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# A detail review of types of *Kshara* with special emphasis on *Rasashastra*

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## ABSTRACT

*Kshara* (Alkali) has been in existence from ancient times. Their importance lies in the fact that they can be comfortably utilized to replace certain surgical procedures. Its properties are compared with that of *Agni* (fire) and yet it has its own special features too. Like although it is *Ushna* (hot) it is *Sheeta* (cool) in touch, although it has cutting and corroding property it can be utilized to be consumed orally as a medicine. And this is what makes it special. It is derived from plant, animal as well mineral sources. Its potency can be changed by combining various *Kshara* as per the need and requirement of the patient. Many *Kshara*'s have been described in our texts. This article aims at compiling those *Kshara* and elaborating their properties. There are also few *Kshara* which have not been classified as *Kshara* but which possess all the properties of *Kshara*, such *Dravya* have also been described in the current article. It is a review of *Kshara* and their properties as described in various Ayurvedic texts with special emphasis on *Rasashastra* (Iatrochemistry of Ayurveda) texts.

**Key words:** *Kshara*, Alkali.

## INTRODUCTION

*Kshara* has been known to the World nearly from the period of 500 years before Christ.<sup>[1]</sup> Although nothing has been mentioned in Vedic literature, the name of *Kshara* reflects in the *Upanishads* for the first time. *Samhita* period has described *Kshara* elaborately. *Charaka* has defined *Kshara* and even given varieties, properties and various applications of them.<sup>[2]</sup> *Sushruta* has dedicated a separate chapter in *Sutrasthana* on *Kshara*.<sup>[3]</sup> *Vagbhata* too has described *Kshara* in both *Ashtanga Sangraha*<sup>[4]</sup> and *Ashtanga*

*Hruday. Harita Sanhita, Sharangdhar Samhita*,<sup>[5]</sup> *Yogranthnaka*<sup>[6]</sup> have all mentioned *Kshara*. *Rasarnava Grantha*<sup>[7]</sup> which is of 10<sup>th</sup> AD and *Rasaratna Samucchay*<sup>[8]</sup> of 13<sup>th</sup> century which are chief texts of *Rasashastra* too have described *Kshara*. Nearly all the *Rasashastra* texts and the modern texts have mentioned *Kshara* in some or the other way. *Kshara* is used both internally and externally. It is said to be used especially in cases wherein surgery can be avoided by using *Kshara*. And so it is very important to understand and study this *Kshara*.

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### What is *Kshara* (Alkali)?

Any *Dravya* (material) that can scrape (*Ksharana*) or corrode or cut (*Kshanan*) through is known as *Kshara*.<sup>[9]</sup> Material which destroys the excessive *Doshas* (*Vaat, Pitta, Kapha*) is known as *Kshara*.<sup>[7]</sup> If in any compound there is a molecule of 'OH' then we can name that *Dravya* as *Kshara Dravya*.<sup>[10]</sup>

*Bhavaprakasha* has described *Kshara* as something which is similar to *Agni* and one which can eradicate *Gulma* (Chlorosis) and *Shoola* (Pain).<sup>[11]</sup>

Charaka has said that although Kshara appears to be a Rasa (taste) it is a Dravya (matter) as it can be felt by all the 5 senses and it is made up of many Rasas (taste) in which Katu (spicy) and Lavana (saline) Rasa are prominent.<sup>[12]</sup>

Alkali is defined as a salt that is extracted from the ashes of sea plants or ashes of plants from the land and which is soluble in water.<sup>[13]</sup> They are also known as fixed alkali i.e. Sajjikshara and Yavakshara. The famous Kshara Dwaya (Pair of alkalie) described in Rasashastra.

Alkali is a soluble salt consisting largely of potassium or sodium carbonate. The property of Alkali is exactly opposite to Acid. The term base and alkali are often used interchangeably. An alkali can also be defined as a base that is soluble in water and its solution has pH more than 7.

Kshara is a acrid substance, one which irritates the surface of the skin. It is a caustic material, obtained from the ashes after distillation. They are mostly alkaline in nature.

### Kshara Varga (Groups of Kshara)

1. Kshara Dwaya (2 alkalies) : Yavakshara and Sajjikshara<sup>[14]</sup>
2. Kshara Traya (3 alkalies) : Yavakshara, Sajjikshara and Tankan<sup>[14]</sup>
3. Kshara Panchaka (5 alkalies):
  - a) Yavakshara, Sajjikshara, Mushka Kshara, Palash Kshara and Tila Kshara.<sup>[14],[6]</sup>
  - b) Yavakshara, Sajjikshara, Palash Kshara, Tila Kshara, Apamarga Kshara.<sup>[15]</sup>
4. Kshara Sashtaka (6 alkalies):
  - a) Tila Kshara, Palasha Kshara, Vacha Kshara, Apamarga Kshara, Kutaja Kshara, Mushka Kshara<sup>[15]</sup>
  - b) Tila Kshara, Apamarga Kshara, Kutaja Kshara, Mushka Kshara, Dhava Kshara, Langli Kshara.<sup>[16]</sup>
5. Kshara Saptaka (7 alkalies):

a) Yavakshara, Sajjikshara, Tila Kshara, Palashkshara, Apamarga Kshara, Shigru Kshara, Mushka Kshara.<sup>[15]</sup>

b) Yavakshara, Sajjikshara, Palash Kshara, Apamarga Kshara, Tagar Kshara, Suvarchika Kshara, Gaurya Kshara.<sup>[17]</sup>

#### 6. Kshara Ashtaka (8 alkalies):

a) Yavakshara, Sajjikshara, Palash Kshara, Apamarga Kshara, Chinchha Kshara, Arka Kshara, Tila Nala Kshara.<sup>[14]</sup>

b) Yavakshara, Sajjikshara, Palash Kshara, Apamarga Kshara, Arka Kshara, Tila Kshara, Mushka Kshara, Tankana.<sup>[18]</sup>

#### 7. Kshara Dashaka (10 alkalies):

Shigru Kshara, Moolaka Kshara, Palasha Kshara, Chukrika Kshara, Chitraka Kshara, Adraka Kshara, Nimba Kshara, Ikshu Kshara, Apamarga Kshara, Mochaka Kshara.<sup>[16]</sup>

### Properties of Kshara

Table 1: Kshara properties

Charak <sup>[19]</sup>	Sushrut <sup>[20]</sup>	Vagbhat <sup>[21]</sup>	Rasataran gini <sup>[22]</sup>
Tikshna (sharp)	Na ati tikshna (not too sharp)	Na ati tikshna (not too sharp)	Tikshna (sharp)
Ushna (hot)	Na ati mrudu (not too mild)	Na ati mrudu (not too mild)	Maha Ushna (very hot)
Laghu (light in digestion)	Shwet (white)	Shukla (white)	Dahak (burns)
Ruksha (dry))	Shlakshna (tender/ Smooth)	Shikhri (can form peaks like salt)	Pachak (digestant)
Kledi (moistening)	Picchil (slimy)	Picchil (slimy)	Mutral (diuretic)
Pakta (ripens the wound)	Avishyandi (doesn't)	Avishyandi (oozing)	Kruminash ak

	produce moistness)		(antihelminthic)
Vidarak (lacerating/tearing)	Shiva (mild)	Shiva (mild)	Vran Shodhak (cleansing of wounds) and Ropak (healing of wounds)
Dahak (burns)	Shighraprabhavkari (quick action)	Shighraprabhavkari (quick action)	
Deepaniya (promoting digestion)		Sukhanirvapyo (which melts easily)	
Chedaniya (cuts through)		Alparugna (less painful)	

### Kshara Dosh

Table 2: Kshara Dosh

Sushrut <sup>[20]</sup>	Vagbhat <sup>[23]</sup>
Atimrudu (Very soft)	Atimrudu (Very soft)
Atiushna (Very hot)	Atiushna (Very hot)
Ati tikshna (Highly penetrating)	Ati tikshna (Highly penetrating)
Atipichhil (Very slimy)	Atipichhil (Very slimy)
Atishwet (Not too white)	Ati Sheet (Very cold)
Prasaranshil (that spreads easily)	Visarpi (that spreads easily)
Sandra (thick)	Atighana (Very thick)
Apakva (Not prepared properly)	Hinapaak (not prepared properly)
	Hina Aushadha (Low quality)

	drug)
	Ati Tanu (Very thin)

**Shelf life of Kshara:** 5 years as per the Gazette of India 2009 and 2016.

**Dose of Kshara:** 2 to 8 Gunja<sup>[22]</sup>

### Types of Kshara<sup>[24]</sup>

Kshara are classified on the basis of many categories. They are as follows:

#### I. On the basis of their origin : 3

- Vanaspatija Kshara* (Kshara of plant origin) - Eg. Arka (*calotropis gigantia*), Apamarga (*achyranthes aspera*), Snuhi (*euphorbia neriifolia*) etc.
- Pranij Kshara* (Kshara of animal Origin) - Eg. Shankha (conch shell), Shukti (pearl oyster), Kapardik (cowries), Navsagar (Ammonium chloride)

Although there is no direct reference of Shankha, Shukti, Kapardik as Kshara, but since they play a role in preparation of types of Pratisarniya Kshara they have been gradually included as Pranija Kshara.

- Khanija Kshara* (Kshara of mineral origin) - Eg. Suryakshara (Potassium nitrate), Tankana (borax).

#### II. According to their availability: 2

- Natural Kshara - Eg. Tankan (borax), Shankha (conch shell)
- Artificially prepared Kshara - Eg. Navsagar (ammonium chloride), Tankan (borax).

It is said that the Kshara which is brought from the market or the one which is artificially prepared should be always purified and used. Dissolve it in sufficient quantity of water. Allow it to remain still for 12 hours. Separate the top layer clear liquid and allow it to dry in a large bottom vessel. Cover it with a fine cloth. After few days Kshara powder is acquired.

#### III. According to their appearance/consistency: 3

- Shushka (Dry) - Eg. Navsagar (ammonium chloride)

- B. *Aardra* (Wet) - Eg. *Navsagar* paste or any *Kshara* paste
- C. *Drava* (Liquid) - Eg. *Ksharodak* (water mixed with *Kshara*), *Churnodak* (lime water)

#### IV. According to its mode of application: 2

- A. *Paniya Kshara* / *Anta Parimarjan* (*Kshara* for internal use)
- B. *Pratisarniya Kshara* / *Bahi Parimarjan* (*Kshara* for external use)

#### V. According to its potency: 3

These are types of *Pratisarniya Kshara*

- A. *Mrudu Kshara*
- B. *Madhyam Kshara*
- C. *Tikshna Kshara*

Dr. Vaman Desai in his book *Bhartiya Rasashastra* has described following types of *Kshara*.<sup>[25]</sup>

#### I. A. *Sthayik Kshara* and B. *Chanchal Kshara*

A. *Sthayika Kshara* (Fixed Alkali): These *Kshara* when heated do not break and dissociate. He said *Yavakshar* and *Sajjikshar* are fixed alkali.

B. *Chanchal Kshara* (Volatile Alkali): These *Kshara* when heated immediately break and dissociate. Ammonium Carbonate is a volatile alkali since it does not remain still in one place.

#### II. A. Alkali and B. Caustic Alkali

A. Alkali: The *Kshara* that are *Mrudu* or soft in their property they are Alkali.

B. Caustic alkali: When alkali is mixed with lime and *Kshara* acquired using *Agni* then caustic alkali is formed which is strong as compared to alkali.

#### III. A. *Parthiv Kshara* and B. *Audbhid Kshara*

Both these *Kshara* are *Vanaspatij Kshara*. The difference between both these *Kshara* is given in the table below.

**Table 3: Difference between *Parthiv* and *Audbhid Kshara***

<i>Parthiv Kshara</i>	<i>Audbhid Kshara</i>
Acquired from ashes of plants grown in salt rich region.	Acquired from ashes of plants grown on land.
Also known as <i>Swarjika</i>	Known as <i>Kshara</i> (Common alkali)
If this <i>Kshara</i> is held against flame it turns blue and yellow.	If this <i>Kshara</i> is held against flame it turns violet.

#### IV. A. *Vruksha Kshara* B. *Bhumikshar*

A. *Vruksha Kshara* (Vegetable alkali): *Kshara* derived from ash of plants ie. carbonate of Potash.

Eg. *Apamarga Kshara*, *Snuhi Kshara*.

B. *Bhumi Kshara* (Mineral alkali): *Kshara* acquired from minerals.

Eg. *Tankan* (Borax), *Sudha* (Lime), *Navsagar* (Ammonium chloride)

**Table 4: Indications and contraindications of *Paniya Kshara***<sup>[26]</sup>

Indications	Contraindications
<b>Gastro Intestinal</b> conditions like <i>Gulma</i> (Chlorosis), <i>Udara</i> (Ascitis), <i>Agnisanga</i> (lack of digestion), <i>Arochak</i> (tastelessness), <i>Ajirna</i> (indigestion), <i>Anaha</i> (guarding of abdominal wall), <i>Arsha</i> (piles)	<i>Jwara</i> (fever), <i>Raktpitta</i> (spontaneous haemorrhage from external orifices), <i>Pittaprakruti</i> (person with <i>Pitta</i> constitution).
<b>Urinary Tract</b> condition like <i>Sharkara</i> (small stones), <i>Ashmari</i> (renal stones).	<i>Ati Durbala</i> (very weak), <i>Balaka</i> (children), <i>Vrudhha</i> (Old people).
<b>Other</b> conditions like <i>Abhyantar Vidradi</i> (internal abscess), <i>Krumi</i> (worms), <i>Visha</i> (poison), <i>Gara Visha</i> (slow poison).	<i>Brahma</i> (dizziness), <i>Mada</i> (jaggedness), <i>Murcha</i> (fainting), <i>Timir Roga</i> (darkness of the eyes).



**Effects of excessive use of Paniya Kshara**

*Paniya Kshara* when used in large excessive quantity or for a longer duration it can lead to Baldness, Greying of hair, Impotency, Blindness and Cutting like pain in the heart.<sup>[2]</sup>

It can also lead to **oligospermia** or **azospermia**

**Table 5: Indications and Contraindications of Pratisarniya Kshara<sup>[26]</sup>**

Indications	Contraindications
Skin diseases like <i>Kushta</i> (leprosy), <i>Kitibha</i> (psoriasis), <i>Dadru</i> (fungal infection), <i>Mandala</i> , <i>Kilas</i> , <i>Dushtavrana</i> (sinus), <i>Teelkalaka</i> (moles), <i>Nyaccha</i> (mole), <i>Charmakeel</i> (wart), <i>Vyanga</i> ( <i>Melasma</i> ), <i>Mashaka</i> .	<i>Atidurbala</i> (very weak), <i>Balaka</i> (children), <i>Ativruddha</i> (Very old people), <i>Bhiru</i> (fearful people), <i>Sarvanga Shotha</i> (Whole body swelling), <i>Udara</i> (Ascitis), <i>Raktapitta</i> (spontaneous haemorrhage from external orifices).
Ano rectal diseases like <i>Arsha</i> (piles), <i>Bhaganda</i> (fistula), <i>Nadi</i> (aneurysm), <i>Arbuda</i> (tumour)	Pregnant women, Menstruating women, Females having vaginal prolapse.  Infertile males
<b>Oral diseases</b> like <i>Upajivha</i> , <i>Adhijivha</i> (swelling of tongue or epiglottis), <i>Upakusha</i> (gum boil), <i>Dantavaidarbha</i> (looseness of the teeth), 3 types of <i>Rohini</i> .	High grade fever, <i>Trushna</i> (excessive thirst), <i>Murcha</i> (fainting).
Other conditions like <i>Krumi</i> (worms) and <i>Visha</i> (poison)	Diseases like <i>Atisara</i> (diarrhoea), <i>Shiroroga</i> (diseases of head), <i>Panduroga</i> (anaemia), <i>Prameha</i> (diabetes), <i>Urakshat</i> (chest injured)
	Post <i>Vamana</i> (induced Emesis), <i>Virechan</i> (induced diarrhoea).

**Preparation of Vanaspatija Kshara**

*Kshara* from the plants is prepared from the ashes of the plants. These ashes are known as carbonate of Potash. Also known as wood ash. Since these *Kshara* are prepared in a broad vessel it is also known as **Bhand Kshara**.<sup>[27]</sup>

**Table 6.1: Preparation of Kshara: Various methods**

Sushrut Samhita <sup>[26]</sup>	Ashtang Sangraha <sup>[28]</sup>	Rasatarangini <sup>[29]</sup>
Burn the dried plant into ash	Burn the dried plants of various plants into ash separately. Add lime in <i>Mokha</i> during burning and afterwards remove it	Burn the dried plant into ash
Add 6 times water to the ash	Take each ash in equal quantity 1 part. Add 4 parts water and 4 parts cow urine to it	Add 4 times water to the ash
Mix it well	Mix it well and strain through a thick cloth	Mix well and soak for 3 hours
Strain it through a cloth for 21 times	Heat it in a big vessel	Strain through 3 layered cloth
In a broad vessel, heat the liquid	Add heated lime stone, <i>Shankha</i> and <i>Shukti</i> to the above liquid and then remove it.	Heat the clear liquid till white <i>Kshara</i> is obtained
When the liquid becomes reddish, sharp and sticky strain it through a cloth	Heat till white <i>Kshara</i> is obtained	
Heat the strained mixture till white <i>Kshara</i> is obtained		

Table 6.2: Preparation of Kshara: Various methods

Ayurved Prakash <sup>[30]</sup>	Ayurvedsaar Sangraha <sup>[31]</sup>	Rasahrudayantra <sup>[32]</sup>
Burn the dried plant into ash	Burn the dried plant into ash	Burn the dried plant into ash
Add 4 times water	Add 8 times water to the ash	Add 8 times water to the ash
Soak overnight	Mix it well. Soak it for 3 days	Soak overnight
Strain top clear liquid with thick cloth	Strain the top clear liquid with 4 layered cloth 7 times	Strain through a cloth
Heat till dry Kshara is obtained	Heat the liquid	Heat the liquid
	When the mixture becomes thick then dry it in a broad vessel	When the mixture becomes thick then dry it in sun.
	Dry it until white coloured, granular Kshara is obtained	

The above method is preparation of *Mrudu Kshara* according to *Sushrut* and *Vagbhat*. They have further described preparation of *Madhyam* and *Tikshna Kshara* as follows.

#### **Madhyam Kshara preparation<sup>[26,28]</sup>**

Add red hot lime, *Shankha Nabhi* (conch shell) and *Shukthi* (pearl oyster) in *Mrudu Ksharodaka* and heat it. Make a paste if required and heat it till *Madhyam Kshara* is obtained. Which becomes grey powder like.

#### **Tikshna Kshara preparation<sup>[26,28]</sup>**

Add *Danti* (*baliospernum montanum*), *Chitrak* (*plumbago zeylanica*), *Langli* (*gloriosa superb*), *Beedlavan* (*Aluminium chloride*), *Hinga* (*asafetida*), *Vekhand* (*acorus calamus*), *Ativisha* (*aconitum heterophyllum*), *Swarnashiri* (*argemone mexicana*), *Putikaranj* (*Caesalpinia crista*), *Sajjikshar* (sodium

carbonate) powder to *Madhyam Ksharodak* and mix them together.

#### **Preparation of Khanij and Dhatviya Kshara**

There is no standard method for *Kshara* preparation from minerals. It is chiefly done by extraction method but this extraction method is unique for each *Kshara*.

Eg. *Navsagar* (Ammonium Chloride), *Sudha* (Lime) and *Tankan* (Borax)

#### **Preparation of Praniya Kshara**

These are prepared by *Bhasma* method i.e. Heating in *Sharava Samputa* until proper *Bhasma* is prepared.

Eg. *Shankha* (conchs shell), *Shukti* (pearl oyster).

#### **Various Vanaspatija Kshara (Vegetable Alkali)**

##### **Yavakshar (Potash Bicarb)<sup>[33],[34]</sup>**

Source: Prepared by burning *Yava Panchanga* (Barley whole plant).

Preparation: As the *Vanaspatij Kshara* are prepared.

Properties: Light, Hot, oily, stimulates *Agni*, digestive, laxative and diuretic.

Dose: 3 to 10 *Gunja* (2 to 4 grams)

Action: Eradicates Chlorosis and Sleen diseases. Melts *Kapha*, Useful in abdominal pain, obstruction of *Vata*, Poisoning, Painful micturition, Renal stones, throat diseases, Anaemia, dysentery, cough and hyperacidity.

Can be used both internally and externally.

Colour: Little white, reddish coloured *Kshara*<sup>[34]</sup>

Taste: Saline and Bitter, Not completely soluble in water

Touch: Dry, granular, On dissolving in water becomes oily and sticky.

Sound: On putting it on flame make "Chat Chat" sound.

Smell: Smells like *Kshara*. Spicy and sharp smell.

*Yavakshara* is combination of Potassium salts i.e. Potassium chloride 50.8%, Potassium sulphate 20.2%, Potassium bicarbonate 12.6%, Potassium bicarbonate 6.8% and traces of other salts.<sup>[35]</sup>

It can be consumed with warm or cold water.

#### **Sajjikshar (sodium carbonate) a vegetable Alkali<sup>[36]</sup>**

Source: Prepared from the ashes of *Ushtrapriya* plant/*Duralabha* (*Fagonia cretica*/Virgin's mantel). This plant grows in a soil which is rich in sodium.

Properties: *Ushna*, *Tikshna*, *Pachan*, *Shudhavardhak*, *Kruminashak*, *Dahan*, *Deepan*, *Chedan*.<sup>[37]</sup>

Taste: Bitter

Action: Eradicates Asthama, Cough. Used in Chlorosis, bloating of abdomen and ascites. Externally used in wound cleaning and healing.

Dose: 3 to 12 *Gunja* (375mg to 1.5gm)

#### **Sajjikshar (sodium carbonate) a Mineral Alkali<sup>[38]</sup>**

According to Vishwanath Dwivedi and some others *Sajjikshar* is a Mineral Alkali i.e. baking soda or Sodium carbonate. It is acquired from *Kshariya* water or land, from the shores of salt water lake or sea hence known as *Bhauma Kshara*. It was used by washermen (*Rajak/Dhobi*) hence known as *Rajak Kshara* also.

Its latin name is *Salsola*.

Colour: White, Granular and quadrangular

Taste: Bitter, Spicy, burning and alkaline.

Touch: Granular, cold, when kept on the tongue causes tingling sensation.

Melts on high temperature, On heating gives out yellow flame

Action: It has stimulant, analgesic and diuretic property. Eradicates liver and spleen diseases. Used in bloating of abdomen and *Udavart*(reverse movement of *vaat* dosha).

#### **Table 7: Difference between *Yavakshar* and *Sajjikshar***

SN	<i>Yava Kshara</i>	<i>Sajjikshar</i>
1.	Whenever <i>Kshara</i> is mentioned, we should consider <i>Yavakshar</i> . Mainly used as a medicine	Generally not used as a medicine

2.	High quality	Low quality
3.	Mirror and soaps prepared from these <i>Kshara</i> are soft	Mirror and soaps prepared from these <i>Kshara</i> are hard
4.	<i>Kshara</i> is formed in a granular form	<i>Kshara</i> is not formed in granular form
5.	Not totally soluble in water	Totally soluble in water
6.	Potash	Soda

#### **Soda and Potash<sup>[27]</sup>**

Soda mineral is present in plants found near sea in the form of sulphate, iodine and chloride. It is present in animals especially in *Rasadhatu*. The way Potash is useful to living being soda is not.

#### ***Apamarga (Achyranthes aspera) Kshara<sup>[39]</sup>***

Also known as *Kinikshar*, *Mayurkshar*, *Kharmanjirikshar*.

Properties: Sharp, its *Siddha* oil is used in ear ache, Eradicates asthama, chlorosis, abdominal pain, painful micturition and renal stone.

#### ***Arka (Calotropis gigantea) Kshara<sup>[40]</sup>***

Also known as *Ravikshar*, *Mitrakshar*, *BhaskarKsharak* and *Kharjughna*.

Properties: It is sharp, eradicates liver and spleen diseases, cough and asthama. Stimulates digestive juice and is an appetiser.

#### ***Tila (Sesamum indicum) Kshara<sup>[41]</sup>***

Also known as *Tila bhuti*, *Homdhanyabhuti* and *Pavitraksharak*.

Properties: It is sharp. It helps in obstruction of urine and Oligouria and Renal stones. Eradicates Spleen diseases and Wound swelling.

#### ***Snuhi (Euphorbia nerifolia) Kshara<sup>[42]</sup>***

Also known as *Vajra Kshara*, *Sehund Kshara*.

Properties: It is sharp. It eradicates Chlorosis, Hepatitis, Ascitis, Cholera, Indigestion, Abdominal pain and Asthama.



**Palasha (*Butea monosperma*) Kshara<sup>[43]</sup>**

Also known as *Kinshuka Kshara*, *Parnakshar* and *Triparna Kshara*.

Properties: Appeiser, eradicates Chlorosis, Spleen and Liver inflammation, Painful micturition and Renal stones.

**Chincha (*Tamarindus indica*) Kshara<sup>[44]</sup>**

Also known as *Amlika Kshara*, *Chinchabhuti*, *Chinchikabhasit*, *Chinchabhasma*, *Amlikabhasit* and *Tintidibhasit*.

Properties: Appetiser, eradicates Chlorosis, Abdominal pain, Painful micturition and Renal stones.

**Chanakhara (*Cicer arietinum*)<sup>[45]</sup>**

Also known as *Chane ka khara*, *Chanak Ioni*, *Chane ka sirka* and *Harbharyachi Aamb*.

In *Margashirsha* season when the leaves are full of salt take a white silk cloth and wipe morning dew drops from the leaves early morning for a month and dry this cloth daily. After a month put this cloth in water and remove all the fragrance from the cloth into the water. Keep this water still for 5 to 7 hours. Strain the water. Dry the residue. Heat the liquid to get *Kshara* and burn the residue into ash and acquire *Kshara*. Mix the above two *Ksharas* together. This is *Chana Kshara*.

**Beet root (*Beta vulgaris*) Kshara<sup>[27]</sup>**

Beet root juice contains sugar, water and *Kshara*. Burn the juice, separate the sugar. Ferment the remaining water. Strain it through a cloth. Allow it to dry it in a broad vessel. Burn the dried material into ash and acquire *Kshara*.

**Various *Pranija Kshara* (Animal Alkali)**

Conch shell and Pearl oyster are used in the preparation of *Madhyama* and *Tikshna Kshara* as described by *Sushruta* and *Vagbhata* and hence they can be included in *Kshara*. They are also used in *Bhasma* form.

**Shankha (Conch shell)<sup>[46]</sup>**

Also known as *Shankhak*, *Kambu*, *Samudraj*, *Dirghanaad*, *Sunad*, *Kamboj*, *Trirekh*. It is the outer covering of Mollusca group of organisms in the sea

which is a kind of shell fish. It contains Calcium Carbonate (CaCO<sub>3</sub>).

Properties: Astringent, Bitter and Alkaline taste. *Sheeta Virya*. It is light, *Grahi*, powerful, Scraping, Stimulant of gastric juices and *Tridoshaghna*. Used against poison, Tuberculosis, Hyperacidity, *Grahani*, Ulcerative colitis, Acne and Diarrhoea.

**Shukti (Pearl Oyster)<sup>[47]</sup>**

Also known as *Shuktika*, *Muktagraha*, *Mahashukti*, *Muktamata*. It is the outer covering of Mollusca group of organisms in the sea which is a kind of shell fish. It contains Calcium Carbonate (CaCO<sub>3</sub>).

Properties: Bitter taste, Sweet *Vipak*, Oily, tasty, stimulant. Eradicates Asthama, Painful micturition, Spleen and abdominal diseases.

**Sheep's wool Kshara<sup>[27]</sup>**

The sheep's sweat contains 1/3<sup>rd</sup> salts. So when their wool after shaving are soaked in water. This water is strained and then the liquid is heated till *Kshara* is obtained.

**Various *Khanij Kshara* (Mineral Alkali)****Sudha (Lime)<sup>[48]</sup>**

Also known as *Shilakshar*, *Churna*, *Churnak*. It is acquired from Lime stone, *Shankha*, *Shukti* or *Shambhuk* by burning them in open air. *Sudha* is generally used in the form of Lime water which is prepared by mixing water in lime in the ratio of 1:20.

Properties of Lime water: It is antihelmentic and antidiarrhoea when used both internally and externally. Useful in Hyperacidity, Abdominal pain, *Grahani* and indigestion in children. It neutralizes the poisonous effects of Sulphuric Acid.

**Sorakhar (Potassium Nitrate)<sup>[49],[50]</sup>**

Also known as *Suryakshar*, *Vanikshar*, *Mrutkshar*, *Sora*. *Shwet Shilajatu* or *Karpur Shilajatu* is described as similar to *Suryakshar*. It is acquired from Mud. It is white, shining and crystalline in appearance.

Properties: Alkaline, Bitter, Saline taste, Hot and sharp but Cool in touch and when put in mouth.

It is Diuretic, Antipyretic, Expectorant, Antiinflammatory and Appetiser. Used in Renal stones, Painful micturition, Diabetes, Indigestion, Stimulant and Anaemia. Used in burns as it has cooling effect.

Preparation: Take 2 pound *Sora* powder and 1 pound Wooden coal powder and grind them together. In a big vessel keep a red hot coal and add the above mixture little by little until all the mixture is burned. Then take all the ash, add 1 gallon water to it, mix well and strain through a cloth. Heat the above liquid in a earthen pot till dry *Kshara* is obtained.<sup>[27]</sup>

This *Kshara* is very pure and should be stored in a green coloured bottle.

#### **Navsagar (Ammonium Chloride/NH<sub>4</sub>Cl)<sup>[51-53]</sup>**

Also known as *Ishtika Lavan*, *Chullikalavan*, *Kittakshar*, *Nrusaar*, *Navsaar*.

Although it is mentioned as a salt in Ayurved Prakash and Rasatarangini, *Navsagar* is included in *Kshara Varga* and its properties are found to be similar to *Kshara*.

This *Kshara* is acquired through many sources, 1) After burning some plants like *Karveer* (*Nerium indicum*), 2) From the Ash of Brick Kilns, 3) From Mud in some areas like Punjab. 4) From stool of Camel (in Egypt), 5) From urine of men (in Europe) and 6) From mines near volcanic eruptions (in Italy).

From the sources we could say that *Navsagar* is a Vegetable, Animal as well as a Mineral Alkali.

*Navsagar* is also prepared in the laboratory using following formula.

a) (Ammonia) NH<sub>3</sub> + (Hydrochloric Acid) HCl = (Ammonium Chloride) NH<sub>4</sub>Cl

b) (Ammonium sulphate) (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> + (Sodium Chloride) NaCl + Heat = (Ammonium Chloride) NH<sub>4</sub>Cl + (Sodium sulphate) Na<sub>2</sub>SO<sub>4</sub>

Properties: It has alkaline and bitter taste. It is oily, hot, sharp, fine, light, stimulant, digestant, *Tridoshaghna*, eradicates splenomegaly, Melts *Kapha* and is good for eyes. It is used in Chlorosis,

Abdominal distension, Scorpion bite, Heart disease and Vitiligo. When mixed in water, water becomes cool.

Its dose is 2 to 8 *Ratti* (250mg to 1gm)

#### **Tankana (Borax/Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub>·10 H<sub>2</sub>O)<sup>[54-56]</sup>**

Also known as *Ksharraj*, *Shwetkshar*, *Rangakshar*, *Seetkshar*, *Saubhagya*, *Suhaga*, *Tankarkshar*, *Annabhedhi*, *Dhatudravak*, *Malatineersambhav*.

It is a combination of sodium and boric acid found both naturally and prepared in laboratory. In India found in Ladakh, Punjab, Maharashtra, Kathiawad. In Tibet, Nepal and Iran, *Tankan* is obtained in the form of crystals on the banks of saline lakes.

Properties: Bitter taste, Hot, Sharp, Dry, laxative, melts *kapha*, good for heart, wound cleanser, stimulates menstrual flow, helps in expulsion of dead foetus. Used in *Vaat* disease, Cough, Asthama, Abdominal distension and Vegetable and mineral poison.

#### **Kankshi (Alum/K<sub>2</sub>SO<sub>4</sub>, Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>·24H<sub>2</sub>O)<sup>[57-59]</sup>**

Alum has been classified as *Kshara* by Damodar Joshi in *Rasamrut*.

It is also known as *Phitkari*, *Shubhra*, *Saurashtri*, *Tuvari*, *Rangada*, *Sphatika*, *Sphuti*. It is acquired from *Saurashtra* region hence the name *Saurashtri*. Mostly prepared artificially in laboratories.

Potash sulphate + Aluminium sulphate + Washed together = Octahedral Alum Potash.

Also prepared from *Sphatik* stone (Alumnite/ K<sub>2</sub>SO<sub>4</sub>, Al<sub>2</sub>(SiO<sub>4</sub>)<sub>3</sub>·4Al(OH)<sub>3</sub>). Powder this stone and heat it with sulphuric acid then mix potassium sulphate. In India, Alum is acquired through Alum Shale.

It is soluble in water but insoluble in alcohol.

Properties: Astringent, Bitter and Spicy taste, Hot, Oily, Good for hair, Wound healer, haemostatic, strengthens the gums, antipruritic. Used in Vitiligo, Fever, *Grahani*, Mouth diseases, Eye diseases, Herpes and Poisoning. It is also used in prolapse of rectum and vagina.

**Papad Kshara (Boraka)<sup>[60]</sup>**

It is obtained from alkaline earth and also artificially prepared. Used in preparation of papad, thus the name. It is white, light and easily breakable.

Properties: It is Diuretic, Laxative, Vaatanulomak, Antacid, Liquefier and Antiinflammatory. Used in Jaundice, Piles, Abdominal distension and Abdominal pain

**CONCLUSION**

*Kshara* is a acrid substance, one which irritates the surface of the skin. They are Caustic materials, obtained from the ashes after distillation. Mostly alkaline in nature. It is said to be superior to all the instruments. It performs *Chedana* (cutting), *Bhedana* (breaking) and *Lekhana* (scraping) action. It is *Tridoshaghna* and used both internally and externally. Used chiefly as a medicine but also in food. It is the answer to avoid complex surgery at times if used meticulously. We need to understand and study *Kshara* in depth to obtain its maximum benefits and then we will see that it can really prove to be a miracle drug that is needed today.

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