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Comparative analytical study of classically prepared and market samples of *Vida Lavana* through advanced instrumental techniques

Ketvi Patel, Bharti Umretia, Bharat Kalsariya

Department of Rasashastra and Bhaishajya Kalpana, Government Ayurved College, Vadodara, Gujarat, India

Abstract

Introduction: *Vida Lavana* (VL) is an important *Kritrima Lavana* described in Ayurvedic texts and prepared by processing *Romaka Lavana* with *Amalaki* followed by controlled heating. Variation in the appearance and composition of commercially available samples indicates the need for systematic analytical evaluation and standardization. **Materials and Methods:** A comparative analytical study was conducted using classically prepared VL and four market samples procured from Varanasi, Pune, Amritsar, and Hyderabad. Classical VL was prepared using *Romaka Lavana* and *Amalaki* in an 8:1 ratio, and *Gajaputa* was selected as the standard heating method based on preliminary pharmaceutical observations. The samples were evaluated for organoleptic characteristics, physicochemical parameters, and elemental composition by inductively coupled plasma mass spectrometry (ICP-MS), energy-dispersive X-ray spectroscopy (EDS), and crystalline phases by X-ray diffraction (XRD). **Results:** The classically prepared sample showed a characteristic reddish-black crystalline appearance, whereas three market samples were yellowish-white. The samples showed low loss on drying (0.112–0.42%), high total ash (88.26–99.86%), and high water-soluble extractive values (94.48–99.64%). ICP-MS demonstrated sodium as the predominant mineral element, whereas EDS confirmed sodium and chlorine as major elements. Variations were observed in potassium, oxygen, carbon, and other minor elements among market samples. XRD showed comparable diffraction patterns, with Serendibite identified as the major crystalline phase and Augite as the minor phase in all samples. **Conclusion:** The study provides preliminary physicochemical, elemental, and crystalline reference data for VL. These findings may support its authentication, quality assessment, and pharmaceutical standardization. Further studies using authenticated manufacturers and larger sample numbers are recommended.

Key words: Inductively coupled plasma mass spectrometry, *Kritrima Lavana,* Market samples, Physicochemical parameters, X-ray diffraction

INTRODUCTION

Lavana occupies an important place in Ayurveda owing to its extensive use in both *Ahara* and *Chikitsa*. Among the various *Lavana* described in classical texts, *Vida Lavana* (VL) is regarded as one of the important Kritrima Lavana, prepared by processing *Lavana* with herbal ingredients followed by controlled heating. Unlike *Prakrita Lavana*, *Vida Lavana* undergoes a specific pharmaceutical process that imparts distinct physicochemical characteristics and therapeutic properties.

VL has been described in several Ayurvedic texts, including Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Ashtanga Samgraha, Bhavaprakasha, Rasa Tarangini, and Rasendra Chudamani. It is indicated in the management of *Agnimandya* (impaired digestive fire), *Ajirna* (indigestion), *Anaha* (abdominal distension), *Adhmana* (flatulence), *Vishtambha* (constipation), *Shula* (abdominal pain), *Gulma* (abdominal lump), *Hridgaurava,*

Address for correspondence:
Ketvi Patel, Department of Rasashastra and Bhaishajya Kalpana, Government Ayurved College, Vadodara, Gujarat, India. Mobile: +91 9662543739.
E-mail: drketvipatel98@gmail.com

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and other disorders associated with deranged *Vata*. Owing to its *Dipana, Pachana, Anulomana, Vata-Kaphahara,* and *Shulahara*[1] properties, VL is widely incorporated in several important classical formulations such as *Chitrakadi Gutika,*[2] *Shankha Vati,*[3] *Takrarishta,*[4] and numerous digestive formulations.

The pharmaceutical processing of VL involves herbal ingredients and controlled heating, which may influence its final characteristics. Currently, it is commercially available under different names, and variations in color, texture, and composition may occur due to differences in raw materials and manufacturing practices. Therefore, systematic evaluation is required for its authentication and standardization.

Recent advances in instrumental analytical techniques have enabled detailed characterization of mineral and herbo-mineral formulations. X-ray diffraction (XRD) is a powerful technique for identifying crystalline phases and detecting structural transformations occurring during pharmaceutical processing. Inductively coupled plasma-mass spectrometry (ICP-MS) provides highly sensitive qualitative and quantitative estimation of major, minor, and trace elements, whereas Energy-dispersive X-ray spectroscopy (EDS) facilitates elemental characterization and distribution within the sample. Together, these complementary analytical techniques provide valuable information regarding the mineralogical composition, elemental profile, and structural characteristics of VL, thereby contributing to its scientific standardization.

Therefore, the present study was undertaken to comparatively evaluate classically prepared and market samples of VL using organoleptic, physicochemical, and advanced instrumental analytical techniques, with the aim of generating preliminary data for its authentication, quality assessment, and standardization.

MATERIALS AND METHODS

The present study was designed as a comparative analytical evaluation of classically prepared VL and market samples of VL. The study consisted of three phases: (i) market survey and sample procurement, (ii) preparation of classically prepared VL according to the classical method, and (iii) comparative analytical evaluation using organoleptic, physicochemical, and advanced instrumental analytical techniques.

A comprehensive market survey was conducted to assess the commercial availability, marketed identity, geographical distribution, and procurement sources of VL in India. A total of 31 traders representing the Northern, Southern, Eastern, Western, and Central regions of India were surveyed through direct interaction. Information regarding the marketed name, source of procurement, commercial availability, and price of VL was recorded. The survey revealed that the marketed product was commonly sold under the names VL, Kala Namak, or Black Salt. To obtain representative samples while avoiding geographical regions of India, the following samples were collected:

Preparation of Classically Prepared VL

The classically prepared VL was prepared according to the procedure described in Rasa Tarangini.[5] Authentic *Romaka Lavana* procured from Sambhar Lake, Rajasthan, and *Amalaki* were used in a ratio of 8:1 (*Romaka Lavana: Amalaki*). Based on the findings of the preliminary pharmaceutical study, *Gajaputa* was selected as the standard heating method because it produced the desired pharmaceutical characteristics. Five batches of VL were prepared under standardized conditions to establish the standard manufacturing procedure. The finished product obtained from these batches was used as the reference for comparative analytical evaluation.

Organoleptic and Physicochemical Evaluation

Classically prepared and market samples were evaluated for appearance, odor, taste, and texture. Physicochemical parameters included pH, loss on drying (LOD) at 105°C, total ash, acid-insoluble ash (AIA), and water-soluble extractive (WSE).

ICP-MS Analysis

Elemental analysis was carried out using ICP-MS to compare the elemental composition of classically prepared VL and market samples. Major elements (Na, K, Ca, Mg, and Cl) were analyzed to assess their mineral profile, whereas heavy metals (Pb, Cd, As, and Hg) were evaluated for safety assessment. The results helped identify variations in elemental composition and the overall safety profile of the samples.

EDS Analysis

EDS analysis was performed to determine the relative percentage of the major elements present in the samples, including carbon, oxygen, sodium, magnesium, aluminum, silicon, phosphorus, sulfur, chlorine, potassium, and calcium. The elemental distribution obtained from EDS was compared with the ICP-MS findings.

XRD Analysis

XRD was performed to evaluate the crystalline phases and structural characteristics of the samples. Diffraction peaks, d-spacing, and relative intensity were compared with standard data from the RRUFF crystallographic database to identify similarities and variations among the samples.

RESULTS

In the present study, classically prepared VL and market samples were subjected to comparative evaluation.

Organoleptic Evaluation

The organoleptic characteristics of the classically prepared VL and market samples are presented in Tables 1 and 2. All samples possessed a characteristic appearance [Figures 1-4], odour, salty taste, and rough texture.

Physicochemical Analysis

The comparative physicochemical parameters are presented in Table 3.

ICP-MS Analysis

The elemental composition determined by ICP-MS is presented in Table 4.

Among the mineral elements, sodium was predominant in classically prepared VL (68.27%), followed by chlorine (4.54%). Variations in sodium and potassium were observed among market samples, with MSVLE showing comparable sodium levels and MSVLN showing higher potassium. Calcium and magnesium were present in low concentrations. Heavy metals showed variable levels, with Pb 0.01–2.43 ppm, Cd 0.02–0.05 ppm, As 0.08–5.81 ppm, and Hg 0.52–2.72 ppm.

Table 1: The details of market samples of *Vida Lavana*

Sample code	Place of procurement	Region
MSVLE	Varanasi	East
MSVLW	Pune	West
MSVLN	Amritsar	North
MSVLS	Hyderabad	South

MSVLE: Market sample of *Vida Lavana* from East,
MSVLW: Market sample of *Vida Lavana* from West,
MSVLN: Market sample of *Vida Lavana* from North,
MSVLS: Market sample of *Vida Lavana* from South

EDS Analysis

The elemental composition obtained by EDS is presented in Table 5.

Carbon, oxygen, sodium, and chlorine were the major elements detected in all samples. The classically prepared VL contained 21.20 wt.% carbon**,** 4.41 wt.% oxygen**,** 27.76 wt.% sodium, and 46.10 wt.% chlorine. Market samples exhibited variation in elemental proportions, particularly in oxygen, sodium, chlorine, and potassium contents. Oxygen content ranged from 4.41 wt.% to 44.61 wt.%, whereas chlorine ranged from 10.91 wt.% to 46.10 wt.%. Potassium showed marked variation, with the highest proportion observed in MSVLN (12.22 wt.%). Minor quantities of magnesium, aluminum, silicon, phosphorus, sulfur, and calcium were also detected.

XRD Analysis

The comparative XRD data of the classically prepared VL and market samples are presented in Table 6.

All samples exhibited highly comparable diffraction patterns. The strongest diffraction peak was observed at approximately 31.8° (2θ) with a relative intensity of 100% in every sample. The corresponding d-spacing ranged from 2.80 Å to 2.81 Å, closely matching the reference diffraction data of Halite (NaCl).

The XRD database identified Serendibite ($CaMg_3Si_3O_{10}$) with an anorthic crystal system as the major crystalline phase in all samples, whereas Augite with a monoclinic crystal system was identified as the minor crystalline phase. No appreciable differences in diffraction peak position or relative intensity were observed among the classically prepared VL and the four market samples, indicating similar crystalline characteristics.

DISCUSSION

VL is categorized under *Lavana Varga* in Ayurvedic classifications and is regarded as a processed (artificially prepared) type of *Lavana* obtained through specific

Table 2: Details of organoleptic characters of classically prepared *Vida Lavana* and market samples of *Vida Lavana*

Sr.no.	Organoleptic Characters	VL	MSVLE	MSVLW	MSVLN	MSVLS
1	Appearance	Reddish-black crystals	Yellowish-white	Yellowish-white	Yellowish-white	Reddish-black
2	Odor	Characteristic	Characteristic	Characteristic	Characteristic	Characteristic
3	Taste	*Lavana*	*Lavana*	*Lavana*	*Lavana*	*Lavana*
4	Texture	Rough	Rough	Rough	Rough	Rough

MSVLE: Market sample of *Vida Lavana* from East, MSVLW: Market sample of *Vida Lavana* from West, MSVLN: Market sample of *Vida Lavana* from North, MSVLS: Market sample of *Vida Lavana* from South, VL: *Vida Lavana*

Table 3: Details of physicochemical parameters of classically prepared *Vida Lavana* and market samples of *Vida Lavana*

Sr. No.	Parameters	*Vida Lavana*	MSVLE	MSVLW	MSVLN	MSVLS
1	pH	8.16	7.42	7.702	7.71	8.91
2	LOD at 105°C (%w/w)	0.112	0.26	0.129	0.42	0.21
3	Total ash (%w/w)	98.64	88.26	99.86	95.93	99.86
4	Acid-insoluble ash (% w/w)	1.69	2.30	0.83	6.08	2.00
5	Water-soluble extractives (%w/w)	98.27	97.92	98.56	94.48	99.64

MSVLE: Market sample of *Vida Lavana* from East, MSVLW: Market sample of *Vida Lavana* from West, MSVLN: Market sample of *Vida Lavana* from North, MSVLS: Market sample of *Vida Lavana* from South

Table 4: Comparative results of ICP-MS of *Vida Lavana* and market samples of *Vida Lavana*

Sr.no.	Elements	Result				
		VL	MSVLE	MSVLW	MSVLN	MSVLS
Heavy metal (ppm)						
1	Lead	2.27	0.01	0.33	2.43	0.02
2	Cadmium	0.02	0.02	0.04	0.05	0.02
3	Arsenic	0.44	0.41	0.15	5.81	0.08
4	Mercury	0.61	2.33	2.14	2.72	0.52
Minerals (%)						
5	Potassium	0.34	6.45	0.17	20.41	0.19
6	Sodium	68.27	63.23	0.29	23.55	52.79
7	Calcium	0.017	0.96	0.29	0.36	00.012
8	Magnesium	0.0008	0.21	0.035	0.087	0.0016
9	Chlorine	4.54	4.46	4.40	4.35	4.50

MSVLE: Market sample of *Vida Lavana* from East, MSVLW: Market sample of *Vida Lavana* from West, MSVLN: Market sample of *Vida Lavana* from North, MSVLS: Market sample of *Vida Lavana* from South, VL: *Vida Lavana*, ICP-MS: Inductively coupled plasma mass spectrometry

Table 5: Comparative EDS analysis of *Vida Lavana* and market samples of *Vida Lavana*

Element	VL		MSVLE		MSVLW		MSVLN		MSVLS	
	Weight %	Atomic %	Weight %	Atomic %	Weight %	Atomic %	Weight %	Atomic %	Weight %	Atomic %
Carbon (C)	21.20	38.67	19.93	30.46	14.59	26.24	15.36	27.40	20.92	29.75
Oxygen (O)	4.41	6.04	33.77	38.76	16.86	22.76	24.35	32.61	44.61	47.64
Sodium (Na)	27.76	26.46	23.55	18.81	27.33	25.68	10.98	10.23	22.88	17.00
Magnesium (Mg)	ND	ND	0.32	0.25	0.09	0.08	0.30	0.26	ND	ND
Aluminum (Al)	0.00	0.00	0.05	0.04	0.10	0.08	0.68	0.54	0.03	0.02
Silicon (Si)	0.15	0.12	0.76	0.50	0.23	0.18	2.48	1.89	0.07	0.04
Phosphorus (P)	ND	ND	ND	ND	ND	ND	0.13	0.09	0.02	0.01
Sulfur (S)	0.03	0.02	1.20	0.69	2.44	1.64	1.49	1.00	0.36	0.19
Chlorine (Cl)	46.1	28.54	19.11	9.90	37.94	23.11	31.14	18.82	10.91	5.26
Potassium (K)	0.08	0.05	0.97	0.46	0.05	0.03	12.22	6.70	0.17	0.08
Calcium (Ca)	0.21	0.12	0.33	0.15	0.37	0.20	0.88	0.47	0.01	0.01

MSVLE: Market sample of Vida Lavana from East, MSVLW: Market sample of Vida Lavana from West, MSVLN: Market sample of Vida Lavana from North, MSVLS: Market sample of Vida Lavana from South, VL: Vida Lavana, EDS: Energy-dispersive X-ray spectroscopy

Table 6: Comparison of the strongest peaks of samples and reference standards of NaCl

Sr No	Sample	Highest Peak (2θ,°)	d-spacing (Å)	Relative Intensity (%)	Major Phase	Minor Phase
1	VL	31.8	2.81	100	Serendibite ($CaMg_3O_{10}Si_3$) – Anorthic	Augite $[Al_{0.285}Ca_{0.831}Cr_{0.003}Fe_{0.185}Mg_{0.803}Mn_{0.004}Na_{0.037}O_6Si_{1.819}Ti_{0.033}]$- Monoclinic
2	MSVLE	31.9	2.80	100	Serendibite ($CaMg_3O_{10}Si_3$) – Anorthic	Augite $[Al_{0.285}Ca_{0.831}Cr_{0.003}Fe_{0.185}Mg_{0.803}Mn_{0.004}Na_{0.037}O_6Si_{1.819}Ti_{0.033}]$- Monoclinic
3	MSVLW	31.864	2.8084	100	Serendibite ($CaMg_3O_{10}Si_3$) – Anorthic	Augite $[Al_{0.285}Ca_{0.831}Cr_{0.003}Fe_{0.185}Mg_{0.803}Mn_{0.004}Na_{0.037}O_6Si_{1.819}Ti_{0.033}]$- Monoclinic
4	MSVLN	31.8	2.81	100	Serendibite ($CaMg_3O_{10}Si_3$) – Anorthic	Augite $[Al_{0.285}Ca_{0.831}Cr_{0.003}Fe_{0.185}Mg_{0.803}Mn_{0.004}Na_{0.037}O_6Si_{1.819}Ti_{0.033}]$- Monoclinic
5	MSVLS	31.873	2.8077	100	Serendibite ($CaMg_3O_{10}Si_3$) – Anorthic	Augite $[Al_{0.285}Ca_{0.831}Cr_{0.003}Fe_{0.185}Mg_{0.803}Mn_{0.004}Na_{0.037}O_6Si_{1.819}Ti_{0.033}]$- Monoclinic
Reference standard						
1	NaCl[6]	31.70	2.82	100	Halite	-



Figure 1: Market sample of *Vida Lavana* from the East



Figure 3: Market sample of *Vida Lavana* from the North



Figure 2: Market sample of *Vida Lavana* from the West



Figure 4: Market sample of *Vida Lavana* from the South

pharmaceutical procedures. Clinically, it is used as a single therapeutic agent in the management of various gastrointestinal disorders, including *Ajirna* (indigestion), *Anaha* (abdominal distension), *Vishtambha* (obstructive constipation), *Shula* (abdominal pain), *Vibandha* (constipation), and *Hridagaurava* [1] (a feeling of heaviness in the cardiac region). In addition, it plays a significant role as an active ingredient in several classical formulations such as *Chitrakadi Gutika,*[2] *Takrarishta,*[4] and *Shankha Vati.*[3]

The present study included a market survey covering 31 traders from different geographical regions of India to evaluate the commercial availability and marketed identity of VL. The survey revealed that the product was commonly marketed under the names VL, Kala Namak, and Black Salt, indicating the absence of uniform market nomenclature. Representative samples procured from the Eastern, Western, Northern, and Southern regions were selected for analytical evaluation to represent the diversity of marketed products. This regional variation in marketed identity may reflect differences in local manufacturing practices, commercial terminology, and distribution channels. However, none of the traders were able to provide authentic information regarding the original manufacturer, actual place of large-scale production, or the primary source from which the marketed VL was procured. Consequently, the manufacturing source and pharmaceutical preparation method of the marketed samples could not be identified.

Organoleptic Evaluation

Organoleptic examination demonstrated noticeable variation in the appearance of the samples. The classically prepared VL appeared as reddish-black crystals, whereas three market samples were yellowish-white and one sample showed a reddish-black color similar to the classical preparation. However, all samples exhibited a characteristic odor, salty taste, and rough texture.

The reddish-black color observed in the classically prepared VL is most likely produced during the controlled heating of *Romaka Lavana* with *Amalaki*. Thermal decomposition of the organic constituents of *Amalaki*, together with mineral interactions during heating, probably results in the formation of carbonaceous material that imparts the characteristic dark color. The variation in color among the market samples suggests differences in pharmaceutical processing, heating temperature and duration of heating, or the quality of raw materials used during manufacture. Since taste, odor, and texture remained similar in all samples, these parameters appear to be relatively conserved despite regional variation in manufacturing practices.

Physicochemical Evaluation

The physicochemical parameters demonstrated that all samples possessed similar basic characteristics, although certain differences were observed. The pH values ranged from 7.42 to 8.91, indicating that all samples were neutral to mildly alkaline in nature. The classically prepared VL exhibited a pH of 8.16, which is consistent with the alkaline nature expected from processed mineral salts.

LOD values were very low in all samples (0.112–0.42%), indicating minimal moisture content. Low moisture improves storage stability. The slightly higher LOD observed in some market samples may be attributed to differences in drying procedures, packaging materials, or storage conditions.

The total ash values ranged from 88.26% to 99.86%, confirming that VL is predominantly composed of inorganic mineral constituents. The classically prepared sample showed a total ash value of 98.64%, indicating efficient conversion of the formulation into a mineral-rich product during pharmaceutical processing. Similarly, the high WSE values observed in all samples (94.48–99.64%) indicate that most of the mineral constituents are readily soluble in water, which is an expected characteristic of a salt-based formulation.

AIA values showed comparatively greater variation among the market samples. The higher AIA observed in MSVLN suggests the presence of relatively higher quantities of silica or other acid-insoluble inorganic impurities.

ICP-MS Analysis

ICP-MS analysis demonstrated considerable similarity in the elemental composition of the samples while also revealing regional variations in mineral content. Sodium was the predominant mineral element in the classically prepared VL (68.27%), confirming sodium chloride as its principal constituent. Chlorine was also detected consistently in all samples.

Although sodium and chlorine predominated in every sample, the concentrations of potassium, calcium, and magnesium varied among the market samples. The northern sample (MSVLN) showed markedly higher potassium content, whereas the eastern sample exhibited sodium levels comparable with the classically prepared sample. These differences may reflect variations in the mineral composition of the raw salt, geographical origin, or differences in pharmaceutical processing.

Heavy metal analysis revealed variation in the concentrations of lead, arsenic, cadmium, and mercury among the market samples. Such variation is expected because mineral salts naturally contain trace elements depending on their geological source. Differences in manufacturing equipment, purification methods, and environmental conditions may also contribute to variations in trace elemental composition. Therefore, elemental analysis should be considered an important component of the quality assessment of commercially available VL.

EDS Analysis

EDS analysis further confirmed the elemental composition obtained by ICP-MS. Carbon, oxygen, sodium, and chlorine were identified as the principal elements in all samples.

The classically prepared VL contained comparatively higher sodium and chlorine percentages, whereas the market samples exhibited variation in oxygen, carbon, and potassium contents. The presence of carbon is expected because *Amalaki* undergoes thermal decomposition during pharmaceutical processing, leaving carbonaceous residues in the finished product. The increased oxygen content observed in some market samples may be associated with oxygen-containing mineral phases or oxide formation during heating. Likewise, differences in potassium and other minor elements indicate variation in the mineral source and processing conditions.

Overall, the EDS findings closely supported the ICP-MS results and confirmed that sodium and chlorine remain the dominant constituents of both the classically prepared and marketed VL samples.

XRD Analysis

XRD analysis demonstrated remarkable similarity among all samples. The strongest diffraction peak was observed at approximately 31.8° (2θ) with a relative intensity of 100% in every sample, closely corresponding to the reference diffraction pattern of halite (NaCl).

Database matching identified Serendibite as the major crystalline phase and Augite as the minor crystalline phase in all analyzed samples. Although these crystalline phases were identified by the software, the close agreement between the strongest diffraction peak and the standard NaCl diffraction pattern, together with the predominance of sodium and chlorine detected by ICP-MS and SEM-EDS, indicates that sodium chloride remains the major mineral constituent of VL.

The presence of Serendibite and Augite probably reflects the complex crystalline mineral matrix formed during high-temperature pharmaceutical processing rather than indicating that these minerals are present in large quantities. The nearly identical diffraction patterns observed in the classically prepared and market samples further indicate that the basic crystalline structure of VL remains similar despite regional variations in elemental composition.

Overall analytical studies showed that classically prepared VL and the market samples were mainly composed of sodium and chlorine, as confirmed by ICP-MS and SEM-EDS analyses, indicating that NaCl is the predominant mineral constituent. XRD analysis revealed a similar crystalline pattern in all samples, with Serendibite ($CaMg_3O_{10}Si_3$), an oxygen-containing mineral, as the major crystalline phase and Augite as the minor phase. However, SEM-EDS showed considerable variation in oxygen and other elemental percentages among the market samples compared with the classically prepared VL, suggesting differences in the proportion of oxygen-containing mineral phases and overall mineral composition, while the basic crystalline structure remained similar.

Although the overall mineral profile was comparable among all samples, differences in oxygen, carbon, potassium, and trace elements suggest variations arising from geographical origin, pharmaceutical processing, heating conditions, and manufacturing practices.

Limitation

The market survey was limited by the unavailability of information regarding the original manufacturer and source of procurement of the market samples. Although the samples were procured through traders, most traders did not disclose or were unable to provide the manufacturer details, place of production, or actual source of VL. Therefore, traceability of the market samples could not be established, and variations observed among samples could not be directly correlated with differences in manufacturing practices or geographical origin. Further studies involving direct procurement from identified manufacturers and samples from multiple geographical regions are required for more comprehensive standardization and quality evaluation of VL.

CONCLUSION

The classical preparation produced a characteristic reddish-black crystalline product with a 57.5% yield, following the prescribed Rasa Tarangini method. The comparative physicochemical evaluation revealed variations in parameters, indicating differences among the samples. The study highlighted the lack of traceability of market samples due to non-disclosure of their original source and manufacturer, which may contribute to variability in commercially available VL. Hence, proper raw material identification, controlled processing, and standardized manufacturing practices are essential for ensuring quality and consistency. The findings provide a preliminary basis for the standardization and quality evaluation of VL. Further studies involving identified manufacturers, diverse geographical regions, multiple batches, and advanced analytical techniques are needed to establish quality standards and authenticate marketed samples.

REFERENCES

1. Charaka A, Samhita C. Sutrasthana 27/302, Brahmanand Tripathi with Chakrapani Tika. Vol. 1. Varanasi:

Chaukhambha Bharti Academy; 2017. p. 492.
2. Charaka A. Charaka Samhita, Chikitsasthana 15/96, Brahmanand Tripathi with Chakrapani Tika. Vol. 1. Varanasi: Chaukhambha Bharti Academy; 2017. p. 567.
3. Bhikshu M. Yogaratnakara, 7/63 ver with Siddhiprada Hindi Commentary by Siddhinandana Mishra. 1st ed. Varanasi: Chaukhambha Orientalia; 2020. p. 123.
4. Charaka A. Charaka Samhita, Chikitsasthana 15/121, Brahmanand Tripathi with Chakrapani Tika. Vol. 1. Varanasi: Chaukhambha Bharti Academy; 2017. p. 571.
5. Sharma PS. Rasa Tarangini, Taranga 14/143-152, with Tarangini Hindi Commentary by Dr. Devanath Sinh Gautam. Varanasi: Chaukhamba Subharti Prakashan; 2018. p. 354.
6. Available from: https://www.rruff.net/odr/rruff_sample#/odr/view/645481/2010/eyi3mduyijoiagfsaxrliiwizhrfawqioii3mzgilcjzb3j0x2j5ijpbeyjzb3j0x2rmx2lkijoinza1miisinnvcnrfzglyijoiyxnjin1dfq/1 [Last accessed on 2026 Jul 24].

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