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Determination of Physiochemical Evaluation and Preliminary Phytochemical Screening of Leaves of Madhuca Longifolia(L.) J. F. Macbr.)

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Abstract: Mahuwa, also known as Madhuca longifolia (L.) J. F. Macbr., is a member of the Sapotaceae family. There are a number of medicinal applications for the powdered leaves. Although leaves are used, there has been no concerted effort to investigate them. When considering the potential medicinal value of a plant part, pharmacognosy is a useful starting point. Several physiochemical metrics and phytochemical screening investigations were planned for this study of Madhuca longifolia. Ethanolic extracts were analysed for a variety of phytochemicals in an initial phytochemical screen; they included alkaloids, glycosides, steroids, saponin, carbohydrates, proteins, flavonoids, and tannins. This study used ash value, fluorescence analysis, and thin layer chromatography on the leaves extract to show that the drug can be quickly identified, which is especially useful when dealing with powdered forms and contributes to the establishment of Pharmacopoeial standards for the designated plant.

Keywords: physiochemical, Mahuwa, Sapotaceae, Leaves,Phytochemistry

1.INTRODUCTION:

Herbal medications date back to the ayurvedic period and are revered as the foundation of ancient systems of treatment due to their powerful pharmacological impact. In poor nations, almost 75% of the population continues to rely on remedies from the past. As a result of scientific investigation, it has been shown that chemicals originating from plants exhibit a wide range of effectiveness and safety with relatively less adverse effects than synthesised molecules. Therefore, further screening of potentially useful plants is required[1, 2].

The Madhuca longifolia (M. longifolia) is a member of the sapotaceae family and is often known as the mahua or butter nut tree. Throughout India, Nepal, and Sri Lanka, you may find these medium-sized evergreen deciduous trees. Due to its wide range of pharmacological qualities, M. longifolia is employed in both conventional and alternative medical systems. Ayurvedic medicine's "universal panacea" moniker is a result of this fact. Epilepsy, diabetes, inflammation, pneumonia, ulcers, and other disorders have all responded well to therapy with various components of M. longifolia. The oil pressed from Madhuca seeds has several applications, including those of a biofuel and a healthy cooking fat. It also has potent antibacterial and antioxidant effects. The flowers have been used for centuries for a wide variety of medicinal purposes, including as a cooling agent, an astringent, and a demulcent; recent clinical research has also shown the blooms' ability to boost sperm count. M. longifolia leaves are utilised for bronchitis and Cushing's disease and contain antioxidant qualities. Treatment for diabetes, snake venom poisoning, itching, and swelling have all been found in the barks[3].

FIG. 1: PLANT OF MADHUCA LONGIFOLIA

2. MATERIALS AND METHODS:

2.1. Collection of plant material:

Authentic leaves samples were collected from Narayan Bagh in Jhansi,India. The given specimen was identified by consulting Floras of Madhya Pradesh, Volume 2, 1997 and was finally

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authenticated after comparison with known Herbarium specimen in Central herbarium, Jhansi. The accession no. of thesample is (ACC. No 28752).

2.2. Physico-chemical evaluation:

Madhuca longifolia leaf extracts were used to determine many physicochemical constants. The criteria were developed using the guidelines for quality control of medicinal plant materials published by the World Health Organization in 2011. The techniques for determining physicochemical properties are described in full below[4].

Ash value:

Total ash, acid-insoluble ash, and water-soluble ash are the three methods used to determine a medicinal plant's ash value[5].

Total ash determination:

Dry, tared silicon crucibles were filled with a coarse powder made from air-dried Madhuca longifolia leaves. Spreading the powder sample and torching it until it achieved a constant weight at 450 0C, at which time the plant material had become white, indicating the absence of organic content, was the next step. After being placed in desiccators to cool, the crucibles were weighed to ascertain the total amount of ash. Data was represented as a percentage w/w of the total ash and used to calculate the percentages of acid insoluble and water soluble ash[6].

Acid insoluble ash determination:

Using a crucible, we boiled the ash from Madhuca longifolia leaves in 25 ml of hydrochloric acid (2N) for 5 minutes while monitoring the temperature using a watch-glass. The watch glass was then washed in water heated to 10 degrees Celsius, and the whole mechanism was placed back into the furnace. After everything was combined, we filtered it through ash-free filter paper and washed it in hot water. A fresh crucible was used to heat the filter paper and insoluble residue at a constant 450 degrees Celsius. The residue was measured for accuracy after being dried out for 30 minutes in a suitable desiccator. The acid-insoluble matter concentrations were calculated in milligrammes per gramme of air-dry weight[7].

Water-soluble ash determination:

A total of 25 cc of distilled water was added to the plant ash that had been collected in a separate crucible. After 5 minutes, the mixture was strained through ashless filter paper after being boiled. The remaining insoluble material on the filter paper was washed away with hot water. It was heated in a crucible for 30 minutes at a temperature of around 450 degrees Fahrenheit. The amount of ash that was really utilised was deducted from the whole. Finally, the percentage of the air-dried material that can be dissolved in water was determined[8, 9].

2.3. Preliminary phytochemical screening

Chloroform, alcohol, and water were used to remove a measured amount of powder from the dried substance. Various components of these extracts were analysed[10].

3. RESULT AND DISCUSSION:

3.1. Physico-chemical evaluation

Ash value determination:

Total Ash value-

Weight of Ash = weight of silica crucible with ash – Weight of empty silica crucible

= 12.22- 11.98

= 0.24gm (Ash value of 2gm of powdered crude drug)

% Ash value= 0.24/2 ×100

= 12%

Acid insoluble ash value

Acid insoluble ash value= (weight of crucible+ Ash – weight of crucible) ×100

= (12.60+.01- 12.60) ×100

= 1%

Water soluble ash value

Water soluble ash value = Weight of total ash – Weight of water insoluble ash

= 0.24-.01

= 0.23gm

% Water soluble ash= weight of water-soluble ash / weight of sample ×100

= .23/2 ×100 =11.5%

3.2.Phytochemical Studies: Results of phytochemical analysis of the extracts are shown in Table 1.

Table 1: Phytochemical screening of ethanolic extract of leaves of Madhuca longifolia

Name of Tests	Ethanolic Extract
CARBOHYDRATES	
Molish Test	+
Fehling's test	+
Benedict's test	+
PROTEIN	
Biuret test	-
Millon's test	-
Precepitation test	-
ALKALOIDS	
Mayer's test	+
Hager's test	+
Wagner's test	+
Dragendorff's test	+
GLYCOSIDES	
Keller-kiliani test	+
Baljet test	+
STEROIDS	
Salkowski test	+
FLAVONOIDS	
Lead acetate	+
NaOH solution	+
TANNINS	
5% $FeCl_3$ solution test	+
Dil. Iodine solution	+
Dil HNO_3	+
SAPONINS	
Foam test	+
TERPENOIDS	
Salkowski's test	+
Ethyl acetate and Dil NH_3 solution	+
Fatty acid and oils	+

(+ is present, - is absent)

4..CONCLUSION:

Researched Herein Based on the phytochemical data, we know that Madhuca longifolialeaves generate several therapeutically useful secondary metabolites. Researchers found promise in using this plant to create medicines for a wide range of conditions. In this way, the plant may serve as a raw material for the production of phytochemicals using modern methods of extraction, screening, identification, and isolation. Previously unknown phytochemicals in Madhuca longifolialeaves have been confirmed by the current investigation.

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REFERENCES:

[1]. Sinha J, Singh V, Singh J, Rai AK. Phytochemistry, ethnomedical uses and future prospects of Mahua (Madhuca longifolia) as a food: a review. J Nutr Food Sci. 2017;7(573):2.

[2]. Jha D, Mazumder PM. Biological, chemical and pharmacological aspects of Madhuca longifolia. Asian Pacific Journal of Tropical Medicine. 2018 Jan 1;11(1):9-14.

[3]. Ramadan MF, Mohdaly AA, Assiri AM, Tadros M, Niemeyer B. Functional characteristics, nutritional value and industrial applications of Madhuca longifolia seeds: an overview. Journal of food science and technology. 2016 May;53:2149-57.

[4]. Schweitzer AD, Howell RC, Jiang Z, Bryan RA, Gerfen G, Chen CC, Mah D, Cahill S, Casadevall A, Dadachova E. Physico-chemical evaluation of rationally designed melanins as novel nature-inspired radioprotectors. PloS one. 2009 Sep 30;4(9):e7229.

[5]. Foo KY, Hameed BH. Value-added utilization of oil palm ash: A superior recycling of the industrial agricultural waste. Journal of hazardous materials. 2009 Dec 30;172(2-3):523-31.

[6]. Momin RK, Ahire PP, Kadam VB. Determination of ash values of some medicinal plants of genus Sesbania of Marathwada region in Maharashtra. International Journal of Drug Discovery and Herbal Research (IJDDHR). 2011(Oct/December):193-5.

[7]. Liu K. New and improved methods for measuring acid insoluble ash. Animal Feed Science and Technology. 2022 Jun 1;288:115282.

[8]. Vassilev SV, Vassileva CG. Water-soluble fractions of biomass and biomass ash and their significance for biofuel application. Energy & Fuels. 2019 Mar 16;33(4):2763-77.

[9]. Ba T, Chaala A, Garcia-Perez M, Rodrigue D, Roy C. Colloidal properties of bio-oils obtained by vacuum pyrolysis of softwood bark. Characterization of water-soluble and water-insoluble fractions. Energy & Fuels. 2004 May 19;18(3):704-12.

[10]. Shaikh JR, Patil M. Qualitative tests for preliminary phytochemical screening: An overview. International Journal of Chemical Studies. 2020 Mar;8(2):603-8.