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INVESTIGATION OF PHYTOCHEMICAL PARAMETERS OF ETHANOLIC EXTRACT OF *PELTOPHORUM PTEROCARPUM* FLOWERS

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ABSTRACT

Peltophorum pterocarpum belongs to the family caesalpiniaceae. It is commanly known as yellow poinciana, golden flame and copper pod. In Ayurveda it is used in many conditions and traditionally it is proved to be used in the treatment of stomatitis, insomnia, constipation, ringworm, dysentery, muscular pains, sores and ski n disorders. The objective of the present study involves the phytochemical investigation of the *Peltophorum pterocarpum* flowers. The flowers are extracted with the 70 % ethanol and phytochemical evaluation was carried out for the determination of Carbohydrates, Alkaloids, Flavonoids, Sterols, Tannins, phenolic compounds and Aminoacids. Results revealed the presence of Carbohydrates, Alkaloids, Flavonoids, Sterols, Tannins, phenolic compounds and Aminoacids.

INTRODUCTION:

Peltophorum pterocarpum is a common deciduous tree grown in topical contries. Different names of this plant are Yellow Poinciana, golden flame, copper pod, Rusty shield bearer and Yellow flamboyant. The plant grows at a height of about 40 to 50 feet and it spreads about 30 to 40 feet. The flowers are in yellow colour with pleasant fragrance which appears with a glow. Generally flowering is observed during summer.[1]

Different parts of this tree are use full to treat many diseases like stomatitis, insomnia, skin troubles, constipation, ring worm. The flower extract is known to be a good sleep inducer and used in insomnia treatment. Bark is used as a medicine for dysentery and can also be used to prepare eye lotions and to treat pains and sores. Leaves of the plant are used in treating skin disorders in the form of decoction. Stem infusion of this plant used to treat dysentery, gargles, tooth powder and to reduce muscle pain. The flowers are used as astringent to relive intestinal disorders after pain at child birth, sprains and to treat swelling. The flowers of these plants are the rich sources of carotinoids [2]. The chemical constituents of this plant are known to exhibit several biological activities such as anti microbial activity, anti oxidant activity, cytotoxic activity, anti glycemic activity, aldose reductase inhibition activity, cardiotonic activity and choline esterase inhibitory activity etc [3-8]. The present objective of the study is preparartion of the ethanolic extract

of *Peltophorum pterocarpum* flowers (EEPP) and investigation of phytochemical parameters of the EEPP.

Figure 1: *Peltophorum pterocarpum* tree

Figure 2: Flowers of *Peltophorum pterocarpum*

MATERIALS AND METHODS:

Collection of *Peltophorum pterocarpum* flowers:

The fresh flowers of *Peltophorum pterocarpum* were collected from the village Peddasettypalli, Proddatur, Kadapa district, Andhra Pradesh, India, in the month of April 2014. The plant was authenticated by Dr. Madhav Chetty, Taxonomist, S.V. University, Tirupathi, India. The flowers were shade dried at room temperature and the shade dried flowers of *Peltophorum pterocarpum* were powdered with the help of rotary grinder.

Extraction of *Peltophorum pterocarpum* flowers:

Finely powdered flower sample (500 gm) was packed in Soxhlet apparatus for extraction with 400 ml of 70 % ethanol until it does not show the presence of any residue on evaporation. Solvents were removed from the extracts with the help of rotary vacuum evaporator.

Phytochemical investigations:

1. Detection of carbohydrates [9]:

A. Molish's test:

To 2 – 3 ml extract few drops of molish's reagent (alpha naphthol solution in alcohol) was added. The test tube was shaken well and conc. sulphuric acid was added along the sides of the test tube. Formation of violet ring at the junction of two liquids.

B. Fehling's test:

In a test tube 1 ml of Fehling's A and 1 ml of Fehling's B solutions were added. These mixed solutions were boiled for a minute. Then equal amount (2 ml) of test solution was added. Brick red precipitate was observed which confirmed the presence of carbohydrates.

2. Detection of Proteins [10]:

A. Xanthoprotein test:

3ml of test solution was taken in a test tube. To this 1ml of conc. Sulphuric acid was added along the sides of the test tube. Yellow precipitate has observed due to the presence of proteins.

B. Millon's test:

1ml of test solution was taken in a fresh test tube followed by the addition of 3 ml of million's reagent. The solution is boiled. Brick red colour observed due to the presence of protein.

C. Ninhydrin test:

About 1 ml of test solution was taken in a test tube. To this solution 3 drops of Ninhydrin reagent was added and boiled. Purple (or) bluish colour observed due to the presence of amino acids.

3. Detection of sterols [11]:

A. Salkowski reaction:

2ml of extract was taken in a test tube. To this 2 ml of chloroform was added. Then 2 ml of conc. sulphuric acid was added along the sides of the test tube slowly and shaken well. Greenish yellow fluorescence appeared. This confirmed as the presence of sterols.

B. Libermann – Burchard reaction:

In a test tube, 2 ml of test solution was taken followed by the addition of chloroform. To this 2 ml of acetic anhydride was added and heated.

Solution was allowed to cool for few seconds then conc. sulphuric acid was added slowly along the sides of the test tube. Blue colour appeared which confirmed the presence of sterols.

4. Detection of Alkaloids [12]:

Little quantity of extract was taken in a test tube. To this, 2ml dil. HCl was added. The solution was shaken well and filtered. This filtrate was used to perform the following tests:

A. Dragendorff's reaction:

2 to 3 ml of filtrate was taken in a fresh test tube. To this few drops of dragendroff's reagent was added. Orange brown precipitate indicates presence of alkaloid**.**

B. Mayer's test:

2 to 3 ml of filtrate was taken in a test tube followed by the addition of mayer's reagent. A white precipitate indicates presence of alkaloid.

C. Hager's test:

2 to 3 ml of filtrate was taken in a test tube followed by the addition of Hager's reagent. A yellow precipitate indicates presence of alkaloids.

D. Wagner's test:

2 to 3 ml of filtrate was taken in a test tube followed by the addition of Wagner's reagent. A reddish brown precipitate indicates presence of alkaloids.

5. Detection of Tannins and phenolic compounds [13]:

A. Ferric chloride solution test:

Little quantity of extract was taken in a test tube. To this, 2 ml ethanol was added and mixed well followed by the addition of 1ml of 5 % ferric chloride reagent. Deep blue colour indicates the presence of tannins.

B. Lead acetate test:

2 m1 of extract was taken in a test tube followed by the addition of alcohol and shaken well. To this 2 ml lead acetate was added. White precipitate formed which indicates presence of tannins.

C. Dilute iodine test:

2 ml of extract was taken in a test tube followed by the addition of alcohol and shaken well. To this add 2 ml of dilute iodine solution. Transient red colour is formed which indicates presence of tannins.

D. Dilute HNO_3:

2 ml of extract was taken in a test tube followed by the addition alcohol and shaken well. To this add 2 ml of dilute HNO_3. Reddish to yellow colour was formed which inferred indicates the presence of tannins.

E. Dilute Potassium permanganate solution:

2 ml of extract was taken in a test tube followed by the addition of alcohol and shaken well. To this add 2 ml of Dilute Potassium permanganate solution was added and the appearance of discolouration.

6. Detection of Flavonoids [14]

A. Shinoda test:

Little quantity of extract was taken in a test tube. To this, 5 ml 95 % ethanol was added followed by the addition of 2 ml conc. HCl along the sides of the test tube slowly. Then 0.5 g magnesium turnings were added. Appearance of pink colour confirmed the presence of flavonoids.

RESULTS:

Peltophorum pterocarpum flowers were subjected to phytochemical screening. Ethanolic extract of the plant contains carbohydrates, proteins and aminoacids, sterols, alkaloids, flavonoids, phenolic compounds and tannins (Table 1).

CONCLUSION:

The Ethanolic extract of 70% Ethanolic extract of *Peltophorum pterocarpum* tested for phytochemical constitutents like reducing sugars, phenolic compounds, flavanoids, protein, carbohydrates. The knowledge of the chemical constituents of plants helps to screen for biological activities. The phenolic and flavanoids are widely distributed secondary metabolites in plants having anti-oxidant activity and have wide range of biological activities as anti-apoptosis, anti-aging, anti carcinogen, anti-inflammation, anti-atherosclerosis, cardiovascular protection and improvement of endothelial function, as well as inhibition of angiogenesis and cell proliferation activities [15].

Table 1: Phytochemical evaluation of *Peltophorum pterocarpum* flowers

S.No.	Plant constituent	Test	Inference
1	Carbohydrates	Molish's reagent Fehling's test	+ve +ve
2	Proteins and Amino acids	Ninhydrin test and Millons test	+ve
3	Sterols	Salkowski reaction Libermann – Burchard reaction	+ve +ve
4	Tannins & Phenolic compounds	Ferric chloride solution test Lead acetate test Dilute Iodine test Dilute HNO_3 test Dilute $KMNO_4$ test	+ve +ve +ve +ve +ve
5	Flavonoids	Shinoda test	+ve
6	Alkaloids	Dragendroff's test Mayer's test and Wagner's test Hager's test	+ve +ve +ve

Figure 3: Tests for tannins (Phenolic compounds)

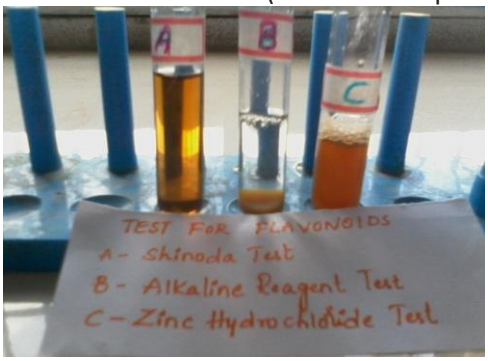

Figure 4: Test for flavonoids

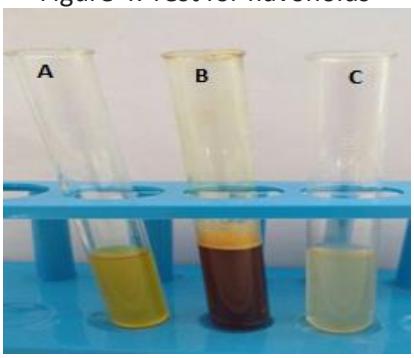

Figure 5: Test for alkaloids (A-Hager's test, B- Dragendorff's test, C- Mayer's test)

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