

A new bamboo species of *Dendrocalamus* Nees (Poaceae: Bambusoideae) from Yen Bai and Phu Tho provinces, Vietnam

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ABSTRACT

A new species of the genus *Dendrocalamus* Nees (Poaceae: Bambusoideae), *D. concaviapiculus* N.H.Xia et V.T.Nguyen, sp. nov., is described and illustrated from Yen Bai and Phu Tho provinces, Vietnam. It differs from other related *Dendrocalamus* species by its 5-veined palea between keels and without any vein, its apex and ligule of culm sheath concave, its culm sheath blade short, and its flexuose basal culm internodes.

KEY WORDS

Mai dáy,
Vietnam,
new species.

RÉSUMÉ

Une nouvelle espèce de Dendrocalamus Nees (Poaceae: Bambusoideae) des provinces de Phu Tho et Yen Bai, Vietnam.

Une nouvelle espèce de *Dendrocalamus*, *D. concaviapiculus* N.H.Xia & V.T.Nguyen, sp. nov., de la province de Phu Tho et Yen Bai du Vietnam est décrite et illustrée. Elle diffère des autres espèces affines du genre par sa glumelle à cinq nervures entre les carènes, mais sans nervure en dehors, par ses gaines de chaume à sommet et ligule concaves, à limbe court, ainsi que par la base des chaumes à entre-noeuds flexueux.

MOTS CLÉS

Mai dáy,
Vietnam,
espèce nouvelle.

INTRODUCTION

Dendrocalamus Nees is a fairly large genus in the subfamily Bambusoideae of Poaceae and was described in 1835 based on *Dendrocalamus strictus* (Roxb.) Nees. This genus comprises about 52 species (Ohrnberger 1999), widely distributed in the tropical and subtropical regions of Asia from India and Nepal to South China, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, and Papua New Guinea (Dransfield & Widjaja 1995; Ohrnberger 1999; Li & Stapleton 2006). This genus is distinguished from the other related genera of the subtribe Bambusineae Presl by its inflorescence subtended by a narrow, 1-keeled prophyll, rachilla internodes very short and not disarticulating, filament free, stigma 1 (Munro 1868; Gamble 1896; Stapleton 1994; Dransfield & Widjaja 1995; Wong 1995; Li & Stapleton 2006)

The genus *Dendrocalamus* in Vietnam was studied by several authors (Camus 1913; Camus & Camus 1923; Nguyen 1989, 1990, 1991; Pham 2000; Nguyen 2006), and currently comprises there about 29 species (Nguyen 2006), but only 14 of them are providing a valid scientific name. Among these taxa, one species whose was planted in Cau Hai bamboo garden, under the local name “Mai day”, was recognized under the name *Dendrocalamus yunnanicus* Hsueh & D.Z. Li by Nguyen (2006) in *Bamboos of Vietnam* based on vegetative characters. In August 2010, during the expeditions to Doan Hung, Yen Lap districts (Phu Tho province) and Van Chan district (Yen Bai province), northern Vietnam, fresh specimens of flowering and vegetative materials of this taxa were collected. The species wholly differs from *Dendrocalamus yunnanicus* Hsueh & D.Z. Li by some morphological characters (see below). It also differentiated from the other related *Dendrocalamus* species (*D. latiflorus* Munro and *D. parvigemma* N.H.Xia, V.T.Nguyen & V.L. Le) by 5-veined palea between keels and without any vein outside of keels, leaf sheath apex glabrous, culm sheath apex concave, culm sheath ligules concave, 3-5 mm high, culm sheath blade short, 1/10-1/6.5 as long as sheath proper and basal culm internodes flexuose. After carefully comparing its morphological characters with type specimens (including pictures of type specimens in

websites of several herbaria), particularly those of the inflorescence, and referring to the publications by Camus (1913), Camus & Camus (1923), Nguyen (1989, 1990, 1991), Stapleton (1994), Dransfield & Widjaja (1995), Wong (1995), Hsueh & Li (1988a, b, 1996), Li & Stapleton (2006), Yi *et al.* (2008), we confirm that the species is clearly a new member belonging to the subgenus *Sinocalamus* of genus *Dendrocalamus* according to the classification of *Dendrocalamus* (Hsueh & Li 1988a, 1996) because it shows 5-7 florets, spikelets with blunt apex and appearing as soft globose masses, 1-keeled prophyll, rachilla-internodes very short and not disarticulated, filaments free and one stigma. This new species is described and illustrated herein.

SYSTEMATICS

Order POALES Small

Family POACEAE Barnhart

Subfamily BAMBUSOIDEAE Aschers. & Graebn.

Genus *Dendrocalamus* Nees

Dendrocalamus concaviapiculus

N.H.Xia et V.T.Nguyen, sp. nov.

(Figs 1, 2)

A.D. yunnanico Hsueh & D.Z. Li *affinis*, *sed paleis 5-nervatis inter et sine nervo extra carinas, apicibus et ligulis vaginarum concavis, laminis vaginarum brevioribus, et inferioribus culmorum internodiis flexuosis differt.*

TYPUS. — **Vietnam.** Prov. Phu Tho, Yen Lap District, My Luong Commune, Vinh Thin village cultivated in households garden, 21°29.754'N, 104°56.69'E, alt. 41 m, 12.VIII.2010, *V.T.Nguyen NVT068* (holo-, VAFS! [Herbarium of Vietnamese Academy of Forest Sciences]; iso-, FSCC! [Forest Science Centre for Central Northern Vietnam of VAFS], IBSC!, VAFS!).

PARATYPES. — **Vietnam.** Prov. Phu Tho, Doan Hung, Chan Mong, cultivated in Cauhai bamboo garden, 21°31.847'N, 105°11.917'E, alt. 69 m, 1.VIII.2010, *V.T.Nguyen NVT003* (FSCC!, IBSC!, VAFS!). — Prov. Phu Tho, Yen Lap, My Luong, cultivated in near stream, 21°28.976'N, 105°56.894'E, alt. 36 m, 12.VIII.2010, *V.T.Nguyen NVT071* (IBSC!, VAFS!). — Prov. Yen Bai, Van Chan, Tu le, cultivated in households garden near road, 21°47.272'N, 104°19.247'E, alt. 1123 m, *V.T.Nguyen NVT200* (FSCC, IBSC!, VAFS!).

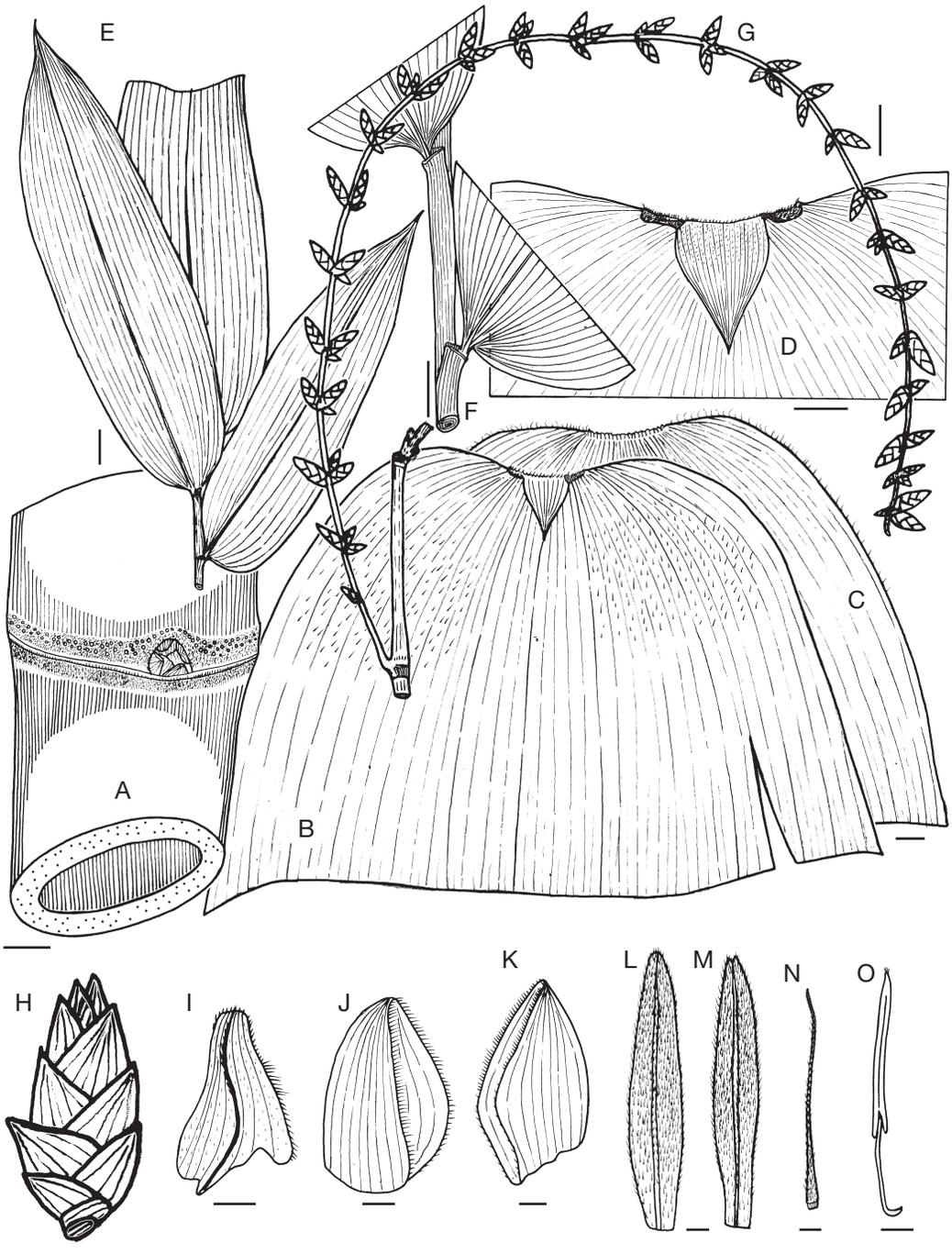


FIG. 1. — *Dendrocalamus concaviapiculus* N.H.Xia et V.T.Nguyen, sp. nov.: **A**, culm and dormant bud; **B**, culm sheath (abaxial view); **C**, culm sheath (adaxial view); **D**, culm sheath ligule; **E**, leaf; **F**, leaf ligule; **G**, flowering branch; **H**, pseudospikelet; **I**, prophyll; **J**, glume; **K**, lemma; **L**, **M**, palea; **N**, pistil; **O**, anther. Drawn from the specimen V.T.Nguyen NVT 068. Scale bars: A-D, G, 2 cm; F, 1 cm; H-O, 1 mm.

ETYMOLOGY. — The specific epithet refers to concave apex of culm sheath.

VERNACULAR NAMES. — Mai dây, Bương trắng, Bương Tú Lệ.

DESCRIPTION

Arborescent bamboo, rhizomes pachymorphic, short necked. Culms 10-14 m tall, 7-10 cm in diameter, apex nodding; basal internodes flexuose, internodes (20-)40-47 cm long, wall 2.5-3.0 cm thick, initially with dense appressed brown hairs; and thin white powdery; above sheath scar with a 10 mm high dark brown villous hair-ring, below each node with a 7 mm yellow or dark brown villous hair-ring; each node of lower culms surrounded with aerial roots or root primordia. Branches 5-7 at mid-culm, often one central dominant; branching from about 14th node up, about 5-6 m above ground. Culm sheaths deciduous, proper leathery, abaxially sparsely appressed black hairy, margins sericeous; apex concave; auricles reflexed, 10-12 × *c.* 1-2 mm, bristly; ligules 3-5 mm high, bristly and concave, marginal bristles 4-5 mm long; blade reflexed, short, 1/10-1/6.5 as long as sheath proper, orange yellow hairy, adaxially glabrous, with prominent longitudinal ribs on both sides. Leaves of ultimate branch 4-6, sheaths sparsely white hispid, sheath apex glabrous; auricle absent; ligules slightly concave, *c.* 2 mm long, glabrous; leaf blade oblong-lanceolate, 34-42 × 8-10 cm, very thin, pedicel 4-5 × *c.* 2.5 mm, base nearly rounded, adaxially smooth, abaxially villous, apex mucronate. Inflorescence iterant, 3-8 clustered pseudospikelets at each node; flowering branch with leaves; pseudospikelet fusiform, 11-16 × 4-5 mm; prophyll 1-keeled, obliquely triangular, 3.6-4.3 × 2.1-2.8 mm, abaxially hispid, apex blunt, margin long ciliate; florets 5-7, all fertile, and each floret opening when mature; rachilla-internodes very short and not disarticulated. Glumes 1 or 2, 5.4-6.3 mm long, 7-8.4 mm wide, abaxially pubescent along the median, apex acute, margins long ciliate, many-veined; lemma ovate-oblong, 7.4-10.5 × 7.5-9.5 mm, glabrous, apex acute, margins long ciliate, many-veined; palea narrowly lanceolate, 2-keeled, 10.7-12.6 × 4.2-4.9 mm, both surfaces densely bristly, 5-veined between keels and without any vein on the other side of keels, apex acute,

sometime slightly concave, margins long ciliate; lodicules absent. Stamens 6; anthers yellow, 5.8-6.3 mm long, exserted, apex mucronate and with few white stinging hairs; filaments distinct. Ovary narrow-lanceolate, *c.* 1 mm, hispid, with a basal stalk *c.* 0.4 mm; style 9-9.9 mm; stigma 1, feathery, with few hairs; pistil 10.2-10.6 mm. Flowering observed in August. Fruit unknown.

DISTRIBUTION, HABITAT AND LOCAL USES

This species is distributed in northwest of Red River (Hong Ha), northern Vietnam, and found in My Luong Commune, Yen Lap District and Chan Mong commune, Doan Hung District, Phu Tho province, and Tu Le Commune, Van Chan District, Yen Bai province. The species is cultivated in household gardens or near stream, between 50 and 1100 m a.s.l, hill or mountain area in Phu Tho and Yen Bai provinces. The flower as well as other material of holotype and isotype specimens were collected from the cultivated clump in My Luong Commune, Yen Lap District, Phu Tho province, Vietnam on 12 August 2010 and the material of paratype specimens were collected in Cau Hai bamboo garden, Chan Mong commune, Doan Hung District, Phu Tho province and Tu Le Commune, Van Chan District, Yen Bai province. Fruiting not seen. Shoot season is from July to September. This species is economically valuable to the local people. Its shoot are sweet and used for food, the leaves are exported to China (Taiwan), and the culms are used for household utensils, as well as raw material for paper-pulp.

CONSERVATION STATUS

Dendrocalamus concaviapiculus sp. nov. was planted for conservation purposes in Cau Hai bamboo garden, Forest Science Centre for Central Northern Vietnam, Chan Mong commune, Doan Hung district, Phu Tho province since 1991. This species was only found as several clumps cultivated in Phu Tho and Yen Bai provinces, and we estimated a total of less than 1000 individuals for these populations. It seems probable natural populations of this species may no more be found. We therefore recommend an IUCN Red List category of Vulnerable (VU) with number fewer than 1000 mature individuals, growing at no more than ten locations (IUCN 2001).



FIG. 2. — *Dendrocalamus concaviapiculus* N.H.Xia & V.T.Nguyen, sp. nov.: **A**, habit; **B**, young shoot; **C**, culm sheath; **D**, culm sheath margins and internode; **E**, culm node with a dormant bud; **F**, leaf ligules; **G**, portion of flowering branch; **H**, lemma; **I**, palea; **J**, pistil. Photos by V. T. Nguyen.

REMARKS

This new species most closely resembles to *D.yunnanicus* Hsueh & D.Z. Li but differs in having longer palea, lemma and anthers, as well as glabrous leaf sheath apex.

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