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PHARMACEUTICO-ANALYTICAL STUDY OF *VASADI KASHAYA*

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ABSTRACT

Introduction: *Vasadi Kashaya* is mentioned in *Bhaishajya Ratnavali*, *Pandu Rogadhikara*, indicated for *Pandu, Kamala, Halimaka*. **Aim:** To prepare *Vasadi Kashaya* and analyse it using various physicochemical parameters. **Materials and methods:** *Vasadi Kashaya* contains the drugs such as *Vasa, Nimba, Guduchi, Katuki* and *Kiratatikta*. All the drugs were taken in equal quantity and *Kashaya* was prepared as per standard operating procedure and phamaceutico analytical parameters were tested and recorded. **Results:** The Physico chemical parameters of *Vasadi Kashaya* were as follows pH 6.09, Refractive index 1.33882, Total solids 11.7 %, Specific gravity 0.9750 and TLC blue band at 254nm. **Discussion:** The pH of *Vasadi Kashaya* showed its weak acidic nature and total solids represents the amount of active constituents and dissolved solids. Values of all other parameters also helps in proving its effectiveness. **Conclusion**: *Vasadi Kashaya* was standardised as per API Guidelines and results of this study can be taken as its preliminary standard profile.

KEYWORDS: *Vasadi Kashaya*, Standardisation, *Pandu.*

INTRODUCTION

Standardizing the drugs and formulations provides framework for evaluating their quality and safety. For assessing the quality of formulations, organoleptic characters, physical constants, qualitative analysis and quantitative analysis were tested. *Vasadi Kashaya* mentioned in *Bhaishajya Ratnavali, Pandu Rogadhikara* is indicated in *Pandu, Kamala* and *Halimaka*.[1]

To create an effective formulation, a thorough understanding of its ingredients is crucial, as the efficacy of formulation relies on it. In this study we have standardised this formulation as per the API guidelines.

AIM: To prepare *Vasadi Kashaya* as per *Sharangdhara Samhita* and analyse it using various physicochemical parameters.

MATERIALS AND METHODS

The Raw drugs were obtained from the GMP Certified SDM Ayurveda Pharmacy, Kuthpady, Udupi. Karnataka.

Ingredients of *Vasadi Kashaya* are tabulated in Table 1 and pictures are depicted in Figure 1-5.

Table 01: Ingredients of *Vasadi Kashaya.*

Drug name	Botanical name	Part used	Ratio
Vasa [2]	*Adhatoda vasica*	*Moola*	10g
Amrutha [3]	*Tinospora cordifolia*	*Kaanda*	10g
Nimba [4]	*Azadirachta indica*	*Twak*	10g
Kiratatikta [5]	*Swertia chirata*	*Panchanga*	10g
Katuki [6]	*Picrorhiza kurroa*	*Kanda*	10g

Fig. 1: Vasa.

Fig. 2: Nimba.

Fig. 3: Guduchi.

Fig. 4: Katuki.

Fig.5: Kiratatikta.

Method of preparation of *Vasadi Kashaya.*

The drugs were subjected to cleaning and drying process. All the drugs were individually reduced to coarse powder through pulverization and then sieved separately. The coarse powder of all drugs were mixed together thoroughly. The coarse powdered drugs were placed in a stainless steel vessel and added with 16 parts of water. The vessel was placed over mild heat and boiled the mixture down to $1/8^{th}$ of its original volume. Then the *Kwatha* was filtered through cloth, and remaining residue was eliminated.

Precautions

- Mild fire is maintained during the preparation of Kashaya.
- The *Kashaya* was stirred intermittently.

Observations during *Kwatha* preparation

- Characteristic odour of its ingredients was observed during and after the *Kwatha* preparation.
- The colour of *Kwatha* was dark brown after the preparation.

Table 02: The analytical parameters done for *Vasadi Kashaya*.

Vasadi Kashaya		
Organoleptic Characters	**Physico chemical Analysis**	**Chromatography**
1. Colour 2. Smell 3. Taste 4. Consistency	1.pH 2.Refractive index 3.Total Solids 4.Specific Gravity	1.HPTLC

pH

pH value of an aqueous solution is defined as the common logarithm of the reciprocal of the hydrogen ion concentration in grams per litre. This definition indicates acidity or alkalinity of a solution. pH can be

measured potentiometrically using a glass electrode, reference electrode and pH meter.

Standard buffer solution: One tablet was dissolved in 100ml of distilled water at pH levels 4, 7, and 9.21ml of sample was taken and diluted to 10ml with distilled water, stirred and filtered. This filtrate was used for experiment. After switching on the pH meter, allowed it to warm up for 30 minutes. The pH 4 solution was introduced and pH was adjusted to 4.02 at 30℃ using knob. Then pH 7 solution was introduced and pH was adjusted to 7. Later the pH 9.2 solution was introduced and reading was recorded without adjusting the knob. Finally sample solution was introduced and pH reading was taken. Experiment was repeated for 4 times and average reading was taken as result.[7]

Refractive index: Placed a single drop of a water on the prism and adjust the drive knob in such a way that the boundary line intersects the separatrix exactly at the center. Recorded the reading. Distilled water has a refractive index of 1.3325 at 25℃. The instrument's error was calculated by subtracting 1.3325 from reading. If the reading is less than refractive index of water, the error is negative (-) correction is positive (+), if the reading is more, the error is positive (+) and the correction is negative (-). The refractive index of *Kwatha* was measured by placing one drop of sample at 28℃.[8]

Total solids: Accurately weighed 50 g of the sample was transferred into an evaporating China dish, which has been previously dried to a constant weight and evaporate to dryness on a water bath and then dried at 105℃ for 3 hours. After cooling the dish with the residual material was placed in a desiccator for 30 minutes, weighed it immediately. The resulting residue weight should meet the specified standards outlined in the individual monograph.[9]

Specific gravity: The specific gravity bottle was cleaned by agitating it with acetone and then with ether, followed by drying the bottle and measuring its weight. After cooling the sample solution to room temperature, the bottle was carefully filled with the test liquid, stopper was inserted and surplus liquid was removed. The weight was accurately recorded. This procedure was repeated using distilled water replacing the sample solution.[10]

HPTLC

It is an advanced form of thin layer Chromatography**.**

A 10ml sample of *Kashaya* amples was partitioned with 20 ml butanol in a separating funnel and kept for 24 hours. The butanol fraction was collected, filtered. The butanol was then evaporated on water bath. Then it was dissolved in 10ml of methanol.

4µl and 8µl of the above samples were applied on a pre-coated silica gel F254 on aluminum plates to a band width of 7mm using Linomat 5TLC applicator. The plate was developed using Ethyl acetate: Methanol: Ammonia (8.0:2.0:0.2) The developed plates were visualized under different UV lights, that is short UV, long UV and scanned UV 254nm. The Rf value, spots colour, densitometric scan data were recorded.[11]

OBSERVATIONS AND RESULT

Pharmaceutical study

Observations during *Kwatha* preparation

Characteristic odour of its ingredients was observed during and after the *Kwatha* preparation. The colour of *Kwatha* was dark brown after the preparation.

Table 1: Results of Pharmaceutical study of *Vasadi Kashaya.*

Quantity of drug taken	10 gms of each ingredient
Quantity of water added	800 ml
Temperature used	95℃ to 100℃
Time taken for *Kashaya* reduction	1 Hour
Quantity of *Kashaya* obtained	100 ml

Table 2: Organoleptic Characters.

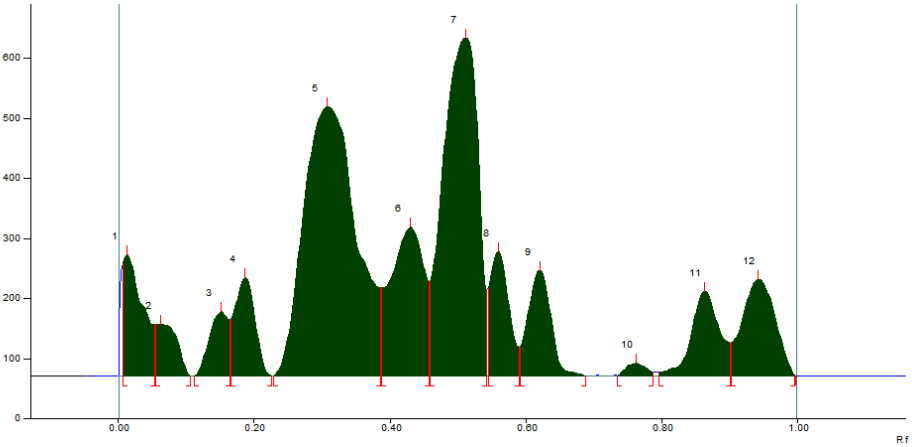
Organoleptic characters	**Results**
Colour	Dark Brown
Taste	*Tikta Kashaya*
Smell	Characterestic odour of its ingredients
Consistency	Liquid consistency

Table 3: Analytical study Results.

Sl.No	**Parameters**	**Results n= 3 %w/w**
1.	pH	6.09
2	Refractive index	1.33882
3	Total Solids	11.7 %
4	Specific Gravity	0.9750

Table 4: R_f values of *Vasadi Kashaya*.

Short UV	Long UV
0.13 (Green)	
0.16 (Green)	
0.26 (Green)	
0.28 (Green)	0.29 (F. blue)
	0.35 (F. blue)
0.38 (Green)	0.38 (F. blue)
0.45 (Green)	
	0.47 (F. blue)
0.49 (Green)	
0.55 (Green)	
	0.60 (F. blue)
	0.74 (F. blue)
0.77 (Green)	
0.84 (Green)	
	0.87 (F. blue)



Track 3, ID: Vasadi kashaya

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	187.2 AU	0.01 Rf	201.3 AU	7.98 %	0.05 Rf	85.2 AU	4266.3 AU	5.01 %
2	0.05 Rf	85.2 AU	0.06 Rf	86.4 AU	3.42 %	0.11 Rf	0.5 AU	1963.5 AU	2.31 %
3	0.11 Rf	0.5 AU	0.15 Rf	107.4 AU	4.26 %	0.16 Rf	93.5 AU	2166.3 AU	2.54 %
4	0.17 Rf	94.8 AU	0.19 Rf	163.7 AU	6.49 %	0.23 Rf	0.2 AU	3487.1 AU	4.09 %
5	0.23 Rf	0.1 AU	0.31 Rf	448.4 AU	17.77 %	0.39 Rf	46.3 AU	25125.8 AU	29.50 %
6	0.39 Rf	146.6 AU	0.43 Rf	247.5 AU	9.81 %	0.46 Rf	56.5 AU	8668.5 AU	10.18 %
7	0.46 Rf	157.4 AU	0.51 Rf	562.7 AU	22.30 %	0.54 Rf	43.5 AU	20863.2 AU	24.50 %
8	0.55 Rf	146.1 AU	0.56 Rf	206.4 AU	8.18 %	0.59 Rf	48.4 AU	4123.2 AU	4.84 %
9	0.59 Rf	48.6 AU	0.62 Rf	175.7 AU	6.96 %	0.69 Rf	0.3 AU	4250.3 AU	4.99 %
10	0.74 Rf	0.7 AU	0.76 Rf	22.1 AU	0.88 %	0.79 Rf	7.0 AU	455.1 AU	0.53 %
11	0.80 Rf	6.0 AU	0.86 Rf	140.9 AU	5.58 %	0.90 Rf	55.3 AU	4174.5 AU	4.90 %
12	0.90 Rf	55.5 AU	0.94 Rf	161.0 AU	6.38 %	1.00 Rf	1.7 AU	5626.5 AU	6.61 %

Fig. 06: *Vasadi Kashaya*, R_f - 0.49 ± 0.02 (Vasicinone).

DISCUSSION

To prepare *Vasadi Kashaya*, all drugs were cleaned and were taken individually and ground into a coarse powder using a pulveriser. The powder was then mixed thoroughly and transferred to a stainless steel vessel. Later 16 parts of water was added to the vessel, which was then placed over mild fire for boiling. The mixture was stirred intermittently to facilitate dissolution of the ingredients. This stirring also helps to prevent drugs from sticking to the bottom of vessel. Additionally stirring prevents burning of *Kwatha* which can negatively impact its quality. Furthermore stirring stops formation of foam over the surface of *Kwatha*. Preventing the formation of foam helps in proper evaporation of *Kwatha*. Once the specified reduction was achieved, the *Kwatha* was filtered through a clean dry cloth to obtain a filtrate containing plant extracts. The cloth was not pressed to prevent leaching of residue into the *Kwatha*. The leaching of residue into *Kwatha* will affect stability and shelf life. The temperature was maintained between 95℃

to 100℃ during the preparation of *Kwatha* to ensure the proper extraction of active principles. The time taken was 1 hour. After the preparation, *Kashaya* exhibits a slightly thicker consistency than water. It is due to the starch content of *Guduchi* and dissolved solids from other ingredients. The pH of *Vasadi Kashaya* showed its weak acidic nature. The refractive index of *Vasadi Kashaya* was 1.33882, it indicates the speed of light passed through *Kashaya* which indicates the amount of dissolved solids in *Kashaya*. Total solids content in *Vasadi Kashaya* was found to be 11.7 %, indicating the amount of active constituents and dissolved solids. The specific gravity of *Vasadi Kashaya* was found to be 0.9750, which is due to the concentration of components. Densiometric scan at 254 nm of *Vasadi Kashaya* shows maximum area at Rf value 0.31, that is 29.50%.

CONCLUSION

In pharamacuetical study, *Vasadi Kashaya* was prepared according to the general method of preparation of *Kashaya Kalpana* mentioned by *Acharya Sharngadhara and* subjected to specified analytical tests and the values were within the permissible limit and it is standardized as per the standard protocol. Hence it can be concluded that this formulation is safe for internal administration and this study can be taken as a preliminary standard profile of this formulation.

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