

200. **CHRYSOPOGON** Trinius, Fund. Agrost. 187. 1820, nom. cons.

金须茅属 jin xu mao shu

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*Centrophorum* Trinius, nom. rej.; *Pollinia* Sprengel, nom. rej.; *Rhaphis* Loureiro, nom. rej.; *Vetiveria* Bory.

Perennial, tufted or with spreading rhizomes. Leaf blades mostly basal, usually narrow; ligule a short ciliate rim or line of hairs. Inflorescence a lax terminal panicle; primary branches whorled, filiform, usually unbranched, each bearing a raceme; racemes composed of few to many spikelet pairs, or more usually reduced to a triad of 1 sessile bisexual spikelet flanked by 2 pedicellate male or barren spikelets; rachis internodes and pedicels slender. Sessile spikelet laterally compressed; callus elongate, acute to pungent, usually bearded; lower glume cartilaginous to leathery, often spinulose; upper glume boat-shaped, usually shortly awned; lower floret reduced to an empty hyaline lemma; upper lemma entire or 2-toothed, awned from apex or sinus or infrequently awnless; awn geniculate, glabrous to pubescent. Pedicelled spikelet dorsally compressed, well developed or reduced, male or barren.

Forty-four species: tropical and warm-temperate regions of the Old World, mainly in Asia and Australia, one species in the SE United States (Florida) and Cuba; four species (one introduced) in China.

*Vetiveria* has traditionally been separated from *Chrysopogon* on the basis of its longer racemes composed of a number of spikelet pairs in addition to the terminal triad. However, it has long been known that intermediates exist, and present knowledge of the group shows that separation into two genera is no longer tenable.

- 1a. Racemes composed of 5–13 spikelet pairs and a terminal triad; callus rounded, subglabrous; plant cultivated ..... 1. *C. zizanioides*
- 1b. Racemes reduced to a triad of 1 sessile and 2 pedicelled spikelets (rarely with 1–4 spikelet pairs); callus pungent, bearded; plant wild.
  - 2a. Lower glume of sessile spikelet tuberculate-spinulose; sessile spikelets ca. 7 mm; culms robust, often more than 1 m tall ..... 2. *C. gryllus*
  - 2b. Lower glume of sessile spikelet not spinulose; sessile spikelets 4–6 mm; culms 20–90 cm tall.
    - 3a. Upper lemma of sessile spikelet with geniculate 4–6 cm awn; pedicels with golden hairs ..... 3. *C. orientalis*
    - 3b. Upper lemma of sessile spikelet with straight 0.4–0.7 cm awn; pedicels glabrous ..... 4. *C. aciculatus*

1. **Chrysopogon zizanioides** (Linnaeus) Roberty, Bull. Inst. Franç. Afrique Noire 22: 106. 1960.

香根草 xiang gen cao

*Phalaris zizanioides* Linnaeus, Mant. Pl. 2: 183. 1771; *Vetiveria zizanioides* (Linnaeus) Nash.

Tussocky perennial; roots stout, aromatic. Culms robust, 1–2.5 m tall, ca. 5 mm in diam. Leaf sheaths glabrous, lower sharply keeled and imbricate in fanlike clusters; leaf blades linear, pale green, stiff, 30–90 × 0.5–1 cm, pilose on adaxial surface toward base, otherwise glabrous; ligule a scarious rim. Panicle oblong in outline, 20–30 cm, usually contracted, purplish; branches numerous, lowermost 5–20 cm, bare at base, smooth or slightly scaberulous; racemes slender, with 5–13 spikelet pairs and a terminal triad; internodes and pedicels slightly scabrid. Sessile spikelet linear-lanceolate to almost linear, 4–5 mm; callus rounded, subglabrous; lower glume muriccate, 3–5-veined, veins spinulosely aculeate, apex acute; upper glume spinulosely aculeate on keel, not awned; upper lemma slightly 2-toothed, awnless or mucronate; mucro 0–2 mm, not exerted. Pedicelled spikelet staminate, sparingly aculeolate or almost smooth. Fl. and fr. Aug–Oct.  $2n = 20$ .

Commonly cultivated. Fujian, Guangdong, Hainan, Jiangsu, Sichuan, Taiwan, Yunnan (Xixuangbanna), Zhejiang [native to India; cultivated elsewhere].

This species (Vetiver Grass) is said to have originated in India, but is now distributed throughout warm parts of the Old World and introduced into the S United States and West Indies. It has long been cultivated for the oil extracted from the aromatic roots, which is used in perfumery. More recently, its potential as a soil binder to prevent erosion

has been recognized. It is planted in hedges for this purpose, particularly along the contours of sloping ground. The deep, non-invasive root system holds the plants firm, while the stiff, dense leaves trap soil and prevent it being washed away. It is also used as a forage grass.

2. **Chrysopogon gryllus** (Linnaeus) Trinius, Fund. Agrost. 188. 1820.

刺金须茅 ci jin xu mao

*Andropogon gryllus* Linnaeus, Cent. Pl. 2: 33. 1756; *A. echinulatus* Nees ex Steudel; *A. gryllus* subsp. *echinulatus* (Nees ex Steudel) Hackel; *Chrysopogon echinulatus* (Nees ex Steudel) W. Watson; *C. gryllus* subsp. *echinulatus* (Nees ex Steudel) Cope; *Rhaphis gryllus* (Linnaeus) Trinius.

Perennial forming tough tussocks. Culms robust, up to 1.5 m tall, scabrid below panicle. Leaf sheaths strongly keeled at base; leaf blades linear, glaucous, up to 30 × 0.2–0.4 cm, sparsely to densely hispid with tubercle-based hairs or glabrous, apex subacute to acuminate; ligule ca. 0.5 mm, a ciliate rim. Panicle open to contracted, 6–25 cm, purplish; branches stiffly ascending to loosely spreading, 3–15 cm, tipped by a single triad or also with 1–4 spikelet pairs below the triad. Sessile spikelet ca. 7 mm; callus subacute, 1.3–1.7 mm, bearded with golden hairs, obliquely attached to branch apex; lower glume narrowly oblong, tuberculate-spinose along intumed flanks, sometimes hispidulous at apex, apex truncate or 2-toothed; upper glume hispid on keel toward apex, awnless, mucronate or with an awn up to 10 mm; upper lemma minutely 2-toothed, awned; awn geniculate, 1.2–3.5 cm, column puberulous. Pedicelled spikelet staminate, 7–11 mm; lower glume with 3.5–7 mm awn. Pedicel 2/3–3/4 length of sessile spikelet, glabrous. Fl. and fr. autumn.

Mountain slopes; ca. 2500 m. S Xizang, Yunnan (Menghai) [Afghanistan, Bhutan, India, Nepal, Pakistan; SW Asia (Caucasus, Iraq), Europe].

**3. *Chrysopogon orientalis*** (Desvaux) A. Camus in Lecomte, Fl. Indo-Chine 7: 332. 1922.

金须草 jin xu cao

*Rhaphis orientalis* Desvaux, Opusc. Sci. Phys. Nat. 69. 1831; *Andropogon wightianus* Nees ex Steudel; *Chrysopogon sinensis* Rendle.

Perennial, tufted, shortly rhizomatous. Culms 30–90 cm tall, glabrous or puberulous below inflorescence. Leaf sheaths glabrous or puberulous; leaf blades linear, 3–10 × 0.2–0.4 cm, lower margins tuberculate-setose, otherwise glabrous, apex sub-acute; ligule 0.2–0.7 mm. Panicle open, 6–20 cm, purplish brown; branches laxly spreading, 3.5–6 cm, tipped by a single triad. Sessile spikelet 4.7–5.5 mm; callus pungent, 2–4 mm, bearded with golden hairs, obliquely attached to branch apex; glumes leathery; lower glume narrowly lanceolate, smooth, glabrous, pilosulous near apex, apex obtuse; upper glume setulose on upper keel, awned, awn 1.2–1.8 cm; upper lemma entire, awned; awn geniculate, 4–6 cm, column puberulous. Pedicelled spikelet male or barren, 5.3–7 mm; lower glume with 5–15 mm awn. Pedicel 3/4 length of sessile spikelet, ciliate with golden hairs. Fl. and fr. Jun–Sep.

Hill slopes, coastal sand at low elevations. Fujian, Guangdong, Hainan [India, Laos, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam].

**4. *Chrysopogon aciculatus*** (Retzius) Trinius, Fund. Agrost. 188. 1820.

竹节草 zhu jie cao

*Andropogon aciculatus* Retzius, Observ. Bot. 5: 22. 1789; *Centrophorum chinense* Trinius.

Perennial with extensively creeping rhizomes, sward forming; rhizomes stout, close-noded. Culms decumbent at base or ascending, 20–50 cm tall. Leaf sheaths glabrous or ciliate at mouth; leaf blades broadly linear, 3–5 × 0.4–0.6 cm, glabrous or adaxial surface pilose near base, margins serrate, apex sub-acute; ligule 0.1–0.3 mm. Panicle dense, oblong in outline, 5–9 cm, purplish brown; branches erect when dry, 1.5–3 cm, tipped by a single triad. Sessile spikelet 3.5–4 mm; callus acicular, 4–6 mm, bearded with golden hairs, obliquely attached to branch apex; glumes leathery; lower glume lanceolate, 2-keeled upward, lower back smooth, glabrous, upper back thinner, keels hispidulous, apex acute to 2-toothed; upper glume setulose on upper keel, acuminate or mucronate, mucro 1–2 mm; upper lemma entire, awned; awn straight, 4–7 mm. Pedicelled spikelet staminate, 4–5.7 mm; lower glume acuminate or with mucro to 1 mm. Pedicel 3/4 length of sessile spikelet, glabrous. Fl. and fr. Jun–Oct.  $2n = 20$ .

Dry open grasslands, waste ground, lawns; 500–1000 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Afghanistan, Bangladesh, Bhutan, Cambodia, India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam; Australia, Pacific Islands (Polynesia)].

Rarely, racemes of this species may have one or more spikelet pairs below the triad.

This is a ground-cover grass used for erosion control and lawns. It sometimes becomes a noxious weed. The needle-sharp callus on the diaspore can injure cattle and other animals, catching in fur and then penetrating the skin.

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