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DEVELOPMENT AND STANDARDIZATION OF VASA PRATISARANEEYA TEEKSHNA KSHARA

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ABSTRACT

Kshara is a powder obtained from water soluble ash. *Kshara* is the substance which sustains the properties of *Ksharana* and *Kshanan* in it. *Acharya Dalhana* has simplified these terms as - *Ksharana* means the one which mobilises and removes the deformed skin, flesh etc. or which clarifies the vitiated *Dosha*. *Kshara* is said to have multiple *Rasa* because it is prepared from various drugs. It is dominated by *Katu Rasa* followed by *Lavana* as *Anurasa*. *Kshara* is considered superior to the *Anushatra* and *Shastra*. *Kshara* proves its therapeutic utility in many clinical conditions. We get numerous instances where *Kshara* has been indicated either internally or externally. The route of administration depends upon the nature of the clinical entity for eg. In case of *Gulma* we get the reference to use *Kshara* internally while in cases of *Arsha*, it been told to be applied topically. It involves a special method of preparation. Standardization of herbal drugs is essential to certify their quality and purity. Kshara (alkaline substances) of *Vasa* (Adhatoda vasica) is an important constitute in many ayurvedic formulations, but its standard manufacturing process is not attempted till date. *Vasa Pratisaraneeya Teekshna Kshara* was prepared by using textual reference and quality control assessment was done according to API. *Vasa* have medicinal value, such as *Raktastambhaka (*Haemostasis), *Vednasthapaka* (Analgesic), *Shothahara* (Anti-inflammatory), *Jantughna (*Antimicrobial) etc. This study is aimed to establish standard manufacturing process for *Vasa Pratisaraneeya Teekshna Kshara*.

KEYWORDS: *Kshara, Vasa,* Standardization, *Vasa Pratisaraneeya Teekshna Kshara*.

INTRODUCTION

Kshara derived from root word (dhatu) '*Kshara*' which denotes the meaning of movement. *Kshara* is defined as the one which abolishes the deteriorated *Dhatus* and take out the unhealthy tissues and *Doshas* from their site.[1] *Acharya Dalhana,* while commenting on the word, *Ksharana* as the one which mobilizes and get rid of the distorted flesh, skin etc. or which eliminates the vitiated *Doshas* from their site.[2]

Kshara possess white in colour and is known to be *saumya* in nature. Even though it is *saumya* it has the ability to perform *dahana, pachana and darana* activities.[3] *Kshara* is known to be having *tridoshaghna* property because it is made by the blend of various medicinal herbs, Which also makes it suitable for being utilised in an assortment of clinical conditions.[4] *Kshara* is known to be superior among *Shastra* and *Anushastra* as it possess activities like *chedana, bhedana and lekhana* which are nothing but different *shastra karma* only. Furthermore, *Kshara* also has special property of *visheshkriyaavachaara* because of having *tridoshaghna* property.[5] *Acharya Sushruta* defines the *Kshara* as the substance which sustains the properties of *Ksharana* and *Kshanan* in it. *Acharya Dalhana* has simplified these terms as - *Ksharana* means the one which mobilises and removes the deformed skin, flesh etc. or which clarifies the vitiated *Dosha.* At the same instance *Acharya Dalhana* has quoted a reference according to which the meaning of *Ksharan* is to be taken as *shodhana* only.[6]

Charaka Samhita is known to be the oldest literature of *Ayurveda*. *Acharya Charaka* has given importance to *Kshara* by mentioning the description of *Kshara* at various occurrences. As it has corrosive nature (*Ksharanat*) it is named as *Kshara* (alkali). *Kshara* is not a *Rasa* in itself but it could be exhibited by the mixture of *Rasas* with the abundance of *Katu* and *Lavana Rasa.*[7] In *Ashtanga Hridaya Pratisaaraniya Kshara* is indicated in the management of *Mashaka, Shvitra, Kustha, Bhagandara, Arbuda, Granthi, Nadivrana* etc. and *Paneeya Kshara* in *Arsha, Bhagandara, Ashmari, Gulma, UdaraRoga* and *Garavisha*.[8]

Kshara could be compared with alkali as mentioned in the modern alchemy. The logic behind this understanding is that the constituents of the *Kshara* mimic the properties as showed by the alkalis. As per the reference available in AFI, *Kshara* can be defined as the alkaline substance extracted from the ashes of the plants.[9]

Vasa Kshara is one of the important *Kshara preparation in terms of it's clinical usage*. It is an alkali extracted from the water-soluble ash of *Vasa Panchanga*.

- **Botanical source**[10] : *Adhatoda vasica(leen).*
- **Family** : *Acanthaceae*
- **Classical names**[11] : *Vasak, Vasika, bhisagmata, Sinhashya, Sinhika, Sinhaparna, Vajidanta*.

Historical review

***Samhita* period**

Charak samhita

In *Charaka Samhita* we find description of *Vasa* with its *guna* and *karma*. *Vasa* is classified under *Tiktaskandha dravyas*.[12] In the *Swasa* and *Kasa* the *Kwath* is given made from *Vasa, draksha* and *Haritaki*. In *Krimi Kustha* the *lepa* of *Vasa* is also mentioned.

***Sushruta samhita*[14]**

Acharya Sushruta has mentioned synonyms and the *guna* in the *Sutrasthan* itself. *Acharya Sushruta* has indicated *Vasa* in various clinical conditions like in *Shosh*, as a *Rasayana*, *Rakta-pitta*, *Kshaya* and in *Swasa Chikitsa*.

***Astanga hridaya*[15]**

Extensive use of *Vasa* is mentioned in *Rakta pitta chikitsa*. Where in *Vasa* is indicated to be used either alone or in combination with *Sharkara* and *Madhu*. Various *Kshaya yogas* are mentioned in *Raktapitta Chikitsa* where Vasa is used as prime ingredient.

Nighantu kala

***Dhanvantri nighantu*[16]**

Here in, the properties and synonyms of *Vasa* are told. In this text the *Vasa* is indicated in conditions like *Rakta pitta* and *Kasa, Kshaya, Kustha* and *Jwara*.

***Bhavaprakash nighantu*[17]**

Here in two varieties of *Vasa* are mentioned i.e. *Rakta Pushpa Vasa* and *Krishna Pushpa Vasa*. Synonyms and properties of the *Vasa* are also told here. *Vasa* is also good for heart and voice.

***Madanapala nighantu*[18]**

In *Madanapala Nighantu* description of 13 *vargas* is available. *Vasa* is mentioned along with synonyms and properties under *Abhayadi Varga*.

Botanical description[19]

Vasa consists of fresh, dried, mature leaves of *Adhatoda vasica* Nees (Fam. *Acanthaceae*), a sub-herbaceous bush, found throughout the year in plains and sub Himalayan tracts in India, ascending up to 1200m, flowers during February-March and also at the end of rainy season, leaves stripped off from older stems and dried in drying sheds.

Perennial ever green shrub, 1. 2 – 2.5 m high.

- **Leaf:** Simple, opposite, lanceolate, entire acute, coriaceous with unicostate reticulate venation and small petioles.
- **Stem:** Terete with greyish-green or yellowish bark, swollen at the nodes and herbaceous above.
- **Root:** Branched tap root system.
- **Inflorescence:** Axillary or terminal, simple or branched spikes, often thyrsi form, 5-10 cm long; peduncle densely flowered.
- **Flower:** Flowers in short dense axillary acteate, zygomorphic, bisexual, hypogynous Pedunculate spikes 2.5-7.5 cm long, towards the end of the branches; peduncles 3.8- 10 cm stout, shorter than leaves bract and bracteoles usually large and prominent, sometimes smaller or absent, ovate or elliptic.
- **Fruit:** Capsule, 18×6mm, clavate, apex subacute and blunt, pointed, 2-valved, stalked; solid, long stalk at a base; seeds 2-4, sub-orbicular or orbicular – oblong and compressed.
- **Flowering and Fruiting time:** Flowers and Fruits in December- April. Flowering occurs during the period from February to March or around spring season.
- **Distribution: Through-out India up to an altitude of 1300m.**

Description

a) Macroscopic

Leaves, 10-30 cm long and 3-10 cm broad, lanceolate to ovate-lanceolate, slightly acuminate, base tapering, petiolate, petioles 2-8 cm long, exstipulite, glabrescent, 8-10 pairs of lateral vein bearing few hairs, dried leaves dull brown above, light greyish brown below, odour, characteristic, taste, bitter.

b) Microscopic

Transverse section of leaf shows, dorsiventral surface with 2 layers of palisade cells, in surface view, epidermal cells sinuous with anomocytic stomata on both surfaces, more numerous on the lower, clothing trichomes few, 1-3, rarely upto 5 celled, thin walled, uniseriate, upto 500 µ and glandular trichomes with unicellular stalk and 4 celled head measuring, 25-36 µ in diameter in surface view, cystoliths in mesophyll layers, elongated and cigar shaped, acicular and prismatic forms of calcium oxalate crystals present in mesophyll, palisade ratio, 5-6, 5-8.5, stomatal index, 10.8-14.2-18.1 for lower surface.

Varieties of *vasa*

In the *bhavprakash nighantu* two varieties are given:

1. *Raktapushpa aadusa* and
2. *Krishnapushpa adusa*.

Chemical constituents[20]

One of the main alkaloid *Vasa* i.e. vasicine is obtained from all the parts, 2-hydroxy-4-glucosyloxychalaone, vasicinine, from flowers, stem and root, arachidic, behinic, cerotic, lignoceric, linoleic and oleic acid from seeds. Ether alkaloids vasicol, adhatodine, vasicinone, vasicinol, vasicinolone are the components reported from varios parts.

Therapeutic evaluation

Clinical trials on drug containing vasicine and vasicinone have revealed that it doesn't show any side effects while treating bronchial asthma. Drug also exhibits abortificiant activity and hence it is contraindicated during pregnancy.

Pharmacological activities[21]

Antispasmodic, hypotensive, bronchodilator, respiratory stimulants, hypoglycemic, uterine stimulant, antiviral and juvenile hormone mimicking, expectorant, antiseptic, antibacterial. Vasicine also showed cardiac depressant, uterotonic and abortificiant activities. Vasicinol showed antianaphylaxis, bronchoconstrictor (*in vivo*) and bronchodilator (*in vitro*) activities also. It is week cardiac stimulant, antitussive, anticonvulsant and antiarrhythmic.

Propagation and cultivation

It can be propagated from seeds or cuttings. The plant tolerates variety of soils and can be grown different climatic conditions varying from arid to damp moist localities. It is one of the

suitable plants to be grown in waste lands.

MATERIALS AND METHODS

Preparation of *vasa pratisaraneeya teekshna kshara*[22]

S. no.	*Ingredient*	*Apamarga Pratisaraneeya Kshara*
1	*Vasa*	*300 gm*
2	*Shukti* (Oyster shell)	*30gm*
3	*Chitrakamoola Kalka*	*3 gm*
4	Water	*1800 ml*

The *Panchanga* of *Vasa* plant were collected, kept it for drying, after it get dried properly it was burnt. Ash was collected from the remains and thus it was mixed with six times of water and filtered 21 times. When the obtained filtrate was clean and clear and resembles like *Gomutra Varna.* Then it was subjected for heating on mild fire and reduced to 2/3rd. Then, *Shukti* is heated separately and made red hot. This red hot *Shukti (*weight 1/10th part of ash) was added to the filtrate and was continuously stirred well. Till this reduced to 1/3rd it was heated. This was further subjected for heating by adding *Chitraka Kalka (*weight 1/10th part of *Shukti).* The end product obtained was in thick solution as *Vasa Pratisaraneeya Teekshna Kshara*. This *Kshara* was collected and stored in air tight container.

Standardization of *vasa pratisaraneeya teekshna kshara*

Standardization is a tool for assessment of quality of test sample. Sample of Vasa *Pratisarneeya Teekshna Kshara* was prepared and assessed quality on behalf of parameters mentioned in *Ayurveda* pharmacopeia of India i.e. Loss on Drying, pH, Total Ash, Acid Insoluble ash, Density, RI.[23]

OBSERVATIONS AND RESULTS

1. Macroscopic

S. no	Organoleptic	*Vasa Pratisaraneeya Teekshna Kshara*
1.	Colour	Light Yellow
2.	Odour	Characteristic

2. Physiochemical Analysis

S. no	Tests	*Vasa Pratisaraneeya Teekshna Kshara*
1.	Loss on Drying (%)	75.56
2.	pH	13.6
3.	Total Ash (%)	28.45
4.	Acid Insoluble ash (%)	16.45
5.	Density (gm/ml)	1.131
6.	RI	1.456

Preparation of *vasa pratisaraneeya teekshna kshara*

Vasa plant

Shukti

Chitraka Moola

Burning *vasa panchanga*

Prepared ash

Added to water

Filtering process

Heating

Heating *Shukti*

Heating after adding

Chitrak mool kalka

Prepared Kshar in kshar Jal

Prepared *vasa pratisaraneeya teekshna kshara.*

DISCUSSION AND CONCLUSION

Vasa Pratisaraneeya Teekshna Kshara was prepared by following aforementioned method. According to *Ayurveda* Pharmacopeia of India Kshara should be light yellow in colour and characteristic odour, same attributes were attained in sample made. The sample was subjected for quality control and phytochemical study and results observed were as follows, Water content was 75.56 %, test sample had found basic in nature and alkalinity was 13.6, total inorganic substance was found 16.45 %. For identification Density and RI was found 1.131 and 1.456 gm/ml. This sample further can be used in clinical background and its efficacy can be tested.

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