

Rediscovery of *Kaempferia marginata* (Zingiberaceae) after a lapse of 100 years from India

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Abstract

Kaempferia marginata was described by Roscoe in 1828 based on a specimen sent by Carey from British India. However, its exact habitat remained unknown, until the present report. It has also not been collected for so long from any where within the territory of present day India. The present study enabled to locate its natural habitat at Keithelmanbi, Manipur, Northeast India. The species is described, illustrated and compared with *K. galanga* L., another species having close morphological resemblance.

Keywords: India, *Kaempferia marginata*, Manipur, Zingiberaceae

Introduction

The generic name *Kaempferia* was given by Linnaeus in honour of the German physician and traveller Engelbert Kaempfer (1651 – 1716). This genus is widespread throughout tropical Asia with the centre of diversity in monsoon Asia (Larsen & Larsen, 2006). According to Sirirugsa (1992) the genus consists of approximately 60 species. Whereas, Wu & Larsen (2000) state that this genus is represented by c. 50 species. Moreover, some of the species of *Kaempferia* have been transferred to other genera, viz., *K. pandurata* Roxb. to *Boesenbergia rotunda* (L.) Mansf. (Mansfeld, 1958), *K. scaposa* ((Nimmo) Benth. to *Curcuma scaposa* (Nimmo) Škorničk. & M. Sabu (Škorničková *et al.*, 2007), *K. involucrata* King ex Baker to *Stahlianthus involucratus* Craib ex Loesener (Loesener, 1930), *K. siphonantha* Baker to *Boesenbergia siphonantha* M. Sabu *et al.* (Sabu *et al.*, 2004) and *K. linearis* Wall., *K. secunda* Wall. and *K. sikkimensis* King ex Baker to *Caulokaempferia* as *C. linearis* (King ex Baker) K. Larsen, *C. secunda* (King ex Baker) K. Larsen and *C. sikkimensis* (King ex Baker) K. Larsen respectively (Larsen, 1964). However, the exact number of species is rather obscure due to lack of any recent revision. Baker (1892) reported 22 species of *Kaempferia* from various parts of (India, Burma (Myanmar) and Malay Peninsula) then British India.

During an expedition for collection of a ginger the author collected an interesting specimen of

Kaempferia from the hills in the subtropical forest of Keithelmanbi in the western periphery of Imphal Valley of Manipur (23°50' –25°42' N and 92°58' –94°45' E). The plant flowered in cultivation under polyhouse environment in June 2008. Upon detailed examination the specimen was identified as *K. marginata* Carey ex Roscoe. Roscoe (1854) in his 'Monandrian plants of the order Scitamineae' stated that the specimen of *K. marginata* was sent from India by Carey, but the place of its collection was not mentioned. Baker (1892) included it based on collections from Burma (Myanmar) by Carey and from Tenasserim (also a part of Myanmar) by Parish. Based on the scrutiny of literature it is apparent that the precise locality of *K. marginata* in India remained unknown despite many authors (Sirirugsa, 1989, 1992; Wu & Larsen, 2000; Picheansoonthon & Koonterm, 2008) mentioned of its distribution there too. Therefore, the record of this species from India after a century with details on place of collection during the present study are discussed and a detailed description is provided. A thorough perusal of literature (Baker, 1892; Sirirugsa, 1989, 1992; Wu & Larsen, 2000; Picheansoonthon & Koonterm, 2008) and comparison of recent collection with the specimen of Parish housed at Kew (barcode - K000640527), with protologue (available at <http://elmer.rbge.org.uk/ZRC/names/names-search.php?cfg=zrc/protologues2.cfg&id=2367>) besides the lithographic drawing of the species in

'Monandrian Plants of the Order Scitamineae' by Roscoe (available at http://plantillustrations.org/illustration_100.php), the specimen was confirmed as *K. marginata*. As it closely resembles *K. galanga* L., a detailed description, notes on habitat, a comparative table and photograph are provided here to facilitate easy identification.

Kaempferia marginata Carey ex Roscoe, Monandr. Pl. Scitam.: t. 93. 1824; Horan. Prodr. Monogr. Scitam.: 21. 1862; Baker in Hook.f., Fl. Brit. India 6: 219. 1890; K. Schum. in Engl., Pflanzenr. 4(46): 20 Heft: 78. 1904; Sirirugsa, Nord. J. Bot. 9: 259. 1989 & Thai Forest Bull., Bot. 19: 10. 1992; T.L. Wu & K. Larsen in Z.L. Wu & P.H. Raven, Fl. China 24: 370. 2000. **Fig. 1**

Rhizomatous herbs, 2 – 3 cm high. Rhizome ovoid, c. 2.5 × 2.5 cm, serially arranged from the oldest to the youngest, greenish yellow inside, aromatic. Roots tuberous, oblong, 7 – 8 × 0.5 – 0.7 cm, translucent and pale brown, often terminated with ovoid tubers of c. 1.5 × 1.5 cm. Pseudostem c. 1.5 cm long, mostly underground, sheathed;

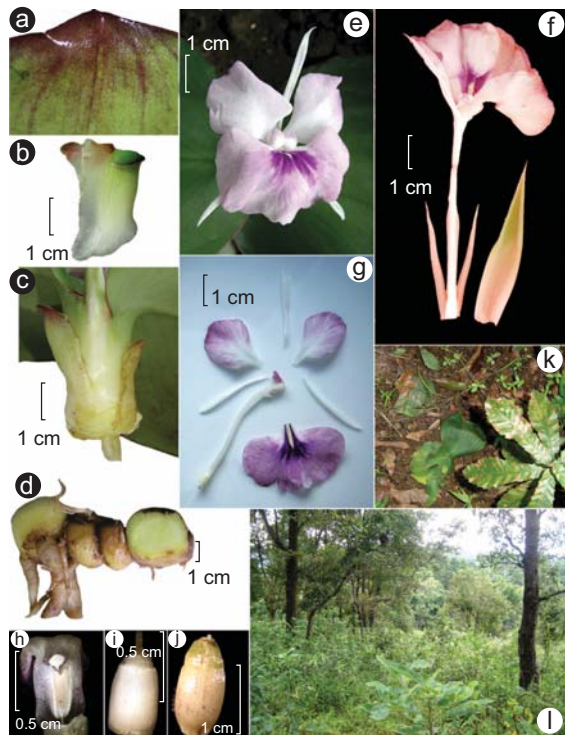


Fig. 1. *Kaempferia marginata* Carey ex Roscoe.: a. Leaf tip on abaxial side; b. A leaf sheath with ligule; c. Leaf sheaths; d. Rhizome; e. A flower; f. Floral parts showing bract, bracteole, calyx, corolla tube, dorsal corolla lobe, staminodes and labellum; g. Dissected floral parts; h. Anther and stigma; i. Ovary; j. Seed; k. *K. marginata* in habitat; l. Natural habitat of *K. marginata* at Keithelmanbi, Manipur, India.

sheaths 2 – 4, pale green. Leaves usually 2, rarely 3 or 4 on one pseudostem, spreading flat on ground; leaf-sheaths c. 3 × 4 – 4.5 cm, hyaline at margins, pale green; ligule triangular, c. 7 mm long, hyaline, translucent, glabrous, purplish; lamina ovate to orbicular, 13 – 15 × 13.5 – 16 cm, glabrous and dark green above, villous and pale green below, always thickened with purple colouration at margins, purple-blotched at apex. Inflorescence terminal, contemporaneous with leafy-shoot, semi-sessile, 1/3rd remained enclosed by the leaf-sheath, each inflorescence with 7 – 10 flowers which opens one after another. Bract one per flower; outer most 3.5 – 4.5 × 2 – 2.5 cm; inner ones lanceolate, smaller in dimension than the outer ones, glabrous, white towards base, greenish above. Bracteoles folded, linear-lanceolate, 3 – 3.8 × c. 0.8 cm, bifid to base, glabrous, translucent white. Flowers 6 – 8, exerted from bracts. Calyx tubular, 2.6 – 3.5 cm long, glabrous, translucent white, unilaterally slit at apex; slit c. 7 mm long. Corolla tube 4.8 – 5.5 cm long, glabrous, white; dorsal corolla lobe lanceolate, c. 3.2 × 0.3 cm, mucronate at apex, hooked, translucent white; lateral lobe linear, c. 3.2 × 0.3 cm, glabrous, translucent white. Labellum broader than long, 2.5 – 2.8 × 3 – 4 cm, deeply bilobed with 2/3rds longitudinal cleft from tip towards the base; lobes overlapping, pale to deep lilac with two darker purple patches towards the base, further inside with a longitudinal white band. Lateral staminodes obovoid, 2.2 – 2.8 × 1.8 – 2.2 cm, lilac with white bases. Anther thecae 4 – 5 mm long, parallel, white; crest c. 7 × 7 mm, prolonged bilobed (dentate), reflexed, white with more or less purple tinge. Stigma subglobose with lateral ciliated ostiole. Ovary 4 – 7 × 3 – 4 mm, glabrous, creamy white, 3-loculed; ovules axile. Seeds ellipsoid, c. 6 × 3 mm; aril lacerate, transparent.

Flowering & Fruiting: June – August.

Habitat: *Kaempferia marginata* occurs as undergrowth in the dense moist sub-tropical forest of Keithelmanbi. It grows in red soil rich in humus. The area receives heavy rainfall from June to September. Dominant tree species of the area are *Pinus kesiya* Royle ex Gordon, *Quercus* spp. and *Bambusa* sp. It also has luxurious growth of *Alpinia galanga* L. The topography is relatively steep, with slopes of up to 35° and altitude ranges from 850 to 900 m. This area forms a part of the Mount Koubrumount Thanging range of Manipur, a place rich in ginger diversity.

Distribution: India (Keithelmanbi, Imphal, Manipur), China (Yunnan), Myanmar and Thailand.

Table 1. Key characters differentiating *K. marginata* Carey ex Roscoe from *K. galanga* L.

Characters	<i>K. marginata</i> Carey ex Roscoe	<i>K. galanga</i> L.
Rhizome	Greenish yellow inside	White inside
Leaf margins	Always purple	Usually white or green
Flower	c. 4 × 4 cm, pale to deep lilac	c. 2.5 × 2.5 cm, white
Labellum	c. 2.8 × 4 cm; lobes overlapping, lilac with purple patch at base	c. 2.5 × 2 cm, apex slightly 2-lobed; lobes non-overlapping, white with purple patch at base

Specimens examined: INDIA, **Manipur**, Imphal, Keithelmanbi, 24°46' N and 93°46' E, 860 m, August 2007, Rajkumar 11 (CAL!). MYANMAR, Moulmein (Mawlamyine), *s. die*, Parish *s.n.* (K!) (barcode - K000640527).

Vernacular Name: Due to their close resemblance, both *K. galanga* L. and *K. marginata* Carey ex Roscoe are known as 'Yai-thamnamanbi' in Manipur.

Notes: This species closely resembles *K. galanga*, but the former can be distinguished from the latter by the thickened, purple-cloured leaf margins, large lilac flowers with purple bands at centre of the labellum and large strongly aromatic rhizome with yellow colouration (Table 1). The plant can be introduced into gardens as an ornamental for its broad leaves appressed to soil and gorgeous bright lilac-coloured flowers. It has been widely used in traditional medicines in China (Chen & Zhang, 1996), Thailand (Chuakul *et al.*, 2002) and also observed during the present study that it is used by local physicians in Manipur. Because of its medicinal properties *K. marginata* is heavily collected from its natural habitat and thus its occurrence becomes restricted to certain pockets. Besides, the practice of shifting cultivation or cultivation of Jhum by the local is also posing immense pressure on the natural habitat of *K. marginata* in Manipur. Hence, it is suggested that the Manipur Forest Department personnel regularly monitor the areas to conserve this species. Further explorations and population studies are required to assess the status in the country.

Acknowledgements

The author is thankful to the Director, IBSD, Imphal, for providing facility and Dr. Jana Leong-Škorničková, Taxonomist (Zingiberaceae), Herbarium (SING), Singapore Botanic Gardens, Singapore, for confirming the identification, and Dr. M. Sabu, Professor, Calicut University, Calicut, for critical reading of the manuscript.

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Received: 1.6.2011

Revised and Accepted: 28.4.2012