



# Pharmacognostic and Ethnobotanical Studies of *Cajanus scarabaeoides* (L.) Thouars and *Jasminum sambac* (L.)

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## Abstract

The study was designed to investigate the pharmacognostic characters and phytochemical profile of crude drugs obtained from different parts of *Cajanus scarabaeoides* (L.) Thouars is a perennial creeper climber, family Leguminosae, Found in India, Asia and Australia. The stem and seeds are very nutritive and can be used for feed and food purposes respectively and it is known to exhibit antibiosis as well as mechanical resistance to pod borers. *Jasminum sambac* it is an evergreen shrub, generally do not bear seeds and the plant is reproduced solely by cuttings, layering, marcotting, and other methods of asexual propagation. The buds have to be white, as green ones may not emit the characteristic fragrance they are known for open flowers are generally not harvested as a larger amount of them is needed to extract oils and they lose their fragrance sooner. The phytochemical analysis showed that the plant extracts contains numbers of secondary metabolites like alkaloids, glycosides, reducing sugars, flavonoids, saponin and volatile oil. *Cajanus scarabaeoides* plant shows the anti inflammatory, antibacterial, treatment of anemia, dysentery, cholera activity.

**Keyword:** Creeper-Climber , Shrub, Microscopy, Phytochemicals, Ethnomedicine, etc.

## 1. Introduction:

### 1.1 *Cajanus scarabaeoides* (L.) Thouars:

*Cajanus scarabaeoides*, commonly known as Ban kurti is a twinning herb of family Leguminosae. Different parts of *C. scarabaeoides* have a wide range of ethnomedicinal uses for treatment of anemia, smallpox, gonorrhoea, rinderpest, sores, dysentery, cholera, swelling and different inflammatory disorders<sup>[1]</sup>. It is a creeper climber the stem and seeds are very nutritive and can be used for feed and food purposes respectively and it is known to exhibit antibiosis as well as mechanical resistance to pod borers. It

is highly resistant to heli cover parmigiana (pod borer) due to presence of short non-glandular trichomes on the pods. *Cajanus scarabaeoides* is most widely distributed wild species of pigeon pea, belongs to the secondary gene pool and is native to tropical and temperate regions of India, Sri Lanka, Australia, Africa, China etc<sup>[2]</sup>. In order to achieve gain in food availability, concentrated efforts to intensify food production and making it sustainable are required<sup>[3]</sup>. The flower initiation is known to be very early in *C. scarabaeoides* as compared to popular pigeon pea cultivars. This trait can be utilized in breeding programs to reduce harvest time to avoid drastic effects of changing climate<sup>[4]</sup>.



**Fig.1: A flowering twig of *Cajanus scarabaeoides* (L.) Thouars**

The pharmacogenetic characterization of the plant *C. scarabaeoides* in a study by Ray and Rahaman with an objective to highlight its qualitative and quantitative estimation of different phytochemical groups. Despite its varied utilities in traditional medicine antifilarial potential of this plant has not been elucidated earlier.. In the ethanolic stem extract of *C. scarabaeoides* possesses significant lethal action against the parasite in all the developmental stages at a considerably low dose. the possible chemo-profiling in the active ethanolic extract of *C. scarabaeoides*, found an abundance of polyphenolic compounds such as gallic acid, caffeic acid, ferulic acid and flavonoids like catechin, rutin, quercetin etc. Phenolic compounds could be the bioactive mediator behind eliciting the antifilarial action of *C. scarabaeoides*. The antifilarial activity of the crude extract can be improved if the total polyphenolic content is optimized. The potential antifilarial action of *C. scarabaeoides* on the filarial nematode *S. cervi* <sup>[5]</sup>.

## 1.2 *Jasminum sambac*:

*Jasminum sambac* is an evergreen vine or shrub reaching up to 0.5 to 3 m (1.6 to 9.8 ft) tall. The species is highly variable, possibly a result of spontaneous mutation, natural hybridization, and auto polyploidy. Cultivated *Jasminum sambac* generally do not bear seeds and the plant is reproduced solely by cuttings, layering, marcotting, and other methods of asexual propagation. The flowers bloom all throughout the year and are produced in clusters of 3 to 12 together at the ends of branches. They are strongly scented, with a white corolla 2 to 3 cm (0.79 to 1.18 in) in diameter with 5 to 9 lobes. The flowers open at night (usually around 6 to 8 in the evening), and close in the morning, a span of 12 to 20 hours. The fruit is a purple to black berry 1 cm (0.39 in) in diameter <sup>[6]</sup>.



**Fig.2: flower of *Jasminum sambac***

The sweet, heady fragrance of *Jasminum sambac* is its distinct feature. It is widely grown throughout the tropics from the Arabian Peninsula to Southeast Asia and the Pacific Islands as an ornamental plant and for its strongly scented flowers. Numerous cultivars currently exist. Typically, the flowers are harvested as buds during early morning. The flower buds are harvested on basis of colour as firmness and size are variable depending on the weather<sup>[7]</sup>. The buds have to be white, as green ones may not emit the characteristic fragrance they are known for open flowers are generally not harvested as a larger amount of them is needed to extract oils and they lose their fragrance sooner.

## 2. MATERIALS AND METHODS

### 2.1. Collection of Plants

The plants were collected from the local nursery of pauni and authenticated by Dr. Nitin Dongarwar, Head of Department of Botany, R.T.M Nagpur University, Nagpur. (Voucher No.031, 032)

### 2.2 Microscopy

The Fresh leaf and stem were used for the microscopically evaluation. Fine sections mounted on glass slide with help of glycerin without any staining reagent used were placed under microscope. Staining of the fine sections with methyl orange and phloroglucinol was done. Various identifying characters, such as type of trichomes and cell composition were recorded. The leaves and the stem were observed under the compound microscope. The section watched under the 10X & 45X magnifications. The staining reagent (Phloroglucinol-HCl and methyl orange) were used as per the standards procedures<sup>[8]</sup>.

### 2.3 Extraction

Take a 20 gm dried plant part and extracted by simple maceration method, with a particular solvent (Hydro-alcoholic) 100ml for 48 hours in a continuous shaking at room temperature. The extract was filtered and concentrated by using a rotary evaporator under vacuum at 45°C temperature<sup>[8]</sup>.

### 2.4 Preliminary Phytochemical Investigation

The plant material were extracted in hydro-alcoholic solvent and tested for various phytoconstituents present in them by standard procedures.

#### 2.4.1 Test for alkaloids

The small portion extracts were stored separately with a few drops of dilute hydrochloric acid and filtered. The filtrate was tested with various alkaloidal agents, such as Mayer's reagent (cream precipitate) and Dragendorff's reagent (orange brown precipitate)<sup>[9]</sup>.

#### 2.4.2 Test for carbohydrates and glycosides

Small quantity of extracts were dissolved separately in 5mL of distilled water and filtered. The filtrate was subjected to Molisch's test to detect the carbohydrates. Another small portion of extract was hydrolyzed with dilute hydrochloric acid for few hours in a water bath and was subjected to Liebermann-Burchard's, legaland, Borntrager's test to detect different glycosides. (Pink to red color indicates presence of glycosides)<sup>[10]</sup>.

#### 2.4.3 Test for flavonoids

5 mL of dilute ammonia solution were added to a portion of aqueous filtrate of plant extract followed by addition of concentrated H<sub>2</sub>SO<sub>4</sub><sup>[11]</sup>. A yellow coloration observed in extract indicated presence of flavonoids. Test for steroids 2mL acetic anhydride was added to 0.5g extracts with 2 mL H<sub>2</sub>SO<sub>4</sub>. The color changed from violet to blue or green in samples indicated presence of steroid<sup>[12]</sup>.

#### 2.4.4 Test for terpenoids (Salkowski test)

5 mL of extracts were mixed in 2 mL of chloroform, and then concentrated H<sub>2</sub>SO<sub>4</sub> (3 mL), was carefully added to form a layer. A reddish-brown coloration formed at the interface indicated presence of terpenoids<sup>[13]</sup>.

#### 2.4.5 Test for saponin

About 1 mL of extract were diluted with distilled water to 20 mL and shaken in graduated cylinder for 15 minutes. One cm layer of foam indicated presence of saponin<sup>[14]</sup>.

#### 2.4.6 Test for tannin

When extract were treated with vanillin-hydrochloric acid reagent, pink or red color was formed due to formation of phloroglucinol<sup>[15]</sup>.

#### 2.4.7 Test for protein

Mellon's reaction: Million's reagent (mercuric nitrate in nitric acid containing a trace of nitrous acid) usually yields a white precipitate on addition to a protein solution, which turns red on heating.

#### 2.4.8 Test for volatile oil or essential oil

A thick section of extract was placed on a glass slide. A drop of Sudan red reagent was added and after two minutes, it was washed with 50% alcohol mountain glycerin<sup>[16]</sup>.

### 2.5 Medicinal uses

#### 2.5.1 Ethno Medicinal uses of *Cajanus scarabaeoides* (L.) Thouars:

**Whole plant-** it is used for swelling and pain in leg during pregnancy, night fever, renal stone, eye diseases, dropsy, anaemia, hemiplegia, burns, wounds, small-pox, syphilis, gonorrhoea, spermatorrhoea, gravel, cholera, dysentery, snake-bite and rinderpest<sup>[17,18]</sup>.

**Leaves-** Leaf paste is used to cure swelling of the body, sores, venereal diseases and pain due to inflammation. **Seeds-** Crushed seeds are used to cure tapeworm<sup>[19]</sup>. **Whole plant-** It is also used for curing diarrhea and dysentery in cattle. Plant decoction is given to cows as a remedy for tongue and mouth sores. **Leaves-** Leaf paste is used to cure swelling of throat in cattle<sup>[20]</sup>.

#### 2.5.2 Ethno Medicinal uses of *Jasminum sambac*:

Traditionally, this plant used as an antidepressant, analgesic, sedative, anti inflammatory, antiseptic, expectorant and aphrodisiac. Wounds and snake bites can be cured by the roots. The flowers and leaves have decongestant and antipyretic properties<sup>[21]</sup>. Various diseases like conjunctivitis, diarrhoea, abdominal pain and dermatitis are treated with its flowers along with roots and leaves are also utilized for curing pain, diarrhoea and fever. It is also used for anaesthetic purposes. Their flowers and leaves utilized as traditional medicines in Asia to treat many diseases including diarrhea, fever, conjunctivitis, abdominal pain, dermatitis, asthma, abscess and breast cancer<sup>[22]</sup>.

### 3. Result:

#### 3.1 Microscopical Evaluation:

##### 3.1.1 *Cajanus scarabaeoides*

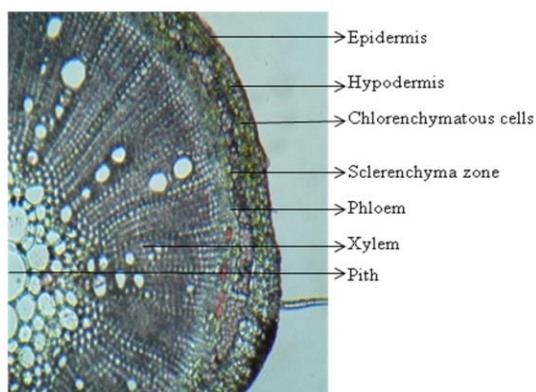


Fig.3: T.S of Stem

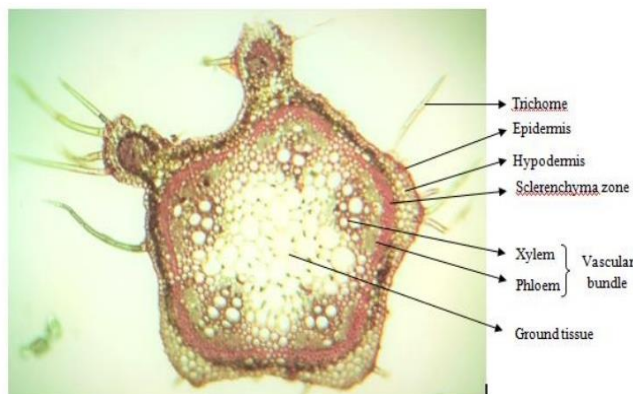


Fig.4: T.S. of Petiole

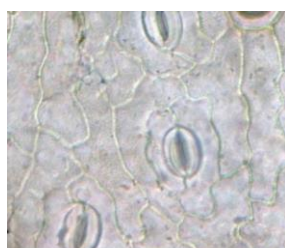


Fig.5: A portion of lower epidermis with stomata

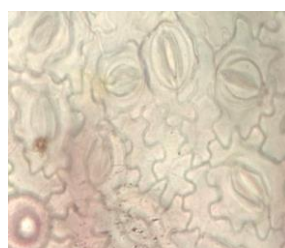


Fig.6: A portion of upper epidermis with stomata



Fig.7: Non glandular trichomes with stomata

##### 3.1.2 *Jasminum sambac*:

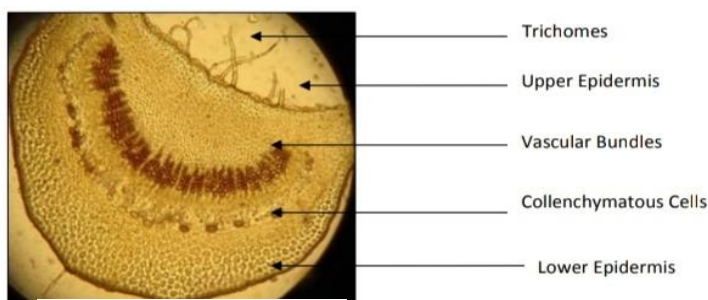


Fig.8: T.S. of Leaf

#### 3.2 Preliminary Phytochemical analysis:

The hydro-alcoholic extracts are prepared by simple maceration extraction method from those plant samples that are the reservoir of secondary metabolites, such as leaves, stems, roots, or bark and preliminary phytochemical analysis has preformed.

**Table: Preliminary Phytochemical analysis of *Cajanus scarabaeides* and *Jasminum sambac***

Test	<i>Cajanus scarabaeides</i>	<i>Jasminum sambac</i>
Alkaloids	+ve	+ve
Carbohydrates	-ve	+ve
Reducing sugars	+ve	+ve
Steroids	+ve	-ve
Glycosides	-ve	-ve
Flavonoids	+ve	+ve
Triterpenes	-ve	+ve
Saponin	+ve	+ve
Proteins	-ve	+ve
Tannins	+ve	+ve
Amino acids	-ve	-ve
Volatile oil or Essential oil	+ve	+ve

#### 4. CONCLUSION:

The methods carried out in the present research work namely .The pharmacognostical and physicochemical characteristics of *Cajanus scarabaeoides* (L.) and *Jasminum sambac* (L.), which could be used in identification and to distinguish the plant material, were determined and established. The ethnobotanical study of plant material reveals about its potential to cure various ailments. The present study may be useful information with regards to its, ethno- pharmacological potential, screening and isolation of phyto-constituent to carrying out further research.

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