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**PRELIMINARY PHYTOCHEMICAL STUDIES ON FLOWER OF *ALBIZIA SAMAN***Milan Hait<sup>\*</sup>, Ajay Giri, Abhilasa Thakur

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**ABSTRACT**

Preliminary screening of phytochemicals is a valuable step in the finding of bioactive compounds present in medicinal plants. The *Albizia saman* extracts and its solvent fractionates were subjected to preliminary phytochemical screening using standard phytochemical tests. The aim of the present study was to investigate the presence of phytochemicals and to determine the total phenolic and flavonoid contents of the selected medicinal plant. Soxhlet apparatus was used for the organic solvent extraction. Solvents used were water, methanol, ethanol, acetone, ethyl acetate, chloroform and petroleum ether. These investigations revealed the presence of flavonoids, tannins, saponins, carbohydrates, terpenoids, phenols and glycosides in the flower of the plant extracts and its fractionates.

**KEYWORDS:** *Albizia saman*, extraction techniques, phytochemical screening.

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**INTRODUCTION**

Plants have a vast importance in our lives because they fulfill our basic requirements. The medicinal value of these plants is mainly due to the presence of some chemical active substances called phytochemicals [1]. Phytochemicals are bioactive chemicals of plant origin. They are regarded as secondary metabolites because the plants that manufacture them may have little need for them, of which there are several classes including alkaloids, flavonoids, coumarins, glycosides, gums, polysaccharides, phenols, tannins, terpenes and terpenoids [2, 3]. They are naturally synthesized in all parts of the plant body; bark, leaves, stem, root, flower, fruits, seeds, etc. i.e. any part of the plant body may contain active components [4]. The quantity and quality of phytochemicals present in plant parts may differ from one part to another. In fact, there is lack of information on the distribution of the biological activity in different plant parts essentially related to the difference in distribution of active compounds which are more frequent in some plant parts than in others [5, 6].

*Albizia saman* (Rain tree) of the family fabaceae that grows upto 30 m. high. It is large erect unarmed, deciduous plant spreading all over India. It has bipinnate leaves; bark rough, gray and globose head of fragrant pinkish flower, 4 cm. long bicolored stamens (white in lower half and reddish above); mature pods are black-brown, 10-30 cm. long and seeds 15-20 per pod, dark

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glossy brown [7, 8]. The rain tree is a traditional remedy for colds, diarrhea, headache, intestinal ailments, acute bacillary dysentery, enteritis, diarrhea, sore throat and stomach ache [9-11]. In the present study, various solvent extracts of flower of *Albizia saman* were qualitatively screened for phytochemicals using standard tests.

## **MATERIALS AND METHODS**

### **Collection of plant materials**

The plant materials (flower) of *Albizia saman* was collected from Purba Medinipur area, W.B. in the month of April. The plant materials were taxonomically identified and authenticated by Botanical Survey of India (BSI) & Central national Herbarium, Shibpur, Howrah (W.B.). A voucher specimen was deposited having the specimen Ref. No. CNH/2016/Tech.II/25 dated 09/06/2016.

### **Processing of Plant Materials**

The plant Materials was cleaned and shade dried until all the water molecules evaporated and the dried plant materials (petals of flower) was taken and powdered. The powdered samples were stored in a clean glassware container until needed for analysis with proper labeling.

### **Preparation of plant extracts**

#### **Solvent extraction**

Crude plant extract was prepared by Soxhlet extraction method. About 20 gm of powdered plant material was uniformly packed into a thimble and extracted with 250 ml of different solvents separately. Solvents used were petroleum ether, chloroform, ethyl acetate, acetone, methanol, ethanol and water as per polarity. The process of extraction continues for 24 hours or till the solvent in siphon tube of an extractor become colorless. After that the extract was taken in a beaker and kept on hot plate and heated at 30-40°C till all the solvent got evaporated. Dried extract was kept in refrigerator at 4°C for their future use in phytochemical analysis.

#### **Qualitative phytochemical analysis**

The extract was tested for the presence of bioactive compounds by using following standard methods [12-16].

#### **Phytochemical Screening:**

##### **Test for Alkaloids (Wagner's reagent)**

A fraction of extract was treated with 3-5 drops of Wagner's reagent (1.27 g of iodine and 2 g of potassium iodide in 100 ml of water) and observed for the formation of reddish brown precipitate (or colouration).

##### **Test for Carbohydrates (Molisch's test)**

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Few drops of Molisch's reagent were added to 2 ml portion of the various extracts. This was followed by addition of 2 ml of conc. H<sub>2</sub>SO<sub>4</sub> down the side of the test tube. The mixture was then allowed to stand for two-three minutes. Formation of a red or dull violet colour at the interphase of the two layers was a positive test.

**Test for Cardiac glycosides (Keller Kelliani's test)**

5 ml of each extract was treated with 2 ml of glacial acetic acid in a test tube and a drop of ferric chloride solution was added to it. This was carefully underlayered with 1ml concentrated sulphuric acid. A brown ring at the interface indicated the presence of deoxysugar characteristic of cardenolides. A violet ring may appear below the ring while in the acetic acid layer, a greenish ring may form.

**Test for Flavonoids (Shinoda test)**

To the extract, a few magnesium turnings and a few drops of concentrated hydrochloric acid were added and boiled for five minutes. Red coloration identifies the presence of flavonoids.

**Test for Phenols (Ferric chloride test)**

A fraction of the extracts was treated with aqueous 5% ferric chloride and observed for formation of deep blue or black colour.

**Test for Phlobatannins (Precipitate test)**

Deposition of a red precipitate when 2 ml of extract was boiled with 1 ml of 1% aqueous hydrochloric acid was taken as evidence for the presence of phlobatannins.

**Test for Amino acids and Proteins (1% ninhydrin solution in acetone).**

2 ml of filtrate was treated with 2-5 drops of ninhydrin solution placed in a boiling water bath for 1-2 minutes and observed for the formation of purple colour.

**Test for Saponins (Foam test)**

To 2 ml of extract was added 6ml of water in a test tube. The mixture was shaken vigorously and observed for the formation of persistent foam that confirms the presence of saponins.

**Test for Sterols (Liebermann-Burchard test)**

1 ml of extract was treated with drops of chloroform, acetic anhydride and conc. H<sub>2</sub>SO<sub>4</sub> and observed for the formation of dark pink or red colour.

**Test for Tannins (Braymer's test)**

2 ml of extract was treated with 10% alcoholic ferric chloride solution and observed for formation of blue or greenish colour solution.

**Test for Terpenoids (Salkowki's test)**

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1 ml of chloroform was added to 2 ml of each extract followed by a few drops of concentrated sulphuric acid. A reddish brown precipitate produced immediately indicated the presence of terpenoids.

#### **Test for Quinones**

A small amount of extract was treated with concentrated HCl and observed for the formation of yellow precipitate (or colouration).

#### **Test for Oxalate**

To 3 ml portion of extracts were added a few drops of glacial acetic acid. A greenish black colouration indicates presence of oxalates.

### **RESULTS AND DISCUSSION**

Results obtained for qualitative screening of phytochemicals in flower of *A. saman* are presented in table 1. Of the thirteen phytochemicals screened for, seven were found present in various solvent extracts. They are cardiac glycosides, flavonoids, phenols, carbohydrates, saponins, tannins and terpenoids. Remarkably, flavonoids, phenols and terpenoids were present in the flower of these plants. This suggests that the flowers offer a wider array of phytochemicals.

According to Tiwari et al., the factors affecting the choice of solvent are; quantity of phytochemicals to be extracted, rate of extraction, diversity of different compounds extracted, diversity of inhibitory compounds extracted, ease of subsequent handling of the extracts, toxicity of the solvent in the bioassay process, potential health hazard of the extractant [17].

The logic in using different solvents when screening for phytochemicals in plant materials was clearly validated in this study. Terpenoids were slightly present in chloroform, ethyl acetate, 70% ethanol, acetone and methanol. This corroborates the reports of Mishra et al. [18].

From the flower, water extract showed the presence of carbohydrate and tannin. However, 70% ethanol and acetone had cardiac glycosides, carbohydrates, flavonoids, phenol and terpenoids. The methanol extract had the presence of cardiac glycosides, carbohydrate, flavonoids, phenol, tannins and terpenoids.

The result indicates that *A. Saman* flower hold promises as source of pharmaceutically important phytochemicals. Flavonoids generally present in areal parts like flowers play some metabolic role and control development in living system. They are also involved in protective function in animals and are used as medicine especially the flavonol glycosides. Tannins are known to inhibit pathogenic fungi. The flavonoids and phenolic compounds in plant have been reported to exert multiple biological effects including antioxidant, free radical scavenging abilities, anti-inflammatory, anti-carcinogenic etc. [17].

**Table1. Result of phytochemical screening of flower of *Albizia saman*.**

S.N.	Phytochemicals/ Solvent Extracts	Pet. Ether	Chloroform	Ethyl acetate	Acetone	Ethanol	Methanol	Water
1	<b>Alkaloids</b>	-	-	-	-	-	-	-
2	<b>Cardiac Glycosides</b>	-	-	-	+	+	+	-
3	<b>Carbohydrates</b>	+	+	+	+	+	+	+
4	<b>Flavonoids</b>	-	-	-	+	+	+	-
5	<b>phenols</b>	-	-	-	+	+	+	-
6	<b>Phlobatannins</b>	-	-	-	-	-	-	-
7	<b>Proteins</b>	-	-	-	-	-	-	-
8	<b>Saponins</b>	+	-	-	-	-	-	-
9	<b>Sterols</b>	-	-	-	-	-	-	-
10	<b>Tannins</b>	-	-	-	-	-	+	+
11	<b>Terpenoids</b>	-	+	+	+	+	+	-
12	<b>Quinones</b>	-	-	-	-	-	-	-
13	<b>Oxalates</b>	-	-	-	-	-	-	-

+ = present; - = absent.

## CONCLUSION

Phytochemicals found present in flower extracts of *A. saman* indicates their potential as a source of principles that may supply novel medicines. Further studies are therefore suggested to ascertain their antimicrobial, antiplasmodic and antihelminthic activities. Furthermore, isolation purification and characterization of the phytochemicals found present will make interesting studies.

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