Chimonobambusa Makino

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Shrubby or seldom arborescent bamboos. Rhizomes amphipodium. Culms diffuse or occasionally caespitose, erect; internodes short, usually less than 20 cm long, terete or basal internodes a little square, flat on the branching side, with 2 ridges and 3 shallow grooves, nodes on the middle or basal culms with a ring of spine-aerial roots, hollow; nodes flat or prominent. Buds 3, subulate, appressed to culms. Branches 3 per node, branch nodes conspicuously prominent, with plate-shaped joints. Culm leaves deciduous, tardily deciduous, or persistent, sheaths papery or leathery, with spots or not abaxially; auricles absent; blades extremely reduced, less than 1 cm long, erect, triangular, or subulate. Foliage leaves 1–3 (5) per branchlet; sheaths pubescent; blades lanceolate, transverse veins conspicuous. Flowering branches gernimated repeatedly, leafless or with several leaves; flowering branches usually subtended by a set of gradually larger bracts; pseudospikelets solitary or 2 or 3, usually purple; florets several to many, sessile or terminal pseudospikelets petiolate (internodes); rachilla internodes glabrous or seldom with short pubescence; glumes

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J. Y. Shi et al., *Illustrated Flora of Bambusoideae in China*,
https://doi.org/10.1007/978-981-15-7884-7_24

1–3, gradually larger; apex of lemma acute, with several ribs; palea 2-keeled, a little longer or shorter than lemma, glabrous; lodicules 3; stamens 3, filaments free, anthers yellow; ovary glabrous, style 1, very short, splitting into 2 plumose stigmas. Caryopses not fully encircled by lemma, pericarp thick, nut-like. New shoots autumn. Flowering and fruiting summer and autumn.

Approximately 28 species, one variety, four forms, all in China, areas of the south of Qinling Mountains and southeast Tibet. Japan, Vietnam, Myanmar (Keng and Wang 1996; Li et al. 2006; Shi et al. 2012; Yi et al. 2008, 2017).

Key to Species

1.	Culm leaves persistent, sheaths thinly papery to papery, longer than internodes; internodes terete, glabrous, or pubescent, except *C. leishanensis* T. P. Yi with verrucose setae	2
–	Culm leaves deciduous, papery to thickly papery, shorter than internodes (except several species); internodes quadrate or terete, with verrucose setae, except *C. szechuanensis* (Rendle) P. C. Keng glabrous	7
2.	Internodes glabrous; culm leaf sheaths with purple-brown to pale spots abaxially, glabrous or with sparse setae, sometimes with dense setae at the base	3
–	Internodes pubescent initially	4
3.	Culms 2–3 (4) m tall, spine-aerial roots only present at basal nodes; foliage leaf blades 6–15 cm long, 8–12 mm wide	*C. marmorea* (Mitford) Makino
–	Culms taller than 3 m, spine-aerial roots present at nodes without branches; foliage leaf blades 5–19 cm long, 5–20 mm wide	*C. neopurpurea* T. P. Yi
4.	Internodes with white pubescence initially; culm leaf sheaths with purple-brown or pale gray spots and dense setae abaxially	5
–	Internodes with light yellow verrucose setae and tomenta initially; culm leaf sheaths without spots	*C. leishanensis* T. P. Yi
5.	Foliage leaf ligules up to 6 mm tall	*C. damingshanensis* Hsueh et W. P. Zhang
–	Foliage leaf ligules short	6
6.	Culms 4–5 m tall, nodes a little prominent; culm leaf sheaths with pale gray spots abaxially	*C. setiformis* T. H. Wen
–	Culms 2–3 m tall, nodes prominent; culm leaf sheaths with purple-brown spots or patches abaxially; internodes 7–8 cm long, nearly solid	*C. brevinoda* Hsueh et W. P. Zhang
7.	Culm leaves longer than internodes	8
–	Culm leaves shorter than internodes	14
8.	A ring of tomenta below nodes of branches; culm leaf sheaths not verrucose abaxially when setae deciduous	*C. hirtinoda* C. S. Chao et K. M. Lan
–	Glabrous below nodes of branches; culm leaf sheaths verrucose abaxially when setae deciduous (at least partially)	9
9.	Culm leaf sheaths yellow-brown, with light green or milky white stripes abaxially	*C. lactistriata* W. D. Li et Q. X. Wu
–	Culm leaf sheaths with purple stripes or not abaxially	10

(continued)

10.	Oral setae of culm leaves present, ligules 2–3 mm tall; foliage leaf auricles tiny, oral setae present	*C. armata* (Gamble) Hsueh et T. P. Yi
–	Oral setae of culm leaves absent or seldom 1–3, ligules less than 1 mm; foliage leaf auricles absent, oral setae absent or several	11
11.	Culm leaf sheaths with brown spots and dense yellow-brown verrucose setae abaxially, black tubercles left when setae deciduous	*C. tuberculata* Hsueh et L. Z. Gao
–	Culm leaf sheaths without spots, glabrous, or with sparse verrucose setae abaxially	12
12.	Culms up to 5 m tall, 2 cm in diameter; foliage leaves 1 or 2 (4) per branchlet	13
–	Culms up to 7 m tall, 3 cm in diameter; sheath scars with gray-yellow setae initially; foliage leaves 2 or 3 (4) per branchlet	*C. tianquanensis* T. P. Yi
13.	Sheath scars with dense short setae; margins of culm leaf sheaths with white cilia	*C. rivularis* T. P. Yi
–	Sheath scars glabrous; margins of culm leaf sheaths without cilia	*C. paucispinosa* T. P. Yi
14.	Foliage leaf solitary per branchlet; margins of foliage leaf sheaths wrapped tightly, not easily stripped	*C. hejiangensis* C. D. Chu et C. S. Chao
–	Foliage leaves 1–5 per branchlet; margins of foliage leaf sheaths not wrapped tightly, easily stripped	15
15.	Culm leaf blades conspicuous, linear-lanceolate, 11–20 mm long	*C. convoluta* Q. H. Dai et X. L. Tao
–	Culm leaf blades tiny, subulate, usually shorter than 5–8 mm	16
16.	Both young and old culms glabrous; culm leaf sheaths glabrous	*C. szechuanensis* (Rendle) P. C. Keng
–	Internodes with verrucose setae, tubercles left when setae deciduous, making culms coarse, especially upper parts of internodes	17
17.	Culm leaf sheaths with yellow-white spots abaxially	18
–	Culm leaf sheaths without colorful spots abaxially	21
18.	Foliage leaf blades narrowly lanceolate to linear, 9–12 mm wide; internodes of rhizomes solid	19
–	Foliage leaf blades lanceolate, 11–21 mm wide; internodes of rhizomes hollow	20
19.	Culms terete, with verrucose short setae when young; culm leaf blades up to 11 mm long; foliage leaves 1 or 2 (3) per branchlet, one side of the middle rib on abaxial surface of blades with white pubescence initially	*C. recurva* T. P. Yi
–	Basal internodes a little quadrate, with dense pubescence and sparse setae when young; culm leaf blades up to 5 mm long; foliage leaves 1–3 (4) per branchlet, blades glabrous	*C. angustifolia* C. D. Chu et C. S. Chao
20.	Culms with dense white pubescence within 1–3 years; sheath scars with persistent white tomenta; foliage leaf blades dark green adaxially and gray-green abaxially	*C. utilis* (Keng) P. C. Keng
–	Culms with yellow-brown setae when young, gradually glabrous; sheath scars with yellow-brown tomenta initially, gradually deciduous; foliage leaf blades dark green on both surfaces	*C. pachystachys* Hsueh et T. P. Yi

(continued)

21.	Young culms with thin white powder	*C. ningnanica* Hsueh et L. Z. Gao
–	Young culms without white powder	22
22.	Intranodes of young culms with tomenta	23
–	Intranodes glabrous	24
23.	Culms hollow; intranodes with yellow-brown tomenta; culm leaf sheaths with gray-white setae abaxially	*C. metuoensis* T. P. Yi
–	Culms solid; intranodes with white tomenta; culm leaf sheaths glabrous abaxially	*C. solida* B. M. Yang et C. Y. Zeng
24.	Culm leaf sheaths glabrous or with sparse setae abaxially	25
–	Culm leaf sheaths with dense setae abaxially; transverse veins inconspicuous	28
25.	Transverse veins of culm leaf sheaths conspicuous, purple; basal internodes quadrate	*C. quadrangularis* (Franceschi) Makino
–	Transverse veins of culm leaf sheaths inconspicuous	26
26.	Sheath scars glabrous; foliage leaf blades with sparse white pubescence abaxially	*C. microfloscula* McClure
–	Sheath scars with brown setae initially; foliage leaf blades glabrous	27
27.	Internodes gray-green initially, with dense gray verrucose setae, coarse; (5) 14–25 spine-aerial roots on each node, 1.5–2 mm long; culm leaf sheaths purple-brown with yellow-white spots abaxially, blades erect; foliage leaves 1–2 (3) per branchlet; leaf sheaths glabrous, margins without cilia, auricles and oral setae absent or seldom with 1–2 slender oral setae	*C. zhizhuzhu* T. P. Yi
–	Internodes green initially, with pale white setae and verrucose setae on upper part, a little coarse; 7–9 spine-aerial roots on each node, (4) 6–8 mm long; culm leaf sheaths without spots abaxially, blades reflexed or erect; foliage leaves 2–4 per branchlet; leaf sheaths with yellow-brown setae abaxially, margins with yellow-brown cilia, auricles absent, oral setae several, erect or crinkled, 4–6 mm long	*C. pingshanensis* T. P. Yi et J. Y. Shi
28.	Culms with moderate height, basal internodes a little quadrate; no joints between culm leaf blades and sheaths; foliage leaf blades 20–23 cm long, 1.5–2 cm wide	*C. yunnanensis* Hsueh et W. P. Zhang
–	Culms short, shrubby, internodes terete; culm leaf blades easily disarticulated from culm leaves; foliage leaf blades large, 30–35 cm long, 2.5 cm wide	*C. grandifolia* Hsueh et W. P. Zhang

Chimonobambusa angustifolia C. D. Chu et C. S. Chao

Culms 2–5 m tall, 1–2 cm in diameter; internodes 10–15 cm long, terete, or basal internodes a little quadrate, with dense white pubescence and sparse setae when young, tubercles left when setae deciduous; sheath scars with light brown cilia initially; nodes flat or prominent; basal intranodes with spine-aerial roots. Branches 3 on each node. Culm leaves shorter than internodes, sheaths with gray or light yellow round spots and light yellow pubescence and setae at the base, transverse

veins purple, margins ciliate; auricles undeveloped; blades subulate-triangular, 3–5 mm long. Foliage leaves 1–3 (4) per branchlet; auricles absent, oral setae several, erect, 3–5 mm long; ligules short; blades linear-lanceolate or linear, 6–15 cm long, 0.5–1.2 cm wide, secondary veins 3 or 4 pairs.

Shaanxi, Hubei, Chongqing, Sichuan, Guizhou, Guangxi. Along riversides or under broad-leaved forests at the altitude 700–1400 m. Zones 8–9 (Fig. 1).

a. *Chimonobambusa angustifolia* C. D. Chu et C. S. Chao f. ***repleta*** T. P. Yi et H. R. Qi

Fig. 1 *Chimonobambusa angustifolia*. (**a**) Branches; (**b**) culms; (**c**) young culms; (**d**) culm buds; (**e**) new shoots; (**f**) culm leaf; (**g**) bamboo grove

Culms short, 1.8 m tall, 0.5 cm in diameter, internodes solid.

Chongqing: Liangping (Yi and Qi 2004). In the understory at the altitude 900 m. Zone 9.

This species is suitable for cultivation on ground or in pots as ornamentation.

Chimonobambusa armata (Gamble) Hsueh et T. P. Yi

Culms 3–5 (10) m tall, 1–3 cm in diameter; internodes 12–14 cm long, terete, glabrous, or coarse due to tubercles; sheath scars with dense yellow-brown tomenta; nodes prominent; middle and basal intranodes with spine-aerial roots. Branches 3. Culm leaves tardily deciduous, longer than internodes, sheaths with yellow-brown setae abaxially, tubercles left when setae deciduous, margins ciliate; oral setae developed, yellow-brown; ligules 2–3 mm tall; blades subulate-triangular, 1–3 mm long. Foliage leaves 3–5 per branchlet; auricles tiny, oral setae developed; blades 20 cm long, 1.5 cm wide, glabrous, secondary veins 4 or 5 pairs. Flowering branches clustered on nodes, 7–9 cm long; pseudospikelets clustered, 5–8 cm long, florets 7–10 per pseudospikelet, bracts 3 or 4 gradually larger apically; bracts light brown, ovate-triangular, thinly papery, potential buds within axilla; rachilla glabrous, internodes 6 mm long; lemma ovate-triangular, 8–9 mm long, papery, apex acute, ribs 7–9; palea as long as lemma, thinly papery, apex blunt or bifid; lodicules membranous and transparent, the two near lemma larger, margins with white cilia; anthers linear; ovary ovate-elliptic, style short, stigmas 2, plumose.

China: Tibet (Motuo), northwest Yunnan. Myanmar, India. Zones 9–10 (Fig. 2).

Chimonobambusa brevinoda Hsueh et W. P. Zhang

Culms 2–3 m tall, 1 cm in diameter; internodes 7–8 cm long, a little quadrate at the base, with white tomenta in line when young, a ring of brown or dark red setae below nodes, nearly solid; nodes prominent; basal intranodes with several spine-aerial roots. Branches 3. Culm leaves persistent, longer than internodes, sheaths with rust spots and sparse purple-brown setae abaxially, with light brown tomenta at the base, margins ciliate; ligules with dense yellow-brown tomenta; blades subulate, less than 1 mm long. Foliage leaves 3–5 per branchlet; auricles undeveloped, oral setae white, up to 13 mm long; blades lanceolate, 13–16 cm long, 1 cm wide, glabrous, pale green abaxially, secondary veins 3 or 4 pairs. New shoots October.

Yunnan: Xichou, Maguan, Malipo. Under broad-leaved forests. Zone 10.

Chimonobambusa convoluta Q. H. Dai et X. L. Tao

Culms 2–3 m tall, 1–2 cm in diameter; internodes 12–20 cm long, terete, or basal internodes a little quadrate, with dense yellow-brown tomenta in line when young, a little coarse due to tubercles left when tomenta deciduous; sheath scars with yellow-brown tomenta initially; nodes flat or prominent like ridges; basal intranodes with several spine-aerial roots. Branches 3 on each node. Culm leaves shorter than internodes, sheaths with purple spots and sparse brown setae abaxially, setae denser at the base, margins with brown-red cilia; auricles absent, oral setae absent or 1 or 2;

Fig. 2 *Chimonobambusa armata*. (**a**) Culms; (**b**) habitat; (**c**) culm leaf; (**d**) culm leaves

ligules less than 1 mm tall; blades linear-lanceolate, 10–20 mm long, 2–3 mm wide, nearly glabrous. Foliage leaves 2–4 per branchlet; auricles absent, oral setae erect, 8–10 mm long; ligules 1 mm tall; blades 16–22 cm long, 1–1.5 cm wide, with dense white short pubescence, secondary veins 4–5 pairs.

Guangxi. Shrubby forests at the altitude from 800 to 1400 m. Zone 10 (Fig. 3).

Chimonobambusa damingshanensis Hsueh et W. P. Zhang

Culms 1.5–2 m tall, 6–8 mm in diameter; internodes terete, 10–13 cm long, green or a little light purple-brown, with dense white short pubescence initially, a ring of dense cream yellow tomenta below nodes, culm walls thick, nearly solid; sheath scars with residues of culm leaf sheaths and brown dense tomenta; nodes prominent obviously, ridges without joints; intranodes 3–4 mm tall, spine-aerial roots inconspicuous or present on basal first or second nodes. Branches 1–3, with dense white

Fig. 3 *Chimonobambusa convoluta*. (**a**) Culms; (**b**) culm leaf; (**c**) culm buds; (**d**) new shoot; (**e**) bamboo grove

tomenta below branch nodes. Culm leaf sheaths thinly papery to papery, persistent, longer than internodes, with dense yellow-brown procumbent short setae and purple-brown large patches abaxially, margins with deciduous cilia; ligules short, arched, margins with cilia; blades deciduous, triangular, 3–4 mm long, 2 mm wide. Foliage leaves 4–6 per branchlet; oral setae up to 11 mm long; ligules up to 6 mm tall, entire; blades 15–18 cm long, 11–13 mm wide, secondary veins 4 or 5 pairs. Flowering branches with 4 or 5 bracts (remnant flowering branches left on specimens); lemma papery, ovate-lanceolate, 10 mm long, 3–4 mm wide, apex tapering with an awn; palea shorter than lemma, 6–7 mm long, apex bifid; ovary elliptic, style short, stigmas 2, plumose.

Guangxi: Wuming (Daming Mountain). At the altitude 1300 m. Zone 10.

Chimonobambusa grandifolia Hsueh et W. P. Zhang

Culms up to 4 m tall, 1–1.5 cm in diameter; internodes 20–25 (30) cm long, terete, the middle and upper part of culms with procumbent brown setae when young, tubercles left when setae deciduous, coarse; sheath scars with dense brown setae; nodes prominent ridge-like, glossy; basal intranodes with spine-aerial roots. Buds 3 on each node, bud scales with dense brown tomenta, later becoming 3 branches. Culm leaves tardily deciduous, 1/3 to 1/2 as long as internodes, sheaths with procumbent brown setae abaxially, especially dense at the base, ribs conspicuous, transverse veins inconspicuous, margins ciliate; ligules 1 mm tall; blades triangular-subulate, 5–7 mm long, joints present between the base of blades and sheaths, easily deciduous. Foliage leaves 6–8 per branchlet; oral setae developed, erect, up to 15 mm long; ligules 2 mm tall; blades 30–35 cm long, 2.5 cm wide, secondary veins 7 or 8 pairs. New shoots September to October.

Yunnan: Pingbian (Daweishan Mountain). Zone 10 (Fig. 4).

Chimonobambusa hejiangensis C. D. Chu et C. S. Chao

Culms 5–7 m tall, 2–3 cm in diameter; internodes 16–20 cm long, terete, coarse, tubercles present; nodes a little prominent; basal intranodes with spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, shorter than internodes, with procumbent brown setae abaxially, especially dense at the base, margins with dense cilia; ligules 1 mm tall; blades subulate lanceolate or triangular lanceolate, 7–13 mm long. Foliage leaf solitary per branchlet; blades 11–23.5 cm long, 1.3–2.3 cm wide, secondary veins 4 or 5 pairs. Flowering branches germinated repeatedly as paniculate, without branching if growing on terminal branches, pseudospikelets 1 (3) on each node; pseudospikelets 10–12 cm long, prophyll 1 and gradually larger bracts 5 or 6, basal 1 or 2 bracts empty, the other bracts with buds or secondary pseudospikelets; glumes absent or 1, florets 8 or 9; rachilla internodes slender, 10–14 mm long; lemma papery, ovate-triangular, apex aristate, ribs 7–9; palea thinly papery, as long as lemma, apex retuse, veins inconspicuous; lodicules membranous; filaments slender, the base of anthers arrowhead-shaped; ovary ovate-elliptic, styles 2, very short, stigmas 2, plumose. Caryopses reniform or elliptic, 10–12 mm long, 3–5 mm in diameter, styles persistent on top of caryopses as beak, pericarp 0.5 mm thick, starch rich.

Fig. 4 *Chimonobambusa grandifolia*. (**a**) New shoots; (**b**) branches; (**c**) culms and culm leaf; (**d**) bamboo grove; (**e**) habitat; (**f**) new shoot and culm

Chongqing, Sichuan, Guizhou. The original bamboo forests are distributed at the altitude 700–1200 m in Simianshan of Chongqing; Shuiwei of Xuyong, Sichuan; and Hushi of Chishui, Guizhou. Zone 9 (Fig. 5).

Chimonobambusa hirtinoda C. S. Chao et K. M. Lan

Culms up to 5 m tall, 1.5–2.5 cm in diameter; internodes 13–14 cm long, a little quadrate at the base, setose when young, coarse when setae deciduous and tubercles left; sheath scars with dense golden brown tomenta; nodes prominent; basal intranodes with spine-aerial roots. Branches 3 on each node, sheath scars of branches with dense golden brown tomenta. Culm leaves longer than internodes, sheaths with sparse procumbent brown setae abaxially, transverse veins purple, margins with cilia at upper part; ligules short; blades subulate, 1–2 mm long. Foliage leaves 2 or 3 per branchlet; auricles undeveloped, oral setae erect, pale; blades 8–16 cm long, 1.2–1.5 cm wide, secondary veins 4 or 5 pairs.

Guizhou: Duyun. Zone 9.

Chimonobambusa lactistriata W. D. Li et Q. X. Wu

Culms 4–5 m tall, 2–4 cm in diameter; internodes 11–13 cm long, a little quadrate, green when young, with purple spots and sparse verrucose setae, coarse when setae deciduous; sheath scars with purple pubescence; nodes with branches prominent strongly, ridge-shaped; middle and basal intranodes with spine-aerial roots 4–19. Branches solid, nodes prominent, ridge-shaped. Culm leaves deciduous, longer than internodes, sheaths papery, middle and upper parts of sheaths gradually thinner and crinkled, dark purple initially, later yellow-brown, with light green or white stripes, sheaths on lower part of culms with sparse light brown verrucose setae abaxially, those on middle and upper culms glabrous, margins with light yellow cilia, transverse veins conspicuous, purple; auricles undeveloped; ligules very short, arched; blades formed by reduction of the apex of sheaths, subulate. Foliage leaves 4–6 (9) per branchlet; auricles undeveloped, oral setae several, 3–5 mm long; ligules arched, margins ciliate; blades 8–17 cm long, 8–20 mm wide, with sparse pubescence abaxially, the base of the middle vein with dense pubescence, secondary veins 4–6 pairs, transverse veins conspicuous, rectangular; petiole with dense pubescence. New shoots October.

Guizhou: Ceheng, Libo. Under broad-leaved forests at the altitude 500 m. Zone 9.

New shoots are edible.

Chimonobambusa leishanensis T. P. Yi

Culms 1.5–3 m tall, 0.6–1 cm in diameter, erect; internodes (4) 14 (17) cm long, terete, flat on the branching side, 3-grooved and 2-ridged, with light yellow verrucose short setae and pubescence, a little coarse due to persistent tubercles, culm walls 3–4 mm thick; sheath scars with downward yellow-brown setae initially; intranodes 1–2 mm tall, nodes below middle parts of culms with spine-aerial roots (2) 4–10. Culm leaves usually longer or sometimes shorter than internodes, persistent, thinly papery, with light yellow verrucose setae abaxially, transverse veins conspicuous,

Fig. 5 *Chimonobambusa hejiangensis*. (**a**) Culm buds; (**b**) new shoots and culms; (**c**) culm leaves; (**d**) bamboo grove

margins with light yellow cilia; auricles absent, oral setae absent or 1–3 on each side; ligules 1 mm tall, margins ciliate; blades erect, 0.6–2.8 cm long, 0.8–1.2 mm wide. Foliage leaves 1 or 2 (3) per branchlet; sheaths glabrous, or seldom with gray pubescence initially, upper margins with cilia initially; oral setae (3) 6–13 on each side, 2–4 mm long; ligules 0.5 mm tall, with gray or light yellow pubescence abaxially at first; petiole 2–3 mm long; blades lanceolate, (6) 11–20 cm long, (0.9) 1.4–2.5 cm wide, the base cuneate, pale green abaxially, secondary veins 5 or 6 pairs, transverse veins a little conspicuous, margins sparsely serrate. Flowering branches unknown. New shoots August.

Guizhou: Leishan (Leigong Mountain). Understory or on vacant lands in the forest at the altitude 1620 m. Zone 9.

New shoots are edible.

Chimonobambusa marmorea (Mitford) Makino

Rhizomes amphipodium. Culms diffuse and a little caespitose, 1–1.5 (3) m tall, 0.5–1 cm in diameter; internodes terete or grooved at the branching side, 10–14 cm long; sheath scars with brown tomenta initially; nodes a little prominent; basal intranodes with several spine-aerial roots. Branches 3 on each node. Culm leaves persistent, a little longer than internodes, sheaths yellow-brown with gray-white spots abaxially, glabrous or with light yellow setae, margins ciliate; auricles absent; ligules truncate or a little arched; blades subulate, erect, 2–3 mm long. Foliage leaves 2 or 3 per branchlet; oral setae 3–4 mm long; blades 10–14 cm long, 0.7–0.9 cm wide, glabrous, secondary veins 4 or 5 pairs. Flowering branches subtended by gradually larger bracts, pseudospikelets 1–4 on middle and upper branches; pseudospikelets linear, 2–4 cm long, bracts 0–2, axilla with or without buds; florets 4–7; rachilla internodes 3–4 mm long, glabrous; glumes 1–2, or absent, 6–8 mm long, 5–7 veins; lemma green or a little purple, 6–7 mm long, 5–7 veins, transverse veins present; palea as long as lemma, 2-keeled, 2 veins between keels, apex truncate or bifid, 2 veins outside each keel; lodicules 3; stamens 3, filaments free; ovary slender ovate, style 1, short, stigmas 2, plumose. Pericarp of caryopses thick, nut-like when dry.

China: Zhejiang, Fujian, Sichuan, Yunnan, north Guangxi. Japan. This species occurs naturally in some scenic spots, and it is also cultivated on ground or in pots. Zone 9.

This bamboo is elegant, beautiful, and suitable for ornamentation. It has been introduced into Europe and Americas (Figs. 6 and 7).

a. ***Chimonobambusa marmorea*** (Mitford) Makino f. ***gimmei*** Muroi et Kasahara

Culms green, internodes with light yellow-green stripes on branching sides; foliage leaf blades with white stripes.

Introduced into Nanjing of Jiangsu. Originally in Japan. Zone 9.

b. ***Chimonobambusa marmorea*** (Mitford) Makino f. ***variegata*** (Makino) Ohwi

Culms yellow, internodes with green stripes, when anthocyanin is exposed under sunshine, culms can become red from yellow; foliage leaf blades with white stripes.

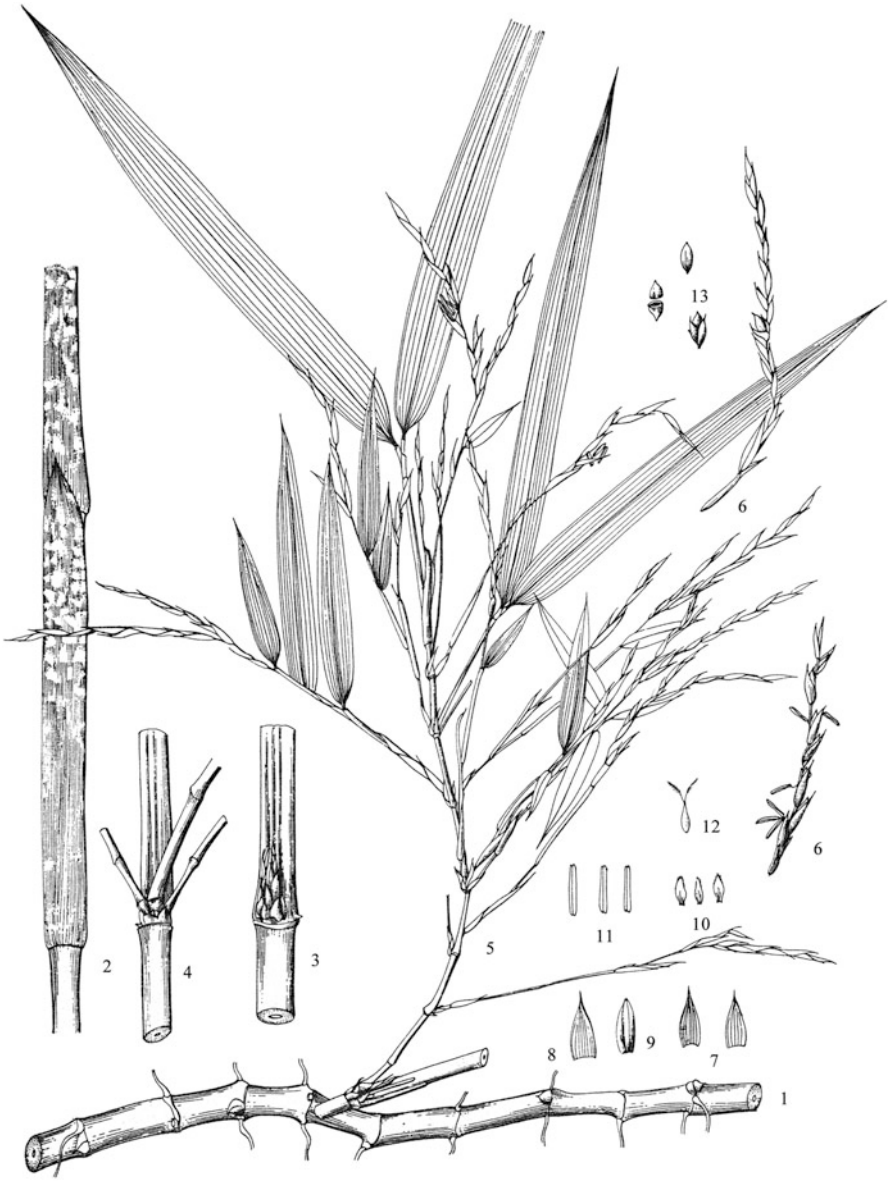

Fig. 6 *Chimonobambusa marmorea*. 1. Rhizome; 2. internodes, showing persistent culm leaves; 3. part of culm, showing buds and spine-aerial roots; 4. part of culm, showing branches; 5. flowering branches; 6. pseudospikelets; 7. glumes; 8. lemma; 9. palea; 10. lodicules; 11. anthers; 12. pistil; 13. caryopses (from Yi et al. 2008)

Fig. 7 *Chimonobambusa marmorea*. (**a**) Inflorescence; (**b**) culm leaf; (**c**) young culms; (**d**) bamboo grove

Introduced into Nanjing of Jiangsu and Dujiangyan of Sichuan. Originally in Japan. Zone 9 (Fig. 8).

Chimonobambusa metuoensis Hsueh et T. P. Yi

Culms 5–7 m tall, 1–2.5 cm in diameter; internodes 20–28 cm long, terete, upper parts with sparse setae, tubercles left when setae deciduous; sheath scars with downward brown setae initially; nodes protruding to be ridges, like two plates covered mutually; intranodes of middle and basal culms with many spine-aerial roots, with yellow-brown tomenta initially. Branches 3 on each node. Culm leaves tardily deciduous, shorter than internodes, sheaths with gray-white setae abaxially,

Fig. 8 *Chimonobambusa marmorea* f. *variegata*. (**a**) Culms; (**b**) culms and branches; (**c**) bamboo grove

margins with gray-brown cilia; ligules 1 mm all; blades erect, subulate or triangular, 1.5–2 mm long. Foliage leaves 2 or 3 per branchlet; blades 12–33 cm long, 1.5–4 cm wide, secondary veins 5–8 pairs. New shoots July to August.

Tibet: Motuo. Broad-leaved forests at the altitude 1900–2200 m. Zone 9 (Fig. 9).

Fig. 9 *Chimonobambusa metuoensis*. (**a**) Culms and aerial roots; (**b**) culm buds; (**c**) culm leaf; (**d**) bamboo grove

Chimonobambusa microfloscula McClure

Culms 4–6 m tall, 1.5–2 cm in diameter; internodes with setae on middle and upper parts, tubercles left when setae deciduous, coarse; sheath scars glabrous; nodes extremely prominent on branching nodes, ridge-shaped; basal intranodes with spine-aerial roots. Branches 3 on each node, branch nodes extremely prominent. Culm

leaves deciduous, sheaths thickly papery, shorter than internodes, glabrous or with sparse setae abaxially, ribs conspicuous, transverse veins inconspicuous, margins with yellow-brown cilia; ligules 1 mm tall, margins ciliate; blades subulate, easily deciduous. Foliage leaves 3–5 per branchlet; margins of sheaths ciliate; oral setae 12 mm long; blades 9–20 cm long, 7–15 mm wide, with sparse white pubescence abaxially, secondary veins 4 or 5 pairs. Flowering branches 8–24 cm long, pseudospikelets 5; pseudospikelets dark red, sessile or with very short petiole; glumes 2, membranous, apex blunt, the first glume 4–5 mm long, veins 5, with sparse pubescence abaxially, the second glume 5–6 mm long, veins 7, glabrous; lemma acute, 7–9 mm long, membranous, apex acute, veins a little purple, glabrous; palea as long as lemma, 2-keeled, coarse between keels, veins 2 between keels, glabrous or nearly glabrous outside keels, apex blunt, nearly entire; lodicules, stamens, pistil, and other parts of florets unknown. Caryopses unknown.

China: Yunnan (Jinping). Vietnam. Zone 10.

Chimonobambusa neopurpurea T. P. Yi

Culms 4–8 m tall, 1–5 cm in diameter; internodes 10–18 (25) cm long, green, a little quadrate; sheath scars with dense yellow-brown setae initially; nodes a little prominent; intranodes with developed spine-aerial roots. Branches 3 on each node. Culm leaves persistent, longer than internodes, purple-brown, sheaths with gray-white spots and sparse brown or yellow-brown setae abaxially, dense at the base, margins with cilia at the middle and upper parts; auricles absent, oral setae absent or several; ligules arched; blades subulate, 1–3 mm long. Foliage leaves 2–4 per branchlet; oral setae absent or several; blades linear-lanceolate, 5–19 cm long, 0.5–2 cm wide, glabrous or with gray-yellow pubescence at the base abaxially, secondary veins 4–6 pairs, transverse veins conspicuous. Flowering branches racemose or paniculate, or singular at the base of leaved branches, terminal flowering branches slender, 4 or 5 gradually larger bracts present at the base, pseudospikelets 1–3; pseudospikelet solitary on nodes of terminal flowering branches, the lateral pseudospikelet subtended by ovate to linear prophyll; pseudospikelets slender and long, 1–14.5 cm long, 1–1.5 mm thick, glabrous, florets 4–12; rachilla internodes flat on the side with florets, 3–12 mm long, glabrous; glumes 1 or 2, ovate-lanceolate or lanceolate, 6–12 mm long, ribs 7 or 8, apex blunt; lemma ovate-lanceolate, 7–12 mm long, veins 7–9, apex acute; palea longer than lemma, apex obtuse or bifid; the 2 lodicules near lemma elliptic, 2 mm long, the other one lanceolate, 1.2 mm long; anthers yellow, 4–6 mm long; ovary elliptic, 1 mm long, glabrous, style very short, split at the base, stigmas plumose, 2 mm long. Caryopses nut-like, elliptic, or seldom nearly globose, 4–7 mm long, 2–4 mm in diameter, green or purple, pericarp 0.3 mm thick, apex with residue of style and beaked. New shoots middle August to September. Flowering April to December.

Sichuan, Chongqing, south Shaanxi, west Hubei; introduced into Xiamen of Fujian. Zone 9.

This bamboo is famous for its delicious new shoots, and it is also a beautiful plant for ornamentation.

This species was treated as a synonym of *Chimonobambusa purpurea* Hsueh et T. P. Yi in *Flora of China* (Li et al. 2006) (Figs. 10 and 11).

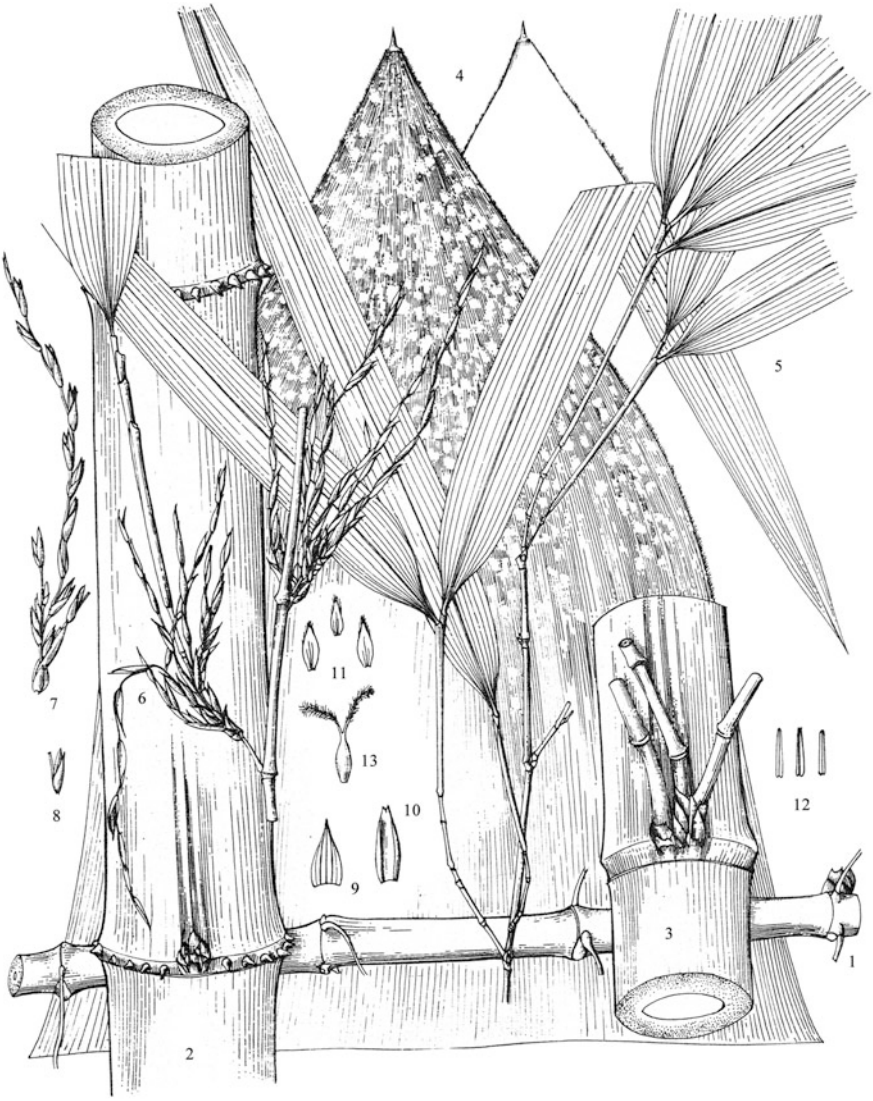

Fig. 10 *Chimonobambusa neopurpurea*. 1. Rhizome; 2. part of culm, showing spine-aerial roots; 3. part of culm, showing branches; 4. culm leaf; 5. branchlets with foliage leaves; 6. flowering branches; 7. part of inflorescence; 8. floret; 9. lemma; 10. palea; 11. lodicules; 12. anthers; 13. pistil (from Yi et al. 2008)

a. *Chimonobambusa neopurpurea* T. P. Yi f. ***lineata*** T. P. Yi et J. Y. Shi

Basal internodes light purple-green with light green stripes; culm leaves shorter than internodes.

Fig. 11 *Chimonobambusa neopurpurea*. (**a**) Young culms; (**b**) culms; (**c**) new shoots; (**d**) culm leaf; (**e**) bamboo grove

Sichuan (Yi et al. 2014). This form can be found in some forests of *Chimonobambusa neopurpurea*.

New shoots are delicious; this bamboo is also suitable for ornamentation.

Chimonobambusa ningnanica Hsueh et L. Z. Gao

Culms 2–4 (5) m tall, 1–2 (3) cm in diameter; middle internodes 12–13 cm long, up to 17 cm long, terete or the base a little quadrate, 2 ridges and 3 grooves on the branching side, with thin white powder when young and verrucose setae, tubercles left when setae deciduous, the surface of culms coarse, culm walls up to 8 mm thick; sheath scars with dense brown setae, setae persistent for more than 2 years; nodes with branches prominent, a little prominent on nodes without branches; intranodes 1–1.5 mm tall, basal nodes with 2–8 (11) straight and sharp 1–1.5-mm-long spine-aerial roots. Branches 3 on each node, later to 11 due to secondary branch development. Culm leaves early to tardily deciduous, 1/2 to 4/5 as long as internodes, sheaths thickly papery, purple, with gray-brown stripes and procumbent sparse yellow-brown verrucose setae abaxially, tubercles left when setae deciduous, ribs conspicuous, sparse transverse veins present on upper margins; auricles and oral

setae absent; ligules truncate or a little arched, margins with short cilia initially; blades tiny, triangular-subulate, erect, 0.5–1 mm long. Foliage leaves 2–5 (8) per branchlet; auricles absent, oral setae absent or 1–3 gray on each side initially; ligules 0.5 mm tall, with tomenta; blades linear-lanceolate, 9–21 cm long, 1–2 cm wide, with gray pubescence along secondary veins or third veins abaxially, secondary veins (3) 4–6 pairs, transverse veins rectangular. New shoots October.

Southwest Sichuan, northeast Yunnan. Creeks or understory along riverbanks at the altitude 1900–2700 m. Zone 9 (Fig. 12).

Chimonobambusa pachystachys Hsueh et T. P. Yi

Culms 3–6 m tall, 1–3 cm in diameter; internodes 15–18 (20) cm long, basal internodes a little quadrate or terete, with dense yellow-brown pubescence when young, upper parts of internodes with yellow-brown setae, coarse when setae deciduous due to tubercles left, culm walls 6–11 mm thick; sheath scars with brown setae initially; nodes with branches prominent; intranodes below branches with many spine-aerial roots. Branches 3 on each node. Culm leaves deciduous or tardily deciduous, shorter than internodes, with gray-white spots and sparse yellow-brown setae or sometimes glabrous abaxially, margins ciliate; ligules 1 mm tall; blades subulate, 3–4 mm long. Foliage leaves (1) 2 or 3 (4) per branchlet; oral setae several; ligules 1 mm tall; blades 6–18 cm long, 1.1–2.1 cm wide, with sparse pubescence or glabrous abaxially, secondary veins (4) 5 (6) pairs, transverse veins present. Flowering branches growing solitarily on nodes of terminal branches, subtended by 3 or 4 gradually larger bracts, or branching repeatedly as panicles; pseudospikelets solitary or 3 on each node of flowering branches, lateral ones sessile, subtended by one linear prophyll; glumes 1 or 2, florets 4–6; lemma papery, glabrous or pubescent abaxially, apex acute; palea thinly papery, shorter than lemma, apex blunt, glabrous; anthers purple; ovary obovate, style short, the base split into 2 stigmas, plumose. Caryopses obovate-elliptic, pericarp thick. New shoots in September.

Sichuan, northeast Yunnan. Understory at the altitude 1000–1500 m. Zone 9.

Chimonobambusa paucispinosa T. P. Yi

Culms 3–5 m tall, 1–2 cm in diameter; internodes 10–14 cm long, basal internodes a little quadrate, with gray-yellow setae when young, culm walls 3.5–6 mm thick; sheath scars glabrous; nodes a little prominent; intranodes below branches with (1) 2–8 (10) spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, glabrous, or with sparse setae at the base, margins without cilia; ligules 0.5 mm tall; blades erect, 3–6 mm long. Foliage leaves 1 or 2 (4) per branchlet; oral setae absent or seldom 1 or 2; blades (4.5) 9–13 cm long, (0.6) 1–1.5 cm wide, secondary veins 3 or 4 pairs. New shoots late September.

Yunnan: Suijiang. Understory of evergreen broad-leaved forests at the altitude 1450 m. Zone 9.

Chimonobambusa pingshanensis T. P. Yi et J. Y. Shi

Culms 3–4 m tall, 1–2 cm in diameter; internodes (8) 15 (20) cm long, terete, basal internodes a little quadrate, sulcate at the branching side or with buds, with

Fig. 12 *Chimonobambusa ningnanica*. (**a**) Culms and aerial roots; (**b**) culm buds; (**c**) new shoot; (**d**) culm leaf; (**e**) bamboo grove

gray-white setae when young and verrucose setae at upper parts, coarse, culm walls 4–5 mm thick, pith membranous; sheath scars with brown setae initially; nodes a little prominent; intranodes 2–2.5 mm tall, spine-aerial roots 7–9 on each node and (4) 6–8 mm long. Culm buds 3, ovate-subulate. Branches 3 on each node, up to

80 cm long, 1.5–3 mm in diameter. New shoots dark purple or green-purple; culm leaves deciduous, sheaths leathery, long triangular, shorter than internodes, without spots abaxially, with brown verrucose setae abaxially, ribs conspicuous, margins with dense brown cilia; auricles and oral setae absent; ligules truncate, purple initially, 0.5 mm tall, margins with short cilia; blades recurved or erect, triangular-subulate, 3–8 mm long, 1–1.5 mm wide, a little coarse at the adaxial base, margins entire. Foliage leaves 2–4 per branchlet; sheaths 3.5–5 cm long, with yellow-brown setae abaxially, margins with yellow-brown cilia; auricles absent, oral setae several, 4–6 mm long; ligules purple-brown, nearly truncate, 0.5 mm tall; petioles 2–4 mm long; blades linear-lanceolate, (7) 11–20 (23) cm long, 1.4–2.5 cm wide, the base cuneate, gray-white abaxially, glabrous, secondary veins 5–6 pairs, transverse veins rectangular, margins serrate. New shoots late September.

Sichuan: Pingshan (Yi et al. 2005). In shrubs at the altitude 1400 m. Zone 9.

New shoots are edible and delicious. Culms can be used for papermaking (Fig. 13).

Chimonobambusa quadrangularis (Franceschi) Makino

Culms 3–8 m tall, 1–4 cm in diameter; internodes 8–22 cm long, terete, or basal internodes a little quadrate, with yellow-brown verrucose setae when young, coarse when setae deciduous due to tubercles left; sheath scars with yellow-brown tomenta and setae initially; nodes with branches flat or very prominent; intranodes below the middle culm with developed spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, shorter than internodes, glabrous or sometimes with procumbent sparse setae at the middle and upper parts, transverse veins purple, margins ciliate; auricles and ligules undeveloped; blades subulate, 3–5 mm long. Foliage leaves 2–5 per branchlet; sheaths glabrous, oral setae erect; ligules tomentose, margins ciliate; blades oblong lanceolate, 9–29 cm long, 1–2.7 cm wide, pubescent abaxially, secondary veins 4–7 pairs. Flowering branches racemose or paniculate, terminal flowering branches slender and glabrous, the base with several gradually larger bracts, pseudospikelets 2–4, sometimes one pseudospikelet present at the base of flowering branches, bracts several; pseudospikelets slender, 2–3 cm long, lateral pseudospikelets subtended by prophyll without bracts; florets 2–5, sometimes the basal 1 or 2 florets sterile, with tiny palea and other parts of florets; rachilla internodes 4–6 mm long, glabrous; glumes 1–3, lanceolate, 4–5 mm long; lemma papery, green, lanceolate or ovate-lanceolate, veins 5–7; palea as long as lemma; lodicules oblong-ovate; anthers 3.5–4 mm long; stigmas 2, plumose. New shoots September to October.

China: Jiangsu, Anhui, Zhejiang, Jiangxi, Fujian, Taiwan, Hunan, Guangxi, and Sichuan; cultivated in Hong Kong and Guangzhou. Japan. Introduced into Europe and Americas. Zones 9–10 (Figs. 14 and 15).

a. ***Chimonobambusa quadrangularis*** (Franceschi) Makino f. ***purpureiculma*** T. H. Wen

Culms purple.

Fujian: Guixi, Shunchang. Zone 10.

Fig. 13 *Chimonobambusa pingshanensis*. (**a**) Culms and aerial roots; (**b**) new shoots; (**c**) culm leaves; (**d**) foliage leaves; (**e**) bamboo grove

Chimonobambusa recurva T. P. Yi

Culms 2–3.5 m tall, 1.2–2 cm in diameter; internodes 12 (16) cm long, with white verrucose setae initially, no or several tubercles left when setae deciduous; sheath scars with light yellow setae initially; nodes a little prominent; basal intranodes with

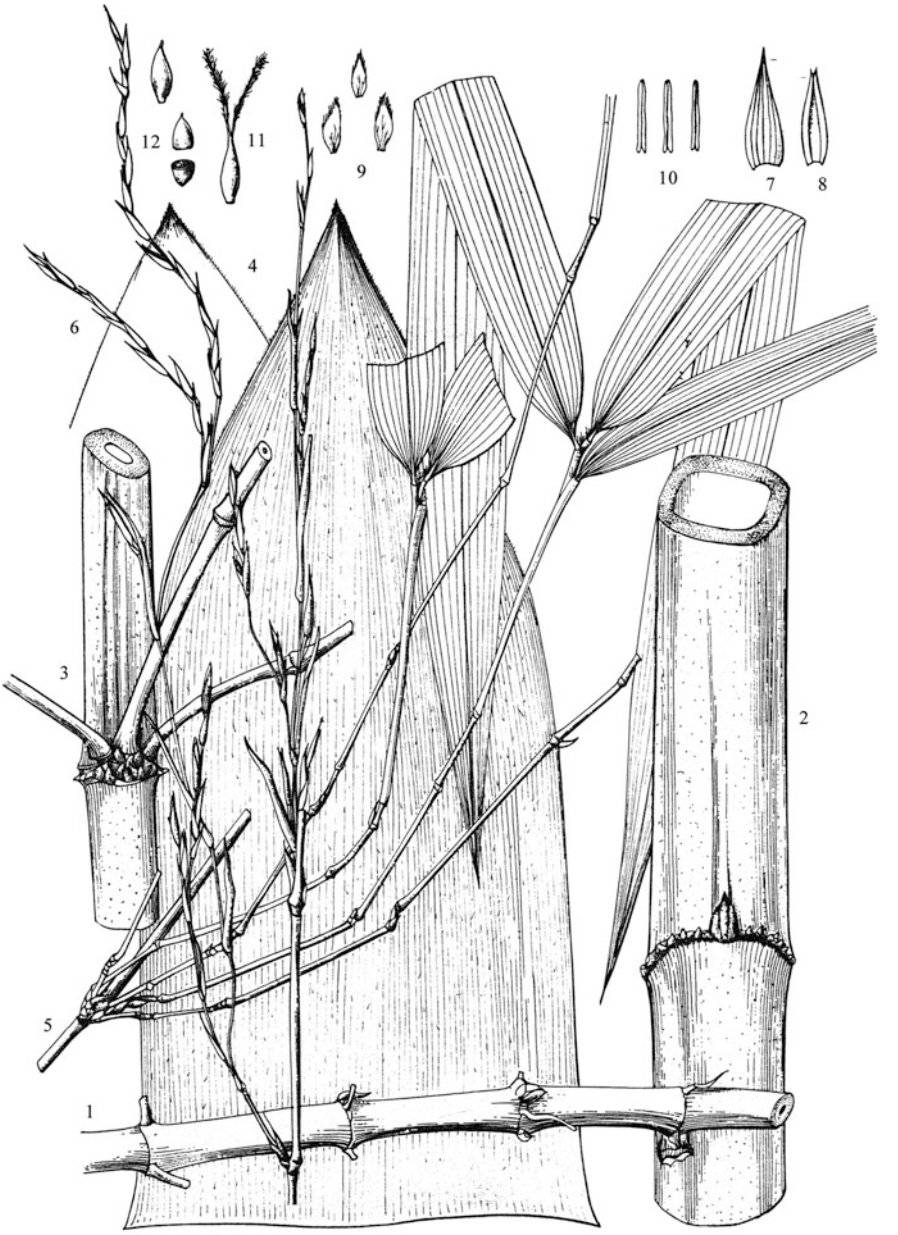

Fig. 14 *Chimonobambusa quadrangularis*. 1. Rhizome; 2. part of culm, showing internode, spine-aerial roots and buds; 3. part of culm, showing spine-aerial roots and branches; 4. culm leaf; 5. foliage leaf branches; 6. flowering branches; 7. lemma; 8. palea; 9. lodicules; 10. anthers; 11. pistil; 12. caryopses (from Yi et al. 2008)

bent spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, the upper part of sheaths with several white spots and seldom light yellow setae abaxially, margins ciliate; ligules 0.5 mm tall; blades triangular, 4–11 mm long, erect or

Fig. 15 *Chimonobambusa quadrangularis*. (**a**) Culm buds; (**b**) flowering branches; (**c**) inflorescence and caryopsis; (**d**) new shoot; (**e**) new shoots and young culms; (**f**) culm leaf; (**g**) bamboo grove

reflexed. Foliage leaves 1–2 (3) per branchlet; ligules 0.3 mm tall; blades (6.5) 11–16 cm long, 0.5–0.9 cm wide, one side of the abaxial middle rib with white short pubescence initially, secondary veins 3 or 4 pairs, transverse veins conspicuous. New shoots middle September to early October.

Sichuan: Gulin. Along riversides of mountainous regions at the altitude 1000 m. Zone 9.

This species was treated as a synonym of *Chimonobambusa angustifolia* C. D. Chu et C. S. Chao in *World Checklist of Bamboos and Rattans* (Vorontsova et al. 2016).

Chimonobambusa rivularis T. P. Yi

Culms 2.5–5 m tall, 1.2–2 cm in diameter; internodes 10–12 (15) cm long, terete, or basal internodes a little quadrate, with white or gray-yellow verrucose setae, coarse when setae deciduous due to tubercles left; sheath scars with dense short setae; nodes flat or prominent when branches present; intranodes below middle parts of culms with spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, longer than internodes, sheaths sometimes with purple stripes, few white or light yellow setae on abaxial surface, margins with white cilia; ligules 1 mm tall; blades erect, long triangular, or linear-lanceolate, 4–20 mm long, 1.2–2 mm wide. Foliage leaves 1 or 2 (3) per branchlet; oral setae 1–3 initially; blades 7–11 cm long, 0.8–1.3 (1.6) cm wide, secondary veins (3) 4 (5) pairs.

West Sichuan. Understory or shrubs along river banks at the altitude 1100–1450 m. Zone 9.

This species was treated as a synonym of *Chimonobambusa lactistriata* W. D. Li et Q. X. Wu in *Flora of China* and *World Checklist of Bamboos and Rattans* (Li et al. 2006; Vorontsova et al. 2016) (Fig. 16).

Chimonobambusa setiformis T. H. Wen

Culms 4–5 m tall, 1.5–2 cm in diameter; internodes 10–15 cm long, solid or nearly solid, with dense white pubescence below nodes; sheath scars with brown-purple setae initially; nodes a little prominent; intranodes with several spine-aerial roots. Branches 3 on each node. Culm leaves persistent, longer than internodes, the abaxial surface of sheaths light green with purple or brown-purple, with white spots and upward brown verrucose setae abaxially, margins without cilia; auricles and oral setae absent; ligules arched; blades erect, subulate, 1–2 mm long. Foliage leaves 2 or 3 per branchlet; auricles absent or tiny, oral setae white, up to 12 mm long; blades narrowly lanceolate, 6–13 cm long, 0.8–1.2 cm wide, glabrous, secondary veins 4–5 pairs. New shoots October.

Fujian: Wuyishan. Zone 9.

This species was treated as a synonym of *Chimonobambusa marmorea* (Mitford) Makino in *Flora of China* and *World Checklist of Bamboos and Rattans* (Li et al. 2006; Vorontsova et al. 2016).

Chimonobambusa solida B. M. Yang et C. Y. Zeng

Culms 1–2 m tall, 0.5 cm in diameter, basal internodes quadrate, upper internodes terete, culms and branches solid; nodes prominent, with white pubescence, a ring of

Fig. 16 *Chimonobambusa rivularis*. (**a**) Culms; (**b**) bamboo grove

aerial roots present on basal internodes; internodes 5–12 cm long, with verrucose setae on the surface, grooves 3 at the branching side; buds 3. Culm leaf sheaths triangular, tardily deciduous, papery, glabrous, upper margins ciliate; auricles and oral setae absent; blades tiny, subulate, erect; ligules very short, truncate. Foliage leaf sheaths glabrous, margins white ciliate; oral setae white; ligules 2 mm tall, truncate, glabrous; blades narrowly oblong, apex tapering, the base cuneate, 13 cm long, 1.1 cm wide, margins serrate, pubescent abaxially, secondary veins 4 pairs. Inflorescence and fruit unknown. New shoots autumn.

Hunan: Yiyang. Zone 9.

This species was treated as a synonym of *Chimonobambusa pubescens* T. H. Wen in *Flora of China* (Li et al. 2006).

Chimonobambusa szechuanensis (Rendle) P. C. Keng

Culms 2.5–4 (6) m tall, 1.5–2 cm in diameter; internodes 18–22 cm long, terete, or basal internodes nearly quadrate, glabrous; sheath scars with sparse brown tomenta; nodes flat or a little prominent; basal intranodes with spine-aerial roots. Branches 3 on each node. Culm leaves tardily deciduous, shorter than internodes, glabrous, with purple stripes, margins ciliate; ligules 0.5–1 mm tall; blades subulate-triangular, 3–5 mm long. Foliage leaves 1–3 per branchlet; oral setae 3–5 mm long;

ligules 1–1.5 mm tall; blades 18–20 cm long, 1.2–1.5 cm wide, secondary veins 4–6 pairs. Flowering branches germinated repeatedly, the terminal with or without foliage leaves, pseudospikelets 1–3 on basal nodes of leaved branchlets; pseudospikelets subtended by 0–4 bracts, the upper 1 or 2 bracts with buds or secondary pseudospikelets; florets 3 or 4; glumes 2 or 3; lemma ovate-lanceolate, apex tapering, veins 7–9; palea long ovate, as long as lemma, apex obtuse or concave, 2-keeled; lodicules 3, the two near lemma larger than the other one, membranous, upper margins with slender white cilia; anthers yellow; ovary ovate, style very short, stigmas 2, plumose. Caryopses ovate-elliptic, 15 mm long, 6 mm thick, pericarp 0.8–1 mm thick, nut-like, pericarp difficult separated from seed coats, only separated from the endosperm.

West Sichuan and west Yunnan (Longchuan). Evergreen broad-leaved forests, evergreen and deciduous broad-leaved mixed forests, or subalpine dark coniferous forests at the altitude (1400) 1700–2400 (3000) m.

In Emei Mountain, *C. szechuanensis* is the dominant native species in the shrubby layer from Jiulaodong to Xixiangchi. These bamboo forests are green all year round, which make tourists enjoyable with natural beautiful scenery. Zone 9 (Fig. 17).

a. *Chimonobambusa szechuanensis* (Rendle) P. C. Keng var. ***flexuosa*** Hsueh et C. Li

Basal internodes zigzag and shortened to be abnormal.

Sichuan: Yaan (Zhougong Mountain). This bamboo is a beautiful ornamental species. Zone 9.

Chimonobambusa tianquanensis T. P. Yi

Culms 5–7 m tall, 1.5–3 cm in diameter; internodes 14–15 (18) cm long, with gray-white verrucose setae at the upper part when young, tubercles left when setae deciduous; culm walls 2.5–5 mm thick; sheath scars with gray-yellow setae initially; nodes with branches prominent ; basal intranodes with spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, longer than internodes, with very sparse light yellow verrucose setae abaxially, margins without cilia or sometimes with sparse cilia initially; auricles and oral setae absent, ligules 0.8 mm tall; blades triangular or linear triangular, up to 9 mm long. Foliage leaves 2 or 3 (4) per branchlet; oral setae erect; ligules 0.5 mm tall, margins fimbriate; blades 10–15 cm long, 1.3–1.8 cm wide, gray abaxially, secondary veins 4 or 5 pairs, transverse veins rectangular.

Sichuan: Tianquan. Forest edges of mountainous regions at the altitude 1450 m. Zone 9.

Chimonobambusa tuberculata Hsueh et L. Z. Gao

Culms 3–4 m tall, 1.2 cm in diameter; internodes 14–18 cm long, terete, sulcate inconspicuous, with dense brown setae when young, tubercles left when setae deciduous; sheath scars with brown tomenta; nodes without branches flat, a little or strongly prominent on nodes with branches; intranodes 2 mm long, intranodes below the middle culm with 4–12 spine-aerial roots. Culm leaves tardily deciduous,

Fig. 17 *Chimonobambusa szechuanensis*. (**a**) Young culms; (**b**) bamboo grove; (**c**) new shoots and culms; (**d**) culm leaf; (**e**) culm leaf

sheaths papery or thickly papery, longer than internodes, with brown spots and yellow-brown procumbent setae abaxially, black tubercles left when setae deciduous; ligules inconspicuous; blades tiny, 1–2 mm long, no joint between the base of the blade and the top of the sheath. Foliage leaves 3 or 4 per branchlet; oral setae several, easily deciduous; ligules 1 mm tall; blades 20–25 cm long, 2–3 cm wide, glabrous, secondary veins 6–9 pairs, transverse veins square. New shoots August to September.

Yunnan: Yongshan, Yanjin, Weixin. Mountainous regions at the altitude 1300–1450 m. Zone 9 (Fig. 18).

Fig. 18 *Chimonobambusa tuberculata*. (**a**) New shoot; (**b**) culm leaf; (**c**) foliage leaves; (**d**) bamboo grove

Chimonobambusa utilis (Keng) P. C. Keng

Culms 5–7 (10) m tall, 2–3.5 (5) cm in diameter; internodes 20–30 cm long, terete, or basal internodes a little quadrate, with dense yellow-brown setae and sparse gray-yellow verrucose setae initially, coarse when setae deciduous due to tubercles left, or smooth, culm walls 4–7 mm thick; sheath scars with brown tomenta; nodes flat or prominent; middle and lower intranodes with developed spine-aerial roots.

Branches 3 on each node. Culm leaves tardily deciduous, shorter than internodes, with conspicuous white spots abaxially, glabrous or with white tomenta at the base, margins ciliate; ligules 0.5–1.2 mm tall; blades subulate-triangular, 4–7 mm long. Foliage leaves 1–3 per branchlet; oral setae several or absent; ligules 1–2 mm tall; blades lanceolate, 14–19 cm long, 1.2–3 cm wide, pale green abaxially, secondary veins 5–7 pairs. Flowering branches growing on nodes of terminal branches with foliage leaves, subtended by 4–5 gradually larger bracts; pseudospikelets one or seldom many growing in axilla of flowering branches, the lateral pseudospikelets subtended by one linear prophyll; florets 4–7, 25–45 mm long, brown or dark brown; rachilla internodes 4–6 mm long, glabrous; glumes 1–3, 6–9 mm long, ribs 7–9; lemma ovate-triangular, 10–12 mm long, apex acute, glabrous; palea 8–10 mm long, apex obtuse or a little concave, veins 2–4 between keels, veins 1 or 2 outside each keel; lodicules oblong lanceolate, 2–3 mm long, margins without cilia or the upper parts ciliate; anthers 5–6 mm long; ovary ovate, glabrous, style short, stigmas plumose, 2.5 mm long; pericarp 1.5–2.5 mm thick, nut-like, elliptic, 1–1.5 cm long, 6–8 mm in diameter, green when fresh, lividity when dry, red-brown when immersing into ethanol. New shoots middle August to middle September or later. Flowering April.

Chongqing, Sichuan, Guizhou, Yunnan. The tall and dense bamboo grove of *Chimonobambusa utilis* is beautiful scenery in the evergreen broad-leaved forests of Jinfo Mountain, Chongqing. New shoots are delicious. Zone 9 (Fig. 19).

Chimonobambusa yunnanensis Hsueh et W. P. Zhang

Culms (6) 10–14 m tall, 2.5 cm in diameter; internodes 20 cm long, quadrate or sometimes terete, with procumbent setae initially, setae deciduous later and tubercles left and coarse; sheath scars with purple-brown tomenta; nodes with branches flat or a little prominent; intranodes with developed and bent downward spine-aerial roots. Branches 3 on each node. Culm leaves deciduous, shorter than internodes, with light yellow-brown setae abaxially, ribs conspicuous, transverse veins inconspicuous, margins with yellow-brown cilia; ligules 0.5 mm tall, arched, margins ciliate; blades triangular-subulate, 3 mm long, no joint between the base of the blade and sheath. Foliage leaves 3 per branchlet, oral setae several, white, 4–5 mm long; ligules 1 mm tall; blades 20–23 cm long, 1.5–2 cm wide, secondary veins 4 or 5 pairs, transverse veins conspicuous.

Guizhou, Yunnan. Mountains at the altitude 1600–2200 m. Zone 9.

This species was treated as a synonym of *Chimonobambusa ningnanica* Hsueh et L. Z. Gao in *Flora of China* and *World Checklist of Bamboos and Rattans* (Li et al. 2006; Vorontsova et al. 2016) (Fig. 20).

Chimonobambusa zhizhuzhu T. P. Yi

Internodes of rhizomes (1.2) 2–4.5 (5.5) cm long, 0.5–1 cm in diameter, terete, solid, tubercles present or 0–3 roots on each node; buds semicircle or shortly subulate. Culms (3.5) 5–6 m tall, 2.5–3.5 cm in diameter, apex erect; internodes (7) 11–16 cm long, flat on the side with buds or branching side, ridges 4 and grooves 3, pale green initially, with gray verrucose setae, coarse, culm walls 3–7 mm thick; sheath scars narrow, brown, with gray setae initially; nodes a little prominent;

Fig. 19 *Chimonobambusa utilis*. (**a**) Internodes and branches; (**b**) culms; (**c**) basal internodes; (**d**) culm buds; (**e**) new shoot; (**f**) new shoot; (**g**) bamboo grove

intranodes 1–1.5 mm tall; spine-aerial roots (5) 14–25 on each node, 1.5–2 mm long. Buds 3, subulate. Branches 3, 50–80 cm long, (2) 3–4 mm in diameter. New shoots purple-brown, with light yellow-white spots; culm leaves deciduous, sheaths thinly

Fig. 20 *Chimonobambusa yunnanensis*. (**a**) Aerial roots; (**b**) culm buds; (**c**) habitat; (**d**) new shoot and culms; (**e**) culm leaf

leathery, shorter than internodes, purple-brown abaxially, with light yellow-white spots and light yellow setae, ribs conspicuous, margins densely ciliate; auricles and oral setae absent; ligules arched, purple-brown, 0.5 mm tall; blades erect, long triangular-subulate, 4–5 mm long, 1–2 mm wide, purple. Foliage leaves 1 or 2 (3) per branchlet; sheaths (2.5) 3–3.5 cm long, margins without cilia; auricles and oral setae absent or seldom oral setae 1 or 2; ligules purple, nearly truncate, 0.5 mm tall; petioles 1–2 mm long; blades linear or linear-lanceolate, 15–22 cm long, 1.4–2.4 cm wide, apex tapering, the base cuneate, green adaxially, gray-green abaxially, secondary veins 5 or 6 pairs, transverse veins conspicuous, rectangular, margins serrate or smooth. Flowering branches unknown. New shoots September.

Sichuan: Ebian (Yi et al. 2011). Mountains at the altitude 1100–1300 m. Zone 9.

New shoots are sweet and edible. This species is one of the staple bamboos for the giant panda.

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