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Standardization of Haritakyadi Varti: An Analytical Research Study

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Abstract

Haritakyadi Varti is a classical *Ayurvedic* formulation indicated in *Netra Kandu* and *Timir,* which is described in authoritative texts such as *Bhaishajya Ratnavali*[1]. Standardization and analytical evaluation of traditional dosage forms are essential to ensure quality, safety, and reproducibility. The present article focuses on the analytical study of *Haritakyadi Varti* prepared using classical guidelines. Various physicochemical parameters were assessed to establish analytical standards, evaluate batch-to-batch consistency, and validate the formulation for contemporary pharmaceutical use.

Keywords: Haritakyadi Varti, Analytical study, Ayurvedic formulation, Varti Kalpana, Standardization, Netra Kandu, Timir.

Introduction

Rasa Shastra comprises two words i.e. *Rasa* and *Shastra*, *Rasa* refers to Mercury and the term *Shastra* signifies an extensive and systematic examination or study. *Rasa Shastra* is a specialized branch of *Ayurveda* which is a science of traditional medical practices that deals with the purification and combination of various metals, minerals and Herbo-mineral compounds. The available literature of *Rasa Shastra* strongly indicates mercury is the basic reason for origination of this science although, therapeutic utilization of metallic, mineral substances through various processing methods for treating numerous diseases is the core subject of *Rasa Shastra*.

Among different dosage forms, *Varti Kalpana* holds a unique place in local applications. *Haritakyadi Varti* is a polyherbal formulation composed of *Haritaki* (*Terminalia chebula*), *Haridra* (*Curcuma longa*), *Pippali* (*Piper longum*), and *Saindhava Lavana* (Rock salt) . These ingredients possess *Chakshushya*, *Lekhana*, *Shothahara*, and *Ropana* properties, making the formulation effective in ocular disorders.

In the current era, analytical evaluation of classical formulations is indispensable for global acceptance of Ayurveda. Analytical parameters help in assessing purity, strength, identity, and stability of the drug. Hence, the present analytical study was undertaken to establish quality control parameters for *Haritakyadi Varti*.

Objectives of the Study

- To establish analytical standards of *Haritakyadi Varti.*
- To ensure reproducibility and batch to batch consistency

Materials and Methods

1. **Collection and Authentication of Raw Materials:** All raw drugs were procured from authenticated sources and identified based on macroscopic and microscopic characteristics as per Ayurvedic Pharmacopoeia of India.
2. **Preparation of *Haritakyadi Varti:*** The formulation was prepared according to classical references. Fine powders of *Haritaki, Haridra, and Pippali* were mixed uniformly with *Saindhava Lavana*. The mixture was then triturated (*Bhavana*) using appropriate liquid media i.e *Jala* until a homogeneous mass was obtained and then rolled into *Varti* of uniform size. The prepared *Varti* were shade dried and stored in airtight containers.
3. **Analytical Evaluation:** The analytical study was carried out using standard protocols.

Organoleptic Parameters -

Parameters such as colour, odour, taste, and appearance were assessed to ensure preliminary quality assessment. (Table no. 1&2)

Physicochemical Parameters -

- **Loss on Drying (LOD):** To determine moisture content.
- **Total Ash Value:** To assess inorganic content.
- **Acid Insoluble Ash:** To detect siliceous matter.
- **Water Soluble Extractive Value:** To evaluate water-soluble constituents.
- **Alcohol Soluble Extractive Value:** To estimate alcohol-soluble active principles.
- **pH Value:** To assess acidity or alkalinity of the formulation.
- **Uniformity of Weight:** Randomly selected *Varti* were weighed to evaluate consistency in weight.
- **Hardness and Friability:** Mechanical strength of the *Varti* was assessed to ensure stability during handling and storage.

1. ORGANOLEPTIC CHARACTERS

A. RAW INGREDIENTS -

Table no. 1 –

Showing the Organo-leptic characters of raw ingredients –

Serial No.	Ingredient	Colour of powder drug	Odour	Taste	Form
1	*Haritaki*	Brown	Pungent	Bitter & Astringent	Powder
2	*Haridra*	Yellowish Orange	Aromatic	Bitter	Powder
3	*Pippali*	Brown	Characteristic Pungent	Bitter, Pungent	Powder
4	*Saindhav Lavana*	Pink	*Nirgandha*	Saltish Sweet	Powder

B. *HARITAKYADI VARTI* SAMPLES –

Table No. 2 Showing the Organo-leptic characters of samples of *Haritakyadi Varti* –

Sample	Colour	Taste	Odour	Texture
Haritakyadi Varti (S1)	Yellowish - Brown	Saline	Characteristic	Solid
Haritakyadi Varti (S2)	Yellowish - Brown	Saline	Characteristic	Solid
Haritakyadi Varti (S3)	Yellowish - Brown	Saline	Characteristic	Solid

2. PHYSICO-CHEMICAL PARAMETERS –

Table No. 3 Showing the Physico- chemical parameters of samples of *Haritakyadi Varti* -

Parameter		S1	S2	S3
Loss on Drying (L.O.D)		8.1649(%w/w)	8.4283(%w/w)	8.1689(%w/w)
Acid-insoluble ash		2.9612(% w/w)	3.0182(%w/w)	2.9710(% w/w)
Alcohol-soluble extractive		17.9105(% w/w)	18.6015 (% w/w)	17.9100 (% w/w)
Water-soluble extractive		42.0947(% w/w)	43.8649(% w/w)	42.0842 (% w/w)
pH (10% aqueous solution)		5.9	5.7	5.9
Uniformity of Weight		6.84%	8.38%	7.61%
Content of NaCl		23.8652(%w/w)	23.1508(%w/w)	23.8552(%w/w)
Disintegration time (minutes)		14	14	14
Total Bacterial count		1200cfu/gm	1360cfu/gm	1260cfu/gm
Total Fungal count		26cfu/gm	32cfu/gm	28cfu/gm
Heavy Metal analysis	Lead	0.0508 ppm	0.0359 ppm	0.0505 ppm
	Cadmium	Not Detected	Not Detected	Not Detected
	Mercury	Not Detected	Not Detected	Not Detected
	Arsenic	0.0046 ppm	0.0067 ppm	0.0056 ppm

HPTLC (High Performance Thin Layer Chromatography) -

HPTLC Fingerprint profile confirms standard scanning of samples to generate the standardization parameter for quality control purpose. Sample S1 was analyzed on different wavelengths 254nm and 366nm.The scanning data shows different spots that confirms the chemical nature and distribution pattern in specified mobile phase. The Rf value of spots differentiate the chemical composition of the sample. The related height and area of scanned spots confirm the concentration of the spots present in the sample.

Table No. 4 & 5 Showing observations of HPTLC scanning under different wavelength -

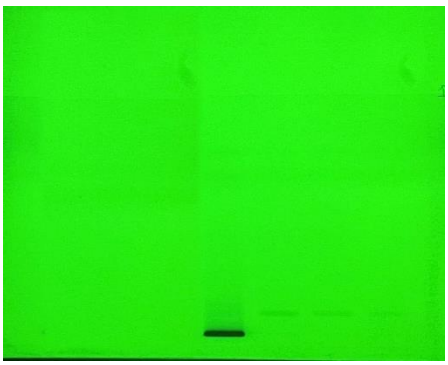
Different scanning wavelength		Number of spots	Approximate Rf Value	Intensity of Spot	Comments
	Lane 1	1	0.05	Faint	Single, very low – moving spot at the origin.

254 nm (UV)	**Lane 2**	2	0.05, 0.1	Faint, Faint	Two faint spots close to the origin, possibly indicating two components.
	Lane 3	2	0.05, 0.1	Faint, Faint	Two faint spots close to the origin.
	Lane 4	2	0.05, 0.1	Faint, Faint	Two faint spots close to the origin.
	Lane 5	1	0.05	Intense	A single, very intense, dark spot at the origin.

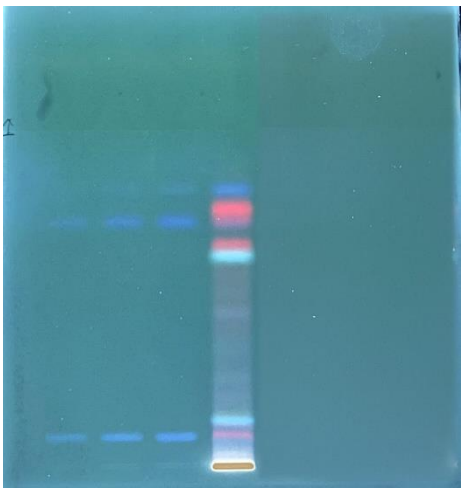
The plate was then visualized under UV light at 366 nm.

Scanning Wavelength	**Lane**	**Band colour at 366nm**	**Approximate Rf Value**
366nm (UV)	1	Blue fluorescent	0.40
	2	Blue fluorescent	0.40
	3	Blue fluorescent	0.40
	4	Red. Blue and light blue fluorescent	0.15, 0.25, 0.40, 0.50, 0.60, 0.70

Images of HPTLC Fingerprint profile of samples of *Haritakyadi Varti* on different wavelength after development of Plate



366 nm



254 nm

Results

The analytical evaluation of *Haritakyadi Varti* showed acceptable organoleptic characters indicating good quality of raw materials. Physicochemical parameters were found to be within permissible limits, reflecting purity and proper processing. Minimal variation in weight suggests uniformity and reproducibility of the formulation.

Discussion

Analytical parameters play a crucial role in standardization of Ayurvedic formulations. Loss on drying indicated controlled moisture content, which is essential for preventing microbial growth. Ash values confirmed minimal inorganic contamination, while extractive values reflected the presence of active phytoconstituents. pH value suggested compatibility for ophthalmic application.

The analytical findings support the classical claims of *Haritakyadi Varti* and provide scientific validation to its pharmaceutical quality. Establishing these parameters ensures consistency and enhances acceptability of the formulation in modern healthcare systems.

Conclusion

The analytical study of *Haritakyadi Varti* successfully established standard quality control parameters. The formulation complied with acceptable physicochemical limits, indicating good quality, purity, and stability. Such analytical evaluation bridges the gap between classical Ayurvedic knowledge and modern pharmaceutical standards, supporting wider clinical and research applications of *Haritakyadi Varti*.

Future Scope

Further studies such as microbial analysis, stability studies, and clinical study can be done to strengthen the standardization and global acceptance of *Haritakyadi Varti*.

References

1. Bhaishajya Ratnavali 64/195
2. Ayurvedic Pharmacopoeia of India Part -1, Vol- 1,4
3. Protocol for testing by Dr D.R.Lohar