

***Dendrocalamus khoonmengii*, a new bamboo species (Poaceae: Bambusoideae)
from peninsular Thailand**

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ABSTRACT. *Dendrocalamus khoonmengii* Sungkaew, A. Teerawatananon & Hodk., a forest bamboo from Nakhon Si Thammarat Province in peninsular Thailand is described as a new species. It appears to be closely related to three species from peninsular Malaysia on the basis of culm sheath and leaf blade characters. A species description and an illustration are provided.

The genus *Dendrocalamus* Nees comprised about 50 species is distributed from southern China to India, Myanmar, Thailand, Cambodia, Laos, Vietnam, and Malaysia through to Papua New Guinea (Ohrnberger, 1999). Eight species have been reported to occur in Thailand (Smitinand, 2001). However, two more species can now be added to this list. *Dendrocalamus khoonmengii* is described here and *Dendrocalamus copelandii* (Gamble ex Brandis) N.H. Xia & Stapleton has been discovered as a new record for Thailand (Sungkaew *et al.*, 2007).

The culm habit of *Dendrocalamus* is usually erect or suberect, never clambering or climbing. Culm sheath blades are erect or spreading to reflexed and generally purplish-green. Culm sheath auricles vary from lobe-like and bristly on the margin to low and inconspicuous. The spikelets consist of (1–)2–4 glumes and 1–3(–6) florets, with or without a vestigial terminal floret (Holttum, 1958; Wong, 1995). Superficially, *Dendrocalamus* is similar to two closely related genera, *Bambusa* and *Gigantochloa*. However, it differs from *Bambusa* in having very short rachilla internodes between the florets and these rachilla internodes not disarticulating below the lemmata. It differs from *Gigantochloa* in having six free staminal filaments. Furthermore, the culm sheath blades of *Bambusa* are typically erect (at least initially) and those of *Gigantochloa* are always green (Wong, 1995).

Although desirable, it is not always possible to use flowering specimens to describe new bamboo species. Furthermore, the lack of flowering specimens makes day to day bamboo identification a difficult task. However, Holttum (1958) suggested that the vegetative parts, particularly the culm sheaths, can provide many diagnostic characters to identify

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bamboos and there are numerous examples where this is the case. For example, 18 Indonesian bamboo species have been described without access to flowering material (Widjaja, 1997).

In 2000, Dr Wong Khoon Meng and his colleagues collected complete sterile specimens of a bamboo from Nakhon Si Thammarat, southern Thailand. They labelled the specimens as '*Dendrocalamus* sp. nov. ined'. During a revision of the genus *Dendrocalamus* for the Flora of Thailand project (Middleton, 2003), specimens of this species were collected again from the same locality as those of Wong Khoon Meng but again all the material was sterile. However, morphological examination has shown that it can indeed be correctly placed in *Dendrocalamus*. This view has been further confirmed by the results from combined phylogenetic sequence analyses of five plastid DNA regions (*trnL* intron, *trnL-F* intergenic spacer, *atpB-rbcL* intergenic spacer, *rps16* intron, and *matK* gene region; Sungkaew *et al.*, in prep.), which show that it is best placed within *Dendrocalamus*. However, when the flowers are obtained it may be necessary to re-examine its generic placement.

Dendrocalamus khoonmengii Sungkaew, A. Teerawatananon & Hodk. sp. nov. *D. pendulus* Ridley, *D. hirtellus* Ridley et *D. dumosus* (Ridley) Holttum affinis, a qua imprimis differt auriculis vaginorum culmorum projectis, leviter curvata et leviter tortilis; laminis foliorum subitus glaucum. Inflorescentia ignota. Typus: Thailand, Nakhon Si Thammarat, Lansaka District, Khaoluang National Park, Wong, Thapyai, & Roisungnern WKM 2868 (holotypus, BKF!; isotypi, K, KLU). Fig. 1.

Rhizomes pachymorph. *Culms* unicaespitose, in a loose clump, up to 13 m long, 3–4 cm in diam., with relatively thin walls, culm tips strongly arching over; internodes 35–50 cm long, plain green, copiously white-waxy all over in very young stages, glabrous and waxless when older, lower internodes not covered with hairs; nodes not swollen, lower nodes without verticils of roots, the region directly below each node of young culm with a band of black hairs. *Branches* developing from mid-culm or from lower quarter upwards; branch complement at mid-culm of one dominant primary axis with two secondary, weaker axes from its base and several smaller higher-order branchlets, the dominant primary axis long and slender, reaching 3–5 m long, much longer than other axes; without aerial roots. *Culm-sheaths* pale pinkish to greenish to orange, covered with black hairs mainly on lower half and copious white wax all over, deciduous, coriaceous, 15–25 by 10–15 cm, top convexly truncate; blades green, narrowly lanceolate, spreading to reflexed, 15–20 by ca 2 cm (width near the base), sparsely hairy near the base on the adaxial surface; auricles purplish-black, lobe-like, 1–1.5 by 0.2–0.7 cm, somewhat curved, slightly twisted, and free at the ends, margin with pale brown bristles to 7–10 mm long; ligule pinkish purple, 3–12 mm long, irregularly toothed, some divisions further divided into fine bristles, about 5 mm long. *Leaves* 5–10 per branch; leaf blades narrow, 5–12 by 0.4–1.2 cm, upper surface glabrous to sparsely hairy, lower surface glaucous and covered with short and fine hairs and scattered with long hairs to 1 mm long, apex acuminate, margin serrate, base rounded to oblique-cuneate; sessile or with pseudopetiole to 1 mm long; auricles absent or just tiny rims, fringed with a few wavy bristles to 3.5 mm long; ligule about 0.1–0.3 mm long, irregularly toothed; secondary veins 2–4 pairs, intermediate veins 4–7; leaf sheaths 2–3 cm long, hairy. *Inflorescences* unknown.

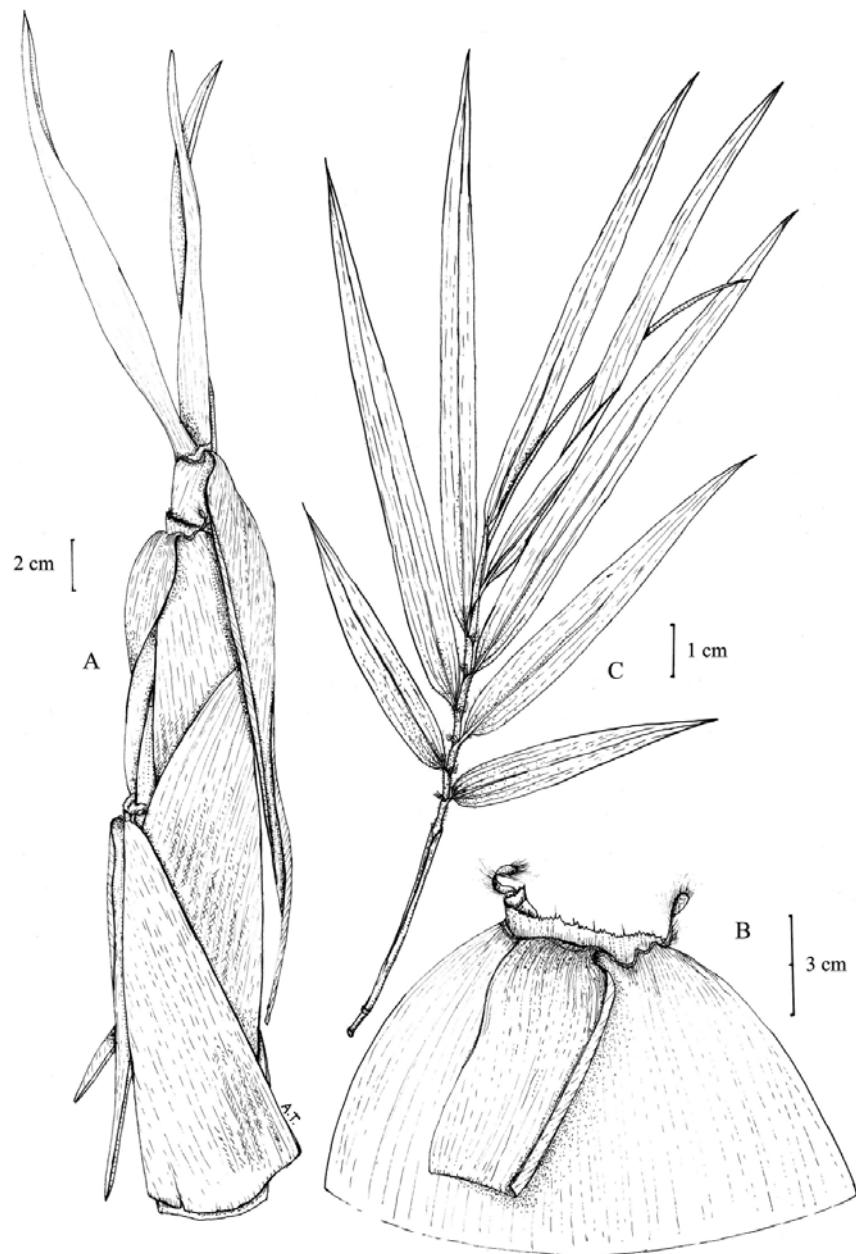


Figure 1. *Dendrocalamus khoonmengii* Sungkaew, A. Teerawatananon, & Hodk.: A. Culm shoot; B. Part of culm sheath from A, showing auricles and ligule; C. Leafy branch. All from Wong, Thapyai, & Roisungnern WKM 2868. Drawn by Atchara Teerawatananon.

Thailand.— PENINSULAR: Nakhon Si Thammarat [Lansaka District, Khaoluang National Park, steep slope beside Kra Rom Waterfall, alt. ca. 250 m, sterile 11 July 2000, *Wong, Thapyai, & Roisungnern* WKM 2868 (BKF, K, KLU); *ibid.*, sterile 28 Aug. 2004, *Sungkaew & Teerawatananon* 257 (Herbarium of Faculty of Forestry, Kasetsart University, Thailand, TCD, Herbarium of Thailand Natural History Museum, National Science Museum)].

Distribution.— So far known only from Nakhon Si Thammarat (Lansaka District).

Ecology.— Steep rocky slopes along stream in tropical monsoon rainforest, deep soil of granite parent material.

Etymology.— This species is named after Professor Dr. Wong Khoon Meng, a Malaysian plant taxonomist, who has been working on bamboos for more than 20 years and by whom the type specimen was collected.

Notes.— Wong Khoon Meng and his colleagues mentioned on the label that this species is similar to *D. pendulus* Ridl. and *D. hirtellus* Ridl. However, the authors have found that it is also superficially similar to *D. dumosus* (Ridl.) Holttum. The primary differences between these three species and *D. khoonmengii*, are its projecting, curved and lightly twisted culm sheath auricles, and its abaxially glaucous leaf blades (see Table 1).

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Table. 1 Comparative table of habitats and vegetative morphological characters between *Dendrocalamus dumosus*, *D. hirtellus*, *D. khoonmengii*, and *D. pendulus*

Habitats and characters	<i>D. dumosus</i>	<i>D. hirtellus</i>	<i>D. khoonmengii</i>	<i>D. pendulus</i>
Habitat	Confined to limestone vegetation, thin soil	Open places and forest fringes	Steep slopes along streams in tropical monsoon rainforest, deep soil of granite parent material	In foothills and valleys of the main mountain ranges or in logged or disturbed forest and forest fringes
Young culm nodes	Glabrous	With a band of silvery-brown hairs above and below node	With a band of black hairs below node only	With a band of silvery-brown hairs above and below node
Culm length	To 7 m	To 15 m	To 13 m	To 30 m
Culm internode length	15–40 cm	40–50 cm	35–50 cm	40–50 cm
Culm diameter	1–2.5 cm	Usually 6–8 cm	3–4 cm	Usually 6–9 cm
Culm-wall thickness	Relatively thick (lacuna $\leq 1/3$ the diameter of the culm), sometimes solid at lower internodes	Relatively thin (lacuna $\geq 1/3$ the diameter of the culm)	Relatively thin	Relatively thin
Verticils of roots at lower nodes	Absent	Present	Absent	Present
Culm sheath indumentum	Black hairs mixed with thin white wax to glabrous	Dense, caducous pale brown hairs mixed with copious white wax	Black hairs mixed with copious white wax	Dense, caducous pale brown hairs mixed with copious white wax
Culm-sheath auricles	Easily deciduous, lobe-like, spreading, sometimes crisped, free at the end, somewhat curved, not twisted, bristly on margin, bristles to 7–10 mm long	With spreading crisped lobes, not free at the ends, bristly on margin, bristles to 12–24 mm long	Lobe-like, spreading, sometimes crisped, free at the ends, somewhat curved and slightly twisted, bristly on margin, bristles to 7–10 mm long	With low rims, sometimes crisped, not free at the ends, bristly on margin, bristles to 7–10 mm long
Leaf blade lower surface indumentum	Not glaucous, short-pubescent to glabrous	Not glaucous, short-pubescent	Glaucous, short hairs mixed with scattered long hairs	Not glaucous, glabrous