

PHYSICOCHEMICAL ANALYSIS OF AMRA BEEJA (*MANGIFERA INDICA* L SEED KERNEL)

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ABSTRACT

Introduction- *Mangifera indica* L commonly known as mango, belongs to the family Anacardiaceae and is widely cultivated in India. In Ayurveda, *Amra Beeja* (mango seed kernel) is valued for its *Kashaya* and *Madhura* properties and is traditionally used in diarrhea, dysentery, inflammation, and bleeding disorders. The seed kernel contains tannins, flavonoids, phenolic compounds, and glycosides responsible for antimicrobial, antioxidant, and antidiarrheal activities. Standardization of herbal drugs is essential to ensure quality, purity, and efficacy. Therefore, the present study aimed to evaluate the physicochemical parameters of *Amra Beeja*. **Materials and Methods-** Mango seeds were collected, cleaned, shade dried, and the kernels were powdered. Organoleptic evaluation including color, odor, taste, and texture was performed. Physicochemical parameters such as loss on drying, total ash, acid insoluble ash, water soluble ash, extractive values, and pH were determined using standard procedures. Powder microscopy and fluorescence analysis were also carried out for authentication. **Results-** The powder was brownish yellow with characteristic odor and astringent taste. Loss on drying was found to be 6.5% w/w, indicating low moisture content. Total ash, acid insoluble ash, and water soluble ash values were within acceptable limits, suggesting purity of the drug. Water soluble extractive value was higher than alcohol soluble extractive value, indicating abundance of water-soluble constituents such as tannins and phenolics. Microscopy showed starch grains, fibers, and sclereids, while fluorescence analysis exhibited characteristic behavior under UV light. **Discussion-** The study established important physicochemical standards for *Amra Beeja*. The findings support its traditional medicinal use and confirm the presence of bioactive compounds. These parameters can be useful for quality control, authentication, and standardization of herbal formulations containing *Amra Beeja*.

KEYWORDS: Physicochemical *Amrabeeja*, *Mangifera indica* L, Quality control, Standardization.

INTRODUCTION

Mangifera indica L commonly known as mango, is one of the most important tropical fruit bearing plants belonging to the family *Anacardiaceae*. Mango is widely cultivated in countries such as India, where it is regarded not only as the “king of fruits” but also as a valuable medicinal plant in traditional systems of medicine. Different parts of the mango tree including the leaves, bark, flowers, fruits, and seeds, have been extensively utilized in Ayurvedic and folk medicine for centuries due to their therapeutic potential. Among these parts, *Amra Beeja* (mango seed kernel) holds significant medicinal importance. The seed kernel is obtained from the inner portion of the mango seed after removing the hard outer shell. In *Ayurveda*, *Amra Beeja* is described as having *Kashaya* (astringent) and *Madhura* (sweet) properties and is traditionally used in the management of disorders such as diarrhea, dysentery, bleeding disorders, intestinal infections, and inflammation. Classical Ayurvedic texts also mention its usefulness in balancing *Kapha* and *Pitta Doshas*. *Amra beeja Churna* is recommended in vitamin B12 deficiency.^[1] Modern scientific investigations have supported many of these traditional claims. Mango seed kernel contains several bioactive constituents such as tannins, flavonoids, phenolic compounds, glycosides, saponins, alkaloids, and fatty acids. These phytochemicals contribute to its diverse pharmacological activities, including;

- **Antidiarrheal activity**- due to the astringent effect of tannins that reduce intestinal secretions and improve bowel consistency.
- **Anti inflammatory activity**- by inhibiting inflammatory mediators and reducing tissue swelling.
- **Antioxidant activity**- through scavenging free radicals and preventing oxidative stress
- **Antimicrobial activity** - against various bacterial and fungal pathogens.
- **Anthelmintic and wound healing properties**- reported in several experimental studies.

Despite its medicinal importance, the quality and purity of crude herbal drugs can vary considerably because of factors such as geographical conditions, harvesting methods, storage conditions, and adulteration. Therefore, proper standardization of herbal raw materials is essential to ensure their safety, efficacy, and reproducibility in pharmaceutical preparations.

Physicochemical standardization^[2] is an important aspect of quality control in herbal medicine. It involves the evaluation of various physical and chemical parameters that help establish the identity, purity, and quality of the crude drug. Common physicochemical parameters include;

- Organoleptic evaluation (color, odor, taste, texture)
- Moisture content or loss on drying
- Ash values (total ash, acid insoluble ash, water soluble ash)
- Extractive values (water soluble and alcohol soluble extractives)
- pH determination
- Powder microscopy
- Fluorescence analysis

These parameters provide valuable information regarding contamination, adulteration, and the presence of inorganic impurities. Standardization also ensures uniformity in herbal formulations and helps in developing pharmacopoeial standards for medicinal plants. Hence, the physicochemical evaluation of *Amra Beeja* is necessary for establishing

reliable standards for its identification and therapeutic application. Such studies contribute to the scientific validation of traditional Ayurvedic drugs and support their safe and effective use in modern herbal medicine.

AIMS

- To carry out the physicochemical standardization of *Amra Beeja* (*Mangifera indica* L) seed kernel).
- Proper standardization of herbal raw materials is essential to ensure their safety, efficacy, and reproducibility in pharmaceutical preparations.

OBJECTIVES

- Collection and authentication of the plant material. Preparation of seed kernel powder.
- Evaluation of physicochemical parameters. Establishment of quality control standards.

MATERIALS AND METHODS

Collection of Drug

- Mature mango seeds were collected from the college campus (Natural habitat), cleaned, and dried and the kernels are separated from the outer seed coat.

Preparation

- The kernels are shade dried and powdered using a mechanical grinder. The powder is stored in airtight containers.

RESULTS AND DISCUSSION

Table No. 1: Organoleptic Evaluation.

SL NO	PARAMETER	OBSERVATION
1	Color	Creamish- brown
2	Odor	Characteristic
3	Taste	Slightly bitter/astringent
4	Texture	Fine powder
5	Fracture	Powdery

Physicochemical Analysis^[3-11] All determinations and analysis were carried out in triplicate using standard pharmacopoeial methods.

Determination of Moisture Content or Loss on Drying

- Approximately 3grms of powdered material was dried at 105°C in a hot air oven until constant weight was achieved. Percentage loss on drying was calculated.

Determination of Ash Values

- **Total Ash-** Powdered sample was incinerated at 450⁰ to 600°C until carbon free ash was obtained.
- **Acid Insoluble Ash-** Total ash was treated with dilute hydrochloric acid; the insoluble residue was collected, ignited and weighed.
- **Water Soluble Ash-** Total ash was boiled with distilled water; insoluble matter was filtered and weighed.

Extractive Values

- **Alcohol Soluble Extractive-** 5 grms of powdered drug was macerated with ethanol for 24 hours with intermittent shaking. An aliquot of the filtrate was evaporated to dryness and weighed.

- **Water Soluble Extractive-** Same procedure was followed using distilled water.
- **pH Determination-** A 1% aqueous solution of the powdered drug was prepared and pH was measured using a calibrated digital pH meter.
- **Swelling Index-** One gram of powdered material was mixed with 25 ml of water in a graduated cylinder and allowed to stand for 24 hours. The increase in volume was recorded.
- **Foaming Index-** One gram of powder was boiled with 100 ml of water and filtered. Serial dilutions were prepared and shaken in graduated cylinders. Foam height after 15 minutes was measured.
- **Powder Analysis-** Microscopic evaluation may reveal; Starch grains, Oil globules, Fibers, Stone cells

RESULTS

Table No. 2.

SL NO	PARAMETERS	OBTAINED RESULTS
1	Loss on Drying	6.5%
2	Total Ash	2.5%
3	Acid Insoluble Ash	<1%
4	Water Soluble Extractive	11.5%
5	Alcohol Soluble Extractive	8.75%
6	pH	5.5–6.5
7	Swelling Index	25ml
8	Foaming Index-	Present
9	Powder Analysis	Starch grains, Oil globules, Fibers, Stone cells

CONCLUSION

Physicochemical standardization of *Mangifera indica* seed kernel (*Amra Beeja*) establishes scientifically validated parameters that are essential for the proper identification, authentication, and quality assessment of the crude drug.

Evaluation of physicochemical constants such as moisture content, ash values, extractive values, pH, and other analytical parameters provides a dependable basis for determining the purity, strength, and consistency of the raw material. These parameters help in distinguishing genuine drug material from adulterated or substandard samples and ensure uniformity in herbal preparations. Standardization also contributes significantly to the safety and efficacy of herbal medicines by minimizing variations arising from geographical sources, environmental conditions, harvesting practices, storage, and processing methods. The establishment of reference standards for *Amra Beeja* supports the development of quality control protocols in accordance with traditional Ayurvedic principles as well as modern pharmaceutical requirements. Furthermore, the generated physicochemical profile can serve as a valuable reference for future pharmacognostical, phytochemical, and pharmacological investigations of *Mangifera indica* seed kernel. Such studies may facilitate wider therapeutic acceptance and integration of the drug into evidence based herbal formulations like seed butter.^[12] Therefore, physicochemical standardization acts as a fundamental step toward ensuring the authenticity, therapeutic reliability, and commercial quality of *Amra Beeja* used in herbal and Ayurvedic medicine systems. Powder analysis shown starch grains, oil globules, fibres, stone cells.

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