wjpmr, 2022,8(10), 233-236

SJIF Impact Factor: 5.922

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

A STUDY OF HARTAL SHODHAN ACCORDING TO RAS RATNA SAMUCHCHAY AND ITS PHYSICO-CHEMICAL ANALYSIS

***Dr. Shreepad Chitnis (PG Scholar) and Dr. Ashvini Deshmukh (Reader)**

Department of RSBKYMT Ayurvedic Medical College and Hospital and PG Institute Kharghar.

***Corresponding Author: Dr. Shreepad Chitnis (PG Scholar)**

Department of RSBKYMT Ayurvedic Medical College and Hospital and PG Institute Kharghar.

Article Received on 18/08/2022 **Article Revised on 08/09/2022** **Article Accepted on 28/09/2022**

ABSTRACT

Rasashastra is the branch of ayurveda which deals with the preparation of different medicines using herbals as well as minerals. In this branch there is use of poisonous drugs which are harmful as per the evidence-based medicine. *Haratal* is most commonly used as medicine besides it harmful or poisonous as per evidence-based medicine. *Shodhan* is one of the methods which is used before preparation of any formulation. *Shodhan* deals with the purification of medicines and improvement in their medicinal properties. *Shodhan* is not only done on minerals but on herbal drugs also. In this present study it is an attempt to evaluate the *Shodhan* procedure using modern equipments.

INTRODUCTION

Rasashastra is the branch of ayurveda which deals with the preparation of different medicines using herbals as well as minerals. In this branch there is use of poisonous drugs which are harmful as per the evidence-based medicine. Arsenic compounds are being popularly used in ayurveda therapeutics since centuries among them.[1] *Haratal* is commonly used in treating diseases like *Raktapitta*, *vatarakta*, *kushtah* and *Shleshma rog*.[2] *Haratal* is called orpiment of yellow arsenic with two molecules of arsenic and three molecules of Sulphur (As2S3). *Haratal* consumed without proper *shodhan* causes many toxic effects on body. Hence, *shodhan* of *haratal* is essential. In *Rasashastra* there are different methods which used to improve the medicinal properties and overcome the poisonous effects. In that *Shodhan* is one of the important methods which is used before preparation of any formulation. *Shodhan* deals with the purification of medicines and improvement in their medicinal properties. It helps to overcome the effects of poison like *Tikshnatva*, *Vyavayi*, *Vikasi*, *Ushna*. Hartal is used in two forms i.e., *shuddhaharatal* and *haratalbhasma*. Shuddha Haratal and hartal bhasma is used in many *kalpas* which are useful in *kushthavyadhi*, *vishamjwara*, V*tarakta*, *Visarpa*,*Vipadika*, *Vicharchika*, *Vrana*, *Nadivrana*, *Bhagandara*, and *Vishamjwara*.[3]

AIM OF THE STUDY

A study of Hartal *shodhan* according to Ras ratna samuchchay and its Physico-chemical analysis.

Objective

- To study the concept of *Shodhana*
- Authentication of *Patra Haratal* (Orpiment)
- To perform *Shodhana* of *Haratal* by *Churnodak*.
- Physicochemical analysis of *Haratal* before and after of *Shodhan* procedure.

MATERIALS AND METHOD

Haratal

As a mentioned in *Rasataragini* there are two types of *haratal* i.e., *Pinda haratal* and *Patri haratal*.[4] As per *Rasatarangini Patra Haratal* is better than *Pinda Haratal*.[5] *Shodhan* of *haratal* is carried out by *Swedan* in *Churnodak purit dolayantra* method which is mentioned in *Rasasratnasamucchaya*.

For this Procedure two samples of *Ashuddha Haratal* were purchased from local market. after that both samples of *Ashuddha Haratal* were authenticated in certified laboratory. According to the findings Sample no. 2 was selected for the study.

Shodhan of haratal

1) *Churnodak Nirman*[6]

Ingredients of *churnodaka*

1. *Churna* (Lime)
2. Water

Procedure

1. Course powder of *Churna* (Lime) was taken in quantity of 25gms.
2. Then it turned into fine powder form.
3. Then powder was put into stainless steel vessel and 6 lit of water was poured into that vessel.

4. The vessel with *Churna* (Lime) and water was kept untouched for 24 hrs.
5. After 24 hrs it was filtered with cotton cloth.

2) *Haratal Shodhan*[7]

Ingredients

i. Ashuddha Haratal

ii. Churnodaka

Materials: Stainless steel vessel, Wooden stick, Cottoncloth, Gas Stove, measuring cylinder, Warm water.

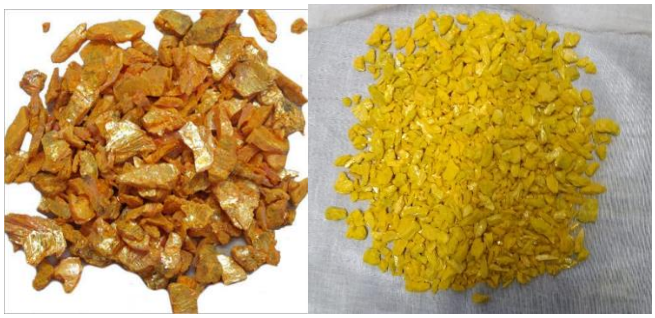
Procedure

1. *AshuddhaHaratal* were taken and crushed into small pieces.
2. The initial weight of *haratal* was 600gms.
3. Those pieces were kept into Cotton cloth and *pottali* was prepared.
4. The *pottali* was suspended in *Dolayantra* which containing *Churnodak*mild heat was given to boil *Churnodak*.
5. When the level of *Churnodak* decreased, again extra *churnodak* was added.
6. This procedure was repeated for 3hrs. After completion of procedure, heating was stopped.
7. Then it get cool down *pottali* was opened and *Haratal* were washed with warm water and dried it.

Observation during procedure

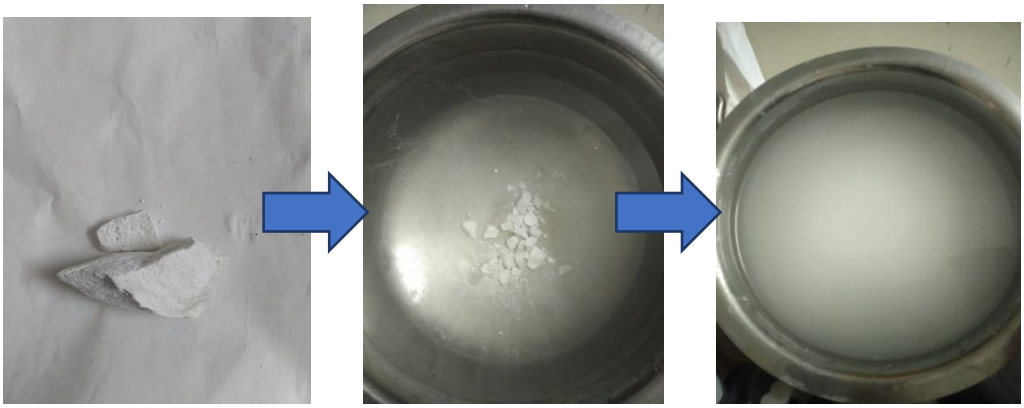
- Fumes liberating from yantra which was having irritating odour.
- Colour of *Churnodak*was changed and it gets yellowish. Which was probably a colour of *Haratal*.
- *Haratal* becomes soft and brittle.
- Shining and glaze of *Haratal* was decreased after *Shodhan*.
- After *ShodhanHaratal* was weighed and final weight was 575 gms.

Pictures



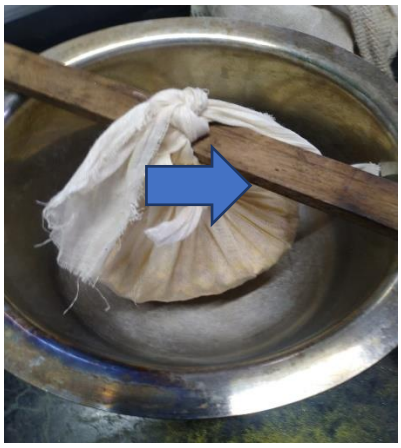
Sample 1 **Sample 2**

Churnodaknirman

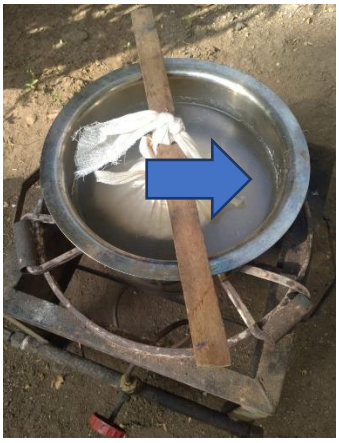


***Churna* (Limestone) *Churna* in water** **after 24hrs**

Haratal Shodhan

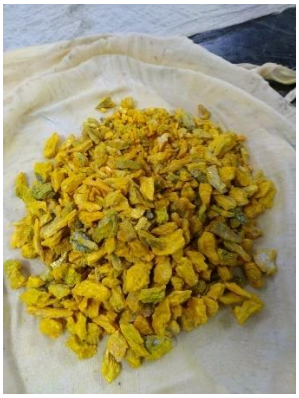


Pottali



Churnodak purit dolayantra

In Process



Shuddha Hartal

RESULTS

Table 1: *Ashuddha Haratal* Organoleptic tests.

Sr	Tests	Results	
		Sample 1	**Sample 2**
1	Appearance	Layered, Shiny	Layered, Shiny
2	Colour	Yellowish orange,	Yellowish
3	Odour	Characteristic odour of arsenic	Characteristic odour of arsenic

Table 2: XRF of *Ashuddha Haratal.*

Sr.	Components	Percentage	
		Sample 1	**Sample 2**
1	As_2S_3	98.6%	99%
2	Ca	1.38%	1.00%
3	As	60.1%	60.3%
4	S	38.6%	38.7%
5	Fe	-	0.0217%
6	Sb	-	0.0077%

Hence as per above XRF study Sample no 2 was selected because it contains 99% of As_2S_3.

Table 3: *Shuddha Hartal* Organoleptic.

Sr.	Test	Result
1	Appearance	Layered
2	Colour	Yellowish
3	Odour	Characteristic odour

Table 4: Weight difference table.

Initial weight of *Ashuddha Haratal*	600gm
Final Weight of *Shuddha Haratal*	575gms
Total Weight loss	25gms

Table 5: XRF study of *ShuddhaHaratal*.

Sr.	Elements (mass%)	Percentage	
		Ashuddha haratal	***Shuddha hartal***
1.	As2S3	99.0%	99.2%
2.	Ca	1.00%	0.517%
3.	As	60.3%	60.4%
4.	S	38.7%	38.8%
5.	Fe	0.0217%	0.310%
6.	Zn	-	0.0098%
7.	Sb	0.0077%	-

DISCUSSION

After *shodhan*of *Haratal* by above method, *Haratal* was subjected to its physicochemical tests. In the organoleptic test it shows the colour and texture difference in *shuddha* and *ashuddha haratal*. *Shuddha Haratal* was yellowish shiny, peculiar odor and crystalline smooth texture. It was observed that the greenish tinge got appeared. The lustre of *haratal* was reduced in *shuddha hartal*. During *Shodhan* of *Haratal* total 600gms of *ashuddha haratal* was taken and after *shodhan* we got 575gms of *shuddha haratal* Total 25gms loss was there.

In this study the percentage of As_2S_3 in *Ashuddha Haratal* was 99% and besides that it also containing some percentage of Calcium, Iron and Antimony. After *shodhan* of *Haratal* it contains As_2S_3 in 99.2%, Calcium Percentage is reduced. Iron is little bit higher and very few percentages of Zinc was observed in *Shuddha Haratal* which was not found in *ashudh haratal* it may be due to use of different vessels during process. The percentage of Antimony was totally absent in *Shuddha Haratal* it may be due to use of *Churnodak* for *Shodhan* purpose.

CONCLUSIONS

Shodhana of *Haratala* reveals that the importance of *Shodhana* in pharmaceutical process which is probably responsible for therapeutic importance of *haratal*. Both *Shodhita* and *Ashodhita Haratala* shows different physical and chemical properties. Organoleptic characteristics of samples of *Haratala* possess different colors, touch, odor, and also XRF analysis Shows difference in before and after *shodhan*. XRF of *shodhit haratal* shows absent of Sb (Antimony) which is harmful for body. As per the study it can be conclude that process of *shodhan* can alter the effects as well as overcome the poisonous effect on the body.

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