

## Preparation and Evaluation of Quality Control Parameters of *Musalyapamarga Churna*.

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### ABSTRACT

**Introduction:** Standardization is still difficult because of difficulties with plant identification, collecting, extraction, and formulation, even with the World Health Organization's recommendations for herbal medicines. Since there were no established criteria for *Musalyapamarga Churna*, an Ayurvedic formulation used for *Badhira*, this study set out to establish them.

**Materials and Methods:** *Musalyapamarga Churna* was prepared from *Musali moola* and *Apamarga moola*, collected, and authenticated. The *churna* was prepared using standard operating procedures, cleaned, dried, pulverized, and sieved. Analytical testing was conducted at a ASU-approved CRF lab of KLE Ayurvedic College, Shahapur, Belagavi, Karnataka, India to determine organoleptic, physicochemical, phytochemicals, and microbial properties.

**Results:** A loss on drying of 3.265%, an ash value of 6.218%, and acceptable limits for microbiological contamination were among the physicochemical tests that the *churna* passed with distinctive organoleptic qualities. Amino acids, tannins, flavonoids, and cardiac glycosides were found by phytochemical investigation. With minor differences in extraction values.

**Discussion:** The physicochemical and phytochemical analysis of *Musalyapamarga Churna*, with acceptable moisture, ash, and extractive values – Alcohol-soluble extract- 4.113% and Water-soluble extract – 16.321%, along with beneficial phytochemicals and minimal microbial contamination. Minor variations in extractive values may result from environmental factors or preparation methods.

**Conclusion:** This research fills in gaps in the literature and improves the reliability of Ayurvedic formulations by establishing the groundwork for *Musalyapamarga Churna*.

**Keywords:** *Musalyapamarga churna*, *Badhirya*, *Analytical study*

## INTRODUCTION:

World Health Organization has established guidelines for assessing the safety, efficacy, and quality of herbal medicines, yet standards for herbal raw materials and finished products are often lacking. Yet, standardization remains complex for herbal medicines due to factors affecting plant identification, collection, extraction, formulation bio-efficacy, and therapeutic consistency which requires careful attention too. Inadequate cGMP guidelines for the herbal industry can lead to significant quality issues and adverse effects.<sup>[1]</sup>

Standardizing herbal medications involves developing technical standards and conducting studies to obtain reliable qualitative and quantitative values, ensuring safety, quality, and reproducibility. This process identifies specific properties of the medication, making standardization a key tool for quality assurance.<sup>[2]</sup> Herbal medications frequently have more than one active ingredient, and it's not always clear what the particular active ingredient is.<sup>[3]</sup>

Despite these challenges, standardization is essential to maintain the therapeutic efficacy, purity, and uniformity of active components in herbal formulations. *Musalyapamarga Churna* is an *ayurvedic* formulation used empirically for *Badhirya*.<sup>[4]</sup> Since no standards were found in the literature review for *Musalyapamarga Churna*, the current study was initiated to develop standards for the *churna*.

## MATERIALS AND METHODS:

**Table 1: Ingredients of *Musalyapamarga Churna***

Ingredients	Botanical Name	Part used	Quantity
<i>Musali moola</i> (Fig: 1)	<i>Curculigo orchioides gaertn</i>	Rhizome	1 part
<i>Apamarga moola</i> (Fig: 2,3)	<i>Achyranthes aspera Linn</i>	Root	1 part

### Collection of Drugs:

*Apamarga moola* was collected from the hilly region of Banahatti, Bagalkot, Karnataka, where it grows abundantly. It wasn't easy to collect the *moola* of *Apamarga*, as the plant was dug carefully and the entire plant was taken out to collect the roots. *Musali moola* was procured from GMP-certified KLE Ayurveda Pharmacy, Khasbag, Belagavi.

### Authentication of Drugs:

*Apamarga moola*, after being verified for identification, authentication, and certification according to API standards at an AYUSH-certified drug testing laboratory, was subjected to *churna* preparation.

### Method of preparation:

Both the drugs were cleaned and dried properly. These were kept separately. As per the SOPs mentioned in the AFI, the *churna* of both drugs were prepared independently using a pulverizer (Fig: 4) and sieved. Each one of them (powder) was prepared separately (Fig: 5,6) and well mixed (Fig: 7). The powder was fine of 80 mesh sieves. Then the *churna* was packed into sachets of 4gms (Fig: 8) and stored in a cool and dry place.

### Precautions:

The pulverizer should be cleaned before it is used.

The vessels should be clean, and dry so that *churna* will be moisture-free.

## ANALYTICAL STUDY: OBSERVATION

Prepared *Musalyapamarga Churna* was subjected to various analytical parameters such as organoleptic characters, physicochemical standards, phytochemical tests and tests for specified Micro-organisms

(Qualitative), and Microbial limit tests (Quantitative) to develop basic standards. The study of this sample was done in ASU approved CRF lab of KLE Ayurvedic College, Shahapur, Belagavi, Karnataka, India (BMK/CRF/244/2022-2023)

**RESULTS:**

**Organoleptic characters:**

The *Musalyapamarga Churna* was subjected to an organoleptic test for assessment of form, color, taste, and odor. The results are tabulated below:

**Table 2: Organoleptic characters of *Musalyapamarga Churna***

Sl.no	Tests	Results
01	Form	Churna
02	Color	Creamish
03	Taste	Bitter and Sweetish
04	Odor	Characteristic

**Physico-chemical standards:**

The *Musalyapamarga Churna* was also tested for the Physico-chemical parameters. The results are given in the table below:

**Table 3: Analytical study of *Musalyapamarga Churna***

Sl.no	Tests	Results
01	Loss on drying	3.265%
02	Ash Value	6.218%
03	Acid insoluble Ash	0.497%
04	Water soluble extractive	16.321%
05	Alcohol soluble extractive	4.113%

**Tests for specified Micro-Organisms (Qualitative)**

The *Musalyapamarga Churna* was also subjected to the specific micro-organism test. Results are given in the table below

**Table 4: Tests for specified Micro-Organism (Qualitative)**

Sl.no	Tests	Limits (As per IP)	Results
01	E coli	Absent/100ml	Absent
02	S aureus	Absent/100ml	Absent
03	P aeruginosa	Absent/100ml	Absent
04	S abony	Absent/100ml	Absent

**Microbial limit test (Quantitative)**

The *Musalyapamarga Churna* was subjected to the microbial limit test (Total bacterial count and total fungal count)

**Table 5: Microbial limit test (Quantitative)**

Sl.no	Test	Limits (As per IP)	Results
01	Total Bacterial Count	30-300 cfu/ml	70 cfu/ml
02	Total Fungal Count	10-100 cfu/ml	03 cfu/ml

**Table 6: Phytochemicals**

Sl.no	Phytochemicals	Acid-Soluble Value	Water-soluble extract value
01	Carbohydrates	Present	Present
02	Reducing Sugar	Present	Present
03	Monosaccharides	Present	Present
04	Pentose Sugar	Negative	Negative
05	Hexose Sugar	Negative	Negative
06	Non-Reducing Polysaccharides	Negative	Negative
07	Proteins	Negative	Negative
08	Amino acids	Negative	Present
09	Steroids	Negative	Negative
10	Cardiac glycosides	Present	Present
11	Anthraquinone glycosides	Negative	Negative
12	Saponins	Negative	Negative
13	Flavonoids	Present	Present
14	Alkaloids	Negative	Negative
15	Tannins	Present	Present

**DISCUSSION:**

*Musalyapamarga Churna* mentioned in *Vaidyasara Sangraha - Dashama Prakarana* is not an uncommon *ayurvedic* formulation that acts as *Rasayana*, where no standard and efficacy studies done. However, its empirical use is sporadic. An attempt has been made to prepare this formulation as per the classical reference. Each of the ingredients and the compounded *Musalyapamarga Churna* exhibited their characteristic odor, with a predominant bitter taste. The mixture of ingredients showed a dark cream color.

The physicochemical test, like loss on drying of the *Musalyapamarga Churna*, was 3.265% which indicates the moisture content present in the sample, which in turn means less chance of microbial contamination.

The Ash value of MC was 6.218%, Acid Insoluble ash test indicates how much inorganic residue is there, MC showed 0.497 % which is within acceptable limits.

Alcohol-soluble extractive and water-soluble extractive represent the loss of biomass proportion as a result of extraction and also it indicates the potency of drug. The values obtained for *Musalyapamarga Churna* were 4.113% and 16.321% respectively.

The phytochemical analysis of *Musalyapamarga Churna* showed the presence of Cardiac glycosides, Flavonoids, Tannins, Carbohydrate, Reducing sugar, and Monosaccharides both in Alcohol-soluble extract and water-soluble extract. Amino acids were present only in water-soluble extract.

The *Musalyapamarga churna* was subjected to microbial growth and limit test, where the bacterial count was 70cfu / ml and 3 cfu / ml for the fungal count within the acceptable range.

If one compares the value of individual ingredients<sup>[5]</sup>, *Apamarga* should have Total Ash value not more than 17, Acid Insoluble Ash not more than 5 %, Alcohol soluble extract not less than 2 %, Water soluble extract not less than 12 % and few studies of *Krishna Musali* Total Ash Value not more than 9, Acid Insoluble Ash not

more than 2 %, Alcohol soluble extract not less than 3 %, Water soluble extract not less than 17 %, shows that there are inorganic residues in the plant sample.<sup>[6,7]</sup>

According to the research mentioned above, the data is compatible with API standards; however, there may be a little fluctuation in the water-soluble and acid-insoluble ash extracts due to changes in dosage form and environmental conditions.

#### **CONCLUSION:**

This research fills in gaps in the literature and improves the reliability of Ayurvedic formulations by establishing the groundwork for *Musalyapamarga Churna*.

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 <p>Fig.No1(Musali moola)</p>	 <p>Fig.No 2 (Apamarga moola)</p>	 <p>Fig.No 3 (Dried Apamarga moola)</p>
 <p>Fig.No 4 (Pulverizer)</p>	 <p>Fig.No 5 (Musali Churna)</p>	 <p>Fig.No 6 (Apamarga churna)</p>
 <p>Fig.No 7 (Musalayapamarga churna)</p>	 <p>Fig.No 8 (Packaging)</p>	