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# *Gigantochloa glabrata* (Poaceae, Bambusoideae), a new bamboo species from Yunnan, China

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*Gigantochloa glabrata* (Poaceae, Bambusoideae), a new bamboo species from  
Yunnan, China

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### Abstract

*Gigantochloa glabrata* N. H. Xia & Y. Zeng ex D. Z. Li & Z. C. Xu, sp. nov., a new species of paleotropical woody bamboo was described and illustrated from Yunnan, China. The new species is morphologically similar to *G. albociliata* and *G. levis* but differs from them by having an erect culm sheath blade; culm sheath ligule 4-6 mm high, truncate, denticulate; and a ring of white tomentum on the intranode and below the node. Based on the morphological features, this species is assigned to *Gigantochloa*.

### Keywords

*Gigantochloa*, new species, paleotropical woody bamboos

### Introduction

*Gigantochloa* Kurz ex Munro was published as a new genus by Kurz (1864) without any detailed description. Munro described the morphological characters of this genus and validated the publication (Munro 1868). Currently, there are more than 60 species recognized in *Gigantochloa* from all over the world, which are mainly distributed in the tropical and subtropical regions of South-East Asia (Holtum 1958; Widjaja 1987; Vorontsova et al. 2017), with 7 species recorded in China (Li et al. 2006; Zeng et al. 2014). Species of *Gigantochloa* are characterized by their commonly striped culms, a floret with 6 stamens and the filaments connected into a firm tube, a single plumose stigma and a 2-keeled palea in the fertile florets (Munro 1868). Many bamboo taxonomists consider it to a “good genus” based on morphological characteristics (Kurz 1875, 1876; Holtum 1958; Clayton and Renvoize 1986; Widjaja 1987).

As a genus of paleotropical woody bamboo, *Gigantochloa* belongs to the subtribe Bambusinae Presl (BPG 2012). It was included in the *Bambusa-Dendrocalamus-Gigantochloa* (BDG) complex together with *Bambusa* Schreber, *Dendrocalamus* Nees, and closely affiliated small genera (Goh et al. 2010; Goh et al. 2013; Zhou et al. 2017). Morphologically, *Bambusa* can be distinguished from *Gigantochloa* by its conspicuous auricles and florets falling separately. *Dendrocalamus* can be recognized by its free filaments. In our recent molecular phylogenetic study, *Gigantochloa* was well resolved as a monophyletic group (Liu et al. 2020).

By studying the species of *Gigantochloa* from the Yunnan-Myanmar-Thailand floristic region, we found that *G. albociliata*, recorded in *Flora Reipublicae Popularis Sinicae* (Keng et al. 1996) and *Flora of China* (Li et al. 2006) is not truly *G. albociliata* (Munro) Kurz. Zeng (2014) noticed this issue and erected a new species with only vegetative characters, *Gigantochloa glabrata* N. H. Xia & Y. Zeng in her Master's thesis. However, according to the Code (Art. 6.3) (Turland et al. 2017), this name was not effectively published. Here, we added reproductive characters and a detailed morphological comparison to validate the new species as *G. glabrata* N. H. Xia & Y. Zeng ex D. Z. Li & Z. C. Xu.

## Materials and methods

All measurements and observation of morphological characters were conducted based on the specimens at the herbaria of the Kunming Institute of Botany, Chinese Academy of Sciences (CAS) (KUN), the Xishuangbanna Tropical Botanical Garden, CAS (HITBC), the South China Botanical Garden, CAS (IBSC), and as well as the photos of living individuals taken during our field survey in southern and southwestern Yunnan, China in the summer of 2019. Pseudospikelets were dissected under an OLYMPUS DP80 digital microscope at Germplasm Bank of Wild Species, Kunming Institute of Botany, CAS. Morphological comparisons with related species were based on characters recorded in the literature and the type specimens. The morphological terminology follows McClure (McClure 1966).

## Taxonomy

***Gigantochloa glabrata*** N. H. Xia & Y. Zeng ex D. Z. Li & Z. C. Xu, *sp. nov.* “少毛巨竹”(Shao Mao Ju Zhu)

*Gigantochloa albociliata* auct. non (Munro) Kurz: C. J. Hsueh & J. L. Sun in P. C. Keng & C. P. Wang, *Flora Reip. Pop. Sin.* 9(1): 198. pl. 50, 1-11 (1996); D. Z. Li et C. Stapleton in C. Y. Wu, P. H. Raven & H. Y. Hong, *Fl. China* 22: 47 (2006); L. B. Zhang in C. Y. Wu, P. H. Raven & H. Y. Hong, *Fl. China Illustr.* 22: 46. Fig. 46:1-11 (2007).

Figures 1, 2

**Diagnosis.** *Gigantochloa glabrata* is morphologically similar to *G. albociliata* and *G. levis* (Blanco) Merr. (Blanco 1837; Merrill 1916), but can be easily distinguished from them by its erect culm sheath blade; culm sheath ligule 4-6 mm high, truncate, denticulate; a ring of white tomentum on the intranode and below the node (Table 1).

**Type.** CHINA. Yunnan: Xishuangbanna Tropical Botanical Garden (XTBG), Menglun, Mengla, 101.2522°E, 21.9303°N, 514 m alt., introduced no. 00.1978.0594, 22 August 2019, *Xuzc2019041* (holotype: KUN!).

**Description.** Sympodial bamboo, loosely tufted. Rhizomes pachymorph. Culms erect, lower nodes with verticillate aerial roots, apically pendulous, 9-14 m tall, 5-9 cm in

diameter; internodes terete, gray green, yellow striped, 20-40 cm long, wall 7-12 mm thick, culm surface initially densely covered with white to brown hairs when young and glabrous or patchy smudge later; nodes inconspicuous, internode 7-10 mm tall, with a ring of white tomentum at the intranode and below the node. Culm sheaths deciduous, leathery, glabrous adaxially, brown to black deciduous strigose abaxially, 20-28 cm long, hay color, with truncate apex; auricles narrowly falcate, 7-10 mm wide, 1-2 mm tall; ligules 4-6 mm tall, denticulate; blades triangular, erect, 4-7 cm long, 1/2 as wide as the apex of culm sheaths. Bud ovate, branching high, from 3-4 m above ground, branches several, 1 dominant. Foliage leaves 8-12 per ultimate branchlet, usually 10; sheaths initially sparsely white hairy and later glabrous, keeled; auricles inconspicuous; ligules ca. 2 mm tall, entire or split; collar with external ligule; blades lanceolate, 10-28 (-40) cm × 2-4 cm, base cuneate, glabrous, margins serrulate, secondary veins 7-11 pairs, pseudopetioles 2-4 mm long.

Inflorescence iterant; flowering branches pendulous, leafless, with clusters of 4-8 (-20) large fertile pseudospikelets mixed with a few small sterile at each nodes, subtended by glumaceous bracts; internodes 2-10 cm long, covered with white deciduous hairs. Pseudospikelets narrowly ovate, light green, 12-18 mm long, 2-3 mm wide; fertile ones sessile, perfect fertile florets 2-4, with diminished florets at the apex; disarticulated above glumes but not between florets; rachilla internodes compressed between florets. Glumes 2-3, broadly ovate, persistent, veined, 5-9 mm long, 4-6 mm wide, margins ciliated at upper half. Fertile lemma lanceolate, 14-16 mm long, chartaceous, apex mucronate, glabrous abaxially, margins ciliated; palea oblanceolate, 2-keeled, equal length to lemma, keels and margins long ciliated; lodicules absent; anthers 6, 8-10 mm long, yellow, with a finely-toothed gradual apical tip 0.5-1 mm long, filaments united into a firm tube, 6-10 mm long; stigmas 1, purple, plumose, ovary umbonate, pubescent apically. Caryopsis unknown.

**Phenology.** New shoots May to August.

**Distribution and habitat.** *Gigantochloa glabrata* is cultivated at the Bamboo Garden, XTBG, following its semi-wild collection from Mengyang Town, Jinghong City, Yunnan, CHINA in 1978; XTBG accession no. 00.1978.0594.

**Etymology.** The specific epithet refers to the culm sheath covered with sparsely deciduous appressed trichomes.

**Additional specimens examined.** CHINA. Yunnan, Mengla Country, Menglun Town, XTBG, cultivated, 31 August 2012, Y. Zeng 17 (IBSC!, no flowering branches); *ibid.*, 101°25.72'N; 114°40.99'E, 570 m alt., 1 August 2007, K. H. He (何开红) C130051 (HITBC!, HITBC0024167, flowering branches); *ibid.*, 30 May 2020, Xuzc2020001 (KUN!)

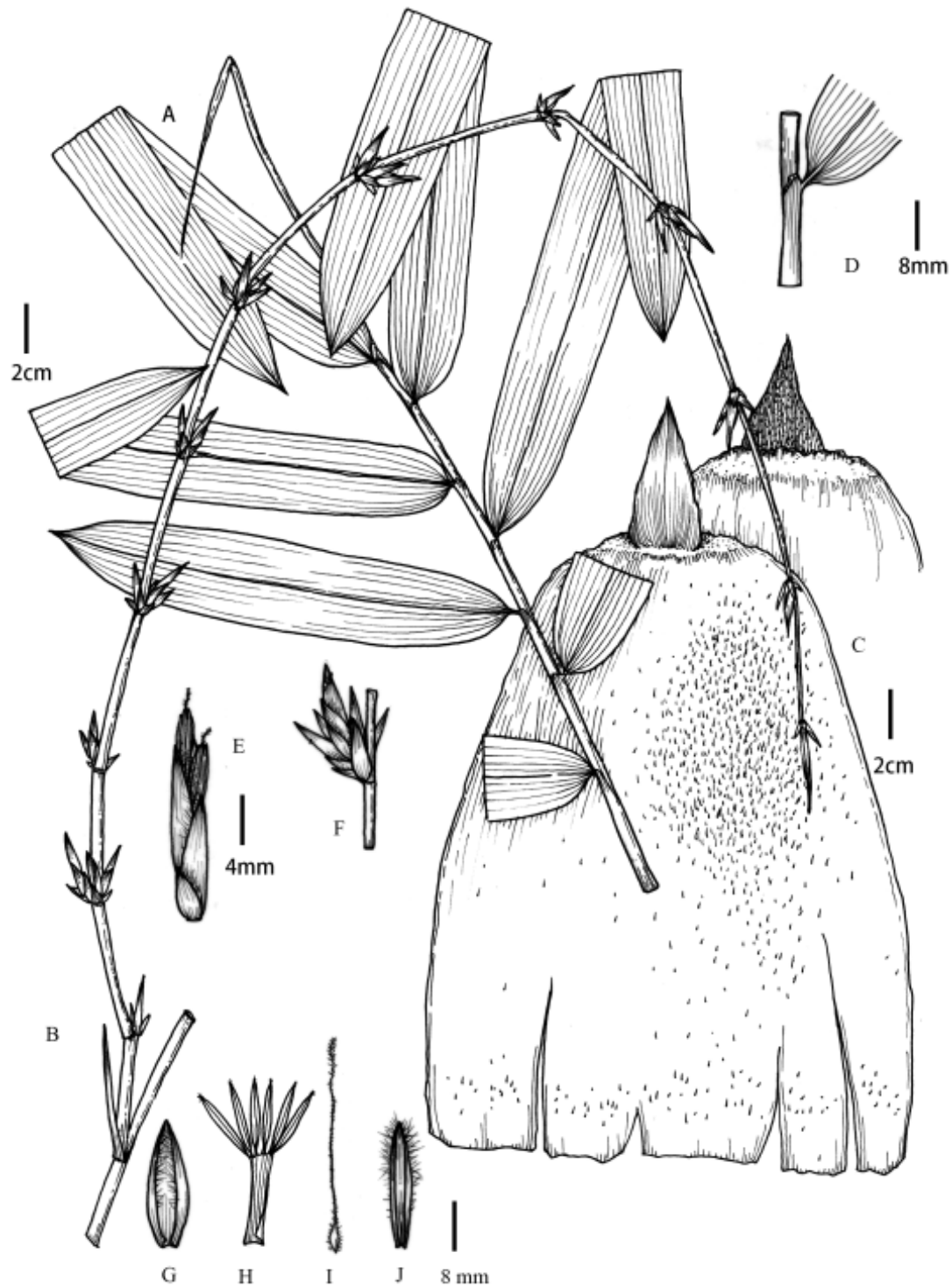
**Notes.** The new species has previously been mistakenly identified as *Gigantochloa*

*albociliata*, including the specimens used for botanical drawing reference in *Flora Reipublicae Popularis Sinicae* (Keng et al. 1996) and *Flora of China* (Li et al. 2006) illustrations. When we checked the specimens of *Gigantochloa* at Xishuangbanna Tropical Botanical Garden, CAS in 2019, we discovered the inflorescence specimens collected by K. H. He (no. C130051) in 2007 and confirmed it was not *G. albociliata*. We collected inflorescence material again in August 2019. After comparison with specimens of *G. albociliata* and other *Gigantochloa* species, we could not place it within any described species of *Gigantochloa*. We noticed that the vegetative phase of our plants was described by Zeng (2014) as a new species with description of the vegetative characters. The name is available via International Plant Names Index (IPNI), however, according to the Code (Turland et al. 2017) it was not effectively published, because it appeared only in a thesis submitted to a university for the purpose of obtaining a degree, with neither an ISBN number nor statement of the name of the printer, publisher or distributor in the original printed version (Art. 30.9). To validate the name, we designate a complete specimen with a culm-sheath and an inflorescence as the type, and describe it here in accordance with the Code.

**Additional Note.** After checking the type specimens and protologue of *Gigantochloa albociliata*, it is clear that *G. albociliata* is naturally distributed in southern Yunnan, China, as well as northern Myanmar and northern Thailand. In Yunnan, it often grows in mixed forest or roadside (CHINA, Yunnan, Menghai Country, Daluo Town, 22 April 2016, *Liujx16024*, KUN!).

**Table 1.** Morphological differences between *Gigantochloa galbrata*, *G. albociliata* and *G. levis*.

Characters	<i>G. glabrata</i>	<i>G. albociliata</i>	<i>G. levis</i>
Diameter of culm	5-9 cm	1-5 cm	7-12 cm
Internode	yellow striped	white striped	not striped
Intranode	with a white hairy ring and below the node	without hairy ring	1 brown hairy ring below the node
Culm sheath blade	erect	reflexed	reflexed
Culm sheath ligule	4-6 mm, truncate, denticulate	10-17 mm, convex in the middle, denticulate	9-14 mm, deep lacerations, bristle
Pseudospikelet	12-18 × 2-3 mm, lanceolate, straight	13-20 × 2-2.5 mm, slender, curved	11-12 × 3-4 mm, ovate, straight



**Figure 1.** *Gigantochloa glabrata* N. H. Xia & Y. Zeng ex D. Z. Li & Z. C. Xu **A** leaf branch **B** flowering branch **C** culm sheath **D** leaf ligule **E** inflorescence **F** pseudospikelet **G** lemma **H** anthers **I** pistil **J** palea. Drawn from the type specimen and pictures by Yi-Fan Li. Scale bars: 2 cm (A, B, C); 8 mm (G, H, I, J); 4 mm (D, E, F).





**Figure 2.** *Gigantochloa glabrata* N. H. Xia & Y. Zeng ex D. Z. Li & Z. C. Xu A-C clum D, F clum sheath E, I leaf G flower branches H, J pseudospikelet K, L glume M lemma(l), palea(p), ovary(o), stamens(st). Scale bars: 1 m (A); 3 cm (C); 1 cm (E, H)



## Discussion

The newly described species *Gigantochloa glabrata* is morphologically similar to *G. albociliata* and *G. levis*. However, it differs from them by its erect culm sheath blade; 4-6 mm long culm sheath ligule, truncate, denticulate; and the presence of a ring of white tomentum on the intranode and below the node. The discovery here not only sheds new light on the biodiversity study of Xishuangbanna, Yunnan, China, but also solves the problem of erroneous identifications and citations of *G. albociliata* in Chinese botanical literature for decades, including the authoritative *Flora Reipublicae Popularis Sinicae* and *Flora of China* and provincial and regional Floras.

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