



A new species of *Zingiber* (Zingiberaceae) from Nagaland, India

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Abstract

A new species, *Zingiber pherimaense* related to *Z. rubens* (Roxb.), is described from Nagaland, India.

Introduction

In recent years, there has been a renewed interest in the study of Zingiberaceae in India, especially in the Western Ghats region and Northeastern states (Kumar *et al.* 2013). So far about 14 species have been reported from Northeast India (Baker 1982; Hajra & Verma 1996; Sabu *et al.* 2013; Kumar *et al.* 2013; Kishor & Skornickova 2013; Thongam *et al.* 2013). During field work in Nagaland by BT in 2012, a *Zingiber* Miller (1754) species with a white and dark pink flower was found growing near bamboo patches on the margin of an evergreen forest at 870 m. elevation. A portion of the rhizome was collected and grown at the Institute of Bioresources and Sustainable Development (IBSD) under the accession number IBSD/Z-105. In July 2013 the plant flowered at the Institute, which provided the opportunity for further documentation, photography and collection of type specimens. Since other identified *Zingiber* species are grown at IBSD, morphological comparisons were made with its allied species, *Z. rubens* Roxburgh (1810:348) and *Z. montanum* (J.Koenig) Link ex A. Dietr. 1831:52). None of these were very similar to the new collection.

In the process of identification, *Zingiber* protologues and regional floras for India, Myanmar, Bangladesh and China were reviewed. In the sectional classification of *Zingiber* as provided by Baker (1892) for India, our taxon would seem to belong in sect. *Cryptanthium* Horan. due to its small spike, similar to *Z. roseum* Roscoe (1828:t.87) and *Z. rubens*, but in having a long prostrate peduncle, it belongs to sect. *Lampuzium* Horan.—“Spikes produced from the rootstock on more or less elongated peduncles with sheathing scariose bract-leaves” (Baker 1892). Although most of the species in this section have a long, erect peduncle as exemplified by *Z. officinale* Roscoe (1828: t. 83), the decumbent peduncle of *Z. intermedium* Baker (1892:246) and *Z. meghalayense* Sushil K. Singh, R. Kumar & Mood (2013:61) are similar to our present collected material (IBSD/Z-105).

In the final analysis, although a few species have some morphological similarity to this taxon in question, none have the same combination of key characters which differentiate *Zingiber* species.

Zingiber pherimaense Biseshwori & Bipin, *sp. nov.* (Fig. 1)

Zingiberi meghalayensi similis, planta brevior ca. 1.5–2 m, laminis brevioribus ca. 33–36 cm longis, 6.8–7.2 cm latis, pedunculis longioribus ad 10–13 cm longis, labelli ordinatione magentea apice lato rotundato differt.

Type:—INDIA. *Bipin K.* IBSD/Z-105, cultivated at IBSD, Imphal, Manipur, India (Holotype ASSAM, isotype IBSD). Originally from India, Nagaland, Pherima, ca. 870 masl, 25°45.426'N 93°57.223'E, 4 August 2012, cultivated as IBSD/Z-105. (Fig. 1)

Terrestrial herb up to 2.0 m tall; rhizome subsurface, multiple, compact, vertical sections each ca. 2 cm diam., externally tan-white, internally with two-concentric rings, inner ca. 15 mm diam., outer 3 mm wide, both light yellow, numerous adventitious roots on the vertical sections, rhizome underside with fleshy, tuberous roots without a terminal swelling. *Leafy shoots or pseudostems* erect, thick, ca. 2–2.5 cm diam., leafless sheaths greenish-red, pubescent. *Leaves* 20–22,

calyx tubular, 1 × 0.4 cm, partially split one side, tri-dentate, transparent white, apices sparsely pubescent. *Corolla tube* slender, 3 cm long, white, sparsely pubescent externally; corolla lobes subequal, white at the base, pink towards the apex, dorsal lobe lanceolate, 3–3.5 × 0.5 cm, apex acute, arching over the anther; lateral lobes lanceolate, 2–2.6 × 0.5 cm, apex acute, extending beyond the labellum. *Labellum* 3-lobed, ca. 3.8 × 0.5 cm, rectangular, slightly concave above the throat, flattening toward the apex, broadening upward to the sidelobes, midlobe ca. 1.5 × 1 cm, rectangular, white with magenta (RHS 72B) longitudinal lines and markings, apex rounded to emarginate, margins slightly undulate, irregular, sidelobes ca. 5 × 5 mm, white with magenta markings, apices slightly acute, reflexed. *Stamen* ca. 1.4 cm long, white with magenta stripes on the upper surface, filament ca. 2 × 2 mm, white, thecae parallel, ca. 6 mm long, ca. 1.5 mm wide (each), creamy-white, anther crest elongate, beaked, ca. 6 mm long, 1.5 mm wide at the base, pollen creamy-white. *Ovary* globose, trilobular, 3 × 5 mm, villous with soft, brown hairs, *style* filiform, white, *stigma* white, ostiole circular with stiff hairs on the perimeter; *epigynous glands* 2, linear, 7 mm long, apices acute, creamy-white. *Fruit* unknown. (Measurements based on living, cultivated material of *Bipin K. IBSD/Z-105*).

Distribution:—Known only from the type locality.

Ecology:—This species was found growing in a dense and tall bamboo thicket at ca. 870 m. along the margin of mixed evergreen forest on loose, grey-brown clay soils covered with humus and leaf litter. Rainfall in this area is 1800–2500 mm/year. The plant is dormant (without stems or leaves) from December to March during the cool, dry season.

Etymology:—Named for Pherima village, Nagaland where it was first found in the nearby forest.

Phenology:—Flowers occur from July through August, opening in the evening and senescing within 24 hours.

Conservation status:—Unknown at this time.

Notes:—Although its vegetative morphology has some similarity to *Z. meghalayense*, *Z. rubens*, *Z. roseum* and others, the very long peduncle, labellum shape and colour, and tightly clumping rhizomatous growth make it distinct. Labellum colour in each *Zingiber* species genetically follows a narrow colour palette with few known exceptions, e.g., *Z. pseudopungens* R.M. Sm. (1989: 413). Even populations in different geographic regions are only slightly variable in colour (tint, shade, tone, intensity) and/or pattern, but not to the extent of having a totally different colour scheme from the type. For instance, different populations of *Z. rubens* observed in India and Burma always have a labellum with a creamy-white and yellow background and a distinct, overlaid, swirled pattern of dark red or orange-red (Kumar *et al.* 2013). When labellum shape is considered, the sidelobes are of key diagnostic importance based on their shape, size and relative position to the midlobe. Species such as *Z. ligulatum* Roxburgh (1810:348), *Z. roseum* and *Z. rubens* have very small sidelobes situated at the base of the midlobe. Often these are difficult to see without flattening the labellum. In contrast, species such as *Z. capitatum* Roxburgh (1810:348), *Z. intermedium*, *Z. meghalayense* (2013:61), *Z. nimmonii* (J. Graham) Dalzell (1852:341) and the new species, have larger, distinct sidelobes originating at the midlobe base, but extending much further up the labellum. Another character which helps to distinguish this species is the width and shape of the midlobe apex. The two common shapes are acute, as in *Z. meghalayense* and *Z. rubens*, or rounded to truncate with an emarginate apex as in *Z. intermedium*, *Z. roseum* and the new species.

The subterranean morphology, *Z. pherimaense* can be considered a tight clumper due to the very short, lateral rhizomatous growth. Here the rhizomes are more vertically developed with each successive growth element formed at the base of the previous growth, resulting in only a few stems in a very small perimeter. This growth is distinct from *Z. rubens* which has a semi-running rhizome, resulting in more widely spaced stems.

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