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BAMBUSA NAIRIANA (POACEAE: BAMBUSOIDEAE) – A NEW BAMBOO SPECIES FROM MEGHALAYA

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ABSTRACT

Bambusa nairiana – a new bamboo species collected from Meghalaya, in the North Eastern part of India, is described and illustrated. it is distinguished from other *Bambusa* species by its short, eciliate auricles, glabrous ligule and pseudospikelets with 3 lodicules, two of them similar, obliquely cut from one side, rounded on another, the third ovate, apiculate, 5-nerved and ciliate along margins. This new species somewhat resembles *Bambusa vulgaris* Schrad. ex Wendl. in the shape of its culm-sheath but differs in having very small auricle. The paper compares it with *B. vulgaris*, provide diagnostic characters, complete description and illustrations.

INTRODUCTION

The genus *Bambusa* Schreb. (Poaceae subfam. Bambusoideae) of more than 100 species is distributed in tropical and warm old world countries with about 65 species endemic to China (Mabberley, 2008). Species of *Bambusa* are often very difficult to distinguish from *Dendrocalamus* Nees and *Gigantochloa* Kurz ex Munro. Vegetatively typical *Bambusa* have larger culm-sheath auricles, glossy culms, uniform branches and small leaves. However, *Bambusa* sps. with narrower prophylls and shorter rachilla sections tend to possess some of the vegetative characters more typical of *Dendrocalamus* sps. which includes small or absence of culm-sheath auricles, dense pubescence on culm-sheath, large leaves etc. When in flower it can be distinguished in having 2-keeled prophylls whereas they are 1-keeled in *Dendrocalamus* sps. Prophylls basal to their pseudospikelets show the same distinction. *Gigantochloa* sps. mainly occur in Malaysia and can be distinguished by termination of their spikelets in long, empty lemma and stamen filaments fused into a tube (Stapleton 1994, a).

Bambusa is the largest bamboo genus in India, represented by 26 species of which 16 are represented in Meghalaya. In the course of 'Taxonomic Studies on Bamboos of Meghalaya' an interesting species was collected in sporadic flowering. Study of literature (Munro 1868; Gamble 1896; Camus 1913; Bor 1940; Widjaja 1987; Majumdar 1989; Tewari 1992; Stapleton 1994a-c, 2000; Shukla 1996; Seethalakshmi & Kumar 1998) and herbaria (ASSAM, BSD, BSHC, CAL, DD) suggest no possible match with any of the bamboo species described earlier. Presence of 2-keeled prophylls, exserted stamens on free filaments and well developed lodicules of this species define this to be a member of the genus *Bambusa* Schreber, hence this is described as a new species *Bambusa nairiana* P. Kumari & P. Singh.

Bambusa nairiana P. Kumari & P. Singh **sp. nov. (Figs. 1 & 2).**

Bambusa nairiana P. Kumari & P. Singh *sp. nov. Bambusae vulgaris* Schrad. ex Wendland vaginus culmi affinis, sed auriculis angustioribus, eciliatis, subligulas locatis; ligulis infra lamino-imperfectas glabris; lodiculis 3, ex qui 2, piliferis et 1 cordatis, apiculatis, marginae omnino longe ciliatis differt.

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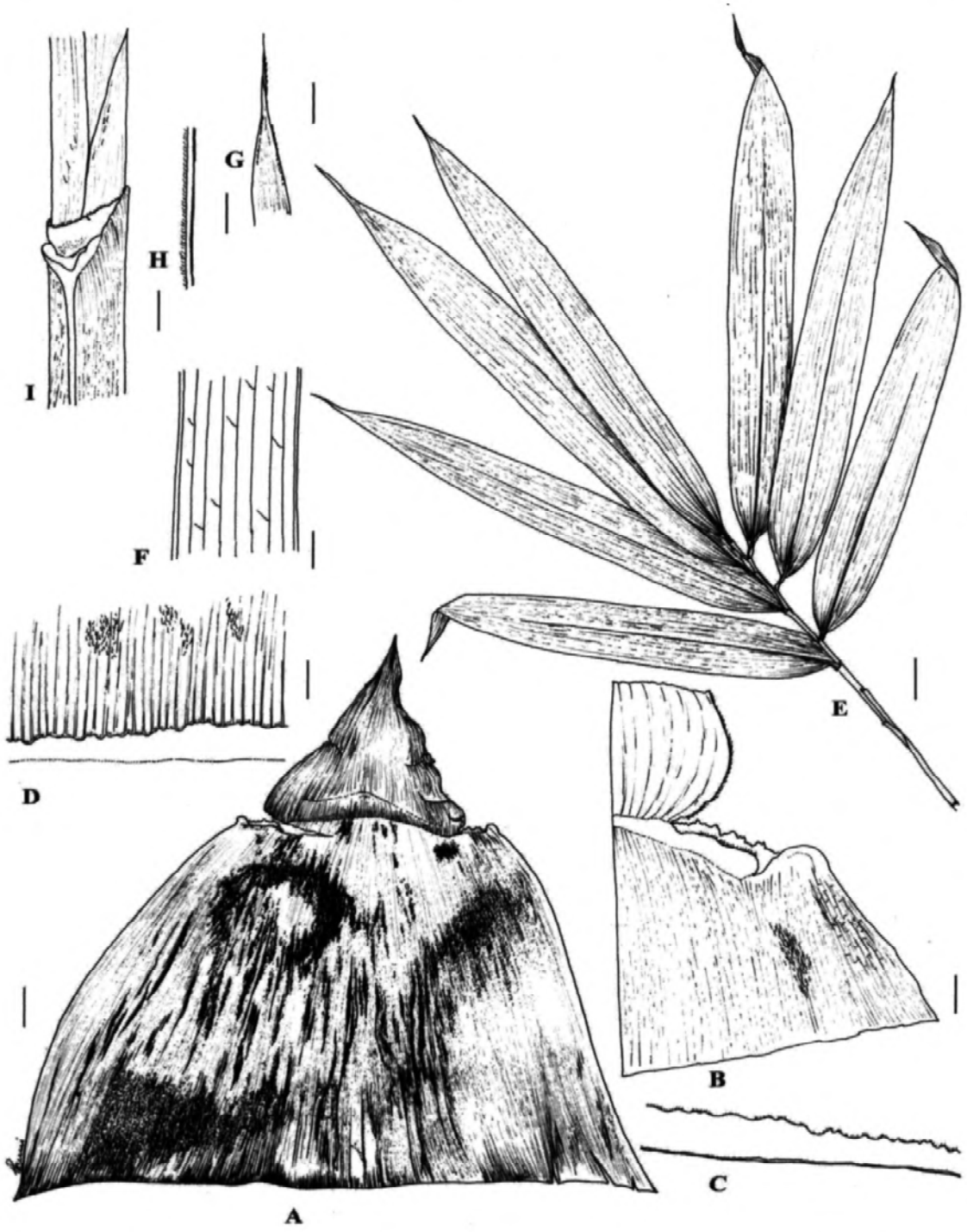


Fig. 1. *Bambusa nairiana* : **A.** Culm-sheath; **B.** Top of culm-sheath showing auricle and ligule; **C.** Ligule underneath blade; **D.** Ligule (as seen on inner surface of culm-sheath); **E.** Leafy twig; **F.** Leaf abaxial surface; **G.** Leaf-apex; **H.** Mid-vein; **I.** Leaf-sheath. Scale bar A & E = 2 cm; B, C, D & H = 5 mm; F = 1 mm; G & I = 2 mm. [Drawn from unmounted specimen *P. Kumari & P. Singh* 34698(CAL) by *P. Kumari*].

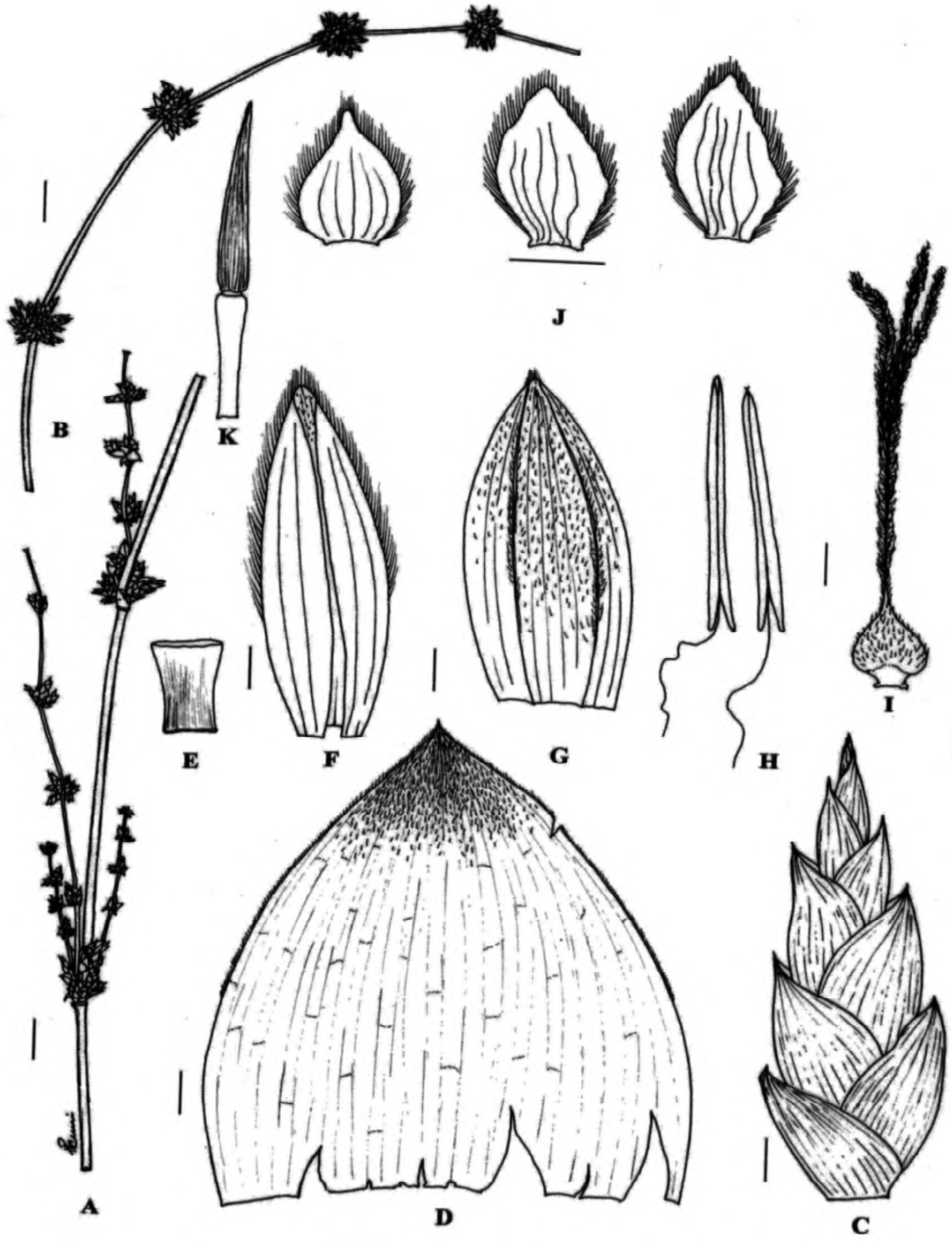


Fig. 2. *Bambusa nairiana* : **A & B.** Inflorescence; **C.** Pseudospikelet; **D.** Lemma; **E.** Rachilla; **F & G.** Palea; **H.** Stamen; **I.** Pistil; **J.** Lodicules; **K.** Terminal immature floret. Scale bar A & B = 2 cm; C & J = 2 mm; D, E, F, G, H, I & K = 1 mm. [Drawn from unmounted specimen *P. Kumari & P. Singh* 34698(CAL) by *P. Kumari*].

Type : India : Meghalaya: Garo hills, near Nokrek, 14 Sept. 2005, *P. Kumari & P. Singh* 34698 (holotypus, CAL; isotypus, ASSAM).

Vernacular name : *'Wa-sim'* (Garo).

Arborescent, erect, clump-forming bamboo. Rhizome pachymorph. Culms c. 10 m high, 6-8 cm in diameter, green with appressed brown hairs when young; nodes even, white-ringed above nodal line, lower ones with rootlets; internodes terete, 30-35 cm long, thick-walled, hollow; branches in triplets, starts from lower nodes, present on all. Culm-sheaths deciduous, triangular, shorter than internodes, yellowish-brown, somewhat thick, crustaceous; sheath proper 18-19 cm long, 26-27 cm broad at base, tapering to c. 11 cm wide, convex rounded top; brown-blackish hairs in patches appressed on outer surface, shining and smooth on inner surface, somewhat papery along the smooth margins; imperfect blade persistent, erect, shorter than sheath proper, triangular, rounded at base, acuminate, incurved, pointed at apex, striate, glabrous except for a few appressed hairs on inner surface, margins smooth except for a few minute cilia near base; ligule 4-5 mm long, unevenly serrate or dentate, minutely ciliate at mouth, glabrous underneath blade; auricles similar, short, below ligule's height, elliptical, 4-5 mm broad, 1 mm high, with few deciduous, short cilia. Leaves 9-10 per leaf-compliment; leaf-blades lanceolate, 17-27 cm long, 2.4-3 cm broad, lower subequally rounded and apical attenuate at base, terminating in a scabrous, pointed apex; glabrous on adaxial surface, abaxial surface sparsely hairy throughout, glabrous on maturity; midvein prominent, raised, secondary nerves 10-11 pairs, tertiary nerves 7, no cross-veins, serrate on margins; leaf-sheath glabrous, striate, keeled, smooth on margins; callus rounded, smooth; ligule c. 2 mm long, oblique, ciliate at mouth; auricles obscure. Inflorescence a branched leafless panicle, the branches with semi-globular heads of pseudospikelets; rachis fistular, striate, glabrous, sometimes hispid towards the apex. Pseudospikelets 2-2.5 cm long, 7-8 flowered, with lower gemmiparous glumes and terminal immature floret on a c. 3 mm long, glabrous rachilla; empty glumes 1-2, 6-8 mm long, ovate, multinerved, glabrous on outer surface, white-pubescent at apex on inner surface, smooth on margins; lemmas 11-12 mm long, ovate, acute at apex, multinerved, glabrous on outer surface, faintly cross-veined and white-pubescent towards apex on inner surface, the margins short ciliate; paleas shorter than lemmas, 8-9 mm long, oblong, 2-keeled, long-ciliate at keels, 5-nerved in between keels, 2-nerved on either side, glabrous on outer surface, faintly cross-veined and minutely pubescent on inner surface, smooth on margins; stamens 6, anthers 5-6 mm long, sagittate at base, acute, with 2-3 translucent hair-like structures at apex; ovary ovate to broadly ovate, hairy, continuous with a 3-5 mm long hairy style, dividing into three, 3-4 mm long, plumose stigmas; lodicules 3, 3-4 mm long, 2 similar, obliquely cut from one side, rounded on another, the third lodicule ovate-cordate with a rounded tip, 5-nerved, long ciliate all along the margins.

Distribution : India : Meghalaya.

Habitat : Found at c. 1400 m, along forest border.

Conservation status : Data deficient. This species was collected from a single locality near Nokrek, Garo hills where 2 clumps were found growing near and each having c. 20 culms. As it is a new species described here, a proper status can only be assessed after other areas are explored and more data is collected.

Etymology : The new species is named in honor of Dr. V. J. Nair, Emeritus Scientist and Co-ordinator of AICOPTAX project on Bamboos and Grasses for his contribution to the taxonomy of Indian Poaceae.

Table 1. Comparison between *Bambusa vulgaris* and *Bambusa nairiana*

Characters	Bambusa vulgaris	Bambusa nairiana
Culm-nodes	even, fine hairy ringed of fallen sheath-scar in younger ones, lower with rootlets	even, white glaucous ringed above nodal line, lower with rootlets
Internodes	green or yellow with green stripes, terete, hollow, thick-walled	green, terete, 30-35 cm long, hollow, thick-walled
Culm-sheath	deciduous, broadly triangular, longer than or equal to internodes	deciduous, triangular, shorter than nternodes
Sheath proper	somewhat roundedly-truncate or slightly concave at top, densely appressed blackish-brown hairs on outer surface	convex rounded at top, appressed brown-blackish hairs in patches on outer surface
Imperfect-blade	broadly triangular, erect, shorter than sheath proper, rounded at base, acuminate, incurved, pointed at apex, striate, glabrous on outer surface, blackish-brown hairy on inner surface, dense below, golden ciliate at basal margin	triangular, erect, shorter than sheath proper, rounded at base, acuminate, incurved, pointed at apex, striate, glabrous except for a few appressed hairs on inner surface, smooth at margins except a few minute cilia near base
Ligule	4-5 mm tall, unevenly serrate, fine ciliate at mouth, having brown translucent, tubular, straight hairs underneath imperfect blade	4-5 mm tall, unevenly serrate or dentate, minutely ciliate at mouth, glabrous underneath imperfect blade
Auricle	similar, broadly rounded, 4-5 cm broad, 1.5 cm high, with golden wavy bristles	similar, elliptical, 4-5 mm broad, 1 mm high, with few deciduous, short cilia
Leaves	glabrous on both surfaces	glabrous on adaxial and sparsely hairy on abaxial surface
Leaf-sheath	striate, keeled, brown sharp hairy, ciliate at margins first, afterwards glabrous	striate, keeled, glabrous, smooth at margins
Ligule	c. 0.5 mm tall, truncate	c. 2 mm tall, oblique
Auricle	well developed, bearing 5-6 c. 2 mm long cilia	obscure, without any cilia
Inflorescence	branched panicle, branchlets with clusters of few pseudospikelets	branched leafless panicle, branches with semi-globular heads of pseudospikelets
Rachis	glabrous	glabrous, sometimes hispid towards apex
Pseudospikelet	2-5 cm long, 4-12 flowered, with terminal imperfect floret and lower gemmiparous glumes	2-2.5 cm long, 7-8 flowered, with terminal immature floret and lower gemmiparous glumes
Rachilla	glabrous	glabrous
Empty glume	1-2, 7-8 mm long, ovate-acuminate, mucronate, multi-nerved, glabrous on both surfaces, ciliate on margins above	1-2, 6-8 mm long, ovate-acute, multi-nerved, glabrous on outer and white pubescent at apex on inner surface, smooth on margins
Lemma	9-10 mm long, ovate, acuminate-mucronate at apex, glabrous on both surfaces, obliquely transverse-veined above on inner surface, margins long ciliate	11-12 mm long, ovate, acute at apex, glabrous on outer surface, faintly cross-veined and white pubescent towards apex on inner surface, margins short ciliate
Palea	as long or longer than lemma, acute, 2-keeled, ciliate at keels, 3-nerved in between keels, glabrous on outer as well inner surfaces, smooth on margins	shorter than lemma, oblong, 2-keeled, ciliate at keels, 5-nerved in between keels, glabrous on outer surface, minutely pubescent on inner surface, smooth on margins
Lodicules	2-3, all alike, oblong-acute, 3-5-nerved, long white-ciliate on margins	3, 2 similar, oblong, obliquely cut from one side rounded on another, 3rd ovate-cordate with rounded tip, 5-nerved, fimbriate all along margins
Stamen	6; filaments c. 2 mm; anthers 6-7 mm long, saggitate at base, obtuse, apiculate at apex	6; filaments c. 4 mm; anthers 5-6 mm long, saggitate at base, acute, with 2-3 translucent hair like structures at apex
Pistil	ovary narrowly oblong, glabrous except hairs at apex; style short, hairy; stigma 1 or 3, 8-10 mm long, plumose	ovary ovate to broadly ovate, hairy; style long, hairy; stigmas 3, 3-4 mm long, plumose

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REFERENCES

BOR, N.L. 1940. *Flora of Assam: Gramineae*, vol. 5. Govt. of Assam. Shillong.

CAMUS, E.G. 1913. *Les Bambusees: monographic, biologic. Culture.* Principaux usages. Paul Lechevalier, Paris.

GAMBLE, J.S. 1896. The Bambuseae of British India. *Ann. Roy. Bot. Gard., Calcutta* 7(1): 1-133. tt.1-119.

MABBERLEY, D. J. 2008. *The Plant Book,* ed.III. Cambridge University Press. Cambridge, U.K.

MAJUMDAR, R.B. 1989. Bambusoideae. In : S. Karthikeyan, S.K. Jain, M.P. Nayar & M. Sanjappa (eds.) *Florae Indicae Enumeratio-Monocotyledonae*. 274-254. Botanical Survey of India, Calcutta.

MUNRO, W. 1868. A Monograph of the Bambusaceae, including descriptions of all the species. *Trans. Linn. Soc. London (Bot.)* 26 (1): 1-157, tt. 1-6.

SEETHALAKSHMI, K., K. KUMAR AND M.S. MUKTESH. 1998. *Bamboos of India: A compendium.* Kerala Forest Research Institute, Peechi & International Network for Bamboo and Rattan, Beijing, Eindhoven, New Delhi.

SHUKLA, U. 1996. *Grasses of North-Eastern India.* Scientific Publishers, Jodhpur.

STAPLETON C.M.A. 1994(a). The bamboos of Nepal and Bhutan Part I: Bambusa, Dendrocalamus, Melocanna, Cephalostachyum, Teinostachyum and Pseudostachyum (Gramineae: Poaceae, Bambusoideae). *Edinb. J. Bot.* 51(1): 1-32.

STAPLETON C.M.A. 1994(b). The bamboos of Nepal and Bhutan Part II: Arundinaria, Thamnocalamus, Borinda and Yushania (Gramineae: Poaceae, Bambusoideae). *Edinb. J. Bot.* 51(2): 275-295.

STAPLETON C.M.A. 1994(c). The bamboos of Nepal and Bhutan Part III: Drepanostachyum, Himalayacalamus, Ampelocalamus, Neomicrocalamus and Chimonobambusa (Gramineae: Poaceae, Bambusoideae). *Edinb. J. Bot.* 51(3): 301-330.

STAPLETON C.M.A. 2000. Bambuseae. In : H.J. Noltie. *Flora of Bhutan* 3(2): 482-514. Royal Botanic Garden, Edinburgh. Royal Govt. of Bhutan.

TEWARI, D.N. 1992. *A Monograph on Bamboo.* International Book Distributors, Dehra Dun.

WIDJAJA, E.A. 1987. A revision of Malesian Gigantochloa. *Reinwardtia* 10(3): 291-380.

बैम्बूसा नाएरिएना (पोएसी:बेम्बूस्वाइडी)-मेघालय, भारत से बाँस की एक नयी जाति

पुष्पा कुमारी एवं परमजीत सिंह

सार संक्षेप

बेम्बूसा नाएरिएना, मेघालय से संग्रह की गयी बाँस की एक नयी जाति का वर्णन एवं चित्र है। छोटे, अरोमक पालियों, चिकनी जीभिका एवं 3 लोडिक्युल्स वाले छद्मशूकिका, जिनमें दो समान, एक बगल से तिरछे कटे हुए, दूसरा बगल गोलाकार, तीसरी शूकिका अंडाकार, तीक्ष्णाग्र, पाँच शिराओं वाला, मालरदार उपान्त के कारण अन्रू बेम्बूसा जातियों से यह पृथक है। यह नयी जाति *बेम्बूसा वल्गेरिस* से कुछ कुछ मिलती है। दोनों में समान नालावरण है।