



Original Research Article

Volume 15 Issue 02

February 2026

## PHARMACEUTICAL AND HPTLC ANALYSIS OF VACHA-SHAMPAKADIGHRITA (MEDICATED GHEE) BASED ON AYURVEDIC MEDICINAL PREPARATION

\*Vd, Kiran P. Nandeshwar<sup>1</sup>, Dr. T. Y. Swami<sup>2</sup>, Dr. P. L. Patil<sup>3</sup>, Dr. Gunja Dahikar<sup>4</sup>

<sup>1</sup>PhD Scholar, Associate Professor, Department of *Kaumarbhritya*, GAC Jalgaon, Maharashtra, India

<sup>2</sup>Professor &HOD, Department of *Kaumarbhritya*, GAC Dharashiv, Maharashtra, India

<sup>3</sup>Professor &HOD, Department of *Kaumarbhritya*, GAC Jalgaon, Maharashtra, India

<sup>4</sup>Associate Professor, Department of Ras-Shastra *Bhaishajyakalpana*, Smt. Vimladevi Ayurved Mahavidyalaya, Wandhari, Chandrapur, Maharashtra, India

\*Corresponding Author's Email Id – [kirannandeshwar12@gmail.com](mailto:kirannandeshwar12@gmail.com), Mobile No. 9175088387

### ABSTRACT

Sneha Kalpana (fat-based preparations) is one of the most commonly prescribed Ayurvedic dosage forms in routine clinical practice. These lipid-based formulations are used to manage a wide spectrum of diseases across all age groups. Vacha-Shampakadi Ghrita is an Ayurvedic herbal formulation specifically indicated for epilepsy (Apasmara) as described by **Acharya Charaka**. Standardization of such formulations is essential to ensure quality, safety, efficacy, and batch-to-batch uniformity.

### Objectives:

To standardize Vacha-Shampakadi Ghrita using various physicochemical, phytochemical, microbial, and chromatographic parameters to assure its safety and efficacy.

### Materials and Methods:

Raw drugs required for the preparation of Vacha-Shampakadi Ghrita were procured from a certified Ayurvedic pharmacy and authenticated by experts from the **Dravyaguna Department**. The ghrita was prepared according to classical Ayurvedic methods. The final product was evaluated for organoleptic characters, physicochemical parameters, microbial load, phytochemical screening, and High-Performance Thin-Layer Chromatography (HPTLC). Analytical testing was conducted at

23

**Qualichen Laboratories**, recognized by the **Bureau of Indian Standards (BIS)**, approved by the **Food and Drug Administration (Maharashtra State)**, and accredited with **ISO 9001:2015**.

**Results:**

The analyzed ghrita showed the following values: pH (5.00), total ash (0.02%), acid-insoluble ash (0.01%), water-soluble extractive (0.35%), alcohol-soluble extractive (14.45%), and loss on drying at 105°C (0.25%). HPTLC analysis was performed using the mobile phase **toluene: ethyl acetate (9:1)**.

**Conclusion:**

The formulation met acceptable qualitative standards based on evaluated parameters. Vacha-Shampakadi Ghrita has been successfully standardized using scientific quality control measures, and the obtained results may serve as a reference standard for quality assurance.

**Keywords:**

Vacha-Shampakadi Ghrita, Epilepsy, Standardization, HPTLC, Chromatography

## INTRODUCTION

Sneha Kalpana is a pharmaceutical technique in which active phytoconstituents of medicinal plants are extracted into a suitable lipid medium. These constituents are derived from various sources such as kalka (paste), kwatha (decoction), drava, and dravya, mixed in specific proportions and processed under controlled heating conditions to achieve the desired therapeutic effect. Lipid-soluble constituents can easily diffuse across biological membranes via liposomal drug delivery mechanisms. Hence, Sneha Kalpanas are capable of penetrating various tissues, including the nervous system, which is predominantly lipoidal in nature.<sup>1</sup>

Ghrita (medicated ghee) is prepared by heating a specific quantity of cow ghee with herbal paste (kalka) and decoction (kashaya) in a classical ratio of **1:4:16** for kalka, sneha, and kashaya, respectively, enabling effective transfer of active principles into the lipid medium.<sup>2</sup> Ghrita-based polyherbal formulations are believed to cross the blood-brain barrier and exert beneficial effects on brain tissue.<sup>3</sup>

Vacha-Shampakadi Ghrita is described in **Charaka Samhita** for the management of Apasmara Vyadhi (epilepsy). The formulation contains **Ghrita, Vacha, Shampaka, Vavastha, Hingu, Guggulu, and Choraka**.<sup>4</sup> The therapeutic efficacy of any formulation largely depends on the quality of raw materials and adherence to standardized preparation methods. To establish scientific validation of traditional herbal formulations, systematic standardization using modern analytical tools is essential.

Chromatography plays a vital role in the analysis and separation of phytoconstituents. High-Performance Thin-Layer Chromatography (HPTLC) is an advanced technique offering high resolution, sensitivity, and reproducibility. It enables detection of compounds at nanogram and picogram levels using UV and fluorometric detection in a short analysis time.<sup>5</sup>

Therefore, Vacha-Shampakadi Ghrita was prepared using purified and authenticated herbal ingredients as per classical Ayurvedic references. The present study was undertaken to evaluate and standardize the formulation using physicochemical, phytochemical, microbial, and chromatographic parameters to establish its authenticity and quality.

## MATERIALS AND METHODS

### Collection of Raw Drugs

The raw drugs required for the preparation of Vacha-Shampakadi Ghrita were procured from a **GMP-certified Ayurvedic pharmacy in Nagpur**. Cow ghee (Go-Ghrita) was sourced from the local market. Authentication of raw drugs and ghee was carried out at a recognized drug testing laboratory.

**Table 1: Ingredients of Vacha-Shampakadi Ghrita**

Sr. No.	Name of the Ingredients	Latin name	Proportion
1	<i>Ghrita</i>	Processed Ghee	1 part
2	<i>Vacha</i>	<i>Acorus calamus Linn.</i>	
3	<i>Shampaka</i>	<i>Cassia Fistula Linn.</i>	
4	<i>Kaitarya (parvatanimba)</i>	<i>Azadirachta Indica A. Juss.</i>	
5	<i>Vayastha</i>	<i>Bacopa Monnieri (linn.) Pannel.</i>	1/4 <sup>th</sup> part in total
6	<i>Hingu</i>	<i>Ferula Northex Boiss.</i>	
7	<i>Choraka</i>	<i>Angelica glauca</i>	
8	<i>Palankasa/ Guggulu</i>	<i>Commiphora Wightii (Arn) Bhand</i>	
9	Water	-	4 part



**Figure 1: Raw ingredients of Vacha-Shampakadi Ghrita**

### **Method of Preparation**

The preparation of *Vacha-Shampakadi Ghrita* was carried out in the **Rasashastra and Bhaishajya Kalpana Laboratory**, Ayurveda Mahavidyalaya, Chandrapur. The formulation was prepared in accordance with the classical **Sneha Kalpana** method, following the standard ratio of **1:4:16** for *Kalka* (paste), *Sneha* (fat), and *Drava* (liquid), respectively.

The *Kalka* of the prescribed drugs (Table 1) was prepared by triturating the finely powdered raw materials with a small quantity of water until a smooth and homogeneous bolus was obtained. In a clean vessel, cow ghee (*Go-Ghrita*) was gently heated until completely melted. The required quantity of liquid (water) was then added and mixed thoroughly with the ghee. Subsequently, the prepared *Kalka* bolus was added to the mixture and stirred well to ensure uniform dispersion.

The entire mixture was subjected to heating on **low flame**, maintaining continuous stirring, until the classical signs of complete ghrita processing (*Sneha Siddhi Lakshanas*) were observed. The attainment of *Sneha Siddhi Lakshana* was confirmed by the formation of a wick (*Varti*) from the residue that burned without crackling sound and by the complete disappearance of froth (*Phena*) from the ghrita.

After completion of the process, the medicated ghee was filtered through a clean, dry cloth to remove the residue. The filtrate was allowed to cool naturally and was then stored in an **airtight container** for further analysis.



**Figure: 2 Prepared vacha-shampakadighrita**

### Organoleptic Study

The organoleptic evaluation of the finished formulation was carried out to assess its sensory characteristics, including **colour, odour, taste, and consistency**. These parameters were carefully observed and recorded, as presented in **Table 2**.

In addition, the individual raw drugs used in the preparation of *Vacha-Shampakadi Ghrita* were separately evaluated for their **organoleptic and morphological characteristics**. Classical Ayurvedic parameters such as **Rasa** (taste), **Guna** (properties), **Virya** (potency), **Vipaka** (post-digestive effect), and **Karma** (pharmacological action) were documented in accordance with standard Ayurvedic literature.<sup>6</sup>

**Table 2: Organoleptic Study of Finished Product**

Sr. No.	Characters	Results
1	Form	<i>Ghrita</i> (Semisolid)
2	Color	Yellow
3	Odour	Rich and Characteristics
4	Taste	Pleasant
5	Touch	Oily

## RESULTS

Table 3 Rasa-Panchak of Vacha-ShampakadiGhrita

<b>Ingredients</b>	<b>Rasa</b>	<b>Guna</b>	<b>Virya</b>	<b>Vipaka</b>	<b>Karma</b>
<i>Go- Ghrita</i>	<i>Madhura</i>	<i>Guru, Snigdha</i>	<i>Sita</i>	<i>Madhura</i>	<i>Vata-Pittahar, Raktaprasadan, ooj Vardhan, Deepana</i>
<i>Vacha</i>	<i>Katu, Tikta</i>	<i>Laghu, Tiksna</i>	<i>Usna</i>	<i>Katu</i>	<i>Vatakaphashamaka, Agnivardaka, apasmahara, unmadahara, bhutaghna, krimighna, vataghna, samjnasthapana, medhya, lekhana</i>
<i>Shampaka</i>	<i>Madhura</i>	<i>Guru, Mrdhu, Snigdha</i>	<i>Sita</i>	<i>Madhura</i>	<i>Vatapittasamaka Rechaka, Jwaraghna, Hradya, anulomana, sothahara, vedanasthapana, pittasaraka, dahaprasamana</i>
<i>Kaitarya</i>	<i>Tikta, Kasaya</i>	<i>Laghu</i>	<i>Sita</i>	<i>Katu</i>	<i>Kaphapittasamaka Grahi, rocana, krimighna, katupausthika, rktashodhaka, jvaragnha, dahaprashmana, vranasodhana, kandughna, vednasthapana</i>
<i>Vayastha</i>	<i>Tikta, kasaya, madhura</i>	<i>Laghu</i>	<i>Sita</i>	<i>Madhura</i>	<i>Vatapittashamaka medya, vayahsthapana, rasayana, smritivardhak, visaghna, sothagha, jvaraghna</i>
<i>Hingu</i>	<i>Katu</i>	<i>Tiksna</i>	<i>Usna</i>	<i>Katu</i>	<i>Kaphavatashamaka Dipana, pachana, Vatanulomana, vatasleshmahara, sulaghna, uttejaka, jwaraghna</i>

<i>Choraka</i>	<i>Madhur, Tikta, Katu</i>	<i>Laghu, Tikshna</i>	<i>Sita</i>	<i>Katu</i>	<i>Hrudya, Kaphavatahara, Rakshoghna, Swedahara, Medohara, Jwarahara, Vishahara, Vranahara</i>
<i>Palankasa</i>	<i>Tikta, Katu</i>	<i>Laghu, tikshna, snigdha, picchila, sukma, sara</i>	<i>Usna</i>	<i>Katu</i>	<i>Tridoshaghna, rasayana, balyasnehana, visada, vatanulomana, vedanasthapana, sothahara, vranaropana</i>

### Chromatographic analysis:

HPTLC: High performance thin layer chromatography was performed for Ghrita using solvent Toluene and ethyl acetate in 9:1 ratio.<sup>7</sup>

Table 4: Specification of HPTLC and analysis report

Development – Glass tank

Chamber type – Twin Trough Chamber 10 × 10 cm

Mobile phase – Toluene : Ethyl acetate (9:1)

Solvent front position – 70.0 mm

Volume – 10.0 ml

Drying device – Oven

Temperature – 60 °C

Time – 5 minutes

Detection – CAMAG TLC Scanner

Information

Application position – 8.0 mm

Solvent front position – 70.0 mm

Instrument – CAMAG TLC Scanner “Scanner\_171005” S/N 171005 (2.01.02)

Number of tracks – 4

Position of first track X – 15.0 mm

Distance between tracks – 23.3 mm

Scan start pos. Y – 5.0 mm

Scan end pos. Y – 75.0 mm

Slit dimensions – 4.00 × 0.30 mm, Micro

Optimize optical system – Light

Scanning speed – 20 mm/s

Data resolution – 100 µm/step

Integration properties

Data filtering – Savitsky-Golay 7

Baseline correction – Lowest slope

Peak threshold min slope – 5

Peak threshold min height – 10 AU

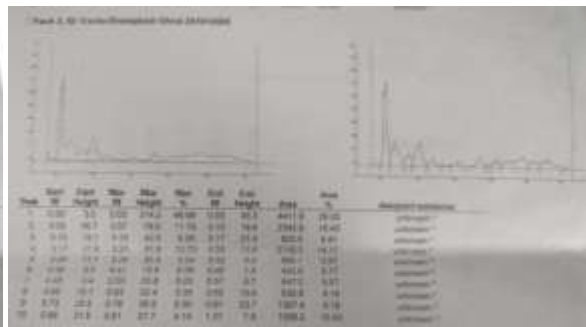
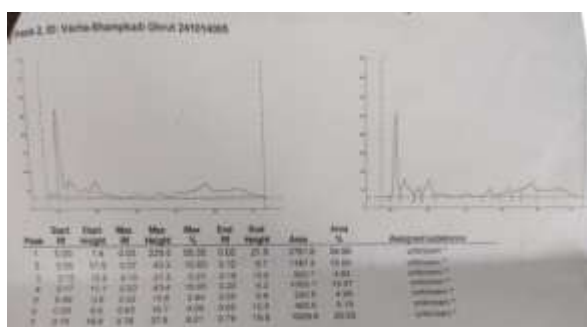
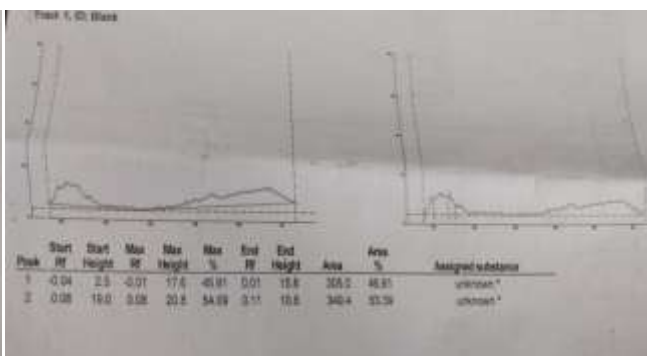
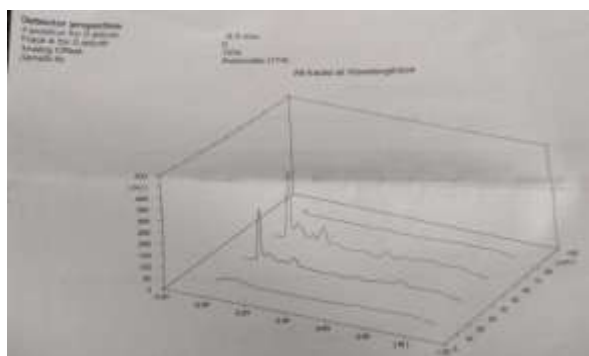
Peak threshold min area – 50

Peak threshold max height – 990 AU

Track start position – 5.0 mm

Track end position – 74.3 mm

Display scaling – Automatic





**Table 5 Physio-chemical standards**

Sr. no.	Tests	Results
1	Loss on drying at 105°C	0.25%
2	pH	5
3	Total Ash	0.02%
4	Acid Insoluble Ash	0.01%
5	Water soluble extractive	0.35%
6	Alcohol Soluble Extractive	14.45%

**Microbial parameters:** It includes a total viable content, total enterobacterial, total fungal and their count. Limiters are utilized as quantitative or semi quantitative tool for ascertainis and control the amount of impurities like the reagents used during manufacturing vessels and the solvents etc.

**Table 6 Microbial parameters of *Vacha-shampakadighrita*.**

Organisms	Limits (as per IP)	Results
E. Coli	Absent/50 ml	Absent
S. aureus	Absent/50 ml	Absent
P. aeruginosa	Absent/50 ml	Absent
S. abony	Absent/50 ml	Absent

## DISCUSSION

The main objective of the present study was to standardize **Vacha-shampakadi ghrita** on various parameters, in order to assure its safety and efficacy. By analyzing the analytical data of the **Vacha-shampakadi ghrita** we can gain extensive knowledge about their quality, safety, efficacy, potency and properties in treating various condition like **Apasmara** in children. **Vacha-shampakadi ghrita** was prepared according to the standard **Sneha**

**Kalpana** ratio in Ayurveda. Raw herbs were authenticated and analyzed before processing because the quality of finished formulation depends on the purity and origin of raw materials. The colour of ghrita was yellowish, ghrita was rich and characteristic in odour due to base of **Go ghrita**. Taste is pleasant and slightly bitter due to added **kalka dravya**. **Vacha-shampakadi ghrita** is semisolid product; in ghrita preparation it is viscous and sticky. Loss on drying, pH, total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive were all in normal range of limits as per API, making it safe and suitable for treatments in Ayurveda for various diseases.

Microbial count of **S. abony**, **P. aeruginosa**, **S. aureus**, **E. coli** were absent per 50 ml of given sample which means that the finished product is standard quality.<sup>9</sup> The findings of **HPTLC** using **toluene: ethyl acetate (9:1)** as the mobile phase as a result from the trials. **Vacha-shampakadi ghrita** is a liquid base formulation; in order to separate its constituent it required selection of solvent system which has increased non-polarity.<sup>10</sup> The **Rf value** was also approximately same due to constituent of **Vacha**, **Shampaka** etc. **kalka** which was synthesized for the formulation.

## CONCLUSION

It is concluded that the final product i.e. **Vacha-shampakadi ghrita** meet the maximum qualitative standards based on several properties and parameters. It has been standardized using scientific quality parameters. Formulations like **Vacha-shampakadi ghrita** offer enhanced therapeutic benefits without any unwanted complications. The use of **HPTLC** allows to explore its hidden potential.

## REFERENCES

1. Singh GK, Pathak R, Pandey SK. A critical review on Sneha Kalpana: oleaginous dosage forms. *World J Pharm Med Res*. 2024;10(3):174–176.
2. Tripathi BR. *Charaka Samhita of Agnivesha* with Hindi commentary. Sutrasthana, Chapter 20, Shloka 10. Varanasi: Chaukhambha Surbharati Prakashan; 2009.
3. Sharma S, Killedar RS, Shindhe PS. Standardization of Bhadrakadi Ghrita: a herbal ghee-based Ayurvedic medicinal preparation. *Indian J Anc Med Yoga*. 2023;16(3):131–137.
4. Shukla AV, Tripathi RD. *Charaka Samhita*. Chikitsasthana 10/27 (Hindi translation).

- Vol. 1. Delhi: Chaukhambha Sanskrita Pratishtan; 2007.
5. Chatwal GR, Anand SK. *Instrumental Methods of Chemical Analysis*. 5th ed. New Delhi: Himalaya Publishing House; 2008. p. 2.615.
  6. Amartya B, Krishanu D, Vikas S. A review on latest developments in the standardization of Ayurvedic drugs. *Int J Pharm Res Biosci*. 2012;1(3):96–119.
  7. Wagner H, Baldt S. *Plant Drug Analysis: A Thin Layer Chromatography Atlas*. 2nd ed. Berlin, Heidelberg: Springer-Verlag; 1996.
  8. Stahl E. *Thin Layer Chromatography*. Reprint ed. Berlin: Springer; 2005. p. 124–241.
  9. Dhurvey Y, Kawtikwar P, Sakarkar D. Evaluation of physiological properties of cow ghee before and after hydrogenation. *Int J ChemTech Res*. 2012;4(1):185–189.
  10. Babalola TO, Apata DF. Chemical and quality evaluation of some alternative lipid sources for aqua feed production. *Agric Biol J N Am*. 2011;2:935–943.