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Phytochemical screening of *Albizia amara* Leaf Extracts

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***Abstract*-** *Albizia amara* is traditional and ethno medicinal plant for medicine. The presence of phyto-constituents in plant acts as resource for the treatment of several endemic diseases such as anti-cancer, anti-hyperlipidimic, anti-inflammatory, antimicrobial, analgesic and antioxidant activities. The aim of the present study is to quantify the secondary components.. Phytochemical screening of *Albizia amara* was done using organic solvents such aqueous, ethanol, chloroform and benzene extracts of *Albizia amara* leaves. The study revealed the presence of alkaloids, flavonoids, terpenoids, glycosides, carbohydrates, phenols, quinines, betacyanins, saponins, tannins, oils and lipids in *Albizia amara* leaf extract.

Key words—*Secondary metabolite, Albizia amara ,Leaf*

I. INTRODUCTION

India is one of the few countries in the world which has unique wealth of medicinal plants for cure of various diseases [8,19]. Medicinal plant constitutes a major source of bioactive substances [7]. *Albizia* is a large genus belonging to the family Fabaceae, which comprises about 150 species. The seeds of *Albizia amara* used as an astringent, treating piles, diarrhoea, gonorrhoea, leprosy, leucoderma, erysipelas and abscesses [23].The flowers have been applied to boils, eruptions, swellings, ulcers, also regarded as an emetic, to tackle hair-fall and dandruff on the scalp and as a remedy for coughs and malaria. It is also known as "Kaunthia", a native term originated from Hindi language, indicating an age-old usage of those species by Indian indigenous communities [5].The *Albizia amara* (Leguminosae) is a small deciduous tree, is rich in alkaloids and the leaves are used as folk remedy for curing various diseases *viz.*, stomach cancer, common cold, diarrhoea, intestinal ailments, dandruff, wounds, skin diseases, gonorrhoea and animal fodder [3,11].In the present study *Albizia amara* leaves were extracted using different organic solvents and their secondary metabolite components were quantitatively screened.

II. METHODOLOGY

Collection of plant materials

Albizia amara were collected from natural habitats in and around the Namakkal, Tamil Nadu (India).

Preparation of extract

Leaves samples of *Albizia amara* were air and shade dried for two weeks and pulverized to powder using mortar. The dried and powered leaves materials (50 g) were extracted successively with 250 ml of aqueous, ethanol, methanol, chloroform and benzene. The extracts were filtered using What man filter paper (No.1) and the filtrate was stored at 4°C for further analysis [9].

Phytochemical analysis

The extract was tested for the presence of bioactive compounds by using following standard methods. The extracts was tested for the presence of bioactive components by using the following standard methods.

Detection of Alkaloids

A) Mayer's test:

To one portion of filtrate, Mayer's reagent [1.36g of mercuric chloride and 5g of potassium iodide dissolved in 100ml distilled water] was added. Formation of yellow cream colored precipitate gives an indication of the presence of alkaloids.

B) Wagner's test:

Few drops of Wagner's reagent [Potassium iodide (2 g) and iodine (1.27 g) were dissolved in 100 ml distilled water] were added to the filtrate a brown colored precipitate indicates the presence of alkaloids [1,10].

Detection of carbohydrates
a)Molisch's Test:
The few ml of extracts are treated with drops of alcoholic α-naphthol [1g in 95% ethanol] solution in a test tube. Formation of the violet ring at the junction of two liquids indicates the presence of carbohydrates.

b)Benedict's Test:
The plant extracts are treated with Benedict's solution and heated gently. Orange red precipitate formed indicating the presence of reducing sugars [14].

c)Starch test:
The extracts are treated with drops of iodine solution formation of brown color which in turns to blue or black color indicates the presence of carbohydrates

Detection of proteins
Biuret Test:
To 1 ml of test extract, 4% of sodium hydroxide solution and few drops of 1% copper sulphate solution were added. Formation of a purplish violet or red color indicated the presence of proteins.

Detection of amino acids
Ninhydrin test:
The ninhydrin reagent [0.2g of ninhydrin dissolved in 100ml ethanol] was added to the test tube containing the extracts. A violet or purple color was developed if amino acids were present [18].

Detection of Flavonoids
a)Alkaline reagent test:
A small amount extract was treated with aqueous NaOH observed for the formation of yellow orange color indicates the presence of flavonoids.

b)Ferric chloride test:
A fraction of the extract was treated with ferric chloride and observed for the formation of blackish red color.

c)Lead acetate test:A small amount of extract was treated with lead acetate and observed for the formation of yellow precipitate [14].

Detection of tannins
Extracts was treated with a few drops of 5% ferric chloride solution. Black or blue-green coloration or precipitate was taken as positive result for the presence of tannins [4].

Detection of terpenoids
Salkowski's Test:
Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of Conc. Sulphuric acid, shaken and allowed to stand. Appearance of reddish brown color indicates the presence of terpenoids.

Detection of Phenols
Phenols are tested by adding 2 ml of ferric chloride solution to 2 ml of plant extract, appearance of bluish green or dark green color indicates the presence of phenols.

Detection of phlobatannins
Plant powder sample was mixed with distilled water in a test tube, then shake it well, and filtered to take plant extract. Then to each plant extract, 1% aqueous hydrochloric acid was added and each plant sample was then boiled with the help of hot plate stirrer. Formation of red colored precipitate confirmed a positive result.

Detection of resins
1ml of the extract was treated with 5 ml of boiling ethanol, grinded and filtered. To the filtrate add 4ml HCl. The presence of resins was recorded when a heavy resinous precipitate.

Detection of Acids
To the alcoholic extract sodium bicarbonate solution was added and observed for the formation of effervescence.

Detection of Betacyanin
1ml of Sodium hydroxide [4g of NaOH dissolve in 100ml distilled water] was added to 2ml of each plant extracts and heated for 5 minutes at 100°C. Formation of yellow color indicated the presence of betacyanin.

Detection of Quinones
1ml of concentrated H_2SO_4 was added to 1 ml of filtrate. Red color indicates the presence of quinones [16].

Detection of Coumarins
NaOH (1ml) was added to 1ml of the plant extract. Formation of yellow color indicates presence of coumarins.

Detection of fixed oils and lipids
a)Stain test:
Small quantity of each extracts were separately pressed between two filter papers, and allowed to dry. Appearance of an oil stain or a grease spot on the filter paper when observed under direct sunlight, indicated the presence of fixed oils [21].

b)Saponification test:
Few ml of extract are treated with few drops of potassium hydroxide [1.426g KOH dissolved in 100ml distilled water] along with a drop of phenolphthalein and heated for 1hr at 50°C.Formation of soap indicates the presence of lipids.

Detection of Saponins
Plant extract was separately shaken with distilled water in a test tube. The formation of frothing, which persists on warming in a water bath for 5 min, shows the presence of saponins [4].

Detection of Cardiac Glycosides
Keller Killani test
1 ml of glacial acetic acid was added to 1 ml of plant extract samples and cooled. After cooling, 2 drops of $FeCl_3$ was added followed by careful addition of conc.H_2SO_4 along the walls of the test tube. Reddish brown color ring formed at the junction of two layers indicated the existence of glycosides [2].

Detection of Anthroquinones
Borntrager's Test
Five ml of the extract was boiled with HCl for few minutes in a water bath. It was filtered and allowed to cool. Equal volume of chloroform was added to the filtrate. Few drops of ammonia solution were added to the mixture and heated. Formation of pink color indicates that the presence anthroquinones.

Detection of Glycosides
Five ml extract were hydrolyzed separately with 5 ml of conc. HCl and boiled for few hours on a water bath and hydrolysates were subjected to the following test: A small amount of alcoholic extract of samples was dissolved in 1ml water and then aqueous sodium hydroxide was added. Formation of a yellow color indicated the presence of glycosides.

III. RESULT & DISCUSSION

Phytochemical screening of the plant extracts provides an understanding of the nature of the metabolites. Plants having alkaloids are plays a role in medicines, antispasmodic and antibacterial activity [15,20]. Flavonoids exhibit pharmaceutical activities [13]. Phenolic compounds are widely found in the secondary products of medicinal plants, which are potential antioxidants and free radical-scavengers [6,17] anti-inflammatory agents [6].The Phytochemical screening of the benzene, chloroform, ethanol, methanol and aqueous extracts was summarized in Table1. The results obtained shows the presence of alkaloids, Flavonoids, terpenoids, glycosides, carbohydrates, phenols, quinones, betacyanins, saponins, tannins, oils and lipids in different extracts.

Table 1: phytochemical screening of leaf extract of *Albizzia amara* (L.).

Tests	**Benzene**	**Chloroform**	**Ethanol**	**Methanol**	**Aqueous**
Alkaloids	-	+	+	+	-
Carbohydrates	+	-	+	+	+
Proteins	-	-	-	-	-
Amino acids	-	-	-	-	-
Flavonoids	+	-	+	+	+
Tannins	+	+	+	-	-
Terpenoids	-	-	-	+	+
Phenols	+	-	+	-	-
Phlobatannins	-	-	-	-	+
Resins	-	-	-	-	-
Acids	-	-	-	-	-
Betacyanins	-	-	+	-	+
Quinones	-	-	+	+	+
Coumarins	-	-	+	-	-
Fixed oils & fats	-	-	-	+	+
Saponins	-	-	-	+	+
Cardiac glycosides	-	-	-	-	-
Anthroquinones	-	-	-	-	-
Glycosides	-	-	-	-	+

(+)Present and (-) Absent

IV.CONCLUSION

The result shows the presence of phytochemicals such as alkaloids, flavonoids, terpenoids, glycosides, carbohydrates, phenols, quinones, betacyanins, saponins, tannins, oils and lipids in different extracts of *Albizia amara* leaf. Thus, medicinal properties are due to the presence of secondary metabolites present in plant plays a major role applied for the remedies associated human diseases. The present investigation has evaluated the strong phytochemicals in *Albizia amara*.

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