

***Zingiber sianginensis* (Zingiberaceae): a new species from Arunachal Pradesh, India**

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Abstracts

Zingiber sianginensis Tatum & A.K. Das a new species of Zingiberaceae from Arunachal Pradesh, India. It is named and described here along with illustration and photographs. The species is compared here with its the most closely related species *Zingiber officinale* Roscoe.

Key words: *Zingiber sianginensis*, Zingiberaceae, new species, Siang valley, Arunachal Pradesh

INTRODUCTION

Zingiber Miller (1754), belongs to Zingiberaceae of Zingiberaceae, is mostly distributed in tropical to warm-temperate Asian region with the highest diversity in the monsoonal parts of Asia. It is considered to be the largest genus in the subfamily *Zingiberoideae* with 211 (IPNI) names corresponding to approximately 141 – 150 species (Wu *et al.* 2000; Kishor & Škorníèková 2013). But exact number of species in the genus is still not known (Kumar & Skornickova 2013).

Roxburgh (1810, 1820) reported the occurrence of 11 species of *Zingiber* in India. Later, Baker (1892) described 24 species from the British India. In the checklist of Indian monocots, Karthikeyan *et al.* (1989) listed 18 species, eight of which were reported by Sabu (2003, 2006) from South India. However, so far, only 7 species has been reported from North-east India (Rao & Mitra 1972; Tripathi & Singh 2006) despite its environmental similarities to other SE Asian regions where from many species have been described. Only little work has been done on the genus *Zingiber* from North-east India in spite of its great diversity in the region. The genus is less understood taxonomically and requires much more detailed study (Tripathi & Singh 2006). However, in rest of the SE Asia about 60 new *Zingiber* taxa have been described in past twenty years by various authors (Sabu 2003; Theilade 1998 & 1999; Theilade & Mood 1997&1999; Skornickova *et al.* 2015).

While exploring the members of Zingiberaceae in Siang valley of Arunachal Pradesh in NE India, the authors found a *Zingiber* species cultivated there quite less-abundantly since time immemorial by the local *Adi* community of Arunachal Pradesh. This species is quite similar to *Z. officinale* Roscoe in morphology, thus various workers assumed it to be a land race or cultivar of common ginger (*Z. officinale* Rosc.). The detailed taxonomic studies and observation found it to be a different species. It could not be matched to any Indian, Chinese, Thai or Indochinese species, or to the protologues of the vast majority of other *Zingiber* species. Type specimens of the most closely related species have been examined

at ASSAM, CAL and ARUN. The literature on the genus *Zingiber* reviewed thoroughly. The new *Zingiber* species is thus described below. The measurements and descriptions provided are based on living material.

***Zingiber sianginensis* Tatum & A.K. Das, *Sp. nov.* [PLATE – I]**

Zingiber officinale Roscoe similis contra- *planta brevioris, gracilifolis, tenui-rhizomatis, bifloriformis, biantheri, linearis styli medio-pupurie; exo-staminodia –purpurea, ovateas, magneas ad petaloidea* .

Perennial aromatic herbs; rhizome branched and creeping, fleshy, creamy inside with many fibers and distinct inner layer, short distance between the adjacent scales (approx. 0.2 cm), young rhizome deep reddish purple, 0.5 – 1 cm in cross section; *roots* many, fleshy, large and long. *Pseudostem* green, slender, cylindrical, 0.4 – 0.5 cm wide and 20 – 70 cm tall, basal part deep reddish purple and basally with 2 – 4 bladeless sheaths. *Leaves* 6 – 20 per leafy stem, sessile or sub-sessile, green, adaxial surface darker, lanceolate, 2 – 20 cm x 0.6 – 3 cm; ligule whitish yellow, membranous, bi-lobed, each lobe 0.3 cm x 0.4 – 0.5 cm; *petiole* pale yellow with less pulvinous. *Inflorescence* radical; peduncle ±30 cm long and 0.5 – 0.7 cm long, basal part reddish purple and upper part green; sheaths 7 – 15, striated, spirally arrange, 2 – 4 cm x 1 – 2 cm, margin thin, apical margin yellowish white, apex cuspidate; *spikes* elliptic, 3 – 9 cm x 1.5 – 2 cm, green with 8 – 24 fertile bracts; *primary bracts* obovate – sub-orbicular, imbricate, 2.2 – 2.5 cm x 1.8 – 2.5 cm, green and lesser green at basal part, apical margin light yellow with small cuspidate, margin thin and entire, strait, apical margin tinged with light yellowish purple, each bract two flowered; *secondary bracts* sub-orbicular, 2 cm x 1.8 – 1.9 cm, white with negligible green, open. *Flowers* pale creamy yellow with purple labellum, open 1 or 2 at a time but generally do not open if there is no conducive environmental conditions; floral buds 2.5 cm x 0.4 cm, *calyx* short tubular and slit at one side, 0.8 – 0.9 cm x 0.3 – 0.4 cm, slightly 3-toothed at apex, white, membranous; *corolla* creamy yellow, tube 1 cm x 0.1 cm, 3-lobes insert below the stamen and labellum, ovate, apex acute; anterior lobe smaller posterior lobes, 1.4 cm x 0.3 – 0.4 cm, covers the labellum; lateral lobes larger, 1.4 cm x 0.5 – 0.6 cm, covering the fertile stamen; *staminodes* purple, ovate, small, adnate to labellum at base, 0.2 cm long and 0.3 cm wide; *external staminode* petaloid, purple with creamy yellow tinge, occur opposite to labellum, ovate-lanceolate, 0.3 – 0.4 cm x 0.2 – 0.3 cm; *labellum* claw very small, ovate – obovate, middle part thick with yellow band, 0.7 cm x 0.4 cm, tinged with creamy yellow blotches. *Fertile stamens* two, unequal, one stamen is larger; *filaments* fleshy, slender and short, 0.2 – 0.3 cm x 0.2 cm; anther 2-celled, each cell separated, reflexed, 0.7 cm x 0.3 cm (each cell 0.7 cm x 0.1 cm), beak deep purple, fleshy, 0.4 – 0.6 cm x 0.1 cm; pollen grain spheroidal. *Ovary* sessile, light greenish to white, oval, 0.3 cm x 0.2 cm, glabrous, tri-locular; ovules many in axile placentation, superposed; *Epigynous glands* 2, slender and acute apex, pale white, 0.4 cm x 0.1 cm; style filiform, 1.7 – 2 cm long and 0.1 cm thick, white, mid-zone purple; sigma simple, funnel shaped with fringed margin.

Distribution, Habitat and Ecology: The species is known to occur in Siang valley of Arunachal Pradesh. It is cultivated in areas with altitude between 150 and 900 m above MSL. It grows well in aerated and fire burnt soil and prefers monsoonal sub-tropical climatic conditions.

Phenology: Flowers during September – October. It hardly produces any flowers if the environmental conditions do not remain favorable, like long spells of both dry and rainy periods. However, it usually flowers in the second year after cultivation. Flowers generally open and last for a few hours only.

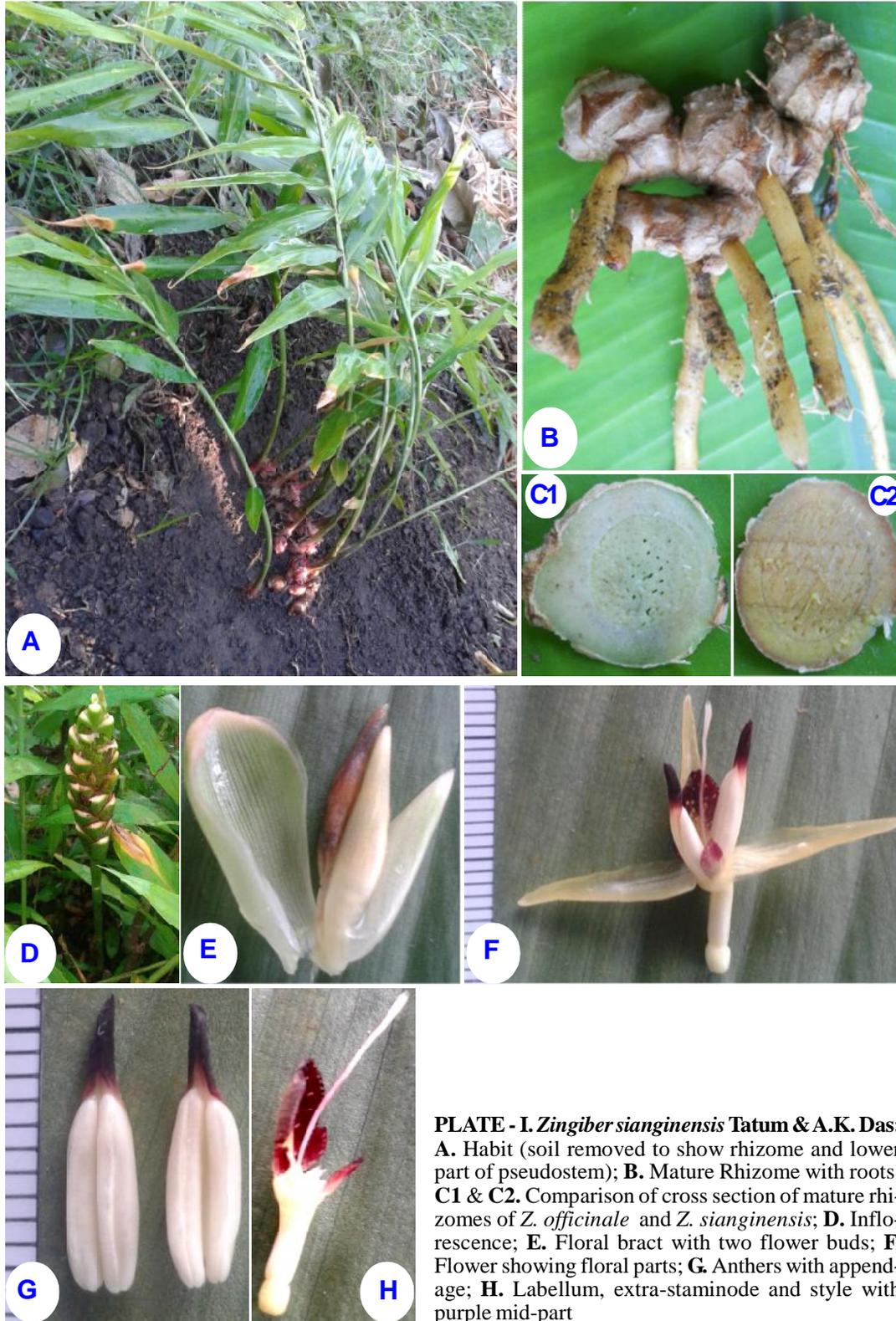


PLATE - I. *Zingiber sianginensis* Tatum & A.K. Das: **A.** Habit (soil removed to show rhizome and lower part of pseudostem); **B.** Mature Rhizome with roots; **C1 & C2.** Comparison of cross section of mature rhizomes of *Z. officinale* and *Z. sianginensis*; **D.** Inflorescence; **E.** Floral bract with two flower buds; **F.** Flower showing floral parts; **G.** Anthers with appendage; **H.** Labellum, extra-staminode and style with purple mid-part

Etymology: The species epithet '*sianginensis*' is named after the mighty river Siang, one of the major tributaries of the river Brahmaputra in Assam and its locality where a handful of people have been cultivating the plant since time immemorial for medicinal and ritualistic purposes.

Conservation Status: No natural population of the species has been located. It is being cultivated by them on religious faith and is located in Siang belt only. Presently the local communities are not attaching much importance to this species as it is not equally useful like commercial Gingers (*Z. officinale* Roscoe). Thus, it can be kept under IUCN's (2001) 'Extinct in the Wild (EW)' category (also see: Skornickova *et al.* 2012). Live specimens are being maintained at Jawaharlal Nehru College at Pashighat, Arunachal Pradesh, India.

Type: Pasighat, East Siang District, Arunachal Pradesh, 06.09.2015, *Tatum-024*, HOLOTYPE at Herbarium of the Rajiv Gandhi University at Itanagar, Arunachal Pradesh.

Vernacular name and uses: The plant is called as *Kekir* by the people of Adi Tribe. It is traditionally used as medicine for bowel disorder, anti-diuretic, anti-septic (fresh wounds) and in ritual purposes. It is also used as flavoring agent and spice by them.

Note: *Zingiber sianginensis* Tatum & A.K. Das is closely similar to *Z. officinale* Roscoe but can be distinguished easily as shown in Table 1.

Table 1. Differences between *Zingiber officinale* Roscoe and *Z. sianginensis* Tatum & A.K. Das

Character	<i>Zingiber officinale</i>	<i>Zingiber sianginensis</i>
<i>Pseudostem</i>	50 – 100 cm long and 0.5 – 0.6 cm thick; basal part not purple	20 – 70 cm long and 0.4 – 0.5 cm thick; basal part deep purple
<i>Rhizome</i>	Larger, fleshy, 1 – 3 cm in diameter; young shoot tip pale; less aromatic	Smaller, deep seated, blaze pale, 0.5 – 0.8 cm in diameter; young shoot apex deep reddish purple; strongly aromatic
<i>Flower</i>	Floral bracts 1-flowered	Floral bracts 2-flowered
<i>Corolla lobes</i>	Equal	Lateral lobes larger than the anterior one
<i>External staminode</i>	Absent	Well developed and prominent
<i>Fertile stamen</i>	One	Two
<i>Style</i>	Fleshy white	Fleshy white with purple mid-part

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