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PHYTOCHEMICAL ANALYSES OF LEAVES AND ROOT EXTRACTS OF *Mimosa pudica* Linn. (Mimosaceae)

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ABSTRACT

Mimosa pudica L is a reviving herb. Additionally termed chuimui, sleeping grass, sensitive plant, petition plant, touch me not, the objective of this study was to investigate the pharmacognostic and phytochemical constituents of a noteworthy medicinal plant, *Mimosa pudica* L. The physico-synthetic boundaries, such as total debris, extractive properties, and variety, are not fixed. The extractive properties can be used to determine Debasement. The initial phytochemical combinations and fluorescence research were examined for the presence of Alkaloids, Flavanoids, Steroids, Tannins, Glycosides, and Amino acids, among other major and minor constituents.

Keywords: *Mimosa pudica* , Phytochemical, sleeping grass, Ethanolic extract, Petroleum ether extract, Aqueous extract

INTRODUCTION

Mimosa pudica Linn. (Mimosaceae), additionally called contact me not, live and pass on, disgrace plant, and humble plant, is

a prostrate or semi-erect subshrub found in tropical America and Australia, as well as India. It is densely furnished with recurved

thistles and has delicate dark green leaflets that crease and hang in the evening or when contacted and cooled [1]. These new bowing adaptations have earned it the designation of 'interest plant.' By all accounts, it appears to be a potential natural possibility worthy of further exploration, as evidenced by its pharmacological profile. It possesses antibacterial [2], antitoxin neutralising agent [3], antifertility [4], anticonvulsant [5], stimulant [6], sexual enhancer, and a variety of other pharmacological properties. For a long period of time, the spice has been used to cure urogenital problems [7], diarrhoea [8], sinusitis [9], and also to treat injuries [10]. This work aims to investigate and classify the different pharmacognostic and phytochemical components of the activity plant *M. pudica* that have been reported to date.

Preparation for extract

a. Preparation of the plant for extraction of the leave and root (Petroleum ether, alcoholic, aqueous) [11–13]

1. Preparation of petroleum ether extract consists of the following steps:

For the extraction of approximately 500 g of dried powder, petroleum ether was utilised. The extraction process was continued until the solvent in the thimble

became transparent. As soon as the extract had been wholly extracted, it was filtered, and the solvent was distilled away. It was then condensed into a dry residue, which was discarded. It was necessary to allow the marc to dry naturally at room temperature before extracting it with the subsequent solvent.

2. The following is the procedure for creating the ethanolic extract:

The marc obtained from the petroleum ether extract was further extracted with the use of ethanol.

3. Preparation of the Aqueous Extract:

After the ethanoic extract had been removed with water, the marc had to be removed

b. Preliminary Phytochemical examination [14-17]

The extracts were subjected to several chemical tests to determine any compounds' presence

IDENTIFICATION OF CARBOHYDRATE

Individually diluted extracts were filtered before being used in the test solution, which included 5ml of distilled water and was prepared as previously described. Investigations were conducted to determine whether carbohydrates were present or not in the filtrates.

Molisch's test

In the case of a true statement, Molisch's test can be used to assess if the statement is true or not accurate. In a test tube, two drops of the alcoholic-naphthol solution were added to the filtrates before 2 mL con. Sulphuric acid was gently poured along the sidewalls of the test tubes to finish the treatment. Due to the configuration of an indigo ring at the intersection, it has been shown that carbohydrate is present.

Benedict Test

The Benedictine Examination is a type of examination that takes place at a monastery. Benedict's reagent was used to treat the filtrates before they were heated in a water bath as part of the experiment. The development of an orange-red impetuous determined the occurrence of reducing sugars.

Fehling's Test

Hydrolysed filtrates were alkalised and heated using Fehling's A and B solutions after being filtered through dilute hydrochloric acid solutions. When red precipitate occurs, it is due to the presence of reducing sugars.

IDENTIFICATION OF ALKALOIDS

To prepare the test solution, the extracts were diluted in dilute hydrochloric acid and filtered separately from one another. The

alkaloid reagents were used to evaluate the filtrates once they were collected properly.

a) Mayer's Test (also known as the Mayer's Test)

The filtrates have been treated with Mayer's reagent (mercuric potassium iodide), and the occurrence of alkaloids was detected by the formation of a yellow cream precipitate.

b) The Wagnerian Experiment

Following Wagner's reagent (iodine in potassium iodide), the filtrates were examined to determine the findings. When alkaloids are present, a brown/reddish-brown precipitate is formed, which can be recognised.

c) Dragendroff test

When working with the filtrates, we used the reagent Dragendroff (solution of potassium bismuth iodide). The production of a crimson precipitate demonstrates the presence of alkaloids.

d) Hager's Test (also known as the Hager's Test)

The filtrates were subjected to Hager's reagent treatment (saturated picric acid solution). The presence of alkaloids is indicated by the presence of yellow colour in the precipitate.

IDENTIFICATION OF GLYCOSIDES

After extracts were hydrolysed with dilute hydrochloric acid, glycoside assays were

performed on the hydrolysate to determine their concentrations.

a) Modified Borntrager's Test

After being treated with ferric chloride solution, the extracts were boiled for around 5 minutes in a boiling water bath to remove the iron. The mixture was chilled and stirred after being added an equal amount of benzene. Separation of the benzene layer was performed, and half of the volume of ammonia solution used to cure it was utilised. The occurrence of anthranol glycoside in the ammonial cover is suggested by pink or cherry red in the layer.

b) The Legal's Examination

To treat the extracts, sodium nitroprusside in pyridine and methanolic alkali were utilised in conjunction with pyridine. The presence of cardiac glycoside is manifested as pink to crimson deposits on the heart's surface.

c) Killer killiani Test

A 0.5g dried extract was diluted within 2 mL glacial acetic acid with one plummet of ferric chloride solution to get a final concentration of 0.5g dry extract. Then 1 ml of concentrated H₂SO₄ was put on top of the solution. The presence of the cardenolides results in the formation of a brown ring.

IDENTIFICATION OF SAPONINS

The test elucidation was completed by dissolving the extract in water and assimilating it together.

a) Froth's Test (also known as the Froth's Test)

The extracts were diluted to a concentration of 20 ml in distilled water and mixing for 15 minutes in a graduated cylinder to get the final concentration. It is possible to identify saponins by creating a one-centimetre layer of foam on the sample's surface.

B) The Liberman Test, developed by Burchard

The extracts were treated with Chloroform and then filtered to remove any impurities. It was necessary to add a small number of acetic anhydride that had been boiled and cooled to the filtrates. Concentrated sulphuric acid was poured into the test tube through the sidewalls of the tube. The existence of steroidal saponins was demonstrated by forming a brown ring at the confluence of the two groups of cells.

IDENTIFICATION OF PHYTOSTEROLS

To make the test extract solution, the extracts were each separately heated in a refluxing chamber with an alcoholic potassium hydroxide solution until they were saponified entirely (see below). After the saponified extract had been diluted with water, undesirable components were eliminated with diethyl ether to prevent contamination. Using Chloroform, the ethereal extract was

evaporated, and the residue (which contained unsaponifiable elements) was analysed.

a) Salkowaski Test

When a small number of concentrated H_2SO_4 were added to the test extract solution and shaken and allowed to stand, the lower layer turned red, signifying the existence of sterols.

b) Libermann's Berchard Test

When con. H_2SO_4 was added from the sides of the test tube to the test solution treated with a few drops of acetic anhydride and mixed, and it showed a brown ring at the junction of the two layers upper layer turned green.

c) Libermann's reaction

Mix three ml of acetic anhydride with three ml of acetic acid, heat, cool. After adding a few drops of concentrated H_2SO_4 , the reaction was complete. The blue colour was apparent.

d) Sulfer Test

When it was added to the test solution, sulphur sank to the bottom.

DETECTION OF FIXED OIL AND FATTY ACIDS

a) Examination of the stain

Additionally, a small number of extracts were squeezed between two filter papers in a separate experiment. The presence of an oily smear on filter paper indicates the presence of fixed oil.

a) The Soap Test (also known as the Soap Dish Test)

In a water bath, the extracts were heated with a 0.5 N alcoholic potassium hydroxide solution for 15 minutes until they were clear. In the occurrence of fixed oils and fats, the creation of soap is a telltale sign of their presence.

THE DETECTION OF TANNINS AND PHENOLIC COMPOUNDS

a) Ferric chloride test

It was necessary to add a few drops of neutral ferric chloride solution to the extract. In the presence of a phenolic nucleus, the development of a bluish-black colour indicates its presence.

b) Gelatin Test

The extract was treated with a 1 percent gelatin solution containing sodium chloride before being diluted. The presence of tannins is demonstrated by the formation of a precipitate that is white in colour.

c) Check for the presence of lead acetate

Following treatment with a bit of drop of lead acetate solution, flavonoids were detected by forming a yellow precipitate on the surface of the extract.

d) Alkaline reagent Test

Individually, the extracts were treated with a few drops of sodium hydroxide to bring them up to pH 7. Adding a few drops of dilute acid

to a solution of flavonoids causes the creation of a brilliant yellow hue, which gradually fades away to leave an almost colourless solution.

e) Test of Shinoda

A few shards of magnesium metal were used to treat each extract independently, and then drops of powerful hydrochloric acid were applied one at a time until the extracts were completely destroyed. The presence of flavonoids is indicated by the formation of a magenta colour.

f) Hydrochloric vanillin as a test substance

A few drops of vanillin hydrochloride reagent were added to the extracts to give them their characteristic flavour. The presence of tannins is indicated by the formation of red colour in the liquid sample.

THE DETECTION OF PROTEINS AND AMINO ACIDS

Preparation of the Test Solution: Test solution extract was dissolved in water and mixed thoroughly.

a) Millons Test

The extracts were treated with 2 mL of Millon's reagent. The presence of proteins is demonstrated by forming a milky white precipitate that convert into red when exposed to elevated temperatures.

b) Biuret test

After being treated with 1 mL of a 10% sodium hydroxide solution, the extracts were boiled to remove any residual sodium hydroxide. A drop of 0.7 percent copper sulphate solution was added to each of the previously mentioned mixtures. In the presence of proteins, the development of a reddish violet colour can be seen.

c) Ninhydrin Test

The extracts were heated for a few minutes after being treated with 0.25 percent ninhydrin reagent. The production of blue colour is indicative of the presence of amino acid.

RESULTS

Preliminary phytochemical screening

Specifically, *Mimosa pudica* leaves and root extracts were chosen as the subject of this inquiry. In separate batches, about 500g of dried leaves and roots were pulverised and extracted with petroleum ether, ethanol, and water. **Table 1** lists the different types of extracts and their respective extractive values, chemical composition, and extractive properties of leaf and root extracts of *Mimosa pudica* (Pudica Mimosa)

Table 2 contains qualitative chemical evaluations of *Mimosa pudica* leaf and root extracts.

Table 1: Nature and extractive values of leaves and root extracts of *Mimosa pudica* (Linn)

| Sr.NO | PART USED OF THE PLANT | SOLVENT | COLOUR | Yield (% w/w) |
|-------|--------------------------------|-----------------|--------------------------|---------------|
| 1 | Leaves of <i>Mimosa pudica</i> | Petroleum ether | Yellowish and sticky | 2.70 |
| | | Alcohol (70%) | Dark brown and semisolid | 11.12 |
| | | Aqueous | Pale brown and semisolid | 11.8 |
| 2 | Root of <i>Mimosa pudica</i> | Petroleum ether | Greenish and sticky | 3.01 |
| | | Alcohol (70%) | Greenish and semisolid | 7.25 |
| | | Aqueous | Pale brown and semisolid | 14.75 |

Table No: 2 Qualitative chemical examinations of leaves and root extracts of *Mimosa pudica* (Linn.)

| Sr. No | Phytoconstituents | EXTRACTS | | | | | |
|--------|--------------------------|----------|-------|-------|-------|-------|-------|
| | | PEMPL | EEMPL | AEMPL | PEMPR | EEMPR | AEMPR |
| 1 | Alkaloids | - | + | + | - | + | + |
| 2 | Glycoside | - | + | + | - | + | + |
| 3 | Saponins | + | + | - | - | + | + |
| 4 | Phytosterols | + | + | + | + | + | + |
| 5 | Phenolics and Tannins | - | + | - | - | + | + |
| 6 | Proteins and Amino acids | + | + | + | - | + | + |
| 7 | Fixed oils and Fats | + | - | - | + | - | - |
| 8 | Carbohydrates | - | + | + | - | + | + |

A positive sign (+) indicates presence; a negative sign (-) indicates an absence

Mimosa pudica petroleum ether leaf extract contains volatile oils, triterpenes, proteins, and saponins, whereas *Mimosa pudica* petroleum ether root extract contains phytosterols, lipid and fixed oils, according to the findings. Alcoholic extracts of *Mimosa pudica* 's leaves and roots contain alkaloids, glycosides, carbohydrates, saponins, proteins, amino acids, tannins flavonoids, and phenolic compounds other things. Alkaloids, carbohydrates, glycosides, phytosterols, proteins, amino acids and root extracts contain saponins, tannins and phenolic compounds, but water has none of these chemicals.

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