wjpmr, 2017,3(11), 121-124

SJIF Impact Factor: 4.103

WORLD JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.wjpmr.com

Research Article

ISSN 2455-3301

WJPMR

# PRELIMINARY PHARMACEUTICO-ANALYTICAL STUDY OF *SNUHI KSHARA*

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**Article Received on 05/10/2017** **Article Revised on 26/10/2017** **Article Accepted on 16/11/2017**

## ABSTRACT

In *Ayurveda*, substances of natural origin, including whole plant or their parts, animal's parts and minerals are used as medicine either alone or in combination. Herbal drugs have served the human society from time immemorial in curing various ailments. *Acharya Charaka* has mentioned 18 parts of plants which can be used for medicinal purpose and *Kshara* is one among them. *Kshara* are derivatives of plant drug ashes in the form of solutions or crystals, all of which have the basic quality of being alkaline. *Snuhi Kshara* is included in *Ksharashtaka. Kshara* obtained from *Snuhi* is one of its modification, advocated in classics for therapeutic objectives. *Snuhi Kshara* is *Tikshna, Agnidipana* and indicated in *Udara, Gulma, Sotha, Visuchika, Ajirna, Sula, Yakrit dosha* and *Svasa.* Different opinions exist regarding proportion of water, time for settling, cloth folding, Number of filtration in the preparation of *Kshara* in *Ayurveda.* The residue after a first wash should never be discarded, they are to be processed further twice to obtain more *Kshara.* After three washes, maximum yield was obtained i.e. 26g (10%), 18g (6.92%) and 8g (3.07%) respectively in each wash. Here an attempt is made to prepare *Snuhi Kshara* by classical references with repeated washing of ash and to develop preliminary profile of *Snuhi Kshara.*

**KEYWORDS:** *Kshara, Snuhi Kshara, Ksharashtaka.*

## INTRODUCTION

In *Ayurveda,* substances of natural origin, including whole plant or their part, animal parts and minerals are used as medicine either alone or in combination. *Acharya Charaka* has mentioned 18 parts of plants which can be used for medicinal purpose and *Kshara* is one among them.[1] *Kshara* are alkaline substances obtained by processing the ash of drugs. According to *Acharya Sushruta*, the substance is called *Kshara,* because it causes *Ksharana* to *Mamsa Dhatu*[2] etc. *Kshara* is also included as an ingredient in many formulations. Due to its *Guna-Karma,* it has gained more importance in pharmaceutics and also had specific therapeutic value. Varieties and method of preparation of *Kshara* are described by *Acharya Sharangadhara*[3] and *Rasataranginikara.*[4] Various combination of *Kshara* are available in classics like *Ksharadvaya,*[5] *Ksharatraya,*[5] *Ksharapanchaka*[5] and *Ksharashtaka.*[5] *Snuhi Kshara* has been mentioned in *Ksharashtaka*[5] in *Ayurvedic* texts.

**Table 1: Methods of preparation of *Kshara* mentioned in various texts.**

| Sr. No. | Reference | Ratio of Ash and water | Duration of soaking | Filtration Pattern |
|---|---|---|---|---|
| 1 | *Sushruta Samhita*[6] | 1:6 | Over night | 21 time |
| 2 | *Sharangadhara Samhita*[3] | 1:4 | Overnight | Filtered through cloth |
| 3 | *Rasatarangini*[7] | 1:4 | 3 hrs | Filtered with 3 folded cloth |
| 4 | *Ayurveda Prakasha*[8] | 1:4 | Over night | Filtered through cloth |
| 5 | *Ayurveda SaraSamgraha*[9] | 1:8 | 2-3 days | Filtered 7 times with 4 folded cloth |
| 6 | *Dravyaguna Vigyana*[10] | 1:6 | Overnight | Filtered 21 times with cloth |

Different opinions exist regarding proportion of water, time for settling, cloth folding and numbers of filtration in the preparation of *Kshara.*

Here an attempt is made to prepare *Snuhi Kshara* by classical references with repeated washing of ash and to develop preliminary profile of *Snuhi Kshara.*

## MATERIALS AND METHODS

### Preparation of *Snuhi Kshara*

- **Collection of *Snuhi*** –*Snuhi panchanga* was collected from the Sundar Ayurved teaching pharmacy J.S. Ayurved Mahavidyalaya, Nadiad which is identified and authenticated by the drug selection committee.
- **Apparatus** – Iron pan for burning of dry *Snuhi*, steel vessel, gas stove, weight machine, pipe for decant, filter paper, stirrer and R.O. water.
- **Method–***Snuhi Kshara* has been prepared by classical methods mentioned in *Sharangadhara* modified by *Acharya Yadavji Trikamji*. Whole process was divided into three phases –

1. Preparation of Ash – Dried *Snuhi* was burnt completely by placing it in a big iron pan. After the self-cooling, white ashes were collected.
2. Preparation of *Kshara Jala* – Ash was collected in a steel vessel and four times of water was added to it. The contents were mashed thoroughly with hands and left undisturbed for overnight. After that, the clear supernatant liquid was decanted with the help of pipe and filtered through three layered cotton cloth for 21 times. The residual ash was again mashed with four times of water and kept undisturbed for the next overnight, followed by a collection of the second filtrate. A similar method was followed for the third time to collect third filtrate.
3. Preparation of *Kshara* – All the three filtrates of *Kshara jala* were individually subjected to heat to evaporate the water content and *Kshara* is obtained from the vessel by scrapping. After weight, stored in suitable air tight container.

## ANALYTICAL STUDY

Organoleptic parameters like colour, taste, appearance were carried out for raw drug, *Kshara Jala* and *Kshara.* Physiochemical parameters like Loss on drying at,[11] Ash value,[12] Acid insoluble ash[13] for raw drug and prepared *Kshara* whereas pH value,[14] specific gravity[15] for *Kshara Jala* and Alkalinity,[16] sodium ion presence[17]were carried out for *Kshara.*

## OBSERVATIONS AND RESULTS

**Table 2: Showing data of ash preparation.**

| Observations | Results |
|---|---|
| Wt. of fresh *Snuhi* | 6 kg |
| Wt. of dried *Snuhi* | 2.5 kg |
| Wt. loss of *Snuhi* after drying | 3.5 kg |
| **%** of loss after drying | 58.33 % |
| Wt. of ash obtained | 260g |
| Vol. of ash obtained | 1 L |
| **%** of ash obtained from dried *Snuhi* | 10.4% |

**Table 3: Showing data of *Kshara Jala* preparation.**

| Parameters | Batch I | | |
|---|---|---|---|
| | 1st wash | 2nd wash | 3rd wash |
| Volume of Ash taken (ml) | 1 L | 1 L | 1 L |
| Volume of water taken (ml) | 4 L | 4 L | 4 L |
| *Kshara Jala* obtained after filtration (ml) | 2400 ml | 3000 ml | 3500 ml |
| *Kshara Jala* obtained (%v/v) | 60 % | 75% | 87.5% |
| *Kshara Jala* loss (%v/v) | 40 % | 25 % | 12.5 % |
| Time required for preparation of *Kshara Jala* | 12 hrs | 12 hrs | 12 hrs |

**Table 4: Showing data of *Snuhi Kshara* obtained in three washes.**

| Parameters | 1st wash | 2nd wash | 3rd wash |
|---|---|---|---|
| Volume of *Kshara Jala* taken (ml) | 2400ml | 3000ml | 3500ml |
| *Kshara* obtained (g) | 26 g | 18 g | 8 g |
| *Kshara* obtained (in comparison to dry *Snuhi)*(%w/w) | 1.04% | 0.72% | 0.32% |
| *Kshara* obtained (in comparison to dry *Snuhi* ash) (%w/w) | 10% | 6.92% | 3.07% |

**Table 5: Showing Organoleptic parameters of Dry*Snuhi, Kshara Jala* and *Snuhi Kshara.***

| Sr. No | Parameters | Dry *Snuhi* | *Kshara Jala* | *Snuhi Kshara* |
|---|---|---|---|---|
| 1 | Colour | Light green | Yellowish | White |
| 2 | Taste | Pungent | Salty | Salty |
| 3 | Touch | Smooth | Smooth | Rough |

**Table 6: Showing the Physico-chemical parameters of Dry *Snuhi.***

| Physico-chemical parameters | Results |
|---|---|
| Loss on drying at $105^0$C (%) | 4.12% |
| Ash value (%w/w) | 2.47% |
| Acid insoluble ash (%w/w) | 1.02% |

**Table 7: Showing the Physico-chemical parameters for *Kshara Jala.***

| Physico-chemical parameters | Results |
|---|---|
| pH value (10% aqueous solution) | 9.11 |
| Specific gravity | 1.0063 |

**Table 8: Showing the Physico-chemical parameters for *Kshara.***

| Physicochemical parameters | Results | | |
|---|---|---|---|
| | 1st decant | 2nd decant | 3rd decant |
| Loss on drying at $105^0$C (%) | 3.75% | 4.2 % | 3.88% |
| Ash value(%w/w) | 97% | 95% | 99% |
| pH value(10% aqueous solution) | 10.20 | 10.15 | 10.14 |
| Acid insoluble ash(%w/w) | 0.90 | 0.96 | 0.92 |
| Alkalinity | 0.04/0.1 M HCL | 0.04/0.1 M HCL | 0.04/0.1 MHCL |
| Sodium ion | Present | Present | Present |

**PREPARATION OF *SNUHI KSHARA***

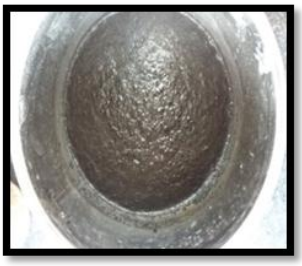
**1. Fresh *Snuhi.***

**2. Dry *Snuhi.***

**3. Burnt *Snuhi.***

**4.*Snuhi* ASH.**

**5.ASH+Water.**



**6. Kept for Overnight.**

**7. Decantation & Filteration of *Ksharajala.***

**8. *Ksharajala.***

**9. Evaporation of *Ksharajala.***

**10. *Snuhi Kshara.***

## DISCUSSION

*Acharya Sharangadhara* and *Rasatranginikara* have not mentioned about the number of filtrations. So filtration is done for 21 times as mentioned by *Acharya Sushruta* and *Acharya Yadavaji Trikamaji* to obtain the clear *Kshara Jala*. Fresh *Snuhi* was made into small pieces for better and easy drying. Plant was burnt in a vessel to prevent contamination during burning. *Snuhi* pieces were added little by little into the fire for proper burning to obtain smoky white ash. R.O. water was taken to avoid inorganic salts. Stainless steel vessel was used to prevent possible chemical reactions. Ash was macerated well in water for proper mixing and allowed to settle down for overnight. If carbon particles are found floating, then they have to be removed with sieve. *Kshara Jala* was decanted without disturbing the vessel. Measures should be taken to avoid the entry of sediment. A clean cotton cloth should be tied on both ends of pipe before decanting the *Kshara Jala* to obtain clear *Kshara Jala*. Proper filtration is to be done with three folded clothes. If still some residues are found in *Kshara Jala,* it should be filtered with filter paper. Initially *Kshara Jala* was yellowish colored clear liquid. Vapors and crackling sound were increased proportionally with temperature. Colour was changed from yellowish to brown gradually as the temperature raised. *Kshara* was started sticking to the vessel and bumping was observed. At this stage mild heat should be given to prevent the burning of *Kshara*. It was stirred carefully to prevent bumping. Finally, White coloured *Kshara* was obtained by scrapping. *Kshara* is considered as a water soluble, but all water soluble content cannot be obtained within a single wash, some of them may remain as residue. The residue after a first wash should never be discarded, they are to be processed further twice to obtain more *Kshara.* After three washes, maximum yield was obtained i.e. 26g (10%), 18g (6.92%) and 8g (3.07%) respectively in each wash. An attempt had been done to prepare Kshara from fourth decant but the yield obtained is very low about 4 g. pH value and Specific gravity of *Kshara Jala* was 9.11, 1.0063 respectively. Average LOD 3.94 % at $105^0$C, Average Ash value(%w/w) 97% and Average pH value (10% aqueous solution) 10.16 was noted in the prepared *Snuhi Kshara.* Sodium ions were found to be present in *Snuhi Kshara.*

## CONCLUSION

Classical method of preparation of *Kshara* mentioned by *Acharya Sharangadhara* modified by *Acharya Yadavaji Trikamaji* is applicable to develop the preliminary profile of *Snuhi Kshara*. Repeated washing of Ash should be done to obtain maximum yield of *Kshara i.e 52* g. These observed Parameters can be considered for further studies and large scale production of *Snuhi Kshara*.

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