



***Stapletonia rigoense* (Poaceae), a new bamboo species bearing very long internodes from Arunachal Pradesh, India**

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Abstract

Stapletonia rigoense, a new bamboo species bearing very long internodes was described from Arunachal Pradesh, India. This taxon shows significant morphological differences to those earlier reported for closely related species, especially *Stapletonia arunachalensis* (H.B. Naithani) P. Singh, S.S. Das & P. Kumari and *Stapletonia seshagirianum* (R.B. Mazumdar) H.B. Naithani.

Introduction

During field survey for an investigation of bamboo species that are closely associated with the ethnic tribes of West Siang District of Arunachal Pradesh, India in January–March, 2017, our attention was drawn to a distinctive bamboo species bearing very long internodes of up to 160cm or more, locally known as *Tabum* by the Galo tribe. This bamboo species is mainly used as components of their handlooms for weaving textiles, in making household and handicraft items, as tying strips in roof and components in drip irrigation (FIGURE 1). It is only known from sparse populations apparently restricted to the forests of Rigo village under Aalo circle of West Siang District (FIGURE 2). Similar long internodes were reported in *Stapletonia arunachalensis* (H.B. Naithani) P. Singh, S.S. Das & P. Kumari, in which they are up to 150cm or more long. *Stapletonia* P. Singh, S.S. Das & P. Kumari was described on the basis of its pachymorph rhizomes with extended necks; oblong-lanceolate leaves bearing fringed auricles; inflorescences of large and dense glomerate heads yielding apple-shaped fleshy fruit with persistent styles. *S. arunachalensis* was reported from forests 55 km to the west of the habitat of the currently described taxon, while *Stapletonia seshagirianum* (R.B. Majumdar) H.B. Naithani, which is not very well known, but also appears to be quite similar, is from about 45 km to the north. *S. rigoense* is similar to *S. arunachalensis* and *S. seshagirianum* in terms of height, diameter, erect to semiscandent nature, bearing inflated base of culm sheath blade and presence of a brown hair ring below the nodes, but differs in leaves due to lack of auricles and longer, more drawn out apices, presence of triangular projection at the base of the blade of the culm sheath and dentate ligule, presence of a white-coloured waxy ring below the brown hair ring etc.

Materials & Methods

The specimens of the new taxon were collected from the natural populations at Rigo area of Aalo Circle of Arunachal Pradesh, India. Morphological studies were conducted following conventional herbarium techniques, with specimens (including types) examined from the local, regional and national herbaria ARUN, APF, ASSAM, CAL and DD. In addition, relevant specimen images from the BM and P herbaria on the JStor Global Plants website [<https://plants.jstor.org>] and Digital herbarium database of Royal Botanical Garden Kew [<http://apps.kew.org/herbcat/navigator.do>] were also consulted. The specimen could not be matched with any of the earlier existed taxon. Hence, the materials were processed as new species and type specimen was submitted to ASSAM.

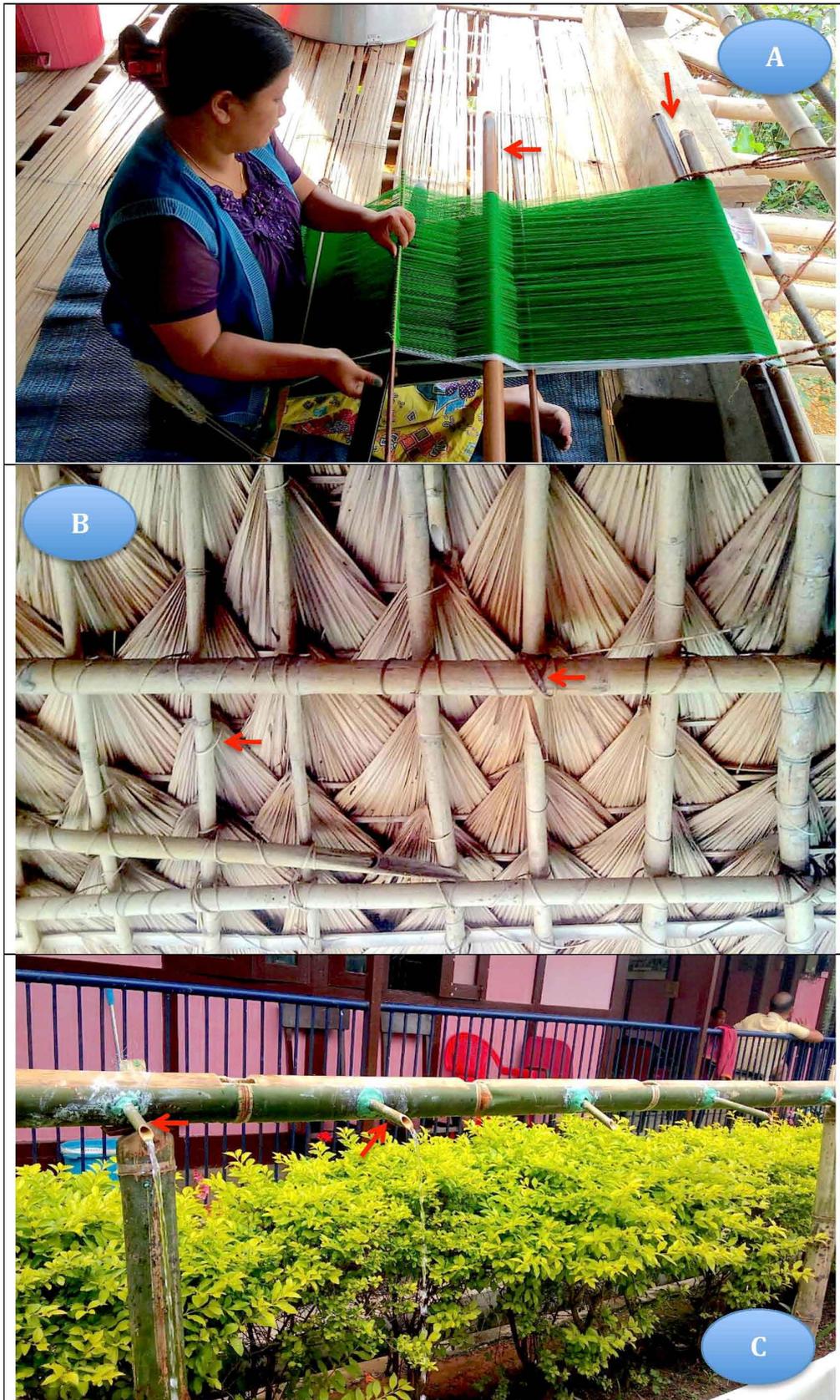


FIGURE 1. A, Use of internodes of *Stapletonia rigoense* as weaving tools, B, as tying strips and, C, in drip irrigation.

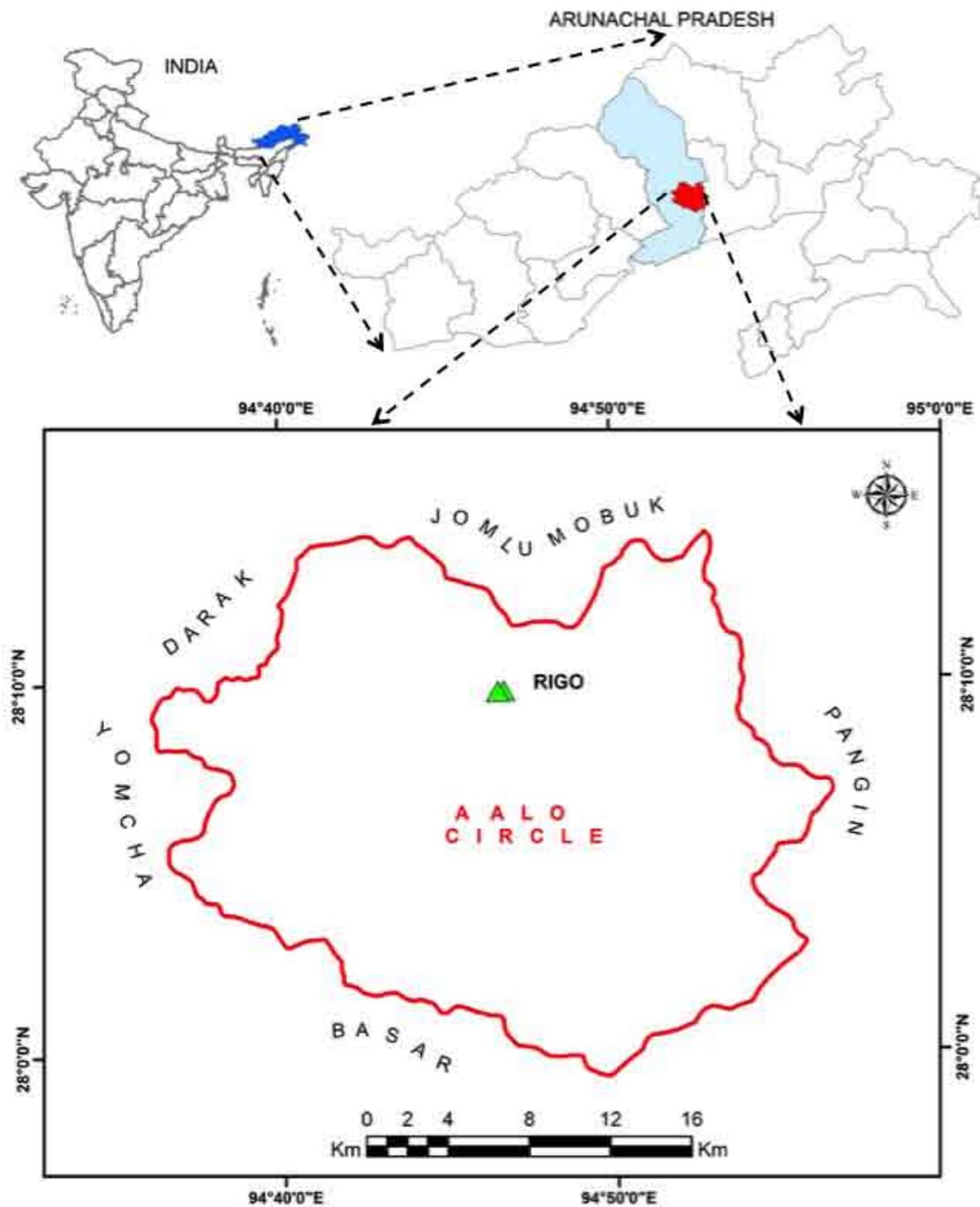


FIGURE 2. Location map of *Stapletonia rigoense* forest at Rigo area of Arunachal Pradesh, India.

Systematics

Stapletonia rigoense L.B. Singha, P. Niri & R. Devi, *sp. nov.* (FIGURE 3–4)

TYPE:—INDIA. Arunachal Pradesh: Near Rigo village, Aalo, restricted natural population located at 28°09'44" N Latitude and 94°46'33" E Longitude; elevation c. 400–500m asl.; hilly terrain, moist and warm climate; Col. No. 001/LBS/2017 (leafy twig and culm sheath)
Holotype: Assam!

Erect to semiscandent bamboo. *Culm*: Moderate in size, 9–15m tall, 3.5–4cm in diameter, 3–8mm thick wall. *Internode*: 45–160cm or more long, longest at the middle, shorter at base and apex, with scattered golden brown hairs extending up to 1cm below the nodes and white colored ring up to 2cm below the node. *Node*: moderately swollen, glabrous, turns glossy when dry. *Branch*: Many, of same length at each node above the middle of the culm. *Branch bud*: Cuspidate at apex. *Leaf*: 17.5–37.5cm long and 3.5–6cm width; lanceolate, subulately acuminate above, tip twisted bearing pointed needle-like structure of 7–20mm long; base oblique, glabrous on adaxial surface whereas, scabrous on abaxial surface, with a 4–7mm long petiole. *Leaf margin*: Minutely scabrous; main vein prominent with 9–12 pairs of secondary veins and 4–5 pairs of intermediate veins; transverse vein absent. *Leaf sheath auricle*: Absent; *Ligule*-short, entire. *Culm sheath*: Slowly deciduous, 22.5–31.8cm long and 16–20cm width, broad, thick, crustaceous and scabrous, covered with appressed golden brown hairs (ca. 1mm long) on abaxial, glabrous on adaxial surface, oblique at the apex, margin ciliate with 2mm long golden brown hairs. *Blade*: Imperfect, erect, 15.5–27cm long and 12–14cm broad, triangular, striate with transverse veins, base not rounded but of similar size, inflated up to 5mm with reticulate veins; *Margins*: Ciliate, with white vertical bristles on lower half; triangular projection present at the base of the blade. *Ligule*: Narrow 1mm long, arching, dentate. *Auricle*: absent. *Inflorescence*: Not known.

Discussion:—TABLE 1 shows the comparative morphological features of *Stapletonia rigoense* with the two species considered to be morphologically the most similar. *S. rigoense* resembles *S. arunachalensis* and *S. seshagirianum* in bearing narrow culms with long internodes and broad culm sheath blades with inflated base. However, the new taxon differs from the two in its twisted leaf apices bearing 7–18mm long pointed needle-like structure; erect culm sheath blade bearing a triangular projection at the base with dentate ligule. Presence of 10mm width ring of golden brown hairs below the nodes followed by 10mm width white-colored ring are also unique character for this species, whereas, in case of *S. seshagirianum* and *S. arunachalensis*, they lack such features on leaf and blade and bear only a white ring with white hairs below the nodes. On the other hand, *S. seshagirianum* bears linear-lanceolate narrow leaves and *S. arunachalensis* bears oblong-lanceolate leaves, whereas the leaves of *S. rigoense* are linear-oblong and the size is intermediate between the other two species. The rhizome of this species is clearly pachymorph and short-necked. The rhizome neck of *S. arunachalensis* was reported as extended (Singh *et al.* 2009), and this was given as a generic character, but the length was not clarified and the illustration given did not demonstrate it very well. Possession of fringed leaf sheath auricles was also given as a generic character, but the occurrence of auricles is itself highly variable between congeneric bamboo species. Although the genus was thus distinguished mainly on its very distinctive flowering and fruit characters, and the inflorescence and fruit of *S. rigoense* are not known, it would nevertheless appear most likely that this new species should also be placed in *Stapletonia*. Much further work is required to describe the in-depth characteristics of several similar species in NE India and Burma, and to determine their generic affinities, morphological species boundaries and geographical distribution.

Etymology:—The species was collected from the forests near Rigo village of Arunachal Pradesh, India, hence the species has been named after its type locality.

Conservation status:—*S. rigoense* is known only from this recent collection in a small, restricted natural population. It is therefore assumed to be threatened.

Acknowledgements

The authors are thankful to National Botanical Survey of India, Calcutta, Shillong and Dehradun as well as state herbaria at Arunachal Pradesh, India for their permission and support while consulting their herbaria and Department of Forestry, North Eastern Regional Institute of Science and Technology for providing required laboratory facility while the study was conducted. Thanks are also due to the villagers of Rigo for their kind support while tracing and gathering detail information on this new bamboo species. Anonymous reviewers are thanked for comments in improving the paper for publication.

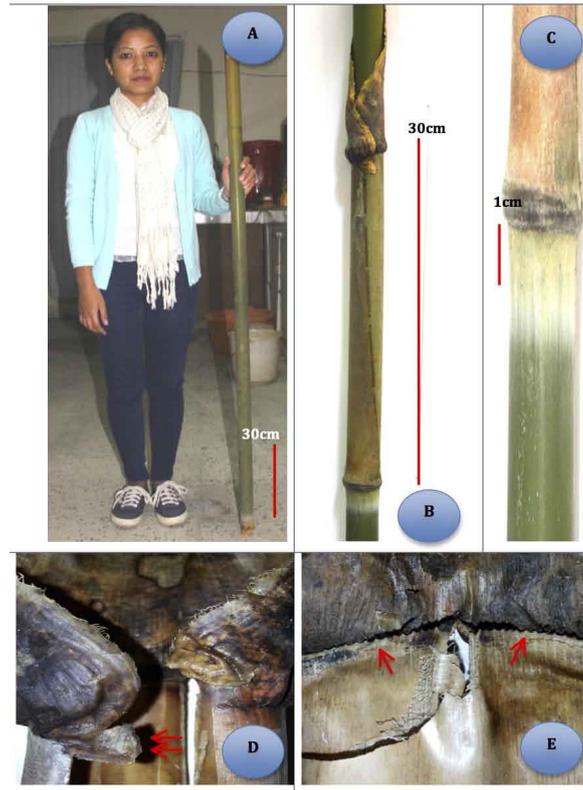


FIGURE 3. A, An internode, B, tightly wrapped culm sheath and blade with inflated base, C, brown hairs with white rings below internode, D, triangular projection at the base of blade, E, dentate ligule on the culm sheath of *Stapletonia rigoense*.

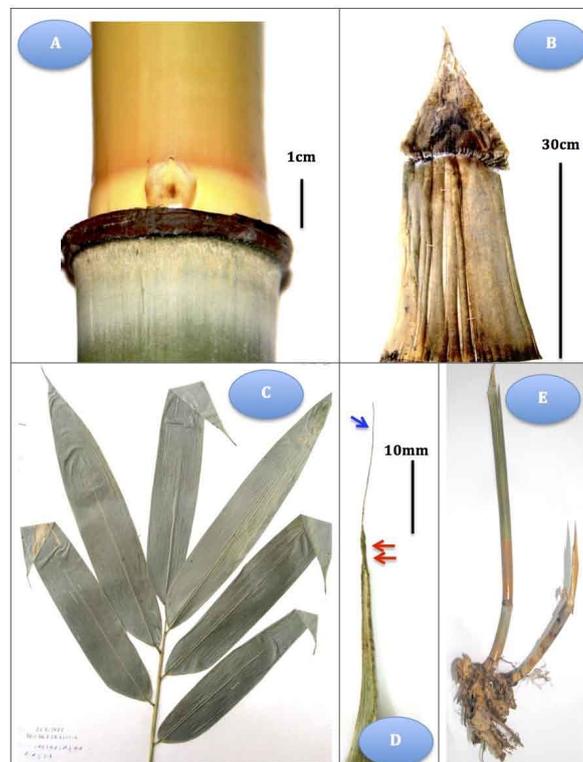


FIGURE 4. A, Branch bud with cuspidate apex, B, culm sheath with blade, C, a leafy twig, D, twisted leaf apex with 7–18mm long needle-like structure, E, short-necked pachymorph rhizome of *Stapletonia rigoense*.

TABLE 1. Comparative accounts of morphological features of *Stapletonia rigoense* with two of its close relatives (*S. arunachalensis* and *S. seshagirianum*).

Significant characters	Bamboo species		
	<i>Stapletonia rigoense</i>	<i>Stapletonia arunachalensis</i>	<i>Stapletonia seshagirianum</i>
Plant form	Erect to semi-scandent	Semi-scandent	Erect to semi-scandent
Culm height (m)	9–15	10–15	2–3
Diameter (cm)	3.5–4	3.2–3.8	2.9–4.8
Internode length (cm)	45–160 or more	20–150 or more	20–80
Rind thickness (mm)	3–8	5–10	2–6
Nodes	Less swollen, scattered golden brown hairs extending up to 1cm below the nodes whereas white colored ring extended up to 2cm below the node, glossy when dry.	Swollen with thick 1cm broad ring of brown hairs.	Less swollen with thick 1cm broad ring of brown hairs.
Leaves	17.5–37.5cm × 3.5–6cm, lanceolate, subulately acuminate above, tip twisted bearing pointed needle-like structure of 7–18mm long, base oblique, upper surface of the leaf smooth/glabrous and lower surface of the leaf is rough/ scabrous, ending into a petiole 4–7mm; leaf margin minutely scabrous; main vein prominent; secondary vein 9–12 pairs; intermediate veins 4–5, transverse vein absent; leaf sheath auricle absent; sheath striate; ligule narrow.	20–52cm × 4.5–18cm, ovate, base oblique, ending into a 15mm long thick petiole, apex acuminate into a twisted point, glabrous on both surfaces, margin minutely scabrous; main veins prominent, secondary veins 8–18 pairs.	8–28cm × 2–4cm, lanceolate, oblique at the base, ending to a 50mm long petiole, apex twisted setaceous, minutely hirsute on upper surface; margins ciliate; midrib prominent, raised, glabrous; secondary veins about 10 pairs; intermediate 6–8 with cross bars, resembling transverse veinlets when dry; sheath striate ciliate; ligule narrow.
Culm sheath and blade	Culm sheath: Semi deciduous, width 22.5–31.8 cm long, 16–20cmbroad, thick, crustaceous covered with golden brown hairs (1mm) on upper surface, glabrous on under surface, oblique at the apex, outer margin with golden brown cilia up to 2mm long; Blade: Erect, imperfect, 15.5–27cm long and 12–14cm broad, triangular, striate with transverse veins, base not rounded but of similar size, inflated or convoluted up to 5mm with reticulate veins. Margins with white bristles on lower half projecting upward; triangular projection present at the base of the blade; ligule narrow 1mm long, dentate.	Culm sheath: Deciduous, 15–26cm long 12–14cm broad, thick, crustaceous, covered with yellow brown hairs on upper surface, glabrous on under surface, oblique at the apex, margin with yellow brown cilia, on upper half; Blade: Erect, imperfect, 20–25cm long, 9–11 cm broad, triangular, straight with transverse veins, base rounded, one side larger than the other, inflated with reticulate veins, margins with bristles on lower half; ligule narrow, entire.	Culm sheath: Deciduous, brown, 20–30cm long, 12–18cm broad, crustaceous sheath proper tubular, hard, covered with sparse brown hairs at outer surfaces; Blade: Reflexed, imperfect, 15–25 cm long, 10–13cm broad, triangular, tapering towards apex with acute tip, inflated portion dark brown, ciliate on the margin up to 1/4th of the length of sheath, covered with many parallel veins on upper surface, each vein with transverse veinlets; ligule narrow, entire.
Inflorescence	Not known	A capitulum	Not known

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