

**61. LOLIUM** Linnaeus, Sp. Pl. 1: 83. 1753.

黑麦草属 *hei mai cao shu*

Liu Liang (刘亮); Sylvia M. Phillips

Annual or perennial. Leaf blades linear, flat or rolled, often auriculate; ligule membranous. Inflorescence a single, stiff, 2-sided raceme, spikelets arranged edgeways on, alternate in 2 opposite rows, their inner edges sunk in hollows of the tough rachis. Spikelets laterally compressed, florets several to many, uppermost florets reduced, disarticulating below each floret; glumes leathery; lower glume suppressed except in terminal spikelet and there similar to upper; upper glume abaxial, narrow, persistent, shorter than lemmas to as long as spikelet; lemmas membranous to leathery, rounded on back, 5–9-veined, with or without a subterminal awn; palea usually equal to lemma. Caryopsis tightly enclosed by hardened lemma and palea; hilum linear.

About eight species: temperate N Africa, Asia, and Europe, especially the Mediterranean region; now widely introduced or adventive elsewhere; six species (at least four introduced) in China.

Most species are good forage grasses. *Lolium* is a difficult genus taxonomically as all the species are more or less interfertile and consequently intergrade. The individual species are also very variable. Most will hybridize with *Festuca arundinacea* and its allies, and the resulting hybrids have the nothogeneric name  $\times$ *Festulolium* Ascherson & Graebner.

- 1a. Lemmas elliptic to ovate, turgid at maturity; mature caryopsis not more than 3 times as long as wide.
  - 2a. Lemmas of lower florets 5.2–8.5 mm, usually awned; caryopsis 4–7 mm ..... 1. *L. temulentum*
  - 2b. Lemmas of lower florets 3.5–5.4 mm, usually awnless; caryopsis 3.2–4.5 mm ..... 2. *L. remotum*
- 1b. Lemmas oblong, not turgid at maturity; mature caryopsis more than 3 times as long as wide.
  - 3a. Perennial with non-flowering shoots at anthesis; young leaf blades folded; lemmas awnless ..... 3. *L. perenne*
  - 3b. Annual (or short-lived perennial); young leaf blades rolled; lemmas awned or awnless.
    - 4a. Spikelets with 8–22 florets; glume less than half spikelet length ..... 4. *L. multiflorum*
    - 4b. Spikelets with 3–10 florets; glume half spikelet length or more.
      - 5a. Rachis 2–3 mm thick; spikelets partly sunken in rachis; lemmas 5–8 mm; awns absent or up to 3(–8) mm, present on upper florets only ..... 5. *L. rigidum*
      - 5b. Rachis 0.4–1.5 mm thick; spikelets not sunken in rachis; lemmas 9–15 mm; awns 5–20 mm, present on all florets ..... 6. *L. persicum*

**1. *Lolium temulentum*** Linnaeus, Sp. Pl. 1: 83. 1753.

毒麦 *du mai*

Annual. Culms tufted, erect or decumbent, slender to moderately robust, 20–120 cm tall, 3–5-noded. Leaf blades flat, thin, 10–25 cm  $\times$  4–10 mm, smooth or scabridulous on abaxial surface, margins scabrid, young blades rolled; auricles present or absent; ligule 0.5–2.5 mm, obtuse to truncate. Raceme stiff, straight, 10–30 cm; rachis thick, smooth or scabridulous, spikelets about their own length apart. Spikelets turgid, 0.8–2.5 cm, florets 4–10, rachilla internodes 1–1.5 mm, smooth, glabrous; glume linear-oblong, rigid, as long as spikelet, often exceeding florets, 5–9-veined, margins narrowly membranous, apex obtuse; lemmas elliptic to ovate, turgid at maturity, 5.2–8.5 mm, apex obtuse; awn usually present, stiff, scabrid; palea ciliolate along keels. Caryopsis very plump, length 2–3 times width, 4–7 mm. Fl. and fr. May–Aug.  $2n = 14$ .

Fields of cereals, introduced. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hunan, Qinghai, Shaanxi, Shanghai, Xinjiang, Zhejiang [N Africa, SW Asia, S Europe].

This is a noxious arable weed, widespread and naturalized in warm-temperate parts of the world (Darnel). The grains are often infected by a fungus (ergot) which produces the alkaloid temulin, causing poisoning when grazed by cattle or when present as a contaminant of flour.

Awnless or weakly awned variants can be distinguished at varietal rank.

- 1a. Lemmas strongly awned; awn

- 10–20 mm ..... 1a. var. *temulentum*
- 1b. Lemmas awnless or weakly awned; awn 0–3 mm ..... 1b. var. *arvense*

**1a. *Lolium temulentum* var. *temulentum***

毒麦(原变种) *du mai (yuan bian zhong)*

Lemmas strongly awned; awn 10–20 mm. Fl. and fr. Jun–Jul.

Fields of cereals, introduced. Anhui, Gansu, Hebei, Heilongjiang, Henan, Qinghai, Shaanxi, Xinjiang, Zhejiang [Europe].

**1b. *Lolium temulentum* var. *arvense*** (Withering) Liljeblad, Svensk. Fl. 80. 1816.

田野黑麦草 *tian ye hei mai cao*

*Lolium arvense* Withering, Arr. Brit. Pl., ed. 3, 2: 168. 1796; *L. temulentum* subsp. *arvense* (Withering) Tzvelev.

Lemmas awnless or weakly awned; awn 0–3 mm.

Fields of cereals, introduced. Hunan (Xiangtan), Shanghai, Zhejiang (Dai Shan) [Russia; Europe].

**2. *Lolium remotum*** Schrank, Baier. Fl. 1: 382. 1789.

疏花黑麦草 *shu hua hei mai cao*

Annual. Culms erect, slender, 30–100 cm tall, 3–4-noded, smooth or scaberulous below inflorescence. Leaf blades linear, up to 25 cm  $\times$  1–6 mm, adaxial surface smooth or scabrid, abaxial surface smooth, margins scaberulous near apex, young blades rolled; auricles to 2 mm or absent; ligule to 2.5 mm,

truncate. Raceme straight, 6–20 cm, slender; rachis smooth, spikelets their own length or more apart. Spikelets 0.8–1.6 cm, florets 5–10; glume linear-lanceolate, 1/2–2/3 as long as spikelet, 3–7-veined, apex obtuse or acute; lemmas elliptic, plump, 3.5–5.4 mm, apex rounded, erose, usually awnless; palea spinulose along upper keels. Caryopsis length 2–3 times width. Fl. and fr. Jul–Aug.  $2n = 14$ .

Fields, roadsides, introduced. Heilongjiang, Xinjiang [Afghanistan, W Russia; Europe].

This species is a weed of *Linum* fields.

### 3. *Lolium perenne* Linnaeus, Sp. Pl. 1: 83. 1753.

黑麦草 hei mai cao

Perennial, turf-forming. Culms tufted, erect or spreading, sometimes prostrate and rooting from lower nodes, 30–90 cm tall, 3–4-noded. Leaf blades soft, 5–20 cm × 3–6 mm, glabrous, young blades folded; auricles to 3 mm; ligule 2–2.5 mm. Raceme stiffly erect, or rarely slightly curved, 10–30 cm; rachis glabrous, smooth, spikelets usually less than their own length apart. Spikelets 0.8–2 cm, florets 5–10, rachilla internodes ca. 1 mm, smooth, glabrous; glume lanceolate, 1/3 as long to subequaling spikelet, 3–9-veined, margins narrowly membranous, apex acute or obtuse; lemmas oblong, herbaceous, 5–9 mm, 5-veined, smooth, apex obtuse to subacute, awnless; palea ciliate along keels. Caryopsis length more than 3 times width. Fl. and fr. May–Jul.  $2n = 14$ , 28.

Meadows, grassy places, moist roadsides. Commonly cultivated in China [Russia; N Africa, Europe].

This species is extensively cultivated in temperate regions of the world as an excellent forage and lawn grass. It is a variable species, with many cultivars (Perennial Rye Grass).

### 4. *Lolium multiflorum* Lamarck, Fl. Franç. 3: 621. 1779 [“1778”].

多花黑麦草 duo hua hei mai cao

Annual, biennial, or short-lived perennial. Culms tufted, erect or decumbent at base, 0.5–1.3 m tall, 4–5-noded. Leaf blades flat, 10–20 cm × 3–8 mm, glabrous, adaxial surface scabrid, young blades rolled; auricles usually present, 1–4 mm; ligule up to 4 mm. Raceme erect or nodding, 10–30 cm; rachis scabridulous, spikelets overlapping or up to their own length apart. Spikelets 0.8–3 cm, florets 8–22; glume lanceolate, much shorter than spikelet, scarcely exceeding lowest floret, 5–7-veined, margin narrowly membranous, apex obtuse, acute or slightly erose; lemmas oblong-lanceolate, 5–8 mm, 5-veined, apex acute, obtuse or erose; awn up to 5(–15) mm, fine, straight, or upper lemmas awnless; palea equal to lemma, ciliate along keels. Caryopsis length 3 times width. Fl. and fr. Jul–Aug.  $2n = 14$ .

Grasslands, introduced. Anhui, Fujian, Guizhou, Hebei, Henan, Hunan, Jiangxi, Nei Mongol, Shaanxi, Sichuan, Taiwan, Xinjiang, Yunnan [N Africa, SW Asia, C and S Europe].

This species is widely grown in temperate regions of the world for pasture and forage (Italian Rye Grass).

*Lolium multiflorum* hybridizes with *Festuca pratensis* to form the hybrid ×*Festulolium braunii* (K. Richter) A. Camus. *Lolium grandispicum* Y. J. Fei (Guihaia 19: 205. 1999), described from Hubei (Jingzhou) is probably based on a specimen of this hybrid. The type (Y. J. Fei 98088, HBAC) has not been seen.

### 5. *Lolium rigidum* Gaudin, Agrost. Helv. 1: 334. 1811.

硬直黑麦草 ying zhi hei mai cao

Annual. Culms tufted, erect or geniculate at base, 20–80 cm tall, 2–4-noded, smooth or scabrid below inflorescence. Leaf blades 5–20 cm × 3–6 mm, adaxial surface and margins smooth or scabrid, abaxial surface smooth; auricles up to 3 mm or absent; ligule 0.5–2.5 mm, rounded or truncate. Raceme stiff, straight or curved, 5–20 cm; rachis slender to fairly stout, smooth or scabrid, 1–3 mm thick, spikelets appressed to partly sunken, overlapping by half their length or up to their own length apart. Spikelets 1–2 cm, florets 5–10; glume lanceolate to oblong, as long as spikelet, 5–7(–9)-veined; lemmas oblong or oblong-lanceolate, 5–8 mm, 3–5-veined, scabrid, apex obtuse or erose; awn absent or 3(–8) mm on upper fertile florets only. Caryopsis length 3 times width or more.

Fields; 200–1800 m. Gansu (Tianshui), Henan [Afghanistan, Pakistan, Turkmenistan; N Africa, SW Asia, Europe].

This taxon comprises a polymorphic species complex. It is a good fodder grass, introduced in temperate parts of the world.

### 6. *Lolium persicum* Boissier & Hohenacker in Boissier, Diagn. Pl. Orient., ser. 1, 13: 66. 1854 [“1853”].

欧黑麦草 ou hei mai cao

Annual. Culms tufted, erect or decumbent, 20–70 cm tall, 3–4-noded, scabrid below inflorescence. Leaf blades flat, 6–15 cm × 2–8 mm, adaxial surface scabrid; auricles up to 2 mm or absent; ligule 0.5–2 mm. Raceme straight, 10–20 cm; rachis scabrid, 0.4–1.5 mm thick, spikelets about their own length apart. Spikelets 1–2 cm, florets 5–9; rachilla internodes ca. 0.5 mm, slightly spinescent; glume narrowly lanceolate, 2/3 as long to subequaling spikelet, 5-veined, apex obtuse or acute; lemmas lanceolate, 6.5–11 mm, 5-veined, apex attenuate into awn; awn 5–20 mm, slightly curved; palea equal to or slightly shorter than lemma, ciliate along keels. Caryopsis length 3.5–5 times width. Fl. and fr. Jun–Jul.  $2n = 14$ .

Streamsides, roadsides, mountain slopes; 1400–2300 m. Gansu, Hebei, Qinghai, Shaanxi, Xinjiang [Afghanistan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

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