ISSN 2456-3110
Vol 3 · Issue 6
Nov-Dec 2018

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

Charaka Publications

Indexed

ISSN: 2456-3110 ORIGINAL ARTICLE Nov-Dec 2018

The Pharmaceutical evaluation of *Draksharishta*

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ABSTRACT

In the field of *Bhaishjya Kalpana*, *Sandhana Kalpas* are regarded as very important due to their long self life, better absorption and efficacy. Process of *Sandhana Kalpana* should be carefully carried out with strict monitoring to avoid various problems that can be encountered during preparations. *Draksharista* is a popularly used preparation in the clinical practice. It is referred in various books and five such references are studied and compared here in order to get an idea, regarding the pharmaceutical and analytical aspects of them. Differences in the type and amount of sweetening substances, usage of fermentation initiator and minor variation in the ingredients make the study interesting to compare them. Less amount of sweetening substance initiated early fermentation and completion. This fact strongly suggests the importance of adding sweetening substances in small portions, when its quantity is very high in the preparation.

Key words: *Aasava, Arishta, Sandhana Kalpana, Draksharishta.*

INTRODUCTION

Ayurveda is an Upaveda of Atharvaveda, which is an ancient literature on earth. So many plants are described in Vedas are in use for curing various diseases. Since the very beginning these plants are the chief sources for Ayurvedic preparations. To treat any disease successfully, a physician should have a thorough knowledge over these drugs. *Oushadha* is the most important instrumental aid for *Vaidya* for the alleviation of disease as well as to maintain and promote the health. One who has mastered in this area is able to treat all diseases. But to make these drugs therapeutically fit for administration, they are to be processed.

Bhaishajya Kalpana is the branch where in such *Samskaras* are clearly mentioned. Here we find the specific norms for the drug collection, storage and their *Samskarana*. Our *Acharyas* have always tried to make the preparations more palatable and potent. Keeping the prepared medicines for a longer duration for further use was a big challenge before them. An unabated try in this direction yielded *Sandhana Kalpana*. This *Sandhana Kalpana* has *Asavas* and *Aristas* as the two major out comes to gain popularity as *Asavarista Vignana*. Many references of *Draksharista* are available in different classics of Ayurveda. Thus it becomes mandatory to reveal the exact physico-chemical changes in the different reference samples of the same preparation. Hence there is pressing necessity to study the final product in terms of organoleptic and chemical characters. By this we can know the difference in the quality of the final products. After considering all references, the evaluation of *Draksharista* is selected for the present work. Hence in this article an attempt is being made to determine the best sample of *Draksharista* on the basis of pharmaceutical aspects and in terms of their physico-chemical characters.

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Submission Date: 18/11/2018 Accepted Date: 24/12/2018

Access this article online

Quick Response Code

Website: www.jaims.in

DOI: 10.21760/jaims.3.6.11

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Materials and Methods

Raw drugs are collected from Sri Sri Ayurveda Pharmacy and Pharmaceutical study was conducted in Sri Sri College of Ayurvedic Science and Research. Five different formulations of *Draksharista* are prepared strictly as per the guidelines of the classical literature.

The references are as follows:

1. *Sharangadhara Samhita, Madhyama Kahanda, Asavaristadi Sandhana*,
2. *Siddhayoga Sangraha*, 13th chapter, *Kasaswasadhikara*.
3. *Bharat Bhaishajya Ratnakara* - 3rd volume, *Asavaarista Prakana*.
4. *Rasatantrasara Va Siddhapraoga Sangraha, Prathama Khanda Asavadi Prakana.*
5. *Rasatantrasara Va Siddhapraoga Sangraha, Prathama Khanda Asavadi Prakana*

Method of *Draksharishta* Preparations[1]: Sample 1

SN	Sanskrit Name	Latin Name / English Name	Quantity
Kashaya Dravyas			
1	*Draksha*	*Vitis Vinifera*	2330gms
2	*Jala*	water	23.8lts
Madhura Daravya			
3	*Guda*	Jaggery	9320gms
Prakshepaka Dravyas			
4	*Twak*	*Cinnamomum Zeylanicum*	46.64gms
5	*Ela*	*Elettaria cardamomum*	46.64gms
6	*Patra*	*Cinnamomum Tamala*	46.64gms
7	*Keshara*	*Mesua Ferrea*	46.64gms
8	*Priyangu*	*Cllicarpa Macrophylla*	46.64gms
9	*Maricha*	*Piper Nigrum*	46.64gms
10	*Pippali*	*Piper Longum*	46.64gms
11	*Vidanga*	*Embelia ribes*	46.64gms

Purva Karma

- Selection of *Sandhana Patra*
- *Patra Samskara.*
- Soaking of *Draksha* in water - 10/04/05, 5PM

Above mentioned *Draksha* are cleaned and soaked in water and kept over night.

Pradhana Karma

Preparation of *Kashaya*

Drakshas are filtered and pounded in *Khalwayantra*

Then 23.8lts of water is taken in a big vessel, along with the pounded *Draksha*. It is boiled on gas stove over *Madhyamagni*. It is reduced to 1/4th i.e. 5.950ml.

Addition of *Guda* and *Praksepaka Dravyas*

Guda is powdered and added. Again the *Kashaya* is filtered and kept in a vessel. After that *Prakshepaka Dravyas* are added and the vessel is tied with a cloth.

Paschat Karma

The onset of fermentation was observed on 25th of April 2005. Proper *Sandhi Bandhana* was carried out. *Sandhi Bandhana* was opened on 10th of June 2005 and found that the fermentation was complete. The filtration was carried out with Kora cloth and total 5 lts of *Draksharishta* was obtained.

Method of *Draksharishta* Preparation[2]: Sample 2

SN	Sanskrit Name	Latin Name / English Name	Quantity
Kashaya Dravyas			
1	*Draksha*	*Vitis Vinifera*	2330gms

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2	*Jala*	water	23.8lts
Madhura Dravya			
3	*Madhu*	Honey	2330gms
	Sharkara	Sugar	2330gms
Prakshepaka Dravyas			
4	*Twak*	*Cinnamomum Zeylanicum*	23.32gms
5	*Ela*	*Elettaria cardamomum*	23.32gms
6	*Patra*	*Cinnamomum Tamala*	23.32gms
7	*Keshara*	*Mesua Ferrea*	23.32gms
8	*Priyangu*	*Cllicarpa Macrophylla*	23.32gms
9	*Maricha*	*Piper Nigrum*	23.32gms
10	*Pippali*	*Piper Longum*	23.32gms
11	*Vidanga*	*Embelia ribes*	23.32gms
12	*Kankola*	*Piper Cubeba*	23.32gms
13	*lavanga*	*Syzygium Aromaticum*	23.32gms
14	*Jatiphala*	*Myristica fragrans*	23.32gms
15	*Javitri*		23.32gms
16	*Chitrakamoola*	*Plumbago Zeylancia*	23.32gms
17	*Chavya*	*Piper Retrofractum*	23.32gms
18	*Pippali moola*		23.32gms
Sandaniya Dravya			
19	*Dhataki*	*Woodfordia Fruticosa*	373.12gms

Purva Karma

- Selection of *Sandhana Patra*
- *Patra Samskara.*
- Soaking at *Draksha* in water - 11/04/05, 5PM

Above mentioned *Draksha* are cleaned and soaked in water and kept over night.

Pradhana Karma

Preparation of *Kashaya*

Drakshas are filtered and pounded in *Khalwayantra*. Then 23.8lts of water is taken in a big vessel, along with the pounded *Draksha*. It is boiled on gas stove over *Madhyamagni*. It is reduced to 1/4th i.e. 5.950ml.

Addition of *Sharkara*

Sharkara is added and is stirred well for 15mins. Filtered and kept in a vessel. After becoming *Swangasheeta Madhu* is added.

Paschat Karma

The onset of fermentation was observed on 22nd April 2005. Proper *Sandhi Bandhana* was carried out. *Sandhi Bandhana* was opened on 23rd May 2005 and found that the fermentation was on. So the sealing was done for the second time. *Sandhi Bandhana* was opened on 5th June 2005 and found that the fermentation was complete. The filtration was carried out with Kora cloth and total 5lts of *Draksharishta* was obtained.

Method of *Draksharishta* Preparation: Sample 3

SN	Sanskrit Name	Latin Name / English Name	Quantity
Kashaya Dravyas			
1	*Draksha*	*Vitis Vinifera*	2330gms
2	*Jala*	water	23.8lts
Madhura Dravya			
3	*Guda*	Jaggery	9320gms

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Prakshepaka Dravyas			
4	*Twak*	*Cinnamomum Zeylanicum*	46.64gms
5	*Ela*	*Elettaria cardamomum*	46.64gms
6	*Patra*	*Cinnamomum Tamala*	46.64gms
7	*Keshara*	*Mesua Ferrea*	46.64gms
8	*Priyangu*	*Cllicarpa Macrophylla*	46.64gms
9	*Maricha*	*Piper Nigrum*	46.64gms
10	*Pippali*	*Piper Longum*	46.64gms
11	*Vidanga*	*Embelia ribes*	46.64gms
Sandaniya Dravya			
12	*Dhataki*	*Woodfordia Fruticosa*	466.40gms

Purva Karma

- Selection of *Sandhana Patra*
- *Patra Samskara.*
- Soaking at *Draksha* in water - 11/04/05

Above mentioned *Draksha* are cleaned and soaked in water and kept over night.

Pradhana Karma

Preparation of *Kashaya*: 12/04/05

Drakshas are filtered and pounded in *Khalwa Yantra*. Then 23.8lts of water is taken in a big vessel, along with the pounded *Draksha*. It is boiled on gas stove over *Madhyamagni*. It is reduced to 1/4th i.e. 5.950ml.

Addition of *Guda*

Guda is powdered and added. Again the *Kashaya* is filtered and kept in a vessel.

Paschat Karma

The onset of fermentation was observed on 21st April 2005. Proper *Sandhi Bandhana* was carried out. *Sandhi Bandhana* was opened on 22nd May 2005 and found that the fermentation was on. So the sealing was done for the second time. *Sandhi Bandhana* was opened on 5th June 2005 and found that the fermentation was complete. The filtration was carried out with Kora cloth and total 5lts of *Draksharishta* was obtained. It was observed that the un-dissolved *Guda* remained at the bottom.

Method of *Draksharishta* Preparation : Sample 4

SN	Sanskrit Name	Latin Name / English Name	Quantity
Kashaya Dravyas			
1	*Draksha*	*Vitis Vinifera*	2330gms
2	*Jala*	water	23.8lts
Madhura Dravya			
3	*Guda*	Jaggery	5860gms
Prakshepaka Dravyas			
4	*Twak*	*Cinnamomum Zeylanicum*	46.64gms
5	*Ela*	*Elettaria cardamomum*	46.64gms
6	*Patra*	*Cinnamomum Tamala*	46.64gms
7	*Keshara*	*Mesua Ferrea*	46.64gms
8	*Priyangu*	*Cllicarpa Macrophylla*	46.64gms
9	*Maricha*	*Piper Nigrum*	46.64gms
10	*Pippali*	*Piper Longum*	46.64gms
11	*Vidanga*	*Embelia ribes*	46.64gms
12	*Sunthi*	*Zingiber Officinale*	46.64gms
Sandaniya Dravya			
13	*Dhataki*	*Woodfordia Fruticosa*	466.40gms

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Purva Karma

- Selection of *Sandhana Patra*
- *Patra Samskara.*
- Soaking at *Draksha* in water - 11/04/05

Above mentioned *Draksha* are cleaned and soaked in water and kept over night.

Pradhana Karma

Preparation of *Kashaya*: 12/04/05

Drakshas are filtered and pounded in *Khalwa Yantra*. Then 23.8lts of water is taken in a big vessel, along with the pounded *Draksha*. It is boiled on gas stove over *Madhyamagni*. It is reduced to 1/4th i.e. 5.950ml.

Addition of *Guda*

Guda is powdered, added and stirred well. Again the *Kashaya* is filtered and kept in a vessel.

Paschat Karma

On 18th April 2005 fungal growth was found. Fungus was removed and the mouth was closed again by cloth. The onset of fermentation was observed on 21st April 2005. Proper *Sandhi Bandhana* was carried out. *Sandhi Bandhana* was opened on 22nd May 2005 and found that the fermentation was on. So the sealing was done for the second time. *Sandhi Bandhana* was opened on 5th June 2005 and found that the fermentation was complete. The filtration was carried out with Kora cloth and total 5lts of *Draksharishta* was obtained. It was observed that the un-dissolved *Guda* remained at the bottom.

Method of *Draksharishta* Preparation: Sample 5

SN	Sanskrit Name	Latin Name / English Name	Quantity
Kashaya Dravyas			
1	*Draksha*	*Vitis Vinifera*	3.114gms
2	*Babbula*	*Acacia Nilotica*	173gms
3	*Madhuka*	*Madhuka indical*	692gms
4	*Jala*	*Water*	23.8lts
Madhura Daravya			
3	*Sharkara*	sugar	8.998gms
Prakshepaka Dravyas			
4	*Twak*	*Cinnamomum Zeylanicum*	34.60gms
5	*Brihat Ela*	*Elettaria cardamomum*	34.60gms
6	*Patra*	*Cinnamomum Tamala*	34.60gms
7	*Keshara*	*Mesua Ferrea*	34.60gms
8	*Pippali*	*Piper Longum*	34.60gms
9	*Sunthi*	*Zingiber Officinale*	34.60gms
10	*Kankola*	*Piper Cubeba*	34.60gms
11	*lavanga*	*Syzygium Aromaticum*	34.60gms
12	*Jatiphala*	*Myristica fragrans*	34.60gms
13	*Chitrakamoola*	*Plumbago Zeylancia*	34.60gms
14	*Nigundi*	*Vitex negundo*	34.60gms
Sandaniya Dravya			
15	*Dhataki*	*Woodfordia Fruticosa*	346gms

Purva Karma

- Selection of *Sandhana Patra*
- *Patra Samskara*
- Soaking at *Draksha* in water - 11/04/05

Above mentioned *Draksha* are cleaned and soaked in water and kept over night.

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Pradhana Karma

Preparation of *Kashaya*: 12/04/05

Drakshas are filtered and pounded in *Khalwayantra*. Then 23.8lts of water is taken in a big vessel, along with the pounded *Draksha*. *Madhuka Puspa* and *Babbula Twaka* is put into it. It is boiled on gas stove over *Madhyamagni*. It is reduced to 1/4th i.e. 5.950ml.

Addition of *Sharkara*

Sharkara is added, stirred well, filtered and kept in a vessel.

Paschat Karma

The onset of fermentation was observed on 16th April 2005. Proper *Sandhi Bandhana* was carried out. *Sandhi Bandhana* was opened on 16th May 2005 and found that the fermentation was on. So the sealing was done for the second time. *Sandhi Bandhana* was opened on 1st June 2005 and found that the fermentation was complete. The filtration was carried out with Kora cloth and total 5 lts of *Draksharishta* was obtained.

Analytical Study

In the present study 5 different samples of *Drakasharista* were prepared as per the references quoted in various classics. Analysis of the finished product is not only essential but also mandatory to fix and confirmed the quality of the finished product. In this study even though there are minor variation in ingredients among the five different samples, major ingredients and indications are similar. It is interesting that in two of the samples, sugar is used as a sweetening agent, where as in other samples *Guda* is the sweetening agents. In Sample 1 no fermentation initiator is mentioned where as in all samples *Dhataki Pushpa* is an essential ingredient and in Sample 5 *Madhuka Pushpa* and *Babbula* are the additional ingredients that help in fermentation. We can also observe minor differences in the *Prakshepaka Dravyas* among the samples.

By considering all these facts it was decided to analyze all the five different samples by using the basic parameters

RESULTS

Table 1: Showing the Physical characters of all samples of *Drakasharista.*

Character	Sample -A	Sample -B	Sample -C	Sample -D	Sample-E
Colour	Dark brown	Dark brown	Dark brown	Dark brown	Dark brown
Odour	Alcoholic odour, *Guda Gandha*	Alcoholic odour, *Sugandha Dravya Gandha*	Alcoholic odour, *Guda Gandha*	Strong Alcoholic odour, *Sugandha Dravya Gandha*	Alcoholic odour, *Prakshepaka Dravya Gandha*
Taste	*Madhura* ++	*Madhura* + *Kashaya* + *Amla* +	*Madhura* ++	*Madhura* +	*Madhura* +++
Touch	Like a thick syrup, cool	Like a thin syrup, cool	Like a thin syrup, cool	Like a thin syrup, cooler than others	Syrupy, thready. cool
Consistency	++++	++	++	+	+++

Table 2: Showing the Physico-Chemical Parameters of all samples of *Drakasharista.*

Characters	Sample -A	Sample -B	Sample -C	Sample -D	Sample -E
P_H	4.96	4.24	4.92	4.46	4.38
Specific gravity	1.2561	1.1767	1.2614	1.1842	1.2755
Total solids (Gm/100ml)	46.63	44.28	48.76	45.71	48.89
Refractive index	1.4370	1.4060	1.4370	1.4080	1.4440
Brix valie	55	40	55	43	58

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Table 3: Showing the Extractive Values of all samples of *Drakasharista.*

Solvents	Sample -A (% w/w)	Sample -B (% w/w)	Sample -C (% w/w)	Sample -D (% w/w)	Sample -E (% w/w)
Methanol	63.16	72.51	64.24	75.71	91.85
Chloroform	0.015	0.10	0.03	0.14	0.05

Table 4: Showing the Alcohol Percentage of all samples of *Drakasharista.*

Alcohol content	Sample-A (% v/v)	Sample-B (% v/v)	Sample-C (% v/v)	Sample-D (% v/v)	Sample-E (% v/v)
After filtration	3.86	3.20	3.20	4.52	3.20
After 4 months of filtration	5.62	5.36	6.42	7.22	4.54

Table 5: Showing the Total sugar content of all samples of *Drakasharista.*

Sugar content	Sample-A (Mg/ml)	Sample-B (Mg/ml)	Sample-C (Mg/ml)	Sample-D (Mg/ml)	Sample-E (Mg/ml)
Total sugar	44.76	29.93	47.57	23.98	55.13

Table 5: Showing the Rf values of all samples of *Drakasharista.*

	Sample-A	Sample-B	Sample-C	Sample-D	Sample-E
1st Spot	0.14	0.15	0.06	0.13	0.16
2nd Spot	0.39	0.23	0.08	0.38	0.18
3rd Spot	0.62	0.27	0.36	0.61	0.40
4th Spot	-	0.37	0.61	-	0.63
5th Spot	-	0.61	0.91	-	0.91
6th Spot	-	0.92	0.98	-	0.95

DISCUSSION

Sandhana Kalpas i.e. the self fermented preparations have unique and important place in the field of Ayurvedic therapeutics. *Asava* and *Arista* preparations are the self generated alcoholic products having most important share not only in the field of therapeutics but also in the pharmaceutical branch of Ayurveda. These *Asava* and *Arista* preparations are important for their quick absorption, better efficacy and long shelf life. They are prepared in pharmaceutical industry widely by using various techniques.

Among these *Asavarista* preparations *Draksharista* has its own important place. Among the various Samples available in the market lots of differences can be observed in the phytochemical and clinical aspects. In most of the cases reference of Sharangadhara Samhita is followed. When an investigation is done into various Ayurvedic classics at least five different references are observed under the name of *Draksharista*.

Five different samples of *Draksharista* are prepared by using different classical references. They were prepared during the same time under same condition and as per the classical references. Variations are present among the samples with respect to the sweetening agents, fermentative initiators and the *Prakshepaka Dravyas*. Major ingredient remains *Draksha* in all the preparations. The samples were compared mainly with respect to the process of fermentation, duration of fermentation and organoleptic characters.

It was very interesting to observe that the process of fermentation was very slow in all the samples w.r.t the onset and also the completion. It is a common

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practice to add sweetening substances in the batches in *Draksharista* because the amount of sweetening agents to be added is quite high (more than200% as against to general rule 40%). There is also a practice of doubling the quantity of decoction (*Drava Daugunya*) which is not correct.

In the present study all the amount of sweetening substance was added at a time and hence the consistency was almost syrupy and the onset of fermentation was very slow. Except the sample- D, In all other samples fermentation started only after $1^{1/2}$ months which is the time for the completion of fermentation in most of the *Asavarista* preparations.

It was very interesting to note that fermentation started as early as on 16^{th} day in the sample-D. This clearly emphasizes the importance of adding *Madhura Dravyas* in divided portions even though this sample is very similar to sample-A, here the amount of *Guda* added is comparatively less, hence fermentation started quickly and also get completed early in comparison with other samples. However in sample-D the presence of *Dhataki* also helped in fermentation. When the concentration of sweetening substance is high the fermenting organisms like yeast cannot thrive and so the fermentation is inhibitated. Even though there is the presence of *Babbula* and *Madhuka* in addition to *Dhataki* in sample-E, absence of any fermentative initiator in sample-A, presence of sugar in sample-B and sample-C, instead of *Guda* in sample-A, no marked differences could be seen either in the time of onset or in the completion among the samples A, B, C, E.

Another observation that strongly suggest the addition of sweetening agents in divided portions is the presence of undissolved and no converted jaggery/ sugar.

In all samples burning candle got extinguished only when it was brought very nearer to the surface of the fermenting liquid and in none of the samples lime water test was strongly positive during fermentation. Presence of bubbles was the main feature indicating the process of fermentation. These findings prove that the process of fermentation was very slow throughout.

CONCLUSION

A search into the Ayurvedic classics refereed the description of *Draksharista* in five different versions. Study of the science of fermentation, along with the fermenters and industrial fermentation has suggested the possibility of using fermenters in a controlled condition for the preparation of *Asavaristas*. More than the type of *Madhura Dravya* and fermentation initiator amount of *Madhura Dravya* added was found to be more crucial in the process of fermentation especially in the example of *Draksharista*, where the amount of *Madhura Dravya* to be added is very high and addition in smaller portions speeds up the process. In the case of *Draksharista* the process of fermentation is very slow and continues for a long period which is proved by the increased observed in the alcohol percentage after 4 months of filtratation. Hence it is essential to use it after maturation. Organoleptic characters of the samples revealed that *Guda* can be a better *Madhura Dravya.* Basic physico-chemical characters of the samples like, specific gravity, pH, and total solids were comparable with the ingredients alcohol and sweetening substances. Estimation of total sugars revealed that maximum concentration is present in the sample E and minimum in sample D. This is because of higher alcohol and also lesser amount of sweetening substances it had. In HPTLC study even though same comparable peaks are observed among the samples, more detailed study by using various combinations of solvent systems becomes essential to get a proper inference. In total it can be said that preparation of at least three samples each for every reference is necessary for a clear comparison in pharmaceutical and analytical study and to fix the standards.

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How to cite this article: Dr. Manoj Kumar Samantaray, Dr. Saran Babu. The Pharmaceutical evaluation of Draksharishta. J Ayurveda Integr Med Sci 2018;6:71-79. http://dx.doi.org/10.21760/jaims.3.6.11

Source of Support: Nil, **Conflict of Interest:** None declared.

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