

Preliminary Physicochemical Profiling of *Guduchyadi Kwatha*: Insights from *Harita Samhita*

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ABSTRACT

Introduction: *Kwatha*(decoction) is a fundamental Ayurvedic dosage form under *Panchavidha Kashaya Kalpana* (five basic preparations), with its therapeutic efficacy influenced significantly by the degree of water reduction during preparation. *Harita Samhita* describes seven distinct types of *Kwatha*—*Tarpana*, *Pachana*, *Kledana*, *Shamana*, *Deepana*, *Shodhana*, and *Vishoshi*—each tailored for specific therapeutic actions and *Doshic* imbalances.

Aim: This study aims to analyse the preliminary physicochemical characteristics of *Guduchyadi Kwatha* prepared according to the seven methods described in *Harita Samhita*, using varied water reduction process.

Materials and Methods: Seven samples of *Guduchyadi Kwatha* were prepared using a standard drug-to-water ratio of 1:16, with reductions as per the reference of *Harita samhita*. Each sample was analysed for organoleptic properties (colour, odour, taste) and physicochemical parameters including pH, specific gravity, viscosity, and total solid content.

Results: The study revealed a progressive intensification in colour and bitterness with increasing reduction. Specific gravity, viscosity, and total solid content also increased correspondingly with the reduction ratio. The most concentrated sample, *Vishoshi Kwatha*, exhibited the highest values for all parameters.

Conclusion: The extent of water reduction plays a critical role in determining the physicochemical and possibly the therapeutic characteristics of *Kwatha*. This highlights the precision and adaptability of Ayurvedic pharmaceuticals and underscores the need for further phytochemical and pharmacological investigations to validate traditional preparation methods.

Key words: Decoction, Extraction, *Guduchyadi Kwatha*, *Harita Samhita*

INTRODUCTION

Ayurveda, the ancient system of Indian medicine, emphasizes the importance of precise formulation techniques to ensure the efficacy and safety of medicinal preparations. Among the various dosage forms, *Panchavidha Kashaya Kalpana* (five basic preparations) hold a significant place. These include *Swarasa* (fresh juice), *Kalka* (paste), *Kwatha* (decoction), *Hima* (cold infusion), and *Phanta* (hot infusion).¹ *Kwatha* is one of the most frequently used among these. It is prepared by boiling coarse powder of the raw drug in water and reducing it to a specific quantity.² The proportion of water, nature of the drug (particularly its hardness),

and the method of boiling play a crucial role in determining the quality and therapeutic potential of the final decoction. Interestingly, classical Ayurvedic texts often differ in their recommended water-to-drug ratios and the extent of reduction, indicating a tailored approach based on drug characteristics and therapeutic objectives. Different preparatory methods have been described in various classical texts. These methods vary from each other on the basis of the ratio of water to drug, reduced quantity of water, types of vessels and fire used.³ Text like Harita Samhita not only outline these variations but also categorize *Kwatha* into seven types based on their pharmacological actions.⁴ They are *Tarpana*, *Pachana*, *Kledana*, *Shamana*, *Deepana*, *Shodhana* and *Vishoshi*.⁵ They also mentioned time of administration of these *Kwatha* according to *Dosha*.⁶ Possibilities of differences in the therapeutic efficacies can be anticipated with variations in the proportions of the extracting media (water).

Though many studies were found on *Kwatha* preparations, only one study conducted on various water reduction methods. This included *Chitraka Kwatha* using 1/10th, 1/2nd and 3/4th water reduction. Result showed *Kwatha* prepared with 1/10th water reduction was more viscous, darker, and had a higher concentration of constituents while the 1/2nd reduction sample was more acidic.⁷

Though no previous work has been found on the seven distinct types of *Kwatha* mentioned in the Harita Samhita, the present study attempts to prepare seven samples of *Guduchyadi Kwatha* as per Harita Samhita and compare them based on primary analytical parameters.

MATERIAL AND METHODS

Collection of Raw Material

Guduchyadi Kwatha Yavakuta (coarse powder) was procured from the government ayurvedic hospital Vadodara. The ingredients and proportions of *Guduchyadi Kwatha Yavakuta*⁸ are listed in Table 1. Different samples of *Kwatha* are prepared as per reference of Harita Samhita mentioned in Table No.2.

Table. No.1: Ingredients of *Guduchyadi Yavakuta*

Sr. No.	Ingredients	Latin Name	Part used	Proportion
1	<i>Gudhuchi</i>	<i>Tinospora cordifolia</i> Miers.	Stem	1
2	<i>Dhanyak</i>	<i>Coriandrum sativum</i> Linn	Fruit	1
3	<i>Nimba</i>	<i>Azadiracta indica</i> A. juss	Stem Bark	1
4	<i>Rakta Chandana</i>	<i>Pterocarpus santalinus</i> Linn.	Heart Wood	1
5	<i>Padmak</i>	<i>Prunus cerasoides</i> D.Don.	Heart Wood	1

Table. No.2: Sample Preparation of *Guduchyadi Kwatha*

Sr. No.	Types of <i>Kwatha</i>	Sample Code	Ratio		Proportion	Reduction to
			<i>Yavakuta</i> (g)	Water(ml)		
1.	<i>Tarpana</i>	TK	50	800	1:16	Equal (till boiling)
2.	<i>Pachana</i>	PK	50	800	1:16	1/2
3.	<i>Kledana</i>	KK	50	800	1:16	1/4
4.	<i>Shamana</i>	SMK	50	800	1:16	1/8
5.	<i>Deepana</i>	DK	50	800	1:16	1/10
6.	<i>Shodhana</i>	SK	50	800	1:16	1/12
7.	<i>Vishoshi</i>	VK	50	800	1:16	1/16

General Preparation method of *Kwatha*

Guduchyadi Kwatha Yavkuta was taken in 50 grams and soaked for 3 hours in water. Then, it was heated until the required reduction. After reduction of water, it was filtered and collected. Sample code was given as per table.no.2

Analytical evaluation

All the samples of *Guduchyadi Kwatha* were subjected to evaluate through organoleptic characters, preliminary physicochemical analysis like pH⁹, Specific gravity¹⁰, Viscosity¹¹, and percentage of total solid contents¹² by following standard guidelines in order to develop possible analytical profile.

RESULTS

In this study, seven distinct types of *Kwatha*—*Tarpana* (TK), *Pachana* (PK), *Kledana* (KK), *Shamana* (SMK), *Deepana* (DK), *Shodhana* (SK), and *Vishoshi* (VK)—were prepared using standardized parameters to evaluate variations in their pharmaceutical characteristics. Each decoction was prepared using 50 grams of crude drug material and 800 ml of water, maintaining a uniform drug-to-water ratio of 1:16. The decoction process for all samples was conducted at a constant temperature of 80°C, while extent of reduction was varied to achieve the traditional specifications of each *Kwatha* type. Observations obtained during the pharmaceutical process of *Kwatha* are mentioned in table No. 3

Table. No.3: Observations obtained during the Pharmaceutical Process of *Kwatha*

Sr. No.	Types of <i>Kwatha</i>	<i>Kwatha</i> Obtained(ml)	Temperature	Duration (minute)
1.	TK	800	80° C	15
2.	PK	400	80° C	90
3.	KK	200	80° C	109
4.	SMK	100	80° C	123
5.	DK	80	80° C	140
6.	SK	66.66	80° C	165
7.	VK	50	80° C	180

Organoleptic Characteristics

Organoleptic assessment revealed a gradual intensification in the colour and taste of the *Kwatha* in correspondence with the reduction levels. Result of organoleptic characteristics, which are mentioned in table.no. 4.

Table. No. 4: Organoleptic Characteristics of all samples of *Kwatha*

Sr. No.	<i>Kwatha</i> Types	Organoleptic Characters		
		Colour	Odour	Taste
1.	TK	Light brown	Characteristic	Bitter
2.	PK	Brown	Characteristic	Bitter +
3.	KK	Brown	Characteristic	Bitter +
4.	SMK	Brown +	Characteristic	Bitter++
5.	DK	Brown ++	Characteristic	Bitter++
6.	SK	Brown +++	Characteristic	Bitter+++
7.	VK	Brown +++	Characteristic	Bitter+++

Physicochemical Parameters

The physicochemical parameters of all seven samples were evaluated and compared based on pH, specific gravity, viscosity, and total solid content. (Table no. 5)

Table. No. 5: Result of physicochemical parameter of all *Kwatha* samples.

Sr. No.	Parameters	Samples						
		TK	PK	KK	SMK	DK	SK	VK
1.	pH	4.58	4.58	4.36	4.67	4.55	4.65	4.62
2.	Specific Gravity	0.8729	0.9181	0.9407	0.9436	0.9619	0.9772	0.9814
3.	Viscosity (milli poise)	1.1491	1.6403	1.7093	3.2618	5.1972	5.7084	5.9777
4.	Total solid content (% w/v)	0.012	0.512	1.395	2.291	2.533	2.622	2.685

DISCUSSION

Kwatha is a traditional Ayurvedic formulation where coarsely powdered herbs are boiled in water until the volume reduces, usually to one-fourth. This process extracts the water-soluble active principles of the herbs. It is a simple yet effective method used for thousands of years in Ayurveda to obtain the medicinal essence of plants. This process is closely related to modern herbal extraction, where solvents (like water, alcohol, or others) and heat are used to extract specific phytochemicals (active compounds) from plant materials. The goal in both is to separate and concentrate the therapeutic constituents.

Various classical Ayurvedic texts describe different methods for preparing *Kwatha*, particularly focusing on the ratio of *Kwatha Dravya* (herbal substance) to water, the reduction level, the type of vessel used, and the intensity of heat.¹³ According to their actions and the degree of water reduction, *Kwatha* can be classified into different types. These types include *Pachana*, *Deepaniya*, *Shodhana*, *Shamana*, *Tarpana*, *Kledana* and *Vishoshi* which are mentioned in *Harita Samhita*. While treating *Jwara* (fever), *Harita Samhita* suggests a step-by-step approach *Pachana* (digestion of *Ama*), *Shamana* (palliation), *Shodhana* (purification) and *Deepana* (stimulation of digestive fire) treatment.¹⁴

In all these stages, *Kwatha* plays a pivotal therapeutic role. *Harita* emphasizes that *Jwara* often arise from *Ama* (metabolic waste) accumulation and *Dosha* vitiation, which obstruct the normal functioning of *Agni* and bodily channels.¹⁵

Kwatha, due to their potent extraction of active herbal constituents through boiling, are ideal for quickly addressing these imbalances. They are easily absorbed, act swiftly, and can be tailored for *Dosha*-specific fevers, such as using *Panchamula Kwatha* for *Vata Jwara*,¹⁶ *Guduchyadi Kwatha* for *Paittika Jwara*¹⁷ and *Dashamula Kwatha* for *Kaphaja Jwara*¹⁸ etc. Types of *Kwatha* with their actions are mentioned in table no.6. These types are given in the context of *Jwara Chikitsa*; the treatment involves administering *Pachana Kwatha* to a *Jwara Rogi* for 3 days.¹⁹

This is followed by *Shamana Kwatha* for 5 nights, *Shodhana Kwatha* for 1 night and *Dipana Kwatha* for 1 nights.²⁰ Time of administration for *Kwatha* according to *Harita Samhita* is mentioned in table no.7.

Table No. 6: Types of *kwatha* and their Actions.²¹

No.	<i>Kwatha</i> Types	Actions
1.	<i>Pachana</i>	<i>Pachate Doshana</i> (digests the aggravated doshas)
2.	<i>Deepaniya</i>	<i>Deepayate Agni</i> (Stimulation of Digestive Fire)
3.	<i>Shodhana</i>	<i>Malashodhi</i> (Purification of Bodily Wastes)
4.	<i>Shamana</i>	<i>Shamayet Gadan</i> (Alleviation of Disorders)
5.	<i>Tarpana</i>	<i>Tarpayet Dhatu</i> (Nourishment of body tissues)
6.	<i>Kledana</i>	<i>Kledakaraka</i> (produces moisture), <i>Hridaya Kleda</i> (Moisture in the Heart)
7.	<i>Vishoshi</i>	<i>Shoshakara</i> (drying)

Table No. 7: Time of administration for *Kwatha* according to *Harita Samhita*²²

<i>Kwatha</i> Types	Time of administration
<i>Pachana</i>	<i>Nisha</i> (Night)
<i>Shamana</i>	<i>Purvahane</i> (Early Morning)
<i>Deepana</i>	<i>Aparahane</i> (Late Afternoon)
<i>Santarpana, Bhedana, Vishoshi</i>	<i>Prabhata</i> (Morning)

Guduchyadi Kwatha was selected here owing to its classical significance and its wide therapeutic applicability. This formulation prominently features *Guduchi* (*Tinospora cordifolia*)—a revered herb in Ayurveda known for its *Rasayana* (rejuvenative), *Jwaraghna* (antipyretic), and *Tridoshashamaka* (balancing all three doshas) properties.²³ The combination of ingredients in *Guduchyadi Kwatha* is specifically aimed at addressing diseases *Sarva Jwara* (all types of fever), *Hirlasa* (nausea), *Arochaka* (tastelessness), *Pratishyaya* (cold), *Pippasa* (thirst), *Shosha* (dryness) and *Daha* (burning sensation) which, makes it a relevant formulation in today's clinical context.²⁴

Furthermore, the unique feature of *Harita Samhita* is its detailed description of seven different methods of decoction preparation—each involving varying degrees of reduction, ranging from no boiling (TK) to intense reduction (VK). These methods are not merely procedural variations but are rooted in a deep understanding of therapeutic customization based on the patient's condition, *Dosha Avastha* (stage of *Dosha*), and the stage of disease. However, despite this detailed classification, modern scientific validation and physicochemical comparison of these methods have been lacking. This gap formed the core motivation behind choosing *Guduchyadi Kwatha* as a model formulation for preliminary analytical evaluation.

Organoleptic analysis supported these findings bitterness, colour intensity, and aroma increased progressively with deeper reduction. This reflects a higher degree of phytochemical extraction, particularly of bitter principles from *Guduchi*. In Ayurvedic pharmacology, *Tikta Rasa* (bitter taste) is associated with *Deepana* (Appetizer), *Pachana* (digestion), *Jwaraghna* (Antipyretic), *Krumighna* (Antiparasitic), *Vishghana* (Antitoxic), *Lekhana* (Scraping)²⁵ and supporting the therapeutic intent of the more concentrated decoctions.

The present work revealed that the extent of reduction directly affects the physicochemical characteristics of the *Kwatha*. Parameters like specific gravity, viscosity, and total solid content increased consistently with greater levels of water reduction. VK, reduced to 1/16th of the original volume, demonstrated the highest concentration in these parameters, indicating a dense and potent form of the formulation. In contrast, TK, which involved no reduction,

showed the lowest values, suggesting a more dilute preparation with potentially milder therapeutic action.

Depending on the intended effect, various types of *Kwatha* are used to target specific physiological or pathological conditions. *Pachana Kwatha* are designed to perform the action of '*Pachate Doshana*'—the digestion or transformation of accumulated *Doshas*. This *Kwatha* is typically used in the initial stages of treatment to prepare the body by breaking down *Ama* (undigested material of body) and improving *Agni*. *Deepaniya Kwatha* enhances the digestive process through '*Deepayate*' (stimulation of *Agni*). *Shodhana Kwatha* are purificatory in nature. Their main action, '*Malashodhi*', focuses on eliminating bodily waste and toxins through natural routes such as the bowels, sweat, or urine. These decoctions are often part of preparatory procedures for *Panchakarma* and other detoxification therapies. Unlike *Shodhana*, *Shamana Kwatha* aim to pacify rather than eliminate. Their action '*Shamayet Gadan*' involves calming the aggravated *Doshas* and stabilizing internal imbalances. These are particularly useful in chronic or low-intensity conditions where deep cleansing may not be necessary. *Tarpana Kwatha* is restorative, functioning through '*Tarpayet Dhatu*', meaning they nourish and replenish the body tissues (*Dhatus*). *Kledana Kwatha* perform moistening actions like '*Kledakaraka*' and are associated with *Hridaya Kleda*, or adding moisture particularly in cardiac tissues. These types of *Kwatha* are used when dryness or excessive rigidity in tissues needs to be counterbalanced with lubrication and softness. In contrast to *Kledana*, *Vishoshi Kwatha* are drying in nature. Their action, '*Shoshakara*', helps in absorbing excess moisture and managing conditions of dampness, congestion, or excessive secretions. These decoctions are useful in *Kapha*-dominant disorders or *Shotha* (edema). As *Kwatha* formulation as its own properties to cure diseases as per its ingredients, reduction proportion may change its therapeutic action.

CONCLUSION

Different reduction of water plays a vital role to change therapeutic action. Proper selection of the *Kwatha* type, guided by the individual's *Prakriti* (constitution) and *Vikriti* (imbalance), is essential for effective treatment. Each type of *Kwatha*—from *Tarpana* to *Vishoshi*—offers specific actions suitable for different stages of disease and *dosha*. This classification underscores the depth of Ayurvedic pharmacology and its holistic view of health management. Thus, proper selection and standardization of *Kwatha* preparation are essential for achieving desired clinical outcomes. Further analysis like HPTLC, phytochemical constituent studies and pharmacological evaluations are recommended to substantiate the therapeutic differentiation proposed in classical texts.

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