IJAPC

Volume 11 Issue 2,
2019

www.ijapc.com

2350-0204

GREENTREE GROUP PUBLISHERS

Int J Ayu Pharm Chem

RESEARCH ARTICLE

www.ijapc.com

e-ISSN 2350-0204

Pharmaceutico-Analytical Study of *Mustakaranjadikwatha* and its New Formulated dosage form *Mustakaranjadiarishta* - A Medication for *Atisara*

Dhanya Vasudevan[1*], Radhika Ranjan Geethesh P[2] and Ravindra Angadi[3]

[1-3]Sri Dharmasthala Majunatheshwara College of Ayurveda and Hospital, Udupi, KA, India

ABSTRACT

Mustakaranjadikwatha is one of the prominent formulations mentioned in Sahasrayoga which is indicated for *atisara*. Kwathakalpana is having limited shelf life whereas Arishtakalpana known for its prolonged shelf life and palatability. Considering these factors, present study has been planned to prepare a new dosage form, Mustakaranjadiarishta from Mustakaranjadikwatha and to evaluate the physico-chemical properties and of the two dosage forms. The present study was carried out in two steps namely, pharmaceutical and analytical study. In the pharmaceutical study, the preparation of Mustakaranjadikwatha and Mustakaranjadiarishta was carried out according to the reference of SharangadharaSamhita. In the analytical study, both the samples were subjected to various analytical parameters to test their quality and they were analysed. The pharmaceutical study revealed that there is no pharmaceutical constraint in obtaining the raw materials for preparing both Mustakaranjadikwatha and arishta. Analytical evaluation including HPTLC could analyze preliminary standards of both Mustakaranjadikwatha and arishta

KEYWORDS

Mustakaranjadikwatha, Mustakaranjadiarishta, Sahasrayoga

Greentree Group Publishers

Received 01/08/19 Accepted 23/08/19 Published 10/09/19

INTRODUCTION

Plant, animals or mineral product in whatever nature they may be, they can be hardly used as a drug in their natural form. Hence almost every substance has to undergo a specific processing to acquire a form of palatable drug. Such processing is termed as pharmaceutics i.e Bhaishajya Kalpana in terms of Ayurveda. The form is termed as a drug delivery system or drug dosage form which ultimately comes into use by the patient. The four basic requirements of a good dosage form are Safety, efficacy, Stability and Palatability. These four basic requirements have its own importance in Ayurveda. Drugs which are in crude forms as well as processed are converted into different dosage forms and are used in Ayurvedic therapeutics. It is necessary that it should not only be effective but also should be easy to administer and agreeable to the patient while using these form of drugs when ready for ingestion.

In present clinical practice most abundantly used kalpana among panchavidhakalshayakalpanas is kwathakalpana. The use of these kashayakalpanas were much reduced because of its short shelf life. These kwathas are available in market with preservatives and also in the form of tablets prepared with the addition of different additives. Even though preservatives and additives are considered to be inert, we cannot expect the same result as that of freshly prepared kwatha. Considering the kashayakalpanas as base, to compete with the need of easy dispensing, palatability etc different dosage forms have been modified and this has been clearly mentioned in ayurvedic classics. The conversion of kwatha in to another dosage form like arishta may help to increase the shelf life without much change in the property of the particular formulation.

Mustakaranjaadi kwatha[1] is one of the many medicines quoted in Atisarachikitsa mentioned in Sahasrayoga. Hence this study is undertaken to understand the pharmaceutical preparation of Mustakaranjadikwatha and also to formulate a new dosage form from the same Mustakaranjadi yoga i.e in Arishta form, and to compare their physico chemical properties.

METHODOLOGY

In this work two steps were done, Pharmaceutical study and Analytical study. In Pharmaceutical study attempts were made to prepare Mustakaranjadikwatha and

Mustakaranjadiarishta and observations are noted. In analytical study different analytical parameters mentioned for assessment of Mustakaranajadikwatha and Mustakaranjadiarishta were carried out.

Pharamaceutical study

The main ingredients of Mustakaranajadikwatha are *Musta, karanjaativisha, Chitraka, Bilwa, Shunti, Vatsaka and Dhanyaka*. The reference of Mustakaranjadikwatha was taken from Sahasrayoga, Atisarakashayayogas

At first Chitraka shodhana[2] was done. 500gm of roots of chitraka are taken and cut into small pieces.It was kept immersed in churnodaka (lime water) for 24 hours. Later it was taken out, washed with hot water and dried. Karanjatwak procured was in fresh form. Therefore it was made completely dried as all the other drugs were in dry form.

Preparation of kwatha

- The kwatha is prepared according to the reference of Sharangadhara Samhita[3].
- All the 8 drugs were taken in quantity of 100 gm each. The raw drugs were made into coarse powder by using pulverizer and it was passed through mesh no 8.
- The coarse powders wereput into stainless steel vessel and 16 times of water was added to it.
- It was then heated till 1\8th reduction, the kwatha was filtered with a cotton cloth into a separate vessel and the residue got in the cloth was discarded.

Preparation of arishta

- Arishta is also prepared from the same ingredients of Mustakaranjadi yoga with addition *of guda, madhu and prakshepakadravyas.* It was prepared according to *anuktamana of Sharangadhara Samhita*[4] as mentioned in Table 1.

Table 1 Ingredients of Mustakaranjadiarishta

Sl No	Ingredients	Quantity
1	MKK	2litres
2	Guda	1000gm
3	Kshoudra	500gm
4	Dhatakipushpa	100gm
5	Prakshepakadravyas	12.5gm each

- A porcelain vessel having the capacity of 6 litres was taken, cleaned well and dried in sunlight. The vessel was subjected to *lepana* with *ghrita*.It was then subjected to *dhupana* with *jatamansi,guggulu, usheera, vidanga, sarshapa*.
- The kwatha was taken to a stainless steel vessel and 1000 gm of guda was added to it. It is stirred well till all the added guda gets dissolved in the kwatha. This mixture was poured to the porcelain jar.
- To this mixture 500 Gm of Honey was added and was sealed with a dry cloth, kept in a dark room for initiation of fermentation.

- On 3rd day after initiation of fermentation *dhatakipushpa* (100gm) was added. Mustakaranjaadidravyas are added at the end as *sookshmachurna* (prakshepa). It was stirred well and *sandhibandhana* was done on the same day with multanimitti and was kept undisturbed in a dark room till the fermentation process was over.
- After completion of fermentation (35 days) confirmatory tests was done, the porcelain jar was opened and the supernatant arishta was filtered through clean and dry cloth. The Arishta was then stored in a porcelain vessel.

OBSERVATION AND RESULT

The obtained quantity of Mustakaranjadikwatha is mentioned in Table 2

Table 2 Obtained quantity of Mustakaranajadikwatha

Parameters	
Drugs taken	100 gms each
Total quantity of water	12.8 litres
Temperature given	80ºC to 90ºC
Time taken for reduction	Approximately 1.5 hours
Total quantity of kwatha obtained	1.6 litres

The smell of the ingredients was appreciated while preparing the MKK and a colour change to brown colour was observed. A mild taste of the drugs which were used for the preparation was observed. The time taken to prepare kwatha was approximately 1.5 hours.

The observations of Mustakaranjadiarishta in different stages of fermentation is mentioned in Table 3

Table 3 Observation of MKA in different stages of fermentation

Characteristics	**Initial stage**	**Onset of fermentation**	**Completion of fermentation**
Roopa	Brownish		Dark brown
Rasa	Tiktakashaya		Tikta, madhura
Gandha	Guda , madhu		Alcoholic odour
State of prakshepadravyas		Floating	Sinks
Effervescence	Absent	3rd day	Absent
Burning candle			Burns
No of days		3rd day	35th day.

Confirmative test was done after completion of fermentation. The *prakshepadravyas* added were sunken after completion of fermentation. It took 35 days for the completion of fermentation and was carried out in the month of April-May Active constituents of drug will get dissolved in alcoholic media.

Analytical study

Analytical study was carried out for both mustakaranjadikwatha and mustakaranjadiarishta at SDM research centre. Organoleptic characteristics and analytical parameters which were analysed are as follows in Table 4 and Table 5

Table 4 Comparison of organoleptic characteristics of MKK & MKA

Organoleptic Characteristics	Mustakaranjadi kwatha	Mustakaranjadi arishta
Colour	Brown	Dark brown
Taste	Tiktakashya	Madhuratikta
Smell	Characteristic kashaya smell	Pleasant smell of kashaya with alcoholic odour
Consistency	Thick fluid	Thick fluid

Table 5 Comparison of physico chemical parameters of MKK & MKA on following parameters

Parameter	MKA	MKK
Refractive index	1.38679	1.33669
Specific gravity	1.1400	1.0461
Viscosity	4.93	6.97
Total solids	27.46	12.5
Alcohol content	8.0	
Total acidity	0.13%	
pH	3.62	6.25
Total sugar	17.06	
Reducing sugar	11.66	
Non reducing sugar	5.40	

DISCUSSION

Kwathakalpana is the most considerable and extensively used dosage form in Ayurvedic pharmaceutics, but it has some disadvantages considering the instant use of the preparation, less shelf life, high dose, unpalatable, storage etc. Physicians are given freedom to employ the Bheshaja in various forms to fight against the diseases in Bhaishajyakalpana. On this regard, a lot of kalpana were developed that were apt to compete with the need of all time availability, easy dispensing, palatability etc. These alterations of kalpanas help in adequacy and prolong shelf life without change in its therapeutic potency. So here we tried to convert kwatha into arishta form by addition of guda, madhuetc and to assess their both physico chemical properties.

Pharmaceutical study

Mustakaranjadikwathadravyas are converted into coarse powder (*yavakuttachurna*) to get proper *veerya*. When powdered coarsely the MKK dravyas will be having required contact with water and a proper extraction will be attained. The fine powdering of MKK dravyas will lead to the loss of active principles while filtering due to improper extraction. *ChitrakaSodhana* was done before making it into coarse powder. *Chitrakashodhana* helps in reducing the *teekshnata* of the drug and thereby enhancing the quality of the drug. *Karanjatwak* was procured freshly and it was dried under sun. According to *Adharabhutasidhanta* wet drugs should be taken double the quantity than that of dry drugs. Here all the drugs were used in dry state to maintain uniformity of weight. During the preparation of MKK, less heat will lead to improper extraction of active principles and overheating leads to charring of MKK dravyas. Hence medium flame was maintained during the preparation of kwatha.

For the fermentation process of Mustakaranajadiarishta porcelain jar was used. . This vessel does not react with the

drugs and maintain a constant temperature throughout the process. Lepa is done with ghrita, as it acts as disinfectant and also helped in maintaining temperature inside. The porcelain jar was undergone fumigation before adding the liquid. It helps in surface sterilization in which micro organisms are destroyed and their further growth is prevented. At first Mustakaranajadikwatha is prepared; when the MKK gets cooled the guda was added. If guda is added in hot state, it may get paaka and leads to late fermentation. The quantity of guda was added 1000gm. The quantity of guda added was more when compared to the anuktamana. This is done to improve the palatability of the final product. A pilot study was done following this method of adding guda and the final product arishta had better palatability. So for this study also guda was added in the same way. When the guda is completely melted in kwatha it is transferred to porcelain jar and later honey is added to it. Sweetening agents are responsible for fermentation and also helps in enhancing the organoleptic characters of the formulation like palatability, pleasant odour, consistency, good colour etc. Mustakaranjadidravyas in sukshma*churna*along with *dhatakipushpa* were added as *prakshepadravy*as to increase the efficacy of the formulation. They are stirred well and *sandhibandhana* was done with multanimitti for the maintenance of constant temperature. The prakshepadravyas added were sunken after completion of fermentation.

Analytical study[5]

Standardization of any Ayurvedic formulation is essential in order to assess the quality, purity, safety and efficacy of drugs that are based on the analysis of their active properties. It adds to the quality and authenticity of the product by testing the ayurvedic preparations using scientific methodologies. Here in this study organoleptic characters of MKK and MKA were observed and their physic chemical analyses were done to ensure the efficacy of the formulations.Thecolour of MKK and MKA was brown and dark brown. This is because of the addition of *guda*, honey, *prakshepakadravyas* the colour of arishta turned to dark brown colour. The specific odourof the MKK is due to the particular drugs added to it. The odour of arishta is pleasant alcoholic smell. This may be because of the fermentation process and presence of alcohol in it.

Refractive index

This is done to access the concentration of solute in the formulation. It is dependent on the colour of the formulation. The R.I of MKK and MKA is 1.33669 and 1.38679 respectively. The colour of arishta was

dark brown in colour and this may be the reason of higher refractive index in arishta when compared to kwatha.

Specific gravity

The opaqueness of kwatha is due to water. On the other hand, arishta is prepared by preparing the kwatha first, and thereby adding guda, honey, prakshepakadravyasand is kept for fermentation for one month. Here the thickness of the preparation will increase in time, leading to shearing stress and strain. The specific gravity of MKK and MKA is 1.0461 and 1.1400 respectively. It can be observed that the difference between these two is due to the addition of guda, madhu, prakshepadravyas in arishta.

Viscosity

The viscosity of a liquid is measure of its frictional resistance to its flow. The viscosity of MKK is 6.97 and viscosity of MKA is 4.93. The smaller drug particles may have attributed to the increase in the viscosity of MKK.

Total solids

The total solid content determines the amount of active constituents in a given sample of the drug. The total solid content is found to be more in arishta than kwatha. This may be due to the presence of guda, madhu, prakshepakadravyas which were added during the preparation.

pH

The pH of MKK and MKA is 6.25 and 3.62 respectively. Here the both samples are weakly acidic in nature. But arishta is more acidic because of the presence of alcohol content than kwatha.

Alcohol content

The alcohol content value shows the amount of self generated alcohol produced. MKA contains alcohol content of 8.0%

Total acidity

Acids are produced during fermentation process of arishta and also during storage and are responsible for the sour taste of these preparations. The total acidity obtained for the sample is 0.13%. This value shows that unwanted acids are not produced during the preparation, showing that the formulation obtained is a standard one.

Total sugar, reducing sugar and non reducing sugar

Reducing sugar indicates the amount of carbohydrates converted to alcohol and non reducing sugar is the one, which does not undergo reduction reaction. Here the value of reducing sugar is 11.66. This value shows that the amount of sugar has been converted to alcohol. Utilization of total sugar shows result in more alcohol percentage.

The HPTLC study helped in analyzing different components as well as the purity of both the formulations. The HPTLC

figures are shown below in figure 1 and figure 2.

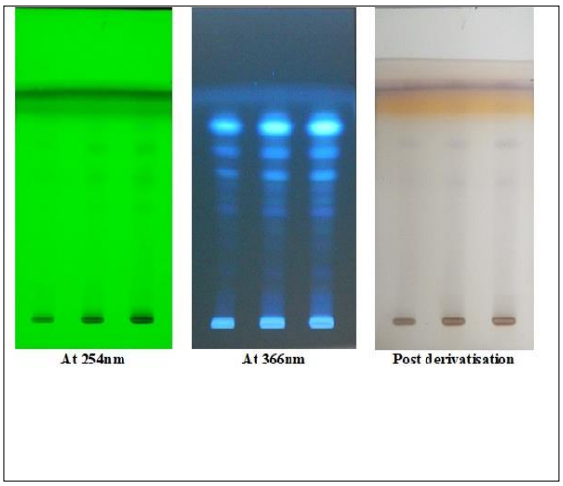

Figure 1 HPTLC photodocumentation of butanol fraction of Mustakaranjadikwatha

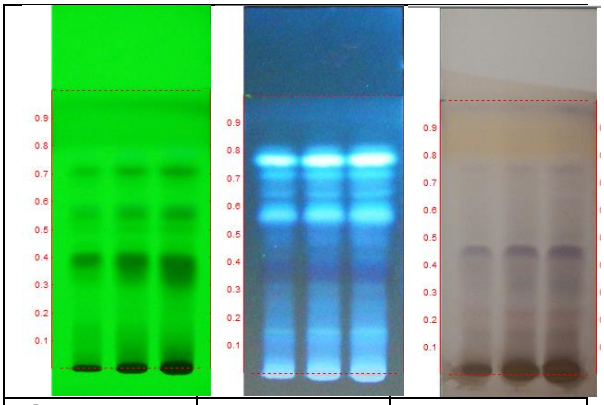

Figure 2 HPTLC photodocumentation of sample of Mustakaranjadiarishta

CONCLUSION

Kwathakalpana is the third most potent formulation among panchavidhakashayakalpanas. The nature of the drug, the quantity of water and its reduction plays an important role in the preparation process of kwathakalpana as it is essential for the proper extraction of the drugs and to be used at once as it has less shelf life.

Kwatha is further converted to arishta by adding madhuradravyas, dhatakipushpa and prakshepadravyas and is kept for fermentation. This helps in the extraction of active principles of the drug in self generated alcohol media and also helps in the preservation of the formulation.

REFERENCES

1. Abhinava Vaghbhatan, Sahasrayogamwith Sujanapriya Vyakhya edited by K. V. KrishnanVaidyan& S. Gopala Pillai, 26th Ed. Mullakal: Vidyarambham Publishers; 2006; p. 43;pp-544.

2. Sadananda Sharma, Rasatarangini, prasadaniSamskrita Commentary and RasaVijnana Hindi Commentary, by HaridattuShastri and KashinathShastri, Reprint Ed. New Delhi: MotilalBanarasidas; p-753; pp-772.

3. SharangadharaSharangadharaSamhitaw ithDeepika Commentary of Adhamalla and GudaarthDeepika Commentary edited by PanditParusuramaShastri, 1stEd.Varanasi: ChaukambaOrientalia; 2016; p.144; pp-398.

4. SharangadharaSharangadharaSamhitaw ithDeepika Commentary of Adhamalla and GudaarthDeepika Commentary edited by PanditParusuramaShastri, 1stEd.Varanasi: ChaukambaOrientalia; 2016; p.233; pp-398.

5. D.R.Lohar, Protocol for testing, 1st Ed. Ghaziabad: Pharmacopeial Laboratory for Indian Mediciness, Government of India, Ministry of Health and Family Welfare; pp.146.