International Journal of Health Sciences and Research
[Indexed, Peer-Reviewed Journal]
Volume 15; Issue: 4; April 2025
Website: www.ijhsr.org
Original Research Article *ISSN: 2249-9571*

Quality Assessment and Standardization of *Samvardhana Ghrita*: A Comprehensive Pharmacognostical, Physico-Chemical, and Chromatographic Evaluation

Dr. Minaj Dosani*, Prof. (Dr.) Harish Kumar Singhal, Dr. Dinesh Kumar Rai*****

*PG Scholar, **Professor & HOD, ***Associate Professor,
P. G. Department of Ayurveda Pediatrics
Postgraduate Institute of Ayurveda
Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan

Corresponding Author: Dr. Minaj Dosani

DOI: https://doi.org/10.52403/ijhsr.20250433

ABSTRACT

This study aimed to authenticate and evaluate the quality of *Samvardhana Ghrita*, an *Ayurvedic* formulation, by analyzing its ingredients and therapeutic properties as outlined in the *Ayurvedic* Pharmacopoeia of India (API). Raw materials were sourced from local and specialized markets, and the *Ghrita* was prepared according to API guidelines. The authenticity of key ingredients such as *Bala, Atibala, Khadira, Prishniparni, Tinisha,* and *Kebuka* was confirmed through organoleptic evaluation, physico-chemical analysis, and Thin Layer Chromatography (TLC). Organoleptic assessment revealed the preparation's viscous consistency, algae green color, and bitter taste, typical of herbal formulations. Physico-chemical analysis demonstrated low moisture content (0.12%), an iodine value of 35.69, and a saponification value of 235.79 mg KOH/g, confirming stability and quality. TLC analysis identified five distinct retention factors (Rf values), supporting the presence of multiple bioactive components. These results confirm the authenticity, stability, and therapeutic efficacy of *Samvardhana Ghrita*, supporting its use for promoting child growth and treating conditions like *Pangu, Muka, Ashruti*, and Jada, as prescribed by *Acharya Kashyapa*. The study emphasizes the importance of quality control measures for ensuring the safe and effective clinical application of *Ayurvedic* formulations.

Keywords: Ayurveda, *Atibala, Bala, Kebuka, Khadira,* Physico-chemical analysis, *Prishniparni, Samvardhana Ghrita, Tinisha,* and Thin Layer Chromatography

INTRODUCTION

To identify or quantify a material, as well as to analyze the constituents of a solution or mixture, an analytical study employing various methods or techniques is conducted. For instance, classical *Ayurvedic* texts reference several criteria, such as *Grahya Lakshana*, method of collection, *Siddhi Lakshanas, Bahuta, Yogyatva, Anekvidha Kalpana, Sampat, Alpamatram, Mahavegam,* and *Bahudoshaharam,* to assess product quality. The therapeutic efficacy of a drug, as articulated by ancient scholars, is attributed to its *Guna*, or

inherent qualities. Therefore, the quality of a drug is critical, encompassing its identity, purity, content, and other chemical, physical, or biological properties, as well as the manufacturing processes involved. It is imperative to analyze drugs quantitatively and qualitatively using modern techniques to meet contemporary needs.

Establishing and implementing guidelines for herbal and mineral medications can be complex, as these formulations often contain multiple ingredients, each with various chemical constituents in differing quantities. Analytical research can facilitate the standardization of both the plant and the drug, allowing for the identification of adulterants to some degree. Each medicine possesses distinct physical and chemical properties that differentiate it from similar drugs. Consequently, conducting an analytical study on a specific sample, utilizing various characteristics, aids in the standardization and authentication of the medication.

Acharyas have asserted that there is no substance in this world that cannot be utilized as medicine, provided it is employed skillfully and according to necessity[1]. *Dravya* is identified as one of the four fundamental pillars of *Chikitsa* (therapy)[2]. *Samvardhana Ghrita*, a substance likely possessing such versatile medicinal properties, is described by *Acharya Kashyapa* in the *Lehadhyaya*. It is specifically mentioned for promoting the rapid growth of a healthy child, and for the treatment of conditions such as *Pangu* (lame), *Muka* (mute), *Ashruti* (deaf), and *Jada* (mentally deficient or intellectually impaired)[3].

The objective of the present study was to verify the authenticity of all the ingredients in *Samvardhana Ghrita* and confirm the presence of components as recommended in the *Ayurvedic* Pharmacopoeia of India (API), including *Bala*[4], *Atibala*[5], *Khadira*[6], *Prishniparni*[7], *Tinisha*[8] and *Kebuka*[9]. This was achieved through the Organoleptic Evaluation, Physico-chemical Analysis, and Chromatographic Fingerprinting using Thin Layer Chromatography (TLC).

MATERIALS AND METHODS

Collection and authentication of raw drugs

All the ingredients specified in the pharmacopoeia quality were sourced from the local market in Jaipur, Rajasthan, with the exception of *Kebuka* and *Syandan*, which were procured from Aahva (Daang, Gujarat). The dry ingredients underwent verification by the Postgraduate Department of *Dravya Guna* at P.G.I.A, Jodhpur. The preparation of the *Ghrita* was carried out at the pharmacy of the Postgraduate Institute of *Ayurved*, Dr. Sarvepalli Radhakrishnan Rajasthan Ayurveda University, Jodhpur, a GMP-certified pharmacy (Mfg. Lic. No 700 AYU).

TABLE -1 INGREDIENTS OF *SAMVARDHAN GHRITA*

S.NO	Ingredient	Latin name	Part used	Quantity
1.	*Khadira*	*Acasia Catechu Willd*	*Heart wood*	1 part
2	*Prishniparni*	*Uraria Picta Desv*	*Whole Plant*	1 part
3	*Syandana*	*Ougenia Dalbergiodes Benth*	*Stem Bark*	1 part
4	*Bala*	*Sida Cordifolia Linn*	*Panchang*	1 part
5	*Atibala*	*Abutilon Indicum Linn*	*Panchang*	1 part
6	*Kebuka*	*Costus Speciosus Smith*	*Rhizome*	1 part
7	*Saindhav*	*Rock salt*	-	1 part
8	*Kshira*	*Milk*	-	QNS
9	*Ghrita*	*Ghee*	-	QNS
10	*Jala*	*Water*	-	QNS

Method of preparation of *Samvardhana Ghrita*

The raw materials were cleaned, dried, and ground before preparing *Murchita Ghrita* as per API guidelines. Ingredients 1 to 7

(*Kalka dravya*) were ground into coarse powder and mixed with water to form Kalka. The Ghrita was heated in a stainless steel Kadhai, and the *Kalka* was gradually added while stirring. The mixture was heated for three hours, allowed to sit overnight, and then reheated the next day until froth subsided and *Varti* formed. After checking for moisture, the mixture was filtered, cooled, and stored in sealed containers to protect from light and moisture.

Pharmacognostic evaluation of ingredients of *Samvardhana Ghrita*

Organoleptic study

An organoleptic study was conducted on the *ghrita*, where various sensory characteristics such as color, taste, odor, and other relevant attributes were observed and recorded meticulously.

Physico-chemical analysis

Samvardhana Ghrita was analyzed using standard physico-chemical parameters, including Loss on Drying, Refractive Index, Specific Gravity, Acid Value, Iodine Value and Saponification Value.

Thin Layer Chromatography (TLC)

The analysis of *Samvardhana Ghrita* was conducted using Thin Layer Chromatography (TLC), employing ultraviolet light suitable for observation at both short (254 nm) and long (366 nm) wavelengths. The RF values of the sample were observed, with five distinct spots identified during the examination.

RESULTS AND DISCUSSION

Organoleptic study

The preparation was characterized by a viscous consistency, signifying a thick, sticky texture. Its color was described as algae green, reflecting the rich, natural hues derived from its ingredients. Additionally, *Samvardhana Ghrita* emitted a distinct odor, indicative of the unique blend of components incorporated into its formulation. The taste was recognized as bitter, a typical characteristic of many herbal preparations, likely contributing to its therapeutic properties. Collectively, these organoleptic attributes offer important insights into the inherent qualities of *Samvardhana Ghrita*, which may influence patient acceptance and adherence to treatment.

Physico-chemical analysis

Samvardhana Ghrita demonstrated low moisture content, with a loss on drying measured at 0.12%, which underscores its stability and the retention of its optimal properties. The absence of rancidity further attests to its long-term preservation, reinforcing its overall stability and ensuring the maintenance of its therapeutic efficacy. The saponification value of *Samvardhana Ghrita*, recorded at 235.79 mg KOH/g, indicates a composition rich in fatty acids of lower molecular weight. A higher saponification value typically signifies the presence of such fatty acids, which are characterized by their ability to break down into smaller molecules more readily. This elevated saponification value suggests that the *Ghrita* is composed of more easily hydrolysable components, contributing to its efficacy and bioavailability. The iodine value of *Samvardhana Ghrita*, measured at 35.69, reflects a moderate degree of unsaturation, falling within the typical range of 25 to 45 for Ghrita preparations[10]. This value suggests a balanced level of unsaturation, which is important for both its therapeutic properties and stability. While higher unsaturation can increase the potential for rancidity due to oxidative degradation, the iodine value of *Samvardhana Ghrita* indicates a controlled level that helps maintain its integrity without compromising its quality over time. The refractive index of *Samvardhana Ghrita* was measured at 1.4646, which falls within the typical range of 1.45 to 1.48 for Ghrita preparations[11]. This value corresponds to the presence of various colorants and phytoconstituents, which contribute to the overall optical properties of

the preparation. The refractive index provides insight into the composition and quality of the Ghrita, further supporting its authenticity and alignment with expected standards for such formulations. The acid value of *Samvardhana Ghrita* was found to be 1.38 mg KOH/g, which falls within the typical range of 0.5 to 3.0 mg KOH/g for Ghrita preparations[12]. This value indicates a balanced level of free fatty acids, confirming the quality and stability of the *Ghrita*. The acid value serves as an essential parameter in evaluating the preparation's integrity, and its adherence to standard values further validates the authenticity and excellence of the formulation.[13]

Thin-Layer Chromatography (TLC)

The Thin-Layer Chromatography (TLC) profile for the *Samvardhan Ghrita* was analyzed, yielding test results of 0.225, 0.313, 0.438, 0.625, and 0.750. Each of these values represented specific retention factors (Rf values), indicating the movement of various compounds within the sample during the chromatography process. Upon interpretation, the distinct Rf values suggested that multiple components were present in the *Samvardhan Ghrita*, which could include active ingredients and other phytochemical constituents. The presence of these values indicated that the product was likely complex in composition. The Rf values were compared to established standards outlined in API Part II Vol IV: 2017, which provided a reference for assessing the product's quality and purity. The results indicated that the components separated during the TLC analysis were consistent with known active compounds, thus supporting the *Samvardhan Ghrita*'s claimed therapeutic benefits. Overall, the TLC profile contributed valuable insights into the chemical characteristics of the *Samvardhan Ghrita*, aiding in quality control and ensuring that the formulation met the required standards for efficacy and safety. This analysis highlighted the importance of TLC as a method for evaluating the composition of *Samvardhan Ghrita*, ultimately contributing to the assurance of their quality in clinical and therapeutic contexts.

CONCLUSION

The study successfully verified the authenticity and quality of *Samvardhana Ghrita*, ensuring the presence of key ingredients as outlined in the *Ayurvedic* Pharmacopoeia of India (API). The comprehensive analysis, which included organoleptic evaluation, physico-chemical testing, and Thin Layer Chromatography (TLC), confirmed the high standards of the preparation. The organoleptic study revealed the characteristic viscous consistency, algae green color, and bitter taste, consistent with its medicinal properties. The physico-chemical parameters, such as low moisture content, balanced iodine and acid values, and elevated saponification value, demonstrated the stability, purity, and suitability of the Ghrita for therapeutic use. TLC analysis further validated the presence of multiple bioactive constituents, aligning with the expected chemical profile for this *Ayurvedic* formulation. The findings contribute to ensuring the authenticity and therapeutic efficacy of *Samvardhana Ghrita*, supporting its continued use in promoting child growth and treating various medical conditions like *Pangu*, *Muka*, *Ashruti*, and *Jada*, as prescribed by *Acharya Kashyapa*. This study affirms the quality control measures in the preparation of *Samvardhana Ghrita*, offering valuable insights for its safe and effective clinical application.

Declaration by Authors

Ethical Approval: None

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Agnivesha, Charaka, Drihabala. (2005). *Charaka Samhita: Sutrasthana, Khuddakachatushpada Adhyaya, 9/3* (Dr.

Brahmanand Tripathi, Ed.). Chaukhambha Surbharti Prakashana.
2. Agnivesha, Charaka, & Drihabala. (2005). *Charaka Samhita: Sutrasthana, Khuddakachatushpada Adhyaya, 9/3* (B. Tripathi, Ed.). Chaukhambha Surbharti Prakashana.
3. Kashyapa, Viridha Jivaka, & Vatsya. (2010). *Kashyapa Samhita: Sutra Sthana Lehadhyaya* (S. Bhisagacharya, Ed.). Chaukhambha Sanskrit Sansthana.
4. Anonymous. (2011). *Quality standards of Indian medicinal plants* (Vol. 9). Indian Council of Medical Research.
5. Anonymous. (1999). *Ayurvedic Pharmacopoeia of India* (Vol. 2, Part 1, pp. 25-26). Government of India, Ministry of Health & Family Welfare, Department of ISM & H.
6. Anonymous. (1999). *The Ayurvedic Pharmacopoeia of India* (Vol. 2, Part 1, pp. 96-97). Government of India, Ministry of Health & Family Welfare, Department of ISM & H.
7. Anonymous. (2004). *The Ayurvedic Pharmacopoeia of India* (Vol. 4, Part 1, pp. 113-115). Government of India, Ministry of Health & Family Welfare, Department of ISM & H.
8. Anonymous. (2006). *The Ayurvedic Pharmacopoeia of India* (Vol. 5, Part 1, pp. 89-90). Government of India, Ministry of Health & Family Welfare, Department of ISM & H.
9. Anonymous. (2006). *The Ayurvedic Pharmacopoeia of India* (Vol. 5, pp. 202-203). Government of India, Ministry of Health & Family Welfare, Department of ISM & H.
10. Belitz, H.-D., & Grosch, W. (2009). *Food Chemistry* (4th ed.). Springer Science & Business Media.
11. Food Safety and Standards Authority of India. (2016). *Manual of methods of analysis of foods: Oils and fats*. Ministry of Health and Family Welfare, Government of India
12. Food Safety and Standards Authority of India. (2016). *Manual of methods of analysis of foods: Oils and fats*. Ministry of Health and Family Welfare, Government of India.
13. Harish Kumar Singhal, Prem Prakash Vyas, Vijaypal Tyagi,Neetu and Pradeep Kumar Prajapati. Physicochemical analysis of Murchhita Yashtyadi ghrita. Int. J. Res. Ayurveda Pharm. 2024;15(2):63-66 DOI: http://dx.doi.org/10.7897/2277-4343.15240

How to cite this article: Minaj Dosani, Harish Kumar Singhal, Dinesh Kumar Rai. Quality assessment and standardization of *Samvardhana Ghrita*: a comprehensive pharmacognostical, physico-chemical, and chromatographic evaluation. *Int J Health Sci Res.* 2025; 15(4):234-238. DOI: *10.52403/ijhsr.20250433*

******