

## A New Species of *Curcuma* L. (Zingiberaceae) from Mizoram, India

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### Abstract

*Curcuma rubrobracteata* Skornickova, M.Sabu & Prasanthkumar *sp. nov.* is described from Mizoram, India.

### Introduction

Exploration for gingers in Mizoram, NE India, carried out by the authors for the research project 'Revision of Indian Zingiberaceae' has brought an interesting species of *Curcuma* to light.

The genus *Curcuma* L. naturally occurs in tropical and sub-tropical Asia with a few species extending to Australia and the South Pacific, but economically important or ornamental species are introduced elsewhere in the tropics. According to the latest records, *Curcuma* has the largest number of species in India, Thailand, Indonesia and China. The total number of species for this genus is still quite uncertain but is estimated at around 100 species (Sirirugsa, 1996; Larsen *et al.*, 1998). From India, 29 species have so far been reported and accepted (Karthikeyan *et al.*, 1989; Mangaly and Sabu, 1993). Several new species of *Curcuma* L. have been described in last 20 years from India (Skornickova and Sabu, 2002). While working on Indian Zingiberaceae in August and September 2002, the authors visited Mizoram, which is considered as the least surveyed corner of India, where an undescribed species of the genus *Curcuma* L. subg. *Curcuma* (*Eucurcuma* K. Schum.) was collected.

*Curcuma rubrobracteata* Skornickova, M. Sabu & Prasanthkumar, *sp. nov.*

*Curcuma roscoeanae* similis in coma inconspicua, spica c. 10 cm supra terram per vaginam protrudenti, bracteis floriferibus rubris, floribus luteo-aurantiacis, calyce trilobato, rhizomate repenti aromatico, lamina elliptico-lanceolata basi cuneata, infra glabra, supra pubescenti in venis principalibus elevatis differt. **Typus:** India, Mizoram, Lawngtlai District, on the way to Ngengpui Wildlife Sanctuary – Khomoi, 22° 30'N,

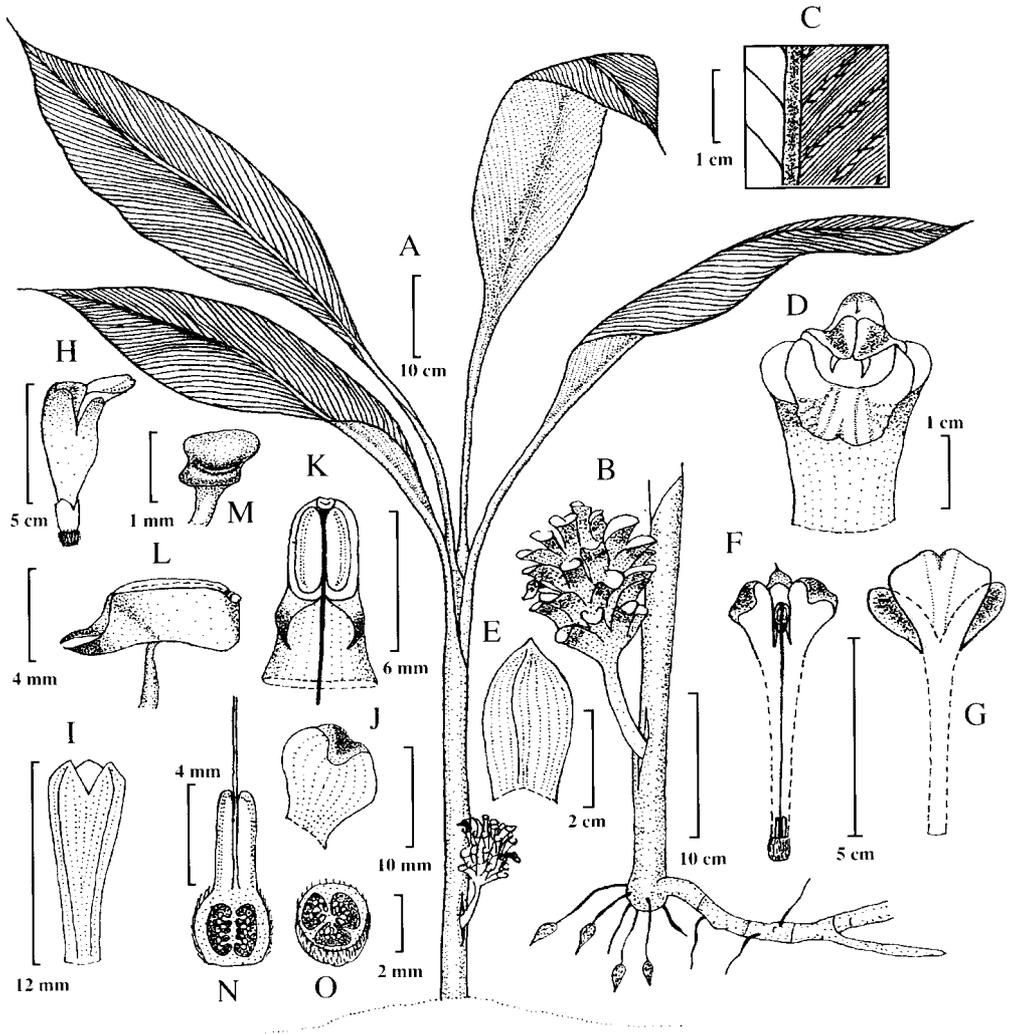
92° 46'E. 10.IX.2002. *Skornickova & Prasanthkumar 86241* (holo MH; iso CALI, K, SING).

### Figure 1, Plate 1.

Rhizomatous herb, up to 1.5 m high. *Rhizome* creeping, slender, 10–30 cm long, c. 1 cm diam., tan outside, scales triangular, papery, light brown, underground quickly decaying, whitish yellow inside, aromatic, smell resembling *Kaempferia galanga* L., taste very bitter, sessile tubers absent, root tubers 2 x 1.5 cm, white inside, distanced c. 5 cm away from main rhizome on 2 mm thick roots. *Leafy shoot* up to 1.5 m long, leaves 4–6, pseudostem green, c. 40 cm long. *Leaves* petiolate, ligule 1 mm long, light green, translucent, petiole green, glabrous 10–45 cm long (lower leaves with shorter petioles). *Lamina* elliptic-lanceolate 35–60 x 10–16 cm, adaxially green, pubescent along the raised veins, abaxially pale green, glabrous, base attenuate, tip acuminate 2 cm long, midrib green, glabrous. *Inflorescence* terminal, but protruding through the base of the pseudostem through lateral slits c. 3–10 cm above ground. *Peduncle* 5–10 cm long, 7 mm diam., whitish, without vegetative bracts. *Spike* 10 x 7–9 cm. *Coma* absent. *Bracts* 20–26 per spike, all fertile, bright red or light red, yellowish or yellowish green towards the base, bract 3.5 x 3.5 cm, glabrous, margin 0.3 mm hairy, hairs 0.1 mm long, subtending a cincinnus of 5–6 flowers, usually only 1–3 flowers per spike open at the same time. *Bracteoles* one per flower, 2–3.5 x 1–3 cm, hyaline, glabrous, white, translucent with reddish dots on the apical part of the biggest bracteoles. *Flowers* 6 cm long, yellow-orange, exserted, 1.5–2 cm longer than the bracts. *Calyx* 1.2 cm, white, translucent, hyaline, glabrous, 3-toothed. *Corolla tube* 3.7–4 cm, light orange, glabrous. *Corolla lobes* light yellow-orange, dorsal lobe 14 x 8 mm fringed by red on upper mucronate portion; lateral lobes 12 x 7 mm. *Labellum* 15 x 17 mm, periphery yellow-orange, centre deep yellow-orange, obscurely 3-lobed, middle lobe split about 2 mm. *Lateral staminodes* 1 x 1.1 cm; yellow-orange, hooded over the anther. *Stamen* c. 9 mm long, anther versatile. *Anther* 6 x 2.5 mm, orange. *Anther spurs* 3 mm long, incurved, orange. *Anther thecae* white, 5 mm long. *Filament* yellow-orange, 5 mm long, constricted, 4 mm at base, 2 mm at upper part. *Ovary* trilobular, 2 x 2.5 mm, pubescent with 0.6 mm long hairs; ovules many. *Stigma* white, closely appressed within the anther lobes. *Epigynous glands* 2, pale orange, 4 mm long, 0.9 mm diam. *Fruits* not seen.

*Flowering*: August – September.

*Distribution*: Hitherto known only from the type locality. From personal communication with other specialists we suspect this species to be identical with unidentified plants growing along the Thai-Burmese border.



**Figure 1.** *Curcuma rubrobracteata*

A. Habit; B. Inflorescence; C. Detail of leaf venation (adaxial side); D. Flower and subtending bract; E. Bracteole; F. Part of flower showing lateral staminodes, dorsal corolla lobe and anther; G. Part of flower showing labellum and anterior corolla lobes; H. Flower (side view); I. Calyx; J. Lateral staminode; K. Anther (front); L. Anther (side); M. Stigma; N. Epigynous glands and ovary; O. Ovary (cross section). Based on the type material *Skornickova & Prasanthkumar 86241*, del. J. Skornickova.

*Habitat:* Growing in undergrowth in teak plantations and along roadsides.

*Etymology:* This gorgeous species takes its name from the striking red bracts of its inflorescence.

*Other specimens examined:* India, Mizoram, Lawngtlai District, on the way to Ngengpui Sanctuary – Khomoi, 22° 30' N 92° 46' E, 10.IX.2002, *Skornickova & Prasanthkumar 86239* (CALI).

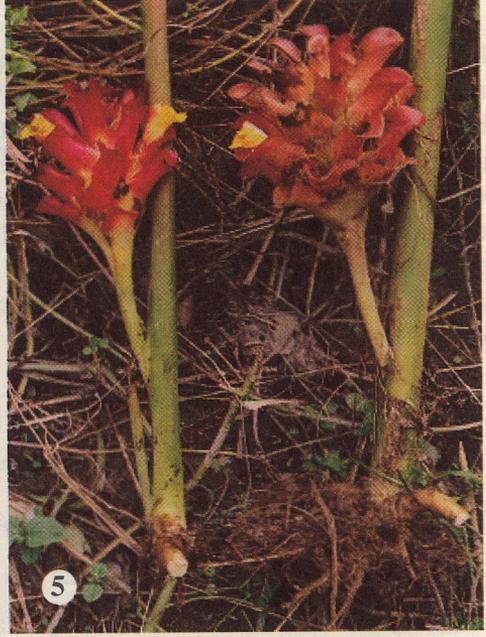
*Notes:* The most obvious characters of this species are the creeping rhizomes, bright red bracts with no distinct coma and, in particular, the position of its inflorescence. Inflorescences with no distinct coma are reported for a few species e.g. *Curcuma roscoeana* Wall., *C. albiflora* Thwaites, *C. ceratotheca* K.Schum. and the recently described *C. rhomba* J. Mood & K. Larsen, which also possesses a small rhizome with linear growth (Mood and Larsen, 2001). The unique character of *C. rubrobracteata* is the position of its inflorescence, which is so far unknown in the genus *Curcuma*.

Many of the earlier taxonomists made attempts to classify the genus into sections based on the position of the inflorescences. Roxburgh (1820) recognised two sections based on the lateral or central inflorescence, while Horaninow (1862) distinguished three sections, namely: I. Exantha (always lateral), II. Mesantha (inflorescence invariably terminal), and III. Amphiantha (inflorescences both terminal and lateral). However, the new species produces an inflorescence about 3–10 cm above ground, which breaks through the pseudostem through lateral slits. This feature has also been observed in the Zingiberaceae in the genus *Plagiostachys* Ridl., where the inflorescence is borne on a peduncle and projects from the side of the leafy stalk (Ridley, 1899). Smith (1985) pointed out that the inflorescence of *Plagiostachys* species, although pushed out laterally, is actually terminal on the leaf shoot and so shows affinity to the genus *Alpinia* Roxb., in which a few species, particularly *A. hansenii* R.M.Smith and *A. havilandii* K.Schum., have similar apparently laterally produced inflorescences.

Recently, Kress *et al.* (2002) carried out molecular studies on phylogeny and classification of the family Zingiberaceae. The results based on analysis of DNA sequences of the nuclear internal transcribed spacer (ITS) and plastid *matK* regions suggest that the genus *Curcuma*, as it is accepted nowadays, is paraphyletic with

### **Plate 1. *Curcuma rubrobracteata***

1. Detail of flower and spike – seen from above; 2. Detail of flower and dorsal corolla lobe – front view; 3. Detail of flower and bracts – lateral view; 4. Habit; 5. Detail of spike protruding through the pseudostem; 6. Creeping rhizome and root tubers. All photographs are of the type material *Skornickova & Prasanthkumar 86241*. Photo J. Skornickova.



genera *Hitchenia*, *Stahlianthus* and *Smithiatriis*, which also share cone-like inflorescences of few flowered, congested bracts, and that genus *Curcuma* is itself paraphyletic with three groups of species. Since the analysis was done with a limited number of samples (six *Curcuma* species), the authors recommended that more species of such large genus should be included in future molecular studies to shed more light on the difficult question of generic boundaries and allied genera.

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### References

- Horaninow. 1862. *Prodromus Monographiae Scitaminearum*. Petropoli (St. Petersburg), Russia.
- Karthikeyan, S., S.K. Jain, M.P. Nayar and M. Sanjappa, 1989. *Florae Indicae. Enumeratio Monocotyledoneae*. Botanical Survey of India, Calcutta. Pp. 289–299.
- Kress, J.W., L.M. Prince and K.J. Williams. 2002. The phylogeny and a new classification of the gingers (Zingiberaceae): evidence from molecular data. *American Journal Botany*. **89**: 1682–1696.
- Larsen, K., J.M. Lock, H. Maas and P.J.M. Maas. 1998. Zingiberaceae. In: K. Kubitzki. (Ed.) *The Families and Genera of Vascular Plants*. **4**: 474–495.
- Mangaly, J.K. and M. Sabu. 1993. A taxonomic revision of the South Indian species of *Curcuma* L. (Zingiberaceae). *Rheedea*. **3**: 139–171.
- Mood, J. and K. Larsen. 2001. New *Curcumas* from South East Asia. *The New Plantsman*. **8**: 207–217.

- Ridley, H.N. 1899. The Scitamineae of the Malay Peninsula. *Journal Straits Branch Royal Asiatic Society*. **32**: 85–184.
- Roxburgh, W. 1820. Monandria monogynia. *Flora Indica*. Serampore, India. Pp. 1–84.
- Sirirugsa, P. 1996. The genus *Curcuma* of Thailand. In: T. L. Wu, Q. G. Wu and Z. Y. Chen (Eds.) *Proceedings 2<sup>nd</sup> Symposium on Family Zingiberaceae*. Zhongshan University Press, China. Pp. 39–46.
- Skornickova, J. and M. Sabu, 2002. The genus *Curcuma* L. in India: Resumé and Future Prospects. In: A.P. Das (Ed.) *Perspectives of Biology*. Bishen Singh, Mahendra Pal Singh, Dehradun, India Pp. 45–51.
- Smith, R.M. 1985. A review of Bornean Zingiberaceae: I (Alpinieae p.p.). *Notes Royal Botanic Garden Edinburgh*. **42**: 261–314.