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PRELIMINARY PHYTOCHEMICAL SCREENING AND THIN LAYER CHROMATOGRAPHY OF PLANT *MIMUSOPS ELENGI* L LEAF ETHANOLIC EXTRACTS

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Abstract:

To study the Physico and phyto chemical characters of the plant Mimusops elengi L (family Sapotaceae) and also to carry out the thin layer chromatographic fingerprint. Phytochemical investigations and fluorescence analysis were carried out as per the standard techniques. Various quantitative parameters like ash values, extractive values and flavonoid content can be used as quality control parameters for the plant Mimusops elengi L were determined. The ethanolic extract with ethanol and analysis was developed by using Thin Layer Chromatography (TLC) technique equipped with pre coated Silica plate of 12cm height using automatic TLC scanner. Alkaloid, tannin, flavonoid, cardiac glycosides, and coumarins were found in preliminary phytochemical research. TLC examination of an ethanolic extract of Mimusops elengi L revealed a variety of phytoconstituents with varying mobile phase compositions. The plant's TLC fingerprint was examined. Mimusops elengi L is helpful as a phytochemical marker and an excellent estimator of genetic variability in plant populations, and it can be used as a diagnostic tool.

Keywords: *Plant extract of Mimusops elengi L leaf, Phytochemical screening, fluorescent character, TLC analysis.*

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INTRODUCTION:

Modern research tools for analyzing plant drugs are now accessible, but the pharmacogenetic method is one of the most straightforward and cost-effective methods for determining the correct identity of the source materials to begin with. In the realm of pharmaceutical biology, natural products are well-known. Plants have been used as a source of medicine for thousands of years. Traditional remedies are still used by up to 80% of individuals, according to the World Health Organization. Many contemporary drugs are natural molecule mimics or contain structures taken wholly or partially from natural patterns. Hindus revere *Mimusops elengi*, and its fragrant blossoms are referenced in the Puranas and even included among the Hindu paradise flowers. By playing his flute beneath a *Mimusops elengi* tree on the banks of the Yamuna, Krisna is said to have bewitched the milkmaids of Mathura. In Kalidasa's classic Sanskrit literature, *Mimusops elengi* blossoms are also a symbol of love and beauty. It has made a great contribution to science both in ancient times and in modern studies due to its vast variety of therapeutic qualities. *Mimusops elengi* is a small to medium-sized evergreen tree that can grow up to 15 metres tall. A short, dark, and very rough trunk with a wide spreading, the ends of which tend to rise and make a thick globular head, forms a thick globular head to the tree. In the Western Ghats' lush evergreen forests, the *Mimusops elengi* tree develops to tremendous proportions; in the Eastern Ghats, it grows in drier areas, frequently on laterite, and is much smaller.

BOTANICAL INFORMATION:

TAXONOMIC POSITION:

Kingdom	:	Plantae
Order	:	Ericales
Family	:	*Sapotaceae*
Genus	:	*Mimusops*
Species	:	*Elengi*

METHODS AND MATERIALS:

Plant collection:

The Mimusops Elengi Linn whole plant was collected from the during august of 2021 from local area of Puliyur, Krishnagiri, Tamil Nadu, India and were authenticated by Dr.K.Gowrisankar, Head And Assistant Professor, PG and Research, Department of Botany, Sri Vijay Vidyalya College Of Arts And Science, Nallampalli, Dharmapuri, Tamil Nadu-636807. One set of the plant has been preserved in our laboratory for future reference.

Plant Extraction:

The plant's leaves were sun-dried and processed until they were a coarse powder with 60-80 mesh sieves. A total of 120 grams of powdered plant material were removed. In a Soxhlet device, the dry powder of *M. elengi* leaf samples were extracted separately with solvents of 20% ethanol at 45°C for 24 hours. These extracts were concentrated and used in a preliminary phytochemical study to determine their quality.

Preliminary screening:

The plant leaf extract with ethanol extracts and the powder were subjected to qualitative chemical analysis as per the following procedure. The results were presented in Table 1. The extract was subjected to phytochemical analysis to test the presence of alkaloids, carbohydrate, protein, phenol, flavonoids, tannins, phytosterols, and reducing sugar in plant leaf extracts.

Tests for carbohydrates:

Fehling's Test:

1 ml. Fehling's a solution and 1 ml. of Fehling's B solution were mixed and boiled for one minute. Now the equal volume of test solution (ethanolic extract) was added to the above mixture. The solution was heated in boiling water bath for 5-10 minutes. First a yellow, then brick red precipitate was observed.

Tests for proteins:

Xanthoproteic Test:

To the small quantity of ethanolic extract 1ml. of conc. H2SO4 41 Available online on www.ijpsr.com was added. This resulted in the formation of white precipitate which on boiling turned yellow. On addition of NH4OH, yellow ppt. turned orange.

Tests for glycosides:

Borntrager's Test:

To the 3ml of ethanolic extract, dil. H2SO4 was added. The solution was then boiled and filtered. The filtrate was cooled and to it equal volume of benzene was added. The solution was shaken well and the organic layer was separated. Equal volume of dilute ammonia solution was added to the organic layer. The ammonical layer turned pink showing the presence of glycosides.

Test for steroids:

Salkowski Test

To 2 ml. of ethanolic extract, 2 ml of chloroform and 2 ml of conc. H2SO4 was added. The solution was shaken well. As a result chloroform layer turned red and acid layer showed greenish yellow fluorescence.

Tests for alkaloids:
The ethanolic extract was evaporated in a test tube. To the residue dilute HCl was added, shaken well and filtered. With the filtrate following tests were performed:

Hager's Test:
To the 2-3 ml of filtrate Hager's reagent was added. Yellow precipitate was formed showing the presence of alkaloids.

Mayer's Test:
To the 2-3 ml of filtrate Mayer's reagent was added. Formation of yellow precipitate showed the presence of alkaloids.

Tests for flavonoids:
Shinoda Test:
To the ethanolic extract, added 5 ml of 95% ethanol and few drops of conc. HCl. To this solution 0.5 g of magnesium turnings were added. Observance of pink coloration indicated the presence of flavonoids.

Lead Acetate:
To the small quantity of ethanolic extract lead acetate solution was added. Formation of yellow precipitate showed the presence of flavonoid.

Sodium Hydroxide:
On addition of an increasing amount of sodium hydroxide, the ethanolic extract showed yellow coloration, this decolorized after addition of acid.

Tests for Tannins and Phenolic compounds:
FeCl3 Solution Test:
On addition of 5% FeCl3 solution to the ethanolic extract, deep blue black colour appeared.

Lead Acetate Test:
On addition of lead acetate solution to the ethanolic extract white precipitate appeared.

Dil. HNO3 Test:
On addition of dilute HNO3 solution to the ethanolic extract, reddish colour appeared.

Test for saponins:
Foam Test:
Drug extract was shaken vigorously with water. No persistent foam was formed

Test for triterpenes:
To the ethanolic extract chloroform and conc. H2SO4 was added. Appearance of red colour indicated the presence of triterpenes.

Thin Layer Chromatography:
To identify the major components, present in the Extract a different number of solvent systems were tried and the solvents Toluene: ethylacetate: Formic acid was identified. Thin layer chromatographic studies of the ethanolic extract of *Mimusops elengi* L leaf.

Chromatographic rectangular glass chamber was used in the experiments to avoid insufficient chamber saturation. Different mobile phase where tried but the satisfactory resolution was obtained in the solvent systems mentioned in figure 2 and 3. After development of plates, there was air-dried and numbers of bands was noted & Rf (Retention Factor) values was calculated.

The Rf value was calculated as follows.

$$Rf = \frac{Distance\ travelled\ by\ \ the\ \ sample}{Distnace\ travelled\ by\ the\ solvent}$$

Evaluation of Ethyl acetate fraction by TLC

Stationary Phase : Silica gel G
Mobile Phase : Toluene: ethyl acatate: Formic acid
Proportion : 5:4:1
Reagent : Ferric chloride reagent
Solvent front : *7.5cm*
No of spots : 1

RESULT AND CONCLUSION:

The results of phytochemical studies are as follows,

Preliminary phytochemical screening:

Tested for its content of different classes of compounds. Various qualitative chemical tests for preliminary phytochemical screening of the extract for different types of chemical constituents were applied. Phytochemical tests on the extract gave positive reactions for alkaloids, reducing sugar, tannins, cardiac glycosides, flavonoids.

Table 1. Preliminary screening of *Mimusops elengi* leaf

SI.NO	PLANT CONSTITUENTS	ETHANOL EXTRACT
1	ALKALOIDS	+
2	REDUCING SUGAR	+
3	CARBOHYDRATE	-
4	TANNINS	+
5	CARDIAC GLYCOSIDES	+
6	COUMARINS	+
7	PHYTOSTEROLS	+
8	FLAVONOIDS	+

Ash of any organic material is composed of their non-volatile inorganic components. Controlled incineration of crude drugs results in an ash residue consisting of an inorganic material (metallic salts and silica). This value varies within fairly wide limits and is therefore an important parameter for the purpose of evaluation of crude drugs. Therefore, percentage of the total ash, acid insoluble ash and water-soluble ash were carried out. Extractive value is also useful for evaluation of crude drug, which gives an idea about the nature of the chemical constituents present in a crude drug and is useful for the estimation of specific constituents, soluble in that particular solvent used for extraction. Total ash value, acid insoluble ash and water-soluble ash were determined and results were in acceptable limits. Ash value, Extractive value and Loss on drying is the loss of mass expressed as percent w/w results are tabulated in Table 2. Fluorescent character of powdered drug under UV light are tabulated in Table 3.

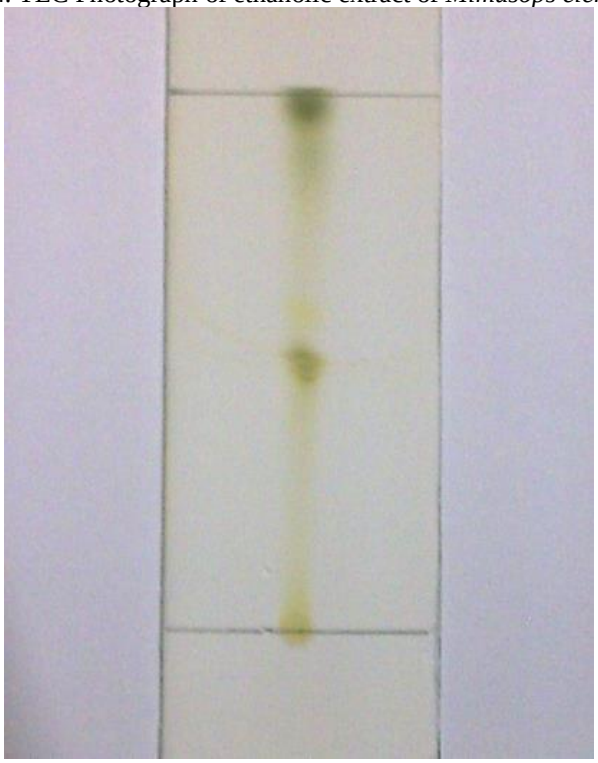
Table 2. Proximate values of *Mimusops elengi* leaf

Sr. No.	Parameters	leaf
	Ash Values (% w/w)	
1.	Total ash	7.9
2.	Acid insoluble ash	2.0
3.	Water soluble ash	-
4.	Sulfated ash	-
	Extractive values (% w/w)	
5.	Alcohol soluble extractive value	16’00
6.	Water soluble extractive value	30’79
7.	Chloroform soluble extractive value	-

Table 3. Fluorescent character of powder drug under uv light

S.NO	Treatment	Leaf
1.	Drug+nitrocellulose in amylacetate	Yellowish green
2.	Drug +1N NaOH in methanol	Black with greenish black
3.	Drug +1N NaOH dried + nitrocellulose in amylacetate	Blackish green
4.	Drug + 1N HCL	Dirty green
5.	Drug + 1N HCL dried + nitrocellulose in amylacetate	Yellow green

Table 4. TLC Photograph of ethanolic extract of *Mimusops elengi leaf*



CONCLUSION:

Thus, the fluorescence character, preliminary phytochemical screening, TLC analysis can be used as a diagnostic tool for the correct identification of the plant. The ethanolic extract fraction of the plant of *Mimusops elengi* L. leaf has a significant tannin content it is useful for further antidote studies.

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