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A New Species of *Bashania* (Poaceae: Bambusoideae) from Mt. Qinling, Shaanxi, China

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ABSTRACT. The new species *Bashania aristata* of Bambusoideae (Poaceae) from the giant panda's habitat of Mt. Qinling, Shaanxi, China, is described and illustrated. The new species differs from *B. fargesii* in its fully developed culm sheath auricles and aristate lemmas and from *B. qingchenshanensis* in its fully developed culm sheath auricles and in its lack of auricle leaf sheaths. Its relationship to the other species of *Bashania* is discussed along with the status of this genus.

Key words: Bambusoideae, *Bashania*, China, Poaceae.

Bashania Keng f. & T. P. Yi was described (Keng & Yi, 1982) for *Arundinaria fargesii* E. G. Cames because *Arundinaria* Michaux is endemic to North America, and they differ from each other both in the flowers and the number of primary branches per culm node. It is readily distinguished from the related Chinese *Gelidocalamus* T. H. Wen by longer branches growing from the culm, and the presence of secondary branches, and more than two leaves on the terminal twigs. *Gelidocalamus* has short branches from the culm, without secondary branches, and with one or two leaves on the twigs.

The genus *Bashania* consists of seven species: *B. fargesii*, *B. qingchengshanensis* (Keng & Yi, 1982, 1996), *B. faberi* (Yi, 1993) (= *B. fangiana*, Wen, 1985; Keng & Yi, 1996), *B. spanostachya* (Yi, 1989; Keng & Yi, 1996), *B. baoxingensis* (Yi, 2000), *B. auctiaurita* (Yi, 1986), and the new species *B. aristata*, most of them endemic to Sichuan and adjacent Shaanxi, Gansu, Hubei, Hunan, and Yunnan Provinces of China.

The new species, *Bashania aristata*, is common in Foping National Nature Reserve and can also be

found in Changqing National Nature Reserve and other areas of Shaanxi Province. These reserves are the main distribution of the giant panda on Mt. Qinling. When we surveyed the plants in the habitat of the giant panda in Mt. Qinling in 1999, we found that some individuals of *Bashania* were flowering but some were not. The flowering individuals and non-flowering individuals were distributed in staggered plots in the area named Sanguanmiao in Foping National Nature Reserve. This phenological pattern was abnormal according to the common knowledge of the flowering behavior of bamboo, and it was assumed that there was only one species, *B. fargesii*, distributed in the reserve. After comparison of the flowering and non-flowering individuals, we found that the flowering individuals differed in having aristate lemmas and auricular culm sheaths. Further survey indicated that the same phenomenon also existed in another giant panda reserve, Changqing National Nature Reserve located south of Foping National Nature Reserve, as well as other areas in Mt. Qinling. The staggered distribution of *B. aristata* and *B. fargesii* correlates with the absence of any report of wholesale bamboo death after flowering over a large area in the forest of *Bashania* in the giant panda's habitat on Mt. Qinling.

Bashania aristata Y. Ren, Y. Li & G. D. Dang, sp. nov. TYPE: China. Shaanxi: Foping County, Sanguanmiao, Chaoyangpo, 33°39'16.875N, 107°47'11.25E, 1600 m, 28 Apr. 1999, Ren Yi 906 (holotype, WNU; isotype, MO). Figure 1.

Species differ a *B. fargesii* vaginis auriculatis, lemmis aristatis, a *B. qingchenshanensi* vaginis auriculatis, auriculis foliorum carentibus.

Rhizome leptomorph, monopodial, internodes

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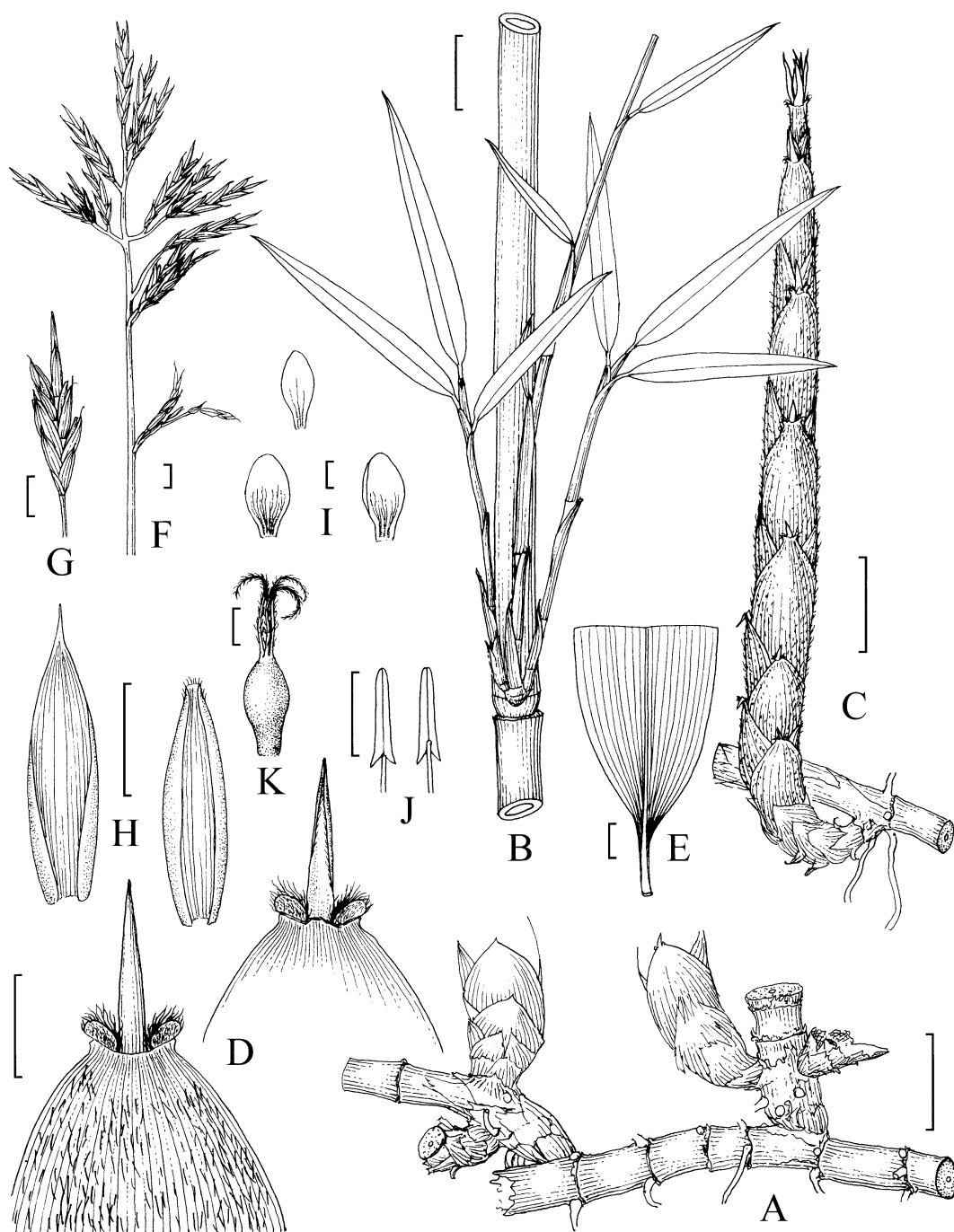


Figure 1. *Bashania aristata* Y. Ren, Y. Li & G. D. Dang. —A. Rhizome and culm base; the transverse rhizome and the left branches show the monopodial growth pattern and the right branches show the sympodial growth pattern. —B. Part of culm. —C. New shoot. —D. Upper part of a culm leaf, showing the sheath auricles and blade. —E. Base of a leaf. —F. Inflorescence. —G. Spikelet. —H. Lemma (left) and palea (right). —I. Lodicules. —J. Stamens. —K. Pistil. Scale bars: A–C = 5 cm; D, E, G = 1 cm; F, H, J = 5 mm; I, K = 1 mm. Drawn by Guo Mu-seng from the holotype, *Ren Yi 906* (WNU), at Sanguanmiao.

(1)3–5 cm long, 5–20 mm diam., hollow. Culms erect except the tips nodding, 2–8(–13) m in height, 2–4(–6.5) cm diam., deep green and with white powder when young, flavescent when old. Internodes 25–40 cm long, slightly flattened above branching complement. Walls 4–8 mm thick; culm nodes slightly bulging, nodal line salient with remnant of sheath. Bud 1 per node, flat; nodal region 6–14 mm long, glabrous. Primary branches 3, secondary branches many, but more slender than primary branches. Culm sheath leathery, shorter than the internode, green when fresh and flavescent when dry, densely covered with black to dark brown setae abaxially, dents or papillae left when hairs fall off; inner ligule 2–4 mm tall, with small setae on it, denticulate at apex; auricle fully developed, half-moon-shaped, with erect hairs on the edge; blade lanceolate, erect or curved, not easily caducous, green when young with caducous cilia at the base of upper surface. Leaves 4 to 6 on each ultimate branch, glabrous adaxially and sparsely velutinate abaxially when young, usually $7\text{--}17 \times 1\text{--}2.3$ cm, with 6 pairs of long veins and compact cross veins; sheath 5–10 cm long; inner ligules 1.5–4 mm tall, tomentulose and with irregular serrae; auricle absent; petiole usually 0.7–0.8 cm long. Inflorescence a panicle, about 9 cm long, 3–4 cm wide, eventually exserted; the major axis and branches of the inflorescence with white microsetae. Spikelets slender cylindrical, dark brown when mature, 2–3 cm long, 3 mm diam., with 4 to 7 florets in each; rachilla internodes 2–3.5 mm long, flat, with white microsetae. Glumes ovate-lanceolate; outer glume 3–6 mm long, 1–3-veined, the inner glume 6–8 mm long, 5- to 7-nerved. Lemmas ovate to lanceolate, with white microsetae at the base, 12–13 mm long, with 7 long veins and sparse cross veins, obviously aristate. Paleas 9–10 mm long, with 2 ridges on the back and bifid at the apex. Lodicules 3, ciliate at the edge, unequal, veined at the base. Stamens 3, with anthers 4–5 mm long. Ovary ovoid; stigmas 3, feathery, about 2 mm long. Caryopsis unknown.

Habitat and distribution. The new species lives on slopes with brown-yellow forest soil under deciduous broadleaved forest and in temperate coniferous broadleaved mixed forest ranges, from 1100 to 1600 m. The soil is thick, slightly wet, and acidic, with thin humus and leaf litter.

The community of the new species is simple. The arboreal layer consists of species of *Quercus* or species of *Quercus* and *Pinus tabulaeformis*. The shrub layer consists mainly of the new species and rarely species of *Acer* and *Viburnum*. The herb layer

is weakly developed and consists mainly of species of Poaceae and Cyperaceae.

The new species is distributed in Foping, Yangxian, and Zhenba Counties of Shaanxi Province, China. These counties are located on the middle part of the south slope of Mt. Qinling, which is the main distribution area of the giant panda on Mt. Qinling.

Bashania aristata is readily distinguished from the six other species of the genus. It is obviously different from *B. fangiana* and *B. spanostachya* by its longer leaves (more than 10 cm long), abaxially sparsely velutinous foliage leaves when young, with brown or dark brown setae on the back of the culm sheath and large culm sheath auricles. *Bashania aristata* is closer to *B. fargesii*, *B. qingchengshanensis*, *B. baoxingensis*, and *B. auctiaurita*, but is also readily distinguished from *B. fargesii* by its large culm sheath auricles and the aristate lemmas, and from *B. qingchengshanensis* and *B. baoxingensis* by its large culm sheath auricles and its lack of leaf sheath auricles. *Bashania aristata* is distinguished from *B. auctiaurita* by its larger stature and less falcate auricles.

Paratypes. CHINA. **Shaanxi:** Foping County, Yueba, Baimagou, 28 Apr. 2000, *Li Yun 101* (WNU); Foping County, around Sanguanmiao, 18 Oct. 2001, *Li Yun 111* (MO); Zhengba County, *Tang Jian-weng 94* (SIFS).

KEY TO CHINESE SPECIES OF *BASHANIA*

- 1a. Leaves longer than 10 cm; culm sheath with brown or dark brown setae on the back.
 - 2a. Leaves sparsely velutinous on lower surface when young, leaf sheath without auricles; culm sheath without basal hair ring.
 - 3a. Culm sheaths without auricles; lemmas not aristate *B. fargesii* (E. G. Camus) Keng f. & T. P. Yi
 - 3b. Culm sheaths with auricles; lemmas aristate *B. aristata* Y. Ren, Y. Li & G. D. Dang
 - 2b. Leaves glabrous, with auricles; culm sheath with basal hair ring.
 - 4a. Culm sheath without auricles.
 - 5a. Internodes of rhizome and the base of culm almost solid *B. qingchengshanensis* Keng f. & T. P. Yi
 - 5b. Internodes of rhizome and the base of culm hollow *B. baoxingensis* T. P. Yi
 - 4b. Sheath on upper part of culm with auricles *B. auctiaurita* T. P. Yi
- 1b. Leaves shorter than 10 cm; culm sheaths glabrous or with yellow-gray setae on the back.
 - 6a. Rhizome with 2 to 5 roots at the node; raceme with 3 to 5 spikelets; spikelets 2.5–4.5 cm long; lemmas 9–14 mm long; paleas

- 7–12 mm long; anther 5–6 mm long
 *B. faberi* (Rendle) T. P. Yi
 6b. Rhizome with 4 to 6 roots at the node; raceme with 2 or 3 spikelets; spikelets 1.8–3 cm long; lemmas 7–10 mm long; paleas 5–6.5 mm long; anthers 3.5–4.5 mm long
 *B. spanostachya* T. P. Yi (including *B. fansipanensis*)

SPECIES EXCLUDED IN THE KEY TO CHINESE SPECIES

Bashania victoralis (Keng f.) T. P. Yi was first described as *Indocalamus victoralis* by Keng f. (1951), but Yi (1993) removed this species to *Bashania* according to the specimens collected from the area where the type was collected. According to Keng f. (1951), there are one or rarely three primary branches on the culm node. This species needs further study.

Bashania abietina T. P. Yi & L. Yang was described based on the specimens without flowers (Yi & Yang, 1998). According to the description, this species has one branch on the culm node, which is similar to the species of *Indocalamus* rather than *Bashania*. This species needs further study.

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