 150 cm tall; old basal leaf sheaths often spirally curling; ligule 0.5–1 mm.

Grassy slopes, dry valleys; below 1400 m. SW Sichuan, Xizang, Yunnan (Yuanmou) [Afghanistan, Bhutan, N India, Nepal, Pakistan; SW Asia (Iran)].

This subspecies is used medicinally.


西薄荷 xi ya xiang mao

Culms 20–40 cm tall; old basal sheaths only infrequently curling; ligule (1–)2–4 mm.

Mountain slopes, dry valleys; 2900–3500 m. W Xizang, Yunnan (Yunnanou) [Afghanistan, NW India, Pakistan; SW Asia (Iran, Iraq, Oman)].

This taxon is somewhat smaller than subsp. juvencescens, and its distribution extends further westward from Pakistan. The basal parts are required for a positive identification. It has been confused in the past with Cymbopogon schoenanthus (Linnaeus) Sprengel, from Africa and Arabia, which has a swollen lowermost pedicel fused to the adjacent internode.


圆基香茅 yuan ji xiang mao

Perennial. Culms densely tufted, wiry, 30–80 cm tall. Leaf sheaths glabrous; leaf blades linear, glaucous, 10–25 × 0.2–0.6 cm, glabrous, base narrowly rounded, apex filiform; ligule 0.7–3 mm. Spatheolate panicle narrow, 10–30 cm, spathes densely clustered; spatheoles reddish brown, 1.4–2 cm; racemes reddish brown, 0.7–1.4 cm; rachis internodes and pedicels ca. 1.5 mm, ciliate on margins; pedicel of homogamous pair linear to columnar, not or only very slightly swollen, not fused to internode. Sessile spikelet oblanceolate, 3–4.3 mm; lower glume flat, deeply grooved below middle (appearing as a line or keel on inside), keels broadly winged above middle, veinless or obscurely 2-veined between keels; upper lemma deeply 2-lobed; awn 1.1–1.5 cm. Pedicelled spikelet 3–4 mm. Fl. and fr. Jul–Sep.


Cymbopogon mekongensis is very close to C. caesius (Nees ex Hooker & Arnott) Stapf, which occurs down to the eastern side of Africa through Arabia to Pakistan and in S India and Sri Lanka. Cymbopogon caesius differs by the markedly swollen, barrel-shaped pedicel of the homogamous spikelet pair, which is fused to the swollen adjacent internode. It also tends to have greenish yellow rather than reddish inflorescences.


圆基香茅 yuan ji xiang mao


Perennial. Culms tufted, wiry, up to 1 m tall. Leaf sheaths glabrous; leaf blades linear or linear-lanceolate, glaucous, 10–30 × 0.5–1 cm, glabrous, margin scabrid, base rounded, apex filiform; ligule 0.5–1.5 mm. Spatheolate panicle narrow, lax, 6–20 cm; spatheoles reddish brown, 2–2.5 cm; racemes reddish brown to purplish, 1.5–2 cm; rachis internodes and pedicels white-ciliate on margins; pedicel of homogamous pair swollen, barrel-shaped or broadly columnar, shiny, fused to internode at base. Sessile spikelet oblanceolate, 3.6–4.5 mm; lower glume flat, deeply grooved below middle (appearing as a line or keel on inside), keels winged above middle, veinless or obscurely 2-veined between keels; upper lemma deeply 2-lobed; awn ca. 1.6 cm. Pedicelled spikelet 3.5–4 mm.

Open forests, forest margins. Yunnan [Laos, Thailand, Vietnam].

This species is taken here in a broad sense to include all slender, narrow-leaved specimens from S China and Indochina with a flat, grooved, winged sessile spikelet and a swollen lowermost pedicel. The differences from Cymbopogon caesius (Nees ex Hooker & Arnott) Stapf, from E Africa to India, are very slight. Cymbopogon caesius tends to have a longer ligule, to 4 mm, and paler inflorescences. Likewise, C. annamensis hardly differs from C. mekongensis, except in the swollen lowermost pedicel.


鲁沙香茅 lu sha xiang mao

Andropogon martini Roxburgh, Fl. Ind. 1: 280. 1820; A. schoenanthus Linnaeus var. martini (Roxburgh) J. D. Hooker.

Perennial from a short woody rootstock. Culms tufted, up to 3 m tall, lower nodes often swollen, meaty. Leaf sheaths glabrous; leaf blades lanceolate, usually glaucous below, dark green above, up to 50 × 2–3 cm, glabrous, base cordate, often amplipectic, apex filiform, ligule 2–4 mm. Spatheolate panicle narrow, dense, erect, 20–30 cm; spatheoles green becoming reddish, 2–4 cm; racemes 1.5–2 cm; rachis internodes and pedicels ciliate on margins, back sometimes pubescent; pedicel of homogamous pair swollen, barrel-shaped, shiny, fused to internode at base. Sessile spikelet oblong, 3.5–4.5 mm; lower glume flat, deeply grooved below middle (appearing as a line or keel on inside), keels winged above middle, veinless or 2-veined between keels; upper lemma 2-lobed; awn 1.4–1.8 cm. Pedicelled spikelet 3.5–4 mm. Fl. and fr. Jul–Oct. 2n = 20, 40.

Grassy slopes; ca. 1000 m. Sichuan, Yunnan [native to India].

This grass is native to India, but is cultivated elsewhere in the tropics for its oils. Two forms can be distinguished in the field, each with a different oil content, but the habit differences are not evident in herbarium material. The cultivar ‘Motia’ yields palmerosa oil and ‘Sofia’ yields ginger-grass oil.

The name “Cymbopogon lancefolium L. Liu” (Fl. Reipubl. Popularis Sin. 10(2): 194. 1997) was not validly published because no Latin description was provided. It appears to be based on a specimen of C. martini with a rather lax panicle.


凉山香茅 liang shan xiang mao

Perennial. Culms solitary or in small tufts, slender, 50–110 cm tall. Leaf sheaths glabrous; leaf blades linear, glaucous, 20–30 × 0.3–0.5 cm, slightly scaberulous, glabrous, lower blades narrowed almost to midrib toward base; ligule 1.5–2.5 mm. Spatheolate panicle open, 30–40 cm, branches slender, laxly ascending; spatheoles narrowly lanceolate, greenish brown, 2–2.5 cm; racemes green, 1.5–1.8 cm, raceme bases linear, not deflexing; homogamous pair reduced, vestigial or often absent; rachis internodes and pedicels slenderly linear, margins ciliate with ca. 0.5 mm hairs increasing to 1.5 mm at apex, apices expanded,
cupular, scarious, toothed. Sessile spikelet narrowly elliptic-oblong, 3.7–4 mm; lower glume shallowly concave below middle, sharply keeled, keels scabrid, wingless, 2–4-veined between keels above middle; upper lemma 2-lobed; awn 1.3–1.5 cm. Pedicelled spikelet narrow, 2–3 mm, reduced to the glumes, lower glume enclosing a much smaller upper glume. Fl. and fr. Jul–Sep.

- Mountain slopes. SW Sichuan.

This species resembles *Andropogon* in its non-deflexing racemes and the lack of an obvious homogamous spikelet pair, although this is usually present as a vestige. It is not known whether the leaves are aromatic. The enlarged, toothed, cupular tips to the raceme bases, raceme internodes, and pedicels are a distinctive character of this species.


细小香茅 xi xiao xiang mao

Perennial. Culms tufted, wiry, 60–70 cm tall. Leaf sheaths glabrous; leaf blades narrowly linear, pale green, ca. 20 × 0.1–0.2 cm, smooth, glabrous, narrowed toward base; ligule 1.3–2 mm. Spathate panicle moderately dense, up to 30 cm; spatholes linear, reddish, 1.2–1.5 cm; racemes green, deflexed at maturity, homogamous pair reduced to 1 short narrow spikelet; racis internodes and pedicels slenderly linear, margins ciliate with ca. 0.7 mm hairs increasing to 2–3 mm at apex, internode apex expanded, cupular, scarious, toothed. Sessile spikelet narrowly oblong, 3.8–4 mm; lower glume herbaceous, shallowly concave below middle, a short tuft of callus hairs in base of concavity, lightly keeled below middle, sharply keeled above, keels scabrid, wingless, 2–4-veined between keels above middle; upper lemma 2-lobed; awn 1.2–1.3 cm. Pedicelled spikelet narrow, 0.5–2.5 mm, reduced to the empty lower glume. Fr. Oct.

- Roadside in grasslands; ca. 900 m. NE Yunnan.

This species is known only from the type. It shares with *Cymbopogon liangshaneensis* the unusual character, not otherwise seen in Chinese species, of reduced homogamous and pedicelled spikelets.


緬甸淺囊香茅 mian dian qian nang xiang mao

Perennial. Culms tufted, slender, 50–100 cm tall. Leaf sheaths glabrous; leaf blades linear, flat or folded, 18–30 × 0.2–0.5 cm, abaxial surface glabrous, adaxial surface scabrid-puberulous, sometimes with long scattered hairs, base straight, apex finely acuminate; ligule 1–2 mm. Spatheate panicle narrowly branched, very lax, 15–30 cm; spatheoles linear, tightly convolute, 2–3 cm; peduncle exserted up to 1.5 cm from near spatheole apex; racemes pinkish gray, ca. 2 cm; racis internodes and pedicels stoutly cuneate, margins shortly but densely ciliate or woolly, back pubescent or subglabrous; pedicel of homogamous pair and lowest internode swollen. Sessile spikelet narrowly lanceolate, 4–4.5 mm; lower glume deeply concave in lower 2/3, channel puberulous with a prominent swelling at base, keels rounded alongside channel, sharp and scabrid above, wingless, 2–3-veined between keels; upper lemma 2-lobed; awn 1–1.3 cm. Pedicelled spikelet 4–5.5 mm.

Grassy hillsides; 1000–2200 m. Yunnan (Kaiyang) [Myanmar].

In Myanmar this grass occurs on calcareous clay soils.

*Cymbopogon gidarba* var. *gidarba* occurs on uplands in India. It has a narrower, more contracted compound panicle and shorter, 2–2.5 mm, narrowly elliptic spatheoles, with the peduncle not or very shortly exserted from near the middle of the spatheole. The spikelets are also slightly smaller, with the sessile spikelet 3.2–4 mm.


喜马拉雅香茅 xi ma la ya xiang mao


Perennial. Culms densely tufted, wiry, erect or genicate, 60–100 cm tall. Leaf sheaths glabrous; leaf blades narrow, folded or involute, glaucous, 15–30 × 0.2–0.3 cm, glabrous, scabrid, apex filiform; ligule ca. 1–2 mm. Spatheate panicle open, 15–25 cm, raceme pairs few, spatheoles 2–3 cm; racemes 1.5–2 cm; racis internodes and pedicels ciliate on margins, glabrous on back; pedicel of homogamous pair not swollen, oblong, free from adjacent internode. Sessile spikelet narrowly lanceolate-oblong, 4.5–6 mm; lower glume papery, concave or almost flat below middle, keels rounded below middle, sharp and scabrid above, wingless or almost so, 3–5-veined between keels above middle; upper lemma 2-lobed; awn 1.4–1.8 cm. Pedicelled spikelet 4.5–6 mm. Fl. and fr. Jul–Dec. 2n = 20, 40.

Mountain slopes, mixed forests, valleys; 1600–3000 m. Xizang, Yunnan [NW India, Nepal, Pakistan; Africa, SW Asia (S Arabia)].


香茅 xiang mao

*Andropogon citratus* Candolle, Cat. Pl. Horti Monsp. 78. 1813.

Perennial, shortly rhizomatous. Culms tufted, robust, up to 2 m tall, ca. 4 mm in diam., farinose below nodes. Leaf sheaths glabrous, greenish inside; leaf blades glaucous, 30–90 × 0.5–2 cm, both surfaces scabrid, base gradually narrowed, apex long acuminate; ligule ca. 1 mm. Spathate compound panicle large, lax, up to 50 cm, drooping, branches slender; spatheoles reddish or yellowish brown, 1.5–2 cm; racemes 1.5–2 cm; racis internodes and pedicels 2.5–4 mm, loosely villous on margins; pedicel of homogamous pair not swollen. Sessile spikelet linear-lanceolate, 5–6 × ca. 0.7 mm; lower glume flat or slightly concave toward base, sharply 2-keeled, keels wingless, scabrid, veinless between keels; upper lemma narrow, entire and awnless, or slightly 2-lobed with ca. 0.2 mm mucro. Pedicelled spikelet 4–5 mm. Fl. and fr. summer. 2n = 40.

Commonly cultivated. Fujian, Guangdong, Guizhou, Hainan, Hubei, Taiwan, Yunnan, Zhejiang [origin unknown; cultivated in tropical Asia and elsewhere].

This species (Lemon Grass), known only from cultivation, is...
grown on a large scale in parts of tropical Asia and South America for the lemon-scented oil extracted from its leaves. The oil is used for both medicinal and culinary purposes. Flowers are seldom produced.


**Andropogon nardus** Linnaeus, Sp. Pl. 2: 1046. 1753.

Perennial from a stout rootstock. Culms tufted, robust, up to 2.5 m tall, 1–2 cm in diam. Leaf sheaths reddish purple at base, smooth, glabrous; leaf blades dark green or dark brown when dry, drooping for 1/3 of their length, 30–100 × 1–2 cm, glabrous, abaxial surface scabrid, adaxial surface smooth, base narrow, apex long acuminate; ligule 2–3 mm. Spatheate panicle when dry, drooping for 1/3 of their length, 30–100 × 1–2 cm, base, smooth, glabrous; leaf blades dark green or dark brown to 2.5 m tall, 1–2 cm in diam. Leaf sheaths reddish purple at base, narrow, open, 15–30 cm, usually simple, rarely with second tier of branching, raceme pairs few; spatheoles green-gray, 2–3.5 cm; racemes 2–3.5 cm; rachis internodes and pedicels 2–3 mm, margins densely ciliate with white soft hairs up to 3 mm; pedicel of homogamous pair not swollen. Sessile spikelet linear-lanceolate, 6–7.8 × 0.8–1.2 mm; lower glume flat or shallowly concave in lower part with 1–2 transverse wrinkles, sharply 2-keeled throughout, keels wingless or narrowly winged, wings 0.15–0.25 mm, 2–4-veined between keels in upper part, apex long acuminate, 2-toothed; upper lemma 2-lobed; awn 1.5–2 cm. Pedicelled spikelet 5–9 mm. Fl. and fr. Jun.–Oct. 2n = 20, 40.

Mountain slopes, valleys, open grassy places; 2000–3500 m. S Gansu, Guizhou, Shaanxi, Sichuan, Yixang, Yunnan [NW India, Nepal, Pakistan].

Aromatic oils are extracted from this species for medicinal and industrial purposes.


**Feng mao**

Perennial from a shallowly rooted rhizome. Culms tufted, robust, up to 2 m or more tall. Leaf sheaths glabrous, reddish inside; leaf blades relatively thin, drooping for 2/3 of their length, 40–80–(100) × 1–1.5(–2.5) cm, abaxial surface glaucous, adaxial surface light green, margins scabrid, base narrow, apex long acuminate; ligule 2–3 mm. Spatheate compound spikelet large, lax, up to 50 cm, much branched, main axis zig-zag, finally nodding; spatheoles reddish brown, 1.2–2.5 cm; racemes 1.5–2.5 cm; rachis internodes and pedicels softly ciliate on margins; pedicel of homogamous pair not swollen. Sessile spikelet elliptic-lanceolate, 4–5 × ca. 1 mm; lower glume flat or slightly concave, sharply 2-keeled, keels narrowly winged, 3-veined between keels; upper lemma very shortly 2-lobed, aawn short or absent, not exserted from spikelet. Pedicelled spikelet 3.5–5 mm. 2n = 20, 40.

Commonly cultivated. Guangdong, Hainan, Sichuan, Yunnan [native to S India and Sri Lanka; introduced elsewhere as a crop plant].

This species yields citronella oil.


**Duo mai xiang mao**

Perennial, shortly rhizomatous; basal sheaths papery, pale brown, slightly curling. Culms tufted, 50–120 cm tall, 2–3 mm in diam., nodes glabrous. Leaf sheaths glabrous; leaf blades linear, 10–20 × 0.4–0.7 cm, glabrous, margins scabrid, base rounded, apex acuminate to a setaceous point; ligule 1–3 mm. Spatheate compound spikelet narrow, lax, 20–30 cm, 1–3 tiers of branching; spatheoles green or tinged purple, 3–3.5 cm; racemes greenish or dark purple, 2.5–3.3 cm; rachis internodes and pedicels ca. 3.5 mm, margins ciliate; pedicel of homogamous pair not swollen. Sessile spikelet narrowly obovate, 5.8–6.5 × 1.5–1.7 mm; lower glume flat or shallowly concave in lower part, transversely wrinkled, sharply 2-keeled throughout, keels wingless above middle, wings 0.25–0.4 mm, 5–7-veined between keels; upper lemma 2-lobed; awn ca. 1.5 cm. Pedicelled spikelet 6–6.3 mm. Fl. Aug.

Mountain slopes; ca. 2500 m. Yunnan.

There is very little besides the lack of red coloration in the basal sheaths and a more wrinkled sessile spikelet to distinguish this taxon from *Cymbopogon goeringii*. It occurs at higher elevations.


**Niú qiao xiang mao**

Perennial, shortly rhizomatous with age; basal sheaths closely overlapping in tight bundles, not curling. Culms densely tufted, erect or ascending, tinged purple, 50–100 cm tall, nodes glabrous. Leaf sheaths glabrous; leaf blades narrowly linear to filiform, flexuous, 10–50 × 0.15–0.3 cm, glaucous, glabrous, margins scabrid; ligule 2–3 mm. Spatheate compound spikelet narrow, open, 15–30 cm, usually simple, rarely with second tier of branching, raceme pairs few; spatheoles green-gray, 2–3.5 cm; racemes 2–3.5 cm; rachis internodes and pedicels 2–3 mm, margins densely ciliate with white soft hairs up to 3 mm; pedicel of homogamous pair not swollen. Sessile spikelet linear-lanceolate, 6–7.8 × 0.8–1.2 mm; lower glume flat or shallowly concave in lower part with 1–2 transverse wrinkles, sharply 2-keeled throughout, keels wingless or narrowly winged, wings 0.15–0.25 mm, 2–4-veined between keels in upper part, apex long acuminate, 2-toothed; upper lemma 2-lobed; awn 1.5–2 cm. Pedicelled spikelet 5–9 mm. Fl. and fr. Jun.–Oct. 2n = 20, 40.

Mountain slopes, valleys, open grassy places; 2000–3500 m. S Gansu, Guizhou, Shaanxi, Sichuan, Yixang, Yunnan [NW India, Nepal, Pakistan].

Aromatic oils are extracted from this species for medicinal and industrial purposes.
Perennial from a short rootstock; basal sheaths reddish brown inside, lax, curling when dry. Culms tufted, slender, 50–150 cm tall, 2–4 mm in diam., nodes glabrous or pubescent, often farinose. Leaf sheaths smooth, glabrous, leaf blades linear, 25–60 × 0.2–0.7 cm, glabrous, margins scabrid, base gradually narrowed, apex finely acuminate; ligule 2–3(–6) mm. Spatheate compound panicule narrow or somewhat spreading, 20–35 cm, 2–3 tiers of branching; spatheoles reddish brown, 1.2–1.5 cm; racemes 1–1.5 cm; rachis internodes and pedicels 1.5–2 mm, margins ciliate; pedicel of homogamous pair not swollen. Sessile spikelet narrowly lanceolate-oblong, 3.5–4.5 × 0.9–1.2 mm; lower glume flat, smooth or slightly wrinkled, sharply 2-keeled throughout, keels narrowly winged above middle, wings 0.15–0.25 mm wide, 2–3-veined between keels; upper lemma 2-lobed; awn 0.7–1 cm. Pedicelled spikelet 3–3.5 mm. Fl. and fr. Jul–Oct. 2n = 20.

Grassy places on light dry soils; below 600 m. S Anhui, Fujian, Guangdong, Guizhou, Hainan, Taiwan, Yunnan, Zhejiang [Philippines, Vietnam].


**纤鞘香茅** ju cao

*Andropogon goeringii* Steudel, Flora 29: 22. 1846; *A. nar- dus* Linnaeus var. goeringii (Steudel) Hackel; *Cymbopogon goe- ringii* var. hongkongensis Soenarko; *C. nar-dus* (Linnaeus) Rendle var. goeringii (Steudel) Rendle; *C. tortilis* (J. Presl) A. Camus subsp. goeringii (Steudel) Koyama; *C. tortilis* var. goeringii (Steudel) Handel-Mazzetti.

Perennial; basal sheaths orange inside, lax, curling when dry. Culms tufted, slender, 50–100 cm tall, 1–2.5 mm in diam., nodes glabrous or puberulous, often farinose. Leaf sheaths smooth, glabrous; leaf blades linear, 15–40 × 0.3–0.5 cm, glabrous, margins scabrid, base gradually narrowed, apex finely acuminate; ligule 1–3(–4.5) mm. Spatheate compound panicule narrow, 15–30 cm, 2 tiers of branching; spatheoles 1.5–2.2 cm; racemes often purplish, (1.3–)1.5–2 cm, rachis internodes and pedicels 2–3.5 mm, margins ciliate; pedicel of homogamous pair not swollen. Sessile spikelet narrowly obovate, 4.5–6 × 1.2–1.7 mm; lower glume flat or slightly concave toward base, smooth or slightly wrinkled, sharply 2-keeled throughout, keels narrowly winged above middle, wings 0.25–0.45 mm wide, (1–)3–5-veined between keels; upper lemma 2-lobed; awn (0.8–)1–2 cm. Pedicelled spikelet 4–6.5 mm. Fl. and fr. Jul–Oct. 2n = 20.

Grassy slopes, roadsides; below 1500 m. Anhui, Fujian, Guizhou, Hebei, Henan, Hong Kong, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Taiwan, Yunnan, Zhejiang [S Korea].

*Cymbopogon goeringii* and *C. tortilis* form an intergrading complex, and the former species is sometimes treated at infraspecific rank under the latter. *Cymbopogon goeringii* tends to have a slightly more northern distribution and can usually be distinguished by its longer racemes of larger, often purplish spikelets.

A local variant in Hong Kong has racemes, spikelets, and awns at the lower end of the size range, perhaps due to introgression from *Cymbopogon tortilis*, but has the obovate lower glume and broadly winged keels of *C. goeringii*. It has been distinguished as var. *hongkongensis*, but scarcely merits separate status.

The name "*Cymbopogon eugenolatus* L. Liu" (Fl. Reipubl. Popularis Sin. 10(2): 206. 1997) has been applied to another variant with intermediate measurements, but was not validly published because no Latin description was provided. The specimen on which it was based has not been seen.


**通麦香茅** tong mai xiang mao

Perennial. Culms densely tufted, erect, 1–1.5 m tall, 2–7 mm in diam., nodes glabrous. Leaf sheaths glabrous; leaf blades narrowly linear, 20–40 × 0.2–0.3(–0.6) cm, adaxial surface scabrid, abaxial surface scabrid, puberulous at narrow base; ligule 1–2 mm. Spatheate compound panicule 20–50 cm, simple or with second tier of branching; spatheoles 2–5 cm; racemes 2–3 cm, base swollen. Sessile spikelet elliptic, ca. 6 × 1.3 mm; lower glume concave along midline, keels winged above middle, wings 0.2–0.5 mm wide, margins scabrid, 2–4-veined between keels; upper lemma awned; awn ca. 1.5 cm. Pedicelled spikelet ca. 0.6 cm. Fl. and fr. Jul–Oct.

- Valleys; 2000–2500 m. SW Sichuan, Xizang (Tungmai), NW Yunnan.

This species is known only from the type, which has not been seen.

17. **Cymbopogon fibrosus** B. S. Sun, J. Yunnan Univ. 21: 95. 1999.

**纤鞘香茅** xian qiao xiang mao

Perennial; old basal sheaths fibrous. Culms tufted, 0.5–1 m tall, 3–4 mm in diam., nodes glabrous. Leaf sheaths glabrous; leaf blades narrowly linear, flat or folded, 50–70 × 0.3–0.5 cm, scabrid, base narrowed to midrib, apex filiform; ligule 2–3 mm. Spatheate compound panicule ca. 30 cm, slightly dense, 2–3 tiers of branching; spatheoles 2.5–2.8 cm; racemes green, 1.7–2.2 cm; rachis internodes and pedicels 1.5–2 mm, margins ciliate; pedicel of homogamous pair not swollen. Sessile spikelet oblong-lanceolate, 4.8–5.3 × 1–1.1 mm; lower glume concave in lower half, smooth or slightly transversely wrinkled, sharply 2-keeled throughout, keels winged above middle, wings 0.15–0.2 mm wide, 2–3-veined between keels; upper lemma awned; awn ca. 10 mm. Pedicelled spikelet 4.7–5 mm. Fl. Oct.

- Mountain slopes. SW Sichuan, SE Yunnan.


**垂序香茅** chui xu xiang mao


Perennial from a short rhizome. Culms tufted, robust, up to 3 m tall, 8–12 mm in diam., nodes glabrous. Leaf sheaths glabrous, auricles to 3 mm at mouth; leaf blades linear, glaucous, up to 100 × 0.7–1.5 cm, glabrous, margins scabrid, base gradually narrowed, apex filiform; ligule ca. 2 mm. Spatheate compound panicule rather lax, decompound, yellowish tinged pale red, up to 1 m, branches drooping, clusters of racemes

Perennial. Culms tufted, robust, up to 2.5 m tall, 3–5 mm in diam., nodes glabrous. Leaf sheaths glabrous; leaf blades linear, up to 60 × 0.5–1.2 cm; ligule ca. 1.5 mm. Spatheate compound panicle very large, open, 80–180 cm, branches lax, drooping, spathes not densely clustered; spathes reddish at maturity; racemes 3–4 cm; rachis internodes and pedicels ciliate on margins; pedicel of homogamous pair not swollen. Sessile spikelet narrowly oblong, 7–9 mm; lower glume flat, sharply 2-keeled throughout, keels broadly winged above middle, 2–5-veined between keels; upper lemma awned; awn ca. 1.2 cm. Pedicelled spikelet linear-lanceolate. Fl. and fr. Aug–Oct.

- Grasslands; ca. 2000 m. Sichuan (Xichang).


Perennial. Culms tufted, robust, up to 2.5 m tall, 3–5 mm in diam., nodes glabrous or pubescent. Leaf sheaths glabrous or pubescent at base above node; leaf blades linear, up to 75 × 1–1.3 cm, abaxial surface bearded at sheath junction, otherwise glabrous, margins scabrid, base gradually narrowed, apex finely acuminate; ligule 3–6 mm. Spatheate compound panicle narrow, erect or slightly spreading, usually purplish, ca. 50 cm or more, branched several times, spathes in lax clusters; spathesoles 1–2 cm; racemes 2–2.5 cm; rachis internodes and pedicels ciliate on margins; pedicel of homogamous pair not swollen. Sessile spikelet narrowly obovate, 5.5–7 × 1–1.5 mm; lower glume flat or shallowly concave below middle, frequently pubescent in depression, often transversely wrinkled, sharply 2-keeled throughout, keels winged above middle, wings 0.3–0.5 mm wide, 2–5-veined between keels; upper lemma awned; awn 1–2 cm. Pedicelled spikelet 5–5.5 mm.

Dry rocky or grassy hill slopes. Yunnan [NE India, Laos, Myanmar, N Thailand].

This species is very close to *Cymbopogon khasianus*, with the erect, purplish compound panicle typical of that species, but has slightly longer, more broadly winged spikelets.


Perennial from a stout rootstock. Culms fairly slender to robust, 1.5–2 m tall, up to 1 cm in diam., nodes glabrous. Leaf sheaths glabrous, shortly auriculate; leaf blades linear, glaucous, 40–75 × 1–1.2 cm, glabrous, scabrid, base narrowed nearly to midrib on lower blades, apex finely acuminate; ligule 5–6 mm. Spatheate compound panicle narrow or somewhat spreading, decompound, yellowish green or tinged purplish, up to 60 cm or more, branches lax, raceme pairs not densely clustered; spathesoles narrowly elliptic, 1–1.5 cm; racemes 1–1.3 cm; rachis internodes and pedicels pilose on margins; pedicel of homogamous pair not swollen. Sessile spikelet narrowly lanceolate-oblong, 3.5–4.5 × ca. 0.8 mm; lower glume flat or shallowly concave below middle, frequently slightly transversely wrinkled, sharply 2-keeled throughout, keels scarcely winged, wings not more than 0.1 mm wide, obscurely 1–3-veined between keels or veinless; upper lemma awned; awn 0.6–0.8 cm. Pedicelled spikelet 3–4 mm. Fl. and fr. Aug–Oct. 2n = 30.

Rocky hill slopes, forest margins; ca. 1200 m. S Yunnan [India, Myanmar, Thailand].

This species is part of the complex centered around *Cymbopogon khasianus* and is distinguished mainly by its small racemes and spikelet parts.


Perennial from a short stout rhizome. Culms robust, up to 3 m tall, 1–2 cm in diam., nodes glabrous or pubescent. Leaf sheaths glabrous, auricles often present; leaf blades linear, up to 100 × 1.5 cm, scabrid, abaxial surface tormentose at sheath junction, adaxial surface pilose at base, otherwise glabrous, base gradually narrowed, apex filiform; ligule 2–5 mm. Spatheate compound panicle very large, lax, decompound, grayish green, up to 60 cm or more, nodes bearded, branches numerous, drooping; spathesoles 1–2 cm; racemes 1–1.7 cm; rachis internodes and pedicels ciliate on margins; pedicel of homogamous pair not usually swollen. Sessile spikelet narrowly elliptic-oblong, 4.4–5 × 0.8–1 mm; lower glume flat or shallowly concave, usually slightly transversely wrinkled, sharply 2-keeled throughout, keels narrowly winged, wings 0.1 mm wide or less, obscurely 3-veined between keels; upper lemma awned; awn 0.8–1 cm. Pedicelled spikelet 3.5–4 mm. Fl. and fr. summer to autumn. 2n = 20, 40.

Grassy slopes; below 1000 m. SW Yunnan [probably native to In-
This grass is cultivated in tropical regions for “oil of lemon grass.” It is thought to be native to India, but is now widely naturalized in Indonesia and elsewhere. It is usually easily recognizable by its very large compound panicle of drooping branches, with numerous short, deflexed racemes of small, narrowly winged spikelets. In Bhutan and NE India the branches are looser with more widely spaced raceme pairs than usual, approaching *Cymbopogon pendulus* in habit. This form has been recognized as *C. flexuosus* var. *sikkimensis* Bor.


卡西香茅 ka xi xiang mao


Perennial from a stout rootstock. Culms fairly slender to robust, up to 2 m tall, 3–6 mm in diam., nodes purple, glabrous, or puberulous to tomentose with creamy hairs. Leaf sheaths glabrous or basal part above node pubescent, auricles to 6 mm at mouth; leaf blades linear, slightly glaucous or sometimes purplish, 40–60 × 0.7–1 cm, abaxial surface usually tomentose at sheath junction, otherwise glabrous, base gradually narrowed, apical filiform; ligule 1.5–4 mm. Spatulate compound panicle narrow, erect, decompound, often purplish, ca. 50 cm or more, much branched, spatheate compound clusters dense; spatheoles 1.2–2 cm; racemes 1.2–1.5(–2) cm; rachis internodes and pedicels ciliate on margins, hairs ca. 1.5 mm; pedicel of homogamous pair not swollen. Sessile spikelet narrowly elliptic, ca. 5 × 1.3 mm; lower glume shallowly concave below middle, transversely wrinkled, sharply 2-keeled throughout, keels winged above middle, wings 0.1–0.3 mm wide, (2–)5(–7)-veined between keels; upper lemma awned; awn 0.8–1.1 cm. Pedicelled spikelet 3–5 mm. Fl. and fr. Sep–Nov. 2n = 60.

Hill slopes, forest margins; 800–2000 m. Guangxi, Yunnan [Bhutan, India, Myanmar, N Thailand].

This is a variable species intergrading with several related species, including *Cymbopogon flexuosus*, *C. microstachys*, and *C. pendulus*. *Cymbopogon khasianus* can be recognized by its erect, often purplish compound panicle and sessile spikelets with a wrinkled, winged, several-veined lower glume. The wing width and number of veins can vary even within the same panicle.


长耳香茅 chang er xiang mao

Perennial. Culms robust, ca. 1.2 m tall, ca. 6 mm in diam., nodes pubescent. Leaf sheaths glabrous, auriculate, auricles broadly lanceolate, ca. 10 mm; leaf blades linear-lanceolate, papyry, ca. 50 × 1.6 cm, smooth, glabrous, abaxial surface glaucous, pubescent at sheath junction, adaxial surface green, base gradually narrowed, apex finely acuminate; ligule 6–7 mm. Spatulate compound panicle ca. 50 cm, open, branches elongate, erect or drooping, spathes not clustered; spatheoles light reddish, 1.8–2 cm; racemes yellow-green, 1.3–1.8 cm; rachis internodes and pedicels ca. 3 mm, ciliate on margins; pedicel of homogamous pair not swollen. Sessile spikelet elliptic-oblong, 4–5 × 0.9–1.2 mm; lower glume flat or shallowly concave below middle, occasionally puberulous in depression, often transversely wrinkled, sharply 2-keeled throughout, keels winged above middle, wings 0.15–0.3 mm wide, 4–6-veined between keels; upper lemma awned; awn 0.9–1 cm. Pedicelled spikelet 4–4.5 mm. Fl. Jun.

Grassy slopes; ca. 1000 m. W Yunnan.

This taxon is closely related to *Cymbopogon khasianus*, but has broader leaf blades and longer sheath auricles.