

171. SETARIA P. Beauvois, Ess. Agrostogr. 51. 1812, nom. cons.,
not Acharius ex Michaux (1803).

狗尾草属 gou wei cao shu

Chen Shouliang (陈守良); Sylvia M. Phillips

Chaetochloa Scribner, nom. rej.

Annuals or perennials. Culms usually tufted, slender to robust or canelike. Leaf blades linear to lanceolate, sometimes plicate or narrowed to a false petiole; ligule ciliate from a membranous base. Inflorescence a panicle, dense and spike-like or open with the spikelets contracted around the primary branches; spikelets (or some of them) subtended by one to several bristles which persist on the branches after the spikelets fall. Spikelets elliptic, plano-convex, sometimes gibbous, awnless, florets 2; glumes and lower lemma membranous to herbaceous; lower glume ovate from a clasping base, usually less than 1/2 spikelet length, 3–5-veined; upper glume half as long to equaling spikelet, several-veined; lower floret staminate or neuter, sometimes sulcate, its palea present, reduced or absent; upper lemma crustaceous, strongly convex, rugose, punctate or smooth, margins inrolled. $x = 9$.

About 130 species: tropics and subtropics, extending to warm-temperate regions of the world; 14 species (three endemic, one introduced) in China.

The bristles in the inflorescence represent modified branchlets. The genus includes pasture grasses, a cereal crop, and a few noxious weeds.

- 1a. Panicle open to contracted with obvious, spaced branches; spikelets usually subtended by a solitary bristle (some lacking a bristle, or rarely with up to 3).
 - 2a. Leaf blades plicate, fusiform-lanceolate to linear-lanceolate, narrowed toward base.
 - 3a. Leaf blades 2–7 cm wide; panicle branches up to 20 cm long; lower glume 1/3–1/2 spikelet length, usually acute to obtuse; lower lemma with narrow falcate apex, longer than upper lemma 1. *S. palmifolia*
 - 3b. Leaf blades 1–3 cm wide; panicle branches up to 8 cm long; lower glume 1/4–1/3 spikelet length, usually broadly obtuse to truncate; lower lemma equaling upper lemma 2. *S. plicata*
 - 2b. Leaf blades flat, not plicate, linear or linear-lanceolate, straight or rounded at base.
 - 4a. Upper glume subequaling spikelet; only branch or branchlet tips extending into a bristle, rarely a solitary bristle below a few spikelets 3. *S. yunnanensis*
 - 4b. Upper glume distinctly shorter than spikelet; most spikelets subtended by one or more bristles.
 - 5a. Tufted annual; upper lemma coarsely rugose 4. *S. intermedia*
 - 5b. Perennials, sometimes rhizomatous; upper lemma smooth or finely punctate-rugose.
 - 6a. Plant tufted; bristles stiff, stout; lower floret usually staminate with well-developed palea 5. *S. forbesiana*
 - 6b. Plant with long scaly rhizomes; bristles slender; lower floret neuter with reduced palea.
 - 7a. Spikelets elliptic; lower lemma equal to spikelet; upper lemma smooth, shiny 6. *S. chondrachne*
 - 7b. Spikelets lanceolate; lower lemma slightly shorter than spikelet; upper lemma punctate-rugulose 7. *S. guizhouensis*
 - 1b. Panicle densely spike-like with congested branchlets, sometimes lobed; spikelets subtended by several to many bristles.
 - 8a. Each branchlet from the main axis with only one mature spikelet; upper glume up to 1/2 as long as spikelet, upper floret clearly exposed.
 - 9a. Spikelets (2.2–)2.5–3.5 mm; lower floret often staminate, its palea ovate, as wide as upper floret; upper lemma coarsely rugose 8. *S. pumila*
 - 9b. Spikelets 1.8–2.3(–2.5) mm; lower floret neuter, its palea lanceolate, much narrower than upper floret; upper lemma finely rugose 9. *S. parviflora*
 - 8b. Each branchlet from the main axis with several mature spikelets; upper glume 2/3 as long to equaling spikelet.
 - 10a. Upper glume 2/3–3/4 length of fertile floret, upper lemma exposed above it; spikelets 2.8–3 mm, acute 10. *S. faberi*
 - 10b. Upper glume subequaling fertile floret, almost completely covering upper lemma; spikelets 2–2.5(–3) mm, usually obtuse.
 - 11a. Upper floret falling free from the glumes and lower lemma at maturity; cultivated plant 11. *S. italica*
 - 11b. Upper floret retained within spikelet, this falling whole; wild plants.
 - 12a. Bristles retrorsely scabrous 14. *S. verticillata*
 - 12b. Bristles antrorsely scabrous.
 - 13a. Spikelets 2–2.5 mm; lower glume 1/4–1/3 as long as the spikelet, usually obtuse 12. *S. viridis*
 - 13b. Spikelets 2.5–3 mm; lower glume ca. 1/2 as long as the spikelet, acuminate 13. *S. arenaria*

1. *Setaria palmifolia* (J. König) Stapf, J. Linn. Soc., Bot. 42: 186. 1914. 棕叶狗尾草 zong ye gou wei cao

Panicum palmifolium J. König, Naturforscher 23: 208. 1788 ["*palmaefolium*"]; *Chamaeraphis palmifolia* Kuntze; *Chaetochloa palmifolia* Hitchcock & Chase; *Panicum neurodes* Schultes; *P. palmifolium* Willdenow ex Poiret (1816), not J. König (1788); *P. plicatum* Willdenow (1809), not Lamarck (1791).

Perennial from a short knotty rhizome. Culms erect or slightly geniculate, 75–200 cm tall, 3–7(–10) mm in diam. Leaf sheaths usually sparsely hispid, margins tuberculate-ciliate near ligule, otherwise glabrous; leaf blades fusiform-lanceolate, plicate, 20–60 × 2–7 cm, glabrous or hispid, narrowed toward base, apex acuminate; ligule 2–3 mm, ciliate. Panicle 20–60 × 2–10 cm, branches up to 20 cm, laxly spreading, flexuous, some spikelets subtended by a single 5–15 mm bristle. Spikelets broadly lanceolate, 3–4 mm, acute; lower glume triangular-ovate, 1/3–1/2 as long as spikelet, obtuse to acute; upper glume ovate, 1/2–3/4 as long as spikelet, 5–7-veined, acute; lower lemma neuter, often distinctly longer than upper floret, 5-veined, tipped with a short incurved beak; lower palea narrow, hyaline, 2/3 as long as lemma; upper lemma indistinctly rugulose to almost smooth, slightly shiny, apex apiculate, green and compressed. Fl. and fr. Aug–Dec. $2n = 36, 54$.

Open forests, thicket margins, shady pathsides. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [W Africa, tropical Asia].

Panicum palmifolium Willdenow ex Poiret (1816) is a *nomen novum* for the illegitimate later homonym *P. plicatum* Willdenow (1809), not Lamarck (1791), but is itself illegitimate as a later homonym of *P. palmifolium* J. König (1788). Both *Chamaeraphis palmifolia* and *Chaetochloa palmifolia* are based on *P. palmifolium* Willdenow ex Poiret, but must be treated as *nomina nova* rather than new combinations.

This species is used for food and medicine.

2. *Setaria plicata* (Lamarck) T. Cooke, Fl. Bombay 2: 919. 1908.

皱叶狗尾草 *zhou ye gou wei cao*

Perennial from a knotty rootstock. Culms loosely tufted, erect or decumbent, 45–130 cm tall, up to 6 mm in diam. Leaf sheaths ± papillose-pilose, margins usually ciliate; leaf blades narrowly lanceolate, plicate, thin, 10–40 × 1–3 cm, papillose-pilose, hispidulous or glabrous, narrowed toward base, apex attenuate; ligule ca. 3 mm, ciliate. Panicle 15–33 cm, branches up to 8 cm, loose, ascending, some spikelets subtended by a single 10–20 mm bristle. Spikelets ovate-oblong, 3–4 mm, acute; glumes with broad papery margins; lower glume ovate-orbicular, 1/4–1/3 as long as spikelet, obtuse to truncate; upper glume 1/2–3/4 as long as spikelet, 5–7-veined, obtuse or acute; lower lemma staminate or neuter, usually equaling upper floret, 5-veined; lower palea often well developed; upper lemma usually distinctly rugose, rarely smooth, apiculate. Fl. and fr. Jun–Oct. $2n = 36$.

Open forests, valleys, moist roadsides. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Indochina, Japan, Malaysia, Nepal, Thailand].

Setaria plicata is a more slender species than *S. palmifolia*, with a

narrower panicle of shorter branches. However, the two species intergrade and must be separated by a combination of characters, as none is reliable on its own. Besides the key characters, *S. plicata* usually has a more distinctly rugose upper floret and shows a greater tendency to develop anthers in the lower floret.

- 1a. Upper lemma distinctly rugose 2a. var. *plicata*
- 1b. Upper lemma nearly smooth, shiny 2b. var. *leviflora*

2a. *Setaria plicata* var. *plicata*

皱叶狗尾草(原变种) *zhou ye gou wei cao* (yuan bian zhong)

Panicum plicatum Lamarck, Tab. Encycl. 1: 171, no. 892. 1791; *P. excurrens* Trinius; *P. neurodes* var. *blepharoneuron* A. Braun; *Setaria excurrens* (Trinius) Miquel; *S. palmifolia* var. *blepharoneuron* (A. Braun) Veldkamp.

Culms up to 130 cm tall. Upper lemma distinctly rugose. Fl. and fr. Jun–Oct. $2n = 36$.

Moist roadsides, valleys, understory of forests. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Malaysia, Nepal, Thailand].

2b. *Setaria plicata* var. *leviflora* (Keng ex S. L. Chen) S. L. Chen & S. M. Phillips, **comb. nov.**

光花狗尾草 *guang hua gou wei cao*

Basionym: *Setaria excurrens* (Trinius) Miquel var. *leviflora* Keng ex S. L. Chen, Bull. Nanjing Bot. Gard. 1988–1989: 3. 1990.

Culms up to 70 cm tall. Upper lemma nearly smooth, shiny.

- Mountain slopes, in open forests. Guangdong, Guangxi, Sichuan.

This combination was not previously validly published by Chen and Sheng (Bull. Bot. Res., Harbin 4(1): 64. 1984) because the basionym was not at that time validly published. Chen and Sheng cited the basionym from Keng (Clav. Gen. Sp. Gram. Sin. 126, 227. 1957 and Fl. Ill. Pl. Prim. Sin. Gram. 707. 1959), where no Latin description was provided.

3. *Setaria yunnanensis* Keng & G. D. Yu ex P. C. Keng & Y. K. Ma, Acta Bot. Yunnan. 2: 418. 1980.

云南狗尾草 *yun nan gou wei cao*

Annual. Culms rather slender, ca. 70 cm tall, ca. 1.5 mm in diam., nodes pubescent. Leaf sheaths glabrous or papillose-pilose, margins ciliate; leaf blades linear-lanceolate, thin, 3–14 × 0.4–1.2 cm, papillose-pilose on both surfaces, narrowed toward base, apex acuminate. Panicle open, 4–17 × 0.5–3 cm, branches ascending, simple or the lowermost with secondary branchlets, every branchlet tip extended into a 1–8 mm bristle, rarely a few spikelets also subtended by a single bristle; axis scabrous to ciliate along the edges. Spikelets ovate-lanceolate to elliptic, 2.4–2.6 mm, yellowish green or tinged purple; lower glume triangular, 1/3 as long as spikelet, 1–3-veined, acute or acuminate; upper glume as long as or slightly shorter than spikelet, 5-veined, acute or obtuse; lower lemma as long as spikelet, subpapery, 3–5-veined, acute; upper lemma as long as lower, finely punctate-rugose. Fl. and fr. Jun–Oct.

• Roadsides, streams, coniferous forests; 2300–3900 m. Sichuan, Xizang, Yunnan.

This species, with a bristle only at the branch tips, is close to *Paspalidium*. The bristles are very inconspicuous when they are shorter than the spikelets.

4. *Setaria intermedia* Roemer & Schultes, Syst. Veg. 2: 489. 1817.

间序狗尾草 jian xu gou wei cao

Panicum tomentosum Roxburgh; *Setaria tomentosa* (Roxburgh) Kunth.

Annual. Culms slender, geniculate at base and rooting from nodes, up to 60 cm tall, glabrous. Leaf sheaths usually loose, lower glabrous and smooth, upper papillose-pilose, margins densely ciliate especially at mouth; leaf blades broadly linear, thin, 10–35 × 0.6–1 cm, papillose-hispid along the main veins, apex acuminate; ligule densely ciliate. Panicle contracted, narrowly lanceolate, 10–17 × 1–1.5 cm, lowest branches 1.5–2 cm, spikelets subtended by 1–2(–3 or more) bristles; axis scaberulous to puberulous; bristles 3–10 mm, stiff. Spikelets elliptic-ovate, 1.5–2 mm, acute; glumes thin, submembranous; lower glume broadly ovate, 1/3–1/2 as long as spikelet, obtuse or acute; upper glume 1/2–2/3 as long as spikelet, 5-veined; lower floret neuter; lower palea almost as long as lemma; upper lemma orange-brown at maturity, dorsally strongly convex, rugose. Fl. and fr. Jul.

Roadsides, fields. Yunnan [Bhutan, India, Japan, Myanmar, Russia, Sri Lanka; E Africa].

This weedy annual is recognized by its sprawling, tufted habit and coarsely rugose, orange-brown fertile floret. The spikelets are usually subtended only by a single bristle, but there are many aborted spikelets in the panicle, giving the appearance of more bristles below each fully developed spikelet.

5. *Setaria forbesiana* (Nees ex Steudel) J. D. Hooker, Fl. Brit. India 7: 81. 1896 [“1897”].

西南葶草 xi nan fu cao

Perennial from a knotty rootstock. Culms rigid, erect or geniculate, 60–170 cm tall, 2–4 mm in diam., glabrous. Leaf sheaths glabrous, margins densely ciliate with silky hairs; leaf blades broadly linear or linear-lanceolate, 10–40 × 0.4–2 cm, glabrous, base subrounded or cuneate, apex acuminate; ligule ca. 3 mm. Panicle open, linear to narrowly pyramidal, 10–40 cm, erect or slightly nodding, branches spaced, ascending, lowest 0.5–2 cm, spikelets subtended by a single bristle; axis scabrous to hispid; bristles 3–4 times spikelet length, stout, stiffly green or purple. Spikelets elliptic or ovate, 2.8–3.2 mm, strongly veined; lower glume broadly ovate, 1/3–1/2 as long as spikelet, acute; upper glume 2/3–3/4 as long as spikelet, (5–)7–9-veined; lower floret staminate, as long as upper floret; lower palea well developed; upper lemma finely punctate-rugose. Fl. and fr. Jul–Oct.

Mountain slopes, valleys, roadsides, streams; 300–2000 m. Anhui, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang [Bhutan, N India, Myanmar, Nepal].

- 1a. Bristles 3–4 times length of spikelet;
lower floret usually staminate 5a. var. *forbesiana*
1b. Bristles equal to spikelet or slightly
longer; lower floret neuter 5b. var. *breviseta*

5a. *Setaria forbesiana* var. *forbesiana*

西南葶草(原变种) xi nan fu cao (yuan bian zhong)

Panicum forbesianum Nees ex Steudel, Syn. Pl. Glumac. 1: 98. 1854; *Chaetochloa forbesiana* (Nees ex Steudel) Scribn. & Merrill; *Setaria dubia* P. C. Keng & Y. K. Ma.

Spikelet subtended by a stiff bristle 3–4 times its length. Lower floret usually staminate. Lower palea as long as lower lemma, as broad as upper floret. Fl. and fr. Jul–Oct.

Mountain slopes, valleys, roadsides, streams; 300–2000 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan, Zhejiang [Bhutan, N India, Myanmar, Nepal].

5b. *Setaria forbesiana* var. *breviseta* S. L. Chen & G. Y. Sheng, Bull. Bot. Res., Harbin 4: 64. 1984.

短刺西南葶草 duan ci xi nan fu cao

Spikelet subtended by a slender bristle of equal length or only slightly longer. Lower floret usually neuter. Lower palea shorter than lower lemma, narrow. Fl. and fr. Jul–Oct.

• Roadsides. Guizhou.

6. *Setaria chondrachne* (Steudel) Honda, J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 3: 234. 1930.

葶草 fu cao

Panicum chondrachne Steudel, Syn. Pl. Glumac. 1: 51. 1853; *Chaetochloa chondrachne* (Steudel) Honda; *C. matsumurae* (Matsumura) Keng; *Panicum matsumurae* Hackel; *Setaria matsumurae* Hackel ex Matsumura.

Perennial with slender rhizomes clothed in imbricate, ovate, appressed-pubescent scales. Culms slender, ascending, 60–170 cm tall, glabrous. Leaf sheaths glabrous, long ciliate along margins and at mouth; leaf blades linear-lanceolate, thin, 5–38 × 0.5–2 cm, glabrous or rarely papillose-pilose, base rounded, margins scabrous, apex attenuate; ligule ca. 0.5 mm, densely ciliate. Panicle open, linear to narrowly pyramidal, 12–30 cm, slightly nodding, branches spaced, stiffly spreading, lowest 1–2.5(–5) cm, most spikelets subtended by a single bristle; axis scabrous, sometimes also hispid; bristles 4–10 mm. Spikelets plumply elliptic, ca. 3 mm, acute; lower glume ovate, 1/3–1/2 as long as spikelet, acute; upper glume 3/4 as long as spikelet, 5(–7)-veined; lower floret neuter, as long as upper floret; lower lemma 5-veined; lower palea narrowly lanceolate, shorter than its lemma; upper lemma finally light brown, smooth, shiny, acute. Fl. and fr. Aug–Oct. *2n* = 36.

Woodlands, moist mountain slopes, roadsides. Anhui, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Japan, Korea].

This is a distinctive species on account of its long, scaly rhizomes, elongate, narrow panicle, and smooth, shiny fertile floret.

7. *Setaria guizhouensis* S. L. Chen & G. Y. Sheng, Bull. Bot. Res., Harbin 4: 62. 1984.

贵州狗尾草 *gui zhou gou wei cao*

Perennial with scaly rhizomes. Culms erect, 37 cm or more tall, nodes usually hairy. Leaf sheaths papillose-pilose dorsally and along margins, but nearly glabrous toward ligule; leaf blades linear-lanceolate, 10–15 × 0.4–0.6 cm, scabrous on both surfaces, base subrounded, apex acuminate; ligule ca. 1.5 mm. Panicle linear, 11–35 cm, branches spaced, very short, appressed to axis, spikelets subtended by 1 or 2 slightly flexuous bristles; axis pubescent to pilose. Spikelets elliptic-lanceolate, ca. 2.5 mm, acute; lower glume triangular-ovate, 1/3 as long as spikelet, acute; upper glume 1/2–2/3 as long as spikelet, 5-veined, acute; lower floret neuter, shorter than upper floret, with or without palea; upper lemma finely rugose-punctate, apex purplish, acute. Fl. and fr. Sep.

• Mountain slopes, thickets, roadsides; 1300–1600 m. Guizhou, Yunnan.

- 1a. Culms ca. 37 cm tall; lower floret without palea 7a. var. *guizhouensis*
- 1b. Culms more than 37 cm tall; lower floret with palea 7b. var. *paleata*

7a. *Setaria guizhouensis* var. *guizhouensis*

贵州狗尾草(原变种) *gui zhou gou wei cao (yuan bian zhong)*

Culms ca. 37 cm tall. Panicle ca. 11 cm. Lower floret without palea. Fl. and fr. autumn.

• Mountain slopes, roadsides; ca. 1600 m. Guizhou.

7b. *Setaria guizhouensis* var. *paleata* S. L. Chen & G. Y. Sheng, Bull. Bot. Res., Harbin 4: 64. 1984.

具稃贵州狗尾草 *ju fu gui zhou gou wei cao*

Culms more than 37 cm tall. Panicle ca. 35 cm. Lower floret with palea. Fl. and fr. autumn.

• Thickets; ca. 1300 m. Guizhou.

8. *Setaria pumila* (Poir.) Roemer & Schultes, Syst. Veg. 2: 891. 1817.

金色狗尾草 *jin se gou wei cao*

Panicum pumilum Poir. in Lamarck, Encycl., Suppl. 4: 273. 1816; *Setaria glauca* (Linnaeus) P. Beauvois var. *dura* (I. C. Chung) I. C. Chung; *S. lutescens* (Weigel ex Stuntz) F. T. Hubbard var. *dura* I. C. Chung.

Annual. Culms erect or geniculate, 20–90 cm tall, smooth or scabrous just below inflorescence, nodes glabrous. Leaf sheaths keeled, glabrous; leaf blades linear, 5–40 × 0.2–1 cm, abaxial surface smooth, adaxial surface scabrous or pilose at base; ligule ca. 1 mm. Panicle densely cylindrical, 3–17 × 0.4–0.8 cm; branches reduced to a single mature spikelet subtended by 5–10 or more bristles (sometimes an aborted spikelet also present); axis pubescent; bristles gold, brownish gold or sometimes purple, 2–3 times spikelet length. Spikelets broadly ovate,

(2.2–)2.5–3.5 mm; glumes ovate; lower glume 1/3–1/2 as long as spikelet; upper glume 1/2–2/3 as long as spikelet; lower floret usually staminate; lower palea hyaline, ovate, matching the upper floret in size and shape, keels narrowly winged; upper lemma broadly ovate, coarsely rugose. Fl. and fr. Jun–Oct. $2n = 18, 36$.

Waste places, mountain slopes, roadsides, forest margins. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Ningxia, Shaanxi, Shandong, Shanghai, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [originally from temperate and subtropical Asia and Europe, but now widespread].

The name *Setaria glauca* (Linnaeus) P. Beauvois has been misapplied to this species.

Setaria pumila and *S. parviflora* are different facets of the same polymorphic complex, and are sometimes regarded as a single, variable species. No character taken on its own is reliable for separating the two species, but the combination of all characters listed in the key will enable most specimens to be assigned to one or the other.

The name *Setaria lutescens* var. *dura* refers to a form with the lower lemma hardened and rugose like the upper lemma. This is a rare variant, known from Fujian and Yunnan and also from Korea. Hardening of the lower floret is known to occur occasionally in other genera of *Panicaceae*.

This species is cultivated for forage.

9. *Setaria parviflora* (Poir.) Kerguelen, Lejeunia 120: 161. 1987.

幽狗尾草 *you gou wei cao*

Cenchrus parviflorus Poir. in Lamarck, Encycl. 6: 52. 1804; *Chaetochloa geniculata* (Poir.) Millspaugh & Chase; *Panicum geniculatum* Poir.; *P. pallidifusum* Schumacher; *P. rubiginosum* Steudel; *Setaria glauca* (Linnaeus) P. Beauvois var. *pallidifusca* (Schumacher) T. Koyama; *S. gracilis* Kunth; *S. pallidifusca* (Schumacher) Stapf & C. E. Hubbard.

Annual or short-lived perennial with basal buds or a short knotty rhizome. Culms erect or geniculate, 20–90 cm tall. Leaf sheaths keeled, glabrous; leaf blades stiff, flat or involute, 5–30 × 0.2–0.8 cm, glabrous or adaxial surface pilose at base, apex acuminate; ligule ca. 1 mm. Panicle densely cylindrical, 2–15 × 0.5–1.2 cm; branches reduced to a single mature spikelet subtended by 8–12 bristles; axis pubescent; bristles golden or purplish brown when mature, 2–3 times spikelet length. Spikelets elliptic, 1.8–2.5 mm; lower glume ovate, 1/3 as long as spikelet, acute; upper glume broadly ovate, ca. 1/2 as long as spikelet, obtuse; lower floret neuter; lower palea firmly membranous, lanceolate, about as long as the upper floret but narrower, keels wingless, minutely papillose; upper lemma ovate-elliptic, finely rugose. Fl. and fr. Oct–Dec. $2n = 72$.

Mountain slopes, roadsides, waste places. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan [throughout the tropics and subtropics].

Forms with perennating basal buds persisting for more than one season are sometimes separated as a different species, but there are no other distinguishing features and this character is probably of little significance. Specimens lacking basal parts become impossible to assign to species. However, if they are separated, *Setaria pallidifusca* is the cor-

rect name for the annual form.

The perennial form of *Setaria parviflora* has been known as *S. geniculata* P. Beauvois, but that name was based not on *Panicum geniculatum* Poir (1798), as has been widely supposed, but on *P. geniculatum* Willdenow (1809), which applies to a different species.

This species is a forage grass and is used medicinally.

10. *Setaria faberi* R. A. W. Herrmann, Beitr. Biol. Pflanzen 10: 51. 1910.

大狗尾草 da gou wei cao

Setaria autumnalis Ohwi.

Annual. Culms solitary, erect or geniculate and rooting at the lowermost nodes, 50–120 cm tall, up to 6 mm in diam., glabrous. Leaves all cauline; leaf sheaths ciliate on upper margins; leaf blades broadly linear, 10–40 × 0.5–2 cm, glabrous or adaxial surface with scattered hairs, narrowed to base, apex acuminate; ligule 1–2 mm. Panicle densely cylindrical, 5–24 × 0.6–1.3 cm, nodding, branchlets bearing several spikelets each subtended by 1–3 bristles; axis white-pilose; bristles green or brownish purple, 10–15 mm. Spikelets elliptic, 2.8–3 mm, glumes and lower lemma thinly membranous; lower glume 1/3–1/2 as long as spikelet; upper glume 2/3–3/4 as long as spikelet; lower floret neuter; lower palea up to 1/2 as long as lemma, sometimes very small; upper lemma finely rugose under upper glume, almost smooth on exposed apex. Fl. and fr. Jul–Oct. $2n = 36$.

Mountain slopes, roadsides, waste places. Anhui, Fujian, Guangxi, Guizhou, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea; introduced in North America].

This robust, annual species is frequently confused with large forms of *Setaria viridis*, but has broader, acute spikelets and a shorter upper glume clearly exposing the tip of the upper lemma.

11. *Setaria italica* (Linnaeus) P. Beauvois, Ess. Agrostogr. 51. 1812.

梁 liang

Panicum italicum Linnaeus, Sp. Pl. 1: 56. 1753; *Chaetochloa germanica* (Miller) Smyth; *C. italica* (Linnaeus) Scribner; *C. italica* var. *germanica* (Miller) Scribner; *Chamaeraphis italica* (Linnaeus) Kuntze; *C. italica* var. *germanica* (Miller) Kuntze; *Panicum chinense* Trinius; *P. germanicum* Miller; *P. italicum* var. *germanicum* (Miller) Koeler; *Pennisetum germanicum* (Miller) Baumgarten; *P. italicum* (Linnaeus) R. Brown; *Setaria germanica* (Miller) P. Beauvois.

Annual. Culms robust, erect, up to 150 cm, nodes glabrous. Leaf sheaths glabrous or pubescent, ciliate; leaf blades linear-lanceolate, 15–45 × 0.6–2 cm, usually glabrous; ligule 1–3 mm. Panicle dense, lobed, 6–40 × 0.5–5 cm, very variable, erect or pendent when mature; spikelets subtended by several bristles 1–5 times spikelet length; axis villous. Spikelets elliptic to ovate or subglobose, 2–3 mm, yellow, brown, orange or purple; lower glume 1/3–1/2 as long as spikelet; upper glume about as long as spikelet, 5–7(–9)-veined, obtuse; lower lemma equal to spikelet, 5–7-veined; lower palea absent or narrow, up to 1/2

as long as lemma; upper floret yellow or orange-yellow, oblong or ovate-oblong, cartilaginous, deciduous at maturity, finely rugose to smooth and shiny. Fl. and fr. summer to autumn. $2n = 18$.

Cultivated. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Heilongjiang, Henan, Hubei, Jiangxi, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [origin uncertain; now introduced and cultivated sporadically worldwide].

This grass (Foxtail Millet) has been cultivated as a cereal in China since ancient times and exists in many races differing in size, shape, and hairiness of the panicle, color of the grain, and length of the bristles. It is also a useful forage grass. It is thought to be derived from *Setaria viridis*.

12. *Setaria viridis* (Linnaeus) P. Beauvois, Ess. Agrostogr. 51. 1812.

狗尾草 gou wei cao

Annual. Culms tufted, erect or geniculate, up to 70(–150) cm tall, 3–7 mm in diam. Leaf sheaths glabrous to papillose-pilose, margins densely ciliate; leaf blades linear to linear-lanceolate, flat, glabrous or papillose-pilose on both surfaces, base subrounded or subtruncate, margins scabrous, apex acuminate; ligule 1–2 mm. Panicle dense, usually cylindrical, usually tapering upward, 1–24 cm, erect or slightly nodding, branchlets bearing several spikelets each subtended by 3–7(–25) bristles; axis pilose or pubescent; bristles green, brown or purple, 4–12 mm. Spikelets elliptic-oblong, 2–2.5(–3) mm, obtuse; lower glume 1/4–1/3 as long as spikelet, obtuse or rarely acute; upper glume elliptic, as long as spikelet, lower lemma equal to spikelet; lower palea about 1/3 as long as lemma; upper lemma pale green, oblong, finely punctate-rugose, obtuse. Fl. and fr. May–Oct. $2n = 18$.

Hill slopes, roadsides, grassy waste places. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangxi, Jiangsu, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [temperate and subtropical regions of the Old World; introduced elsewhere].

- 1a. Culms 5–25 cm tall; panicle ovate or elliptic, 1–4 cm 12c. subsp. *pachystachys*
- 1b. Culms usually more than 25 cm tall; panicle cylindrical, up to 24 cm.
 - 2a. Culms up to 70 cm, much branched at base; panicle to 12 cm, not lobed; spikelets 2–2.5 mm 12a. subsp. *viridis*
 - 2b. Culms 60–150 cm, little branched; panicle to 24 cm, sometimes lobed; spikelets 2.5–3 mm 12b. subsp. *pyncocoma*

12a. *Setaria viridis* subsp. *viridis*

狗尾草(原亚种) gou wei cao (yuan ya zhong)

Panicum viride Linnaeus, Syst. Nat., ed. 10, 2: 870. 1759; *P. viridescens* Steudel; *Setaria viridis* var. *purpurascens* Petermann; *S. viridis* var. *weinmannii* (Roemer & Schultes)

Heynhold; *S. weinmannii* Roemer & Schultes.

Culms branching at base, up to 70 cm tall. Leaf blades broadly linear, 5–20 × 0.2–1.8 cm. Panicle cylindrical, 2–12 × 0.4–1.3 cm; bristles below the spikelet 3–7, green, yellowish brown, purplish red or purple, 4–12 mm. Spikelets livid-green, 2–2.5 mm. Fl. and fr. May–Oct. $2n = 18$.

Mountain slopes, roadsides, grassy waste places. Distribution as for species [temperate and subtropical regions of the Old World; introduced elsewhere].

This is a cosmopolitan annual weed of warm-temperate regions.

12b. *Setaria viridis* subsp. *pyncocoma* (Steudel) Tzvelev, Novosti Sist. Vyssh. Rast. 5: 19. 1968.

巨大狗尾草 ju da gou wei cao

Panicum pyncocomum Steudel, Syn. Pl. Glumac. 1: 462. 1854; *P. viride* var. *giganteum* Franchet & Savatier; *P. viride* var. *majus* Gaudin; *Setaria gigantea* (Franchet & Savatier) Makino; *S. pyncocoma* (Steudel) Henrard ex Nakai; *S. viridis* var. *major* (Gaudin) Petermann (1838), not Gray (1821).

Culms little branched at base, 60–150 cm tall. Leaf blades 15–40 × 1–2.5 cm, glabrous on both surfaces. Panicle sometimes lobed, 7–24 × 1.5–2.5 cm; bristles green, brownish or purplish, 7–12 mm. Spikelets 2.5–3 mm. Fl. and fr. Jun–Oct.

Roadsides, forest margins, a crop weed, especially in *Setaria italica* fields; below 2700 m. Gansu, Guizhou, Hebei, Heilongjiang, Hong Kong, Hubei, Hunan, Jilin, Nei Mongol, Shaanxi, Shandong, Sichuan, Xinjiang [Japan, Russia; C and SW Asia, C and S Europe, North America].

This robust form of *Setaria viridis* may be of hybrid origin, resulting from crossing with *S. italica*. Unlike *Setaria italica*, the spikelets are shed whole.

12c. *Setaria viridis* subsp. *pachystachys* (Franchet & Savatier) Masamune & Yanagihara, Trans. Nat. Hist. Soc. Taiwan 31: 327. 1941.

厚穗狗尾草 hou sui gou wei cao

Panicum pachystachys Franchet & Savatier, Enum. Pl. Jap. 2: 594. 1879; *Chaetochloa viridis* (Linnaeus) Scribner var. *pachystachys* (Franchet & Savatier) Honda; *Setaria pachystachys* (Franchet & Savatier) Matsumura; *S. viridis* var. *pachystachys* (Franchet & Savatier) Makino & Nemoto.

Culms usually decumbent at base, much branched, 5–25 cm tall. Leaf sheaths densely tuberculate-pilose in the lower part; leaf blades narrowly lanceolate, stiff, 1.5–5 × 0.2–0.4 cm, glabrous but scabrous on both surfaces. Panicle ovate or elliptic, 1–4 cm; bristles below spikelet 10–25, very dense, green, yellow, or purple, 6–8 mm. Spikelets 2–2.5 mm.

Sand and pebbles of the seashore. Guangdong, Taiwan [Japan, Korea].

This is a maritime form characterized by its low, branching habit and short, broad, densely bristly panicle.

13. *Setaria arenaria* Kitagawa, Rep. Inst. Sci. Res. Manchoukuo 4: 77. 1940.

断穗狗尾草 duan sui gou wei cao

Setaria viridis var. *sinica* Ohwi.

Annual. Culms densely tufted, geniculate at base, slender, 20–100 cm tall, smooth, glabrous. Leaf sheaths loose, lower papillose-pubescent, upper glabrous, margins and mouth ciliate; leaf blades narrowly lanceolate, thin, 5–15 × 0.2–0.7 cm, glabrous, scabrous on both surfaces, base subrounded, apex long acuminate. Panicle narrowly cylindrical, commonly interrupted below, 2–9 × 0.5–0.8 cm; branchlets with several spikelets, these subtended by 1–4 bristles; axis pilose, rarely glabrous; bristles green or purple, 2–8 mm. Spikelets narrowly elliptic, 2.5–3 mm, acute; lower glume ovate, thinly papery, ca. 1/2 as long as spikelet, acuminate; upper glume as long as spikelet or slightly shorter; lower floret neuter, lemma equal to spikelet, 5-veined; lower palea small, narrowly lanceolate; upper lemma pale green or yellowish, finely rugose, acuminate. Fl. and fr. Jul–Sep.

• Sandy places; 1000–1300 m. Hebei, Heilongjiang, Nei Mongol, Shanxi.

14. *Setaria verticillata* (Linnaeus) P. Beauvois, Ess. Agrostogr. 51. 1812.

倒刺狗尾草 dao ci gou wei cao

Panicum verticillatum Linnaeus, Sp. Pl., ed. 2, 1: 82. 1762; *Chaetochloa brevispica* Scribner & Merrill; *C. verticillata* (Linnaeus) Scribner; *Chamaeraphis italica* (Linnaeus) Kuntze var. *verticillata* (Linnaeus) Kuntze; *C. verticillata* (Linnaeus) Porter; *Panicum asperum* Lamarck; *Pennisetum verticillatum* (Linnaeus) R. Brown; *Setaria brevispica* (Scribner & Merrill) K. Schumann.

Annual. Culms tufted, much branched, ascending, 20–100 cm tall, glabrous. Leaf sheaths thin, glabrous or papillose-pub-

erulous, margins ciliolate; leaf blades broadly linear, flaccid, 5–20 × 0.4–1.8 cm, usually glabrous, base subrounded, margins scabrous, apex long acuminate; ligule 0.5–1 mm. Panicle densely spikelike, or lobed with short lateral branches on vigorous specimens, 4–15 cm, spikelets subtended by 1–4 bristles; axis shortly hispidulous; bristles green or brownish, 3–8 mm, retrorsely barbed and often becoming entangled. Spikelets elliptic, 1.8–2.4 mm, green with obvious darker veins, obtuse; lower glume 1/3–1/2 as long as spikelet, obtuse; upper glume boat-shaped, as long as spikelet, 7-veined; lower floret neuter; lower palea much reduced; upper lemma dorsally compressed, finely rugose. Fl. and fr. Jun–Sep. $2n = 18, 36$.

Roadsides, open weedy places; 300–1000 m. Nei Mongol, Taiwan, Yunnan [tropical and warm-temperate regions of the Old World; introduced in America].

This is an easy species to recognize because of its clinging, retrorsely barbed bristles.

