

56. OPHIOPOGON Ker Gawler, Bot. Mag. 27: t. 1063. 1807, nom. cons.

沿阶草属 *yan jie cao shu*

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Chloopsis Blume; *Flueggea* Richard (1807), not Willdenow (1806); *Mondo* Adanson, nom. rej.; *Slateria* Desvaux.

Herbs perennial, rhizomatous, sometimes stoloniferous. Roots occasionally woody or with fleshy, tuberous part near tip. Stem suberect or prostrate, usually simple, elongate or short, sometimes indistinct. Leaves basal or cauline, alternate, tufted or scattered, sessile or petiolate, linear to oblong, usually whitish streaked abaxially. Scape arising from a leaf axil. Inflorescence a raceme or reduced panicle, rarely a panicle, several to many flowered; bracts small. Flowers bisexual, campanulate to opening flat, usually nodding; pedicel articulate. Tepals 6, free, deciduous or persistent in fruit. Stamens 6, inserted at base of tepals; filaments usually very short; anthers basifixed, sometimes connate. Ovary semi-inferior, 3-loculed; ovules 2(–6) per locule, basal. Style 1, columnar; stigma capitate, small. Fruit bursting irregularly at an early stage and exposing young seeds. Seeds usually blue at maturity, berrylike.

About 65 species: warm-temperate, subtropical, and tropical Asia; 47 species (38 endemic) in China.

Several species with elongate stems bearing distant tufts of leaves were recently described. They have not yet been well studied, and are here treated provisionally as different species, although future research is needed to clarify their exact circumscription.

- 1a. Inflorescence a panicle 47. *O. paniculatus*
- 1b. Inflorescence a raceme or reduced panicle.
 - 2a. Stem elongate, not rhizomelike, with spaced nodes; leaves in distant tufts (rarely in a single, subterminal tuft) or laxly scattered.
 - 3a. Leaves laxly scattered.
 - 4a. Raceme 5–10-flowered; bracts white, basal one ca. 6 mm; pedicels articulate proximally; tepals white or purplish, ca. 5 mm 14. *O. chingii*
 - 4b. Raceme ca. 60-flowered; bracts pale green, basal one ca. 6 cm; pedicels articulate distally; tepals salmon pink, ca. 3.5 mm 15. *O. filipes*
 - 3b. Leaves in distant tufts, rarely in a single, subterminal tuft.
 - 5a. Stem with a single, subterminal tuft of leaves 23. *O. hongjiangensis*
 - 5b. Stem with distant tufts of leaves.
 - 6a. Leaves distinctly petiolate.
 - 7a. At least some flowers in clusters of 2 or 3 2. *O. dracaenoides*
 - 7b. Flowers all solitary.
 - 8a. Anthers 2–4 mm, much shorter than tepals.
 - 9a. Stem covered with purple-brown or deep brown sheaths; leaf blade 15–30 mm wide 1. *O. sarmentosus*
 - 9b. Stem covered with greenish to grayish sheaths; leaf blade 4–8 mm wide 5. *O. sylvicola*
 - 8b. Anthers 6–7 mm, slightly shorter than or nearly as long as tepals.
 - 10a. Anthers free; tepals spreading 3. *O. tienensis*
 - 10b. Anthers connate; tepals revolute 4. *O. heterandrus*
 - 6b. Leaves basally attenuate, indistinctly petiolate or subsessile.
 - 11a. Inflorescence densely 110–180-flowered; anthers connate, ca. 1/2 as long as style 8. *O. multiflorus*
 - 11b. Inflorescence laxly several to 60-flowered; anthers free, slightly shorter than or equaling style.
 - 12a. Bracts nearly as long as pedicels.
 - 13a. Leaves 3–4 mm wide; pedicels articulate near middle 7. *O. reptans*
 - 13b. Leaves 7–16 mm wide; pedicels articulate proximally.
 - 14a. Scape and inflorescence (20–)30–45 cm; bracts linear-lanceolate 10. *O. motouensis*
 - 14b. Scape and inflorescence ca. 12 cm; bracts ovate to ovate-lanceolate 11. *O. menglianensis*
 - 12b. Bracts much longer than pedicels.
 - 15a. Tepals white, 7.5–9 mm 6. *O. yunnanensis*
 - 15b. Tepals purplish, 2.5–7 mm.
 - 16a. Tepals ca. 2.5 mm; pedicel 2–3 mm 9. *O. tsaii*
 - 16b. Tepals 4.8–7 mm; pedicel 6–9 mm.
 - 17a. Plants to 70 cm tall; tepals 4.8–5 mm 12. *O. jiangchengensis*
 - 17b. Plants less than 40 cm tall; tepals ca. 7 mm 13. *O. albimarginatus*
 - 2b. Stem indistinct or rhizomelike, with dense nodes; leaves somewhat crowded, densely scattered, or tufted.
 - 18a. Stem rhizomelike, with dense nodes; leaves subterminal, somewhat crowded or densely arranged.
 - 19a. Plants stoloniferous.
 - 20a. Anthers free; leaves 8–24 mm wide; pedicel 3–4 mm 16. *O. amblyphyllus*

- 20b. Anthers connate; leaves 3–7 mm wide; pedicel 8–10 mm 17. *O. angustifolius*
- 19b. Plants not stoloniferous.
- 21a. Roots somewhat stiltlike, straight, 3–5 mm thick, stiff, ± woody, glabrescent.
- 22a. Leaves 4–6 mm wide; pedicel shorter than tepals 18. *O. fooningensis*
- 22b. Leaves at least partly more than 10 mm wide; pedicel longer than tepals.
- 23a. Pedicel much longer than bracts, articulate proximally; inflorescence 5–6 cm 19. *O. platyphyllus*
- 23b. Pedicel shorter than or equaling bracts, articulate distally; inflorescence 10–20 cm 20. *O. latifolius*
- 21b. Roots not stiltlike, 1–2.5 mm thick, soft, not woody, usually densely hairy.
- 24a. Anthers free.
- 25a. Leaves 2–3 mm wide; flowers solitary 27. *O. lushuiensis*
- 25b. Leaves (4–)7–14 mm wide; at least some flowers paired.
- 26a. Bract at base of inflorescence 2–4 cm; style ca. 7 mm 21. *O. grandis*
- 26b. Bract at base of inflorescence 5–7 mm; style ca. 2.5 mm 22. *O. mairei*
- 24b. Anthers connate.
- 27a. Anthers 6.5–7 mm; flowers all solitary 28. *O. szechuanensis*
- 27b. Anthers 2.5–3(–4.5) mm; at least some flowers paired.
- 28a. Bract at base of inflorescence much shorter than pedicels 26. *O. sinensis*
- 28b. Bract at base of inflorescence nearly as long as or much longer than pedicels.
- 29a. Filaments ca. 1 mm; bract at base of inflorescence nearly as long as pedicels 24. *O. stenophyllus*
- 29b. Filaments indistinct; bract at base of inflorescence much longer than pedicels 25. *O. bockianus*
- 18b. Stem indistinct; leaves basal or nearly so, tufted.
- 30a. Leaves oblong to oblanceolate, distinctly petiolate.
- 31a. Plants stoloniferous; filaments ca. 2 mm; pedicel articulate near apex 30. *O. clavatus*
- 31b. Plants not stoloniferous; filaments less than 1 mm; pedicel articulate proximally or near middle.
- 32a. Leaves with pinnate-parallel venation, 4(–6) lateral veins running from midvein, margin ± wrinkled 29. *O. peliosanthoides*
- 32b. Leaves with parallel venation, veins running from base, margin not wrinkled.
- 33a. Roots somewhat stiltlike, straight, 3–5 mm thick, stiff, ± woody, not hairy 35. *O. xylorrhizus*
- 33b. Roots not stiltlike, 1–2 mm thick, soft, not woody, usually hairy.
- 34a. Inflorescence a raceme, several flowered; flowers solitary; tepals 8–11 mm; anthers ca. 6 mm 31. *O. pingbienensis*
- 34b. Inflorescence a reduced panicle, 10–35-flowered; at least some flowers in clusters of 2 or 3; tepals 4–8 mm; anthers 3–4 mm.
- 35a. Tepals oblong-lanceolate, ca. 8 mm; style ca. 8 mm 34. *O. marmoratus*
- 35b. Tepals ovate to oblong, 4–5 mm; style 3.5–5 mm.
- 36a. Tepals reflexed distally, white; anthers connate; leaves 1–2.2 cm wide, papery 33. *O. pseudotonkinensis*
- 36b. Tepals erect, purplish; anthers free; leaves 2.5–3.5(–4.2) cm wide, leathery 32. *O. tonkinensis*
- 30b. Leaves grasslike or linear, indistinctly petiolate or sessile.
- 37a. Plants stoloniferous.
- 38a. Tepals 7–8 mm; filaments distinct, ca. 1.5 mm, ca. 1/3 as long as anthers 46. *O. clarkei*
- 38b. Tepals 4–6 mm; filaments very short or indistinct.
- 39a. Style terete, slender, basally not widened; tepals ± spreading; scape and inflorescence usually slightly shorter than leaves 44. *O. bodinieri*
- 39b. Style somewhat narrowly conical, moderately thick, basally widened; tepals scarcely spreading; scape and inflorescence usually much shorter than leaves 45. *O. japonicus*
- 37b. Plants not stoloniferous.
- 40a. Rhizome gingerlike, ca. 3 cm thick, fleshy 36. *O. zingiberaceus*
- 40b. Rhizome not gingerlike, much thinner.
- 41a. Leaves 1–1.5 mm wide 43. *O. umbraticola*
- 41b. Leaves (2–)3–25 mm wide.
- 42a. Plants basally ± purple-brown; roots yellow-brown hairy; bracts at middle of inflorescence more than 1 cm 37. *O. megalanthus*
- 42b. Plants basally not purple-brown; roots whitish hairy; bracts at middle of inflorescence less than 1 cm.
- 43a. Anthers 3–4 mm, ca. 1/2 as long as tepals.
- 44a. Style basally widened, without a clear line of demarcation between ovary and style 42. *O. reversus*
- 44b. Style not basally widened, terete, with a clear line of demarcation between ovary and style 41. *O. intermedius*
- 43b. Anthers 7–8 mm, ca. 2/3 as long as or equaling tepals.

- 45a. Filaments very short or indistinct; tepals revolute; pedicels articulate near base 38. *O. revolutus*
45b. Filaments distinct, 1–2 mm; tepals spreading; pedicels articulate near or above middle.
46a. Leaves 10–15 mm wide, white streaked abaxially; flowers in clusters of 2–4; anthers free 39. *O. corifolius*
46b. Leaves 4–7(–9) mm wide, not streaked abaxially; flowers solitary; anthers initially connate, later free 40. *O. sparsiflorus*

1. *Ophiopogon sarmentosus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 251. 1978.

匍茎沿阶草 pu jing yan jie cao

Stem prostrate, elongate, 3–4 mm thick, slender, with spaced nodes, covered with purple-brown or deep brown, membranous sheaths. Leaves cauline, in distant tufts, 5 or 6 per tuft; petiole 4–11 cm; leaf blade glaucous abaxially, oblong to oblong-elliptic, 5–10 × 1.5–3 cm, apex subacute. Scape arising from an apical leaf axil, 7–10 cm. Inflorescence a raceme, 5- or 6-flowered; bracts lanceolate, basal one 7–10 mm. Flowers solitary; pedicel 7–10 mm, articulate proximally. Tepals purplish, lanceolate to ovate, 7–8 × 2–4 mm. Filaments very short; anthers free, ca. 4 mm. Style nearly exceeding perianth, slender. Seeds ellipsoid, ca. 8 mm in diam. Fl. Aug, fr. Sep–Oct. $2n = 36^*$.

• Dense tropical forests, evergreen broad-leaved forests, river banks; 1000–2700 m. NW Guangxi (Tian'e Xian), S Yunnan [?Vietnam].

This species probably also occurs in Vietnam: one locality is on the border between Yunnan and Vietnam.

2. *Ophiopogon dracaenoides* (Baker) J. D. Hooker, Fl. Brit. India 6: 268. 1892.

褐鞘沿阶草 he qiao yan jie cao

Flueggea dracaenoides Baker, J. Bot. 12: 174. 1874;
Mondo dracaenoides (Baker) Farwell.

Stem suberect, elongate, covered with grayish brown sheaths, sometimes with several stilllike, woody roots near base. Leaves in distant tufts, 4–7 per tuft; petiole 2–7 cm; leaf blade oblong to oblong-oblancoate, 5.5–14 × 1.8–3.5 cm. Scape arising from an apical leaf axil, 8–12 cm. Inflorescence a reduced panicle, 10–25-flowered; bracts ovate-lanceolate, basal one 0.8–1.2 cm. Flowers solitary or in clusters of 2 or 3; pedicel 4–6 mm, articulate at middle. Tepals white, lanceolate to ovate-lanceolate, 4–6 × 1.5–2.5 mm. Filaments very short; anthers ca. 2.5 mm. Style slightly or scarcely exceeding perianth. Seeds broadly ellipsoid, ca. 1.2 cm in diam. Fl. Aug, fr. Sep–Oct. $2n = 36^*$.

Evergreen broad-leaved forests, bamboo forests, moist places in forests, hillsides along ravines; 200–1800 m. W Guangxi, Guizhou, S Yunnan [NE India, Laos, Sikkim, N Thailand, Vietnam].

3. *Ophiopogon tienensis* F. T. Wang & Tang, Bull. Fan Mem. Inst. Biol. 7: 283. 1937.

云南沿阶草 yun nan yan jie cao

Ophiopogon lancangensis H. Li & Y. P. Yang.

Stem prostrate, elongate, 2–4 mm thick, with some aerial roots. Leaves in distant tufts, 3–9 per tuft; petiole (5–)8–18 cm;

leaf blade abaxially glaucous, lanceolate to oblong-lanceolate, 7–20 × 0.8–1.5 cm, ca. 11-veined, apex acute or acuminate. Scape arising from an apical leaf axil, 7–12 cm. Inflorescence a raceme, several to 20-flowered; bracts ovate to ovate-lanceolate, 3–12 mm, membranous. Flowers solitary; pedicel 6–10 mm, articulate proximally. Tepals chalk white, ovate to ovate-lanceolate, 8–9 × 2.5–3 mm. Filaments ca. 1 mm; anthers free, 6–7 mm. Style nearly as long as anthers. Seeds ellipsoid, 8–10 mm in diam. Fl. May–Jun, fr. Jul–Aug. $2n = 36^*$.

• Mixed forests, bamboo forests; 1700–2500 m. Guangxi, Yunnan.

4. *Ophiopogon heterandrus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 251. 1978.

异药沿阶草 yi yao yan jie cao

Stem prostrate, elongate, 2–3 mm thick, covered with grayish, membranous sheaths, proximally with some aerial roots. Leaves in distant tufts, 2–4 per tuft; petiole 5–8 mm; leaf blade abaxially glaucous, oblong to narrowly so, 4.5–6.5 × 1–1.6 cm, ca. 7-veined. Scape arising from an apical leaf axil. Inflorescence a raceme, 3- or 4-flowered; bracts lanceolate, basal one 3–4 mm. Flowers solitary; pedicel 6–8 mm, articulate at or below middle. Tepals revolute, white, lanceolate, 7–8 × 1.5–2.5 mm. Filaments very short; anthers lanceolate, ca. 7 mm, connate to form a cone. Style slightly longer than anthers. Fl. Jul.

• Forests; 1200–1700 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan.

5. *Ophiopogon sylvicola* F. T. Wang & Tang, Bull. Fan Mem. Inst. Biol. 7: 281. 1937.

林生沿阶草 lin sheng yan jie cao

Ophiopogon dielsianus Handel-Mazzetti.

Stem elongate, 3–4 mm thick, covered with grayish sheaths, proximally with some aerial roots. Leaves in distant tufts, 5–8 per tuft; petiole 1.5–5(–10) cm; leaf blade abaxially glaucous, narrowly oblanceolate to linear-lanceolate, 5–20(–30) cm × 4–8 mm, 5–7-veined. Scape arising from an apical leaf axil. Inflorescence a raceme, 4–10-flowered; bracts lanceolate, basal one 6–8 mm. Flowers solitary; pedicel 4–6 mm, articulate proximally. Tepals bluish, ovate, ca. 5 × 2.5–3 mm. Filaments ca. 0.5 mm; anthers ca. 2 mm. Style ca. 2 × as long as anthers, slender. Fl. Jun. $2n = 36^*$.

• Broad-leaved forests, scrub forests, streamsides, moist and shady places, cliffs; 700–1800 m. N Guizhou, S Sichuan.

6. *Ophiopogon yunnanensis* S. C. Chen, Acta Phytotax. Sin. 26: 140. 1988.

滇西沿阶草 dian xi yan jie cao

Stem elongate, subterete, 5–7 mm thick, covered with gray-

ish sheaths, with some aerial roots. Leaves in distant tufts 3–4 cm apart, 9–11 per tuft, sessile, long linear, 40–50 cm × 5–9 mm, base somewhat equitant, margin membranous. Scape arising from an apical leaf axil, 17–22 cm. Inflorescence a reduced panicle, more than 10-flowered; bracts lanceolate to linear-lanceolate, 1–2 cm. Flowers paired, rarely also solitary; pedicel much shorter than the bracts, articulate proximally. Tepals white, oblong to subovate, 7.5–9 × 3–5 mm, inner ones slightly wider than outer. Filaments very short; anthers ca. 5 mm. Style slightly exceeding anthers, slender. Fl. Jun.

- Forests along rivers; 1700–2200 m. W Yunnan (Lushui Xian).

7. *Ophiopogon reptans* J. D. Hooker, Fl. Brit. India 6: 268. 1892.

蔓茎沿阶草 man jing yan jie cao

Mondo dracaenoides (Baker) Farwell var. *reptans* (J. D. Hooker) Farwell.

Stem prostrate, elongate, sometimes with a few somewhat stiltlike roots. Leaves in distant tufts, subsessile, abaxially glaucous, long linear, 10–15 cm × 3–4 mm, ca. 5-veined, margin membranous at base. Scape arising from an apical leaf axil, 4–8 cm, slender. Inflorescence a reduced panicle, several flowered; bracts ovate-lanceolate, 4–6 mm, membranous. Flowers solitary or paired; pedicel 5–8 mm, articulate near middle. Tepals greenish yellow, lanceolate, 5–6 × 1.5–2 mm. Filaments very short; anthers ca. 3 mm. Style nearly as long as anthers. Seeds subglobose, 4–5 mm in diam. Fl. Jun–Jul, fr. Aug. $2n = 36$.

Forests, sandy soil along streams; 1300–1800 m. SW Guangxi, Hainan [India, Thailand, Vietnam].

8. *Ophiopogon multiflorus* Y. Wan, Guihaia 8: 235. 1988.

隆安沿阶草 long an yan jie cao

Stem prostrate, distally ascending, elongate, 1–2 cm thick, with a few woody roots. Leaves in distant tufts, indistinctly petiolate, abaxially longitudinally grayish streaked, grasslike, 35–80 × 1.3–2.6 cm, base attenuate, margin membranous. Scape 1 (or 2) arising from apical leaf axils. Inflorescence a reduced panicle, densely 110–180-flowered; bracts ovate-lanceolate to lanceolate, basal one 2–3(–5) cm. Flowers usually in clusters of 2–6; pedicel 1.2–1.8 cm, articulate near middle. Tepals recurved, purplish blue, ovate, ca. 6 × 2.5 mm. Filaments very short; anthers 2.5–3 mm, connate. Style ca. 5 mm. Seeds ellipsoid, ca. 13 × 9 mm. Fl. Oct, fr. Nov.

- Forests on rocky slopes. WC Guangxi (Long'an Xian).

9. *Ophiopogon tsaii* F. T. Wang & Tang, Bull. Fan Mem. Inst. Biol. 7: 282. 1937.

簇叶沿阶草 cu ye yan jie cao

Stem prostrate, distally ascending, elongate, ca. 4 mm thick, covered with grayish brown sheaths, proximally with some white-hairy roots. Leaves in distal tufts, 8–12 per tuft, sessile, grasslike, 4–35 cm × 4–6 mm, margin membranous at base. Scape arising from an apical leaf axil, 13–19 cm. Inflorescence a reduced panicle, 10–25-flowered; bracts setiform, ca. 1 cm, basal one to 3.5 cm. Flowers solitary or in clusters of 2–4; pedi-

cel 2–3 mm. Tepals purplish, oblong to subelliptic, ca. 2.5 × 1.5 mm. Filaments short; anthers ca. 2 mm. Style ca. 3 mm, slender. Seeds ellipsoid to globose, 8–10 mm in diam. Fl. Jun–Jul, fr. Aug–Oct. $2n = 36^*$.

- Forests, hillsides along ravines; 800–1800 m. S Yunnan.

10. *Ophiopogon motouensis* S. C. Chen, Acta Phytotax. Sin. 17(4): 111. 1979.

墨托沿阶草 mo tuo yan jie cao

Stem prostrate, distally usually suberect, occasionally branched, elongate, 10–30 cm × 4–8 mm, covered with purplish brown sheaths. Leaves in distant tufts 5–10 cm apart, usually 4–8 per tuft, sessile, long linear, 40–60 × 0.7–1.2 cm, 9–15-veined, base somewhat distichous equitant, margin purplish brown at base. Scape arising from an apical leaf axil, (20–)30–45 cm. Inflorescence a reduced panicle, more than 10-flowered; rachis slightly flat and narrowly 2-winged; bracts linear-lanceolate, 5–9 mm. Flowers usually paired; pedicel 5–9 mm, articulate proximally. Tepals white, narrowly ovate to oblong-lanceolate, 8–9 × 1.5–3 mm. Filaments very short; anthers 6–7 mm. Style 6–8 mm, slender. Fl. Aug.

- Forests, shady places; 800–1700 m. SE Xizang (Mêdog Xian).

11. *Ophiopogon menglianensis* H. W. Li, Acta Bot. Yunnan. 13: 268. 1991.

勐连沿阶草 meng lian yan jie cao

Stem ± prostrate, elongate, subterete, 5–7 mm thick, covered with sheaths and with a few roots. Leaves in distant tufts 4–5 cm apart, 7–9 per tuft, sessile, adaxially green, abaxially glaucescent, long linear, 28–40 × (0.7–)1–1.6 cm, base somewhat distichous equitant, margin membranous at base, apex acuminate. Scape arising from an apical leaf axil, ca. 6 cm, slightly compressed, wingless. Inflorescence a reduced panicle, ca. 6 cm; bracts ovate to ovate-lanceolate, 5–7 mm, base ca. 5 mm wide, apex acuminate to long acuminate. Flowers often in clusters of 3 or 4; pedicel less than 8 mm, articulate proximally. Tepals white, subovate, ca. 7 × 3 mm.

• Forests; ca. 1000 m. SW Yunnan (Menglian Dai-Lahu-Va Zu Zizhixian).

12. *Ophiopogon jiangchengensis* Y. Y. Qian, Acta Bot. Austro Sin. 7: 14. 1991.

江城沿阶草 jiang cheng yan jie cao

Stem erect, rarely prostrate, elongate, 2.5–4 mm thick, covered with sheaths and with a few woody, striate, densely pubescent roots 3–4 mm thick. Leaves in distant tufts 5–7 cm apart, 4–14 per tuft, indistinctly petiolate (petiole 1–10 cm), adaxially deep green, abaxially gray-green or whitish streaked, long linear, 5–35 cm × 4–8(–11) mm, papery, base attenuate, sheathing, margin membranous at base, apex acuminate. Scape arising from an apical leaf axil, deep violet, 8–20 cm, slightly compressed, furrowed. Inflorescence a reduced panicle, 4–12 cm, 20–60-flowered; bracts ovate-lanceolate, basal one 1–2 cm. Flowers in clusters of 2–5, campanulate, 8–11 mm in diam.; pedicel 6–8 mm, articulate near middle. Tepals pale violet, ovate, 4.8–5 × 3–3.2 mm, apex slightly revolute. Filaments 0.2–

0.3 mm; anthers narrowly ovate-deltoid, 3.5–4 × ca. 1.5 mm, free. Style 4–4.5 mm. Seeds pale violet at maturity, ellipsoid, 7–10 × 5–7 mm. Fl. Aug–Sep, fr. Oct–Feb.

• Forests; 300–1300 m. S Yunnan (Jiangcheng Hani-Yi Zu Zhi-xian).

This species is similar to *Ophiopogon siamensis* M. N. Tamura (Acta Phytotax. Geobot. 49: 27. 1998), from N Thailand, but differs in having longer bracts and shorter filaments and style. *Ophiopogon siamensis* has bracts less than 1 cm, filaments 0.7–1.1 mm, and style 5–5.4 mm. Further studies are needed to ascertain whether or not these two species are really distinct.

13. *Ophiopogon albimarginatus* D. Fang, J. Trop. Subtrop. Bot. 6: 97. 1998.

白边沿阶草 bai bian yan jie cao

Stem prostrate proximally and erect distally, or wholly decumbent, elongate, terete, 13–22 cm × 2–5 mm, covered with sheaths and with a few roots (1–)2–3 mm thick. Leaves in distant tufts, indistinctly petiolate, long linear to narrowly elliptic-linear, 14–30 cm × 6–11 mm, 5–9-veined, base slightly attenuate, apex acuminate. Scape arising from an apical leaf axil, slightly compressed, narrowly 2-winged. Inflorescence a reduced panicle, 4.5–6.5 cm, 14–18-flowered; bracts linear-lanceolate to narrowly ovate, basal one ca. 2 cm, base 3–5 mm wide, membranous. Flowers in clusters of 2 or 3; pedicel 6–9 mm, shorter than bracts, articulate proximally or near middle. Tepals reflexed distally, purple with white margin, narrowly ovate to lanceolate, ca. 7 × 2.3 mm, apex obtuse. Seeds broadly ellipsoid, 8–11 × 5–8 mm.

• Valley forests; ca. 300 m. E Guangxi (He Xian).

The present authors have not seen flowers of this species. Judging from the characteristics of the vegetative organs, it is similar to *Ophiopogon jiangchengensis*. Detailed observation of the flowers is necessary in order to ascertain whether or not the two species are really distinct.

14. *Ophiopogon chingii* F. T. Wang & Tang, Bull. Fan Mem. Inst. Biol. 7: 282. 1937.

长茎沿阶草 chang jing yan jie cao

Ophiopogon chingii var. *glaucifolius* F. T. Wang & L. K. Dai.

Stem prostrate, distally ± ascending, sometimes branched, elongate, 2–5 mm thick, proximally with stiff, somewhat woody roots. Leaves scattered, subsessile, abaxially glaucous, sword-shaped, 7–20 cm × 3–8(–20) mm, 5–9-veined, base clasping, margin membranous at base. Scape arising from a distal leaf axil, 8–15 cm. Inflorescence a reduced panicle, 5–10-flowered; bracts white, ovate to lanceolate, scarious, basal one ca. 6 mm. Flowers solitary or in clusters of 2–4; pedicel 6–12 mm, articulate proximally. Tepals white or purplish, oblong to ovate-oblong, ca. 5 × 2 mm. Filaments ca. 1 mm; anthers ca. 2 mm. Style 3–4 mm. Fl. May–Jul. $2n = 36^*$.

• Dense evergreen broad-leaved forests, bamboo forests, thickets, rocky and moist places; 700–2100 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan.

15. *Ophiopogon filipes* D. Fang, J. Trop. Subtrop. Bot. 6: 98. 1998.

丝梗沿阶草 si geng yan jie cao

Stem decumbent, elongate, terete, more than 19 cm × 3–5 mm, proximally with dense, residual sheaths. Leaves scattered distally on stem, sessile, long linear, 16–24 cm × 2.5–5 mm, 5- or 6-veined, base not attenuate, apex acuminate. Scape arising from an apical leaf axil, ca. 5 cm. Inflorescence a reduced panicle, ca. 12 cm, ca. 60-flowered; bracts pale green, linear-lanceolate to narrowly deltoid, basal one ca. 6 cm, base ca. 2 mm wide. Flowers in clusters of 2–4; pedicel filiform, 13–15 mm, articulate distally. Tepals salmon pink, ovate to narrowly so, ca. 3.5 × 2–2.5 mm, apex obtuse. Filaments very short; anthers narrowly ovate, ca. 2.5 mm, free. Style ca. 4 mm. Fl. Oct.

• Limestone hills. SW Guangxi (Daxin Xian).

16. *Ophiopogon amblyphyllus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 251. 1978.

钝叶沿阶草 dun ye yan jie cao

Stem rhizomelike, terete, elongate, stout, with dense nodes and several creeping stolons. Leaves nearly crowded and subterminal; petiole 3–6 cm; leaf blade abaxially glaucous, oblanceolate-oblong to suboblanceolate, 6–8 × 0.8–2.4 cm, apex subrounded or obtuse. Scape 9–15 cm. Inflorescence a raceme or a reduced panicle, 5–8 cm, several to 15-flowered; bracts lanceolate, basal one 5–8 mm. Flowers solitary or rarely paired; pedicel 3–4 mm, articulate near middle. Tepals purple, ovate, ca. 4 × 2 mm. Filaments short, less than 1 mm; anthers ca. 1.5 mm. Style ca. 3 mm. Seeds ellipsoid, ca. 9 mm. Fl. Jul, fr. Aug–Sep. $2n = 108^*$.

• Forests, shady and humid places, hillsides; 1600–2200 m. S Sichuan, NW Yunnan.

17. *Ophiopogon angustifolius* (F. T. Wang & Tang) S. C. Chen, Acta Phytotax. Sin. 26: 141. 1988.

短药沿阶草 duan yao yan jie cao

Ophiopogon bockianus Diels var. *angustifolius* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

Stem rhizomelike, elongate, subterete, 4–6 mm thick, stout, with dense nodes, stoloniferous. Leaves nearly crowded and subterminal, long linear, 15–25 cm × 3–7 mm. Scape 5–15 cm. Inflorescence a raceme, usually 3–6-flowered; bracts lanceolate, 6–9 mm. Flowers solitary; pedicel 8–10 mm, articulate near middle. Tepals subovate, 7–8 × 3–3.5 mm. Filaments very short; anthers 3.5–4 mm, connate to form a cone. Style 6–7.5 mm, slender. Seeds globose, 5–7 mm. Fl. Jul–Aug, fr. Sep–Oct. $2n = 36^*$, 72^* .

• Dense forests, mossy forests, hillsides, valleys, stream banks, moist and shady places; 800–3200 m. Guangxi, Guizhou, Hubei, Hunan, Sichuan, NW Yunnan (Weixi Xian).

18. *Ophiopogon fooningensis* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

富宁沿阶草 fu ning yan jie cao

Stem rhizomelike, elongate, stout, with dense nodes, usually with somewhat woody, white-hairy roots. Leaves somewhat crowded and subterminal, abaxially slightly glaucous,

grasslike, 30–50 cm × 4–6 mm, 7–9-veined, margin serrulate, white membranous at base. Scape arising from an apical leaf axil, much shorter than leaves. Inflorescence a reduced panicle, 10–22-flowered; bracts ovate-lanceolate to lanceolate, basal one ca. 6 mm. Flowers solitary or paired; pedicel ca. 4 mm, articulate distally. Tepals purplish, oblong to ovate-lanceolate, ca. 6 × 2 mm. Filaments distinct, ca. 1 mm; anthers ca. 4 mm. Style ca. 4.5 mm, slender. Fl. May. $2n = 36^*$.

- Evergreen broad-leaved forests; 1000–1600 m. SE Yunnan.

One of us (Tamura) has never seen specimens of this species and, therefore, does not know the exact characteristics of the stem. If the stem is not rhizomelike and the leaves are not only tufted subterminally but also at distant nodes along the stem, then *Ophiopogon fooningensis* is similar to *O. siamensis* M. N. Tamura (Acta Phytotax. Geobot. 49: 27. 1998), from N Thailand. However, *O. fooningensis* flowers in May, whereas *O. siamensis* flowers in September and October.

19. Ophiopogon platyphyllus Merrill & Chun, Sunyatsenia 2: 211. 1935.

宽叶沿阶草 kuan ye yan jie cao

Ophiopogon hainanensis Masamune.

Stem rhizomelike, elongate, stout, with dense nodes and somewhat woody roots. Leaves somewhat crowded and subterminal, sessile, abaxially glaucous, linear-lanceolate, (24–) 40–55 × 1.8–2.2 cm, leathery, margin membranous at base. Scape 12–16 cm. Inflorescence a reduced panicle, ca. 6 cm, 20–26-flowered; bracts ovate, basal one ca. 7 mm. Flowers usually in clusters of 2–4; pedicel 7–9 mm, articulate proximally. Tepals white, lanceolate to narrowly so, ca. 7 × 1.5–2 mm. Filaments very short; anthers ca. 6 mm. Style ca. 6 mm. Seeds oblong, ca. 11 × 5 mm. Fl. May–Jun, fr. Jul–Aug.

- Forest, hillsides, stream banks; 600–1800 m. Guangdong, Guangxi, Hainan.

20. Ophiopogon latifolius L. Rodriguez, Bull. Soc. Bot. France 75: 998. 1928.

大叶沿阶草 da ye yan jie cao

Stem rhizomelike, elongate, stout, with dense nodes and somewhat woody roots. Leaves somewhat crowded and subterminal, sessile, grasslike, 55–100 × 1–2.7 cm, leathery. Scape 40–45 cm. Inflorescence a reduced panicle, 10–20(–25) cm, many flowered; bracts lanceolate to subulate, basal one 1–1.5 cm. Flowers in clusters of 3 or 4; pedicel ca. 1 cm, articulate distally. Tepals bluish, 5–6 mm, outer ones lanceolate, inner ones ovate. Filaments very short; anthers ca. 3 mm. Style longer than anthers, apically curved. Seeds subglobose. Fl. Aug. $2n = 36^*$.

- Forests, moist places along valleys; 100–1200 m. Guangxi, SE Yunnan [Vietnam].

21. Ophiopogon grandis W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 171. 1921.

大沿阶草 da yan jie cao

Stem rhizomelike, elongate, 4–10 mm thick, stout, with dense nodes and relatively slender, hairy roots. Leaves somewhat crowded and subterminal, grasslike, 25–55 cm × (4–)7–11

mm, 5–9-veined, margin distinctly denticulate, white membranous at base. Scape 15–20 cm. Inflorescence a reduced panicle, 7–8 mm, many flowered; bracts lanceolate to subulate, broadly membranous at margin, basal one 2–4 cm. Flowers usually paired; pedicel 3–5 mm, articulate near middle. Tepals white, ovate to ovate-lanceolate, 8–9 × 2–2.5 mm, inner ones slightly narrower than outer. Filaments distinct, ca. 1 mm; anthers 4–6 mm. Style ca. 7 mm. Seeds ellipsoid, ca. 9 mm in diam. Fl. Jun–Jul, fr. Aug–Sep.

- Forests; 1800–2800 m. Guizhou, Yunnan.

22. Ophiopogon mairei H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 78. 1910.

西南沿阶草 xi nan yan jie cao

Anemarrhena mairei (H. Léveillé) H. Léveillé.

Roots numerous, long, soft, usually with fusiform, tuberous part near tip. Stem rhizomelike, elongate, stout, with dense nodes. Leaves somewhat crowded and subterminal, sessile, abaxially glaucous, grasslike or sword-shaped, 20–40 × 0.7–1.4 cm, ca. 9-veined, margin serrulate, membranous at base. Scape 10–15 cm. Inflorescence a reduced panicle, 5–7 cm, densely many flowered; bracts subulate, basal one 5–7 mm. Flowers solitary or paired; pedicel 3–5 mm, articulate near middle. Tepals white to blue, ovate, 4–5 × 1.5–2 mm. Filaments ca. 0.5 mm; anthers ca. 2 mm. Style ca. 2.5 mm. Seeds bluish gray at maturity, ellipsoid to ovoid-globose, ca. 8 mm in diam. Fl. May–Jul, fr. Jul–Aug. $2n = 36^*$.

- Forests, ravines, moist and shady places; 800–2100 m. Guizhou, Hubei, Sichuan, Yunnan.

23. Ophiopogon hongjiangensis Y. Y. Qian, Acta Bot. Austro Sin. 9: 54. 1994.

新疆沿阶草 hong jiang yan jie cao

Roots numerous, ± long and thick. Stem not rhizomelike, short, with a few roots. Leaves in a single, subterminal tuft, grasslike; petiole 3–16 cm, winged; leaf blade adaxially deep green, abaxially glaucous, 15–60 cm × 7–13 mm, 11–15-veined, base attenuate, apex acute or obtuse. Scape 14–22 cm. Inflorescence a reduced panicle, 3–9 cm, 10–20-flowered; bracts ovate-lanceolate, basal one 0.8–1.4 cm. Flowers in clusters of 2–4, rarely solitary; pedicel 4–6 mm, articulate at middle or ± distally. Tepals white or pale purple, long ovate, 5–6 × 2–3 mm. Filaments ca. 0.5 mm; anthers pale green, lanceolate, 3–4 mm. Style 4–5 mm. Fl. Jul–Aug.

- Forests; ca. 1100 m. S Yunnan (Jiangcheng Hani-Yi Zu Zizhixian).

24. Ophiopogon stenophyllus (Merrill) L. Rodriguez, Bull. Mus. Hist. Nat. (Paris), sér. 2, 6: 95. 1934.

狭叶沿阶草 xia ye yan jie cao

Peliosanthes stenophylla Merrill, Philipp. J. Sci. 13: 134. 1918.

Stem rhizomelike, stout, with dense nodes and somewhat woody, densely hairy roots. Leaves somewhat crowded and subterminal, sessile, grasslike, 25–60 × (0.4–)0.7–1.3 cm, ca. 9-veined, margin serrulate, membranous at base. Scape 10–

30 cm. Inflorescence a reduced panicle, 4–14 cm, usually ca. 100-flowered; bracts lanceolate, basal one 0.8–1.5 cm. Flowers solitary or paired; pedicel 1–1.4 cm, articulate proximally or at middle. Tepals white or purplish, ovate to lanceolate, ca. 6 × 2.5–3 mm. Filaments ca. 1 mm; anthers ca. 3 mm, sometimes ± connate. Style ca. 5 mm. Seeds ellipsoid, ca. 1 cm in diam. Fl. Jul–Sep, fr. Oct–Nov. $2n = 36^*$.

• Dense forests; 900–2300 m. Guangdong, Guangxi, Hainan, S Jiangxi, SE Yunnan.

25. *Ophiopogon bockianus* Diels, Bot. Jahrb. Syst. 29: 254. 1900.

连药沿阶草 *lian yao yan jie cao*

Mondo bockianum (Diels) Farwell.

Roots 1–3 mm thick, white hairy, sometimes with tuberous part near tip. Stem rhizomelike, relatively short, more than 1 cm thick, with dense nodes. Leaves somewhat crowded and subterminal, subsessile, abaxially glaucous, suboblong, 20–30 (–80) × (0.7–)1.4–2.2 cm, margin serrulate, membranous at base. Scape 18–28 cm. Inflorescence a reduced panicle, 5–14 cm, more than 10-flowered; bracts lanceolate, basal one 1.2–1.5 cm. Flowers paired; pedicel 6–9 mm, articulate proximally. Tepals purplish, ovate, 6–7 × 2–3 mm, apex usually recurved or revolute. Filaments very short; anthers 2.5–3 mm, connate. Style ca. 5 mm. Seeds ca. 10 × 8 mm. Fl. Jun–Jul, fr. Aug. $2n = 36^*$.

• Forests, bamboo forests, hillsides along ravines, shady and humid places; 900–2100 m. Guangxi, NE Guizhou (Fanjing Shan), Hubei, Hunan, Sichuan, Yunnan.

26. *Ophiopogon sinensis* Y. Wan & C. C. Huang in Y. Wan, Acta Phytotax. Sin. 25: 398. 1987.

中华沿阶草 *zhong hua yan jie cao*

Stem rhizomelike, relatively short, ca. 1 cm thick. Leaves nearly crowded and subterminal, indistinctly petiolate, oblanceolate-oblong to suboblong, 23–35 × 3.2–4 cm, apex obtuse. Scape ca. 14 cm. Inflorescence a reduced panicle, ca. 5 cm, several flowered; bracts ovate, basal one 5–7 mm. Flowers solitary or paired; pedicel 1.2–1.5 cm, articulate proximally. Tepals white, tinged purplish at base, oblong, ca. 7 × 2.5 mm. Filaments very short; anthers ca. 4.5 mm, initially connate, later free. Style ca. 6 mm. Fl. Jul.

• Forests on limestone slopes; 1300–1400 m. Guangxi, SE Yunnan.

27. *Ophiopogon lushuiensis* S. C. Chen, Acta Phytotax. Sin. 26: 141. 1988.

泸水沿阶草 *lu shui yan jie cao*

Stem rhizomelike, 7–9 cm × ca. 5 mm, with dense nodes and slender roots. Leaves somewhat crowded and subterminal, sessile, long linear, 20–35 cm × 2–3 mm, margin membranous at base. Scape 10–15 cm. Inflorescence a raceme, 4–7 cm, 7–12-flowered; bracts lanceolate, basal one 1–1.5 cm. Flowers solitary; pedicel 3–4 mm, articulate at middle. Tepals oblong to ovate, 5–8 × 3–5 mm, inner ones slightly wider than outer. Filaments ca. 0.8 mm; anthers 3–4 mm. Style ca. 4 mm. Fl. May.

• Evergreen broad-leaved forests, moist and shady places; 1900–3000 m. W Yunnan (Lushui Xian).

28. *Ophiopogon szechuanensis* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

四川沿阶草 *si chuan yan jie cao*

Roots relatively slender, sometimes with fusiform, tuberous part near tip. Stem rhizomelike, stout, with dense nodes. Leaves somewhat crowded and subterminal, sessile, abaxially glaucous, grasslike, 25–60 cm × 5–11 mm, 5–9-veined, margin serrulate, membranous at base. Scape 13–26 cm. Inflorescence a raceme, 4–11 cm, several to many flowered; bracts lanceolate, basal one 0.8–1.6 cm. Flowers solitary; pedicel 7–9 mm, articulate proximally. Tepals purple or purplish red, ovate-lanceolate, 8–9 × 2–2.5 mm. Filaments very short; anthers 6.5–7 mm, connate to form a cone. Style ca. 7 mm, slender. Fl. Jun–Jul. $2n = 36^*$.

• Moist places in sparse forests, hillsides along streams; 1000–2000 m. Sichuan, Yunnan.

29. *Ophiopogon peliosanthoides* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

长药沿阶草 *chang yao yan jie cao*

Rhizome 1–2 cm. Roots slender, stiff, usually with fusiform or oblong, tuberous part near tip. Leaves basal or nearly so, tufted; petiole 10–35 cm; leaf blade abaxially glaucous, oblong, 10–15 × 3.2–3.8 cm, pinnate-parallel veined, with 4(–6) lateral veins running from midvein, margin ± wrinkled. Scape ca. 30 cm. Inflorescence a reduced panicle, ca. 13 cm, 20–25-flowered; bracts ovate, ca. 1 cm, margin membranous. Flowers solitary or in clusters of 2 or 3; pedicel 5–11 mm, articulate near middle. Tepals purple or white, lanceolate to narrowly so, 1–1.2 cm × 1.5–2.5 mm. Filaments very short; anthers ca. 8 mm. Style ca. 9 mm. Fl. May. $2n = 36^*$.

• Evergreen broad-leaved forests, bamboo forests, scrub forests, moist places in thickets; 1000–2100 m. Guangxi, SW Guizhou, SE Yunnan.

30. *Ophiopogon clavatus* C. H. Wright ex Oliver, Hooker's Icon. Pl. 24: t. 2582. 1895.

棒叶沿阶草 *bang ye yan jie cao*

Mondo clavatum (C. H. Wright ex Oliver) Farwell.

Plants stoloniferous; stolons with spaced nodes. Leaves basal, tufted; petiole 2.5–10 cm; leaf blade abaxially glaucous, narrowly oblong to suboblanceolate, 5–12 × 0.5–1.3 cm, 5–7-veined, base attenuate, apex subrounded or obtuse. Scape 7–11 cm. Inflorescence a raceme, 1–3(or 4)-flowered; bracts ovate, ca. 7 mm, margin membranous. Flowers solitary; pedicel 5–8 mm, articulate near apex. Tepals scarcely spreading, white, tinged purplish, suboblong, ca. 1.2 cm × 3–4.5 mm. Filaments ca. 2 mm; anthers ca. 7 mm. Style ca. 1 cm, slender. Seeds deep blue at maturity, ellipsoid, ca. 8 mm in diam. Fl. May–Jun, fr. Jul–Aug. $2n = 36^*$.

• Forests, sparse forests, hillsides along streams; 1000–1600 m. Guangdong, Guangxi, NE Guizhou (Fanjing Shan), Hubei, Hunan, Sichuan.

31. *Ophiopogon pingbienensis* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 251. 1978.

屏边沿阶草 ping bian yan jie cao

Stem very short, indistinct. Leaves basal, tufted; petiole 4–14 cm; leaf blade abaxially slightly glaucous, narrowly elliptic-oblong, 5.5–9 × 1.5–2 cm, base attenuate, apex acute. Scape 6–10 cm. Inflorescence a raceme, several flowered; bracts ovate to ovate-lanceolate, 6–8 mm. Flowers solitary; pedicel 4–6 mm, articulate at middle. Tepals oblong-lanceolate to narrowly oblong, 8–11 × 2.5–3.5 mm. Filaments ca. 1 mm; anthers ca. 6 mm. Style ca. 7 mm, slender. Fl. May. $2n = 36^*$.

• Dense forests; 1800–2000 m. SE Yunnan (Pingbian Miao Zu Zizhixian).

32. *Ophiopogon tonkinensis* L. Rodriguez, Bull. Soc. Bot. France 75: 998. 1928.

多花沿阶草 duo hua yan jie cao

Rhizome short, with densely white-hairy roots. Leaves basal, tufted; petiole (6–)10–20(–28) cm; leaf blade oblanceolate-oblong, 15–25 × 2.5–3.5(–4.2) cm, thickly leathery, apex acute or mucronate. Scape 15–24 cm. Inflorescence a reduced panicle, 9–12 cm, 15–35-flowered; bracts ovate to lanceolate, basal one 6–9 mm. Flowers usually in clusters of 2–4; pedicel 3–5 mm, articulate at middle. Tepals purplish, ovate to oblong, ca. 4 × 2 mm. Filaments ca. 1 mm; anthers ca. 3 mm. Style 3–4 mm, slender. Seeds ellipsoid to globose, ca. 9 mm in diam. Fl. Sep, fr. Oct–Nov. $2n = 36^*$.

Dense forests, scrub forests, thickets, open grassy slopes; 1000–1600 m. W Guangxi, SE Yunnan [Vietnam].

33. *Ophiopogon pseudotonkinensis* D. Fang, J. Trop. Subtrop. Bot. 6: 100. 1998.

拟多花沿阶草 ni duo hua yan jie cao

Rhizome ca. 2.5 × 1 cm, robust. Roots ca. 1.5 mm thick. Leaves basal, tufted; petiole 4–8 cm; leaf blade usually narrowly elliptic-oblong, rarely linear, asymmetric, 13.5–27 × 1–2.2 cm, papery, 9–16-veined, base attenuate, apex ± obtuse. Scape ca. 5.5 cm, compressed. Inflorescence a reduced panicle, ca. 7 cm, ca. 30-flowered; bracts narrowly ovate, membranous, basal one ca. 7 mm, base ca. 3 mm wide. Flowers in clusters of 2 or 3; pedicel ca. 1 cm, articulate at middle. Tepals reflexed distally, white, ovate, ca. 5 × 3.5–4 mm, apex obtuse. Filaments very short; anthers ovate-oblong, ca. 3 mm, connate, apex subtruncate. Style ca. 5 mm. Fl. Sep.

• Limestone hillsides. NW Guangxi (Nandan Xian).

34. *Ophiopogon marmoratus* Pierre ex L. Rodriguez, Bull. Soc. Bot. France 75: 997. 1928.

丽叶沿阶草 li ye yan jie cao

Roots slender, soft. Leaves basal, tufted; petiole 8–12 cm; leaf blade narrowly oblong, 13–18 × 1.8–2.5 cm, distinctly ca. 7-veined, base attenuate, apex acute to shortly acuminate. Scape 15–30 cm. Inflorescence a reduced panicle, 10–13 cm, laxly 15–20-flowered; bracts ovate to broadly so, membranous, basal one ca. 1 cm. Flowers solitary or in clusters of 2 or 3; pedicel ca. 8

mm, articulate proximally. Tepals white, oblong-lanceolate, ca. 8 × 1.5–2.5 mm. Filaments very short; anthers ca. 4 mm. Style ca. 8 mm. Fl. Aug. $2n = 36^*$.

Dense forests along valleys. SW Guangxi, SE Yunnan [Cambodia, Laos, Thailand, Vietnam].

35. *Ophiopogon xylorrhizus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

木根沿阶草 mu gen yan jie cao

Roots somewhat stiltlike, straight, 3–5 mm thick, stiff, ± woody, not hairy. Leaves basal, tufted; petiole 7–9 cm; leaf blade suboblong, 11–16 × 3.2–4.2 cm, base attenuate, apex shortly acuminate. Scape ca. 10 cm. Inflorescence a reduced panicle, ca. 6 cm, more than 20-flowered; bracts ovate, 4–5 mm. Flowers solitary or in clusters of 2 or 3; pedicel ca. 3 mm, articulate at middle. Tepals bluish, ovate-lanceolate to lanceolate, ca. 5 × 2 mm. Filaments ca. 1 mm; anthers 2–2.5 mm. Style ca. 4 mm. Fl. Jun. $2n = 36^*$.

• Dense forests, rainforests, thickets, moist and shady places; 600–1200 m. S Yunnan.

36. *Ophiopogon zingiberaceus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 252. 1978.

姜状沿阶草 jiang zhuang yan jie cao

Rhizome gingerlike, ca. 3 cm thick, fleshy. Leaves basal, tufted, sessile, grasslike, 15–30 cm × 4–6 mm, 5–9-veined. Scape ca. 18 cm. Inflorescence a raceme, ca. 3 cm, more than 10-flowered; bracts linear, basal one ca. 7 mm. Flowers solitary; pedicel ca. 2.5 mm, articulate near middle. Tepals deltoid-ovate, ca. 4 mm (in slightly immature flowers). Filaments very short; anthers ca. 3 mm. Style ca. 3 mm. Fl. May–Jun. $2n = 36^*$.

• Mixed forests, bamboo forests, moist and shady places; 1400–3000 m. S Sichuan, N and SE Yunnan.

37. *Ophiopogon megalanthus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 253. 1978.

大花沿阶草 da hua yan jie cao

Plants basally ± purple-brown. Rhizome tuberous, thick. Roots densely yellow-brown tomentose when young. Leaves basal, tufted, sessile, grasslike, 25–60 × 0.8–1.5 cm, margin membranous at base, serrulate distally; leaf tufts surrounded by many linear-lanceolate sheaths. Scape 30–35 cm. Inflorescence a reduced panicle, 7–10 cm, 10–25-flowered; bracts lanceolate, slightly falcate, broadly membranous at margin, basal one 1.5–4 cm. Flowers in clusters of 2–4; pedicel 1–1.5 cm, articulate proximally. Tepals purplish red, 9–10 mm, outer ones ovate, inner ones lanceolate. Filaments very short; anthers ca. 5 mm. Style ca. 8 mm. Fl. Jul. $2n = 36^*$.

• Dense forests, scrub forests, thickets along streams; 1100–2800 m. S Yunnan.

38. *Ophiopogon revolutus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 253. 1978.

卷瓣沿阶草 juan ban yan jie cao

Roots slender, white hairy, sometimes with small,

tuberous part near tip. Leaves basal, tufted, indistinctly petiolate, abaxially glaucous, grasslike, 25–50 × 0.8–1.2 cm, base attenuate, margin serrulate; leaf tufts surrounded by broadly lanceolate sheaths. Scape 20–40 cm. Inflorescence a raceme or a reduced panicle, 8–23 cm, 10–24-flowered; bracts subulate, basal one 16–28 mm. Flowers solitary or sometimes paired; pedicel 7–9 mm, articulate near base. Tepals revolute, white or purplish, linear, ca. 9 × 1.5 mm. Filaments very short; anthers ca. 7 mm, slightly connate or free. Style ca. 8 mm, slender. Seeds ellipsoid, ca. 9 × 5 mm. Fl. and fr. Sep–Oct. $2n = 36^*$.

Rainforests, evergreen broad-leaved forests, dense or sparse forests; 500–1900 m. S Yunnan [Thailand].

Tanaka (in J. Jap. Bot. 74: 321–328. 1999) reduced *Ophiopogon revolutus* to the synonymy of *O. griffithii*. However, one of us (Tamura) prefers to maintain the former species and regard the latter as a synonym of the very variable *O. intermedius*.

39. *Ophiopogon corifolius* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 353. 1978.

厚叶沿阶草 hou ye yan jie cao

Roots slender, soft, white hairy. Leaves basal, tufted, indistinctly petiolate, abaxially glaucous and white streaked, grasslike, 38–60 × 1–1.5 cm, leathery, rigid, base attenuate, margin slightly recurved; leaf tufts ± surrounded by membranous sheaths. Scape ca. 22 cm. Inflorescence a reduced panicle, ca. 12 cm, many flowered; bracts purple-brown, subovate, basal one ca. 6 mm. Flowers usually in clusters of 2–4; pedicel 1–1.2 cm, articulate distally. Tepals purple, ca. 9 mm, outer ones linear, inner ones lanceolate. Filaments ca. 1 mm; anthers ca. 8 mm. Style ca. 9 mm, slender. Seeds ellipsoid, ca. 10 × 8 mm. Fl. Apr–May, fr. Jul–Aug.

- Dense forests; 1200–1400 m. Guangxi, SW Guizhou.

40. *Ophiopogon sparsiflorus* F. T. Wang & L. K. Dai in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 15: 253. 1978.

疏花沿阶草 shu hua yan jie cao

Roots slender, soft, densely white hairy. Leaves basal, tufted, indistinctly petiolate, abaxially glaucous, grasslike, 15–40 cm × 4–7(–9) mm, 5–9-veined, base attenuate; leaf tufts surrounded by membranous sheaths. Scape 13–28 cm. Inflorescence a raceme, 6–8 cm, several to 15-flowered; bracts lanceolate, basal one 7–8 mm. Flowers solitary; pedicel ca. 1 cm, articulate near middle. Tepals purplish, narrowly lanceolate, ca. 10 × 2.5–3 mm. Filaments ca. 2 mm; anthers ca. 7 mm, initially connate, later free. Style ca. 8 mm, slender. Fl. May.

- Forests, moist and shady places along streams; 800–1400 m. SW Guangdong, Guangxi.

41. *Ophiopogon intermedius* D. Don, Prodr. Fl. Nepal. 48. 1825.

间型沿阶草 jian xing yan jie cao

Flueggea dubia Kunth; *F. griffithii* Baker; *F. Jacquemontiana* Kunth; *F. japonica* (Linnaeus f.) Richard var. *intermedia* (D. Don) Schultes; *F. wallichiana* Kunth; *Mondo intermedium* (D. Don) L. H. Bailey; *M. japonicum* (Linnaeus f.) Farwell var.

griffithii (Baker) Farwell; *M. japonicum* var. *intermedium* (D. Don) Farwell; *M. japonicum* var. *wallichianum* (Kunth) Farwell; *M. scabrum* Ohwi; *M. wallichianum* (Kunth) L. H. Bailey; *Ophiopogon aciformis* F. T. Wang & Tang ex H. Li & Y. P. Yang; *O. compressus* Y. Wan & C. C. Huang; *O. griffithii* (Baker) J. D. Hooker; *O. japonicus* (Linnaeus f.) Ker Gawler var. *intermedius* (D. Don) Maximowicz; *O. longibracteatus* H. Li & Y. P. Yang; *O. longipedicellatus* Y. Wan & C. C. Huang; *O. wallichianus* (Kunth) J. D. Hooker; *O. xiaokuai* Z. Y. Zhu.

Roots sometimes with fleshy, tuberous part near tip. Rhizome short, thick. Leaves basal, tufted, sessile, grasslike, 15–55(–70) cm × 3–15 mm, 5–9-veined, base attenuate, margin usually serrulate; leaf tufts usually surrounded by brownish, membranous sheaths. Scape (15–)20–50 cm, sometimes slightly flattened and narrowly 2-winged. Inflorescence a reduced panicle, (2.5–)5–16 cm, many flowered; bracts subulate, linear, or lanceolate, basal one 1.5–4 cm. Flowers in clusters of 2 or 3 or sometimes solitary; pedicel 4–7 mm, articulate proximally or at middle. Tepals white or purplish, oblong, ovate, or ovate-lanceolate, 4–7 × 2–2.5 mm. Filaments very short; anthers 2–4 mm. Style 3–4 mm. Seeds ellipsoid. Fl. May–Aug, fr. Aug–Oct. $2n = 36^*$, 54, 68, 72*, 108*, 112.

Evergreen broad-leaved forests, mixed forests, bamboo forests, scrub, moist and shady places along streams, grassy slopes; 700–3000 m. Anhui, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Sikkim, Sri Lanka, Thailand, Vietnam].

Ophiopogon intermedius is a very variable species. *Ophiopogon griffithii*, reported by Yang and Li (Acta Bot. Yunnan., Suppl. 3: 82–83. 1990) from S Yunnan, seems to be conspecific with *O. intermedius*.

42. *Ophiopogon reversus* C. C. Huang, Fl. Hainan. 4: 534. 1977.

高节沿阶草 gao jie yan jie cao

Rhizome short. Leaves basal, tufted, sessile, long linear, 30–50 cm × 3–8 mm, (5–)7–9-veined, base attenuate, margin serrulate distally. Scape 18–25 cm, slightly flattened and minutely winged. Inflorescence a reduced panicle, 5–7 cm, many flowered; bracts deltoid to ovate, basal one to 2 cm. Flowers in clusters of 2 or 3 or solitary; pedicel curved, 5–10 mm, articulate distally. Tepals purple, or white tinged with purple, oblong-ovate, ca. 5 × 2 mm, 1-veined. Filaments short; anthers oblong. Style 5–6 mm, slender. Seeds purple-blue at maturity, ellipsoid or globose. Fl. and fr. Aug–Oct.

- Forests, hillsides along streams, moist places. Guangxi, Hainan.

43. *Ophiopogon umbraticola* Hance, J. Bot. 6: 115. 1868.

阴生沿阶草 yin sheng yan jie cao

Flueggea japonica (Linnaeus f.) Richard var. *umbraticola* (Hance) Baker; *Mondo umbraticola* (Hance) Ohwi; *M. japonicum* (Linnaeus f.) Farwell var. *umbraticola* (Hance) Farwell; *Ophiopogon japonicus* (Linnaeus f.) Ker Gawler var. *umbraticola* (Hance) C. H. Wright.

Rhizome short. Leaves basal, tufted, sessile, grasslike, 15–35(–50) cm × 1–2 mm, ca. 3-veined, margin serrulate. Scape ca.

30 cm. Inflorescence a reduced panicle, 8–16 cm, many flowered; bracts nearly subulate, basal one 6–8 mm. Flowers in clusters of 2 or 3 or solitary; pedicel ca. 1 cm, slender, articulate near middle. Tepals bluish, lanceolate to oblong, ca. 4×1.5 –2 mm. Filaments ca. 0.8 mm; anthers ca. 2 mm. Style ca. 1.2 mm in diam., longer than anthers, basally widened. Fl. Aug. $2n = 68^*$, 72^* .

• Forests, scrub, cliffs, streamsides, moist and shady places along valleys; 700–1000 m. N Guangdong, NE Guizhou (Fanjing Shan), Jiangxi, SE Sichuan (Jinfo Shan).

44. *Ophiopogon bodinieri* H. Léveillé, Mem. Pontif. Accad. Romana Nuovi Lincei 23: 343. 1905.

沿阶草 yan jie cao

Mondo bodinieri (H. Léveillé) Farwell; *M. formosanum* Ohwi; *Ophiopogon bodinieri* var. *pygmaeus* F. T. Wang & L. K. Dai; *O. filiformis* H. Léveillé; ?*O. lofouensis* H. Léveillé.

Plants stoloniferous. Roots slender, usually with tuberous part near tip. Leaves basal, tufted, sessile, grasslike, (5–)20–40 \times 1–4(–7) mm, margin serrulate. Scape (5–)15–35 cm. Inflorescence a reduced panicle, 1–7 cm, several to many flowered; bracts yellowish, linear, basal one ca. 7 mm. Flowers solitary or paired; pedicel 5–8 mm, articulate at middle. Tepals white, purplish, or yellowish, tinged reddish, ovate-lanceolate to suboblong, 4–6 \times 1.5–3 mm. Filaments 0.5–0.8 mm; anthers ca. 2.5 mm. Style 4–5 mm, slender. Seeds subglobose or ellipsoid, 5–6 mm in diam. Fl. Jun–Aug, fr. Aug–Oct. $2n = 36^*$, 108^* .

• Forests, scrub forests, thickets, hillsides along ravines, moist places on grassy slopes; 500–3600 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [?Bhutan].

The tuberous roots are used medicinally.

45. *Ophiopogon japonicus* (Linnaeus f.) Ker Gawler, Bot. Mag. 27: t. 1063. 1807.

麦冬 mai dong

Convallaria japonica Linnaeus f., Suppl. Pl. 204. 1782; *Anemarrhena cavaleriei* H. Léveillé, nom. illeg. (included *Ophiopogon stolonifer*); *C. japonica* var. *minor* Thunberg; *Flueggea japonica* (Linnaeus f.) Richard; *Mondo japonicum* (Linnaeus f.) Farwell; *M. stolonifer* (H. Léveillé & Vaniot) Farwell; *O. argyi* H. Léveillé; *O. chekiangensis* Koiti Kimura & Migo; *O. stolonifer* H. Léveillé & Vaniot; *Slateria japonica* (Linnaeus f.) Desvaux.

Plants stoloniferous. Roots moderately thick, usually with tuberous part near middle or tip. Leaves basal, tufted, sessile, grasslike, generally 10–50 cm \times 2–4 mm, 3–7-veined, margin serrulate. Scape 6–15(–27) cm, much shorter than leaves. Inflorescence a reduced panicle, 2–5 cm, several to more than 10-flowered; bracts lanceolate, basal one 7–8 mm. Flowers solitary or paired, usually nodding; pedicel 3–4 mm, articulate near middle. Tepals white or purplish, lanceolate, ca. 5×2 mm. Filaments very short; anthers 2.5–3 mm. Style somewhat narrowly conical, ca. 4 mm, moderately thick, basally widened. Seeds globose, 7–8 mm in diam. Fl. May–Aug, fr. Aug–Sep. $2n = 34^*$, 36^* , 67 , 68^* , 72^* , 108^* .

Forests, dense scrub in ravines, moist and shady places on slopes and along streams, cliffs; 200–2800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].

Widely cultivated in China for its tuberous roots, which are used medicinally.

46. *Ophiopogon clarkei* J. D. Hooker, Fl. Brit. India 6: 268. 1892.

长丝沿阶草 chang si yan jie cao

Mondo dracaenoides (Baker) Farwell var. *clarkei* (J. D. Hooker) Farwell.

Plants stoloniferous. Roots slender, usually with fusiform, tuberous part near middle or tip. Leaves basal, tufted, sessile, grasslike, 7–30 cm \times 2–3 mm, 5–7-veined, margin slightly serrulate. Scape 10–20 cm. Inflorescence a reduced panicle, 2–3 cm, 2–5-flowered; bracts lanceolate to narrowly ovate, basal one 6–7 mm. Flowers solitary or paired; pedicel 4–5 mm, articulate at or below middle. Tepals white, ovate to ovate-lanceolate, 7–8 \times 2.5–3.5 mm. Filaments ca. 1.5 mm; anthers ca. 4.5 mm. Style basally slightly widened. Fl. Jun–Jul. $2n = 36^*$, $?38$.

Forests, scrub forests, cliffs, streamsides; 2000–3500 m. E Xizang, NW Yunnan [Bhutan, NE India, Nepal, Sikkim].

47. *Ophiopogon paniculatus* Z. Y. Zhu, Guihaia 14: 206. 1994.

锥序沿阶草 zhui xu yan jie cao

Plants stoloniferous. Rhizome stout. Roots slender. Leaves basal, tufted, subsessile or indistinctly petiolate, grasslike, 12–33 \times 0.2–0.7 cm, 5–7-veined, base attenuate. Scape 15–20 cm. Inflorescence a panicle, 3–5 cm, many flowered; branches 5–7 mm, 2–4-flowered; bracts and bracteoles lanceolate to ovate-lanceolate, 5–7 mm. Pedicel 4–7 mm, articulate near apex. Tepals white, oblong to oblong-lanceolate, 5–6 \times 1.5–2 mm. Filaments indistinct; anthers lanceolate, 3.8–4.5 mm. Style 4–5 mm, slender. Fl. Jun–Jul.

• Slopes; ca. 1000 m. Sichuan.

