RESEARCH PAPER

Critical Appraisal of Marichadi Churna Standardization and Phytochemical Insights in Ardhavabhedaka with Migraine Correlation

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ABSTRACT

Background

Marichadi churna is an Ayurvedic formulation mentioned in 24th chapter of Rasa Ratna Samuchchaya, indicated for Ardhavabhedaka (Migraine). This churna can be used as pradhamana nasya (nasal instillation of a powder medicine), a procedure mentioned in Ayurveda, in which the medicine is given through the nose. To prepare the Marichadi churna and determine its organoleptic characters, physicochemical, phytochemical properties.

Materials and Methods

This formulation follows the traditional methods of preparing churna. The dried Maricha powder was obtained from GMP-certified pharmacy, and Shigru patra was collected to extract swarasa. The bhavana process has been performed to evaluate its organoleptic characteristics, physicochemical parameters, phytochemical parameters, and microbial properties.

Results

The formulation complied with API standards like loss of drying is 7.952% not more than 10%, ash value is 5.986% not more than 10%, acid insoluble ash is 1.027% not more than 2% and microbiological test shows no detectable pathogenic contamination, these results fulfil WHO/API safety standards.

Conclusion

The evaluation of Marichadi churna confirms its standardization and validation through modern analytical parameters while adhering to classical Ayurvedic methodology. The formulation exhibits desirable organoleptic, physicochemical, and microbial safety properties, supporting its therapeutic use via the nasal route. With known antioxidant, analgesic, anti-inflammatory, and neuroprotective effects, it holds promise for integrative management of Ardhavabhedaka (Migraine).

Keywords: Ardhavabhedhaka, Marichadi churna, Migraine, Standardization.

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Introduction : *Ardhavabhedaka* explained under *Shiroroga* (disease of the head in *Ayurveda*) occurs due to the vitiation of *Tridosha* (all three biological humors). The signs and symptoms of migraine can be harmonized with *Ardhavabhedaka*. **(Kanakhara & Chaudhari 2018)** Migraine is the second most common cause of headache, and the leading headache related neurologic cause of disability worldwide, which afflicts more in women than men. Migraines are usually an episodic headache associated with sensitivity to light, sound, or movement. Nausea and vomiting often accompany these headaches. Individuals with migraines are particularly sensitive to environmental and sensory stimuli; they do not habituate easily. This sensitivity increases for females during the menstrual cycle. Headache may be triggered by various factors, such as glare, bright lights, sound or type of afferent stimulation, hunger, letdown from stress, physical exertion, stormy weather, or barometric pressure changes. Migraine without aura is the most common form, accounting for 75% of cases. **(Pescador Ruschel & De Jesus 2024).** Conventional medicine is widely used for migraines, but long-term use may cause adverse reactions. Consequently, the demand for indigenous therapeutic approaches is growing because they are regarded as safe and

associated with minimal adverse effects. *Marichadi churna* is one of the formulations indicated in *Ardhavabhedaka*. It is prepared by following the principles of *Churna kalpana,* where *churna* refers to a powder substance, and *Shigru patra swarasa* is used for *bhavana* in this preparation. This formulation is derived from 24th chapter of *Rasa Ratna Samuchchaya*, which is indicated for *Ardhavabhedaka* (Migraine). It may be administered in the form of *pradhamana nasya*, (a type of *nasya*) using a small dose for managing *Ardhavabhedaka*.

Materials And Methods

Sample Collection

The raw drug preparation of *Marichadi Churna* includes *maricha churna* and fresh *shigrupatra,* which were collected. In these, *Maricha churna* was collected from the GMP certified KLE Ayurveda Pharmacy, Khasbag, Belagavi, Karnataka, and fresh *shigru* patra was collected from KLE Ayurveda Pharmacy, Khasbag, Belagavi, Karnataka, to prepare fresh *shigru patra swarasa* .(Table no.1)

Authentication of raw drugs

The authentication of all the mentioned raw drugs were verified in accordance with the institutional and national ethical guidelines in the Central Research Facility (AYUSH approved ASU Drug Testing Laboratory) of KAHER'S Shri BMK Ayurveda Mahavidyalaya, Shahapur, Belagavi, Karnataka, 590003.

Preparation of *Marichadi churna*

Marichadi churna was prepared as per the classical reference, based on the general method of preparation of *churna* from *Sharangdhara Samhita* **(Savrikar, 2020)**, at GMP-certified KLE Ayurveda Pharmacy at Khasbag, Belagavi.

The preparation starts with collecting the raw herbal drug of *Maricha churna* (coarse powder of 80 mesh size) and fresh *shigru patra,* which were collected and pulverized into *swarasa..* One part of *Maricha churna* and a sufficient quantity of *Shigru patra* were pulverized and squeezed using a clean cloth to extract the maximum amount of *swarasa.* The extracted swarasa was taken in a *khalva yantra,* and *bhavana* (levigation or wet grinding) was performed by mixing the liquid with the *churna* in an amount sufficient to completely submerge the *churna.*

The process is continued to attain the *Subhavita Lakshana* (confirmatory test for completion of the process with desired characteristics). Finally, the complete absorption of liquids into the powder and drying of the mixture yield the product.

Analytical Study:

Pharmacognostical study of *Marichadi churna* was analyzed for the organoleptic parameters, such as form, color, and odor. Physicochemical analysis of *Marichadi churna,* such as loss of drying, ash value, acid-insoluble ash, water-soluble extractive, alcohol soluble extractive, and pH was carried out using general standard procedures in accordance with the Ayurveda Pharmacopeia of India (API). **(Government of India, Ministry of Health and Family Welfare, Department of AYUSH, 2017)** *Marichadi churna* was analyzed for Specific Micro-Organism (Qualitative) and Microbial limit test (Quantitative). The analytical study was carried out at the Central Research Facility (AYUSH-approved ASU Drug Testing Laboratory Lic no.TL-8/2011) of KAHER'S Shri B.M. Kankanawadi Ayurveda Mahavidyalaya, Belagavi, Karnataka, 590003.

Ethical Statement: "Not Applicable" as this is an in-vitro herbal analysis.

Statistical Analysis: Not Applicable

RESULTS

The organoleptic characters include *churna* in form, brown in colour, pungent in taste, and aromatic in odor. The physicochemical test, like loss on drying of the *Marichadi Churna,* was 7.952% (not more than 10%). This indicates the moisture content present in the sample, which means there is less chance of microbial contamination. The ash value of *Marichadi churna* was 5.986% (not more than 10%). The acid-insoluble ash test indicates how much inorganic residue, such as silicates, soil, is present. The results of *Marichadi churna* shows 1.027%, which is within acceptable limits (which means not more than 2%). The alcohol-soluble extractive and water-soluble extractive represent the loss of bioactive constituents as a result of extraction, it indicates the potency of the drug. The values obtained for *Marichadi Churna* were 14.381% (not less than 10%) and 14.237%(not less than 12%), respectively. Its pH 5.91%, which is close to the physiological range of nasal secretions. This ensures mucosal compatibility and reduces local irritation. All these physicochemical parameters were interpreted in line with general API guidelines for *churna* (Table no 2). The phytochemical analysis further validates the potential of *Marichadi Churna* exhibits the presence of carbohydrates, reducing sugar enhances solubility and absorption through the nasal mucosa. Flavonoids and tannins are present in both alcohol-soluble and water-soluble extracts. They contribute anti-inflammatory, antioxidant, and mucosal protective properties, which are useful in allergic conditions**. (Cosme et al., 2025)** Monosaccharides, steroids, and cardiac glycosides were present only in the alcohol-soluble extract, which shows additional anti-inflammatory and circulatory support. **(Moustafa et al., 2025)** The absence of alkaloids, proteins, amino acids, and saponins minimizes the risk of toxicity or hypersensitivity reactions, ensuring repeated nasal use**. (Samtiya et al., 2020)** (Table no.4) Microbial growth and limit test, showed the bacterial and fungal count was absent. This confirms aseptic preparation and proper storage conditions. According to the research mentioned above, the data is compatible with API standards (Table no.3). There may be a little fluctuation in the water-soluble and acid-insoluble ash extracts due to changes in dosage form and environmental conditions.

DISCUSSION

Maricha (*Piper nigrum*) is considered *Kapha vatahara*, due to its *katu rasa*, katu *vipaka,* and *ushna virya*. It helps to balance the *Kapha* and *Vata doshas* in the body. *Piper nigrum* contains key bioactive compounds such as piperine,

flavonoids, essential oils, and it has extensive applications in both modern and traditional medicine. These properties enhance the pharmacological activities, which includes antidiabetic, antioxidant, anticancer, antimicrobial, anticonvulsant, analgesic, antidepressant, anti-inflammatory, hypolipidemic, hepatoprotective, neuroprotective, antipyretic, and antiulcer effects. **(Piper nigrum L., 2025)** This scientific evidence highlights *Maricha* as a potent and multifaceted herb with diverse systemic benefits and demonstrates the importance of exploring classical Ayurvedic herbs through modern scientific inquiry. **(Maricha(Piper nigrum Linn.), 2025)**

Shigru (Moringa oleifera) is considered *Kapha vatahara* due to its *katu, tikta rasa,* and *katu vipaka, usna virya.* The leaves of *M. oleifera* are rich in beta-carotene, vitamin C, vitamin E, and polyphenols, making them a good source of natural antioxidants. Furthermore, *M. oleifera* is reported to enhance a broad range of biological functions, including anti-inflammatory, anti-cancer, hepatoprotective, and neuroprotective effects**. (Fahey, 2010)** Its therapeutic value extends anti-diabetes, anti-atherosclerosis, anti-infertility, and anti-depression functions. **(Posmontier, 2011)** In addition, aqueous and ethanolic extracts from *M. oleifera* leaves exhibit encouraging anti-bacterial properties, showing strong inhibitory effects on gram-positive species over gram-negative species. **(Hashappa & Srikanth, 2024)** Usually, natural compounds rich in polyphenols, like those *M.oleifera*, have strong antioxidant properties that reduce oxidative damage in tissues by scavenging free radicals. **(Xie et al., 2024)** Providentially, as a medicinal plant, *M. oleifera* extracts from both mature and tender leaves exhibit strong antioxidant activity against free radicals and prevent oxidative damage due to the amelioration of polyphenols. **(Hernandez-Fuentes et al., 2025)** At present, our study was designed as a pharmacognostical and standardization work, focusing on physico-chemical, phytochemical, and microbial parameters to establish quality control. We fully agree that clinical validation with larger human samples would strengthen the findings. While such a study was beyond the scope of the current work, so we have focussed on preparation and standardization of the formulation.

CONCLUSION

The evaluation of *Marichadi churna* establishes its preliminary standardization, formulation according to classical Ayurvedic methodology, and validation using analytical parameters that are used in modern practice. The result confirms that the *churna* possesses desirable organoleptic and physicochemical properties, as well as microbial safety, making it suitable for therapeutic use, especially for the nasal route. Based on previous studies, these compounds are known for their antioxidant, analgesic, anti-inflammatory, neuroprotective properties, which are scientifically useful in the traditional therapeutic application of *Marichadi churna* in *Ardhavabhedaka* (Migraine). Based on all scientific analytical evaluations, this formulation is suitable for the integrative management of *Ardhavabhedaka.*

Limitation of study: As there is an absence of API monograph standards for newly formulated *churna* limits definitive interpretation of phytochemical analysis. These formulations were newly prepared and evaluated using a single laboratory batch, so batch-to-batch preparation is required to confirm a standard analytical evaluation.

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Abbreviations API – Ayurvedic Pharmacopoeia of India, ASU Drugs Testing Lab - Ayurveda, Siddha, and Unani Drugs Testing Laboratory, Cfu- Colony-Forming Unit, GMP-Good Manufacturing Practices, KAHER -KLE Academy of Higher Education and Research, WHO- World Health Organization, AYUSH: Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy, IP: Indian Pharmacopoeia; NMT: Not more than; NLT: Not less than

Conflict of interest: There is no conflict of interest

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Summary: *Marichadi churna*, a traditional Ayurvedic formulation used for *Ardhavabhedaka*, was scientifically standardized using organoleptic, physicochemical, and phytochemical analyses, as well as microbial safety assessments. This study confirmed that this formulation can be used for therapeutic purposes.

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Table 1: Ingredients of *Marichadi Churna*

Sanskrit name	Botanical Name	Part used	Rasa	Guna	Veerya	Vipaka	Karma
Maricha	*Piper nigrum*	Fruit	*Katu*	Laghu, Tikshna	Ushna	Katu	Kaphavatahara
Shigru	*Moringa oleifera*	Leaf	Katu ,Tikta	Laghu, Tikshna, Ruksha	Ushna	Katu	Kaphavatahara sulaghna sirashula

Table 2: Organoleptic characters and Physico-chemical analysis of *Marichadi Churna*

Organoleptic characters		Physico-chemical analysis	
Tests	**Results**	**Tests (with Permissible li**	
1. Form	- *Churna*	1. Loss on drying (NMT 1	
2. Color	- Brown	2. Ash Value (NMT 10	
3. Taste	- Pungent	3. Acid-insoluble Ash (NM	
4. Odor	- Aromatic	4. Water-soluble extractive	
		5. Alcohol soluble extractiv	
		6. Ph (5.0 to 7. 0%)	

Table 3: Tests for specified Micro-Organism (Qualitative) and Microbial limit test (Quantitative)

Micro-Organism (Qualitative)			Mi
Tests	**Limits (As per IP)**	**Results**	T
1.*E. coli*	Absent/100ml	- Absent	1.T
2.*S. aureus*	Absent/100ml	- Absent	c
3.*P. aeruginosa*	Absent/100ml	- Absent	2.
4.*S. abony*	Absent/100ml	- Absent	

Table 4: Phytochemical analysis

Sl.no	Phytochemicals	Water
01.	Carbohydrates	Positive
02.	Reducing Sugar	Positive
03.	Monosaccharides	Positive
04.	Pentose Sugar	Negative
05.	Hexose Sugar	Negative
06.	Non-Reducing sugar	Negative
07.	Proteins	Negative
08.	Amino acids	Negative
09.	Steroids	Negative
10.	Cardiac glycosides	Negative
11.	Anthraquinone glycosides	Negative
12.	Saponins	Negative
13.	Flavonoids	Positive
14.	Alkaloids	Negative

15.	Tannins	Positive	Positive