GLIRICIDIA SEPIUM FLOWER EXTRACT: A QUALITATIVE PHYTOCHEMICAL STUDY

Yogesh P. Thawari[1], Kishor S. Itankar[2]

1. Department of chemistry, Nevjabai Hitkarini College Bramhapuri, Gondwana University, Gadhchiroli, India.
2. Department of chemistry, Yashwantrao Chawhan arts, Commerce and Science college Lakhandur, R.T.M. Nagpur university, Nagpur India.

Abstract : *Gliricidia Sepium, a nitrogen-fixing, rapidly growing tree which is used for an assortment of conservation services and products over the tropical zone, is a noteworthy medicinal plant in the fabaceae family. The primary aim of present paper deals with the detection of phytocompounds present in G. Sepium flower extract qualitatively. G. Sepium is extensively naturalized throughout the world, especially in the Asian continent. The presence or absence of plant-based chemicals has been researched in various types of G. Sepium floral extracts (aqueous, methanol, acetone, petroleum ether, and chloroform). The phytochemical examination of a selected plant section showed that whilst alkaloids and flavonoids had been detected in petroleum ether, chloroform, and acetone extract, more additional metabolites, such as anthocyanin and Anthocyanidins, tannins, cardiac glycosides, and carbohydrates, were present in the aqueous and methanol extracts. Therefore, it could potentially have said that the flower of the G. sepium plant may be an appropriate choice for use in drug therapy.*

Keywords: *Gliricidia Sepium, Medicinal plant, fabaceae, Phytochemical analysis, Drug Therapy.*

---

1. Introduction.

India is blessed with an abundance of plants that have therapeutic potential. All facets of society use these plants extensively, whether directly as traditional medicines or inadvertently as a modern pharmaceutical formulation [1]. With the beginning of life, human began using plants to control and treat illness. Many plants do really have medicinal benefits; it has been discovered in more recent year after extensive investigation [2]. In recent year, there has been a growing understanding of the significances of medicinal plants. The plant kingdom offers a treasure trove of potential medication. The most obvious choice for looking at the current quest for therapeutically effective novel medication, such as anti-cancer, anti-bacterial drugs and anti-hepatotoxic chemicals is the plant that have been selected for medical use over thousands of year [3]. About 2,50,000 species of higher plants exist in the globe, however the majority are not investigated for their pharmacological properties [4]. The medicinal properties of the plants are determined by the phytochemical constituents. Chemical substances that are naturally found in the plants that can have either beneficial or detrimental impact on health are known as phytonutrients [6]. Some of the important phytochemicals includes Alkaloids, flavonoids, phenolic, tannins, saponins, steroids,

glycosides terpenes etc. which are distributed in various segments of plants [7]. Different extraction process can be used to separate the biomaterials from the plant source like traditional methods such as maceration, percolation, infusion, digestion, decoction, hot continuous extraction (soxhlet extraction) etc are mostly carried out [8]. Among all of them existing study employed maceration process. Primary and secondary metabolites are the substances that are producted by plants and have different purposes. Amino acid, simple sugar, protein and lipids are the examples of primary metabolites other than primary all constituents are secondary metabolites [9]. The secondary biomaterials are active ingredient which have proven their antimicrobial, anti-inflammatory, antiviral, anticancer and Antimalerial properties. [10]. By considering all above facts concern to medicinal plants, the present study was carried out using *Gliricidia sepium* plant flower.

Gliricidia sepium belongs to *fabaceae* family. The medium sized, single or multiple stemmed tree has come from central and south America [11]. furthermore, it is employed as rodent poison, in fact the Latin term ***Gliricidia*** means "Rodent Poison" [12]. As an expectorant, insecticidal, rodenticides, sedatives, supportive, antibacterial, antifungal, antiviral and many more *G. Sepium* has been described in modern time [13]. *G. sepium* is fast growing, nitrogen fixing tree widely studied by many researchers. Antimicrobial activity of leaves, flowers and bark is reported [14,15]. Similarly, the phytochemical investigation of *G. Sepium* leaves and root bark is narrated by scholars. There hasn't been a scientific report on phytochemical investigation of flower of *G. Sepium* plant. therefor the objectives of the present research were to examine the phytochemical assessment of the various floral extract of *G. Sepium* plants.

fig: *Gliricidia Sepium* Plant

2. Method and Materials.

2.1. Collection of *G. Sepium* flower sample.

The Fresh and disease free racemes/penicles of selected plant was collected from road side field region of lakhandur-wadsa highway and it was the identified by Dr. Mahakalkar sir, Assistant professor, M.G. College, Armori, Gondwana university, Gadhchiroli. The collected sample was washed smoothly with deionized water 2 to 3 times to remove dust and debris then dried in shaded area for about 8 to 10 days. The dried sample were manually ground to fine powder and was stored at room temperature.

2.2. Preparation of different Solvent extract

The extract preparation for the determination of presence of bioactive materials, Maceration extraction process has been employed to the granulated material along

with various acknowledged solvents like Petroleum ether, Chloroform, Acetone, Methanol and distilled water being in succession.

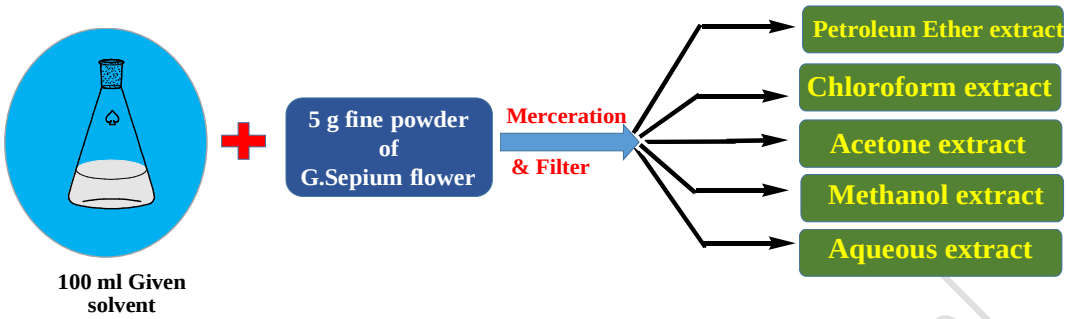


Fig. 1: Diagrammatic preparation of various extract of *G. Sepium* flower

2.3. Phytochemical screening

This part including several tests to determine the presence of bioactive substances. We examined the content of flavonoids, alkaloids, tannins, glycosides, Terpenoids and steroids**,** Cardiac glycosides, reducing sugar, and other compounds in each of the solvent extracts of *G. Sepium* petals.

a) Flavonoids: (Ferric chloride test)

In a test tube containing 1ml of extract, 5-6 drops of dilute hydrochloric acid were added and small pieces of magnesium were added. Red color was observed for flavonoids and orange color for flavones. [8,16].

b) Alkaloids:

In order to conduct a phytochemical study of the chosen plants, 0.2 g of the sample material was added, and It was combined with 3 ml of hexane, thoroughly shaken, and filtered. Next, put 5 milliliters of 2% HCl into a test tube containing the hexane and plant extract combination. After heating and filtering the liquid in a test tube, add a few drops of picric acid to the mixture. Alkaloids are present when a precipitate with a yellow hue forms. [8]

c) Tannins:

To heat 2 milliliters of floral extract for tannins, add strong HNO3 and additional ammonia. The presence of tannins is shown by the production of white precipitation**.** [17].

d) Saponin:

0.5 gram of the *G. Sepium* flower extract was taken in a test-tube and 5.0 ml of distilled water was added and shaken vigorously. A persistent froth that lasted for about 15 minutes indicated the presence of saponins [18].

e) Glycosides: [Liebermann's test]

Two milliliters each of acetic acid and chloroform were combined with crude extract. Ice was used to chill the concoction. A precise concentration of H_2SO_4 was introduced. When the color changed from violet to blue to green, it meant that the steroidal nucleus or glycine portion of the glycoside was present [3].

f) Terpenoids and steroids:

Five grams of the sample were added to two milliliters of chloroform, and the addition of sulfuric acid which caused the sample to become a blowfish green at the interface confirmed the presence in steroids [9].

g) Cardiac glycosides: [Keller killiani's test]

One milliliter of glacial acetic acid, one drop of ferric chloride solution, and one milliliter of strong sulfuric acid were added after around 100 mg of extract had been dissolved. [19].

h) Reducing sugar:

Fehling's solution (A + B) was added to 1 milliliter of extract, 2 milliliters of distilled water, and the combination was heated in a serological water bath at 40 degrees Celsius. Brick red precipitate formed at the test tube's bottom, signifying the presence of reducing sugar [18].

and so on.

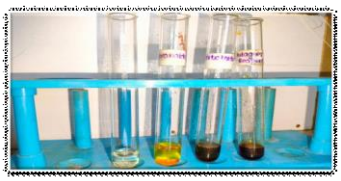
SR	Test	Petroleum Ether	Chloroform	Acetone	Methanol	Water
1	**Anthocyanin's & Anthocyanidins**	-	-	-	+	+
2	**Flavonoids**	+	+	+	+	-
3	**Tannins**	-	-	-	+	+
4	**Saponins**	-	-	-	-	+
5	**Steroids**	-	-	+	-	-
6	**Alkaloids**	+	+	+	-	-
7	**Cardiac Glycosides**	-	-	-	+	+
8	**Carbohydrates**	-	+	+	+	+
9	**Reducing Sugars**	-	-	-	-	+
10	**Proteins**	-	-	-	+	-
11	**Volatile Oils**	+	+	+	-	-

Table No.1: - Observation table of results of phytochemical test of various bioactive metabolites.

3. Result & Discussion

The phytochemical characteristics of G. Sepium flower extract tested were summarized in table no. 1. The table showed the phytochemical examination of G. Sepium flower in petroleum ether, Chloroform, Acetone, Methanol, and aqueous extract analysis.

Petroleum ether Extract test



Chloroform Extract test

Methanol Extract test

Acetone Extract test

Aqueous Extract test

Analysis of all the extracts revealed that the flavonoids is present in all the extracts except aqueous medium similarly carbohydrate was found in each extract bargin for petroleum ether.

4. References:

- Raval,P. K.and Nishteshwar,K.and Patel,B. R.and Shukla,V. J. (2012) , Asparagus racemosus Willd. - "a comparative phytochemical analysis of fresh dried roots of Shatavari". *International Journal of Pharmaceutical & Biological Archives*; 3(6):1458-1461**.**
- K. N. Agbafor, N. Nwachukwu, (2012) "Phytochemical Analysis and Antioxidant Property of Leaf Extracts of *Vitex doniana* and *Mucuna pruriens*", *Biochemistry Research International*, vol., Article ID 459839, 4 pages.
- Yadav, RNS & Agarwala, Munin. (2011). Phytochemical analysis of some medicinal plants. *Journal of Phytology*, 3(12): 10-14.
- Biradar, Sanjay & Rachetti, Bhagyashri. (2021). "Extraction of some secondary metabolites &Thin layer chromatography from different parts of Acacia farnesiana L" *IOSR Journal of Pharmacy and Biological Sciences*. 7(5), 44-48.
- Parekh, Jigna & Chanda, Sumitra. (2010). Antibacterial and phytochemical studies on twelve species of Indian Medicinal Plants. *African Journal of Biomedical Research*,(ISSN: 1119-5096) Vol 10 Num 2. 10.
- Mehta, Kavit. (2013). Phytochemical analysis of leaf extract of Phyllanthus fraternus. *Research Journal of Recent Sciences* 2. 2277-2502.
- Shaikh, Junaid & Patil, Matsyagandha. (2020). Qualitative tests for preliminary phytochemical screening: An overview. *International Journal of Chemical Studies*; 8(2): 603-608.
- Oladeji, Oluwole & Abraham, Odelade & Oloke, Julius. (2019). Phytochemical screening and antimicrobial investigation of Moringa oleifera leaf extracts. *African Journal of Science, Technology, Innovation and Development*. 12. 1-6.
- Galib, Nasr & Ali, Khaled Said & Munaiem, Ramzi & Mohammed, Aiman. (2017). PHYTOCHEMICAL SCREENING AND THIN LAYER CHROMATOGRAPHY OF ACACIA ETBAICA SSP. UNCINATA LEAVES. *World Journal of Pharmaceutical Research*. 6. 1278-1283.
- Craig R.E, John K.F. (2006), Gliricidia sepium, fabaceae (Legume family); *Species profile for pacific island agroforestry*, 2.1.
- Sukumar, Durairaj & Aparna, C.. (2012). Phytochemical Studies And Antibacterial Investigations on Gliricidia Sepium. Paripex - *Indian Journal of Research*. 3. 12-13.

- Juanico, Mhieco & Purnamasari, Listya & Hwang, Seong & dela Cruz, Joseph. (2023). The Potential of Gliricidia sepium Plant Extract as Antibacterial and Antifungal: A Review. *European Journal of Veterinary Medicine*. 3. 1-6.
- Jose B, Reddy L. (2010) Evaluation of antibacterial activity of the leaf and flower essential oils of *Gliricidia sepium* from South India. *Int. J. Appl. Pharm.*; 2: 20- 22.
- Kolawole OM, Joseph AK, George OA. (2018) Antibacterial and phytochemical activity of *Gliricidia sepium* against poultry pathogens. *Microbiol. Res. J. Int.*; 24: 1-10.
- Haridas, Renjini & P, Sumathi & Thomas, Binu. (2017). PHYTOCHEMICAL INVESTIGATION BY USING TENDER LEAF PART OF GREWIA TILIIFOLIA VAH. *Kongunadu Research Journal*. 4. 68-70
- Chavan, Jaykumar & L., Shevale & S., Mundrawale & Yadav, Shrirang & Jamdade, Chandani & Patil, Dhairyasheel. (2015). Phytochemical and antimicrobial studies on Asparagus racemosus. *World Journal of Pharmaceutical Research*. 4. 1805-1810.
- Article, Research & Shubham, Snigdha & Mishra, Ravish & Gautam, Narayan & Nepal, Manisha & Kashyap, Nilotpol & Dutta, Kishore. (2019). Phytochemical Analysis of Papaya Leaf Extract: Screening Test. *EC Dental Science* 18.3: 485-490.
- Tambe BD, Pedhekar P, Harshali P, (2021), Phytochemical Screening and Antibacterial Activity of *Syzygium cumini* (L.) (Myrtaceae) Leaves Extracts, *Asian Journal of Pharmaceutical Research and Development.*; 9(5):50-54.
- Abulude FO, Adebote VT. Antibacterial investigation of crude extracts of the root bark of *Gliricidia sepium*. *Cont. J. Microbiology.* 2009; 3: 23-26.