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NOTE

THE MALAY CARDAMOM *MEISTERA ACULEATA* (ROXB.) ŠKORNIČK. & M.F. NEWMAN (ZINGIBERACEAE: ALPINOIDEAE) FROM THE PALGHAT GAP: A NEW RECORD TO KERALA, INDIA

Vadakkeveedu Jagadesh Aswani, Manjakulam Khadhersha Jabeena & Maya Chandrashekar Nair

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The Malay Cardamom *Meistera aculeata* (Roxb.) Škorničk. & M.F. Newman (Zingiberaceae: Alpinioideae) from the Palghat gap: a new record to Kerala, India

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Zingiberaceae, the ginger family, comprises 53 genera and more than 1,375 species widely distributed throughout tropical Africa, Asia, and America (Kress et al. 2002; Kong et al. 2010). *Amomum* Roxb. s.l. is the second largest genus in the family Zingiberaceae with about 150–180 species (Xia et al. 2004). The distribution of the genus in India is concentrated in northeastern India, peninsular India, and the Andaman & Nicobar Islands with 22 species (Thomas & Sabu 2012). *Amomum* is reported to have 48 species in the Flora of British India (Hooker 1894), while five species were reported by Fischer (1928) in the Flora of Presidency of Madras. Recent taxonomic studies have resulted in the discovery of 12 taxa under the genus *Amomum* (Thomas et al. 2010, 2012a,b, 2014, 2015, 2016; Thomas & Sabu 2012; Hareesh & Sabu 2018).

Presently *Amomum* is circumscribed to a monophyletic genus based on multi-marker phylogenetic framework using matK and nrITS as markers. The targeted sampling combined with the molecular data, phylogenetic analysis and morphological characters

allowed the re-circumscription of 10 clades of the genus *Amomum* as separate genera (De Boer et al. 2018). Accordingly, certain species in the genus *Amomum* are either resurrected or transferred to the genus *Meistera* Giseke.

Meistera is characterized by semi-lunar anther crest, echinate fruit and solitary flower in each fertile bract (Thomas & Sabu 2018). The genus comprises 42 species and three varieties, and is distributed from Sri Lanka and India, throughout the Indo-Chinese region to Sundaland (De Boer et al. 2018).

During the exploratory studies on the floristic diversity in the Walayar forest range of the southern Western Ghats, the authors collected specimens belonging to the genus *Meistera* growing on the foothills of Jamanthimala coming under Pudukkottai North Section (10.863°N & 76.789°E) near the Palakkad Gap region in June 2019. The specimens were preserved as herbarium using standard herbarium procedures. The specimen was identified as *Meistera aculeata* (Roxb.) Škorničk. & M.F. Newman after consulting relevant taxonomic

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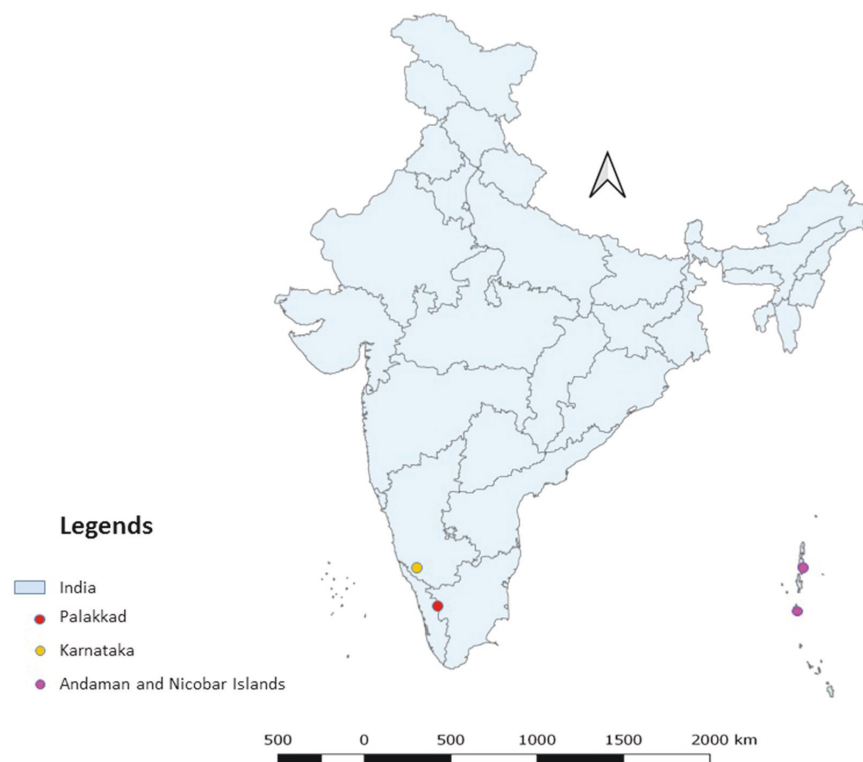


Figure 1. Known locations of the Malay Cardamom *Meistera aculeata* (Roxb.) Škorničk. & M.F. Newman in India. Map by V.J. Aswani.

literature and the type specimen housed at the Natural History Museum (BM).

Balakrishnan & Nair (1979) reported this species from the Andaman & Nicobar islands and recently, this was reported from Kodagu in Karnataka (Patil & Lakshminarasimhan 2018) as a new addition to its distribution in mainland India. Our collection from the foothills of Jamanthimala forms a new record to the flora of Kerala as this taxon has not been included in any of the literature pertaining to the flowering plants of Kerala (Vajravelu 1990; Sasidharan 2002, 2011; Nayar et al. 2006, 2014) as well as the revisionary studies on *Amomum* s.l. (Sabu 2006; Thomas 2011). A detailed description of the taxon along with photographs and distribution map is provided. The specimens are deposited at Madras Herbarium (MH), Calicut University Herbarium (CALI), and Government Victoria College Herbarium (GVCH).

Meistera aculeata (Roxb.) Škorničk. & M.F. Newman in Taxon 67(1): 25. 2018. *Amomum aculeatum* Roxb. in Asiat. Res. 11: 344, t. 6. 1810 & Fl. Ind., Carey and Wall. ed. 1: 40. 1820; Baker in Hook. f. Fl. Brit. Ind. 6: 242. 1894; N.P. Balakr. & N.G. Nair in J. Bombay Nat. Hist. Soc. 76: 196. 1979; Vasudeva Rao in J. Econ. Taxon Bot. 8: 151. 1986; Karthik. et al. Fl. Ind. Enumerat. -Monocot.: 290. 1989; Sameer Patil & Lakshmin. in J. Threat. Taxa 10(13): 12850. 2018. *Amomum hatuanum* Náves in Fernandez-

Villar & Naves, Nov. App.: 224. 1880 (Image 1).

Type: Ind. Orient., India, *William Roxburgh* s.n. (BM000958151, Image!)

Perennial herb, 2–3.5 m tall with distichous leaves. Root stock rhizomatous, branched and creamy brown within. Leafy shoots elongated, 2–3 cm thick, reddish brown towards base. Leaves sessile or shortly petiolate; lamina 30–60 cm long and 5–9 cm broad, oblong-lanceolate, acuminate at apex, cuneate at base, margins entire, glabrous on both surfaces, midrib yellowish-green, glabrous; petioles 0–3 mm long. Ligules bifid or subentire, longer than petiole, 1–1.5 cm long. Spikes many flowered borne directly from root stock, peduncles 10–15 cm long, 1–1.25 cm thick, glabrous. Bracts many, imbricate, very closely sheathing and spirally arranged, ovate, reddish-brown, cuspidate at apex, 4–6 cm long, 2.5–3.5 cm broad, glabrous inside and puberulous outside. Fertile bracts pinkish-red, ovate, cuspidate at apex, 4–5 cm long and 2–2.5 cm wide, puberulous towards base inside, glabrous towards apex on both surfaces. Each floral bract subtends a single flower. Bracteole tubular, abruptly 3 lobed, 1.4–1.6 cm long, membranous towards apex, glabrous on both surfaces. Flowers 1–4, open simultaneously in a head pattern with older flowers beneath which appears brown and slimy, 4–4.5 cm long. Calyx tubular, 2–2.5 cm long, 1.2–1.6 cm wide, 3 lobed from middle,

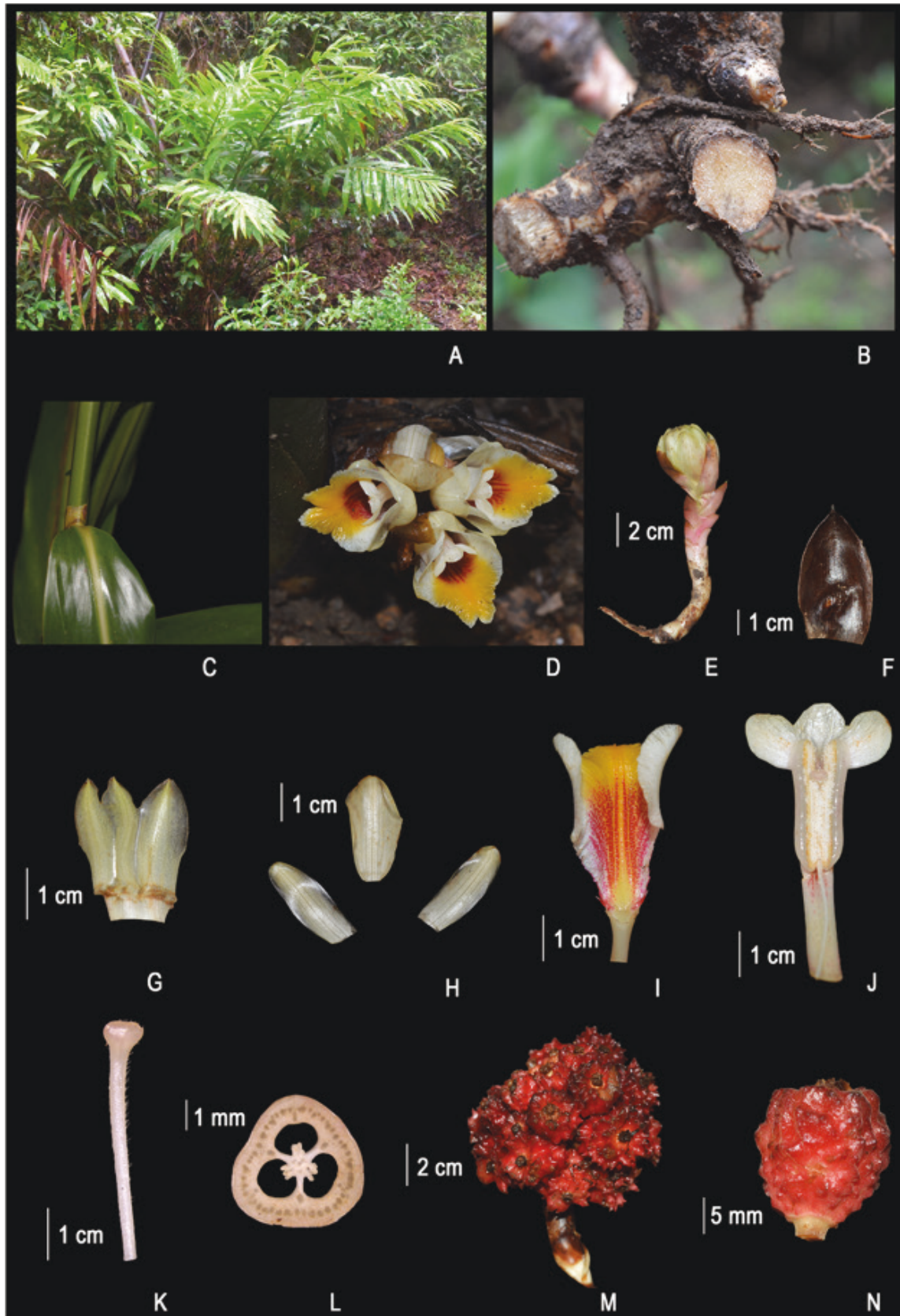


Image 1. *Meistera aculeata* (Roxb.) Škorničk. & M.F.Newman. A—Habit | B—Rhizome | C—Ligule | D—Flowers | E—Inflorescence at bud stage | F—Floral bract | G—Calyx | H—Petals | I—Labellum | J—Stamen with petaloid anther crest | K—A portion of style with stigma | L—C.S of Ovary | M—Fruit cluster | N—Single fruit. © Aswani, V.J. & Jabeena M.K.



apex mucronate, margins ciliate. Corolla tube 1.8–2.8 cm long, white, glabrous. Dorsal corolla lobe obovate, broader than lateral lobes, 2–2.8 cm long, rounded at apex, margins ciliate and slightly wavy. Lateral corolla lobes oblong, 1.2–1.5 x 1–1.5 cm long, rounded at apex, margins ciliate. Labellum obovate, trilobed, 3.5–3.6 cm wide, margins slightly undulate, glabrous. Median lobe truncate, clefted, white with yellow along with red streaks towards base and lateral lobes orbicular, lateral staminodes 2, subulate at base, red, 0.2–0.3 cm long, glabrous; anther one, oblong, 1.2–1.5 cm long, 0.3–0.4 cm broad furnished with a white petaloid anther crest; anther crest tri-lobed, middle lobe truncate or rounded and lateral lobes orbicular; thecae oblong, 1.2–1.5 cm long, white with irregular pink spots, apex rounded, base slightly acute, glabrous dehiscing throughout length. Gynoecium 4.8–5 cm, ovary 0.3–0.5 cm long, minutely pubescent, three celled with many ovules in each cell; style 3.8–4 cm long, glabrous except for ciliate hairs on one side half way long; stigma cup shaped, 0.1 cm long and 0.15 cm wide, creamy yellow with ciliate hairs in mouth region. Fruits 1.5–1.8 x 1.3 cm, echinate in clusters, glabrous, deep red when mature, many seeded.

Specimen examined: 177854 (MH) 23.vi.2019, INDIA: Kerala: Palakkad District, Walayar forest range, Pudussery North Section, Jamanthimala, 10.863°N & 76.789°E, 559.2m, coll. Aswani & Maya; 7005 (CALI) 23.vi.2019, Palakkad District, Walayar forest range, Pudussery North Section, Jamanthimala, 10.863°N & 76.789°E, 559.2m, coll. Aswani & Maya; 4078 (GVCH), 23.vi.2019, Palakkad District, Walayar forest range, Pudussery North Section, Jamanthimala, 10.863°N & 76.789°E, 559.2m, coll. Aswani & Maya; 4153 (GVCH) 01.vii.2019, Palakkad District, Walayar range, Pudussery North Section, Jamanthimala, 10.864°N & 76.788°E, 561.8m coll. Aswani; 4385 (GVCH) 19.vii.2019, Palakkad District, Walayar range, Akamalavaram section, Malampuzha (Moochikadavu), 10.880°N & 76.703°E, 500.5m, coll. Aswani & Maya.

Flowering: May–July; Fruiting: July–August.

Distribution: India (Karnataka: Kodagu – Pushpagiri Wildlife Sanctuary; Kerala: Palakkad, Walayar, Pudussery North, Jamanthimala; Andaman Islands: Figure 1), Myanmar, Thailand, Vietnam, Indonesia, Malay Archipelago, Malaysia, also extending across Wallace's Line to Sulawesi, New Guinea, and Australia.

Ecology: This plant grows at an elevation of 500–600m in humus-covered semi-evergreen forest floor. Small populations at an average of 20–30 mature plants were observed within a distance of 100m. The taxon was found growing in some restricted localities of Walayar

forest range along with *Ancistrocladus heyneanus* Wall. ex J. Graham, *Atalantia monophylla* D.C., *Dioscorea oppositifolia* L., *Cyclea peltata* (Lam.) Hook.f. & Thomson and *Anamirta cocculus* (L.) Wight & Arn.

Discussion

In the Palghat Gap region, exhaustive surveys covering the nearby forest ranges could not locate this species. Recently, this species was reported from Pushpagiri Wildlife sanctuary, Kodagu, Karnataka (Patil & Lakshminarasimhan 2018) and earlier from Andaman & Nicobar Islands (Balakrishnan & Nair 1979). Further, the threat status of the taxon is designated as Least Concern on the IUCN Red List (Olander 2020). As the population is discrete and discontinuous, the most appropriate causes for these disjunctions need to be studied and exhaustive explorations are required to fix the threat status of this taxon.

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