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Chimonobambusa multiramosa (Poaceae, Bambusoideae), a new bamboo species from northeast Yunnan, China

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Abstract

Chimonobambusa multiramosa, a new species from Yunnan, China, is described and illustrated. This new species is morphologically similar to *C. ningnanica*, but differs in having much more branches per culm node, culm leaf sheaths longer than the internodes and sheath-scar bearing tardily deciduous hairs. Based on the morphological features, this new species is assigned to *Chimonobambusa* sect. *Oreocalamus*.

Key words: Arundinarieae, temperate woody bamboos, *C.* sect. *Oreocalamus*, New species

Introduction

Chimonobambusa Makino (1914: 153), belonging to the subtribe Arundinariinae of the tribe Arundinarieae (Poaceae, Bambusoideae) (Triplett & Clark. 2010; Guo *et al.* 2021). *Chimonobambusa* Makino *sensu lato* contains ca. 46 species in China, mainly distributed in the southwestern mountainous areas, with a few species occurring in the south of Qinling Mountains, the middle mountain area of southern Xizang (Tibet) and the southeast coastal regions. Species of *Chimonobambusa* are mainly characterised by shrubby, rarely subarborescent habit, leptomorph rhizomes, usually conspicuously enlarged and prominent culm supranodal ridges, basal nodes often with a ring of sparse or dense root thorns, relatively small sheath blades, and three branches at each culm node (Hsueh & Zhang 1996; Zhu 1994; Li & Stapleton. 2006).

Based on the shape of internodes, whether there are aerial roots at the basal nodes and culm sheaves deciduous or persistent, the genus *Chimonobambusa* Makino was divided into three groups, *C.* Sect. *Chimonobambusa* [autonym] (1990: 11), *C.* Sect. *Qiongzhueta* T. H. Wen & Ohnrberger (1990: 12) and *C.* Sect. *Oreocalamus* (keng) T. H. Wen & Ohnrberger (1940: 146) (Ohnrberger, 1990; Ohnrberger, 1999).

In December 2021, we found an unrecorded bamboo species during the investigation of *Chimonobambusa* species in Yunnan. This species has the typical features of *C.* sect. *Oreocalamus*, such as internodes slightly quadrangular at the median or basal part of the culms; nodes prominent, with a ring of spines at the median or basal part of the culms. Through a comparative study of known species of *Chimonobambusa*, it is concluded that this species is actually a new species.

Materials and methods

Morphological observation of fresh and dried samples was performed using hand lens and stereomicroscope. Morphological features of the related species [*C. quadrangularis* Makino (1914: 153), *C. microfloscula* McClure (1940: 17), *C. metuoensis* Hsueh et T. P. Yi (1983: 34), *C. tuberculata* Hsueh et L. Z. Gao (1987: 11), *C. ningnanica* Hsueh et L. Z. Gao (1987: 13), *C. grandifolia* Hsueh et W. P. Zhang (1988: 17), and *C. paucispinosa* T. P. Yi (1990: 24)] were obtained from the literature.

Taxonomy

Chimonobambusa multiramosa A.J. Cao, Y.L. Ding et Y.T. Zhang, *sp. nov.* (Fig. 1–4)

Type. CHINA. Yunnan: Zhaotong City, Ludian County, elevation 2545–2600 m, 27°8'21"N, 103°22'15"E, 9 December 2021, Y. L. Ding, Y. T. Zhang and A. J. Cao ZT1209 (holotype: NF!).

Diagnosis. *Chimonobambusa multiramosa* A. J. Cao, Y. L. Ding et Y. T. Zhang is morphologically similar to *C. quadrangularis* Makino and *C. ningnanica* Hsueh et L. Z. Gao particularly in usually internodes hirsute, culm sheaths caducous, but can be easily distinguished in having 10–18 per culm node in branches, culm sheaths usually longer than the corresponding internodes, and 3–6 leaves per ultimate branch.

Description. Shrubby or arborescent bamboo. Rhizomes leptomorph, rhizome neck 1.0–3.4 cm long, without groove. Culms erect, 3.6 m tall and 1.8–2.5 cm in diameter; internodes 11.6–13.5 cm long, terete or basal ones slightly 4-angled, nearly not grooved above branches, green, yellow-green tuberculate short strigose, longitudinal fine lines indistinct, hollow; supra-nodal ridge raised on nodes with branches, or slightly raised at nodes without branches, glabrous; sheath sears distinct, brown pubescent; nodal region ca. 2.1–3.6 mm high, with 6–12 spines or aerial roots at the median and basal parts of the culms. Culm sheaths deciduous, 12.6–17.2 cm long, longer than internode, papery or thickly papery, oblong-ovoid or triangular, without blotches, abaxially densely yellowish-brown hairs, longitudinal veins distinct, transverse veinlets indistinct, adaxially smooth and shiny, margins densely brown ciliated; auricles absent; sheath blade reduced, subulate, ca. 1.4 mm long. Culm buds apex slightly hairy, stout, ovate-subulate, adnate to the internode surface, branch sheaths many per bud; culm bud initially 1, differentiated and grew into many small buds in the winter of that year, shooting out branches from several nodes near the top of culms in the spring of the next year. Branches 10–18 per node, 30–50 cm long. Foliage leaves 3–6 at the top of branchlets; blades lanceolate; leaf sheaths 5.9–7.1 cm long, abaxially ridged and longitudinal veins distinct, glabrous, auricles absent; foliage leaf oral setae 2–6, erect; inner ligule truncate; blade papery, narrowly lanceolate, apex long acuminate, 8.2–16.9 cm long, 1.1–1.8 cm wide, glabrous, lateral veins 5–6 pairs, margins serrated. Inflorescence unknown.

Phenology. New shoots produced during Oct. to Nov.

Distribution and habitat. Only found in Ludian County, northeast Yunnan (Figure 4), elevation 2545–2600 m, under the evergreen broadleaved forests or by the roadside commonly.

Infrageneric assignment. *C. sect. Oreocalamus*.

Chinese name. 多枝方竹 (Chinese pronunciation: duō zhī fāng zhú).

Similar species and notes

Chimonobambusa multiclada is similar to *C. quadrangularis* (Fenzi) Makino Hsueh et W. P. Zhang and *C. ningnanica* Hsueh et L. Z. Gao. The morphological comparison among *C. multiclada* and its similar species is shown in Table 1.

Key to the species of *Chimonobambusa* sect. *Oreocalamus*

- 1a. Culms sheaths caducous or late; internodes terete or basal ones slightly 4-angled, with a ring of spines at basal nodes; shoots appearing from April to December..... *C. sect. Oreocalamus*
- 1a. Culm sheaths abaxially glabrous or sometimes sparsely hispid.
- 2a. Young culm internodes hispid, the glabrous..... *C. paucispinosa*
- 2b. Young culm internodes hirsute, the tuberculate.
- 3a. Culm sheath blade articulate *C. microfloscula*
- 3b. Culm sheath blade not articulate *C. quadrangularis*
- 1b. Culm sheaths abaxially densely hispid.
- 4a. Culm sheaths abaxially with irregular blotches..... *C. tuberculat*
- 4b. Culm sheaths abaxially without blotches.
- 5a. Culm sheaths delayed deciduous.
- 6a. 2–3 leaves at the apex of branchlets; foliage leaf blades 12–33 cm long..... *C. metuoensis*
- 6b. 6–8 leaves at the apex of branchlets, foliage leaf blades 30–35 cm long..... *C. grandifolia*
- 5b. Culm sheaths caducous.
- 7a. Branches 3 per culm node; culm sheaths usually shorter than internodes *C. ningnanica*
- 7b. Branches 10–18 per culm node; culm sheaths usually longer than internodes *C. multiramosa*



FIGURE 1. *Chimonobambusa multiramosa*. **A.** Habit; **B.** Branch complement; **C.** Branch node; **D.** Culm bud, front view; **E.** Culm bud, side view; **F.** Foliage leaves; **G.** New shoots; **H.** Rhizome. All photos by Y. T. Zhang.

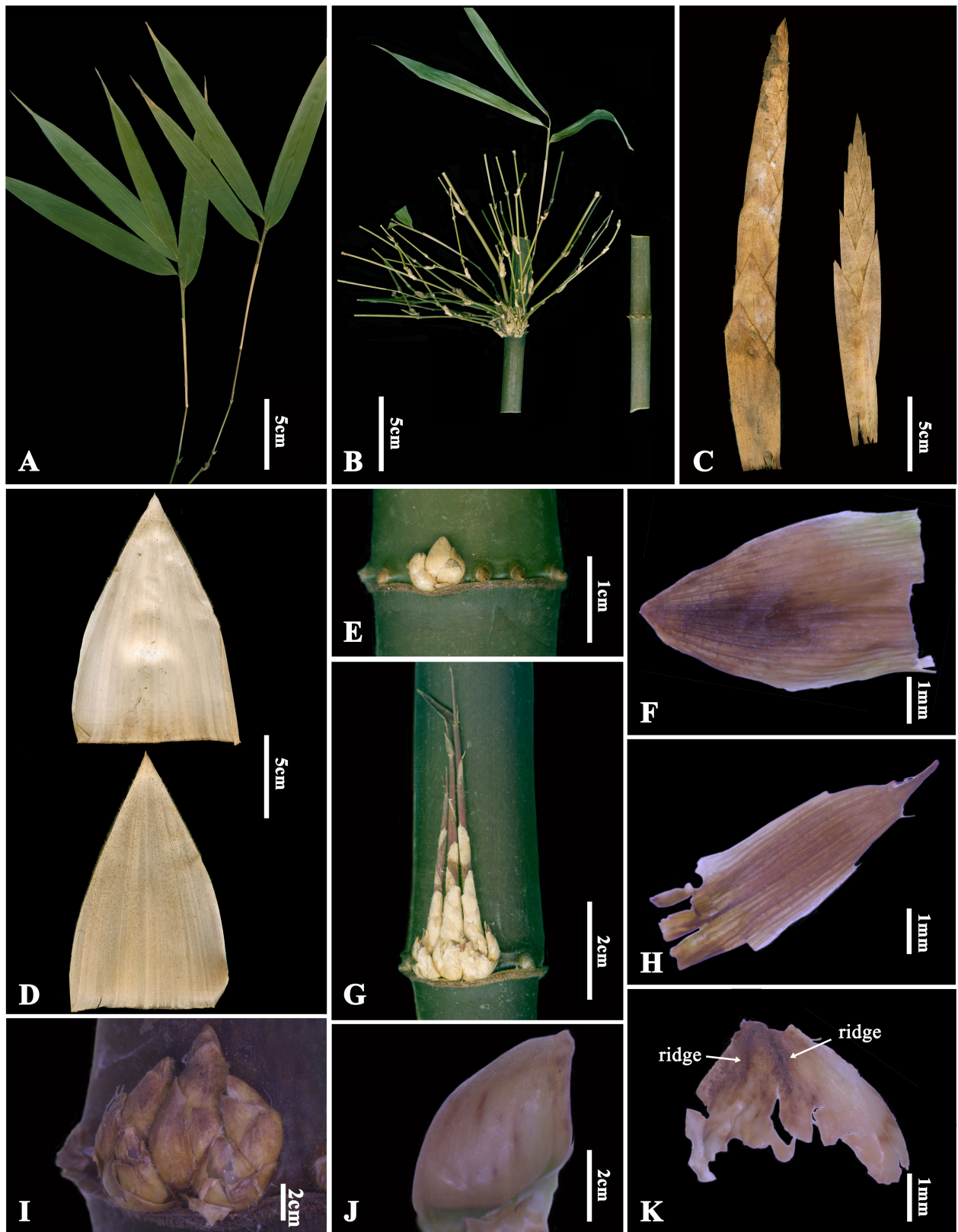


FIGURE 2. *Chimonobambusa multiramosa*. **A.** Foliage leaf branches; **B.** Branch complement and culm node; **C.** Degenerative bamboo shoots; **D.** Clum sheath, adaxial (up) and abaxial (down) view; **E, G, I, J.** Clum bud; **F, H.** Branch sheath; **K.** Prophyll. All photos by Y.T. Zhang.

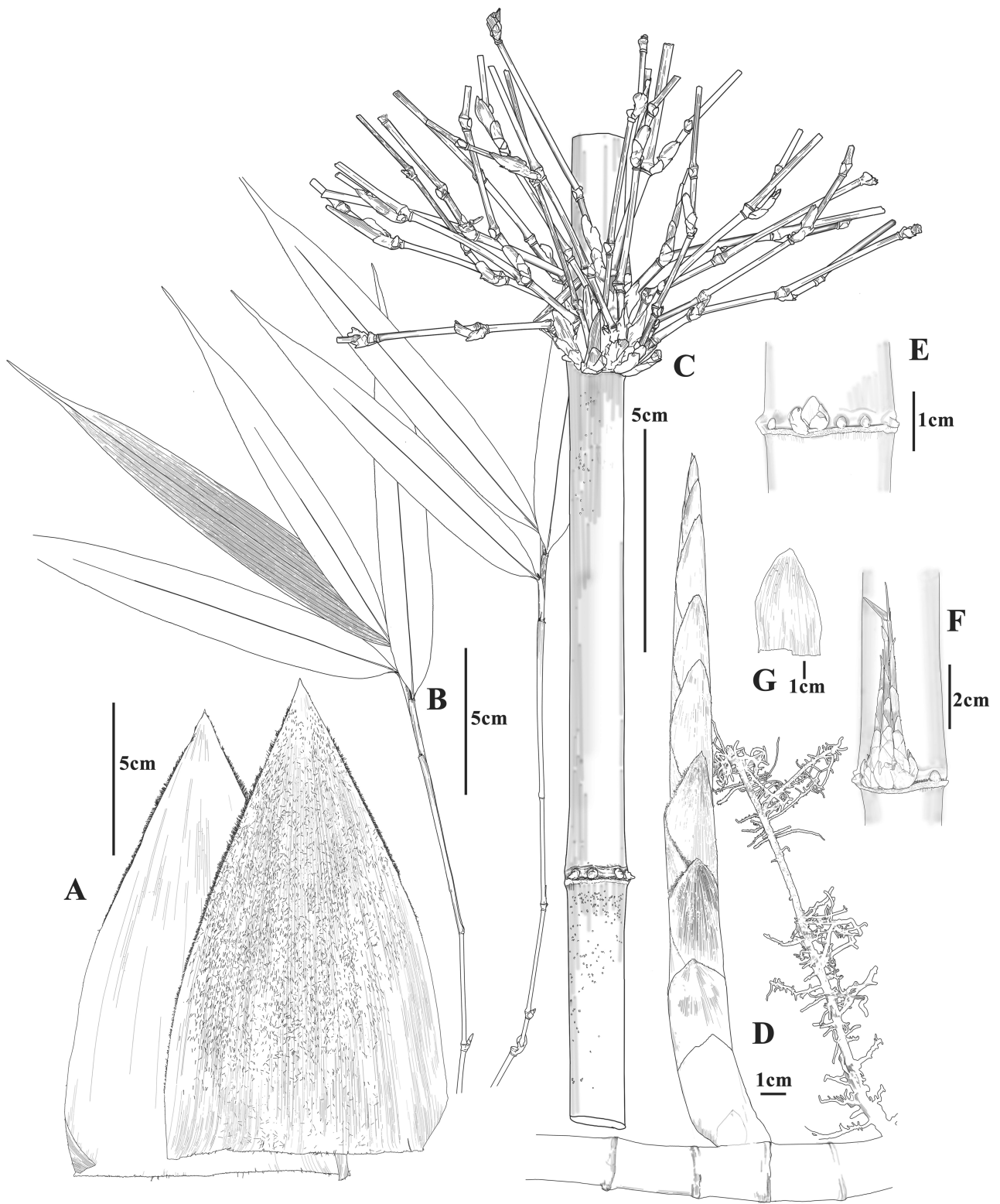


FIGURE 3. *Chimonobambusa multiramosa*. **A.** Culm sheath, adaxial (up) and abaxial (down) view; **B.** Foliage leaf branches; **C.** Branch complement; **D.** bamboo shoot; **E.** **F.** Culm bud; **G.** Branch sheath. Drawn by Y.T. Zhang.

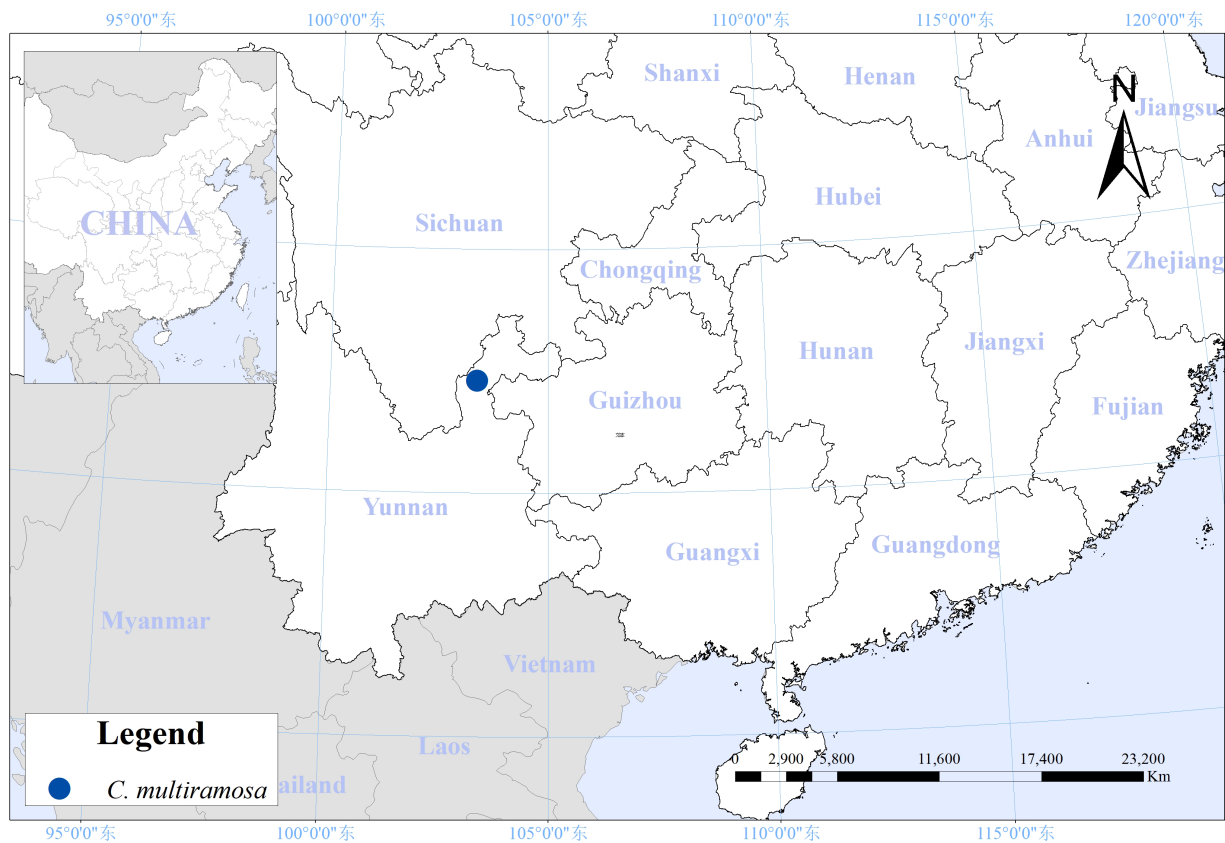


FIGURE 4. Distribution map of *Chimonobambusa multiramosa* in Yunnan, Zhaotong, China.

Table 1. Morphological comparison of *Chimonobambusa multiramosa* and related species.

Characters	<i>C. multiramosa</i>	<i>C. quadrangularis</i>	<i>C. ningnanica</i>
Culm height	3.6 m	3–8 m	10 (14) m
Internodes	11–13 cm long	8–22 cm long	13–22 cm long
Circular hair on the sheath-scar	tardily deciduous	tardily deciduous	persistent
Culm sheaths	longer than internodes; transverse veinlets indistinct	shorter than internodes; transverse veinlets distinct	shorter than internodes; transverse veinlets indistinct
Hairs on abaxial surface of culm sheaths	Densely yellow–brown setose	Glabrous or thin upper part of culm sheaths	Densely yellowish brown hairs
Number of leaves on ultimate branch	3–6	2–5	3
Mid-culm branches	6–18	3	3

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