Phytochemical Analysis and Antioxidant Activity of Pisonia Umbellifera Leaf Extract

Kaviya priya. P[1], Shobana. B[2], Karthiha. N[3]
[1, 2, 3] Dept of Biochemistry
[1, 2, 3] Sri Ramakrishna College of Arts and Science for Women,Coimbatore-44, Tamil nadu.

Abstract- *Medicinal Plants are gifts of nature which are the sources of bioactive constituents. Medicinal plants have played an essential role in the development of human culture. They are the resources of traditional medicines and many of the modern medicines are produced indirectly from plant. Medicinal plants have long played important roles in the treatment of diseases all over the world. Pisonia umbellifera is a traditional medicinal plant. It is commonly known as Leeachai kottai keerai in tamil, is widely used plant which belongs to Nyctaginaceae family. The present investigation focus on screening of phytochemical constituents, antioxidant activity of Pisonia umbellifera leaf extracts.*

Keywords- Medicinal plants, phytochemicals, antioxidant.

I. INTRODUCTION

The term of medicinal plants include a various types of plants used in herbalism and some of these plants have a medicinal activities. These medicinal plants consider as a rich resources of ingredients which can be used in drug development and synthesis [1].

According to the World Health Organization state that traditional medicine is used in plant parts such as a leaf, stem, bark, and flowers estimated to be used medicine by 80% of the population most of developing countries [2].
Plants are important source of drugs; especially in traditional medicine. It is a common practice in Nigeria and other parts of the world to use the plant in the form of crude extracts, decoction, infusion or tincture to treat common infection and chronic conditions [3].

The herbal products today are considered to be safer to human and environment in India has different parts of several medicinal plants or their extracts are used for the treatment of various diseases. Herbal medicines have not gained much importance due to the deficient in of scientific facts for their mechanism of exploit [4].

Pisonia umbellifera belongs to the Nyctaginaceae family, commonly known as Lettuce Tree, is an evergreen tree of 9-12m height found wild in the beach forests of Andaman Islands and cultivated to a small extent in South India and Ceylon. It is used as a diuretic. A perusal of literature revealed that *Pisonia umbellifera* is an untapped candidate for anti-diabetic activity though it is extensively used in traditional healing in Kerala for diabetes [5].

Pisonia umbellifera is also used in the treatment of ulcer, dysentery and snake bite. The leaves are edible and mostly used to treat wound healing, rheumatism and arthritis [6].This study is also focused on antioxidant antibacterial anti-diabetic and anti-inflammatory activity of *Pisonia umbellifera*.

II. MATERIALS AND METHODS

Pisonia umbellifera leaf extract were selected for these studies. The materials and methods pertaining to the current study "phytochemical screening and Antioxidant activities in the ethanolic leaf extract of *pisonia umbellifera* are discussed under the following phases:

PHASE I

1.1 Collection of plant sample

1.2 Extraction Procedure
- **1.2.1 Preparation of Aqueous extract**
- **1.2.2 Preparation of Ethanol extract**

PHASE II

2.1 Phytochemical Screening
2.2 *In vitro* Antioxidant Activity
- **2.2.1 Ferric Reducing Antioxidant Power Assay**

PHASE I

1.1 Collection of plant sample

Healthy fresh leaf of *pisonia umbellifera* were collected from the nearby areas of karur, district. The plant sample is rinsed with distilled water and dried at room

temperature for 15 days. The dried leaf were powdered and stored in air-tight container for further analysis.

1.2 Extraction Procedure

1.2.1 Preparation of aqueous extract

Taken 3gm of *Pisonia umbellifera* powder and to it add 60 ml of distilled water. Then mixed it well using a glass rod and it is filtered. Then the filtrate is used for phytochemical analysis.

1.2.2 Preparation of Ethanol extract

Taken 30 gm of *Pisonia umbilifera* powder was packed in filter paper and extracted in Soxhlet's apparatus using 150 ml of ethanol. The samples in the apparatus was kept boiling till the solution becomes clear and the dark colored extract was collected at the bottom of the apparatus. The extract was stored in a container for further use.

PHASE II`

2.1 Phytochemical Screening

2.1.1 Test for Phenol

Taken 1ml of the plant leaf extract added 20µl of 1% ferric chloride. The appearance of bluish black precipitate indicates the presence of phenol [7].

2.1.2 Test for Flavonoids

Taken 1ml of the plant leaf extract added few drops of 1% sodium hydroxide solution. The appearance of yellow colour indicates the presence of flavonoids [7].

2.1.3 Test for Terpenoids

Taken 0.5ml of the plant leaf extract added 2ml of chloroform and 3ml of concentrated sulphuric acid along the sides of the test tubes. The appearance of reddish brown colour at the interface indicated the presence of terpenoid [8].

2.1.4 Test for Quinones

To 1ml of the plant leaf extract added few drops of concentrated hydrochloric acid. The presence of yellow precipitate indicated the presence of quinines [8].

2.1.5 Test for Glycosides

To 2ml of the plant leaf extract added 1ml of glacial acetic acid. To that added 1% ferric chloride solution drop by drop and then added concentrated sulphuric acid along the sides of the test tube. The appearance of greenish blue color indicates the presence of glycosides [9].

2.1.6 Test for Tannins

To 1ml of the leaf extract added 10ml of distilled water. The solution was then filtered and then added few drops of 0.1% ferric chloride slowly to the filtrate. The appearance of brownish green colour indicated the presence of tannins [7].

2.1.7 Test for Saponins

To 1ml of the plant leaf sample added 2ml of distilled water. The solution was shaken and then added three drops of coconut oil; the solution was shaken again and then observed for formation of emulsion. The formation of emulsion indicated the presence of saponins [8].

2.1.8 Test for Steroids

Taken 1ml of the plant leaf extract added few drops of chloroform, acetic anhydride and concentrated sulphuric acid. The appearance of dark pink or red colour indicates the presence of steroids [8].

2.1.9 Test for Alkaloids

Taken 1ml of the leaf extract added 1ml of saturated picric acid solution (Hager's solution). The appearance of yellow precipitate indicates the presence of alkaloid [8].

2.1.10 Test for Reducing Sugars

Taken 1ml of the plant leaf extract added equal volume of Benedict's reagent and allowed to stand in a water bath for 10 minutes. The appearance of brownish red precipitate indicates the presence of reducing sugars [8].

2.2 *In vitro* Antioxidant Activity

2.2.1 Ferric Reducing Antioxidant Power Assay

The reducing power of the plant extract was determined by the method of [10]**.** Substances which have reduction potential react with potassium ferric cyanide (Fe^{3+}) to form potassium Ferro cyanide (Fe^{2+}), which then reacts with ferric chloride to form ferric-ferrous complex that has an absorption maximum at 595nm. Increase in the reduction of

ferric to ferrous ion increases the absorbance indicating the reducing ability of plant extract.

Procedure

Varying concentration of sample (200, 400, 600, 800 and 1000µg) in double distilled water was mixed with 2.5ml of phosphate buffer and 2.5ml of Fe^{3+}. The mixture was incubated at 50°C for 20 minutes after which 1.5ml of TCA was added and centrifuged at 3000rpm for 10 minutes. From all the tubes, 0.5ml of supernatant was mixed with 1ml of distilled water and 0.5 ml of ferric chloride. The absorbance was measured at 595nm in a spectrophotometer. Ascorbic acid was used as standards for comparison. Increased absorbance of the reaction mixture indicates increasing reducing power, incubation with water in place if additives were used as the blank.

% scavenging of hydrogen peroxide= $(A_0-A_1) \times 100/A_0$

A_0 = Absorbance of control

A_1 = Absorbance in the presence of plant extract.

III. RESULT AND DISCUSSION

PHYTOCHEMICAL SCREENING

Table: 1 **Phytochemical screening of *Pisonia umbellifera* leaf extract**

TESTS	ETHANOL	AQUEOUS
ALKALOIDS	+	-
FLAVONOIDS	+	+
TERPENOIDS	+	-
PHENOL	+	+
TANNINS	+	+
REDUCING SUGAR	+	+
SAPONINS	+	+
STEROIDS	-	+
QUINONES	+	-
GLYCOSIDES	+	+

From the table 1 shows that *Pisonia umbellifera* leaf extract has the presence of of flavonoids, phenol,tannins, reducing sugar ,saponins ,steroids, glycosides in the aqueous extract. The ethanolic extract of *Pisonia umbellifera* shows the presence of alkaloids, flavonoids, terpenoids, phenol, tannins, glycosides, reducing sugar, saponins, and glycosides.

IV. FERRIC REDUCING POWER ASSAY

The oxidation reaction produces reactive oxygen species, which may start chain reactions that can damage biomolecules but antioxidants can terminate these chain reaction by removing free radical intermediates. The basic function of antioxidant molecules is to help in preventing the oxidative stress and to help in protecting the cells by scavenging the free radicals and they may play important role in the treatment of various diseases [11].

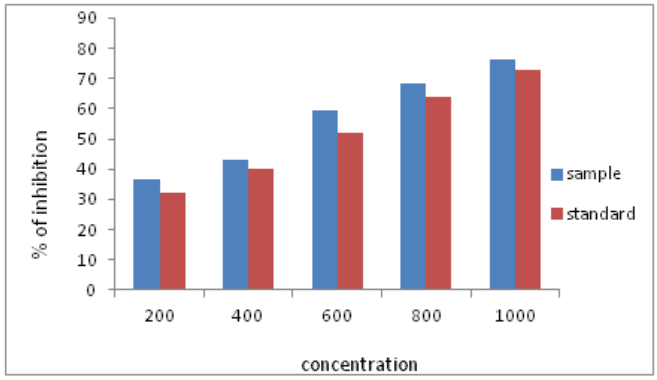

Fig.1 Antioxidant activity of ferric reducing assay of *Pisonia umbellifera* leaf extract

From the figure 1 shows that the presence of antioxidant activity ethanol leaf extract of *Pisonia umbellifera* at different concentration. The result shows that inhibition of FRAP of ethanolic extract of *Pisonia umbellifera* is compare to standard. The sample value gradually increased in the concentration of 600,800,100 µl/mg.

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