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Research Article

EXAMINATION OF PHYTOCHEMICAL CONSTITUENTS – USING SEED EXTRACT OF *MADHUCA LONGIFOLIA*

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ABSTRACT

Objective: Our main scope and objective are to prepare seed extract of *Madhuca longifolia*, to characterize them using phytochemical activity studies, and to study the presence of so many bioactive substances established phytochemical activity and anti-foot ulcer treatment.

Methods: Weighed 75 g of plant sample (without preliminary drying) accurately (precisely weighed to within 0.10 g) in a tarred evaporating dish. Care was taken so that no substantial amount of moisture is lost during preparation and that was representative of the official sample and the sample has been made to screening to following studies such as physicochemical constants, determination of moisture content, evaluation of pH of aqueous solution, evaluation of total ash, evaluation of acid-insoluble ash, evaluation of extractive values, evaluation of water-soluble extractive, evaluation of alcohol-soluble extractive, and preliminary phytochemical screening phytochemical profile of *M. longifolia* seed.

Results: The presence of so many bioactive substances established phytochemical activity and anti-foot ulcer treatment using *M. longifolia* seed which supports the traditional tribal medicinal consumption of the plant.

Conclusion: The quality of the plant can be estimated by determining the physical parameters. These investigations are of great importance for carrying out the revalidation and it was accomplished from the phytochemical study that the solvent extract contains flavonoid, carbohydrate, saponin, tannin, glycoside, protein, alkaloid, and amino acid which are responsible for various pharmacological actions and promotes that biological study is required to explore their potential therapeutic activities.

Keywords: Phytochemicals, *Madhuca longifolia*, Iluppai, Seed, Tribal and medicinal plants.

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INTRODUCTION

Madhuca longifolia belongs to the family Sapotaceae and is an Indian tropical tree found largely in South Indian plains and forests. It is commonly known as iluppai (Tamil word) which means honey. It is also known as Indian butter tree. Iluppai is a deciduous and medium-sized tree found in India, Nepal, and Sri Lanka [1,2], all the parts of iluppai possess many medicinal qualities. Seed – antiulcer, wound healing, refrigerant, aphrodisiac, and tonic, and leaf – anthelmintic, emollient, and rheumatism. Flower – refrigerant, liquor, increase milk production in woman, diuresis, antihelmenthic, and hepatoprotective. Bark – tonsillitis, stomachache, and anti-venom in snake poisoning. Oil – laxative, hemorrhoids, and piles [3]. It is composed of various phytoconstituents which include flavonoids, triterpenoids, glycosides, saponins, and steroids [4]. The trees of *M. longifolia* seed are represented in Fig. 1 Taxonomical classification is shown in Table 1 [5,6].

The seeds of *M. longifolia* (Iluppai) are fed on by the moth *Antheraea paphia* which produces tassar silk (tussah) a form of wild silk of commercial importance in India. Oil extracted from its seeds is used for the treatment of foot ulcer, care of the skin, and manufacturing of soap and detergents and also used as vegetable butter. The oil is also used as a fuel oil.

METHODS

Collection of plant material: The plant seeds of *M. longifolia* (iluppai) were collected from Dr. Mahalingam College of Engineering and Technology, Campus Pollachi, Coimbatore District, Tamil Nadu, India. The plant was identified by Dr. U. Mani, Biotechnologist, and CSIR-Central Leather Research Institute, Adayar, Chennai.

Chemical analysis

Physicochemical constants determination of moisture content

Weighed 75 g of plant sample (without preliminary drying) accurately (precisely weighed to within 0.10 g) in a tarred evaporating dish. Care was taken so that no substantial amount of moisture is lost during preparation and that was representative of the official sample. The weighed sample of the plant was placed in the tarred evaporating dish, dried at 110°C for 3 h, and weighed. The drying and weighing were nonstop at 1 h period until distinction between two consecutive weighing almost corresponds and distinction was not more than 0.25%. When unvarying weight was reached, the material was cooled for 1 h in a desiccators and the percentage of moisture content was calculated.

Evaluation of pH of aqueous solution

The powdered materials (90 µm mesh) were floating in glass distilled water. After 1.5 h, clean and the clear solution was calculated for pH.

Evaluation of total ash

Incinerated concerning 6 g of precisely weighed plant sample in a tarred silica dish at temperature not exceeding 650°C in anticipation of free from carbon and weighed. premeditated the proportion of ash with reference to the air-dried plant sample.

Evaluation of acid-insoluble ash

Boiled the ash obtained from total ash for 10 min with 35 ml of dilute hydrochloric acid. Collected the insoluble matter in an ash less filter paper, washed with hot water, and ignited to constant weight. Calculated the proportion of ash with reference to the air-dried plant sample. The results are shown in Table 2.

Table 1: Taxonomical classification

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Ericales
Family	Sapotaceae
Genus	*Madhuca*
Species	*Longifolia*

Table 2: Physicochemical analysis of *Madhuca longifolia*

S. No.	Parameters	Value % W/W
1.	Colour	Brown coloured fine powder
2.	pH	6.83
3.	Loss on drying	6.7605
4.	Total ash content	12.1912
5.	Acid insoluble ash	0.6742

Table 3: Extractive values of *Madhuca longifolia*

S. No.	Parameters	Extractive values (%) W/W
1.	Hexane	0.5186
2	Ethyl acetate	0. 8931
3.	Methanol	65.57
4.	Aqueous	87.25

Fig. 1: The tree of *Madhuca longifolia* seed are represented

Evaluation of extractive values

Rightfully weighed quantity of the air dried, trampled plant sample was transfer to an extraction thimble, extracted with a mixture of solvents in the order of increasing polarity using Soxhlet extraction apparatus (for 8 h). Filtered the extract quantitatively into a tarred evaporating dish and evaporated off the solvent on a water bath. The residue was dried at 110°C to constant weight. Particular extractive values reminiscent of water-soluble extractive and alcohol-soluble extractive value were determined as per standard procedure mentioned in the WHO Library [3]. The results are shown in Table 3.

Evaluation of water-soluble extractive

A 5 g of the air-dried plant sample was macerated with 100 ml of water in a closed flask for 24 h, frequently shaken during the first 6 h and allowed to stand for 18 h. Filtered and evaporated 25 ml of remains to dryness in tarred flat-bottomed China dish and dried at 105°C until constant weight is added. Premeditated the percentage of water-soluble extractive with reference to the air-dried plant sample.

Table 4: The preliminary phytochemical analyses of *Madhuca longifolia* extracts

Phytochemical compounds	Cold percolation method			
	Methanol extraction	Aqueous extraction	Hexane extraction	Ethyl acetate extraction
Flavonoid	+	+	+	+
Carbohydrate	+	+	+	+
Saponin	–	–	–	–
Tannin	+	+	–	+
Glycoside	+	+	–	–
Protein	+	+	–	+
Alkaloid	+	–	+	+
Amino acid	+	+	+	+

+: Present, –: Absent

Evaluation of alcohol-soluble extractive

A 10 g of the air-dried plant sample was macerated with 200 ml of alcohol in a closed flask for 48 h, frequently shaken during the first 12 h and was allowed to stand for 18 h. Rapidly filtered taking safety measures against loss of solvents. Evaporated 35 ml of filtrate to dryness in a tarred flat-bottomed China dish and dried at 105°C until constant weight is added. Premeditated the percentage of alcohol-soluble extractive with reference to the air-dried plant sample.

Preliminary phytochemical screening

Newly prepared a variety of extracts of seed were analysis for the occurrence of phytochemical constituents using reported methods [7-9].

RESULTS AND DISCUSSION

Moisture content of drugs could be at bare minimum level to detect the growth of bacteria, yeast, or fungi during storage [10]. Ash values used to wrap up quality and purity of crude drug. It indicates the presence of various impurities such as silicate, carbonate, and oxalate [11,12]. In addition, the total ash of a crude drug also reflects the care taken in drug perpetuation, and the purity of crude and the prepared drug [13]. Acid-insoluble ash reflects the calcium oxalate content of the drug. In the current examination, considerable amount of total ash was noticed in seed, findings can be employed as quality parameter to evaluate *M. longifolia.* The vigorous chemical constituents may be soluble in different semi-polar, polar, and non-polar solvents [13]. Methanol and water showed highest extractive values, and both are able to extract most of phytoconstituents from the seed. Water decoction is a conventional method for preparation of drugs from the therapeutic plant [14]. The extractive values are valuable to assess the chemical constituent's current in the crude drug and also help in the estimation of specific constituents soluble in a particular solvent. The beginning phytochemical screening with the range of qualitative chemical tests naked the presence of various phytoconstituents such as carbohydrate, flavonoids, protein, tannins, and saponins. The results are shown in Table 4. The current investigate plants contained steroidal compounds. It should be noted that steroidal compounds are of importance and significance in pharmacy due to their relationship with such compounds as sex hormones [15]. The herb also contains saponins which are used to stop bleeding and in treating wounds and foot ulcers as it helps in red blood cell coagulation [16].

CONCLUSION

The current research is related to pharmacognostical, physical constants, and preliminary phytochemical screening of *M. longifolia* seeds provided useful information about its correct identity and evaluation. These parameters are required for the recognition of drugs and examination of the bioactive constituent in therapeutic herbs. The existence of a variety of chemical constituents in *M. longifolia* may be

a prospective cause of cure of various disorders. The quality of the plant can be estimated by determining the physical parameters. These investigations are of great importance for carrying out the revalidation and it was accomplished from the phytochemical study that the solvent extract contains flavonoid, carbohydrate, saponin, tannin, glycoside, protein, alkaloid, and amino acid which are responsible for various pharmacological actions [17-20].

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AUTHORS' CONTRIBUTIONS

Dr. P. A. Periasamy and Dr. S. Parveen conceptualized the research idea, performed literature search, phytochemical analysis part of this work, reviewed the manuscript, and edited.

CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest.

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