

Kaempferia rotunda L. (Family Zingiberaceae) –A new record to the Flora of Tamil Nadu, India

Binitha Pushpakaran¹ and R. Gopalan²

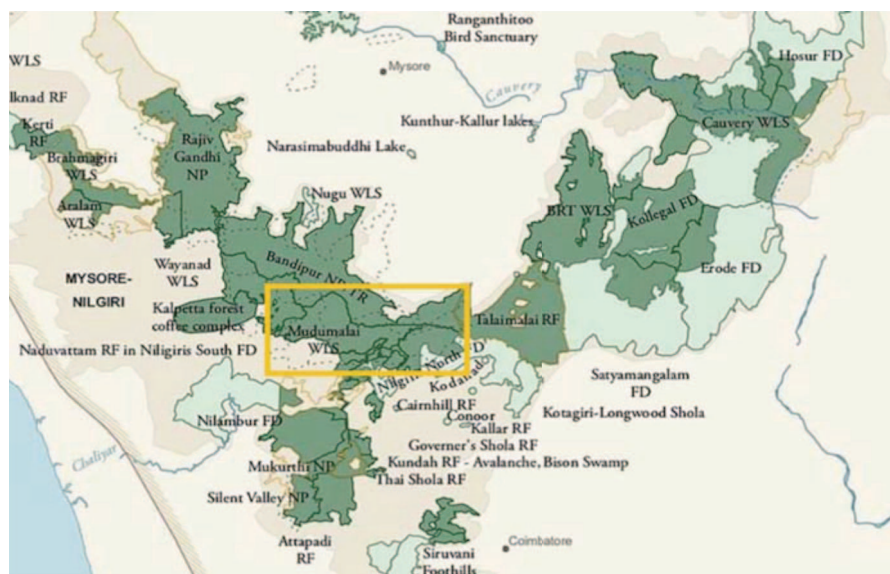
The family Zingiberaceae consists of about 53 genera and more than 1200 species, distributed mainly in the tropics and sub tropics with the centre of distribution in the Indo–Malayan region, but extending through tropical Africa to Central and South America (Kress *et al.*, 2002). About 40% of genera are represented in the native flora of India. Of the 21 indigenous genera of Zingiberaceae present in India 10 are represented in South India (Sabu, 2006).

The genus *Kaempferia* includes about 70 species, about two-third of which are found in Asia and the remaining in Africa (Kam, 1980). In South India 4 species are reported - *K. galanga*, *K. rotunda*, *K. scaposa* and *K. elegans*, which is an exotic.

In the course of study on the wetland flora in Mudumalai Tiger Reserve the authors came across a bed of flowers on the forest floor. The herb had inflorescence arising from tuberous roots with no leaves. On critical study of the specimen it was identified as *Kaempferia rotunda*. Survey of literature revealed that *Kaempferia rotunda* first found its name in print in Van Rheedee's 'Hortus Malabaricus' as "Malan Kua". Fischer in Gamble's 'The Flora of Presidency of Madras' has described it as "often cultivated and doubtfully wild". In South India it is endangered and grows on the Western ghats at higher and low elevations in Karnataka and Kerala (Sabu, 2006). It has so far not been reported from Tamil Nadu. As *Kaempferia rotunda* is cultivated widely its discovery in the wild is reported here as a record and new addition to the flora of Tamil Nadu.

Etymology of Generic name

Linnaeus in honour of Engelbert Kaempfer named this genus of gingers as *Kaempferia*, commonly known as ground gingers or peacock gingers. Kaempfer was a physician of the Dutch East India company appointed to the trade delegation in Japan and had collected many plants which he introduced to Europe. Linnaeus first used the genus "Kaempferia" in 1736 in a catalogue of plants in the collection of George Clifford. This catalogue, "Hortus Cliffortianus" shows



Mudumalai Tiger Reserve

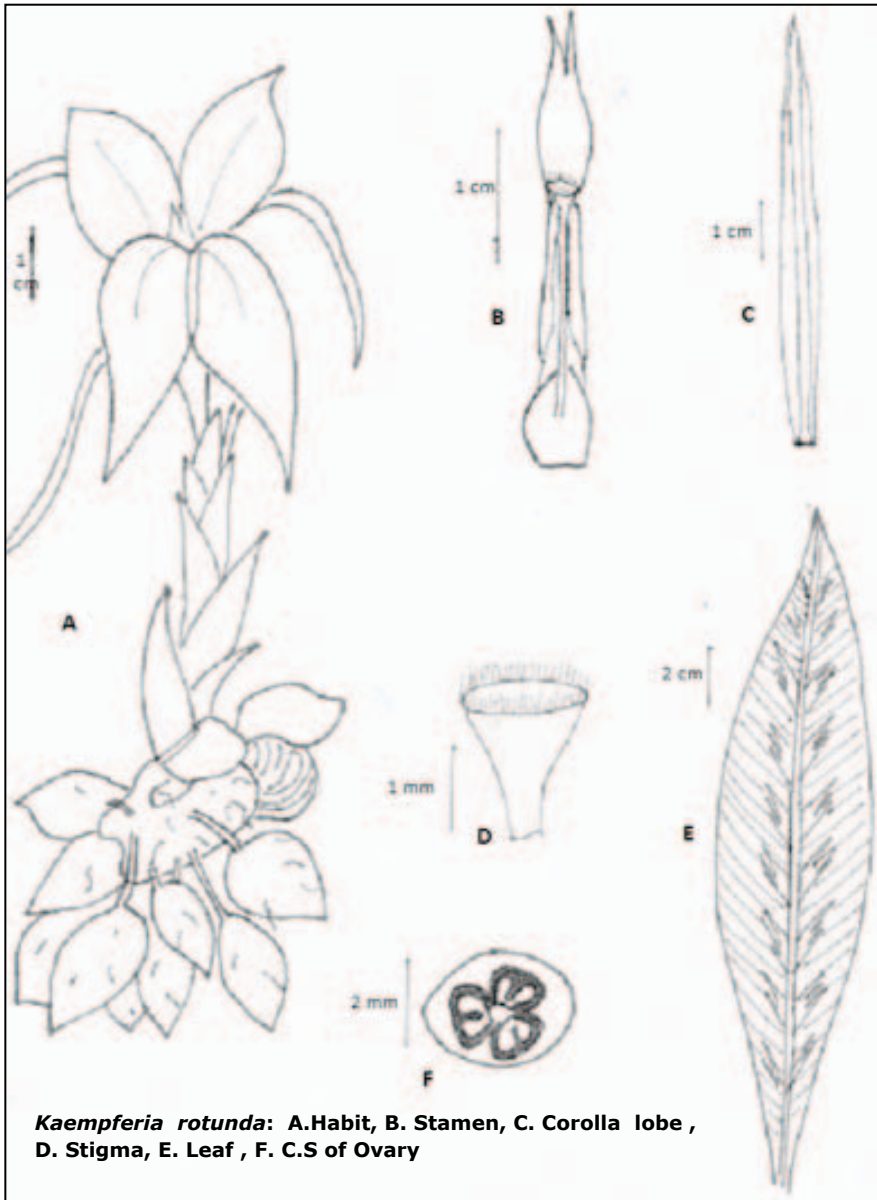


a plant named "*Kaempferia rotunda*", so named because of its round leaves! It was later determined to be *Kaempferia galanga* and in 1753 in 'Species Plantarum', Linnaeus named it *Kaempferia galanga* and the plant name 'rotunda' is now used to describe the plant we now know as *Kaempferia rotunda* which does not have the round leaves so common in the genus.

***Kaempferia rotunda* L., Sp. Pl.**
1:3.1753; Roxb., Asiat. Res. 11:327.1810 &, Fl. Ind. 1:15.1820; J.Graham, Cat. Pl. Bombay 208.1839; Dalz. & Gibson, Bombay Fl. 86.1861; Baker in Hook. f., Fl. Brit. India 6: 222. 1890; Trimen, Handb. Fl. Ceylon 4 :244. 1898; K. Schum. in Engler, Pflanzenr. 4(46):87.1904; T. Cooke, Fl. Bombay 2 : 727.1907; Ridley, Mat. Fl. Malay Penins. 4 : 246. 1924;

C.E.C.Fisch. in Gamble, Fl. Madras 8 : 1484. 1928; Holttum, Gard. Bull. Singapore 13 : 120. 1950; A.S. Rao & D.M. Verma, Bull. Bot. Surv. India. 14: 124. 1972 ; B. L. Burtt in Manilal. Bot. Hist. Hort. Malabaricus. 144.1980; B. L. Burtt & R. M. Sm. in Dassan. Revis. Handb. Fl.Ceylon 4: 509. 1983; Nicolson *et al.*, Interpret. Van Rheedee's Hort. Malab. 318. 1988; K. G. Bhat, High. Pl. Indian Subcont. 4: 90. 1993, & Fl. Udupi, 633. 2003; M. Sabu & Mangaly, Proc. 2nd Symp. Fam. Zingiberaceae 21.1996. Sabu, Zingiberaceae and Costaceae of South India 215.2006.

^{1,2}Department of Botany, Karpagam University, Coimbatore, Tamil Nadu.
¹binithap@gmail.com,² gopalanurichi@gmail.com



***Kaempferia rotunda*: A.Habit, B. Stamen, C. Corolla lobe , D. Stigma, E. Leaf , F. C.S of Ovary**

Specimens examined: India, Tamil Nadu, Mudumalai Tiger Reserve, Gamehut, 7.04.12, *Binitha Pushpakaran*, deposited at Karpagam University, 271 (KU); Kerala, Palghat, Silent Valley R.F, 3.4.1979, *E. Vajravelu*, 108909 & 108910 (MH); Nagaland, Lumani, Nagaland University Campus, 18.5.2006, *M. Sabu & A.K Pradeep*, 103603 (CALI); Mizoram, Mamit, Mamit R.F, 20.9.2002, *Prasanth Kumar & Jana Skornickova*, 86268 (CALI).

Rhizome short, aromatic, ca. 3x2 cm; roots fleshy often terminating in ovoid ca. 3x1cm yellow tubers. Leaf shoot ca. 60cm high. Leaves radical, erect; lamina ca. 30 x 8 cm, oblong-lanceolate, acute at base, acuminate at apex, purple beneath, mottled green above, pubescent beneath; petiole ca. 7cm long; ligule 2-4 mm long, hairy. Inflorescence appearing before the leaves, shortly peduncled, enclosed within greenish white narrow sheaths; 9-12 flowered, usually 1-2 flower open at a time. Bracts imbricating, ca. 3.5 cm long, oblong, apex acute. Bracteoles upto 2.5cm long. Calyx ca. 6cm long, unilaterally split, with two dorsal ridges, white. Corolla tube longer than the calyx, ca. 7cm long, slender, obliquely, infundibuliform towards the mouth; lobes ca. 7x0.8 cm white, narrow, lanceolate, acuminate apex. Labellum ca. 6x2.5cm, broadly

***Kaempferia rotunda* : A. Inflorescence stage, B. In vegetative stage.**

Photo credit : Binitha Pushpakaran



ovate, deeply divided into 2 sub-ovate lobes, lilac. Lateral staminodes ca. 3x0.5cm ovate-elliptic, apex acuminate, white with violet tinge towards the margin, with a small cleft in the middle. Filament short, erect, 5mm long, sparsely pubescent; thecae 9mm long, lanceolate or subulate segments. Style filiform, stigma slightly flattened and cupular, margin hairy. Epigynous glands two, filiform, erect, embracing the lower part of the style. Ovary ca. 5x3mm, tricarpeal with many ovules on axile placenta.

Flowering: March-April. The flower blooms on the floor of the forest and soon disappears before the appearance of the leaves.

Fruiting: Not commonly seen.

Distribution: India, Tamil Nadu, Nilgiris District, Mudumalai Tiger Reserve, Benne beat and Mudumalai beat, on the shady slopes of Semi-evergreen forests as undergrowth. Commonly cultivated throughout India, Sri Lanka, and Myanmar (Sabu, 2006).

Uses: Exploited for medicinal purpose in ayurvedic preparations. The powder extracted from the dried tubers of *Kaempferia rotunda* is made into an ointment and is used for healing fresh wounds. It is taken internally to remove coagulated blood or purulent matter within the body (Sabu, 2006).

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REFERENCES

- Baker, J.G. (1890-1892).** Scitamineae. in: J. D. Hooker, *Flora of British India*, Vol.6: 198-264. London.
- Burt, B.L. (1980).** Cardamoms and other Zingiberaceae in Hortus Malabaricus. in : K. S. Manilal, (ed.), *Botany and History of Hortus Malabaricus*.139-148. New Delhi.
- Burt, B.L. and R.M. Smith, (1983).** Zingiberaceae . in: M. D. Dassanayake, (ed.), *A Revised Handbook to the Flora of Ceylon* Vol.4. 488-532. Amerind Publishing, New Delhi.
- Cooke, T. (1907).** *The Flora of Presidency of Bombay* Vol. 2 : 625 - 816. London.
- Dalzell, N.A and Gibson. (1861).** *The Bombay Flora*. Bombay.
- Fischer, C.E.C.(1928).** Zingiberaceae. in: J. S Gamble, *Flora of the Presidency of Madras*, Pt. 8: 1478-1493. London.
- Graham, J. (1839).** *Catalogue of the Plants growing in Bombay and vicinity*. Bombay.
- Henry, A.N., V. Chitra and N.P Balakrishnan. (1973).** *Flora of Tamil Nadu*, Series I: Analysis, Vol-3. Botanical Survey of India, Southern Circle, Coimbatore.
- Holtum, R.E.(1950).** Zingiberaceae of the Malay Peninsula. *Garden's Bulletin, Singapore*. 13 : 1-249.
- Kam, Y.K. (1980).** Taxonomic studies in the genus *Kaempferia* (Zingiberaceae). *Notes from the Royal Botanic Garden, Edinburgh*. 38: 1-12.
- Kress, W.J., Prince, Linda M. and K.J. Williams (2002).** The Phylogeny and a new classification of the gingers (Zingiberaceae) : evidence from Molecular data. *Amer. J. Botany*. 89(10): 1682-1696.
- Nicolson, D.H., Suresh C.R. and K.S. Manilal (1988).** An Interpretation of *Van Rheedee's Hortus Malabaricus*. Germany.
- Rao, A.S and D.M Verma (1972).** Materials towards a monocot flora of Assam -11 (Zingiberaceae and Marantaceae),. *Bulletin of Botanical Survey of India* 13. 339-341.
- Ridley, H.N. (1924).** *The Flora of the Malay Peninsula*. Vol. IV. Ed. 1967. Amsterdam.
- Roxburgh, W. (1810).** Descriptions of several of the Monandrous plants of India. *Asiatic Researcher or Transactions of the Society*.11 : 318-362.
- Roxburgh, W. (1820).** *Flora Indica*, Vol. 1-3.
- Sabu, M and J.K. Mangaly.(1996).** Taxonomic Revision of South Indian Zingiberaceae. *Proceedings of the 2nd Symposium of Family Zingiberaceae*. South China Institute of Botany. 15 - 22.
- Sabu, M. (2006).** *Zingiberaceae and Costaceae of South India*. Indian Association for Angiosperm Taxonomy, Calicut.
- Sharma, B.D., B.V. Shetty, E. Vajravelu, G.R. Kumari, K. Vivekanathan, M. Chandrabose, M. S. Swaminathan, R. Chandrasekran, G.V. Subba Rao, J. L. Ellis, N.C. Radhakrishnan, S. Karthikeyan, V. Chandrasekaran, & S.R. Srinivasan (1977).** Studies on the Flora of Nilgiris, Tamil Nadu. *Biological Memoirs*. 2 (1 & 2) : 1-186.

- Sahumann, K. (1904).** Zingiberaceae. In: A. Engler, *Das Pflanzenreich*, IV. 46 (Heft 20): 1-458. Leipzig, Berlin.
- Suresh, H.S., R. Bhat, Harish, H.S. Dattaraja & R. Sukumar.(2006).** Revised Flora of Mudumalai Wildlife Sanctuary, Tamil Nadu, India. *J. Econ. Taxo. Bot.*, 30 : 97-126.
- Trimen, H. (1898).** *Handbook of the Flora of Ceylon* (Rep.ed.1974). Bishen Singh Mahendra pal Singh, Dehra Dun, Periodical Experts , Delhi. 4: 250-251.
- Stephen, D. (1994).** *Studies on the Flora of Mudumalai Wildlife Sanctuary*. Phd. Thesis, Barathiar University, Coimbatore, Tamil Nadu, India.