

PHARMACEUTICAL PREPARATION OF *MULAKA KSHARA* AND ITS PRELIMINARY  
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**ABSTRACT**

Standardization of herbal drugs is essential to certify their quality and purity. Herbal remedies are having a vital role in health care system. As the habitual usage of herbal drugs has increased worldwide, issues regarding their quality, safety and efficacy have been also raised up. The purpose of standardization of medicinal plants is to ensure the therapeutic efficacy. *Mulaka Kshara* is a caustic alkaline preparation of the drug *Mulaka* (*Raphenus Sativus* Linn). *Mulaka Kshara* has been explained in *Sushrut Samhita Uttara Tantra*<sup>[1]</sup> in the context of “*Gulma Pratishedh Adhyay* which is a powdered preparation of drug *Mulaka*. *Mulaka Kshara* is indicated in diseases like *Mutrakrucha*, *Mutrashmari*, *Gulma*<sup>[2]</sup> etc. This alkaline preparation has many therapeutic usages and even has replaced many surgical procedures and proved to be effective in treating many disorders. So the present study is planned to prepare *Mulaka Kshara* and develop its preliminary Physico-chemical profile. For the preparation of 1.242 kg *Kshara*; 200 kg raw *Mulaka* was required. This data will help the Ayurvedic fraternity regarding preparation of *Mulaka Kshara* in future.

**KEYWORDS:** *Mulaka Kshara*, Herbal Preparation, *Kshara*, pH value, Standardisation.**INTRODUCTION**

In present era herbal medicines are widely used in health care. The use of herbal medicines has been increased remarkably worldwide. Ayurveda utilises different forms of herbs in therapeutics. *Kshara* is one among such forms. *Kshara* is the herbal extracts of plants. *Kshara* can be a compound or mixture of many herbs or may be from a single herb. *Ksharas* are alkaline substances obtained from the water soluble ashes of herbal drugs.<sup>[3]</sup> Several *ksharas* have explained in Ayurveda for different therapeutic uses. *Mulaka Kshara* is one of them. The world health organisation has appreciated the importance of herbal plants for public health care. So it is needed to develop and revalidate the Ayurvedic formulations using modern and ancient parameters. In present study, we prepared *Mulaka Kshara* by following classical reference of *Sushruta Samhita, Ksharapakavidhi Adhyay*.<sup>[4]</sup> For the preliminary physico-chemical profile loss on drying, pH value, ash value, water soluble ash and acid insoluble ash were measured.

**MATERIALS AND METHODS****Drug review*****Mulaka* (*Raphenus sativus* Linn.)**

*Mulaka* (*Raphenus sativus* Linn) belongs to the Cruciferae family is a fresh whole plant an annual herb, cultivated throughout India. As per *Ayurvedic* classics *Mulaka Kanda* (tuberous root) is having much significant importance being extensively used for its varied benefits. Almost all *Acharyas* of *Ayurveda* have referred this drug for its multiple benefits in therapeutics.

**Properties and actions of *Mulaka***<sup>[5]</sup>

**Rasa** : *Katu, Tikta*  
**Guna** : *Laghu, Tikshna*  
**Virya** : *Ushna*  
**Vipaka** : *Katu*  
**Doshakarma** : *Tridoshkhara*  
**Karma** : *Deepana, Pachana, Hradya, Svarya, Ashmaribhedana, Mutrala*<sup>[6]</sup>

## PROCEDURE FOR PREPARATION OF MULAKA KSHARA

### Collection of *Mulaka*

Fresh *Bal Mulaka* 200kg (*Raphenus sativus* Linn.) was collected from the local market of Vadodara in the month of February 2017.

It has been prepared by following classical methods. Whole process is divided into three phases.

### 1. Preparation of ash

Total 200 Kg. of fresh *Bal Mulaka* was collected and was cut into small slices. Then it was subjected to dry in sunlight for 7 days till all water content got evaporated. Then it was burnt completely in open place. After self cooling ash was collected.

### 2. Preparation of *Ksharajala*

The ash was collected in a steel vessel and 6 times water was added to it. The contents were mashed thoroughly with hands and left for settling down overnight. The next morning the clear liquid part decanted and filtered for 21 times through cotton clothes.

### 3. Preparation of *Kshara*

Later the water content is subjected to heat on *Mandagni* around 8 hours till all water gets evaporated to obtain flakes of *Kshara* from bottom of vessel and grind to get fine powder form. *Kshara* was stored in air tight container away from sunlight and rain.

**Table 1: Observations and results obtained during preparation of *Mulaka Kshara*.**

Observations	Result
Weight of fresh <i>Mulaka</i>	200 kilogram
Weight of dried <i>Mulaka</i>	8.216 kilogram
Weight loss of <i>Mulaka</i> after drying	191.78 kilogram
Percentage of loss after drying	95.89 %
Weight of ash obtained	2.403 kilogram
Percentage of ash obtained from dried <i>Mulaka</i>	29.24%
Percentage of ash obtained from fresh <i>Mulaka</i>	1.20%

**Table 2: Results of *Mulaka Kshara*.**

Weight of Ash	2.403 kilogram
Ratio of Water	14.418 Litres
<i>Ksharajala</i> Obtained	11.400 Litres
Percentage of <i>Ksharajala</i>	79.06%
Weight of <i>Kshara</i> obtained from <i>Ksharajala</i>	1.242 kilogram
Percentage of <i>Kshara</i> obtained	10.90%

### Analytical Study

The *Kshara* was identified and authenticated by the experts. Analytical study was carried out in the pharmaceutical Chemistry Laboratory of Parul institute of Ayurved, Vadodara.

### Organoleptic characters

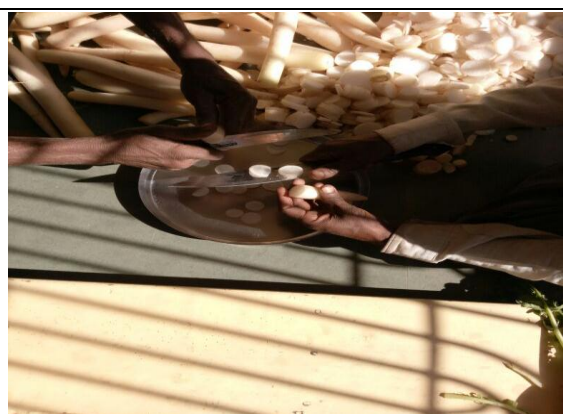
1. Odour – Characteristic
2. Taste - Salty, irritant
3. Colour - White
4. Touch – Smooth and fine

**Table 3: Physico-chemical parameters of *Mulaka Kshara*.**

Sr.no.	Name of the test	Value
1	Loss on drying	0.059 %
2	pH value	11
3	ash value	96 %
4	Water soluble ash	8.5 %
5	Acid insoluble ash	2.5 %



**Fig 1: Freshly collected *Mulaka*.**



**Fig 2: *Mulaka* being chopped into slices.**



**Fig 3: Kept for drying under sunlight for 7 days.**



**Fig 4: Mulaka slices after drying.**



**Fig 5: Subjected for burn to ash.**



**Fig. 6: Ash mixed with 6 times of water.**



**Fig 7: Content mashed with hands.**



**Fig 8: Filtration of Ksharajala.**



**Fig 9: Ksharajala.**



**Fig 10: heating on mandagni.**

Fig. 11: Last stage of *kshara* preparation.Fig. 12: Prepared *Kshara*.Fig. 13: Prepared *Kshara*.

Fig. 14: Collected and packed in plastic bag.

## DISCUSSION

In the present study, preparation and analysis of physico-chemical parameters of *Mulaka Kshara* has been carried out. *Mulaka Kanda* should be made into small slices for better drying. After all water content got evaporated, *Mulaka* should be burnt into open place to obtain ash. 6 times water should be added. Stainless steel vessel should be used to avoid possible chemical reactions. Ash should be rubbed well in water for proper mixing and allowed to settle down for overnight. *Ksharajala* should be obtained very cautiously through the rubber pipe without disturbing the vessel. Precautions should be taken to avoid the entry of sediments. A clean cotton cloth should be used for filtering. The *Ksharajala* should have the *Gomutra Varna* (yellowish coloured clear liquid). *Ksharajala* should be kept on *Mandagni* to obtain *Kshara*. Vapors and crackling sounds were increased with temperature. Colour was changed from yellowish to whitish gradually as the temperature raised. *Kshara* was started sticking on the bottom of the vessel in last stage and bumping was observed. It was stirred carefully to prevent bumping and sticking. Finally white coloured *Kshara* was obtained. Organoleptic characters of *Mulaka Kshara* like fine and smooth touch, white colour, salty taste and characteristic odour. Material absorbs moisture during the storage and moisture will lead to the activation of enzymes and give suitable condition to the

proliferation of living organism. Hence moisture content can harm the quality of the drug. So *Kshara* must be preserved in closed container as it is hygroscopic in nature. Although the weight loss in the sample is due to water, small amount of other volatile materials will also contribute to the weight loss. The pH value of a given sample expresses the degree of acidity or alkalinity of a sample solution.

## CONCLUSION

*Kshara* Preparation is a very tough pharmaceutical procedure consist many steps. In present study, 10.90 % *Mulaka Kshara* was obtained from 11.400 liters *Ksharajala* which was prepared from 2.403 kg of ash. Prepared *Kshara* having ph of 11 and other analytical parameters proves its authenticity. This work will be beneficial for further clinical studies and will be helpful in future.

## REFERENCES

1. Sushrut Samhita, Uttara Tantra 42<sup>nd</sup> chapter Ayurved Tatva Sandipika Hindi commentary by Kaviraj Ambikadatt Shastri, published by Chaukambha Sanskrit Sansthan, Varanasi, Edition, 2013 341.
2. Waddar S, Gopi KBJ, Rao PN, Kumar H, Raj AGR, A case discussion on the efficacy of *Mulaka Kshara* in the management of *Mutrashmari* (urolithiasis).

- In ternational journal of Herbal Medicine, 2014; 1(6): 18-21.
3. Hasmukh Jadav, Galib R, Prajapati PK. Pharmaceutical Standardization of Apamarga Kshara. J Ayurveda integr Med, 2015; 6: 290-4.
  4. Sushrut Samhita, Sutra Sthana 11<sup>th</sup> chapter Ayurved Tatva Sandipika Hindi commentary by Kaviraj Ambikadatt Shastri, published by Chaukambha Sanskrit Sansthan, Varanasi, Edition, 2013; verse-15: 48.
  5. Ashtanga hradaya, Sutra Sthana, Annaswarup Vigyaniya Adhyay ,Nirmala Hindi Commentry by Dr. Bhramanand Tripathi, Chaukambha Sanskrit Sansthan first edition, 2014; verse 102; 108.
  6. Acharya YT, Charak Samhita of Agnivesha revised by Charak and Dridhbala with Ayurveda Deepika commentary of Chakrapanidatta. Reprint edition Varanasi: Chaukambha Sanskrit Sansthan, 2006; 645-8.