



Physio-chemical Analysis and Ethnomedical Properties of Dried Mahua (*Madhuca longifolia*) Powder

Shanti Devi Ahirwar¹, Dr Neetu Singh² and Prashant Sagar³

1. MSc FST Department of Food and Nutrition, School of Home Science Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India.

2. Associate Professor and PhD Scholar³, School of Home Science Babasaheb Bhimrao Ambedkar University, Lucknow, Uttar Pradesh, India

Abstract

Madhuca longifolia is known by the common name “Mahua”. It is the member of Sapataceae family. It is a significant economic tree that grows all throughout India. It is a tree that is very nutritious and also be use as herbal remedy to cure a variety of disease. Mahua flower are said to be cooling aphrodisiac, galactagogue, and carminative properties according to the Indian system of medicine (ayurvedic). They are said to be helpful for heart problems as well. Mahua flowers are renowned for having high levels of nutrients and decreasing sugar. They are edible and are used to many regional recipes as a sweetener. Hence the present research study entitled “Phyto-chemical analysis and ethnomedical properties of dried mahua (*Madhuca longifolia*) powder. The research was carried out at Babasaheb Bhimrao Ambedkar University Lucknow's Department of Food and Nutrition. The trial will run for six months, starting from Jan2023 to July2023. Mahua is an abundant in sugar content (sucrose, glucose fructose or few amount of maltose), vitamins, protein alkaloids, phenolic compound etc according to phytochemistry study. Hence it is utilize as a numerous products. Mahua has been the subject of extensive medicinal study, which demonstrates its ethnomedical traits including antibacterial, anticancer, and hypoglycemic analgesic actions.

Keywords: *Madhuca longifolia*, Physiochemical, Analgesic, Ethnomedical.

Introduction :

Some food plant are thought to be significant sources of nutrition and contain chemicals that may have medicinal effects. It is these plants. reliable source of herbal and botanical medicine and are actually helpful for the provision of basic healthcare. Due to the great variety of bioactive molecules plants produce, they are a valuable source of medicine. At the beginning of the ayurveda period, the bulk of the population use only on herbal medicine due to its holistic methods that include of casier method of use and better outcomes. Despite vast ongoing development Herbal sources are used in medication treatment the high significance around 60% of people worldwide still use these medication on a regular basis, making herbal source is very important. They are utilised in basic healthcare not just a rural locations in developing nations, but even in developed nation where expensive medication are more readily available. Even in the modern period, the Plants have been used as a source of medication for passed down through generation and is a crucial part of

Indian health care systems and other countries. The focus of the ayurvedic remedies for various illness has been on the necessity for public research as a whole.

Due to their origin and lack of side effects herbal medicines have had an exponential growth and popularity over the past several years, both in developing and developed countries. Even in the modern period, using plant as a source of medication is still a significant part of the medical system in India and other nations. Mahua (*Madhuca longifolia*), a member of the Sapotaceae family, is one of the multifunctional forest tree species and a source of fuel, according to research by Banerji and Mitra. It is commonly used in South Asian nations.

Phytochemicals are naturally occurring compounds found in plants that have been shown to have a variety of health benefits for humans. They are separated into two categories: primary and secondary constituents. Primary constituents include basic nutrients such as carbohydrates, proteins, and fats, which are essential for the growth and development of plants, These primary constituents are also important for human health. Secondary metabolites include alkaloids, flavonoids, tannins, and other compounds that have been shown to have a variety of health benefits for humans, such as antioxidant, anti-inflammatory, and anticancer properties. Research has shown that including a variety of phytochemicals in our diet can aid in lowering the risk of chronic conditions include diabetes, heart disease, and cancer.

Botanical profile of mahua (*Madhuca longifolia*)-

Botanical Name - *Madhuca longifolia*

Family- Sapotaceae

Subfamily- Caesalpinioideae

Genus- *Madhuca*

Species- *longifolia*

Order- Ericaleae.

Ethnomedical properties-

Anti-bacterial activity: According to Verma et al.(9) that the flower of *Madhuca longifolia* had antibacterial properties against *Klebsiella pneumonia* and *Bacillus subtilis*. Ethanolic extract of Mahua flower powder used for analysis. The flower of Mahua (*Madhuca longifolia*) has an great antibacterial against the rice pest illness and *Escherichia coli* resistant.

Anti-cancers activity- Bhaumik et al. (2) investigated the in vitro anti-cancer efficacy of various Mahua (*Madhuca longifolia*) extracts against cancer cells in humans lines and utilised the MTT method to assess cell expansion suppression. Results indicate that several flower-seed extracts from Extremely good to moderate anticancer effectiveness is possessed by *Madhuca longifolia*.

Hepatoprotective activity- The *Madhuca longifolia* flower's ethanolic extract has hepatoprotective efficacy against paracetamol-induced hepatotoxicity. The blood levels of many biochemical markers, such as serum glutamic pyruvic transaminase (SGPT) and serum alkaline phosphate (ALP), were significantly reduced by the methanolic extract of Mahua (*Madhuca longifolia*), which demonstrated a substantial protective effect.

Analgesic activity- Mahua(*Madhuca longifolia*extracts from flowers both alcoholic or aqueous forms have features of analgesia. Mahua alcoholic extract exhibits a dependent analgesic in each of the three nociceptive techniques used on either rats or mice.

Materials and Methods:

The current investigation was carried out at a food science and technology laboratory. Babasaheb Bhimrao Ambedkar University in lucknow , for the period of 6 months. The experimental design are describing a process for preparing flower powder for physio-chemical analysis. This process involves several steps including sorting and washing the flowers with normal water, drying the flowers in sunlight for 2 days, dehydrating the flowers in a dehydrator until all moisture is removed, blending the dried flowers into a fine powder, and storing the powder in an airtight container for further analysis.

Sampling -

The selection of sample i.e. (Mahua flower) was purchased from local market from bhilai, chhattishghar. And then selected the fresh flowers for further preparation.

Preparation of Mahua flower powder -

Flowers were sorting and washing with normal water. Then kept all the flowers in sunlight to dry, for 2 days. After that put the dry flowers in Dehydrator for solar drying until the moisture is complete gone (Generally for 5-6 hours). And then put the dry flowers in the blender, and blend until the flower become a fine powder. And store in a airtight for physio-chemical analysis.



Fig.1.Fresh mahua flower

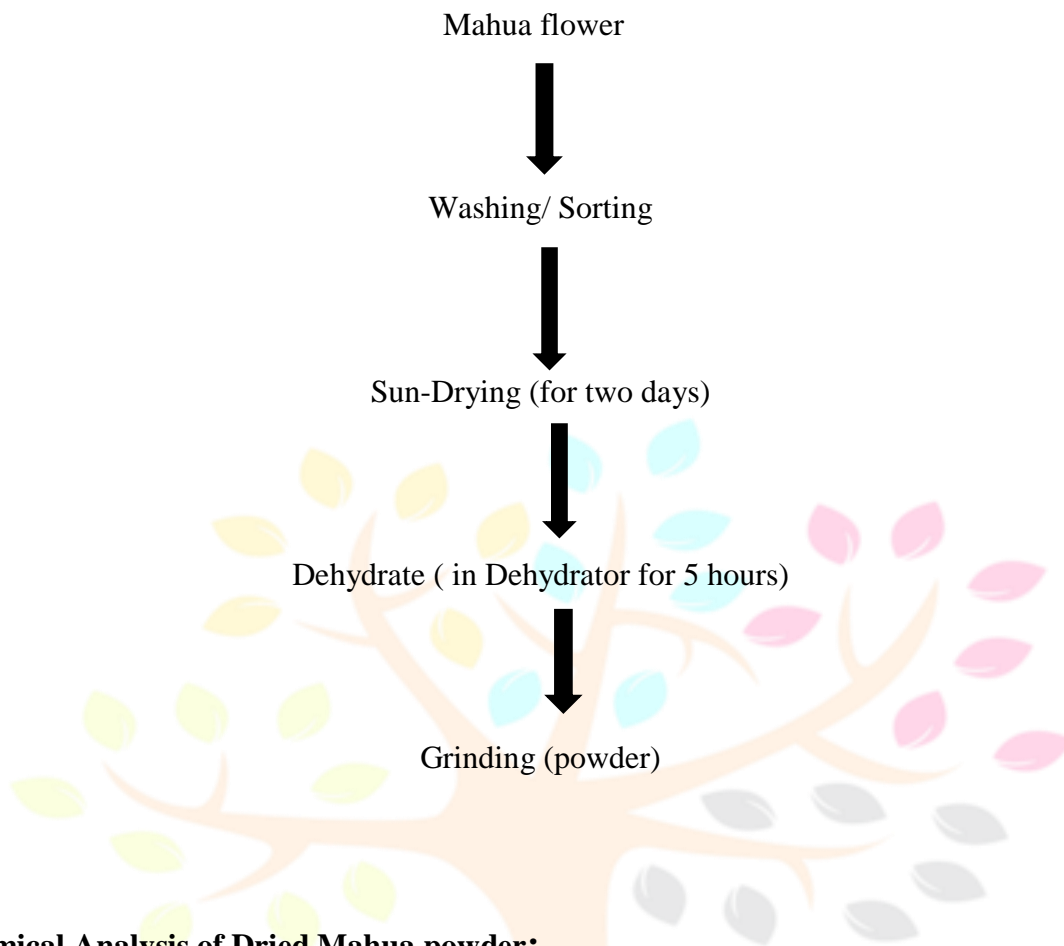


Fig.2. Dried mahua flower



Fig.3. Dried mahua flower powder

Flow chart of preparation of Mahua flower powder



Physio-chemical Analysis of Dried Mahua powder:

Mahua (*Madhuca longifolia*) flower powder ethanolic extract was submitted to preliminary phytochemical analysis using the methodology. Ethanolic extract of *Madhuca longifolia* showed of Alkaloid, Tannin, Flavonoids Amino acids and other phytoconstituents. Ethanolic extract shows more activity than methanolic extract for the analysis.

Ethanolic extract-

For making ethanolic extract solution take, 2ml dried powder sample after add 10ml ethanol solution in conical flask and rest for 30minets . after that filter the solution with filter paper.

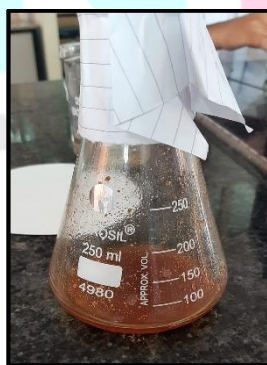


Fig.1. Ethanolic extraction of Mahua powder

Mayer's test for Alkaloid-

Procedure- Firstly make ethanolic extract of the sample. After that take about 2ml of liquid extract with the help of dropper into the test tube and transfer the equal amount into 2nd test tube, after transferring 2ml of extract in both test tube now we are going to perform Mayer's test. Take Mayer's reagent and add few drops in 1st test tube and compare the changes with 2nd test tube formation of cream precipitate indicate the presence of alkaloid in the sample.



Fig.-2. Alkaloid analysis

Ferric chloride test for Tannin-

Procedure- Take 2ml of ethanolic extract into the test tube, transfer the same amount of extract in 2nd test tube. The second test tube we have taken for the comparison of changes in the color of extract after performing the test. To the one test tube add 5% of ferric chloride solution if the color of extract changes to the dark green then its condensed tannin and if the dark blue color then its hydrolysable tannin.



Fig.3.- Tannin analysis

Alkaline reagent test for Flavonoid Analysis-

Procedure- Take 3ml ethanolic extract in test tube with the help of dropper, take same amount of extract in another test tube for the reference purpose. After the addition of extract in test tube add drop by drop 2% of NaOH solution in both test tube, the color changes in intense yellow. After the formation of yellow color add few drops of dilute HCL in left test tube now see the color which was formed after the addition of NaOH solution start disappearing after the addition of dilute HCL. This confirms the presence of flavonoid in our ethanolic solution.

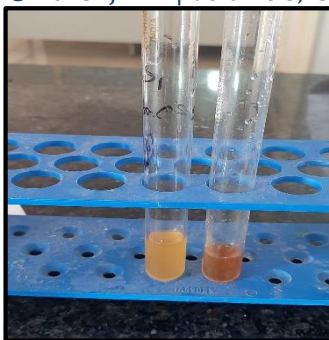


Fig.4. Flavonoid analysis

Ninhydrin test for Amino acid:

Procedure- Take 1gm of powder sample Add 1 ml of distilled water to a dry test tube to prepare the sample for analysis. A few drops of 2% Ninhydrin should then be added to the put a test tube in a water bath for five minutes. the emergence of blue or violet color indicates the presence of amino acid.

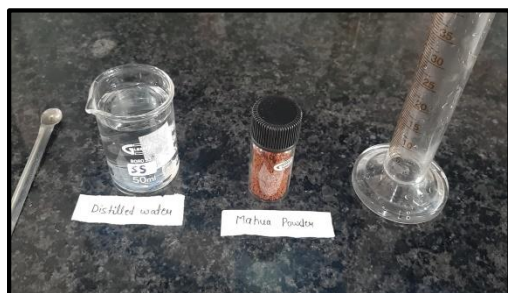


Fig. 5. Preparing sample

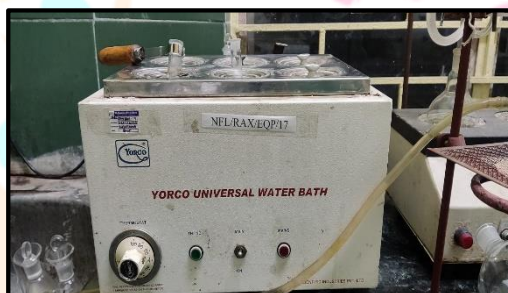


Fig.6. Testing of Amino Acid

Result and Discussion:

The nutritional profile and physiochemical properties of Mahua powder are exhibited in table Phytoconstituents composition of Mahua flower powder. This presented in table-1 revealed that the presented study in table-1 shows that, Alkaloids , Tannin , Flavonoids were found to be positive in the ethanolic extract and Amino acid were found Negative in the ethanolic extract of Dried Mahua flower powder. The study correlates well with the results. These may improve the nutritional value of Mahua powder, these results are found with various comparable analysis Mahua flower powder is also shown to improve the nutritional quality.

Phytoconstituents	Test	Observation in ethanolic extract
Alkaloids	Tannin acid test	+ve
Tannin	Ferric acid test	+ve
Flavonoids	Alkaline reagent test	+ve
Amino acid	Ninhydrin test	-ve
PH	Ph Meter	

(-Ve): Not present, (+Ve): Present

Table:1 Qualitative phytochemical study of Mahua (*Madhuca longifolia*) flower powder obtained by ethanol extraction

The obtain results are summarized in Table-1. Alkaloid, Tannin, Flavonoids are observed present and Amino acid is absent in Mahua flower powder.

Conclusion:

According to the physio-chemical testing of Mahua (*Madhuca longifolia*) flower contains a lot of nutrients, including a variety medical ethnography qualities, included-Antibacterial, Anticancer, Hepatoprotective Anti-hyperglycemic and actions of analgesics etc. The purpose of the research to emphasise the therapeutic potential of mahua flower and it can be concluded that incorporation or preparation in food or medicines.

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