

127. ORINUS Hitchcock, J. Wash. Acad. Sci. 23: 136. 1933.

固沙草属 *gu sha cao shu*

Chen Shouliang (陈守良); Sylvia M. Phillips

Perennials, with long scaly rhizomes. Leaf blades linear to involute, with setiform slightly pungent apex; ligule membranous. Inflorescence a sparse panicle of few to several ascending racemose branches along a central axis. Spikelets shortly pedicelled, laterally compressed, florets (1 or)2 to several, rachilla disarticulating above glumes and between florets; glumes thin, lower 1-veined, upper 3-veined, acute to obtuse; lemmas lanceolate-oblong, 3-veined, pilose, lightly keeled, entire, acute or mucronate; palea equal to or slightly shorter than lemma, ± ciliolate along keels, ± hairy between keels. Caryopsis cylindrical.

Four species: Himalayas from Kashmir to Nepal and W China, at high altitudes; four species (three endemic) in China.

The widely spreading, scaly rhizomes are well adapted to survival in shifting sands, and the species are good stabilizers of dunes.

- 1a. Lemmas pilose all over; leaf sheaths usually pilose.
 - 2a. Spikelets 5–6.5(–11) mm; florets 2–5 1. *O. thoroldii*
 - 2b. Spikelets 8–11 mm; florets 5–8 2. *O. tibetica*
- 1b. Lemmas pilose only along margins and lower keel; leaf sheaths usually glabrous.
 - 3a. Spikelets 7–8.5 mm; florets 3–5; lemmas obviously pilose 3. *O. kokonorica*
 - 3b. Spikelets 5–6 mm; florets 1–2; lemmas inconspicuously pilose 4. *O. anomala*

1. *Orinus thoroldii* (Stapf ex Hemsley) Bor, Kew Bull. [6] 1951: 454. 1952.

固沙草 *gu sha cao*

Diplachne thoroldii Stapf ex Hemsley, J. Linn. Soc., Bot. 30: 121. 1894; *Cleistogenes thoroldii* (Stapf ex Hemsley) Roshevitz; *Kengia thoroldii* (Stapf ex Hemsley) H. Yu & N. X. Zhao; *Orinus arenicola* Hitchcock.

Rhizomes clothed in hard imbricate scales, roots woolly. Culms erect, slender, 12–20(–50) cm tall, smooth and glabrous or rarely loosely pilose. Leaf sheaths hirsute, densely so at mouth; leaf blades flat, finally involute, pale green, 2–9 × 0.2–0.5 cm, hirsute to subglabrous, base rounded, apex pungent; ligule lacerate, 1–1.5 mm. Panicle up to 15 cm, racemes 4–8, inserted singly, (1–)3–5(–7) cm, ascending or eventually spreading. Spikelets cuneate, 5–6.5(–11) mm, florets 2–5; rachilla glabrous, internodes 1–2.5 mm; glumes lanceolate, dorsally often purplish, margins hyaline, glabrous or loosely pilose; lower glume 3–5 mm; upper glume 4–6 mm; lemmas purplish brown to brown-black or blotched with purple, lowest 4.5–5(–7) mm, pilose all over, acute or mucronate; palea pilose along keels, between upper keels and on outer flaps, apex 2-lobed. Callus glabrous. Anthers (1–)3–3.5 mm. Caryopsis narrowly oblong. Fl. Aug.

High arid sandy or gravelly steppe, sometimes with *Artemisia*, fixed sand dunes; 3300–4300 m. Qinghai, Xinjiang, Xizang [Kashmir, Nepal].

The name *Cleistogenes thoroldii* has been misapplied to *C. songorica* in C Asian literature.

2. *Orinus tibetica* N. X. Zhao, Acta Bot. Yunnan. 16: 228. 1994.

西藏固沙草 *xi zang gu sha cao*

Culms erect, 15–35 cm tall, densely long-pilose. Leaf sheaths pilose, especially along margins and at mouth; leaf

blades linear-lanceolate, usually flat, 2–8 × 0.2–0.4 cm, villous on both surfaces, rarely tuberculate-hairy at the base; ligule lacerate, ca. 1 mm. Panicle (3.5–)5–9 cm; racemes inserted singly, the lowest 3–5 cm. Spikelets purplish brown, 8–11 mm, florets 5–8; glumes lanceolate, dorsally purplish brown, membranous with hyaline margins, glabrous or laxly pilose; lower glume 4.5–5.5 mm; upper glume 5–6 mm; lemmas pilose all over, lowest 5–6 mm, apex acute or lowest mucronate; palea keels pilose, apex narrow or emarginate. Anthers ca. 3 mm. Caryopsis oblong. Fl. Jul–Aug.

• Mountain slopes; ca. 4400 m. Xizang (Dingjie).

3. *Orinus kokonorica* (K. S. Hao) Keng ex X. L. Yang, Fl. Reipubl. Popularis Sin. 10(1): 40. 1990.

青海固沙草 *qing hai gu sha cao*

Cleistogenes kokonorica K. S. Hao, Bot. Jahrb. Syst. 68: 582. 1938; *Diplachne kokonorica* (K. S. Hao) Conert; *Kengia kokonorica* (K. S. Hao) Packer.

Culms erect, (20–)30–50 cm tall, smooth or scabrid. Leaf sheaths glabrous, scabrid or rarely hirtellous; leaf blades stiff, usually involute, 4–9 × 0.2–0.3 cm, scabrid or hirtellous on both surfaces, apex long acuminate; ligule lacerate, 0.5–1 mm. Panicle 4–7(–19) cm, very narrow; racemes inserted singly, erect, bearing (3–)4–6(–11) spikelets. Spikelets 7–8.5 mm, florets (2–)3–5, rachilla puberulous, internodes 1–1.5 mm; glumes lanceolate, dorsally black-purple, margins membranous, yellowish brown, glabrous; lower glume 3.5–5 mm, acute; upper glume 4.5–6 mm, acute or obtuse; lemmas thin, dorsally black-brown but yellow-brown at base and apex, lowest 5–5.5 mm, margins and lower keel loosely pilose, apex denticulate, middle vein exerted into a short mucro; palea keels ciliolate, loosely puberulous on outer flaps, apex acute or emarginate. Callus laterally puberulous. Anthers ca. 3 mm. Caryopsis narrowly oblong. Fl. Aug.

• Dry mountain slopes, steppe; 3000–3500 m. Gansu, Qinghai.

This is an excellent sand-binding grass.

4. **Orinus anomala** Keng ex P. C. Keng & L. Liu, Acta Bot. Sin. 9: 68. 1960.

鸡爪草 ji zhua cao

Culms loosely tufted, erect, 35–50 cm tall, puberulous below nodes. Leaf sheaths glabrous or pilose at the mouth; leaf blades stiff, erect, involute, 7–12 × 0.2–0.35 cm, glabrous or adaxial surface scabrid or loosely pilose at base, apex long acuminate; ligule erose, ca. 0.5 mm. Panicle ca. 10 cm, linear; racemes solitary or rarely paired, erect, 3.5–4 cm, with 7–9 spikelets. Spikelets yellowish or purplish green, 5–6 mm, florets 1–2, rachilla minutely puberulous, internodes ca. 1.5 mm; glumes glabrous, scabrid along upper keel, acuminate; lower glume 3–3.5 mm; upper glume 4–4.5 mm; lemmas oblong-lanceolate, lower 4.5–5 mm, margins and keel shortly and inconspicuously pilose in lower 1/3, apex acute; palea scabrid on upper keels, apex emarginate. Anthers yellow, ca. 2 mm. Fl. Aug.

- Mountain slopes. Qinghai, Sichuan.

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