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PHARMACEUTICAL EVALUATION OF MASHATMAGUPTADI KWATHA CHURNA

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ABSTRACT

Medicinal plants form an integral part of traditional healthcare systems and are now recognized globally for their therapeutic importance. Their curative actions are attributed to a wide range of secondary metabolites present in various plant parts. **Mashatmaguptadi Kwatha** is a classical Ayurvedic formulation prepared from four key herbs in equal proportion, with two Prakshepa Dravyas added to enhance efficacy. The present work aims to explore its phytochemical profile, pharmacological attributes, and probable mechanism of action. The decoction shows Tridoshaghna activity, mainly Vata-Kaphashamaka, and exhibits Nadibalya, Dhatuvardhaka-Pushtikara, Shophahara, Rasayana, and Vrushya properties that help in pacifying Vata Dosha and managing Pakshaghata (hemiplegia). The present study, carried out at ALN RAO MEMORIAL AYURVEDIC MEDICAL COLLEGE AND PG CENTRE, KOPPA, CHIKMAGALUR (KARNATAKA), includes standardization parameters such as identity, purity, strength, preliminary phytochemical screening, and TLC profiling. These findings play a crucial role in establishing scientific quality control measures and enhancing the therapeutic credibility of Ayurvedic formulations.

KEYWORDS: Mashatmaguptadi Kwatha, Tridoshaghna, Nadibalya, Shophahara, Pakshaghata, Rasayana.

INTRODUCTION

Ayurveda, the ancient science of life, emphasizes not only the therapeutic utility of formulations but also their proper pharmaceutical preparation and evaluation. Kwatha (decoction) is one of the most widely used dosage forms in Ayurvedic pharmaceutics (Rasa Shastra and Bhaishajya Kalpana).[1] To achieve desired therapeutic effects, the quality of the raw drugs and the precision of the preparation process are of paramount importance.

Mashatmaguptadi Kwatha is a classical polyherbal formulation described in Chakradutta and Bhaishajya Ratnavali.[2,3] It contains Masha (Phaseolus mungo), Atmagupta (Mucuna pruriens), Bala (Sida cordifolia) and Eranda (Ricinus communis) in equal proportions, with Hingu (Ferula foetida) and Saindhava Lavana (sodium chloride) as Prakshepa Dravyas [2,3]. The formulation is primarily indicated in Pakshaghata (hemiplegia) and exhibits Vata-Kaphashamaka activity.[2,3] Additionally, it possesses Nadibalya (nervine strengthening), Dhatuvardhaka-Pushtikara (tissue-nourishing), Shophahara (anti-inflammatory), Rasayana (rejuvenating), and Vrushya (aphrodisiac) properties, making it beneficial in neurological and degenerative disorders associated with Vata imbalance due to its ingredients.[4] The pharmaceutical evaluation of this Kwatha Churna involves organoleptic, physicochemical, and qualitative parameters to ensure consistency and standardization.[5]

AIMS AND OBJECTIVES

1. To prepare Mashatmaguptadi Kwatha Churna according to classical Ayurvedic texts.
2. To evaluate its pharmaceutical parameters including organoleptic, physicochemical, and phytochemical properties.
3. To establish standard quality control measures for the formulation, Mashatmaguptadi Kwatha churna.

MATERIALS AND METHODS

Source of Data

1. Classical text book of Ayurveda
2. Text books of Modern science
3. Published articles from periodical journals another magazines.

Raw Materials

All the raw drugs were collected from authentic Ayurvedic suppliers and identified based on their **macroscopic and microscopic characters** as per *API (Ayurvedic Pharmacopoeia of India)* standards.

Method of Preparation[2,3]

Mashatmaguptadi Kwatha churna was prepared as per the reference of Bhaisajya Ratnavali(Vatavyadhi).[1] The ratio of the ingredients has been shown in (Table no.1). Samples of the raw drugs were shade-dried. The drugs were powdered individually in disintegrator and passed through mess no.[8] Then all the individuals corse powders were mixed in equal parts to prepare the final product, Mashatmaguptadi Kwatha churna. Then the sample of final product, Mashatmaguptadi Kwatha churna was packed in air tight container, labeled with name, parts of ingradients and send to Laboratory for Pharmacological evaluation.

Table No.1: Ingredients of Mashabaladi Kwatha.

Sl. No.	Name	BOTANICAL NAME	FAMILY	PARTS USED	RATIO
1	Masha	*Phaseolus mungo*	Fabaceae	Seeds	1
2	Bala	*Sida cordifolia*	Malvaceae	Whole plant	1
3	Atmagupta	*Mucuna pruriens*	Fabaceae	Seeds	1
4	Eranda	*Ricinus communis*	Euphorbiaceae	Root	1
5	Hingu	*Ferula foetida*	Apiaceae	Resin	-
6-	Saindhav Lavana	*Sodium chloride*	-	Crystalline form	-

INGREDIENTS OF MASHATMAGUPTADI KWATHA

PHARMACEUTICAL STUDY/ ANALYTICAL STUDY[6-13]

The Mashatmaguptadi Kwatha churna was analyzed by adopting various related analytical parameters like.

A. Organoleptic Characteristics.

Colour, odour, taste and appearance of kwatha churna were observed and mentioned in (Table no.2)

(Table No. 2)

Colour	Dull green
Odour	Characteristic
Taste	Slightly bitter, sweet, astringent
Texture	Coarse powder

B. Physiochemical Analysis

Loss on drying at 105^0c, total ash value, water soluble ash, acid insoluble ash, pH value. Alcohol soluble extractives, Water soluble extractives was carried out for raw materials and results are mentioned in (Table no.3)

(Table No.3)

Parameter	Result (% w/w)	Remarks / Observation
Loss on Drying at 105°C	5.17%	Indicates moisture content
Total Ash	6.02%	Represents total mineral content
Acid Insoluble Ash	0.25%	Reflects siliceous (sand/silica) matter
Water Soluble Ash	3.84%	Indicates water-soluble inorganic salts
Alcohol Soluble Extractives	19.31%	Shows alcohol soluble phytoconstituents
Water Soluble	38.52%	Represents water soluble active components

Extractives		
pH (5% Aqueous Solution)	4.82 ± 0.10	Slightly acidic nature

These results indicate good quality of the Kwatha Churna, with optimal moisture and extractive values suggesting stability and solubility.

C. Preliminary Phytochemical Tests (Qualitative Tests)

For various functional groups were done and observation and result of the *kwatha churna* was asserted in.

(Table no.4).

Phytochemical Test	Result
Carbohydrate	Present
Protein	Present
Alkaloid	Present
Cardiac Glycoside	Present
Flavonoids	Present
Tannins	Present
Anthraquinone Glycoside	Present
Triterpenoids	Present

The presence of these phytochemicals supports the Balya, Rasayana, and Vatahara properties described in Ayurvedic literature.

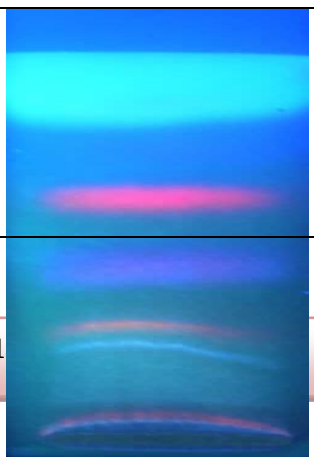
D. FLUORESCENT TESTS

Reagent / Sample Treatment	Under Visible Light	Under Long UV
Sample + Water	Light yellow	Fluorescent yellow
Sample + MeOH	Greenish yellow	Fluorescent green
Sample + 10% NaOH	Light orange	Fluorescent green
Sample + 10% HCl	Light yellow	Fluorescent yellow
Sample + 10% HNO_3	Greenish yellow	Fluorescent green
Sample + 10% H_2SO_4	Greenish yellow	Fluorescent yellow
Sample + 10% NH_3	Light brown	Brown

E. TLC PROFILE

Solvent System: Toluene: Ethyl acetate: 80:20

Rf Value	Colour Under Long UV
0.04	Fluorescent blue
0.11	Fluorescent green
0.14	Fluorescent green
0.20	Fluorescent green
0.25	Fluorescent blue



0.30	Orange	
0.37	Fluorescent green	
0.45	Fluorescent blue	
0.54	Light orange	
0.64	Light orange	
0.68	Light fluorescent blue	

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C. Fluorescent tests:

	Under Visible Light	Under Long UV
Sample + Water	Light yellow	Fluorescent yellow
Sample + MeOH	Greenish yellow	Fluorescent green
Sample + 10% NaOH	Light orange	Fluorescent green
Sample + 10% HCl	Light yellow	Fluorescent yellow
Sample + 10% HNO_3	Greenish yellow	Fluorescent green
Sample + 10% H_2SO_4	Greenish yellow	Fluorescent yellow
Sample + 10% NH_3	Light brown	Brown

D. Thin Layer Chromatography

Solvent System: Toluene: Ethyl acetate:: 80:20

Rf Values	Under Long UV
0.04	Fluorescent blue
0.11	Fluorescent green
0.14	Fluorescent green
0.20	Fluorescent green
0.25	Fluorescent blue
0.30	Orange
0.37	Fluorescent green
0.45	Fluorescent blue
0.54	Light orange
0.64	Light orange
0.68	Light fluorescent blue

Patron: Honourable Shri Aroor Ramesh Rao
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Reference Number: QC/ST/15/2025 **Date: 12th July 2025**

Purpose: Analysis for Mashatmaguptadi Kwath Churna

Result:

A. Organoleptic Characters

Colour	Dull green
Odour	Characteristic
Taste	Slightly bitter, sweet, astringent
Texture	Coarse powder

B. Physico-chemical parameters

Loss on Drying at 105°C	5.17%
Total ash	6.02 %
Acid insoluble ash	0.25%
Water soluble ash	3.84 %
Alcohol soluble extractives	19.31%
Water soluble extractives	38.52 %
pH (5% aqueous solution)	4.82 ± 0.10

C. Preliminary Phytochemical Tests (Qualitative Tests)

Carbohydrate	Present
Protein	Present
Alkaloid	Present
Cardiac glycoside	Present
Flavonoids	Present
Tannins	Present
Antraquinone glycoside	Present
Triterpenoides	Present

Patron: Honourable Shri Aroor Ramesh Rao
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E. Microbial contamination

Total aerobic count	$1.1*10^2$cfu
Total fungal count	$1.1*10^2$ cfu

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DISCUSSION[6-14]

The pharmaceutical evaluation of Mashatmaguptadi Kwatha Churna demonstrated that the formulation maintains desirable organoleptic and physicochemical characteristics suitable for Kwatha preparation. The extractive values indicate a balanced solubility of active principles in both aqueous and alcoholic media. The presence of vital phytoconstituents such as alkaloids and flavonoids ensures neuroprotective and anti-inflammatory activity, correlating with its therapeutic indications in Vata Vyadhi like Pakshaghata.

The analytical data of *Mashatmaguptadi Kwatha Churna* indicates that the formulation possesses satisfactory physicochemical characteristics ensuring its quality, stability, and efficacy. The **loss on drying (5.17%)** reveals a low moisture content, suggesting good stability and reduced susceptibility to microbial contamination. The **total ash value (6.02%)** represents the overall mineral content, confirming the presence of inorganic constituents derived from the raw herbal materials. The **acid-insoluble ash (0.25%)** being very low denotes minimal siliceous or earthy impurities, reflecting the purity of the ingredients used. The **water-soluble ash (3.84%)** suggests a considerable amount of inorganic salts soluble in water, contributing to the formulation's therapeutic mineral fraction. The **alcohol-soluble extractive value (19.31%)** indicates the presence of moderately polar phytoconstituents such as alkaloids, flavonoids, and resins, whereas the **water-soluble extractive value (38.52%)** highlights the predominance of polar bioactive compounds like glycosides, tannins, and saponins that are easily extractable in aqueous media. The **pH value (4.82 ± 0.10)** shows a slightly acidic nature, which is acceptable and suitable for oral administration. Overall, the results demonstrate that *Mashatmaguptadi Kwatha Churna* is a well-balanced formulation with appropriate physicochemical properties supportive of its stability and therapeutic potential.

The **phytochemical analysis** of *Mashatmaguptadi Kwatha Churna* revealed the presence of a wide range of bioactive compounds that collectively contribute to its therapeutic efficacy. The detection of **carbohydrates** and **proteins** indicates the presence of essential nutritional components that may support tissue nourishment and rejuvenation (*Balya* and *Rasayana* properties). The presence of **alkaloids** suggests potential neuroprotective, analgesic, and anti-inflammatory activities, which align with the formulation's indication in *Vata Vyadhi* such as *Pakshaghata* (paralysis). **Cardiac glycosides** may support circulatory and muscular functions, enhancing the overall vitality of the patient. The identification of **flavonoids** and

tannins points to potent antioxidant and anti-inflammatory properties that help reduce oxidative stress and protect body tissues from degeneration. The presence of **anthraquinone glycosides** indicates mild purgative activity, aiding detoxification and regulation of *Vata* through bowel cleansing. **Triterpenoids**, known for their adaptogenic and immunomodulatory roles, further enhance the formulation's restorative potential. Altogether, the phytochemical profile confirms that *Mashatmaguptadi Kwatha Churna* is rich in diverse active principles that synergistically promote nerve strengthening, rejuvenation, and overall systemic balance.[9]

The **TLC (Thin Layer Chromatography) analysis** of *Mashatmaguptadi Kwatha Churna* under long UV light exhibited multiple distinct **Rf values**, indicating the presence of a diverse range of phytoconstituents with varying polarities. Eleven well-defined spots were observed with **Rf values ranging from 0.04 to 0.68**, showing characteristic colors such as fluorescent blue, fluorescent green, orange, and light orange. The appearance of **fluorescent blue and green spots** at lower and mid Rf values (0.04–0.45) suggests the presence of compounds like alkaloids, flavonoids, and phenolic substances, which are known to fluoresce under UV light. The **orange and light orange spots** at higher Rf values (0.54–0.64) indicate the presence of less polar compounds such as triterpenoids or glycosides. The **variety of fluorescent colors and well-separated bands** demonstrate the complex and multi-constituent nature of the formulation, reflecting its rich phytochemical diversity. These chromatographic findings confirm that *Mashatmaguptadi Kwatha Churna* contains multiple active compounds that may work synergistically to produce its therapeutic effects, thereby supporting its efficacy as a *Vatahara* and *Rasayana* formulation.

Proper standardization ensures batch-to-batch uniformity, enhances shelf life, and provides a scientific foundation for traditional formulations. Hence, pharmaceutical evaluation is an indispensable step before clinical or pharmacological studies.

CONCLUSION

The Mashatmaguptadi Kwatha Churna prepared according to classical procedures and evaluated on modern pharmaceutical parameters meets the qualitative standards required for safe and effective Ayurvedic formulations. The study confirms that the formulation possesses acceptable physicochemical characteristics and significant phytochemical constituents supporting its traditional claims in Vata Vyadhi management. Further analytical and pharmacological studies can strengthen its evidence-based use.

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