

dong, Sichuan, Taiwan, Yunnan, Zhejiang [NE India, Japan, Korea, Myanmar, Russia; cultivated in SE Asia].

This species is cultivated as a vegetable in China. The young

shoots and rhizomes are edible when infected, swollen, and softened by the fungus *Ustilago esculenta*. The presence of the fungus prevents flowering. The grains were used for food by the Emperor in ancient China, and are currently being used by fishermen.

## 5. Tribe BRACHYELYTREAE

短颖草族 duan ying cao zu

Lu Shenglian (卢生莲); Sylvia M. Phillips

Perennials. Leaf blades narrowly lanceolate, with or without indistinct cross veins, constricted at base; ligule membranous. Inflorescence a scanty panicle. Spikelets all alike, floret 1 with bristle-like rachilla extension, dorsally compressed, disarticulating above glumes; glumes unequal, tiny, lower glume vestigial, upper glume subulate, 1/10–1/4 length of floret; lemma firmly herbaceous, 5-veined, tapering into a straight awn from apex; palea as long as lemma, convolute; stamens 2. Caryopsis linear, the apex with a pallid pubescent beak bearing 2 terminal stigmas; pericarp thick, separable with difficulty. Leaf anatomy: non-Kranz, microhairs and fusoid cells absent.  $x = 11$ .

One genus and three species: two in E North America and one in E Asia including China.

### 42. BRACHYELYTRUM P. Beauvois, Ess. Agrostogr. 39. 1812.

短颖草属 duan ying cao shu

Description and distribution as for tribe.

**1. *Brachyelytrum japonicum*** (Hackel) Matsumura ex Honda, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 210. 1930.

日本短颖草 ri ben duan ying cao

*Brachyelytrum erectum* var. *japonicum* Hackel, Bull. Herb. Boissier 7: 647. 1899; *Brachyelytrum erectum* subsp. *japonicum* (Hackel) T. Koyama & Kawano.

Perennial from a short knotty rhizome. Culms solitary or loosely tufted, slender, erect, 40–100 cm tall, unbranched, 6–7-noded. Leaf sheaths shorter than internodes, glabrous or puberulent; leaf blades linear-lanceolate, thin, soft, 8–15 × 0.6–0.8 cm, scabridulous or puberulous when young, margins ciliate, apex acuminate; ligule 2–5 mm, obtuse to acuminate, usually

erose. Panicle narrow, 9–15 cm; branches short, suberect, capillary, scabrous, bearing a few subsessile spikelets. Spikelets 8–10 mm, gray-green; lower glume 0.4–1.5 mm; upper glume 1–4 mm, 1-veined or obscurely 3-veined at base, margins scarious; lemma narrowly lanceolate, 8–10 mm, rigid, 5-veined, scabrous on veins; awn 1.2–1.8 cm, slender, scabrous; palea 2-toothed at apex; callus ca. 0.8 mm, shortly pilose. Anthers 3.3–4.5 mm. Rachilla extension 4–7 mm. Fl. Jun–Jul.

Woodland shade. Anhui, Jiangsu, Jiangxi, Yunnan, Zhejiang [Japan, Korea (Cheju Island)].

This species is very similar to the other two species of the genus in North America, but these have wider leaf blades (0.8–2 cm wide) and a shorter lower glume (0.2–0.7 mm).

## 6. Tribe PHAENOSPERMATEAE

显子草族 xian zi cao zu

Lu Shenglian (卢生莲); Sylvia M. Phillips

Perennial. Leaf blades broadly linear with transverse veinlets, narrowed into a false petiole, this twisted to bring the abaxial surface uppermost; ligule long, membranous. Inflorescence a large open panicle, branches usually verticillate, scabridulous. Spikelets all alike, floret 1, rachilla extension absent, dorsally compressed, falling entire; glumes unequal, membranous to scarious; lemma as long as spikelet, herbaceous with scarious margins, strongly 3–5-veined, marginal veins obscure; palea resembling lemma but 2-veined, furrowed between keels, splitting at maturity; lodicules 3; stamens 3; stigmas 2. Caryopsis globose with small apical beak from style base, exposed between gaping lemma and palea at maturity, pericarp thick, softening and peeling away when wet, embryo very small, hilum as long as the caryopsis. Leaf anatomy: non-Kranz; microhairs absent; fusoid cells absent.  $x = 12$ .

One species: E Asia.

### 43. PHAENOSPERMA Munro ex Bentham, J. Linn. Soc., Bot. 19: 59. 1881.

显子草属 xian zi cao shu

*Euthryptochloa* Cope.

Description and distribution as for tribe.

**1. *Phaenosperma globosa*** Munro ex Bentham, J. Linn. Soc., Bot. 19: 59. 1881.

显子草 xian zi cao

*Euthryptochloa longiligula* Cope.

Culms robust, solitary or tufted, stiff, erect or climbing, 1–1.5(–3) m, 4–5-noded, unbranched. Leaf sheaths smooth, usually shorter than internodes; leaf blades 10–50 × 1–3 cm, smooth or scabrous, abaxial (upper) surface dark green, adaxial (lower) surface whitish, apex acuminate; ligule 5–15(–25)

mm, scabrous. Panicle 15–40 cm, branches 5–10 cm, widely spreading at maturity. Spikelets narrowly elliptic-oblong at first, gaping at maturity, 4–4.5 mm, glossy; lower glume ca. 1/2 spikelet length, 1–3-veined; upper glume as long as spikelet, 3–5-veined; lemma narrowly ovate, apex obtuse. Anthers 1.5–2 mm. Caryopsis black-brown, 2.5–3 mm wide, rugose. Fl. and fr. May–Sep.

Mountain slopes, streams, valleys, roadsides in forests; 100–1800 m. Anhui, Gansu, Guangxi, Hubei, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [NE India, Japan, S Korea].

## 7. Tribe STIPEAE

针茅族 zhen mao zu

Wu Zhenlan (吴珍兰); Sylvia M. Phillips

Perennials, usually forming tussocks. Leaf blades linear to filiform, often convolute or folded; ligule membranous, margin often ciliolate. Inflorescence an open or contracted panicle, sometimes spikelike, spikelets all alike. Spikelets with 1 floret (to 3 in *Duthiea*), terete or laterally compressed, disarticulating above glumes; rachilla extension usually absent (present in *Stephanachne*, *Sinochasea*, and *Duthiea*); glumes equaling or longer than floret, persistent, hyaline to membranous, 1–7-veined; floret callus obtuse to pungent; lemma rounded on back, membranous to leathery, firmer than glumes, often indurated at maturity, 3–9-veined, often enclosing palea, apex entire or 2-toothed, awned from apex or between teeth; awn straight or geniculate, glabrous, pubescent or plumose; palea subequal to lemma, hyaline to membranous, usually 2-veined (5–7-veined in *Psammochloa*) but not keeled, apex usually acute. Lodicules 2 or 3. Stamens mostly 3 (1 in *Stephanachne monandra*), anthers sometimes bearded with apical tuft of short hairs. Stigmas 2 or 3. Caryopsis fusiform, tightly enclosed by lemma and palea; hilum linear; embryo short.

Between nine and 17 genera: temperate and warm-temperate regions; ten genera (one endemic) and 67 species (17 endemic) in China.

The number of genera that should be recognized in *Stipeae* is still controversial. Sometimes a broad view is taken of *Stipa*, but in Asia it has usually been broken into segregate taxa. This traditional treatment is followed here, with a few exceptions, to avoid the creation of many new combinations while the taxonomy is still unsettled.

Additionally, the first four small genera are of uncertain tribal placement. These are little known, undercollected grasses from the Himalayas and W China. They are sometimes placed in *Aveneae*, but on balance show more Stipoid characteristics, including multiveined glumes, an unkeeled palea, often 3 lodicules, and a linear hilum.

Lemma measurements refer to the lemma body and the callus together.

- 1a. Lemma apex deeply 2-lobed, lobes slenderly acuminate or bristle-like.
  - 2a. Lemma with a crown of hairs arising from base of apical lobes.
    - 3a. Rachilla extension present ..... 44. *Stephanachne*
    - 3b. Rachilla extension absent ..... 45. *Trikeria*
  - 2b. Lemma without an apical crown of hairs.
    - 4a. Ovary strigose; stigmas raised upon a long slender style ..... 47. *Duthiea*
    - 4b. Ovary glabrous; stigmas sessile.
      - 5a. Stigmas 2 ..... 45. *Trikeria*
      - 5b. Stigmas 3 ..... 46. *Sinochasea*
- 1b. Lemma apex entire or shortly 2-toothed (if rarely 2-lobed, lobes not bristle-like).
  - 6a. Palea 5–7-veined, resembling lemma ..... 48. *Psammochloa*
  - 6b. Palea 0–2-veined.
    - 7a. Floret dorsally compressed ..... 49. *Piptatherum*
    - 7b. Floret terete or laterally compressed.
      - 8a. Callus usually long (more than 0.6 mm), pungent; lemma usually leathery, margins overlapping and enclosing palea, apex entire or minutely 2-toothed; awn usually deciduous, strongly geniculate with twisted column ..... 50. *Stipa*
      - 8b. Callus usually short (less than 0.6 mm), obtuse to acute; lemma usually papery, margins typically not overlapping with palea midline exposed, infrequently overlapping, apex usually 2-toothed; awn persistent or deciduous, straight or weakly geniculate.
        - 9a. Awn plumose throughout ..... 51. *Ptilagrostis*
        - 9b. Awn scabrid or column pubescent.
          - 10a. Lemma apex usually shortly 2-toothed, without retrorse spines ..... 52. *Achnatherum*
          - 10b. Lemma apex with cylindrical beak armed with stout retrorse spines ..... 53. *Orthoraphium*