ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Research Article

STANDARDISATION OF VARIOUS PROCESSES IN THE PREPARATION OF *KOUSHEYASHMA BHASMA* ACCOUNTING ITS CLINICAL UTILITY

Nileena J Prabhash[1]*, Anand S[2]

*[1]PG Scholar, [2]Assosciate Professor, Department of Rasasastra and Bhaishajya kalpana, Government Ayurveda College, Thiruvananthapuram, Kerala, India.

Article info

Article History:

Received: 30-06-2022

Revised: 09-07-2022

Accepted: 19-07-2022

KEYWORDS:

Kousheyashma, Asbestos*, Sikatha varga.*

ABSTRACT

Asbestos, one among the inosilicate group of minerals is listed under the *Sikatha varga* (Silicate compounds) in the Rasasastra treatises, in the name, *Kousheyashma*. Though the asbestos is vastly used for commercial purposes, it is not found to be used in clinical practices owing to its toxicity. But in Ayurveda, Acharyas have opined that by the judicious usage, even the poison can be bestowed medicinal value. And hence, after undergoing appropriate pharmaceutical processes as mentioned in the treatises, *Kousheyashma* can be effectively administered in *Bhasma* (after incineration) form in the treatment of various ailments like leucorrhoea, painful micturition, inflammation of urinary tract, menorrhagia.

In this work, an attempt is made to expose the hidden medicinal values of asbestos by converting it into *Bhasma* form. *Kousheyashma* is a very cost effective and potent medicine which could be effectively used by Ayurvedic practitioners. In the present work, conversion of raw *Kousheyashma* into medicinal *Bhasma* form is discussed elaborately. The processes involved includes *Sodhana* and *Marana* of *Kousheyashma*. The liquid media used for the purpose of *Sodhana* was *Gomutra* and for *Marana* purpose, *Harithamanjari swarasa* was used. Three *Putas* were required to obtain *Kousheyashma bhasma* which satisfied the *Bhasma pareekshas*.

INTRODUCTION

In Ayurveda, *Kousheyashma* is said to be of medicinal value by converting it into suitable form, pharmaceutically. It is found as ingredient in various formulations like *Kachuradi churna,*[1] *Shirastoda gutika,*[2] *Marma gutika,*[3] *Valiyangadi kashaya,*[4] *Thenginpookkuladi ghrita,*[5] *Balashoolari churna,*[6] *Vayu gutika,*[7] *Kasturyadi gutika,*[8] *Kshaya kulanthaka churna,*[9] etc. But its single usage needs yet to be explored in the Ayurveda system of medicine.

Though it finds its occupancy in the *Rasasastra* texts under the group, *Sikatha varga*, it was not described in any of the *Brihatrayees* or *Laghutrayees.* May be this accounts for its unpopularization as a single drug among the Ayurvedic practitioners, though it is widely accepted in the Sidha system of practice as *Kalnar parpam*.

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Quick Response Code

https://doi.org/10.47070/ijapr.v10i7.2423

Being a cost effective and potent medicine with minimum dosage, it can be made familiar among the Ayurvedic practitioners. Here in this work, various pharmaceutical processes like *Sodhana* (purification) *Marana* (incineration) which are undergone by *Kousheyashma* for it to be transformed into medicinal *bhasma* form is unveiled in a detailed manner.

MATERIALS AND METHODS

In this work, the methodology involves all the steps starting right from the procuring genuine raw material till the completion of the *Bhasma pareeksha*. Method of preparation comprises of:

- Collection of raw materials
- *Sodhana* of *Kousheyashma*
- *Marana* of *Kousheyashma*

Collection of *Kousheyashma*

The raw drug required for the preparation of *Bhasma* was collected from the market of Nagercoil, Tamil Nadu and also from the local folklore drug vendor in Trivandrum. Of the 2, the one obtained from Nagercoil excelled in quality, as it was very soft, named as *Panjikkannaram*, colloquially, which had high

medicinal value and hence, it was opted for the study purpose. And, the other one, obtained from Trivandrum, which was a stony variety, was discarded. *Gomutra*, which was used for *Sodhana karma* was obtained from a "*Gosala*" in Trivandrum.

Harithamanjari, the *Bhavana dravya* (drug for wet trituration) was collected from the premises of Govt. Ayurveda College, Trivandrum and also from the local folklore drug vendor in Trivandrum.

Kousheyashma

Harithamanjari

Sodhana of *Kousheyashma*[10]

The process adopted for *Sodhana* was *Swedana* in which *Gomutra* was used as the liquid media.

Ingredients

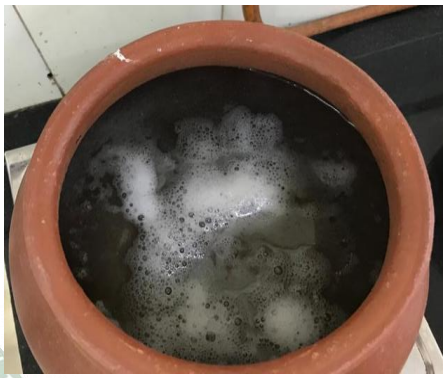
Drug	Quantity
Kousheyashma	500gm
Gomutra	3lt

Procedure

500 gm of raw, unpowdered *Kousheyashma* was taken in a *Khalwa yanrta* (mortar & pestle) and was crushed to smaller pieces. Then it was transferred into an earthen pot. Fresh *Gomutra* was added to it and boiled continuously for a period of 3 *Nazhika* (72 minutes). Whenever required, fresh *Gomutra* was added in small quantities. Thus, a total of 3L *Gomutra* was added intermittently. On the completion of 3 *Nazhika*, fire was put off and it was left for self cooling. *Kousheyashma* was then collected after decanting out the left *Gomutra*. The collected *Kousheyashma* was washed with hot water and dried. Thus 487gm of *Sodhita Kousheyashma* was obtained.

Precautions

- The utensils were used after cleaning thoroughly so as to prevent any adulteration.
- Care was taken to avoid touching the *Asodhita Kousheyashma* with bare hands.
- Whenever the quantity of liquid medium was seemed to be reduced, *Gomutra* was added little by little.
- Intermittent stirring was ensured throughout the process.
- While decanting out the *Gomutra*, maximum care was taken so as to minimize the loss of the final product.



Observations

Table 1: Volume of *Gomutra* added during the boiling of *Kousheyashma*

Time (Min)	Volume of Gomutra added (ml)
00	2.4L
20	200ml
40	250ml
60	150ml

- After drying, there was a minimal loss of weight of the study drug, *Kousheyashma* (13gm).
- This loss of weight might have in accordance with the loss that have taken place during the washing of the *Sodhita Kousheyashma* and due to the presence of any water soluble physical impurities.
- The colour of the study drug has converted to whitish grey colour from greyish white colour.

Marana of *Kousheyashma*[11]

The process of *Marana* of the study drug, *Kousheyashma* is not mentioned in any of the classical treatises of Rasasastra. Here the procedure is adopted from a previous work.

Principle: *Samputeekarana*

Purpose: For *Bhasmeekarana* of *Kousheyashma*

Marana consisted of the procedures *Bhavana* and *Putapaka.*

The process of *Bhavana* consisted of 2 steps:

- Extraction of the *Swarasa* from the plant
- *Bhavana* of the study drug, *Kousheyashma*

Extraction of *Swarasa* from *Harithamanjari* (*Acalypha indica*):

Principle: *Nishpidana*[12]

Equipments used: Stainless steel vessel, cloth, knife, measuring jar, mixer grinder

Ingredients:

Harithamanjari- 1.5 kg

Water- q.s

Procedure

The drug *Harithamanjari* was collected fresh. It was then cleaned well and washed under water to eradicate the physical impurities. Around 1 kg of *Harithamanjari* which was well cleaned was taken in a mixer grinder and was ground well. The paste thus obtained was taken out and was kept in a cloth and was well squeezed out to obtain the *Swarasa* (juice). The quantity of the *Swarasa* thus obtained was measured using a measuring jar and the quantity was found to be 700 ml. The *Swarasa* was collected in the same method for subsequent *Putas* too.

Table 2: Quantity of *Harithamanjari swarasa* obtained

***Harithamanjari* (gm)**	***Swarasa*(ml)**
1500	700
1000	450
1000	550

For the first *Puta* (quantum of heat to be applied) 700 ml of *Harithamanjari swarasa* was used for *Bhavana* which was collected out of 1.5 kg of the drug. For the second *Puta*, 450 ml of *Harithamanjari swarasa* was used for *Bhavana* which was collected out of 1 kg of the drug. For the third *Puta*, 550 ml of *Harithamanjari swarasa* was used for *Bhavana* which was collected out of 1 kg of the drug.

Bhavana* of *Kousheyashma

Kousheyashma obtained after the process of *Sodhana* was taken in a clean dry *Khalva yantra* and was powdered well to obtain a fine powder form. Then *Bhavana* was done by adding *Harithamanjari swarasa* in small quantities. For the first *Puta*, a total of 10 hours of grinding was done and was completed in 6 days. The total mass, which has by then turned to be fine and pasty was made into *Chakrika* form (pellets). The *Chakrikas* were then kept in shade for drying. The weight of the *Chakrikas* after drying was taken.

Table 3: Quantity of *Harithamanjari swarasa* taken for each *Bhavana*

Puta	**Quantity(ml)**	**Time taken(hr)**
1	700	10 hr
2	450	6 hr
3	550	5 hr

A total of 3 *Putas* were given for the *Kousheyashma*. Total quantity of *Harithamanjari swarasa* used was 1.7L and the total time taken was 21 hours to complete the *Bhavana*.

Sandhibandhana

The dried *Chakrikas*, after being weighed were taken in *Sarava* (earthen plate). It was spread uniformly over the earthen plate and was covered with another earthen plate of uniform size. The edges of the two earthen plate was covered using a clay smeared cloth and thus sealed well. After that it was dried properly. Thus, a total of 7 times of sealing was done using the clay smeared cloth, repeating the same procedure.

Putapaka

The process is incineration. The *Chakrikas* which has undergone *Samputeekarana* was placed in a muffle furnace and the temperature was set to be 600 degree Celsius and was maintained for 1 hour. It was then allowed to cool. And after *Swangaseetha,* it was taken out and the *Bhasma* was collected on powdering the *Chakrikas* and *Bhasma pareeksha* was carried out.

Thus the process of *Bhavana, Sandhibandhana and Putapaka* were carried out for a total of 3 times until the *Bhasma pareeksha* was satisfied.

Table 4: Change in weight of *Kousheyashma* after each *Puta*

No. of *Puta*	**Weight in gm**	**Weight in gm**	**Weight loss (%)**
	Before *Puta*	**After *Puta***	
1	493.5	470	4.86
2	204	198	2.94
3	200	196	2

For the first *Puta*, 487 gm of *Sodhita Kousheyashma* was taken. After *Bhavana*, the weight of the dried *Chakrikas* before *Puta* was found to be 493.5gm. After *Puta*, the weight was found to be 470gm. For the second *Puta*, 200gm of the *Kousheyashma* after first *Puta* was taken. After *Bhavana*, the weight of the dried *Chakrikas* before *Puta* was found to be 204gm. After second *Puta,* the weight was found to be 198gm. For the third *Puta*, the whole obtained *Kousheyashma* after 2nd *Puta* was taken. After third *Puta*, the weight was found to be 196gm.

After the third *Puta*, the *Bhasma pareekshas* were satisfied by the finished product.

Table: Physical tests (*Bhasma Pareeksha*) of *Kousheyashma bhasma*

Puta	1	2	3
Colour	**Greyish**	**Greyish white**	**Greyish white**
Varithara	Slightly	Present	Present
Rekhapoorna	Present	Present	Present
Nischandra	Absent	Absent	Present
Unnama	Absent	Slightly	Present

Storage

The *Bhasma* thus obtained was weighed and stored in a clean dry airtight container.

Precaution

- *Kousheyashma* taken for *Bhavana* purpose should be in fine powder state.
- Fresh *Swarasa* should be taken for the purpose of *Bhavana.*
- Trituration should be done by adding the *Swarasa* little by little, as needed.
- *Chakrikas* should be of uniform size and shape.
- Proper drying of the *Chakrikas* should be ensured.
- Proper sealing of *Sarava* should be ensured and it should be well dried after each *Sandhibandhana.*

Purified *Kousheyashma churna*

***Harithamanjari* juice**

Bhavana

***Chakrikas* before drying**

***Chakrikas* after drying**

Sarava samputa

Muffle furnace

Bhasma

RESULTS AND DISCUSSION

Though *Kousheyashma* was easily available among the drug vendors in Kerala, the stony variety was more available. The other variety of *Kousheyashma*, which was colloquially named *Panjikannaram* was not easily available and this variety was used for the study purpose which was procured from Nagercoil.

There was no much reference regarding the *Sodhana* and *Marana* of *Kousheyashma*. The reference of *Sodhana* was found in Agastya vaidya chandrika, where it is mentioned that three different medias can be used for *Sodhana*. And they are *Hayamutra*, *Naramutra* or *Gomutra*. Here, in this study, *Gomutra* was used as media, owing to its easy availability and therapeutic values. Two different methods of *Sodhana* were found with this *Sodhana dravya- sthapana* and *swedana* with the time period 10 days and 72 minutes respectively. Also one method is *Niragni* method and the latter is *Saagni* method. In this study, the second method was adopted as it was more feasible and convenient. *Gomutra* was added every 20 minutes throughout the *Sodhana* process. Total quantity of *Kousheyashma* taken was 500gm and the *Sodhita Kousheyashma* obtained was 487gm. The colour of raw *Kousheyashma* was grayish white and on *Sodhana,* the colour changed as whitish grey colour, with more of whitish tinge. The loss in weight and the change of colour may be due to the physical impurities that might have got mixed and washed away with *Gomutra*.

Procedures of *Marana* included *Bhavana* with *Ishvari* (Birthwort) (*Aristolochia indica*) juice, Bhavana with *Nimbu* (lemon) *swarasa, Bhavana* with *Harithamanjari* (*Acalypha indica*) *swarasa*. Here in this research work, in the process of *Marana, Bhavana* is performed with *Harithamanjari swarasa*. As *Harithamanjari* was easily available, which grows in an abundant manner, it was taken for the study. In a study of *Kousheyashma i*n 2006, similar pharmaceutical processing were used. So, considering the same as standard operating procedure (SOP), the same method was followed in the present study. On starting the *Marana* with the pounding (*Mardana*) of *Sodhita Kousheyashma*, it is observed that the drug is easily powdered. It denotes the less hardness of the drug. On tirturation with *Harithamanjari swarasa*, the *Bhavana dravya* acts as a rich source of trace elements. And hence, it enhances the therapeutic action of the drug. Also, it aids in reducing the particle size, prevents large

loss of particles, owing to its fineness on tituration. Also it act as a catalystic agent for the reaction that happens on *Samputeekarana*. Also, as it is a liquid media, it ensures the homogenousity of the *Chakrikas*. *Bhavana* was done 10 hours, 6 hours and 5 hours respectively for each *Puta*. Quantity of *Swarasa* used was 700ml, 450 ml and 550ml respectively. Here, the first *Bhavana* took more quantity of *Swarasa* and time. This may be due to the fibrous nature of the drug was more predominant initially and due to the hygroscopic nature of the drug. On preparation of *Chakrikas*, the semi solid mass is converted into circular flat pellets. The shape of the *Chakrikas* ensures enough surface area that allows the equal distribution of the heat creating favourable environment for the upcoming reaction that takes place. In *Samputeekarana*, the Sarava used was earthen *Sarava* which ensures the vessel used is of inert nature. Also, earthen *Saravas* are having good stability to heat and also not good conductors of heat. The *Sarava* is sealed well with a mud smeared cloth in 7 consecutive layers. This closed environment restricts the entry of any air, thus moderating the reaction. The earthen Saravas used are of shallow in size, thus ensuring the easiness in the entry of heat to the *Chakrikas* which is kept inside. The *Puta* used was *Kukkuta puta*, owing to the study of *Kousheyashma* previously taken place, from which the SOP for the present research work is taken. The temperature was set to be 600 degree celesius in the muffle furnace which was maintained for a period of one hour. On self cooling, the seal of *Sarava* is broken and the final product is weighed and stored. The end product, i.e, the formation of *Kousheyashma bhasma* takes in this phase. Heat energy, which is generated during the process of *Marana*, causes a dissimilar manner of linear expansion of the drug. The repetition of the process of *Marana* results in the repeated oxidation, reduction and also the separation of the particles. While heating, the inorganic materials that are present in the liquid media which is used for *Bhavana* gets assimilated to the product. The final product obtained was devoid of its fibrous nature, which indicates the change from its orginal form, which fulfills the purpose of *Marana*.From first *Puta* to final *Puta*, there was a loss of the initial quantity, which indicates the oxidation reduction of the organic material.

In Ayurveda, *Bhasma pareeksha* helps in analyzing the quality and purity of the *Bhasma* obtained.

***Varithara pareeksha*:** After subjecting to the second and third *Puta*, *Varitaratva* was exhibited by the *Bhasma*. The fact that *Bhasma* floats on the water surface was suggestive that it is of smaller in particle size and of a lighter density, which aids in floating on the surface of water. In the first *Puta*, *Varitaratva* was not fully attained suggests that there may be the presence of any unconverted particles, which made it sink.

***Unnama pareeksha*:** After subjecting to the third *Puta*, *Bhasma* passed the *Unnama bhasma pareeksha*. This is suggestive of the lesser density of the *Bhasma*, which aids in the better absorption.

***Rekhapoornatva pareeksha*:** The *Bhasma* has attained *Rekhapoornatva* from the very first *Puta* itself. This is suggestive of the smaller particle size, fineness and softness of the *Bhasma*. Also is suggestive of the consistency of the *Bhasma*. If the *Bhasma* is hard, irregularly sized or of rough in nature, then it would have adhered into the cruises of the fingers despite of the smaller size of particles. Considering all these, *Rekhapoornatva* is an indicator that the *Bhasma* is easily absorbed and assimilated by the body.

***Nischandratva*:** The *Bhasma* has passed the *Nischandra pareeksha* after subjecting it to the third *Puta*. This suggests that the metallic content present in the *Bhasma* which imparted the property of lusture to it, might have converted into amorphous form. If *Nischandratva* is present in a *Bhasma* after *Puta*, it has to be further be incinerated till attaining *Nischandratva* inorder to use it for therapeutic purposes.

CONCLUSION

The soft variety of *Kousheyashma* was used for the study purpose discarding the stony variety hence the soft variety was clinically more effective. The procedure of *Sodhana* was adopted with *Gomutra* as authenticated in the treatise, Agastya vaidya chandrika. Apart from purification alone, *Gomutra* enhances the therapeutic property of the study drug. *Marana* was continued till the end product satisfied the *Bhasma pareeksha*. Total number of *Putas* required for satisfying *Bhasma pareeksha* of the obtained *Kousheyashma bhasma* were 3 in number. By adopting these methods in this work, *Kousheyashma bhasma* is standardized and this standardized *Kousheyashma bhasma* can be used in the treatment of various ailments like leucorrhoea, painful micturition, inflammation of urinary tract.

ACKNOWLEDGEMENT

The authors are thankful to the authorities of Govt Ayurveda College, Trivandrum for providing the necessary infrastructure and assistance for the completion of this work.

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Cite this article as:
Nileena J Prabhash, Anand S. Standardisation of Various Processes in the Preparation of Kousheyashma Bhasma Accounting its Clinical Utility. International Journal of Ayurveda and Pharma Research. 2022;10(7):13-18.
https://doi.org/10.47070/ijapr.v10i7.2423
Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**
Dr. Nileena J Prabhash
PG Scholar,
Department of Rasasastra and Bhaishajya kalpana, Government Ayurveda college,
Thiruvananthapuram, Kerala, India.
Email: nileenaj89@gmail.com
Ph no: 9446061894