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PRELIMINARY PHARMACEUTICO-ANALYTICAL STUDY OF *SARJIKA KSHARA*

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ABSTRACT

Context: *Sarjika Kshara* is prepared by processing the ash of plant named *Dhanvayasa* i.e Fagonia Cretica Linn. It possess *KatuRasa*; *Ushna*, *Tikshna*, *Laghu*, *Ruksha Guna* and *Ushna Virya*. **Aim:** To develop preliminary Pharmaceutico- Analytical profile of *Sarjika Kshara*. **Materials and Methods:** Sarjika Kshara was prepared by processing the ash of *Dhanvayasa Panchanga* (Fagonia Cretica Linn.) with 1:8 ratio of ash and R.O water as per reference of Rasatarangini. The raw drug i.e Dhanvayasa Panchanga, In process material viz. Dhanvayasa Ash and Sarjika Kshara Jala and final product i.e Sarjika Kshara were analysed for various Organoleptic, Physico-Chemical and Phytochemical parameters. Sarjika Kshara was also analysed for Qualitative ions study. **Results:** After three washes, maximum yield was obtained i.e.410g(22.70%), 105g(7.55%) and 25g(1.95%) respectively in each wash. Average LOD 1.8 % at 105^0C, Average Ash value(%w/w) 95.02% and Average pH value 10.23 is noted in the prepared *Sarjika Kshara*.Various ions like Sodium, Potassium, Carbonate, Bicarbonate etc were found to be present in prepared *Sarjika Kshara*. **Conclusions:** Classical method of preparation of *Sarjika Kshara* is applicable to develop the

preliminary profile of *Sarjika Kshara*. Repeated washing of Ash should be done to obtain maximum yield of *Kshara.*

KEYWORDS: *Dhanvayasa, Kshara, Sarjika Kshara, Fagonia Cretica*Linn.

INTRODUCTION

In Ayurveda, substances of natural origin, including whole plant or their part, are used as medicine either alone or in combination. Apart from *Panchavidha Kashaya Kalpana* there are many dosage forms that can be used for therapeutic purposes and *Kshara* is one of important dosage form among them. *Kshara* is prepared out by the dried plant ashes by a special process known as *KsharaKalpana*. The substance which produce *shodhana* of bodily *Dosha, Dhatu, Maladi* because of its *Ksharana* action is called *Kshara.*[1] *Kshara* is an alkaline substance obtained by processing the ashes of the plants and it possess erosion property. 18 parts of plants which can be used for medicinal purpose are mentioned in ayurvedic classics and *Kshara* is one among them.[2] Varieties and method of preparation of *Kshara* are described in different ayurvedic texts with their indications and therapeutic uses. *Sarjika Kshara* is prepared by processing the ash of plant named Dhanvayasa (Fagonia Cretica Linn.).[3] *Sarjika Kshara* possess *Katu rasa*; *Ushna, Tikshna, Laghu, Ruksha Guna* and *Ushna Virya. Sarjikakshara* is a good digestive and mitigates *vatadosha*. It is useful in *Kasa* and *Swasaroga*. It improves the appetite and cures *Gulmaroga* and *Adhmana*. It heals the wounds, cures all types of *Udara* roga and *Krimiroga.*[4,5,6] Different opinions exist regarding proportion of ash and water, time for soaking, cloth folding and numbers of filtration in the preparation of *Kshara* (Table 1).

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 Su. 11/13	1:6	Over night	21 time
2.	Sharangadhara Samhita Ma. Kha.11/101-103	1:4	Overnight	Filtered through cloth
3.	Rasatarangini 14/59-61	1:4	3 hrs	Filtered with 3 folded cloth
4.	Ayurveda Prakasha6/123-124	1:4	Over night	Filtered through cloth
5.	Ayurveda SaraSamgraha Page No. 609	1:8	2-3 days	Filtered 7 times with 4 folded cloth
6.	Dravyaguna Vigyana Yadavji Trikam ji, 97-99	1:6	Overnight	Filtered 21 times with cloth
7.	Ayurvedic. Formulary of India Part 1, 10 chapter pg. no 163	1:6	-	Filtered 2-3 times with cloth

MATERIALS AND METHODS

Preparation of *Sarjika Kshara*

- **Procurement of *Dhanvayasa Panchanga* -** *Dhanvayasa panchanga* was procured from Sundar Ayurved Pharmacy, J.S. Ayurved Mahavidyalaya, Nadiad with due permission from Concern authorities.
- **Equipments** – Iron pan for burning of dry Dhanvayas*a*, steel vessel, gas stove, weight machine, pipe for decant, stirrer, scale, and Thermometer.
- **Method of Preparation –***Sarjika Kshara* was prepared as per classical reference of Rasatarangini.

The Whole process of preparation of *Sarjika Kshara* was divided into three phases –

1. **Preparation of Ash** – Dried *Dhanvayasa* 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 Eight times of water was added to it. The contents were mashed thoroughly with hands and left undisturbed for 3 hours. After that, the clear supernatant liquid was decanted with the help of pipe and filtered through three layered cotton cloth for 7 times. The residual ash was dried, weighed and again mashed with Eight times of water. Kept undisturbed for the 3 hours, 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 *Ksharajala* 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

Raw drug i.e Dry *Dhanvayasa Panchanga* powder, *Dhanvayasa* Ash, *Sarjika Kshara Jala* and *Sarjika Kshara* were analysed for various Organoleptic parameters like Colour, taste, touch and odour; Physico- chemical parameters; Phytochemical parameters. The prepared *Sarjika Kshara* was also analysed for Qualitative analysis of various ions. Analytical study was done as per the reference of Ayurvedic Pharmacopeia of India.

OBSERVATIONS AND RESULTS

Table 2: Showing data of *Dhanvayasa* Ash Preparation.

Sr. No.	Parameters	Results
1	Weight of Dry *DhanvyasaPanchanga (Kg)*	30
2	Weight of Ash obtained (g)	1836
3	% of ash obtained from dried *Dhanvayasa Panchanga*(%)	6.12

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

Sr.No.	Parameters	Batch			Average
		1st wash	2nd wash	3rd wash	
1	Wt. of Ash taken (g)	1806	1390	1280	**1492**
2	Vol. of Ash taken (ml)	3750	1870	1700	**2440**
3	Vol. of water taken (ml)	30000	14960	13600	**19520**
4	*Ksharajala* obtained after filteration (ml)	24000	13000	12800	**16600**
5	% *Ksharajala* obtained (v/v)	80	86.89	94.11	**87**
6	% *Ksharajala* loss (v/v)	20	13.11	5.89	**13**
7	Time reqd. for Preparation of *Ksharajala* (H)	3	3	3	**3**

Table 5: Showing data of *Sarjika Kshara* obtained in three washes.

Sr. No.	Parameters	Batch			Average
		1st wash	2nd wash	3rd wash	
1	Volume of *KsharaJala* taken (ml)	24000	13000	12800	**16600**
2	Time req. for *kshara* prep. (H)	10	7	6	**7.66**
3	*Kshara* obtained (g)	410	105	25	**180**
4	*Kshara* obtained (in comparison to dry Dhanvayasa)(%w/w)	1.36	0.35	0.08	**0.59**
5	*Kshara* obtained (in comparison to dry Dhanvayasa ash) (%w/w)	22.70	7.55	1.95	**10.73**

Table 6: Showing Organoleptic characters of *Dhanvayasa* powder, *Dhanvayasa* Ash, *Sarjika KsharaJala* and *SarjikaKshara*.

Sr. No.	Parameters	*Dhanvayasa*			
		Powder	Ash	*Ksharajala*	*Kshara*
1	Colour	Light green	Smoky white	Clear like water	White
2	Touch	Rough	Rough	Slimy/smooth	Rough
3	Taste	Bitter&Astirngent	Salty	Salty	Salty
4	Odour	Characteristic	Characteristic	Characteristic	Characteristic

Table 7: Showing the Physico-chemical parameters of *Dhanvayasa* Powder and Dhanvayasa Ash.

Sr.No.	Parameters	Dhanvayasa Powder	Dhanvayasa Ash
1	Loss on drying 105c (%w/w)[7]	6.27	2.47
2	Ash value (%w/w)[8]	6.91	96.5
3	Acid insoluble ash (%w/w)[9]	0.3	35.5
4	W.S.E(%w/w)[10]	10.4	29.6
5	A.S.E(%w/w)[11]	8.4	5.6
6	pH[12]	-	10.24

Table 8: Showing Physico-chemical Parameters of *Sarjika Kshara Jala.*

Sr.No.	Parameters	Batch			Average
		1st wash	2nd wash	3rd wash	
1	pH value (10% aqueous solution)	10.28	10.12	9.84	**10.08**
2	Specific gravity[13]	1.0130	1.0015	0.9968	**1.0037**
3	Viscosity[14]	0.92	0.92	0.94	**0.92**
4	Total solid content mg/l[15]	14000	5500	2200	**7233.33**

Table 9: Showing the Physico-chemical parameters of Sarjika *Kshara.*

Sr.No.	Parameters	Batch			Average
		1st wash	2nd wash	3rd wash	
1	pHvalue (10% aqueous solution)	10.38	10.27	10.04	**10.23**
2	Loss on drying 105^0c (%w/w)	1.90	1.5	2	**1.8**
3	Ash value (%w/w)	96.04	95.24	93.79	**95.02**
4	Acid insoluble ash (%w/w)	0.56	0.44	0.38	**0.46**
5	W.S.E(%w/w)	74.8	73.9	72	**73.56**
6	A.S.E(%w/w)	25.6	25.2	24.6	**25.13**
7	Alkalinity(ml of 0.1 M HCL)	3.8	3.4	2.9	**3.36**

Table 10: Showing Qualitative Phytochemical Parameters[16] of *Dhanvayasa* powder, ash, *Kshara Jala* and *Sarjika Kshara.*

Sr.No.	Parameters	*Dhanvayasa* Powder	*Dhanvayasa* Ash	*Sarjika Ksharajala*	*Sarjika Kshara*
1	Alkaloid	Present	Absent	Absent	Absent
2	Carbohydrates	Present	Present	Present	Present
3	Glycosides	Present	Absent	Absent	Absent
4	Amino acids	Present	Absent	Absent	Absent
5	Proteins	Present	Absent	Absent	Absent
6	Tannin	Present	Absent	Absent	Absent
7	Flavanoids	Present	Absent	Absent	Absent
8	Saponin	Present	Absent	Absent	Absent
9	Steroids	Present	Absent	Absent	Absent
10	Starch	Absent	Absent	Absent	Absent

Table 11: Showing Qualitative Estimation of ions[17] in *Sarjika Kshara.*

Sr. No.	Ion	Result in *Sarjika Kshara*
1	Sodium	Present
2	Potassium	Present
3	Calcium	Present
4	Magnesium	Present
5	Iron	Present
6	Carbonate	Present
7	Bicarbonate	Present

Plate no. 1: Preparation of Sarjika Kshara.

Fig.1 Dry *Dhanvayasa* burnt to ash

Fig.2 *Dhanvayasa* Ash

Fig. 3 Ash + R.O water

Fig. 4 Maceration

Fig. 5 Kept undisturbed for 3 hrs

6 Decantation &Filtration of *Kshara Jala*

Fig. 7 *Kshara Jala*

Fig.8 Evaporation of *Kshara Jala*

Fig.9 *Sarjika Kshara*

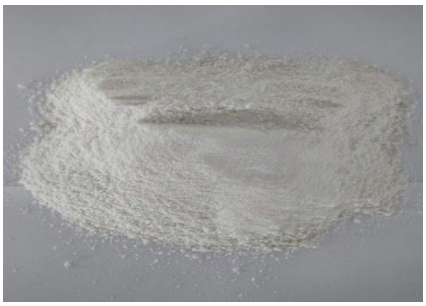

Fig. 10 *Sarjika Kshara*

DISCUSSION

Dried *Dhanvayasa* was burnt in an iron vessel to prevent contamination during burning. *Dhanvayasa Panchanga* was 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 three hours. *Kshara Jala* was decanted without disturbing the vessel. Measures should be taken to avoid the entry of sediment. A clean cotton cloth was tied on both ends of pipe before decanting the *Kshara Jala* to obtain clear *Kshara Jala* as the colour of *Kshara* depends on the colour of *Kshara Jala*. Proper filtration was done with three folded cloth for 7 times. The residual ash was dried in sunlight and weighed. This was done for the proper estimation of weight of ash after extraction of first filtrate, so that required quantity of water can be added. Ash was again mashed with Eight times of water and kept undisturbed for the 3 hours, followed by a collection of the second filtrate. A similar method was followed for the third time to collect third filtrate. Initially *Kshara Jala* was clear liquid. Vapors and crackling sound were increased proportionally with temperature and decrease in water level was also observed during preparation of *Sarjika Kshara* from *Sarjika Kshara Jala.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 from bottom. *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.410g(22.70%), 105g(7.55%) and 25g(1.95%) respectively in each wash. Average LOD **1.8** % at 105^0C, Average Ash value(%w/w) **95.02** % and Average pHvalue(10% aqueous solution) **10.23** is noted in the prepared *Sarjika Kshara*. Various ions like Sodium, Potassium, Magnesium, Calcium, Iron, Carbonate and Bicarbonate were found to be present in prepared *Sarjika Kshara.*

CONCLUSION

Classical method of preparation of *SarjikaKshara with 1:8* ratio of ash and water mentioned by Acharya Sadanand Sharma in his text Rasatarangini is applicable to develop the preliminary profile of *Sarjika Kshara*. Repeated washing of Ash should be done to obtain maximum yield of *Kshara i.e* 540 g. These observed Parameters can be considered as a base for further studies and large scale production of *Sarjika Kshara* on industrial level.

REFERENCES

1. Priya Vrat Sharma, Sushruta Samhita, With English translation of text and Dalhana's commentary, Chapter 11/4, Chaukhambha Visvabharati, Varanasi.
2. Acharya Agnivesha, Charaka Samhita, Sutrasthana, Yadav ji Trikamji Acharya, Chapter 1/73, Chaukhamba Surbharati Prakashan, Reprint, 2016.
3. Acharya Sadananda Sharma, Rasatarangini, Pandit Kashinath Shastri, Tarang 13/45-47, Chaukhambha Sanskrit Bhavan, Varanasi, Reprint, 2014.
4. R.K. Sharma Bhagvandash, Acharya Agnivesha, Charaka Samhita, Chikitsa Sthana Chapter27/304 Reprint, 2011varanasi, Chaukhamba Sanskrit series.
5. Kaviraj Ambikadutta Shastri, *Acharya Sushruta, Sushruta Samhita*, Sutrasthan, Chapter 46/325. Chaukhambha Sanskrit Sansthana, Varanasi, Reprint, 2011.
6. Acharya Sadanand sharma, Rasatarangini, Pandit Kashinathshastri, Tarang, 13/48-49, Chaukhambha Sanskrit Bhavan, Varanasi, Reprint, 2014.
7. Anonymous, The Ayurvedic Pharmacopoeia of India, Part II, I: Appendix-2, (2.2.10) 141.
8. Anonymous, The Ayurvedic Pharmacopoeia of India, Part II, I: Appendix-2, (2.2.3): 140.
9. Anonymous, The Ayurvedic Pharmacopoeia of India, Part II, I, Appendix-2, (2.2.3): 140.
10. Anonymous, The Ayurvedic Pharmacopoeia of India, II, 3: 147.
11. AnonymousThe Ayurvedic Pharmacopoeia of India, II, 3: 147.
12. AnonymousThe Ayurvedic Pharmacopoeia of India, II, 3: 198.
13. AnonymousThe Ayurvedic Pharmacopoeia of India, II, 3: 197.
14. AnonymousThe Ayurvedic Pharmacopoeia of India, II, 3: 205.
15. AnonymousThe Ayurvedic Pharmacopoeia of India, II, 3: 206.
16. C.K Kokkate, A.P. Purihit and S.B. Gokhale, "Pharmacognosy", Nirali Publication, 46th Edition, Dec2012; A-1.
17. Indian Pharmacopoeia, 2007; I.