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PHARMACEUTICO-ANALYTICAL STUDY OF *VASADI ARISHTA*

Dr. Aparna M. S.[1]*, Dr. Radhika Ranjan Geethesh P.[2] Dr. Ravindra Angadi[3], Dr. Ashok Kumar B. N.[4] and Dr. Sushmitha V. S.[5]

[1]P.G Scholar, Department of P.G & PhD Studies in Rasashastra & Bhaishajya Kalpana. Sri Dharmasthala Manjunatheswara College of Ayurveda, Hospital and Research Centre. Kuthpady, Udupi. Karnataka.

[2,4]Associate Professor, Department of P.G & PhD Studies in Rasashastra & Bhaishajya Kalpana. Sri Dharmasthala Manjunatheswara College of Ayurveda, Hospital and Research Centre. Kuthpady, Udupi. Karnataka.

[3]Professor and Head, Department of P.G & PhD Studies in Rasashastra & Bhaishajya Kalpana. Sri Dharmasthala Manjunatheswara College of Ayurveda, Hospital and Research Centre. Kuthpady, Udupi. Karnataka.

[5]Assistant Professor Department of P.G & PhD Studies in Rasashastra & Bhaishajya Kalpana. Sri Dharmasthala Manjunatheswara College of Ayurveda, Hospital and Research Centre. Kuthpady, Udupi. Karnataka.

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***Corresponding Author**
Dr. Aparna M. S.

P.G Scholar, Department of P.G & PhD Studies in Rasashastra & Bhaishajya Kalpana. Sri Dharmasthala Manjunatheswara College of Ayurveda, Hospital and Research Centre. Kuthpady, Udupi. Karnataka.

ABSTRACT

Introduction: *Vasadi Kashaya* is mentioned in *Bhaishajya Ratnavali*, *Pandu Rogadhikara*, indicated for *Pandu, Kamala, Halimaka*. Due to the limited shelf life *Kashaya* has been converted to *Vasadi Arishta* with the *Anuktamana* of *Arishta Kalpana* mentioned in *Sharngadhara Samhita* **Aim:** To prepare *Vasadi Arishta* and analyze it using various physicochemical parameters. **Materials and methods:** The *Dravadravya* of *Vasadi Arishta* was *Vasadi Kashaya* (*Ingredients are Vasa, Nimba, Guduchi, Katuki* and *Kiratatikta),Madhura drvaya* as *Guda ,Sandhana Dravya* as *Dhataki Pushpa* and *Prakshepaka Dravya* as ingredients of *Vasadi Kashaya.* All ingredients were taken according to the *Anuktamana* of *Arishta* and *Arishta* was prepared as per standard operating procedure and pharmaceutico- analytical parameters were tested and recorded. **Results:** The Physico chemical parameters of *Vasadi Arishta* were as follows pH *3.9*, Refractive index

1.38506, Total solids 35.1, Total acidity 0.01, Specific gravity 1.08 Alcohol percentage 7.0, Total Sugar (%) 33, Reducing Sugar (%) 31.17, Non reducing sugar (%)1.83 and TLC at 254nm. Discussion: Conclusion: *Vasadi Arishta* was standardised as per API Guidelines and results of this study can be taken as its preliminary standard profile.

KEYWORDS: *Vasadi Kashaya, Vasadi Arishta,* 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]

Kashaya has to be used instantaneously as its shelf life is limited. In market bottled *Kashaya* and its modified forms such as *Kashaya* tablets are available. In *Ayurveda* there is mentioning of conversion of one dosage form into another without compromising the principles of *Bhaishajya Kalpana*.[2] Here *Kashaya* is converted into *Arishta,* so that the palatability and shelf life can be increased. 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 Arishta* 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 Arishta* are tabulated in Table 1 and pictures are depicted in Figure

Table 01: *VASADI ARISHTA* (Ingredients and Ratio).

Sl. No		Drug	Ratio
1.	*Dravadravya*	*Vasadi Kashaya*	2L
2.	*Madhura Dravya*	*Guda*	1Kg
3.	*Praksehpaka Dravya*	*Kwatha Dravya*	20g of each ingredient
4.	*Sandhana Dravya*	*Dhataki Pushpa*	100g

Table 02: Ingredients of *Vasadi Kashaya.*

Drug name	Botanical name	Part used	Ratio
Vasa[3]	*Adhatoda vasica*	*Moola*	200g
Amrutha[4]	*Tinospora cordifolia*	*Kaanda*	200g
Nimba[5]	*Azadirachta indica*	*Twak*	200g
Kiratatikta[6]	*Swertia chirata*	*Panchanga*	200g
Katuki[7]	*Picrorhiza kurroa*	*Kanda*	200g

Fig. 1: *Vasa.*

Fig. 2: *Nimba.*

Fig. 3: *Guduchi.*

Fig. 4: *Katuki.*

Fig. 5: *Kiratatikta.*

Preparation of *Vasadi Arishta*

Fig. 6:*Vasadi Kashaya* boiling.

Fig. 7: Filtration of *Vasadi.*

	Kashaya
	
Fig. 8: Dissolving *Guda* in *Kashaya.*	**Fig. 9: *Dhupana.***
	
Fig. 10: *Ghrita Lepana.*	**Fig 11: *Kashaya* trasferring to *Sandhana Patra.***
	
Fig. 12: *Sandhana Dravya.*	**Fig. 13: *Prakshepaka Dravya.***
	
Fig. 14: Addition of *Prakshepaka Dravya.*	**Fig. 15: Addition of *SandhanaDravya.***

Fig. 16: Floating of *Prakshepaka Dravya.*

Fig. 17: *Sandhibandhana.*

Fig. 18: Opening of *Sandhana Patra.*

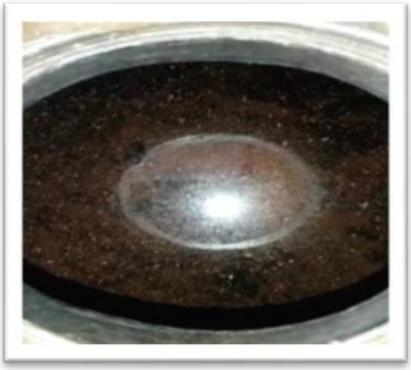


Fig. 19: Settling of *Prakshepaka Dravya.*

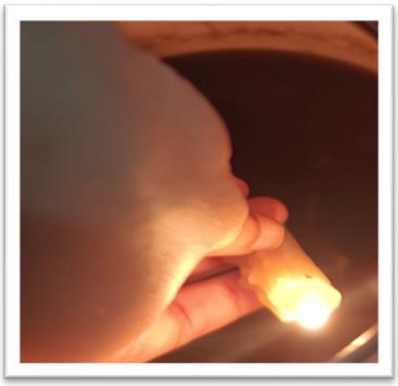


Fig. 20: Candle light test.

Fig. 21: Final product.

Instruments

Weighing machine, Pulverizer, *Mritpatra* (Mud Pot), Cora cloth, Measuring jar.

Method of Preparation

Purva Karma

- *Sandhana Patra* selection- *Mrit Patra* was selected for *Vasadi Arishta* preparation.
- *Patra Samskara* -First the *Mrit Patra* having capacity of 5 Liters was taken and washed with hot water and dried. Later *Ghrita* was smeared inside the *Sandhana Patra*. After *Lepana*, Fumigation /*Dhupana* was done to the *Sandhana patra* with drugs such as *Guggulu*,

Agaru, Jatamamsi. These drug were taken and burned, the smoke produced is directed into the inner part of *Sandhana Patra*.

Pradhana Karma

- The Prepared 2 Litre *Kashaya* was taken .1 kg of *Madhura Dravya, Guda* was taken and crushed into smaller pieces. The *Guda* was added into the *Kashaya* and dissolved in it. After dissolving the *Guda* it was filtered through a clean cloth, so that the impurities can be eliminated. The filtered *Dravadravya (Kashaya)* after cooling was transferred into the *Sandhana Patra*.
- Addition of *Prakshepaka Dravya*- The finely powdered *Prakshepaka Dravya* was added into the *Dravadravya.*
- Addition of *Sadhana Dravya* -The properly cleaned *Dhataki Pushpa* was crushed and added into the *Dravadravya.*
- Temporarily closing the *Sandhana Patra*- The *Sandhana Patra* was temporarily closed and kept inside the Fermentation room.
- The onset of fermentation was observed on 3rd day and on the 5th day the fermentation onset was noted and *Sandhibandhana* was done with mud smeared cloth and dried. Then the *Sandhana Patra* was kept inside the fermentation room. During the fermentation period, periodically it was checked for fermentation completion.

Paschat Karma

- After 30 days the tests mentioned for confirming the fermentation process were performed and confirmed with the completion of fermentation process.
- Later the *Vasadi Arishta* was filtered through a clean cloth and stored in suitable container.

Table 03: The analytical parameters done for *Vasadi Arishta.*[8]

Vasadi Arishta		
Organoleptic Characters	**Physico chemical Analysis**	**Chromatography**
Colour Smell Taste Consistency	pH Total acidity Specific Gravity Refractive index Total Solids Alcohol Percentage Total Sugar	1.HPTLC

	Reducing Sugar Non Reducing Sugar	

OBSERVATIONS AND RESULT

Table 04: Observations of specific characters in different stages of fermentation of *Vasadi Arishta.*

Parameters	Before fermentation	Fermentation onset	Completion of Fermentation
Colour	Dark Brown	Dark Brown	Darker Brown
Taste	*Tikta Kashaya*	-	*Tikta*
Smell	Characterstic odour of its ingredients	-	Alcoholic smell

Table 05: Other observations during different stages of fermentation of *Vasadi Arishta.*

Parameters	Before fermentation	Fermentation onset	Completion of Fermentation
Prakshepaka Dravya	Floating	Floating	Settling
Effervescence	Absent	Present	Absent
Hissing sound	Absent	Present	Absent
Burning candle	-	Burning candle is put off	Burning candle continues to burn

- Onset of fermentation was observed on 5th day and completion of fermentation was noted on 30th day.

ANALYTICAL STUDY

Table 06: Organoleptic characteristics of *Vasadi Kashaya* and *Vasadi Arishta.*

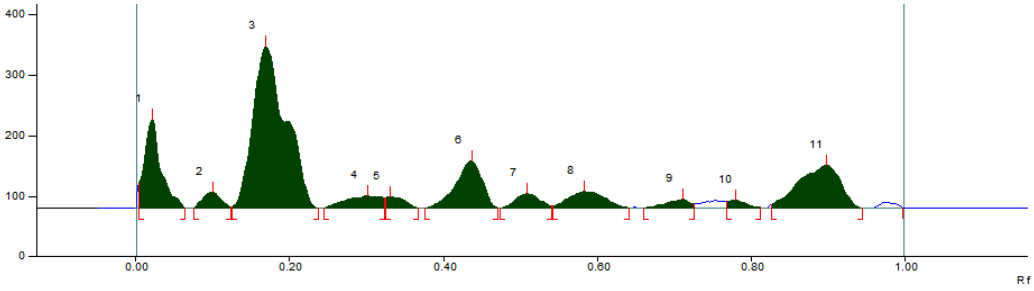
Organoleptic characters	*Vasadi Arishta*
Colour	Darker Brown
Taste	*Tikta*
Smell	Alcoholic odour
Consistency	Liquid consistency

Table 07: Results of standardization parameters of *Vasadi Arishta.*

Parameter	Results n= 3 %w/w
	Vasadi Arishta
pH	*3.9*
Refractive index	1.38506
Specific gravity	1.08
Total Solids	35.1
Total acidity	0.01
Alcohol percentage (%)	7.0
Total Sugar (%)	33
Reducing Sugar (%)	31.17
Non reducing sugar (%)	1.83

Table 08: R_f values of *Vasadi Arishta.*

Short UV	Long UV
0.17 (Green)	
0.38 (Green)	
	0.61 (F. blue)
	0.81 (F. blue)



Track 4, ID: Vasadi arishta

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.00 Rf	40.5 AU	0.02 Rf	146.1 AU	20.73 %	0.06 Rf	0.5 AU	2236.0 AU	12.03 %
2	0.08 Rf	0.9 AU	0.10 Rf	25.7 AU	3.65 %	0.12 Rf	1.1 AU	439.7 AU	2.37 %
3	0.13 Rf	1.7 AU	0.17 Rf	267.3 AU	37.93 %	0.24 Rf	0.3 AU	8202.3 AU	44.13 %
4	0.25 Rf	0.2 AU	0.30 Rf	20.5 AU	2.91 %	0.32 Rf	17.5 AU	679.7 AU	3.66 %
5	0.33 Rf	17.5 AU	0.33 Rf	18.0 AU	2.56 %	0.37 Rf	0.1 AU	320.0 AU	1.72 %
6	0.38 Rf	0.0 AU	0.44 Rf	77.8 AU	11.05 %	0.47 Rf	0.3 AU	1914.7 AU	10.30 %
7	0.47 Rf	0.1 AU	0.51 Rf	23.4 AU	3.32 %	0.54 Rf	3.5 AU	542.6 AU	2.92 %
8	0.54 Rf	3.8 AU	0.58 Rf	27.5 AU	3.90 %	0.64 Rf	0.1 AU	945.0 AU	5.08 %
9	0.66 Rf	0.5 AU	0.71 Rf	14.3 AU	2.03 %	0.73 Rf	6.9 AU	316.6 AU	1.70 %
10	0.77 Rf	10.5 AU	0.78 Rf	13.4 AU	1.90 %	0.81 Rf	1.1 AU	219.5 AU	1.18 %
11	0.83 Rf	6.3 AU	0.90 Rf	70.6 AU	10.02 %	0.95 Rf	0.1 AU	2770.8 AU	14.91 %

Fig. 22: *Vasadi Arishta*, R_f - 0.49 ± 0.02 (Vasicinone).

DISCUSSION

Vasadi Arishta was prepared using the ingredients of *Vasadi Kashaya* with quantities taken according to the *Anukta Mana* of *Arishta* mentioned by *Acharya Sharngadhara*.[9]

First *Vasadi Kashaya* was prepared according to the general ratio of *Kwatha (*BATCH B). Then specified quantity of *Guda* was dissolved into the *Kashaya* and filtered through clean cloth to remove the impurities present in the Jaggery. After filtration the liquid was transferred to *Mrit Patra*, which had been prepared by *Lepana* and *Dhupana*. For *Lepana, Ghrita* was smeared on the interior part of the pot to reduce porosity and to maintain temperature. For *Dhupana* the drugs like *Agaru, Guggulu* and *Jatamamsi* were burned and their fumes were directed into the inner part of the vessel to create an antibacterial and antiseptic environment.

After preparing the *Patra,* the liquid mixture on cooling was transferred into it, leaving some empty space ($1/4^{th}$ of total quantity) for gas formed during the fermentation. *Sandhana Dravya- Dhataki pushpa* and finely powdered *Praskshepaka Dravyas* were then added to the liquid. *Vasadi Churna* was used as the *Prakshepaka Dravya* to increase the efficacy, taste and aroma. After adding all ingredients, the *Sandhana Patra* was temporarily closed and the *Patra* was transferred to the fermentation room to maintain the temperature and prevent the direct contact with light and air which hinders fermentation.

The Fermentation onset was checked on 3^{rd} day and on the fifth day it was confirmed, and *Sandhibandhana* was done with cloth smeared with mud. The *Patra* was stored for one month in the fermentation room. After one month the seal was opened and the completion of fermentation was checked. Signs such as strong alcoholic odour, absence of effervescence and hissing sound, sinking of *Prakshepaka Dravya* and candle flame continuing to burn indicated completion of fermentation. Then the *Arishta* was filtered and stored.

During the fermentation process the Glucose is converted into Ethanol and Carbon dioxide by Yeast in the absence of oxygen. The bioconversion of starch to ethanol is a two-step process involving saccharification (starch to sugar) and fermentation (sugar to ethanol) using specific microorganisms (Amylolytic microorganism, Saccharomyces cerevisiae) and enzymes (Glucoamylase and α Amylase).

Vasadi Arishta had *Tikta Rasa* with Alcoholic flavor.It was acidic which is due to the presence of self-generated alcohol. Refractive index of *Arishta* was 1.38506 is due to the presence of dissolved solids. Total solids of *Vasadi Arishta* was 35.1 %, This indicates that *Vasadi Arishta* has a significantly higher total solids content which may be attributed to the presence of Jaggery and *Prakshepaka Dravya*. *Arishta* had a specific gravity of 1.08, it indicates the concentration of components and a greater density due to the presence of Jaggery and *Prakshepaka Dravyas.* The Alcohol content of *Vasadi Arishta* was determined to be 7% which is within the permissible limit. This 7% alcohol content represents the percentage of self-generated alcohol present in the *Arishta.* The total acidity is the amount of acid present in the formulation and it was determined to be 0.01 indicates an optimal fermentation process. Sugar is categorized into two types, reducing and non-reducing sugar based on their ability to undergo chemical reactions. Reducing sugar such as glucose participates in chemical reaction during fermentation and are converted into alcohol. Whereas non reducing sugar remains inert to these reactions. Total sugar includes both reducing and non-reducing sugar.

The reducing sugar content in *Vasadi Arishta* is found to be 31.17 %, non-reducing sugar content is 1.83 % and total sugar content is 33%. The sugar content indicates the quality of fermentation process.

Densiometric scan at 254 nm of *Vasadi Arishta* shows maximum area at Rf value 0.17, that is 44.13%.

CONCLUSION

In pharamacuetical study, *Vasadi Kashaya* was prepared according to the general method of preparation of *Kashaya Kalpana* and due to less shelf life it has been converted to *Vasadi Arishta* as per the *Anukta mana* of *Arishta* mentioned by *Acharya Sharangadhara* 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 *Vasadi Arishta* is safe for internal administration and this study can be considered as a preliminary standard profile of this formulation.

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