

**NOTES ON FLOWERING IN SCHIZOSTACHYUM
ARUNACHALENSIS H.B. NAITHANI (POACEAE: BAMBUSOIDEAE)**

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During present study *Schizostachyum arunachalensis* was found flowering and fruiting in the wild on the hill slopes in Kane Wildlife Sanctuary of West Siang district (Arunachal Pradesh). A good population was observed near Magee village which is about 10 km from Elephant Camp. This bamboo can be easily distinguished by long internodes, larger leaves and peculiar leaf sheaths. A supplemented taxonomic description of this bamboo is provided. In light of flowering and fruiting material available now, its taxonomic placement in the new genus *Stapletonia* has been suggested, a new combination has been proposed, and coloured photographs have been provided to facilitate identification.

STAPLETONIA P.Singh, S.S.Dash & P.Kumari **gen. nov.**

Typus species: Stapletonia arunachalensis (H.B. Naithani) P. Singh, S.S. Dash & P. Kumari. *Schizostachyum arunachalensis* H.B.Naithani.

affinis *Cephalostachyum* sed auriculibus folio vaginae ad 1 cm longae fringitis, baccis succulentis, c.5 cm longis differt.

Shrubby bamboo, forming loose clumps or diffused. Rhizome pachymorph with extended necks. Culms erect at base, clambering above, walls thin. Nodal branches subequal. Leaf-blade unequal at base; leaf-sheath auricles prominent with c. 1 cm long fringes. Inflorescence iterant, bracteate, in large densely glomerate heads. Spikelets 1-flowered with terminal rachilla extension. Glumes 6-8, long aristate. Lemma shortly aristate, rosy pink. Palea narrowly 2-keeled. Lodicules 3, large. Stamens 6, filaments free. Ovary stalked, glabrous; style long; stigma 2, hairy. Fruit apple shaped, fleshy, with persistent style base.

Etymology : This genus is named in honor of Dr. C.M.A. Stapleton who made significant contributions to the taxonomy of Himalayan bamboos.

Notes : The genus *Stapletonia* shows some affinities with *Cephalostachyum* in habit and habitat but differs mainly in having fringed leaf auricles, 6-8 glumes and fleshy fruits about 5 cm across. A comparison of morphological characters of all the related genera are given in a tabular form (*Table-1*).

Stapletonia arunachalensis (H.B.Naithani) P.Singh, S.S.Dash & P.Kumari **comb. nov.**

Schizostachyum arunachalensis H.B. Naithani, Ind. For. 118 (3): 230. 1992. (Baja near Daporijo, 300 m, Subansiri District, Arunachal Pradesh, 17.3.1986, H.B. Naithani 1406 (holotype, DD).

Vern.: “Tuchur” (Adi and Miri); “Tauk” (Gallongs); “To” (Apatanis); “Tabom” (Nishis).

A semiscandent bamboo. Rhizome pachymorph. Culms 10-15 m high, 6-7 cm in diameter, at first erect then branches pendulous, dark green when young turning yellow with age; nodes swollen, with a ring of fallen culm-sheath base and c. 1 cm broad ring of thick, brown deciduous hairs; internodes terete, at base c. 20 cm long and up to 1.5 m or more long above, smooth, hollow, walls 5-10 mm thick; bud oval, rounded at apex; branches 6 (4, 2 cm in girth). Culm-sheaths deciduous, shorter than internodes, brownish, thick crustaceous; sheath proper covered with yellow-brown hairs on outer surface, glabrous inside, 15-26 cm long, 12-14 cm broad at base, sides more or less parallel with 10-11 cm broad obliquely round top; one margin completely

Table 1 : A comparison of *Stapletonia* with allied genera.

Characters	Melocanna	Cephalostachyum	Schizostachyum	Pseudostachyum	Teinostachyum	Melocalamus	Stapletonia
Habit	Arborescent	Arborescent or shrubby	Arborescent sometimes shrubby or scrambling	Shrubby	Arborescent	Climbing bamboos	Shrubby bamboos
Rhizome	Pachymorph, long necked	Pachymorph, short necked	Pachymorph, short necked	Pachymorph, long necked	Pachymorph, without extended necks	Pachymorph, short necked	Pachymorph with extended necks
Culm	Erect, thin walled	Erect, pendulous or clambering, thin wall	Erect or scrambling, usually thin walled	Erect with pendulous tips, thin walled	Erect or pendulous, usually thin walled	Clambering, nearly solid	Erect at base, clambering above, walls thin
Culm sheath	Persistent, crustaceous, blade erect, auricles absent	Deciduous, thickly papery to leathery, blade reflexed, auricles conspicuous, oral setae prominent	Deciduous, leathery to thick papery, auricles inconspicuous	Deciduous, blade deciduous, erect, auricles very small	Ridged, edges thick, blade rolled longer than sheath, oral setae prominent	Leathery, auricles present or absent	Deciduous, thick crustaceous, blade triangular shorter than sheath, auricle obscure, with transverse veins, one side longer
Mid-culm branches	Many, subequal	Many, subequal,	Many, subequal	Many, clustered, subequal	Subequal, sometimes dominating branch replacing the main culm	Many, one dominant	Many, subequal
Leaves	Leaf sheath auricles absent; leaf blade lanceolate	Leaf sheath auricles present or absent; leaf blades linear, lanceolate, oblong or ovate	Leaf sheath auricles present or absent; leaf blades linear, lanceolate, oblong or ovate	Leaf blades, lanceolate or oblong	Leaf blades, lanceolate or oblong	Leaf sheath auricles present or absent; leaf blades lanceolate or oblong	Leaf sheath auricles prominent, fringed hairy; Leaf blade oblong lanceolate obliquely attenuate at base
Inflorescence	Iterauctant, fully bracteate	Iterauctant, fully bracteate, globular or subglobular heads	Iterauctant, fully bracteate	Iterauctant, fully bracteate panicles	Iterauctant, fully bracteate, spicate	Iterauctant, arranged glomerately on large leaf less flowering branch	Iterauctant, bracteate, in large densely glomerate heads
Spikelets	1-fertile floret and 1-several sterile, rhachilla articulate	1-flowered with rhachilla extension	1-2, or florets 3-4 with only terminal or subterminal fertile, rhachilla extending beyond fertile floret	Solitary or several clustered in the axils of the bracts, with one fertile floret	Several fertile florets, with rudimentary floret or rhachilla extension	2- flowered with rhachilla extension	1-flowered with rhachilla extension
Glumes	2-4	2-3	Usually absent	1	Several	2	6-8
Lemna	Similar to glumes	Similar to glumes	Convolute	Similar to glume	Similar to glume	Similar to glume	Similar to glumes
Palea	Convolute	2-keeled	Not keeled	2-keeled	2-keeled	2-keeled	Narrowly 2-keeled
Lodicules	2	3	Usually absent, sometimes 1-3	3-5, persistent	2-3	3	3, persistent
Stamens	6, filaments free or irregularly connate	6, filaments free	6, filaments usually free	6, filaments free	6, filaments free or connate	6, filaments free	6, filaments free
Pistil	Glabrous, Style long, Stigma 2-4, hairy	Stalked, Style long, Stigma 2-3 plumose	Stalked, Style Simple, Stigma 3, plumose	Stalked, glabrous, Style long, Stigma 2	Style long	Stalk less, Style short	Stalked, glabrous, Style long, Stigma 2, hairy
Fruit	Pear shaped, large, beaked at apex, pericarp thick, fleshy	Nut like, terete, apex with persistent style	Caryopsis fusiform, with persistent style base	Globose, base with persistent glumes, lemma, palea and lodicules, beaked at apex, pericarp crustaceous	Rostrate	Berry like, globose, with fleshy pericarp	Apple shaped, fleshy, with persistent glumes, lemma, palea and lodicules, beaked at apex, pericarp fleshy



Fig. 1: *Stapletonia arunachalensis* (H.B. Naithani) P. Singh, S.S. Dash & P. Kumari

A. Habit; **B.** Culm sheath; **C.** Sterile flowering head; **D.** Flowering head with fertile spikelets and drooping anthers; **E.** Sterile and fertile spikelets; **F.** Fertile spikelet; **G.** Fructescence; **H.** A fruit with persistent style; **J.** Cross section of fruit; **K.** Germinating fruit; **L.** Young seedling showing rhizome with extended necks.

ciliate, another usually at top only, cilia c. 2 mm long, dense, dark brown; imperfect blade shorter than sheath proper, 10-25 cm long, 9-11 cm broad, triangular, one side longer than the other, rounded at base, acute at apex, erect, transversely veined, minute hirsute at somewhat wrinkled base on outer surface, scanty appressed hairy on inner surface, margins ciliate at base, smooth upwards; ligule narrow, entire. Leaf-blades oblong-lanceolate, up to 48 cm long and 18 cm broad, obliquely attenuate at base, acuminate at apex with c. 2 cm long, incurved, twisted setaceous apex, minutely hirsute on abaxial surface; midrib raised, prominent, glabrous, secondary veins 12-18 pairs, tertiary 5-7(8), pseudopetiole 1- 1.5 cm long; leaf-sheaths striate, thin keeled, puberulous, ending above in a thin callus, densely ciliate at margins; ligule narrow; auricles oblong-conical, extending along margins up to c. 1.5 cm length, long fringed, fringes c. 1 cm long, deciduous. Inflorescence a dense, globular, terminal or subterminal head, 6-10 cm in diameter consisting of fertile spikelets among majority of empty aristate bracts or sterile spikelets. Fertile spikelets c. 4 cm long, glabrous; empty glumes 6-8, 1.2 - 3 cm long, ovate at base, long scabrous-aristate above, glabrous, striate, 5-7 nerved. Lemma 2.5 - 3.5 cm long, shortly aristate, rosy pink. Palea 2-3 cm long, rosy pink, narrowly 2-keeled. Rhachilla extension c. 0.5 cm long, hairy in lower half. Lodicules 3, c. 1.3 cm. long, lanceolate, papillate hairy on inner surface, glabrous outside, ciliate on margins, rosy pink, white near base. Stamens c. 5 cm long; anthers c. 1 cm long; filaments free, thread like. Pistil stipitate, c. 3 cm long; style long, hollow; stigma bifid, hairy. Fruit c. 5 cm across, globose, slightly depressed at top with elongated persistent, acicular style when young (**Fig. 1**).

Specimens examined : Arunachal Pradesh : Upper Subansiri district, Daporijo, 11.4.2005, *Tika Prasad Sharma* 34537 veg.(CAL). West Siang district, Kane Wildlife Sanctuary, 27° 39' 41'' N, 94° 42' 14' E, 13-09-2009, *S.S. Dash* 32210 & 32211 (ARUN, CAL). Kane wildlife sanctuary, 27° 39' 41'' N, 94° 42' 14' E, 20-12-2009, *S S Dash* 32800 (ARUN).

Distribution and Ecology : The species is endemic to Arunachal Pradesh, distributed in East Siang, West Siang and Upper Subansiri districts. It is found growing at an altitude of 300-900 m above msl in the tropical evergreen forests and also as pure patches along the shallow streams. The gregarious flowering has been observed for the first time.

Conservation status : This bamboo with the longest internodes amongst the Indian species is extracted for use in making baskets and other handicraft items. The recent study by the authors revealed that the species needs appropriate conservation and management strategies for sustainable utilization.

Note : Naithani (op. cit.) described this species based on vegetative material and assigned it to the genus *Schizostachyum*. Inflorescence in globular heads shows resemblance to *Cephalostachyum* but succulent baccate fruit found during present studies compelled us to place it in a new genus.

Amongst the Indian bamboos, this species is with the longest internodes and the largest leaves. It also has very characteristic leaf sheath auricles having c. 1 cm long fringes. Inflorescence is in large dense globular heads and fruits are apple shaped, fleshy.

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