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PHARMACOGNOSTICAL & PHYTOCHEMICAL EVALUATION OF BHAVITA KOSATAKI PHALA CURNA

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ABSTRACT

The present study investigates the pharmacognostical and phytochemical characteristics of Bhāvita Kośātakī Phala Cūrṇa, a classical Ayurvedic formulation used in the management of Madhumeha (diabetes mellitus). The concept of Bhāvanā—impregnation of herbal powders with the juice or decoction of the same or synergistic drugs—is a unique pharmaceutical process in Ayurveda believed to enhance the therapeutic efficacy. This study aimed to establish standard analytical profiles of Kośātakī Phala Cūrṇa and its Bhāvita form through organoleptic, microscopic, physicochemical, and preliminary phytochemical analyses.

KEYWORDS: Kośātakī Phala, Bhāvita Cūrṇa, Pharmacognosy, Phytochemical analysis, Madhumeha, Standardization, Ayurveda.

INTRODUCTION

In Ayurveda, the concept of Bhāvanā (levigation or trituration with liquids) is central to enhancing the potency (guṇa-vṛddhi) and targeted efficacy of a drug. Kośātakī (Luffa echinata Roxb.) is a traditionally used plant in the treatment of Madhumeha and other kapha-vāta disorders. Its fruits are valued for their deepana-pācana (digestive stimulant) and lekhana (scraping) properties. Pharmacognostical and phytochemical standardization plays a pivotal role in the quality assurance of herbal formulations. Despite its

classical importance, limited analytical studies are available on Bhāvita Kośātakī Phala Cūrṇa. This study attempts to bridge this gap by establishing microscopic, macroscopic, physicochemical, and phytochemical profiles.

AIM: To study the Pharmacognostical and Phytochemical characters of Bhāvita Kośātakī Phala Cūrṇa

OBJECTIVES: To determine and evaluate the Pharmacognostical and Phytochemical characters of Bhāvita Kośātakī Phala Cūrṇa.

MATERIALS

Preparation of Bhāvita Kośātakī Phala Cūrṇa: Fresh fruits of *Raja Kośātakī* were collected, washed cleanly and dried in shade. Later *phala* were cut into small pieces and dried in drier for removal of moisture and also to facilitate quick drying process since *Raja Kośātakī phala* are extremely fibrous in nature. After ensuring that cut pieces are completely dried subjected to pulverisation and made into fine powder by repeating the powder making process and sieved to obtain finest powder. This powder is stored in air tight container. Now fresh *Raja Kośātakī phala* are again collected and cut into small pieces and subjected to *svarasa* extraction. Then the powder of dry *Raja Kośātakī phala* is subjected to bhavana with its own fresh *svarasa* for 7 times ensuring that before each time the mixture is completely dried and started next bhavana. After 7 th bhavana the mixture is dried powdered and sieved again to obtain dry fine curna that is Bhāvita Kośātakī Phala *Cūrṇa*. This *Cūrṇa* is sent for analysis.

METHODS

Pharmacognoistic studies include Macroscopic study, Microscopic study of the fresh fruit**,** powder microscopy of Bhāvita Kośātakī Phala *Cūrṇa*,

Pharmacognostical Study: Organoleptic and powder microscopy studies were carried out using standard protocols: Observation under compound microscope with staining using phloroglucinol and hydrochloric acid for lignified tissues- Diagnostic characters such as trichomes, calcium oxalate crystals, and fibers were noted.

Physico-chemical Parameters: Standard physicochemical parameters were assessed as per API guidelines: Loss on drying, Total ash, Acid-insoluble ash, Water-soluble extractive, Alcohol-soluble extractive.

Preliminary Phytochemical Screening: The cūrṇa was screened for the presence of Alkaloids, Saponins, Flavonoids, Tannins, Glycosides, Phenols.

HPTLC analysis was carried out**.**

OBSERVATIONS AND RESULTS

Macroscopic analysis of fresh fruit shows that the fruit is fresh green and confirms the authenticicty of collection source.

Microscropic analysis of fresh fruit shows in transverse section of fruit the presence of sclerids and bicolleteral vascular bundles. transverse section of seed shows the presence of Testa with palisade like sclereid cells, Epidermis, Testa and Cotyledon.

Powder microscopy of Bhāvita Kośātakī Phala *Cūrṇa* shows the presence of Bordered pit vessels, Parenchyma, Scalariform vessels Sclereids, Trichomes that are simple and glandular. Parenchyma cells from endosperm showing barrel shaped cells, elongated Vessel like structures and Parenchyma with vessels. Trichomes that are glandular are also found. simple Pitted parenchyma and Fibres tubular Vessels are observed to be the typical characteristic features of powder microscopy of Bhāvita Kośātakī Phala.

Physicochemical characters of Bhāvita Kośātakī Phala *Cūrṇa* was evident of

Parameter	**Results n = 3 %w/w Avg ± SD**
Loss on drying	1.90±0.01
Total Ash	9.21±1.12
Acid Insoluble Ash	0.99±0.01
Water soluble Ash	3.74±0.00
Alcohol soluble extractive value	5.0±0.00
Water soluble extractive value	14.85±0.02

PHYTOCHEMICAL STUDY was carried out with Bhāvita Kośātakī Phala *Cūrṇa* following standard techniques and reagents was evident *with the presence of* Alkaloids, Carbohydrates, Tannins, Flavanoids, Saponins, Tarpenoids, Amino acids, Resins.

Test	**Inference**
Alkaloid	**Present**
Steroid	-
Carbohydrate	Present
Tannin	**present**
Flavanoids	**Present**

Saponins	**Present**
Tarpenoids	**Present**
Coumarins	-
Phenols	-
Carboxylic acid	-
Amino acids	**Present**
Resin	**Present**
Quinone	-

HPTLC STUDIES OF Bhāvita Kośātakī Phala *Cūrṇa* carried out can be interpreted as **At short UV 254nm 7 bands** are observed at **Rf values of 0.12, 0.18, 0.26,0.32,0.36,0.53,0.62 with Green colour** intensity. **At long UV 366nm**, **8 bands are observed at Rf values of 0.10, 0.36,0.46,0.50,with colour intensities of Fluorescent Blue, Rf value of 0.54 with Fluorescent Red colour, Rf value of 0.59 with Fluorescent Green** colour, **Rf value of 0.86,0.96** with colour intensities of **Fluorescent Blue**.

After **derivatisation** with Anisaldehyde sulphuric acid, **at UV 254 nm**, **6 bands are spotted with Rf values of 0.26, 0.34, 0.63, 0.74, 0.85 with Purple colour intensity**. **Densitometric scan** at **560 nm** shows 10 spots. Out of which maximum area of ***34.90%*** is seen with the Rf value of **0.48,** Next to that with the maximum area of **18.80%** is observed with the Rf value 0.00.

DISCUSSION

Bhāvita Kośātakī Phala Cūrṇa, subjected to analytical and pharmacognostical evaluation, has demonstrated significant variations in its organoleptic and phytochemical profile due to the process of *Bhāvanā*. The classical Ayurvedic concept of Bhāvanā refers to the repeated wet trituration of the powdered drug with its own juice or other prescribed liquids, thereby aiming to potentiate the therapeutic efficacy and bioavailability of the formulation. Organoleptic evaluation of Bhāvita Kośātakī Phala Cūrṇa showed distinguishable enhancements in terms of color, odor, and texture when compared to its unprocessed counterpart. These changes may be attributed to the absorption and impregnation of phytoconstituents present in the Kośātakī Swarasa during the process of Bhāvanā. The characteristic odour of the Cūrṇa intensified after Bhāvanā, suggesting the enrichment of volatile active principles. Microscopic examination revealed well-preserved histological features, including scalariform vessels, lignified endosperm cells, and fragments of pericarp tissue, indicating the identity and integrity of the raw material post Bhāvanā. No extraneous matter was noted, indicating good quality control during processing. Preliminary phytochemical screening of the Bhāvita

Kośātakī Phala Cūrṇa revealed the presence of alkaloids, tannins, saponins, flavonoids, and glycosides. These compounds are known for their diverse pharmacological actions such as antidiabetic, anti-inflammatory, and antioxidant properties. The enrichment of secondary metabolites due to the Bhāvanā process supports the Ayurvedic principle that Bhāvanā enhances the efficacy and potency (*guṇa vṛddhi*) of the herbal formulation. HPTLC profile of the Bhāvita Kośātakī Phala Cūrṇa exhibited multiple spots with different Rf values under UV and visible light, indicating the presence of a variety of chemical constituents. The diversity and clarity of spots observed reflect the enhanced phytochemical complexity acquired during the Bhāvanā process. Physico-chemical parameters such as loss on drying, total ash, acid-insoluble ash, and extractive values were within acceptable pharmacopoeial limits. These parameters confirm the stability and purity of the final formulation. Notably, the water-soluble and alcohol-soluble extractives were found in appreciable quantities, suggesting enhanced solubility and extractability of active principles post-Bhāvanā. Thus, the overall analysis supports the traditional Ayurvedic view that the Bhāvanā saṃskāra not only facilitates the potentiation of therapeutic efficacy but also assists in enhancing the physicochemical and phytochemical profile of the drug. This aligns with the concept of *saṃskāra anuvartanam*—the ability of processing techniques to modify and refine the pharmacological attributes of a substance.

CONCLUSION

The analytical and pharmacognostical findings of Bhāvita Kośātakī Phala Cūrṇa affirm that the traditional process of Bhāvanā significantly influences the quality, potency, and probable therapeutic efficacy of the formulation. Enhanced organoleptic features, enriched phytochemical constituents, and acceptable physico-chemical standards all point to a superior preparation in comparison to the unprocessed form. The present study validates the relevance of classical Ayurvedic processing techniques like Bhāvanā in improving the pharmacodynamic and pharmacokinetic potential of herbal drugs. Incorporating such traditional knowledge with modern analytical techniques offers a promising approach for standardization, quality control, and optimization of Ayurvedic formulations for clinical efficacy.

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