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Calamus himalayanus (Arecaceae: Calamoideae), a new species from Eastern Himalaya, India

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Abstract: A new species of *Calamus* L., *C. himalayanus* is proposed here based on the specimens collected from the lower hills of Darjeeling Himalaya, India. The new species has morphologically close affinity with *Calamus flagellum* Griff. ex Walp. but can be clearly distinguished by its habit of smaller size, thicker stem diameter with sheath, all uniform flat spines on leaf sheath, ocrea surface without spines, conspicuous glabrous knee, much longer flagellate inflorescence, relatively small fruits; scale rows number. Taxonomic description, photograph, illustration and comparison with closely related species are provided.

Keywords: Rattan, Calamoideae, New Taxa, Darjeeling

Introduction

Calamus L. is the largest genus and prime group that comprises of about 416 species (POWO, 2024) under the subfamily Calamoideae of Arecaceae and distributed mostly in Africa, South and Southeast Asia, Northern Australia and Fiji (Dransfield, 2008; Henderson, 2020). Species of *Calamus* are mostly spiny clustering robust climbers or shrubby, having scaly fruits and is quite common in various tropical forests in Asian countries (Peters *et al.,* 2014; Mondal 2020). Indian wild habitat houses around 44 species of *Calamus,* that are growing in various tropical and sub-tropical forests of Eastern Himalaya, North-East India, Western Ghats and the Andaman and Nicobar Islands (Beccari, 1894; Basu 1992; Renuka, 2011; Mondal *et al.,* 2019, 2021). The tropical forests in terai, duars and lower hills of the Indian eastern Himalaya are quite rich in regards to population sizes and species diversity of rattans (Mondal & Chowdhury, 2018). Few interesting specimens of *Calamus* from one gathering were critically examined morphologically. The specimen gathering were collected from the Choklong forest (between 300–330 m asl.) of Darjeeling district, West Bengal during 2019–2021 and the specimens were processed through herbarium technique (Paul *et al.,* 2020), deposited at NBU herbarium. The detailed morphological study of the specimen, consultation of relevant literatures (Renuka, 1987; Basu, 1992; Henderson, 2020; Mondal, 2020; Mondal *et al.,* 2018; 2020; 2021), and comparison with pre-identified herbarium specimens (CAL, ASSAM & BHSC) and virtual herbarium images (K), revealed that the species under study is an undescribed species of *Calamus.*

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Taxonomic Treatment

Calamus himalayanus S. Mondal, S. K. Basu & M. Chowdhury **sp. nov.** **Figs. 1–2**

Similar to *Calamus flagellum* Griff. ex Walp. but can be clearly distinguished by shorter habit (up to 13 m long *vs c.* 30 m long), thicker stem with sheath (6–12 cm diam. *vs* 2.1–5.9 cm diam.), single type of flat spines on leaf sheath, ocrea surface without spines, conspicuous glabrous knee, much longer flagellate inflorescences (8–9.5 m long *vs* 5–6.5 m long), smaller fruits (12–16 × 7–9 mm *vs c.* 30 × *c.* 22 mm), and number of vertical scale rows on fruits (15 *vs* 12).

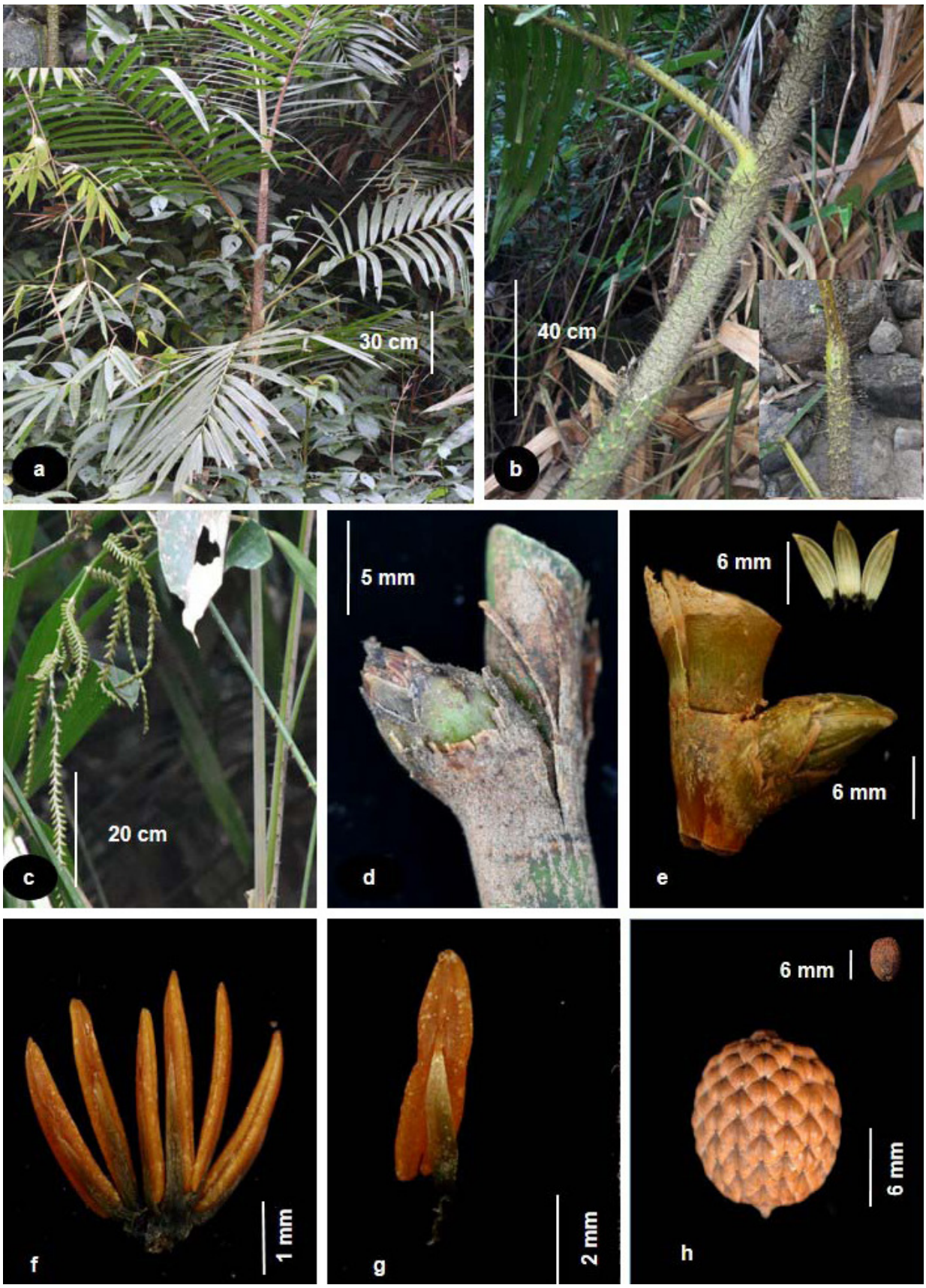

Fig. 1. *Calamus himalayanus* sp. nov.: **a.** Habitat; **b**. Stem with sheath; **c**. Staminate inflorescence; **d**. Female flower; **e**. Male flower with petals; **f** & **g**. Stamen with anther; **h**. Fruit and seed.

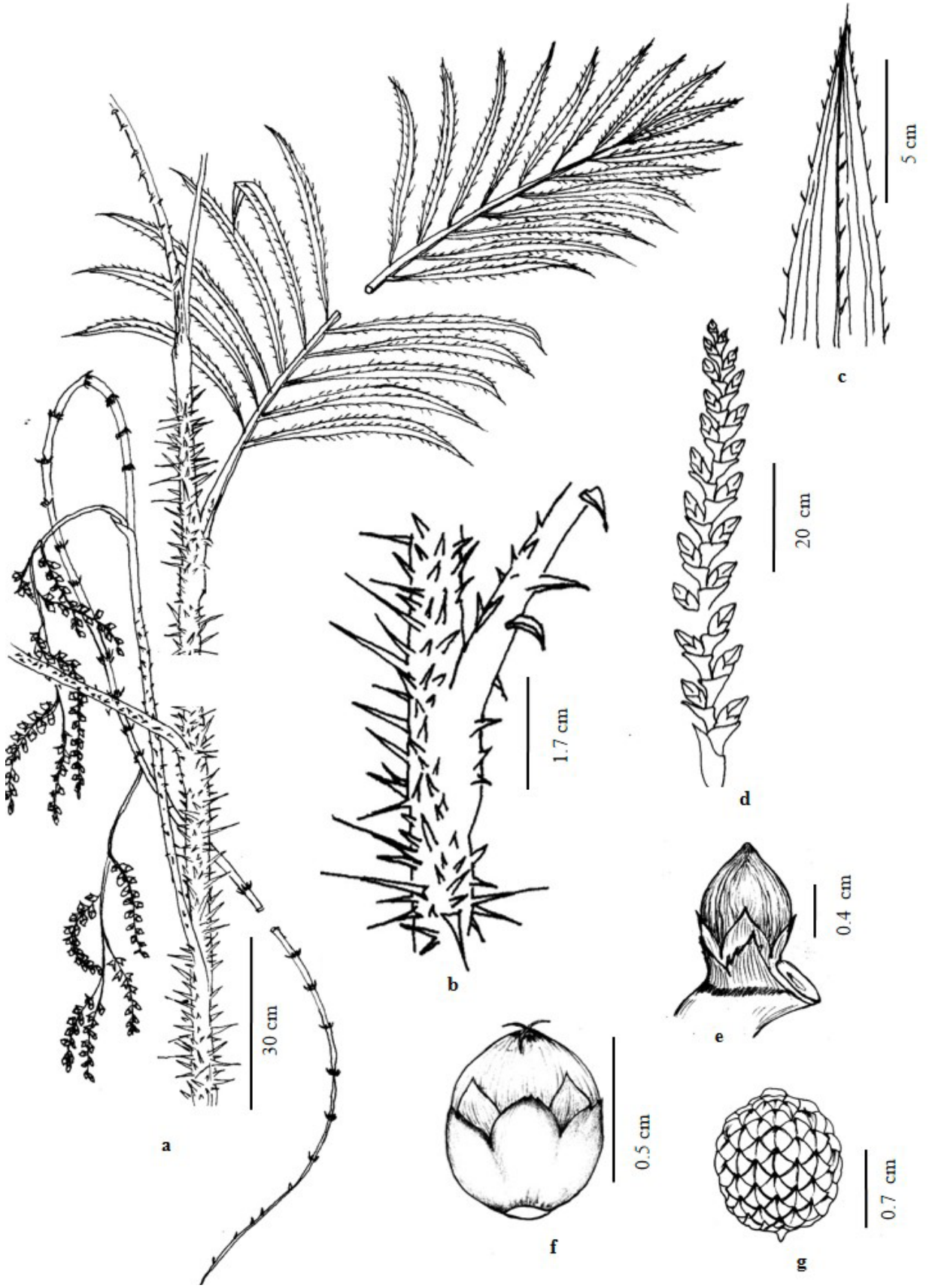

Fig. 2. *Calamus himalayanus* sp. nov.: **a.** Habit; **b.** Stem with remarkable knee; **c**. Part of leaflet; **d**. Partial inflorescence; **e**. Male flower with calyx; **f**. Female flower with calyx; **g**. Fruit [Illustrations; a-f Papiya Saha; g Suravi Ghosh].

Type: INDIA, **West Bengal**, Darjeeling district, Choklong forest, hill slopes of the Mahananda WLS outskirts, 26°51′43″ N, 88°21′42″ E, 320 m, 08.02.2020, *Mondal & Chowdhury 0184* (holo NBU!; iso CAL!, CUH!).

Climbing, clustering rattans up to 13 m tall; stem 4–9 cm in diameter, stem 6–12 cm in diam. with sheath, internodes 4.5–10 cm long; leaf sheath rusty, tubular, 18–28 cm long, brownish, covers with dense irregular spines, all spines flat, straight, black variable in sizes, 0.5–8 cm long; ocrea well developed, spines absent, glabrous; knee conspicuous, glabrous, greenish. Leaves ecirrate, 1.5–2 m long; petiole glabrous, 18–38 cm long, dense grouped spines along the edges, spines variable in sizes, 12–19 mm long; rachis 1.2–1.7 m long; solitary, hooked spines present abaxially on petiole and rachis, spines 4–9 mm long, yellow, arranged in regular interval; leaflets 18–34 on each side of rachis, alternate, equally distributed, linear to ensiform, basal leaflets 42–58 × 2.9–4.1 cm, middle leaflets 58–65 × 2–4.2 cm, apical leaflets 14.2–18.5 × 1.9–2.8 cm, terminal leaflets joined basally. Inflorescences flagelliform, very long; staminate inflorescences 8–9.5 m long, slightly armed with claws, primary bracts cylindrical, obliquely truncate; partial inflorescence 0.4–0.6 m long; bracts cylindrical, open, brown papery after drying, basal bracts tomentose at opening, rachillae opposite, 7–19 cm long. Staminate flowers 4–8 × 3–4 mm. Calyx 3-lobed; sepals ovate, 3–5 × 1–3 mm, base wide. Stamens 6, dorsifixed, hanging freely; filaments short; anther 2-celled, 2–5 × 1–1.5 mm. Pistillate inflorescence 6–8.5 m long, partial inflorescence 25–55 cm long; primary bracts papery, brownish, 25–55 × 9–16 mm each carrying 15–22 rachillae, individual rachillae 6–15 cm long, with 6–14 pistillate flowers each. Pistillate flowers, 5–7 × 3–4 mm. Calyx cupulate; Sepals 3. Petals 3-lobed, 4–6 × 2–3 mm. Fruits very small, globose, prominently beaked, yellowish, 12–16 × 7–9 mm, covered by triangular scales, inserted in 15 distinct vertical rows; scales 2–4 × 3–6 mm, regular, entire with blackish brown margins. Seeds 6–10 × 4–7 mm, brown with blackish spotted with slightly yellow sarcotesta, on one side flattened with deep germpore, other side convex, endosperm ruminate.

Vernacular name: In Nepalese this species is called "Karalohora, Bethgera".

Flowering & fruiting: Flowering from January to March and fruiting from April to June.

Habitat: *Calamus himalayanus* grows along the tropical riverine forest along the lower hilly slopes of Eastern Himalayas between 300–330 m asl. and growing in associated with *Achyranthes aspera* L., *Aglaia spectabilis* (Miq.) S.S. Jain & S. Bennet, *Dillenia pentagyna* Roxb., *Pericampylus glaucus* (Lam.) Merr., *Phanera scandens* (L.) Lour. ex Raf., *Leea macrophylla* Roxb. ex Hornem.

Distribution: Hitherto know from the type locality Mahananda WLS in Darjeeling district of West Bengal.

Etymology: The specific epithet, "*himalayanus*" denotes the type locality which is part of Himalaya a global biodiversity hotspot.

Uses: Leaves and stem are used as thatch and walking stick; local peoples have the fruits to treat diabetes

Notes: The new species is morphologically close to *Calamus flagellum* Griff. ex Walp. but can clearly distinguished by its smaller sized cluster forming habit, thicker stem diameter with sheath, single type of flat spines on leaf sheath, ocrea surface without spines, conspicuous glabrous knee, much longer 9.5 m flagellate inflorescences, relatively small, globose fruits (12–16 × 7–9 mm), scale rows 15 in number (Table 1). The type locality is situated at lower elevation of riverine forest in the eastern Himalaya of Darjeeling district of West Bengal. The population of the species was found to have a restricted distribution range in the current investigation. This less-known population of *Calamus himalayanus* is facing various anthropogenic threats, like mass ecotourism and habitat fragmentation due to road

Table 1. Comparison of diagnostic morphological characters between *Calamus himalayanus* with its allied species.

Characters	*Calamus flagellum* Griff. ex Walp.	*Calamus himalayanus* sp. nov.
Habit	Up to 30 m long	Up to 13 m long
Stem	2.1–5.9 cm in diam. with sheath	6–12 cm in diam. with sheath
Leaf sheath	5.5–10 cm long, greenish-yellow, covered with dense irregular spines; spines two types, one large, flat straight black or brown, other short needle like	18–28 cm long, brownish, covered with dense irregular spines; all spines flat, straight, black
Ocrea	Densely covered with short spines	Glabrous without any spines
Knee	Inconspicuous, mottled with uneven brands of tomentum	Conspicuous, without mottled or any bands, glabrous
Leaves	2.3–3.7 m long, grouped spines present abaxially on petiole; rachis 1.2-3 m long; spines straight, 2–5 mm long, flat, grouped	1.5–2 m long, densely grouped spines (12–19 mm) along the edges on petiole; rachis 1.2–1.7 m long; spines 4–9 mm long, hooked regular, solitary
Staminate Inflorescence	5–6.5 m long; partial inflorescence 1 m long, rachillae 8.7–27.5 cm long	8–9.5 m long; partial inflorescence 0.4–0.6 m long, rachillae 7–19 cm long
Pistillate Inflorescence	4–5 m long; partial inflorescence, 20–40 cm long; primary bracts 14–35 × 4–1.1 mm	6–8.5 m long; partial inflorescence, 25–55 cm long; primary bracts 25–55 × 9–16 mm
Fruits	*c.* 30 × *c.* 22 mm; scales on 12 vertical rows	12–16 × 7–9 mm; scales on 15 vertical rows
Seeds	9–17 × 5–10 mm, brown without any spots; sarcotesta greenish-grey	6–10 × 4–7 mm, brown with prominent blackish spots; sarcotesta slightly yellowish

network, tea garden extension, and unscientific withdrawal of plant resources. Therefore, it is recommended to undertake immediate an *in-situ* and *ex-situ* conservation initiative, even if the species' threatened status has not been evaluated.

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Literature Cited

BASU S.K. 1992. *Rattans (Canes) in India. A monographic revision.* Rattan Information Centre, Kepong.

BECCARI O. 1894. Palmae. *In:* HOOKER J.D. (ed.), *The Flora of British India.* Volume 6. L. Reeve & Co. London. pp.402–483.

DRANSFIELD J., UHL N.W., ASMUSSEN C.B., BAKER W.J., HARLEY M.M. & C.E. LEWIS2008. *Genera Palmarum – the evolution and classification of palms.* Royal Botanic Gardens, Kew. 732 pp.

HENDERSON A. 2020. A revision of *Calamus* (Arecaceae, Calamoideae, Calameae, Calaminae)., *Phytotaxa* 445(1): 001–656.

MONDAL S. 2020. *Taxonomy, Phenology and Ethnobotany of Palms in West Bengal*. Ph.D. Thesis (Unpublished). University of North Bengal, Siliguri.

MONDAL S. & M. CHOWDHURY 2018. Rattan's diversity in West Bengal, India. *Advances in Plant Sciences* 31: 159–165.

MONDAL S., BASU S.K. & M. CHOWDHURY 2019. *Calamus pseudoerectus* (Arecaceae), a new species from the eastern Himalaya, India. *Journal of Threatened Taxa* 11:13605–13610. https://doi.org/10.11609/jott.4493.11.5.13605-13610

MONDAL S., BASU S.K. & M. CHOWDHURY 2020. A new species of *Calamus* (Arecaceae) from Eastern Himalaya, India. *Turczaninowia* 23(3):92–98. http://turczaninowia.asu.ru/article/view/8561

MONDAL S., BASU S.K. & M. CHOWDHURY M. 2021. *Calamus arborescens* (Arecaceae): an addition to the flora of India from West Bengal. *Rheedea* 31(2): 82–84. https://dx.doi.org/10.22244/rheedea.2021.31.02.08

PAUL P., DHAR S., DAS D. & M. CHOWDHURY 2020. *Herbarium Techniques: Evolution from Conventional to Digitization*. Orange Book Publication, Chattisgarh.

PETERS C. M., HENDERSON A., DUNG N.Q. & T. LEDECQ 2014. *Systematics, ecology and management of rattans in Cambodia, Laos and Vietnam. The Biological Bases of Sustainable Use*. WWF/IKEA/NYBG: *Agricultural Publishing House* pp.222.

POWO 2024 (continuously updated). *Plants of the World Online*. Facilitated by the Royal Botanic Gardens, Kew. Available at: http://sftp.kew.org/pub/data-repositories/WCVP/[Accessed on 21.05.2024].

RENUKA C. 2011. *All India Coordinated Project on the Taxonomy of Palms*. Kerala Forest Research Institute, Peechi. pp. 220.

RENUKA C. 1987. A new species of *Calamus* (Palmae) from India. *Kew Bulletin* 42: 433–435.