*International Journal of Scientific Research and Engineering Development-– Volume 8 Issue 5, Sep-Oct 2025*
*Available at www.ijsred.com*

RESEARCH ARTICLE OPEN ACCESS

# Preliminary Phytochemical Screening of the Flowers of *Spathodea Campanulata* P. Beauv

Mankumar Chaudhary*, Dhruv Pandya, Mukesh Patel
Department of Botany, R. R. Mehta College of Science and C. L. Parikh College of Commerce, Palanpur, Banaskantha, Gujarat, India.
*Email id: shilpabenpatel705@gmail.com

## Abstract:

Plants derived bioactive compounds have been the focus of recent research due to their health promoting effects. *Spathodea campanulata* P. Beauv., belonging to the family Bignoniaceae, is a big erect tree with an ancient history of medicinal use in Africa. The present investigation was carried out to assess the qualitative phytochemical analysis of flowers of *Spathodea campanulata* P. Beauv. In the study two different solvents were used for the phytochemical screening named Chloroform and Aqueous. Different solvent screening showed the presence of Alkaloids, Flavonoids, phenols Terpenoids, Sterols and Glycosides. Since the plant contain high quantities of these new bioactive potential compounds, it is reliable to possess large number of pharmacological values like antioxidants, antifungal, antibacterial, anti-inflammatory, antiulcer, diuretics activities and are being employed for the treatment of different ailments in the indigenous system of medicine.

**Key words:** *Spathodea campanulata* P. Beauv., Phytochemicals, Secondary metabolites.

## Introduction:

The medicinal plants are useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents. Phytochemicals are naturally occurring in the medicinal plants leaves, stem bark, fruits and roots that have defense mechanism and protect from various diseases. Natural products from plants called secondary metabolites are the end products of primary metabolites such as carbohydrates, amino acid, and chlorophyll lipid so on. They are synthesis large variety of chemical substances known as secondary metabolites which include alkaloids, steroids, flavonoids, terpenoids, glycoside, phenolic compounds etc. *Spathodea campanulata* P. Beauv. plant is famous wild plant, but it also having different phytochemicals like alkaloids, flavonoids, tannis, glycosides, terpenoids etc. The study was focused on the screening of flowers of *Spathodea campanulata* P. Beauv. in chloroform and aqueous solvents.

## Material and Methodology:

### Collection of Plant material:

The fresh flowers of Spathodea campanulata P. Beauv. were collected from R. R. Mehta College of Science and C. L. Parikh College of Commerce, Palanpur, Banaskantha, Gujarat (Feb to April, 2025). The plant material was identified by Dr Dhruv Pandya, Assistant Professor Department of Botany, R. R. Mehta College of Science and C. L. Parikh College of Commerce, Palanpur, Banaskantha, Gujarat.

### Extract Preparation Method:

The flowers were air dried for 10 days and crushed to form powder of dried plant material. The powdered samples were obtained after pulverization then they were subjected to successive extraction with organic

  

solvents such as Distilled water and chloroform by dry crude extraction. 10gm weighed powdered material of each sample were treated with different solvents including chloroform and distilled water and incubated for 24 hrs. on shaker. After one day all the samples were filtered with the help of what man filter paper no.1. The filtered extracts were kept at room temperature for evaporation of solvents. After 2 days we got the crude extract of each sample.

**Qualitative Analysis of Secondary Metabolites:**

**Test for Alkaloids:**

3 mg extract were dissolved individually in 3 ml ethanol and 1 N HCl was added then filtered it with whatman filter no. 1. The filtrates were used to test the presence of Alkaloids.

**Mayer's test:** 1 ml filtrate was treated with 2 ml Mayer's reagent; cream colour precipitation indicates the presence of alkaloids.

**Wagner's test:** 1 ml filtrate was treated with Wagner's reagent; reddish brown colour indicates the presence of alkaloids.

**Test for Flavonoids:**

**Lead acetate test:** 1 ml liquid extracted was treated with 10 % lead acetate solution; formation of yellow precipitation indicates the presence of flavonoids.

**$H_2SO_4$ test:** 1 ml extract was treated with few drops of $H_2SO_4$; orange colour precipitation indicates the presence of flavonoids.

**Alkaline reagent test:** 1 ml extract was treated with few drops of dil. NaOH and few drops of dil. HCl; yellow colour turns in to colour less soln. indicates the presence of flavonoids.

**Test for Phenols:**

**Ferric chloride test:** 1 ml extract was treated with few drops of 5% ferric chloride solution; formation of bluish black colour indicates the presence of phenols.

**Lead acetate test:** 1 ml extract was treated with 2-4 ml 10 % acetic acid; formation of yellow colour precipitation indicates the presence of phenols.

**Test for Saponins:**

**Frothing test:** About 0.5 mg of extract was shaken with 5 ml of distilled water; formation of froth (appearance of creamy small bubbles) show the presence of saponins.

**Test for Tannins:**

**Lead acetate test:** 1 ml of extract was treated with 1 ml 10% lead acetate solution; white colour precipitation indicates the presence of tannins.

**Ferric chloride test**: Small quantity of extract was mixed with water and heated in water bath, the mixture was filtered and 0.1% ferric chloride soln. was added to filtrates; dark green colour indicates the presence of tannins.

**Test for Terpenoids:**

**Salkowski's test:** Few mg of extract mixed with 2 ml of chloroform and 3 ml of conc. $H_2SO_4$ was carefully added to form a layer; an appearance of reddish-brown colour ring indicates the Presence of terpenoids.

**Copper acetate test:** extract was dissolved in water and treated it with 5% copper acetate solution; formation of emerald green precipitation indicates the presence of terpenoids.

  

**Test for Glycosides:**

**Bromine $H_2O$ test:** 1 ml of test solution was dissolved in bromine $H_2O$; formation of yellow Colour precipitation indicates the presence of glycosides.

**Keller-Kiliani test:** 2 ml of test solution was treated with few drops of glacial acetic acid and 1% ferric chloride solution mixed, concentrated Sulphuric acid was added and observed for the formation of two layers; lower reddish brown and upper acetic acid layer which turns bluish green indicates a positive test for glycosides.

## Results and Discussion

As per result of flowers screening the alkaloids, flavonoids, saponins, tannins, phenols, glycosides and terpenoids are present in the flowers of *Spathodea campanulata* P. Beauv. Wagh and Butal 2018 showed the presence of steroids, glycosides, alkaloids, tannins. In this research work medicinally important secondary metabolites were assessed qualitatively through biochemical tests.

**Table:1 Showing the presence and absence of secondary metabolites in different Solvents**

- **Shows absence, + shows presence, ++ shows average presence, +++ shows higher presence of the secondary metabolite.**

## Conclusion:

*Spathodea campanulata* P. Beauv. is a wild plant but it also has many commercially and medicinally important substances like alkaloids, flavonoids, phenols, terpenoids, steroids, glycosides and cardiac glycosides were present in the screening so, further quantification of the secondary metabolite and pharmacological properties like antibacterial, antifungal, antiviral, anticancer etc. can be assessed for the future advantages.

| Phytochemicals | Qualitative Tests | Flowers of *Spathodea campanulata* P. Beauv | |
|---|---|---|---|
| | | Aqueous | Chloroform |
| **Alkaloids** | Mayer`s Test | + | ++ |
| | Wagner`s Test | ++ | ++ |
| **Flavonoids** | Lead acetate Test | + | + |
| | $H_2SO_4$ Test | + | + |
| | Alkaline Reagent Test | ++ | - |
| **Phenols** | Ferric Chloride Test | + | - |
| | Lead acetate Test | + | - |
| **Saponins** | Frothing Test | - | - |
| **Tannins** | Ferric Chloride Test | ++ | + |
| | Lead acetate Test | + | - |
| **Terpenoids** | Salkowski`s Test | ++ | + |
| | Copper Acetate Test | +++ | + |
| **Glycosides** | Bromine $H_2O$ Test | ++ | + |
| | Keller-killiani Test | ++ | + |

**Table: 1 Showing Qualitative Analysis of Secondary Metabolites of flowers of *Spathodea campanulata* P. Beauv**

  

**References:**

Padhy, G. K. (2021). *Spathodea campanulata* P. Beauv.—A review of its ethnomedicinal, phytochemical, and pharmacological profile. *Journal of Applied Pharmaceutical Science*, *11*(12), 017-044.

Wagh, A. S., & Butle, S. R. (2018). Plant profile, phytochemistry and pharmacology of *Spathodea campanulata* P. Beauvais (African tulip tree): a review. *International Journal of Pharmacy and Pharmaceutical Sciences*, *10*(5), 1-6.

Joshi, B., Pandya, D., & Mankad, A. (2018). Comparative study of phytochemical screening and antibacterial activity of *Curcuma longa* (L.) and *Curcuma aromatica* (Salib.). *J. Med. Plants*, *6*, 145-148.

Singh, B., Pandya, D., & Mankad, A. (2019). Qualitative analysis of secondary metabolites of *Azadirachta indica* A. Jusm. *J. Gujarat Res Soc*, *21*, 473-476.

Prajapati, M., Pandya, D., & Maitrey, B. (2018). Comparative Phytochemicalscreening and Antibacterial activity of leaf and flowering bud of *Syzygium aromaticum*. *L Int. J. Botany Stud*, *3*, 55-60.

Ogunsanya, M. U., Nwozo, S. O., Mohammed, B. A., Garba, R., & Mohammed, Y. A. (2021). *Spathodea companulata* (African tulip tree) stem and root barks extracts ameliorated n-nitroso diethylamine induced hepatic impairment in male rats.

Shalini, S., & Sampathkumar, P. (2012). Phytochemical screening and antimicrobial activity of plant extracts for disease management. *International Journal of Current Science*, *1*(1), 209-218.

Pandya, D., Patel, M., Patel, J., & Dabgar, Y. (2024). Antibacterial activity of methanolic and ethanolic extracts of leaves of *Catharanthes roseus* L. *J Med Plants Stud*, *12*(1), 135-138.

Solanki, P., Pandya, D., & Maitreya, B. (2020). Antimicrobial activity of methanolic & aqueous extracts of leaves & young stem bark of *Holoptelea integrifolia* L. *Int. J. Bot. Stud*, *5*, 123-127.

  