



## Research Article

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### STANDARDIZATION OF YAVA KSHARA: AN ALKALINE HERBAL PREPARATION

Mitra Shuchi<sup>1\*</sup>, Gupta Sanjay<sup>2</sup>, Gupta Akanksha<sup>3</sup>

<sup>1</sup>Lecturer, Department of Ras Shastra and Bhaishjya Kalpana, Rishikul Government Ayurved P.G. College, Haridwar, Uttarakhand, India

<sup>2</sup>Assistant Professor, Department of Panchkarma, Gurukul Kangri Government Ayurved College, Haridwar, Uttarakhand, India

<sup>3</sup>P.G. Scholar, Department of Ras Shastra and Bhaishjya Kalpana, Rishikul Government Ayurved P.G. College, Haridwar, Uttarakhand, India

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#### \*Corresponding author

Dr. Shuchi Mitra, Lecturer, Department of Ras Shastra and Bhaishjya Kalpana, Rishikul Government Ayurved P.G. College, Haridwar, Uttarakhand, India E-mail: dr.akankshagupta@yahoo.com

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#### ABSTRACT

Kshara is a commonly used alkaline herbal preparation in Ayurveda. Different methods are mentioned in Ayurvedic texts for Kshara preparation. The aim of this study was to carry out standard operating procedure fixation and standardization of Yava kshara and to find out the best method for Kshara preparation. Yava kshara has been prepared by the method mentioned in Rastarangini 13 Tarang and 14 Tarang by specific and general method. The specific method comes out to be the best in terms of yield. Kshara has also been obtained by filtering the mud residue and heating it again and there was no much difference in the kshara obtained from initial ash and mud residue. But the kshara prepared from general method was more acidic. So we can conclude that the quality of kshara depends on the number of filtration, more filtration better the kshara.

**Keywords:** Kshara, Yava kshara, Standard Operating Procedure, Standardization

#### INTRODUCTION

Herbal based medication has been an integral part of human dwellings in the battle against ill health. Acharya Charaka has mentioned 18 parts of plants which can be used for medicinal purpose and Kshara is one among them (ch.su.1/74)<sup>1</sup>. The chosen topic is not included in basic Panchvidh kashaya kalpana, it is a secondary kalpa but it has been chosen for the purpose of exploring Kshara kalpana which has remained an untouched topic till date. Yava kshara is of great clinical importance and has been mentioned in kshara varg in Ayurvedic texts.<sup>2-4</sup> It is an important constituents of various formulations, though different texts have mentioned the method of preparation of Kshara with some differences but here Yava kshara was prepared according to the specifications of Rastarangini. Tarang 13 quotes the specific preparation of Yava kshara while in Tarang 14 presents the general method of preparation of kshara. The experimental work has been done with the following objectives:

- To fix the standard operating Procedure (SOP) of Yava kshara preparation and standardization.
- Exploring practical aspect of Kshara preparation step by step according to Rastarangini.
- Evaluating the two methods of Kshara preparation i.e. specific and general one.
- Establishing the best method of Kshara preparation.
- To estimate the final yield from the starting material.
- To study yavakshara in terms of preparation parameters, yield, properties and on chemical grounds.

#### MATERIAL AND METHODS

##### Procurement of raw material

Fresh and mature Barley (*Hordeum vulgare*) plant was collected as whole (panchang) with fruits and roots as well from village area of dist. Haridwar, India. Then it was allowed to dry in air and warmth.

##### Method of preparation

The method given in various literatures is controversial especially in terms of filtrations. In texts it has not been clearly mentioned that the same Kshara jal obtained from dissolving ash should be filtered again and again or the mud residue, as with the residue the Kshara also get wasted so what should be done to that residue. Here we have prepared Kshara by the method mentioned in R.T 13/3-5<sup>5</sup> and it is the specific method of preparation of Yavakshara: This method of preparation involves burning of panchang into ash and then dissolving the ash in 8 times of water and filtering it over 7 times on a thick cloth before subjecting it to fire to yield Kshara. This method has been repeated 3 times to fix the S.O.P

General method of preparation of Kshara: RasTarangini 14/59-61<sup>5</sup>

In general method of preparation of Kshara the plant ash was dissolved in 4 times of water and was filtered over three layered cloth just once after thorough mixing of the ash and water mixture manually for three hours at a stretch.

- When Yava kshara was prepared from this method due to low quantity of water, the ash was difficult to mix. In both procedures the Kshara was also obtained by mud residue by filtering and heating it again.

## RESULTS

**Table 1: Total ash obtained in three batches**

	Batch 1	Batch 2	Batch 3
Raw material fresh	90 kg	90 kg	90 kg
After drying	50 kg	52 kg	48 kg
Loss on drying	4.5 %	4.3 %	4.5 %
Ash obtained	6.75 kg	6.78 kg	6.65 kg
% ash obtained	13.5 % (of dried plant)	13 % (of dried plant)	13.8 % (of dried plant)

This total ash obtained in three batches was then divided in 2 parts.

**Table 2: Yava kshara prepared by (general method)**

	Batch 1	Batch 2	Batch 3
Ash	3 kg	3 kg	3 kg
Water	4 times (12 l)	4 times (12 l)	4 times (12 l)
Dissolution time	3 h	3 h 5 min.	3 h
Filtration time	2 h	2 h 10 min	2 h 6 min
Filtrate obtained	7.25 lt	7.20 lt	7.14 lt
Heating time	7 h 30min	7 h 25 min	7 h 18 min
Kshara obtained	257 g	259 g	250 g
Mud residue (m)	5.3 kg (wet)	5 kg (wet)	5.9 kg (wet)
Water for dissolution (m)	2.5 l	2.5 l	2.5 l
Filtrate (m)	1.3l	1.2 l	1.4 l
Kshara obtained (m)	36 g	33 g	35.5 g
Kshara obtained (net)	293 g	292 g	285.5 g

Note- (m) stands for mud residue

**Table 3: Yava kshara prepared by (specific method)**

	Batch 1	Batch 2	Batch 3
Ash	3 kg	3 kg	3 kg
Water	8 times	8 times	48 times
Dissolution time	2 h	2 h 5 min.	2 h
Filtration time	40 h	41 h 10 min	39 h 6 min
Filtrate obtained	17.25 l	17.20 l	17.14 l
Heating time	15 h for 3 days	14.5 h for 3 days	15 h 18 min for 3 days
Kshara obtained	322 g	324 g	319 g
Mud residue(m)	5.2 kg (wet)	5 kg (wet)	5.9 kg (wet)
Water for dissolution (m)	2. l	2 l	2 l
Filtrate (m)	1l	1.2 l	1.4 l
Kshara obtained (m)	15 g	14.3 g	15.5 g
Kshara obtained (net)	337 g	383.3 g	334.5 g

### Analysis

The final product was analyzed on various parameters such as total ash, water soluble and acid insoluble ash, loss on drying etc. as per Pharmacopoeial standards.

**Table 4: Comparative Physico-Chemical Test Results of Kshara Samples (values of radicals in ppm)**

Parameters	Method of testing	Y	Ym
Color	Organoleptic test	Light cream	Dirty Grey
Odor		Unpleasant	Unpleasant
Taste		Acridly Sweet and cooling	Acrid Bitter
Appearance		Coarse Powder	Small Cake
pH	pH meter	10.5	10.2
Total ash	Laboratory method	96.75	97.5
Water soluble ash		91	92
Acid insoluble ash		3	3.5
Loss on drying		4.5	4
Total alkalinity/ CO <sub>3</sub> -HCO <sub>3</sub>	Titration	54000	400000
Chloride	Titration	78597	43655
Sulphate	UV method	3813.3	4176.3
Nitrate	UV method	871.80	732.4
Sodium	Flame photometry	190	430
Potassium	Flame photometry	24000	18240
Calcium	AAS	1100	2356
Iron	AAS	268	124
Magnesium	AAS	173	188

Rasa	Katu, Teekshna- Madhur, Sheetal
Guna	Laghu, Snigdha, Teekshna
Veerya	Ushna
Vipaka	Katu

## DISCUSSION

Kshara kalpana is one of the commonly used but less explored kalpana. Yava Kshara constitute number of Ayurvedic preparations but still remained less studied, so to throw adequate light on the practical aspects of Kshara preparation with special emphasis on Yava Kshara this study has been conducted. Method mentioned in Rastarangini was adopted for Kshara preparation and it was evident that Kshara preparation is not a simple process, number of fact as should be taken care of from the first step till last one as;

- The raw material should be collected from the region of their adequacy.
- It should be properly dried to ensure effective burning.
- Manually dried material did not give 100 % ash so it will be better if it is burnt in electric furnace as controlled fire in controlled condition so as to ensures maximum yield of Kshara.
- Kshara should be prepared in Sharadritu (September - October) as one prepared in rainy season absorb moisture easily and thus reduce potential.
- Clean utensils of inert material such as earthen or iron should be used as contamination may alter the real chemical nature of Kshara

On comparing both of these methods we can say that the specific method of preparation is better both in terms of

quality and quantity as Kshara obtained is more in quantity as well as less acidic. There are different references for filtration of Kshara as Acharya Sushruta<sup>6</sup> said it should be 21; and some quoted seven times. This variation in amount of water and number of filtration is merely an attempt to extract as much as Kshara as possible from the plant ash. From the work conducted it becomes clear that more the filtration more the Kshara, however number of filtration affects yield of Kshara only when filtration is repeated over the same ash residue, this permits more extraction of Kshara from plant to permeate with the repeated filtrate. As on processing the mud some Kshara is obtained so if we discard it will cause loss of considerable amount of Kshara. The plants are rich source of inorganic molecules and when they are burnt these likely to be incorporated with the ash, when ash is dissolved in water the plant minerals which are soluble in water permeate through filtration. Generally they are in soluble form with the predominance of bicarbonate. Some minerals as that of calcium which are insoluble or less soluble are discarded with mud. With heating as per part of evaporating filtrate these salts are converted into solid form but still they retain their hygroscopic nature, thus in Kshara water soluble alkali salts are likely to be added. This seems to be the logic behind Kshara preparation involving dissolution in water then filtering instead of directly using the plant ash and as calcium is almost

removed from Kshara due to repeat filtration these are used for Ashmari or Renal stone.

## CONCLUSION

Thus it can be concluded that quality and quantity of Kshara depends on number of filtration as it increases yield and improves its properties.

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