

Synopsis of Chinese *Kengia* (Poaceae)

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The generic name *Cleistogenes* is invalid because it is identical with the technical term “cleistogene”. According to Art. 20.2 of the current ICBN, *Kengia* Packer (tribe Eragrosteae, Poaceae) is the correct name for *Cleistogenes*. The present paper deals with the Chinese species of the genus. There are 18 species and 8 varieties of *Kengia* in China. Nine new combinations are proposed herein.

Key words: *Cleistogenes*, *Kengia*, nomenclature, taxonomy

Cleistogenes was erected by Keng (1934) typified by *C. serotina* (L.) Keng; it is considered to belong in the tribe Eragrosteae (Hubbard 1936). Packer (1960) argued the name *Cleistogenes* is invalid by its similarity to the technical term “cleistogene” according to Art. 68 of Paris' Code (Lanjouw 1960) (= Art. 20.2. of the current Code; Greuter *et al.* 2000). So a new name *Kengia* Packer was proposed to replace *Cleistogenes*. However, some authors (Bullock 1965, 1967, Bor 1970) concluded that *Cleistogenes* was valid because the term “cleistogene” is not Latin. Since then there has been a more or less equal usage of the names *Cleistogenes* (Chen 1962, Stace 1978, Tutin 1980, Wang 1983, 1986, Tan 1985, Li & Ni 1995, Wang *et al.* 2004) and *Kengia* (Istituto Botanico Boreali-Occidentali Academiae Sinicae 1976, Cope 1980, Clayton & Renvoize 1986, Koyama 1987, Xu 1997, 1999, Holub & Procházka 2000).

The spermatophyte committee had expressed in 1994 that *Cleistogenes* was not a valid name. Thus some names formerly placed under *Cleistogenes* need to be transferred to *Kengia*. Here

we propose to treat the Chinese species using the latter name.

Kengia Packer

Bot. Not. 113: 291. 1960. — *Cleistogenes* Keng, Sinensia 5: 147. 1934, *nom. inval.*, see Taxon 43: 123. 1994. — TYPE: *Kengia serotina* (L.) Packer.

Key to the Chinese species and varieties of *Kengia*

1. Lemma awnless or with a mucro of 0.5 mm long; the lower sheaths usually aggregate and forming thickened base of culm 2
1. Lemma awned; culms usually with pointed scaly shoots at base 8
2. Panicle diffuse, branches spreading 3
2. Panicle narrow, branches ascending obliquely 6
3. Sheaths longer than internodes; ligule ciliate 4
3. Sheaths usually shorter than internodes; ligule glabrous 9. *K. kokonorica*
4. Spikelets 4–10mm long, 3–6-flowered 5
4. Spikelets 10–14mm long, 5–8-flowered ... 5. *K. gracilis*
5. Lemmas oval–lanceolate; spikelets green or sometimes purplish 15. *K. songorica*

5. Lemmas lanceolate; spikelets yellowish brown or upside sometimes purplish 11. *K. mucronata*
6. Lowermost lemma 5–6 mm long; second glume 1-nerved 7
6. Lowermost lemma 4 mm long; second glume 3-nerved 18. *K. thoroldii*
7. Panicle 5–9 cm long, 2–5 cm wide; first glume 2–4 mm long, second 4–5 mm long
..... 13a. *K. ramiflora* var. *ramiflora*
7. Panicle 4–4.5 cm long, 1–1.5 cm wide; first glume 1.5–2 mm long, second 3–4 mm long
..... 13b. *K. ramiflora* var. *tianmushanensis*
8. Culms slender; panicle usually a few spikelets 9
8. Culms erect or slightly oblique; panicle usually many spikelets 11
9. Awn 2 mm long 17. *K. striata*
9. Awn 3–7 mm long 10
10. First lemma 5 mm long, with an awn 3–5 mm long
..... 16a. *K. squarrosa* var. *squarrosa*
10. First lemma 6 mm long, with an awn 7 mm long
..... 16b. *K. squarrosa* var. *longe-aristata*
11. Culms 0.5–1.5 mm thick; sheaths glabrous or the mouths villose; blades 1–4 mm wide 12
11. Culms 1–2.5 mm thick, sheaths usually villous-tomentose; blades 2–8 mm wide 21
12. Blades 1–2 mm wide; awn 1–3 mm long 13
12. Blades 2–6 mm wide; lowermost lemma mucronate, scarcely 1–3 mm long 17
13. Panicle narrow, base wrapped by sheaths
..... 8b. *K. kitagawai* var. *foliosa*
13. Panicle diffuse, panicle finally exerted 14
14. Spikelets 1–3-flowered; panicle branches shorter, 2–4 cm long 10. *K. longiflora*
14. Spikelets 3–7-flowered; panicle branches longer, 3–6 cm long 15
15. Second lemma 3–5.5 mm long 16
15. Second lemma 10 mm long 1. *K. andropogonoides*
16. First glume 3–4.5 mm long; lemmas 5-nerved
..... 3. *K. chinensis*
16. First glume 2 mm long; lemmas 3-nerved
..... 4. *K. festucea*
17. First glume 1–3 mm long, second 2–3.5 mm long 18
17. First glume 3–4 mm long, second 5 mm long
..... 8a. *K. kitagawai* var. *kitagawai*
18. Spikelets 5–7 mm long, 1–3-flowered 19
18. Spikelets 7–12 mm long, 3–7-flowered 20
19. Awn 0.5–1 mm long ... 2a. *K. caespitosa* var. *caespitosa*
19. Awn 1–3 mm long; culms more ramose at upper part
..... 2b. *K. caespitosa* var. *ramosa*
20. Spikelets not viviparous ... 14a. *K. serotina* var. *serotina*
20. Spikelets viviparous 14b. *K. serotina* var. *vivipara*
21. Awnless or awn 0.5–2 mm long 22
21. Awn 3–9 mm long 25
22. Spikelets 5–6 mm long
..... 6c. *K. hackeli* var. *brachychylla*
22. Spikelets 8–14 mm long 23
23. Sheaths glabrous or papillose-pilose 24
23. Sheaths villous-tomentose .. 7b. *K. hancei* var. *jeholensis*
24. Blades stiff, ascending obliquely; panicle narrow, base wrapped by sheaths 12. *K. polyphylla*

24. Blades thin, flat; panicle diffuse, finally exerted
..... 7a. *K. hancei* var. *hancei*
25. Spikelets 5–7 mm long; lowermost lemma 4–5 mm long, awn 2–5 mm long 6a. *K. hackeli* var. *hackeli*
25. Spikelets 7–12 mm long; lowermost lemma 5–7 mm long, awn 3–9 mm long 6b. *K. hackeli* var. *nakaii*

1. *Kengia andropogonoides* (Honda) Packer

Bot. Not. 113(3): 292. 1960. — *Cleistogenes andropogonoides* Honda, Rep. First Sci. Exped. Manch. 4, 4 (Index Fl. Jehol.): 98. 1936. — *Cleistogenes squarrosa* (Trin.) Keng subsp. *andropogonoides* (Honda) Vorosch., Byull. Mosk. Obsch. Ispyt. Prir., Biol. 95, 2: 91. 1990. — TYPE: China. Nei Mongol, Wudan City, Balin Bridge, 28.IX.1933 *Nakai*, *Honda & Kitag. s.n.* (holotype TI).

Culms densely tufted, 15–25 cm tall. Sheaths glabrous, aggregate. Blades 4–7 cm long, 1 mm wide, flat or involute towards tip. Panicle loose, 4–10 cm long, branches solitary. Spikelets 3-flowered, lanceolate, 7–10 mm long. First glume oblong, 3 mm long, hyaline-membranaceous, 3-nerved, second 10 mm long, narrow-lanceolate, 5-nerved. Lemma lanceolate, 4–7 mm long, with an awn 1–3 mm long.

DISTRIBUTION: China (Nei Mongol).

SELECTED SPECIMEN EXAMINED: **China.** Nei Mongol, Baotou City, 10.VIII.1956 *W. Z. Fang* 295 (NAS).

2. *Kengia caespitosa* (Keng) Packer

Bot. Not. 113(3): 292. 1960. — *Cleistogenes caespitosa* Keng, *Sinensia* 5: 154. 1934. — TYPE: China. Beijing, Wofu temple, dry hill-sides, 29.IX.1920 *N. H. Cowdry* 1003 (holotype NAS).

2a. *Kengia caespitosa* (Keng) Packer var. *caespitosa*

Culms tufted, erect, 30–40 cm tall, about 1 mm thick. Sheaths glabrous or mouths villous, lower ones aggregate and forming a thickened base of culm; ligule a ring of short hairs about 0.5 mm long. Blades firm, 2.5–7.5 cm long, 2–4 mm wide, flat or frequently involute towards tip. Panicle rather loose, 4–6 cm long, branches simple, 1–2.5 cm long, spreading at maturity.

Spikelets 1–3-flowered, 5–7 mm long. First glume 0.8–2 mm long, hyaline, often nerveless, second 1.5–4 mm long, 1-nerved. Lemmas 5-nerved, minutely 2-toothed, lowermost 4–5 mm long, with a mucro 0.5–1 mm long.

DISTRIBUTION: China (Nei Mongol, Ningxia, Gansu, Hebei, Shanxi, Shaanxi).

SELECTED SPECIMENS EXAMINED: **China.** Shaanxi Province, Suide City, 11.IX.1954 *Huanghe Team 818* (IBSC); Gansu Province, slopes, 27.IX.1954 *Z. B. Wang 17567* (IBSC); Shanxi Province, Datong City, grassland, 1040 m, 2.VIII.1953 *Shanxi Team 416* (KUN).

2b. *K. caespitosa* var. *ramosa* (F.Z. Li & C.K. Ni) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes caespitosa Keng var. *ramosa* F.Z. Li & C.K. Ni, Bull. Bot. Res. North-East. Forest. Univ. 15, 4: 433. 1995. — TYPE: China. Shandong Province, Jiaonan County, Dazhu mountain, 15.IX.1979 *H. B. Chen 131* (holotype SDNU).

Kengia caespitosa var. *ramosa* differs from *K. caespitosa* var. *caespitosa* by having ramose culms at the upper part; panicle extremely narrow, 3–5 mm wide; spikelets 5–6 mm long, 2–3-flowered; and an awn 1–3 mm long.

DISTRIBUTION: China (Shandong).

SELECTED SPECIMENS EXAMINED: **China.** Shandong Province, Jiaonan County, Dazhu mountain, 15.IX.1979 *H. B. Chen 131* (SDNU); Shandong Province, IX.1960 *Shan dong Normal University Practical Team 1254* (NAS).

3. *Kengia chinensis* (Maxim.) Packer

Bot. Not. 113 (3): 291. 1960. — *Diplachne serotina* (L.) Link var. *chinensis* Maxim., Bull. Soc. Nat. Mosc. 54: 70. 1879. — *Cleistogenes chinensis* (Maxim.) Keng, Sinensia 5: 152. 1934. — TYPE: Unknown.

Culms densely tufted, erect, about 30 cm tall. Sheaths glabrous or mouths villous, lower ones aggregate and forming a thickened base of culms. Blades 2.5–5 cm long, 1–2 mm wide, flat or involute towards tip. Panicle diffuse, 4–8 cm long, branches simple, 1–3.5 cm long. Spikelets 3–7-flowered, 4–8 mm long. First glume 3–4.5 mm, second 4–5.5 mm long, usually 1-nerved, acuminate. Lemmas 5-nerved, entire, lowermost 5–6 mm long, with an awn 1–2(3) mm long.

DISTRIBUTION: China (Nei Mongol, Ningxia, Qinghai, Xinjiang, Hebei, Shanxi, Shaanxi).

SELECTED SPECIMENS EXAMINED: **China.** Shanxi Province, Taiyuan City, 28.IX.1983 *Y. R. Lin 83-82* (IBSC); Xinjiang, Baluntai County, slopes, 1800m, 9.VIII. 1965 *T. Y. Zhou 651361* (IBSC); Hebei Province, Zhulu County, 29.VIII.1955 *C. Yang 1728* (NAS); Hebei Province, Lin City, 22.VIII.1954 *J. R. Xue 574* (N).

4. *Kengia festucacea* (Honda) Packer

Bot. Not. 113, 3: 292. 1960. — *Cleistogenes festucacea* Honda, Rep. First Sci. Exped. Manch. 4, 4 (Index Fl. Jehol.): 98. 1936. — TYPE: China. Liaoning Province, Jinzhou City, Chaoyang County, 9.VIII.1933 *Nakai, Honda & Kitagawa s.n.* (holotype TI).

Culms tufted, erect, 40–45 cm tall. Sheaths glabrous or mouths villous, usually longer than internodes. Blades involute, glabrous, 4–5 cm long. Panicle diffuse, 7–8 cm long, 1–1.5 cm wide, branches solitary, 2–5 cm long, spreading at maturity. Spikelets lanceolate, 7–9 mm long, 3–5-flowered. Glumes 1-nerved, glabrous, first 2 mm, second 4.5 mm long. Lowermost lemma lanceolate, 5 mm long, 3-nerved, with an awn 1.5 mm long.

DISTRIBUTION: China (Liaoning).

SPECIMENS EXAMINED: Known only from the type specimen.

5. *Kengia gracilis* (Keng ex Keng f. & L. Liou) Packer

Bot. Not. 113, 3: 293. 1960. — *Cleistogenes gracilis* Keng ex Keng f. & L. Liou, Acta Bot. Sinica 9: 69. 1960. — TYPE: China. Shaanxi Province, Wugong County, Zhangjiagang, 1940 *J. S. Tian s.n.* (holotype NAS).

Culms erect, gracile, many-noded, 30–75 cm tall, 1 mm thick. Sheaths longer than internodes, glabrous or mouths white villous; ligule ciliolate. Blades linear, involute, 1.5–7 mm long, 1–2.5 mm wide. Panicle diffuse, 5–12 cm long, branches solitary, sparse. Spikelets yellowish green or purplish, 10–14 mm long, 5–8-flowered. Glumes lanceolate, submembranaceous, 1-nerved, first 2–4 mm, second 3.5–5 mm long. Lemmas lanceolate, 5-nerved, lowermost 5 mm

long, with an awn 0.2 mm long.

DISTRIBUTION: China (Shannxi, Ningxia).

ADDITIONAL SPECIMEN EXAMINED: **China**. Shaanxi Province, Wugong County, Zhangjiagang, 1940 *J. S. Tian* (NAS).

6. *Kengia hackelii* (Honda) Packer

Bot. Not. 113, 3: 291. 1960. — *Diplachne hackelii* Honda, Fac. Sci. Univ. Tokyo 111. Bot. 3: 112. 1930. — *Cleistogenes hackeli* (Honda) Honda, Bot. Mag. Tokyo 1: 437. 1936. — *Cleistogenes hackeli* Keng, Sinensia 11: 409. 1940. — *Diplachne serotina* (L.) Link var. *aristata* Hack., Bull. Herb. Boiss. 7: 704. 1899. — TYPE: Japan. Hondo, Shirako, Musashi Prov., 1880 *Matsum. 4* (holotype TI).

6a. *K. hackelii* var. *hackelii*

Culms tufted, with pointed scaly shoots at base, 30–85 cm tall, 0.5–1 mm thick, many noded. Sheaths longer or shorter than internodes, usually papillose-pilose, mouths villous; ligule ciliate, 0.2–0.5 mm long. Blades 3–10 cm long, 2–(5)6 mm wide, flat or involute. Panicle diffuse, 4–10 cm long, base branch 3–5 cm long. Spikelets 5–7(9) mm long, 2–4-flowered. Glumes 1-nerved, first 1–2 mm, second 2–3 mm long. Lemmas 5-nerved, margins and apex purplish, lowermost 4–5 mm long, with an awn 2–5 mm long.

DISTRIBUTION: Japan, Korea, China (Gansu, Hebei, Shanxi, Shandong, Henan, Shaanxi, Jiangsu, Anhui, Hubei, Hunan, Sichuan, Fujian, Guizhou).

SELECTED SPECIMENS EXAMINED: **China**. Henan Province, Lushi County, 520 m, 20.IX.1958 *J. Q. Fu 839* (IBSC); Hunan Province, Wugang County, roadside, 300 m, 24.X.1963 *L. H. Liu & G. Z. He 16443* (IBSC); Guizhou Province, Bijie County, riverside, 1300 m, 22.VIII.1957 *P. H. Yu 507* (IBSC); Anhui Province, Huang mountain, roadside, 1700 m, 31.VIII.1957 *S. L. Liu 77* (IBSC); Henan Province, Lushi County, riverside, 1000 m, 25.IX.1958 *B. Z. Guo 3943* (KUN); Shaanxi Province, Mei County, hillsides, 890 m, 18.X.1958 *X. M. Zhang 821* (KUN); Jiangsu Province, Suzhou City, 22.IX.1933 (NAS, without collector).

6b. *K. hackelii* var. *nakaii* (Keng) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes serotina (L.) Keng var. *nakaii* Keng, Sinensia 5: 151. 1934. — *Diplachne latifolia* Nakai Bot. Mag. Tokyo

35: 139. 1921, non Hack. 1902. — *Kengia hackelii* (Honda) Packer subsp. *nakaii* (Keng) T. Koyama, Grasses of Japan & Neighbour Regions: 513. 1987. — *Cleistogenes hackelii* (Honda) Honda var. *nakaii* (Keng) Ohwi, Bot. Mag. Tokyo 55: 309. 1941. — *Kengia nakaii* (Keng) Packer, Bot. Not. 113, 3: 291. 1960. — *Cleistogenes nakaii* (Keng) Honda, Rep. First Sci. Exped. Manch. 4, 4: 98 (Index Fl. Jehol.). 1936. — *Cleistogenes nakaii* (Keng) Keng, Sinensia 11: 409. 1940. — LECTOTYPE (designated here): Korea. Kaijy, *Nakai 3055* (TI).

Kengia hackelii var. *nakaii* differs from *K. hackelii* var. *hackelii* by having grayish green spikelets, 2–5-flowered; 1-0nerved glumes; lemmas lanceolate, the lowermost 5–7 mm long, with an awn 3–9 mm long.

DISTRIBUTION: Japan, Korea, China (Liaoning, Nei Mongol, Gansu, Hebei, Shanxi, Shandong, Henan, Shaanxi, Jiangsu, Zhejiang, Hubei).

SELECTED SPECIMENS EXAMINED: **China**. Liaoning Province, Dalian City, slopes, 23.IX.1975 *K. J. Guan 75565* (PE); Zhejiang Province, Hangzhou City, slopes, 26.IX.1958 *1224* (PE, without collector); Henan Province, Lushi County, 520 m, 20.IX.1958 *J. Q. Fu 839* (KUN); Jiangsu Province, Shangfang Mountain, 9.X.1933 (NAS, without collector); Jiangsu Province, Nanjing City, 15.X.1927 *R. C. Ching 3888* (N).

6c. *K. hackelii* var. *brachyphylla* (Ohwi) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes hackelii var. *brachyphylla* Ohwi, J. Jap. Bot. 18, 9: 540. 1942. — TYPE: China. Hopei, Ping Tsun vel Hyoson, *T. Kanashiro 3324* (holotype TI).

Kengia hackelii var. *brachyphylla* differs from *K. hackelii* var. *hackelii* by having subulate-involute blades towards the tip; the lowermost lemma is awnless or the awn is 2/3 of lemma length.

DISTRIBUTION: China (Hebei).

SPECIMEN EXAMINED: **China**. Hebei Province, VII.1953 *Z. W. Wen s.n.* (NAS).

7. *Kengia hancei* (Keng) Packer

Bot. Not. 113, 3: 292. 1960. — *Diplachne sinensis* Hance, Bot. 8: 76. 1870, non *Cleistogenes chinensis* (Maxim.) Keng 1934, nec *Kengia chinensis* (Maxim.) Packer 1960. — *Cleistogenes serotina* (L.) Keng var. *sinensis* Keng, Sinensia 5: 150. 1934. — *Cleistogenes hancei* Keng, Sinensia 11: 408.

1940. — TYPE: China. Beijing, VIII.1865 S. W. Williams 12572 (holotype BM).

7a. *K. hancei* var. *hancei*

Culms loosely tufted, erect, stout, 50–80 cm tall, 1–2 mm thick, with outer ascending stiff scale at base. Sheaths shorter than internodes, glabrous or loosely papillose-pilose; ligule short. Blades linear, 3–12 cm long, 3–8 mm wide, flat or involute. Panicle diffuse, 6–11 cm long. Spikelets grayish green or sometimes purplish, 8–14 mm long, 3–7-flowered. Glumes 3–5-nerved, first 2–3.5 mm, second 3.5–5 mm long. Lemmas lanceolate, with a purplish black stripe on back, 5-nerved, lowermost about 6 mm long, with an awn 1–2 mm long.

DISTRIBUTION: China (Nei Mongol, Hebei, Shanxi, Liaoning, Shaanxi, Shandong, Jiangsu, Anhui, Jiangxi, Fujian).

SELECTED SPECIMENS EXAMINED: **China**. Jiangsu Province, Kun Mountain, 14.X.1933 (NAS, without collector); Beijing, West mountain, slopes, 11.IX.1961 *Keng s.n.* (N); Fujian Province, Xiamen City, 19.XII.1955 H. B. Zhou & S. M. Huang 17 (N).

7b. *K. hancei* var. *jeholensis* (Kitag.) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes serotina (L.) Keng var. *jeholensis* Honda, Rep. First Sci. Exped. Manch. 4, 4: 62. 1936. — *Cleistogenes hancei* Keng var. *jeholensis* (Honda) Kitag., Jap. Bot. 27, 7: 201. 1952. — *C. hackelii* Honda var. *jeholensis* (Honda) Ohwi, Jap. Bot. 19: 170. 1943. — TYPE: China. Liaoning Province, Lingyuan County 13.VIII.1933 *Nakai, Honda & Kitagawa s.n.* (holotype TI).

Kengia hancei var. *jeholensis* differs from *K. hancei* var. *hancei* by having villous-tomentose sheaths.

DISTRIBUTION: China (Liaoning, Jiangsu).

SELECTED SPECIMEN EXAMINED: **China**. Jiangsu Province, Nanjing City, 22.IX.1929 *Keng 1216* (NAS).

8. *Kengia kitagawai* (Honda) Packer

Bot. Not. 113, 3: 292. 1960. — *Cleistogenes kitagawai* Honda, Rep. First Sci. Exped. Manch. 4, 4 (Index Fl. Jehol.): 99.

1936. — TYPE: China. Liaoning Province, Lingyuan County, 13.VIII.1933 *Nakai, Honda & Kitag. s.n.* (holotype TI).

8a. *Kengia kitagawai* var. *kitagawai*

Culms densely tufted, erect, 50 cm tall, 1–1.5 mm thick, with pointed scaly shoots at base. Sheaths glabrous or mouths villous; ligule short, truncate. Blades linear or linear-lanceolate, 2–7(9) cm long, 3–4 mm wide, usually involute. Panicle 5–8 cm long, branches solitary, (2)3–4 cm long. Spikelets lanceolate, about 9 mm long, usually 4-flowered, glabrous. Glumes lanceolate, first 3–4 mm, second 5 mm long, lowermost lemma lanceolate, glabrous, 5 mm long, 3–5-nerved, mucronate or with a thin awn 1 mm long.

DISTRIBUTION: China (Liaoning, Hebei).

SELECTED SPECIMENS EXAMINED: **China**. Hebei Province, Chengde City, VII.1953 Z. W. Wen *s.n.* (NAS); Hebei Province, Longhua City, VII.1953 Z. W. Wen *s.n.* (NAS).

8b. *K. kitagawai* var. *foliosa* (Keng) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes foliosa Keng, Wash. Acad. Sci. 28: 298. 1938. — *Cleistogenes kitagawai* Honda var. *foliosa* (Keng) S.L. Chen & C.P. Wang, Fl. Reipubl. Popul. Sin. 10, 1: 50. 1990. — *Kengia foliosa* (Keng) Packer, Bot. Not. 113, 3: 292. 1960. — TYPE: China. Nei Mongol, Bailing temple Y. L. Keng 3538 (isotype NAS).

Kengia kitagawai var. *foliosa* differs from *K. kitagawai* var. *kitagawai* by having narrower blades, 1.5–2 mm wide; the lemmas are 5-nerved with loosely villous margins.

DISTRIBUTION: China (Nei Mongol, Gansu, Hebei, Shandong).

SELECTED SPECIMENS EXAMINED: **China**. Nei Mongol, Bailing temple, Y. L. Keng 3538 (NAS); Nei Mongol, Bailing Temple, 21.VIII.1935 *Keng 3539* (NAS); Nei Mongol, Bailing Temple, sandy rocks on the hill, 13.VIII.1935 *Keng 3477* (NAS).

9. *Kengia kokonorica* (K.S. Hao) Packer

Bot. Not. 113, 3: 293. 1960. — *Cleistogenes kokonorica* K.S. Hao, Bot. Jahrb. 68: 582. 1938. — TYPE: China. Xizang, 3340 m, 24.VIII.1930 *Hodkinson 998* (holotype B).

Culms erect. Sheaths glabrous, usually shorter than internodes. Blades linear, involute; ligule membranaceous, glabrous, 1.5 mm long. Panicle diffuse, 40–80 cm long, 20–40 cm wide, branches ascending, 20 cm long. Spikelets elliptic or lanceolate, 7 mm long. First glume hyaline-membranaceous, translucent, elliptic or lanceolate, second similar or longer than first. Lemmas shorter than glumes, lowermost 3-nerved, mucronate.

DISTRIBUTION: China (Xizang).

SPECIMENS EXAMINED: KNOWN only from the type specimen.

10. *Kengia longiflora* (Keng ex Keng f. & L. Liou) Packer

Bot. Not. 113, 3: 293. 1960. — *Cleistogenes longiflora* Keng ex Keng f. & L. Liou, Acta Bot. Sinica 9: 69. 1960. — TYPE: China. Hebei Province, Laiyuan County, Baishi Mountain, 810 m, 13.VII.1934 J. M. Liu 2823 (holotype NAS).

Culms densely tufted, erect, slender, 20–45 cm long, 0.5–1 mm thick, flexuous after drying, usually with pointed scaly shoots at base. Sheaths shorter or longer than internodes, glabrous, mouths loosely villose; ligule ciliate, 2 mm long. Blades linear-lanceolate, 2–7 cm long, 0.5–2 mm wide, flat or involute. Panicle diffuse, 6–11 cm long, 2–5 cm wide, base branches 2–4 cm long, ascending obliquely. Spikelets grayish green or purplish brown, (6)8–10 mm long, 1–3-flowered. Glumes hyaline, narrow-lanceolate, 1-nerved, first 2–4 mm, second 4–6 mm long. Lemmas lanceolate, margins loosely puberulent, 5-nerved, lowermost 6 mm long, with an awn 2–3 mm long.

DISTRIBUTION: China (Nei Mongol, Hebei, Xinjiang).

SELECTED SPECIMENS EXAMINED: **China**. Xinjiang, Hejing County, riverside, 1700 m, 1.VIII.1958 A. R. Li & J. R. Zhu 06250 (IBSC); Xinjiang, Tian Mountain, 3.VIII.1957 K. J. Guan 2366 (IBSC); Nei Mongol, 28.VII.1958 C. P. Wang 154 (N).

11. *Kengia mucronata* (Keng ex Keng f. & L. Liou) Packer

Bot. Not. 113, 3: 293. 1960. — *Cleistogenes mucronata* Keng

ex Keng f. & L. Liou, Acta Bot. Sinica 9: 70. 1960. — TYPE: China. Gansu Province, Z. B. Wang s.n. (holotype NAS).

Culms tufted, 15–45 cm tall, 0.5–1 mm thick, glabrous, lower sheaths aggregate and forming thickened base of culm. Sheaths longer than internodes, mouths villous; ligule ciliate. Blades linear, involute, 1–6 cm long, 1–2 mm wide, glabrous, margins and upside sparse. Panicle diffuse, 3–11 cm long, branches solitary, sparse, base 2–4 cm long. Spikelets yellowish brown or upside purplish, (6)8–10 mm long, 4–6-flowered. Glumes lanceolate, first 3 mm long, 1-nerved, second 4 mm long, 3-nerved. Lemmas lanceolate, 5-nerved, lowermost 3–4.5 mm long, with a micro 0.5 mm long.

DISTRIBUTION: China (Gansu, Qinghai, Shaanxi, Shandong).

SELECTED SPECIMENS EXAMINED: **China**. Qinghai Province, Xinghai County, 2800 m, 15.VII.1963 *Exped. Geobotany* 237 (KUN); Shaanxi Province, Suide City, slopes, 1300 m, 8.VIII.1957 Y. W. Cui 10400 (NAS); Shandong Province, Jinan City, 22.VIII.1979 Y. T. Liang 208 (NAS); Gansu Province, Zhangye City, slopes, 1800 m, 27.VIII.1958 B. Q. Zhong 8738 (N).

12. *Kengia polyphylla* (Keng ex Keng f. & L. Liou) Packer

Bot. Not. 113, 3: 293. 1960. — *Cleistogenes polyphylla* Keng ex Keng f. & L. Liou, Acta Bot. Sinica 9: 69. 1960. — TYPE: China. Hebei Province, Beidaihe City, riverside, 20.VIII.1951 F. Z. Wang 122 (holotype NAS).

Culms tufted, erect, stout, 15–40 cm tall, 1–2.5 mm thick, many-noded. Sheaths papillose-pilose, lower ones aggregate and forming thickened base of culm; ligule truncate, about 0.5 mm long, ciliate. Blades lanceolate or linear-lanceolate, 2–7 cm long, 2–4 mm wide. Panicle narrow, 4–7 cm long, branches solitary. Spikelets 8–13 mm long, 3–7-flowered. Glumes lanceolate or oblong, 1–3(5)-nerved, first 1.5–2(4) mm, second 3–4(5) mm long. Lemmas lanceolate, 5-nerved, lowermost 4–5 mm long, with a short awn 0.5–1.5 mm long.

DISTRIBUTION: China (Jilin, Liaoning, Nei Mongol, Hebei, Shanxi, Shaanxi, Shandong).

SELECTED SPECIMENS EXAMINED: **China**. Hebei Province, Zhulu County, 29.VIII.1955 *C. G. Yang 1729* (NAS); Hebei Province, Beidaihe City, roadside, 21.VIII.1955 *Y. B. Li 56444* (NAS); Shanxi Province, Datong City, VIII.1957 *X. C. Yang 1326* (N).

**13. *Kengia ramiflora* (Keng & C.P. Wang)
H. Yu & N.X. Zhao, *comb. nova***

Cleistogenes ramiflora Keng & C.P. Wang, Bull. Bot. Res. 6, 1: 175. 1986. — TYPE: China. Nei Mongol, Daqing Mountain, 29.VIII.1960. *C. P. Wang 69* (holotype NMAC).

13a. *Kengia ramiflora* var. *ramiflora*

Culms tufted, 25–35 cm tall, erect or slightly oblique. Sheaths glabrous or mouths villous; ligule short, truncate. Blades linear, flat or involute, 3–4 cm long, 2 mm wide. Panicle narrow, 5–9 cm long, 2–5 cm wide, base branches 2–4 cm long. Spikelets 7–9 mm long, 3–4-flowered. Glumes narrow-lanceolate, 1-nerved, first 2–4 mm, second 4–5 mm long. Lemmas lanceolate, margins and apex purplish, lowermost 5–6 mm long, 5-nerved, awnless or with a mucro 0.5 mm long.

DISTRIBUTION: China (Nei Mongol).

ADDITIONAL SPECIMEN EXAMINED: **China**. Nei Mongol, *C. P. Wang 69* (N, isotype).

13b. *K. ramiflora* var. *tianmushanensis* (F.Z. Li & C.K. Ni) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes ramiflora Keng & C.P. Wang var. *tianmushanensis* F.Z. Li & C.K. Ni, Bull. Bot. Res. North-East. Forest Univ. 15, 4: 436. 1995. — TYPE: China. Zhejiang Province, West Tianmushan, 11.IX.1959 (holotype SDNU, without collector).

Kengia ramiflora var. *tianmushanensis* differs from *K. ramiflora* var. *ramiflora* by having a ciliolate ligule; a narrower panicle, 4–4.5 cm long and 1–1.5 cm wide; and shorter glumes, first 1.5–2 mm, second 3–4 mm long.

DISTRIBUTION: China (Zhejiang).

SPECIMEN EXAMINED: See holotype cited above.

14. *Kengia serotina* (L.) Packer

Bot. Not. 113, 3: 291.1960. — *Festuca serotina* L., Syst. Nat. ed. 10, 2: 876. 1759. & Sp. Pl. ed. 2, 1: 111. 1762. — *Agrostis serotina* L., Mantissa: 30. 1767. — *Molinia serotina* (L.) Mert. & Koch. in Roehl., Deutschl. Fl. ed. 3, 1: 585. 1823. — *Diplachne serotina* (L.) Link, Hort. Berol. 1: 155. 1827. — *Cleistogenes serotina* (L.) Keng, Sinensia 5: 149. 1934. — *Schedonorus serotinus* P. Beauv., Ess. Agrostol. 99: 163, 177. 1812. — LECTOTYPE (cf. Cafferty et al. 2000: 251): [icon] “*Gramen loliaceum serotinum, panicula dispansa*” in Séguier, Pl. Veron. 3: t. 3, f. 2. 1754.

14a. *Kengia serotina* var. *serotina*

Culms erect, 30–60 cm tall, leafy, usually with pointed scaly shoots at base. Sheaths usually glabrous, smooth or roughish; ligule a ring of short hairs about 0.5 mm long. Blades 3–15 cm long, 2–6 mm wide, acuminate, flat or involute. Panicle 4–12 cm long, branches usually simple, ascending, 2–4 cm long. Spikelets 3–7-flowered, 7–12 mm long. First glume 2–3 mm, second 3–5 mm long, both 1-nerved or second 3-nerved below, acute or obtusish. Lemmas 3–5-nerved, minutely 2-toothed, lowermost lemma glabrous or frequently pilose near margins, 4–6 mm long, mucronate or with an awn 1–2 mm long.

DISTRIBUTION: Mediterranean countries and China (Jiangsu, Shanxi, Hebei, Beijing, Shandong, Liaoning).

SELECTED SPECIMENS EXAMINED: **China**. Jiangsu Province, Nanjing City, 22.IX.1927 *Keng 1216* (IBSC); Jiangsu Province, Nanjing City, 20.VIII.1928 *Keng 1762* (IBSC); Jiangsu Province, Nanjing City, 27.VII.1928 *Keng 1626* (IBSC); Jiangsu Province, Nanjing City, 14.X.1927 *Keng 3754* (IBSC).

14b. *K. serotina* var. *vivipara* (Honda) H. Yu & N.X. Zhao, *comb. nova*

Cleistogenes serotina (L.) Keng var. *vivipara* Honda in Rep. First Sci. Exped. Manch. 4, 4: 62. 1936. — *Cleistogenes serotina* (L.) Keng f. *vivipara* Kitag., Lineam. Fl. Mansh.: 69. 1939. — TYPE: China. Hebei Province, Chengde City, 19.VIII.1933 *Nakai, Honda & Kitagawa s.n.* (holotype TI).

Kengia serotina var. *vivipara* differs from *K. serotina* var. *serotina* by usually having vivipa-

rous spikelets.

DISTRIBUTION: China (Hebei).

SPECIMEN EXAMINED: Known only from the type specimen cited above.

15. *Kengia songorica* (Roshev.) Packer

Bot. Not. 113, 3: 293. 1960. — *Diplachne songorica* Roshev., Fl. USSR 2: 752. 1934. — *Cleistogenes songorica* (Roshev.) Ohwi, J. Jap. Bot. 18: 540. 1942. — TYPE: China. Nei Mongol, Bailing temple, sandy steppe, 1.VIII.1935 *Keng* 3378 (holotype NAS).

Culms tufted, erect or slightly oblique, 15–50 cm tall. Sheaths longer than internodes, glabrous or mouths villous, lower ones aggregate and forming thickened base of culm; ligule 0.5 mm long, ciliolate. Blades linear, 2–6 cm long, 1.5–2.5 mm wide. Panicle diffuse, 2–8 cm long, 4–7 mm wide, branches diffuse or slightly ascending. Spikelets 4–8 mm long, 3–6-flowered. Glumes oval-lanceolate, first 2–3 mm, second 3–4 mm long. Lemmas oval-lanceolate, membranaceous at margins, lowermost 3–4 mm long, 5-nerved, awnless or mucronate.

DISTRIBUTION: Japan, Russia, and China (Nei Mongol, Ningxia, Gansu, Xinjiang, Shaanxi, Heilongjiang).

SELECTED SPECIMENS EXAMINED: **China.** Nei Mongol, Bailing temple, sandy steppe, 1.VIII.1935 *Keng* 3378 (NAS); Shaanxi Province, Hengshan Country, 1000 m, 2.VIII.1953 *K. J. Fu* 7160 (PE); Xinjiang, Tang City, slopes, 1600 m, 17.VIII.1953 *K. J. Guan* 4518 (PE); Xinjiang, slopes, 1800 m, 9.VIII.1965 *T. Y. Zhou* 651361 (KUN); Heilongjiang Province, Anda City, 20.VIII.1955 *C. X. Zhong et al.* 55232 (N).

16. *Kengia squarrosa* (Trin.) Packer

Bot. Not. 113, 3: 292. 1960. — *Molinia squarrosa* Trin. in Ledeb. Fl. Alt. 1: 105. 1829. — *Diplachne squarrosa* (Trin.) Richt., Fl. Europ. 1: 72. 1890. — *Cleistogenes squarrosa* (Trin.) Keng, Sinensia 5: 156. 1934. — TYPE: Unknown.

16a. *Kengia squarrosa* var. *squarrosa*

Culms erect, tufted, about 15–45 cm tall, nearly 1 mm thick. Sheaths glabrous, longer than

internodes. Blades linear-lanceolate, 2.5–6 cm long, 0.5–2 mm wide, usually involute. Panicle narrow. Spikelets 1–3-flowered, about 5 mm long. First glume 1–2 mm, second 2–5 mm long, both 1-nerved, acuminate. Lemmas 3–5-nerved, lowermost equaling spikelets, with an awn 3–5 mm long.

DISTRIBUTION: Europe, Eastern Siberia, Mongolia, and China (Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Gansu, Xinjiang, Hebei, Shanxi, Shaanxi, Shandong).

SELECTED SPECIMENS EXAMINED: **China.** Heilongjiang Province, Anda County, 13.IX.1951 *Y. L. Zhang et al.* 823 (PE); Nei Mongol, Hailaer, 14.VIII.1956 *Zhongde Team* 8089 (PE); Liaoning Province, Xinwu County, 25.VIII.1955 *Keng f.* 55333 (N).

16b. *K. squarrosa* var. *longe-aristata* (Rendle) Packer

Bot. Not. 113, 3: 292. 1960. — *Diplachne squarrosa* (Trin.) Richt. var. *longe-aristata* Rendle, Journ. Linn. Soc. Bot. 36: 411. 1904. — *Cleistogenes squarrosa* (Trin.) Keng var. *longe-aristata* (Rendle) Keng, Sinensia 5: 156. 1934. — SYNTYPE: China. Shensi, Kaolinsien, *Hugh s.n.* (BM); Mt. Kiansan, Husiensien, *Hugh s.n.* (BM).

Kengia squarrosa var. *longe-aristata* differs from *K. squarrosa* var. *squarrosa* by having narrow glumes, first 2–2.5 mm, second 4–4.5 mm long; and the lowermost lemma about 6 mm long, 3-nerved, with an awn about 7 mm long.

DISTRIBUTION: Endemic in China (Nei Mongol, Gansu).

SELECTED SPECIMENS EXAMINED: **China.** Nei Mongol, VIII.1956 *W. Z. Fang* 421 (NAS); Gansu Province, 9.IX.1955 *Huanghe Team* 3223 (NAS); Nei Mongol, slopes, 29.VIII.1960 *C. P. Wang* 86 (N).

17. *Kengia striata* (Honda) Packer

Bot. Not. 113, 3: 292. 1960. — *Cleistogenes striata* Honda, Rep. First Sci. Exped. Manch. 4, 4 (Index Fl. Jehol.): 100. 1936. — TYPE: China. Liaoning Province, Jinzhou City, Chaoyang County, 8.VIII.1933 *Nakai, Honda & Kitagawa s.n.* (holotype TI).

Culms densely tufted, erect, 30–40 cm tall. Sheaths longer than internodes, glabrous or

mouths villous. Blades 4–5 cm long, 1–2 mm wide, flat or involute. Panicle diffuse, 8–10 cm long, 2–4 cm wide, branches solitary, spreading at maturity, 2.5–5 cm long. Spikelets lanceolate, 8–10 mm long, 5–7-flowered, glabrous. Glumes 1-nerved, glabrous, first 3.5 mm, second 6 mm long; lowermost lemma lanceolate, 5-nerved, 6 mm long, awn 2 mm long.

DISTRIBUTION: China (Liaoning).

SPECIMEN EXAMINED: KNOWN only from the type specimen cited above.

18. *Kengia thoroldii* (Stapf & Hemsl.) H. Yu & N.X. Zhao, *comb. nova*

Diplachne thoroldii Stapf & Hemsl., Linn. Soc. Bot. 30: 121. 1894. — *Cleistogenes thoroldii* (Stapf & Hemsl.) Roshev., Fl. Kirgh. 2: 107. 1950. — TYPE: China. Xizang, 4800 m, 1892 *Thorold 120* (holotype K).

Culms erect. Sheaths longer than internodes, pilose; ligule truncate, 1 mm long. Blades involute, glabrous. Panicle narrow, 5–10 cm long. Spikelets pedicelled, 3-flowered, 6–8 mm long. First glume 3 mm long, oblong-lanceolate, unnerved, second 4 mm long, 3-nerved. Lemmas oblong-lanceolate, 4 mm long, lowermost mucronate.

DISTRIBUTION: China (Xizang).

SPECIMEN EXAMINED: KNOWN only from the type specimen cited above.

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