

African Tulip Tree (*Spathodea Campanulata*) - An Introduction to Dead Pool Tree For Bees

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SUMMARY

Spathodea campanulata is an African plant introduced into South America and other tropical and subtropical areas for ornamental purposes. This plant has been linked to insect mortality, bees included. It causes death of stingless bees in defence mechanism. These plants have been used as one of the important source for treating various diseases of humans. Different parts of *Spathodea campanulata* such as flowers, leaves, stem, bark and roots have been reported for possessing anti - inflammatory, analgesic, cytotoxic, anti - diabetic and anticonvulsant activity. Available literatures evidently show that *Spathodea campanulata* possess a wide range of pharmacological activities that could be explained by the presence of variety of phytochemicals . The aim of the present review to provide detailed information regarding geographical distribution, phytochemicals pharmacological properties of this plant.

INTRODUCTION

Spathodea campanulata commonly known as African tulip tree or flame tree. It is a single species of monotypic genus *Spathodea* in the flowering plant family Bignoniaceae of chromosome number $2n=26, 36, 38$, which is composed of around 800 species. It is noted for producing an extra ordinary bloom of reddish orange tulip like flowers at the tip of the branches clad with attractive pinnate compound evergreen leaves.

Taxonomic Position

Domain: Eukaryota

Kingdom: Plantae

Phylum: Spermatophyta

Subphylum: Angiospermae

Class: Dicotyledonae

Order: Scrophulariales

Family: Bignoniaceae

Genus: *Spathodea*

Species: *Spathodea campanulata*

Origin

African tulip tree is native of West and Central Africa, and western East Africa, from southern Senegal east to western Kenya and Tanzania, and south to northern Angola and southern Democratic Republic of Congo.

Distribution

African tulip tree is widely grown in tropical and subtropical regions outside Africa. It has become naturalized and is an important component of secondary vegetation, e.g. in Mexico and Puerto Rico, and is considered a weed in Guam and Hawaii.

Description

Tree: Small to medium-sized deciduous tree up to (25–35) m tall.

Leaves: Imparipinnate; stipules absent; petiole 7–15 cm , rachis 15–35 cm.

Inflorescence: Terminal corymb-like raceme.

Flower: Flowers bisexual, zygomorphic, large and showy.

Fruit: Narrowly ellipsoid woody capsule 15–27 cm × 3.5–7 cm.

Seed: Thin and flat, very broadly winged.

Habitat

A tree that invades abandoned agricultural land, roadsides, waterways, disturbed sites, waste areas, forest margins and disturbed rainforests in tropical and sub - tropical regions. It favours wetter habitats, and is especially common along creeks and gullies. The tulip tree does not tolerate frost and demands full sun for fast growth and best flowering . The biggest trees grow in moist sheltered ravines. This species loves rich soil, but puts up with just about anything with a little fertility to it, including limerock. It will survive a bit of salinity. This plant is also commonly found in India as an ornamental plant



Habit

A large upright tree (growing up to 25 m tall) with a spreading crown and a slightly buttressed trunk.

Chemical components

A new cerebroside namely Campanulatoside was isolated from the stem bark of *S. campanulata* along with seven known compounds including (Kumaresan *et al.*, 2011)

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| 1. Ursolic Acid | 5. Oleanolic Acid, |
| 2. 3-Epoxypropanol, | 6. Spinasterol, |
| 3. Stigmasterol | 7. Campesterol |
| 4. A- D-Glucopyranosyl-O-(1a2)-A-D Fructofuranoside. | |

Genetic resources and breeding

The Subtropical Horticultural Research Unit, Miami, United States has a germplasm collection of 16 accessions. Seed is available commercially from many sources. An orange to buttercup - yellow form of the species, originally from Uganda, is popular in horticulture. It is multiplied vegetatively .

Common uses

African tulip tree is used for soil improvement, reforestation, erosion control and land rehabilitation, and as a live fence. It has been used as a shade tree in coffee plantations. In teak plantations, African tulip tree can be used to attract initial populations of teak defoliator (*Hyblaea puera*), which can then easily be destroyed

Pharmacological uses

S.campanulata is the most important perennial plants commonly used as a folkloric medicine in Nigeria. The extracts from the stem bark of *S.campanulata* have been used in antimalarial activity. The flowers are used in diuretic and anti inflammatory, while the leaves are against kidney diseases.

Bee poisoning

Trigo and Santos (2000) suggested the existence of a defense mechanism in *S. campanulata* that protects flower buds from nectar and pollen thieves. Otherwise these resources could be stolen by some meliponine bees, such as *S. postica* or other efficient pillagers, before flower opening. Endress(1994) noted that some plants , including Bignoniaceae, produce a mucilaginous or watery liquid to protect juvenile flower organs before anthesis. Flower bud secretion would thus be a plant defense system, of chemical or physical nature, suffocating the bees. Considering these effects and the actual expansion of meliponiculture in Brazil (Contrera *et al.*, 2011), the use of *S. campanulata* trees is not recommended in areas foraged by stingless bees.

CONCLUSION

This paper concluded that *Spathodea campanulata* P. Beauvais has been used in the treatment of various diseases and reported to have antimalarial, anticancer, antidiabetic, antioxidant and antibacterial activities. In the recent year's traditional medicines received more attention and evaluated for its efficacy and generally, they are safe for human beings. Numerous phytochemical and pharmacological studies have been conducted on different parts of the *Spathodea campanulata* P. Beauvais.

REFERENCES

- Contrera, F.A.L., Menezes, C. & Venturieri, G.C. (2011). New horizons on stingless beekeeping (Apidae, Meliponini). Rev. Bras.Zootec. 40 (sppl.esp): 48-51.
- Endress , P.K. (1994). Diversity and evolutionary biology of tropical flowers. Cambridge: Cambridge University Press , 511p
- Kumaresan M ,Palanisamy PN , Kumar PE. (2011) Chemical investigation of the flower of *Spathodea campanulata* by GC - MS . J Nat Prod Plant Resources; 1: 14-7.
- Trigo , J.R. & Santos , W.F. (2000) . Insect mortality in *Spathodea campanulata* Beauv. (Bignoniaceae) flowers . Rev. Bras . Biol . 60 : 537-8 .