

## Spathodea campanulata

Nandi flame, flame of the forest

### LOCAL NAMES

Cantonese (neerukayi mara); English (flame of the forest, tulip tree, squirt tree, fountain tree, Nile flame, Nandi flame, Uganda flame, African tulip tree); French (immortel étranger); Hindi (rugtoora); Luganda (kifabakazi); Malay (panchut-panchut); Sinhala (kudulu, kudaella gaha); Spanish (tulipán africano, espatodea, amapola, mampolo); Swahili (kifabakazi, kibobakasi); Tamil (patadi); Trade name (Nandi flame, flame of the forest)

### BOTANIC DESCRIPTION

*Spathodea campanulata* is medium sized, reaching a height of 10-35 m, deciduous, with a round, heavy crown of dense, dark foliage, sometimes somewhat flattened; young bark pale, grey-brown and smooth but turns grey-black, scaly and cracked vertically and horizontally with age.

The opposite imparipinnate leaves are exstipulate. Each leaf consists of 5-7 pairs of opposite leaflets and a terminal one. The leaflets are oblong-elliptic, about 1 cm long and 0.5 cm broad, entire, broadly acuminate, unequal at the base, dark green on top and light green on the underside; there are glandular swellings at the base of the lamina (usually a pair); the midrib and nerves are yellow, raised and very slightly pubescent; the venation is reticulate; the short, thick petiole is about 0.7 cm long; there are conspicuous lenticels on the rachis; rachis base is swollen.

Flowers large, red, hermaphrodite, orange inside; calyx green, about 1 cm long and split on the posterior side, ribbed and tomentellous; petals 5, each about 1.5 cm long; stamens 4 with orange filaments; style extruding with a 2-lipped stigma; flower buds curved and contain a red sap. A yellow-flowered variety has been reported.

Fruit upstanding, dark brown, cigar-shaped, woody pod, 15-25 cm long and split on the ground into 2 boat-shaped valves, releasing many flat-winged seeds; 1-4 pods usually develop from 1 flower cluster; seeds thin, flat and surrounded by a filmy wing.

The generic name comes from the Greek word 'spathe' (blade), from the shape of the corolla. The specific name means pertaining to a Campanula, a name coined in 1542 by Fuchs for the type of corolla with a broad rounded base and a gradually expanded tube corresponding to the sound bow of a church bell.

### BIOLOGY

Large, orange to scarlet, funnel-shaped hermaphrodite flowers are produced from rust-coloured, hairy buds in the bunches at the ends of branches. The flowers open from the outside of the bunch towards the centre. *S. campanulata* may begin flowering as young as 3 or 4 years of age, with open grown trees flowering when they are about 5 m tall; in some tough environments, flowering is delayed until the trees are much larger. Flowering stretches over a 5 or 6 month period, and the pods mature and begin releasing their seeds about 5 months after flowering. The tree reproduces aggressively, so it is frequently a nuisance in pastures and fields with perennial crops. The winged seeds are wind dispersed.

Beauv.

Bignoniaceae



The pictures of flowers were taken in Norzagrav, Bulacan, Philippines (Jerry E. Adrados)



Dense, velvety erineum caused by the microscopic mites of the Eriophyoidea collected in Kenya. This tree is used as an ornamental tree in South Africa. (Neser S)



Flowers at Tree Top Park, Florida (Forest and Kim Starr)

## Spathodea campanulata

Beauv.

Bignoniaceae

Nandi flame, flame of the forest

### ECOLOGY

*S. campanulata* grows naturally in Africa in secondary forests in the high forest zone and in deciduous, transition, and savannah forests. It colonizes even heavily eroded sites, though form and growth rate suffer considerably on difficult sites.

### BIOPHYSICAL LIMITS

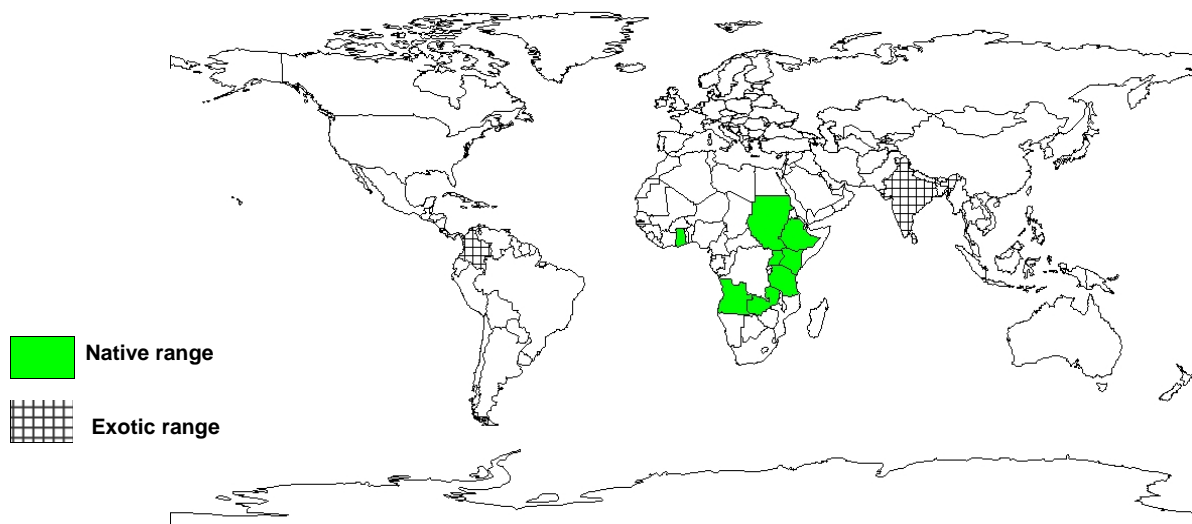
Altitude: 0-2 000 m, Mean annual temperature: 27-30 deg. C, Mean annual rainfall: 1 300-2 000 mm

Soil type: The African tulip tree develops best in fertile, deep, well-drained loams. Soil texture may range from loamy sands to clays, pH is between 4.5-8, and soil drainage may vary from poor to excessive.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Angola, Ethiopia, Ghana, Kenya, Sudan, Tanzania, Uganda, Zambia

Exotic: Colombia, Costa Rica, Cuba, India, Jamaica, Puerto Rico, Sri Lanka, Zanzibar



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

## **Spathodea campanulata**

Beauv.

Bignoniaceae

Nandi flame, flame of the forest

---

### **PRODUCTS**

**Food:** The seeds are edible and used in many parts of Africa.

**Timber:** In its original habitat, the soft, light brownish-white wood is used for carving and making drums.

**Poison:** The hard central portion of the fruit is used to kill animals.

**Medicine:** The bark has laxative and antiseptic properties, and the seeds, flowers and roots are used as medicine. The bark is chewed and sprayed over swollen cheeks. The bark may also be boiled in water used for bathing newly born babies to heal body rashes.

### **SERVICES**

**Shade or shelter:** Recommended as a shade tree for parks and yards; it has been used for coffee shade.

**Reclamation:** *S. campanulata* helps rehabilitate disturbed lands through its quick invasion and rapid growth.

**Ornamental:** *S. campanulata* has been planted as an ornamental throughout the tropics. The flowers bloom with great profusion, and the trees can be seen from great distances. It is not browsed by domestic animals and although a popular decorative tree for avenues it has shallow roots and a tendency for branches to break off in a storm.

**Boundary or barrier or support:** The species, either planted or growing naturally, is frequently used for living fence posts.

## **Spathodea campanulata**

Beauv.

Bignoniaceae

Nandi flame, flame of the forest

---

### **TREE MANAGEMENT**

*S. campanulata* will coppice up to at least pole size.

### **GERMPLASM MANAGEMENT**

Seed storage behaviour is recalcitrant; seed should be sown fresh. From its seed size, the species might be able to show orthodox storage behaviour. There are about 125 000 seeds/kg.

### **PESTS AND DISEASES**

In Uganda, 2 lepidopteran species, 2 termite species, and 1 bark beetle attack *S. campanulata*. In Puerto Rico 9 insect species in the orders Homoptera, Hymenoptera, Lepidoptera, and Thysanoptera have been reported as feeding on various parts of *S. campanulata*. The species is quite susceptible to butt and heart rot; wood of the tree rots quickly when in contact with the ground.

## **Spathodea campanulata**

Beauv.

Bignoniaceae

Nandi flame, flame of the forest

---

### **FURTHER READING**

- Anon. 1986. The useful plants of India. Publications & Information Directorate, CSIR, New Delhi, India.
- Beentje HJ. 1994. Kenya trees, shrubs and lianas. National Museums of Kenya.
- Bekele-Tesemma A, Birnie A, Tengnas B. 1993. Useful trees and shrubs for Ethiopia. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Birnie A. 1997. What tree is that? A beginner's guide to 40 trees in Kenya. Jacaranda designs Ltd.
- Eggeling. 1940. Indigenous trees of Uganda. Govt. of Uganda.
- Francis JK. 1990. African tulip tree. SO-ITF-SM-32. Rio Piedras, Institute of Tropical Forestry.
- Hamilton A.C. 1981. A field guide to Uganda forest trees.
- Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.
- ICRAF. 1992. A selection of useful trees and shrubs for Kenya: Notes on their identification, propagation and management for use by farming and pastoral communities. ICRAF.
- Katende AB et al. 1995. Useful trees and shrubs for Uganda. Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Kokwaro JO. 1976. Medicinal plants of East Africa. East African Literature Bureau.
- Lanzara P. and Pizzetti M. 1978. Simon & Schuster's Guide to Trees. New York: Simon and Schuster
- Leeuwenberg AJM. 1987. Medicinal and poisonous plants of the tropics. Pudoc Wageningen.
- Mbuya LP et al. 1994. Useful trees and shrubs for Tanzania: Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Noad T, Birnie A. 1989. Trees of Kenya. General Printers, Nairobi.
- Storrs AEG. 1995. Know your trees: some common trees found in Zambia. Regional Soil Conservation Unit (RSCU).
- Taylor CJ. 1960. Synecology and silviculture in Ghana. CJ Taylor.
- Williams R.O & OBE. 1949. The useful and ornamental plants in Zanzibar and Pemba. Zanzibar Protectorate.

### **SUGGESTED CITATION**

Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. 2009. Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>)