



A Review on *Tibouchina urvilleana* (DC.) Cogn

Vinnakota Gowthami ^{1*} Jada.Naga Lakshmi¹

¹. Department of Pharmacology, Chalapathi Institute of Pharmaceutical Sciences, Lam, Chalapathi Nagar, Guntur-522034, INDIA

*Corresponding author's E-mail: gowthami1821@gmail.com

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ABSTRACT

Tibouchina urvilleana (DC.) Cogn belongs to family Melastomataceae. Native place of the plant is in Brazil. *Tibouchina urvilleana* plants characteristic are young stems were 4-sided and covered in short hair, broad grayish green leaf, with softly hair on the leave. Flowers are large, bright purple flowers with obviate petals. Fruits are Hypanthium reddish and shaped like a u- shaped vase - growth habit, and it is quite tall when matured. *Tibouchina urvilleana* is used as Ornamental Plants because of their purple flowers. Literature survey of *Tibouchina urvilleana* revealed the presence of different classes of natural products including flavonoids, flavonol- glycosides, isoflavonoids, anthocyanins, tannins, triterpenes, and phenolic derivatives. The plant is traditionally reported for its use for the treatment of anti-inflammatory, antioxidant, anti-nociceptive (relieving chronic pain), anti- microbial, anti-lesimanial activity; aluminum accumulation in leaves, Nobotanin B extracted from the plant *Tibouchina* Species is a potent PARG(Poly(ADP-ribose)glycohydrolase inhibitor. This review is short review on *Tibouchina urvilleana*.

Keywords: *Tibouchina urvilleana* (DC.) Cogn, Princess Flower, *Lasiandras urvilleana*, Quaresmeria.

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Tibouchina urvilleana

Family name: Melastomataceae
Synonyms: *Appendicularia grandiflora*,
Appendiculatia splendens,
Pleroma urvilleana, Lasiandra.

Common name: Princess flower, Glory Bush, Purple Glory Tree, Lasiandra, Pleroma, Brazilian Senduduk.

Taxonomy / Scientific Classification

Kingdom: Plantae
Division: Tracheophyta
Order: Mytales
Family: Melastomataceae
Genus: *Tibouchina*
Species: *Tibouchina urvilleana* (DC.) Cogn, Princess Flower, Glory Bush, Lasiandra Princess Flower
Class: Dicotyledonate

Description and Ethnobotany

Tibouchina urvilleana is a large, dense, and rounded –but sprawling. Evergreen shrub or small ornamental tree ranges from 10 to 15 feet (20 feet with proper training) in height. The dark green, velvety, four to six –inch long leaves have several prominent longitudinal veins instead of the usual one and are often edged in red. Large, royal purple blossoms, flaring open to five inches, are held on terminal panicles above the foliage, creating a spectacular

INTRODUCTION

Tibouchina Urvilleana is species of flowering plant that belong to the Melastomataceae family¹. Being popularly known as Glory bush, Princess Flower, Lasiandra urvilleana². Phonetic spelling tib-OO-kee-nuh ur-VIL-ah-nuh³. *Tibouchina urvilleana* is mainly distributed in Brazil, tropical and subtropical regions of Americas, and it grown as a garden plant throughout the world. In Brazil, *Tibouchina* species are known as “Quaresmeria”⁴. *Tibouchina urvilleana* can be evergreen shrubs or herbaceous perennials, with simple prominently veined, soft hairy leaves and saucer- shaped purple flowers with conspicuous stamens⁵.



Figure 1: *Tibouchina urvilleana* (DC.) Cogn








sight when in full bloom⁶.Fruits are egg- shaped pale brownish capsules 8-14mm long, five celled, with many small round seeds⁷. The parts are listed in the [Table 1]

Habitat and Cultivation

It is considered an invasive species in Hawaii where it is found in damp areas, such as forests and roadsides. Fast – growing species is suitable for beginners, required little

maintenance. It grows best in fertile, moist, but well-draining soil that is slightly acidic. Space individual 2.4-3m apart. Protect this species from wind and direct afternoon sun during hot weather. Feed plants with a phosphorus rich fertilizer after blooming. Species has a sprawling grows habit. It can also be planted in a large container and placed on a sunny portion⁷.

Table 1: *Tibouchina urvilleana* (Parts of the Plant)

S. No	Part of the plant	Description	Image	Ref
1.	Stems	Young stems are 4-sided.		7
2.	Flowers	Beautiful flowers are 3-5 inches (8-13cm) across and have 5 broad petals and 5 bright reddish sepals wide the stamens are held horizontally and curve upwards near the tip. Flowers last only about a day. The inflorescence is a terminal cluster.		7,8
3.	Fruits	Capsules 5-valved with persistent. Hypanthium, 1.5 0.8cm, dehiscent loculicidally		9
4.	Leaves	Leaves are grayish green and are softly hair. Oppositely arranged along the stems, leaves are normally ovate with entire leaf margin (5-10cm long 2.5-3.8 cm wide). They have pinnate venation with 3-5midribs.		7
5.	Trunk/bark/ Branches	Droop as the tree grows and will require pruning for vehicular or pedestrian clearance beneath the canopy; routinely grown with, or trainable to be grown with, multiple trunks; not particularly showy; no thorns.		5

Propagating

The easiest way to propagate princess flower is by rooting softwood cuttings: Cut 4-inch lengths of soft green stem, making the cut just below a leaf node. Remove the leaves from the bottom half of the stem, then dip the end into rooting hormone. Plant the cutting into a container filled with a seed-starter mix, and then covers the container with a large plastic bag or plastic dome. Place the cutting in a bright area out of direct sunlight, with temperatures between 65- and 75-degrees Fahrenheit. Open the bag or remove the dome daily to mist the soil and cutting. After 10 to 12 weeks, the cutting should be sufficiently rooted so that it can be potted up or planted in an outdoor garden location¹⁰.

Maintenance of the plant

a) Light

Tibouchina urvilleana prefers full sun but can tolerate partial shade, provided it still receives at least five hours of direct sunlight each day¹⁰.

b) Soil

Appreciate damp, rich soil. While the plant does need regular watering, it's important that the soil drains well; princess flower can experience root rot if the soil is soggy. This plant prefers a slightly acidic soil, which can be provided through soil amendments such as peat moss, or by feeding it with an acid fertilizer¹⁰.

c) Water

Somewhat tolerant of drought but does best when regularly watered. Unless it's very hot, weekly watering is sufficient (no more than 1 inch of water per week, through a combination of rainfall and irrigation). Be careful to avoid overwatering, as very wet soil can injure the plant¹⁰.

d) Temperature and humidity

It cannot tolerate a real frost and will die back once a frost hits. If you want to keep your plant from dying back you can bring it indoors for the winter. One option is to cut a potted plant back to about 8 inches and keep it in the garage or basement. If you do keep the plant in the dark, water it only enough to keep it from drying out¹⁰.

e) Fertilizer

It's best to fertilize your princess flower each spring, summer, and fall. You can use fertilizer intended for acid-loving plants such as rhododendron or azalea, but your plant will also appreciate a bit of manure. Mulching will help your princess flower to retain moisture¹⁰.

f) Pruning princess flower

Like most shrubs, princess flower should be pruned to remove dead or damaged branches whenever you spot them. Beyond this, pruning is usually done to maintain a rounded shape, or to train it into standard if you prefer a tree shape. Any pruning is best performed immediately after the shrub finished blooming¹⁰.

Other**Pests and diseases**

Some of its pests are scales and nematodes. Mushroom root rot in soil which is kept too wet⁵.

Phytochemical Composition

Phytochemical composition of the *Tibouchina urvilleana* has been extensively studied in the last few decades. Different part of the plant is reported to possess Flavoids-flavonol glycosides, isoflavonoids, anthocyanins, phenolic derivatives, tannins, and triterpenes are major phyto chemical groups^{11,12}.

Traditional Uses

Traditional uses are described in the literature for *Tibouchina*. Among them are anti-inflammatory, antioxidant, anti-nociceptive (relieving chronic pain) anti-bacterial, anti-fungal, anti-parasitic and anticancer activities of leaf extracts¹³.

Toxicity

The California Poison Control System includes *Tibouchina* spp. in its list of nontoxic plants and does not mark the plant as being toxic to humans, dogs and cats. However, as the CPCS notes, even nontoxic plants can be a choking hazard for small children, and vomiting is still a possibility¹⁴.

Preliminary Studies**a) Secondary metabolites / leaves and stems / known activities of metabolites**

Chemical study of leaves and stems of *T. urvilleana* yielded ten triterpenes, two flavonoids, two sterols, and NH₄Cl. Compound 10 (arjunolic acid) has been considered antioxidant, antifungal, antibacterial, anticholinesterase, antiasthmatic, and anti-diabetic. β -amyrin has also shown antidiabetic potential. Glutinol has shown cytotoxicity against four human cancer lines and also shown anti-inflammatory activity¹³.

b) Malvidin / anthocyanin from flowers

Study isolated anthocyanins from the purple flower petals of *T. urvilleana*, identified as Malvidin-3-(p-coumaroyl glucoside)-5-glucoside¹².

c) Anthocyanin stability study

Study showed fully formed but unopened bud had the highest amount of total anthocyanins extracted from fresh petals. The ideal suitable storage is in acidic conditions in the dark. Results suggest a potential usage of colored anthocyanins as natural food colourants and shelf-life indicator for acidic foods¹⁵.

d) PARG inhibitor / Nobotanin B

Excessive activation of poly (ADP-ribose) polymerase 1 (PARP1) leads to NAD⁺ depletion and cell death during ischemia and other conditions that generate extensive DNA damage. Nobotanin B extracted from the plant *Tibouchina semidecandra* Cogn. Is a potent PARG inhibitor^{16,17}.

e) Antileishmanial activity

In vivo study of crude extracts showed antileishmanial activity in the following plants: *T. purpurea*, *A. rohituka*, *S. chirata*, *Tibouchina semidecandra* and *T cordifolia*¹⁸.

f) Aluminum accumulation in leaves:

Evaluated the differences in characteristics of Al accumulation (i.e., accumulation potential, chemical form, and localization) in three woody Al accumulators: *Symplocos chinensis*, *Melastoma malabathricum*, and *Tibouchina urvilleana*. Oxalate was partly involved in the internal Al detoxification mechanisms in leaves of all three Al accumulators. The order of Al accumulation potential under hydroponic conditions was SC-MA>TU¹⁹.

g) Antinociceptive and anti-inflammatory effects

Antinociceptive and anti-inflammatory effects were evaluated by the hot plate [HP, 1] and subcutaneous air pouch [SAP, 2] models, respectively²⁰.

h) Antimicrobial activity

Evaluation of the antimicrobial activity of extracts, isolated compounds, and semi-synthetic derivatives of ursolic acid against endodontic bacteria. HRGC analysis of the n-hexane extract of *Tibouchina candolleana* allowed



identification of *b*-amyryn, *a*-amyryn, and *b*-sitosterol as major constituents. The triterpenes ursolic acid and oleanolic acid were isolated from the methylene chloride extract and identified. In addition, the flavonoids luteolin and genistein were isolated from the ethanol extract and identified. The antimicrobial activity was investigated via determination of the minimum inhibitory concentration (MIC) using the broth micro dilution method. Amongst the isolated compounds, ursolic acid was the most effective against the selected endodontic bacteria. As for the semi-synthetic ursolic acid derivatives, only the methyl ester derivative potentiated the activity against *Bacteroides fragilis*²¹.

CONCLUSION

Based on this review *Tibouchina urvilleana* as promising medicinal plant with wide range of pharmacological activities which could be utilized for several medical applications because of its effectiveness and safety.

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