

PHYTOCHEMICAL SCREENING ON SESBANIA GRANDIFLORA LEAVES

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ABSTRACT

Plants are being explored as a major source of medicinal compounds. There are around 60 global species including genus *Sesbania*, which are commonly available. The leaves of *Sesbania grandiflora* is used as local traditional medicine. Most of all parts of plant of *S. grandiflora* are used in traditional medicine as well as phytochemical investigations, seeds and roots of *Sesbania grandiflora* to provide scientific validation of its properties. The family of *Sesbania grandiflora* is Fabaceae and is widely used as a traditional Indian medicine. The common name of plant *Sesbania grandiflora* is Agate, as well as crook wood. It is widespread distributed in West Bengal, Assam, Karnataka and North-Eastern parts. The present study intended to explore the various phytochemicals present in the plant *Sesbania grandiflora* leaves. Qualitative analysis for various phytochemical was done using isopropyl alcohol as solvent and some active compounds have been detected. These active compounds can be used in the field of medicine.

KEYWORDS: *Sesbania grandiflora*, Traditional medicine, Phytochemical, solvent, Scientific validation, Fabaceae.

INTRODUCTION

Sesbania grandiflora has unique medicinal properties and used as an herbal drug for its antibiotic, anthelmintic, anti-tumour and contraceptive properties. The parts of these plants serve as a natural anti-oxidant.^[1] The juice of the leaves is considered to possess anthelmintic property and is used to treat worms, fever, gout, itchiness, and leprosy.^[2] The exact origin of *Sesbania grandiflora* is not known but it is considered native to many south east Asian countries where the annual rainfall is between 2000-4000 mm per year and so considered to be a native of these regions. *Sesbania grandiflora* is a loosely branching tree up to 15m tall. Its leaves are pinnately compound up to 30 cm long with 20 – 50 leaflets in pairs, dimensions 12.4 x 5.15 mm oblong to elliptical in shape. Flowers were large, white yellowish, rose pink or red with a calyx 15.22 mm long.^[3,4] The tender leaves, green fruit, and flowers are eaten alone as a vegetable or mixed into curries or salads. Flowers may be dipped in batter and fried in butter.^[5,6] Tender portions serve as cattle fodder. Overeating is said to cause diarrhoea.^[7] Ripe pods apparently are not eaten. The flowers and young leaves of *Sesbania grandiflora* are edible and are often used to supplement meals. Tender pods may also be eaten as vegetables. The dried leaves of *S. grandiflora* are used in some countries as a tea which is considered to have antibiotic, anthelmintic,^[8,9,10] anti-tumour^[8] and contraceptive properties.



SESBANIA GRANDIFLORA

SYSTEMATIC POSITION OF SESBANIA GRANDIFLORA

Taxonomic hierarchy of *Sesbania grandiflora*

Kingdom: Plantae-Plant

Subkingdom: Tracheobionta-Vascular plant

Super division: Spermatophyta-Seed plant

Division: Magnoliophyta-Flowering plant

Class: Magnoliopsida-Dicotyledons

Subclass: Rosidae

Order - Fabales

Family- Fabaceae

Genus-Sesbania Adans

Species-Sesbania grandiflora (L.) Pers.

Botanical name: - *Sesbania grandiflora*

Languages	Traditional name
English	August tree leaves
Telugu	Ettagise sukanasamu
Hindi	Hathya
Tamil	Sevvagatti
Bengal	Buko
Malayalam	Akatti

MATERIALS AND METHODS

Collection of Plant Material

Fresh plants were collected from a place named Muppala near Narasaraopet in Andhra Pradesh, India. The leaves were separated, washed under running tap water and shade dried at room temperature. The dried leaves were ground to fine powder using a blender. The powder was preserved in an air tight bottle for further use.

Preparation of leaf extracts (Maceration)

30 grams of the leaf powder was mixed with 150 ml of solvent and kept shaking for about 3-7 days. Solvent used for extraction was Isopropyl alcohol. The collected supernatants were used for phytochemical screening.

PHYTOCHEMICAL SCREENING

The presence of different phytochemicals extracted by using solvent as Isopropyl alcohol was confirmed by the following tests.

Qualitative analysis of phytochemicals

Test for carbohydrates

Molish test

Take 2ml of extract and then add 2ml of Molish reagent and shaken well. Then add 2ml of conc.H₂SO₄ was added from sides of the test tubes. A reddish violet ring appeared immediately at the junction of two layers indicating the presence of carbohydrates.^[11]

Test for Alkaloids

Mayer's Test

To the extract added 1% Hydrochloric acid and 6 drops of Mayer's reagent and Drangendroff's reagent was added. An organic precipitate indicated the presence of alkaloids in the sample.^[11]

Test for cardiac glycosides (Keller-Killiani test)

0.5gm of extract diluted to 5ml of water then added 2ml of glacial acetic acid containing one drop of ferric chloride solution. This was underlayered with 1ml of concentrated sulphuric acid. A brown ring at the interface indicates the presence of a deoxy sugar characteristic of cardenolides.

A violet ring may appear below the brown ring, while in the acetic acid layer a greenish ring may form just above the brown ring and gradually spread throughout this layer.^[11]

Test for Terpenoids

To 2ml of extract add 5ml of solvent and 2ml of conc.H₂SO₄ was added reddish-brown colour was observed.

Test for steroids

To 2ml of leaf extract was mixed with 1ml of Isopropyl alcohol and later 2-3 drops of glacial acetic acid was added and heat and add conc.H₂SO₄. Orange colour formation indicated the presence of steroids.^[12]

Detection of Flavonoids

Lead acetate test

The aqueous extract was treated with few drops of 10% lead acetate solution. The formation of yellow precipitate confirmed the presence of flavonoids.^[13]

Test for Saponins

To 2ml of extract add water and shaken vigorously for frothing presence visualizes saponins. Formation of froth (or) foam was observed.

Test for Phenols

To 1ml of extract add alcohol and few drops of ferric chloride solution. Greenish yellow colour was observed.

Test for Tannins

5ml of extract was added to few drops of 1% lead acetate. A yellow precipitate indicated the presence of tannins.^[14]

Test for Quinones

To 2ml of extract add conc. HCl and mix. Green colour was observed.

RESULTS

Screening of Phytocompounds in *Sesbania grandiflora*.

Type of Test	Positive	Negative
Test for Carbohydrates Molish Test	✓	-
Test for Alkaloids Mayer's Test	-	✓
Test for Cardiac glycosides	✓	-
Test for Terpenoids	✓	-
Test for Steroids	✓	-
Test for Flavonoids	✓	-
Test for Saponins	✓	-
Test for Phenols	-	✓
Test for Tannins	✓	-
Test for Quinonines	✓	-

CONCLUSION

Qualitative phytocompounds were screened in *Sesbania grandiflora*, according to the results Carbohydrates, glycosides, terpenoids, steroids, flavonoids, saponins, tannins, and Quinonines are present. Based on the results, it can be concluded that the *Sesbania grandiflora* leaf extracts can be used in the treatment of folk

medicine since these compounds have antioxidants and antimicrobial activity.

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