



PHYSICO-CHEMICAL PROPERTIES OF FRESH AND PRESERVED *KSHARSOOTRA*

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ABSTRACT

Ksharsootra is used in the treatment of fistula-in-ano since long time and popularize in western countries. In Ayurveda expiry date of the *churna* has been mentioned up to two months and ingredients of the *Ksharsootra* are in powder form. So in-vitro study was conducted to find out the expiry date of *Ksharsootra*. The physico-chemical properties of fresh *Ksharsootra* (6 day preserved) and preserved *Ksharsootra* (60-67 day preserved) were tested in laboratory for their physico-chemical properties. It was observed that *Ksharsootra* preserved for 60-67 days makes significant changes in the physico-chemical properties.

Keywords: Ayurveda, Fistula-in-ano, *Ksharsootra*, physico-chemical property.

INTRODUCTION

In Ayurveda there is no direct description about *Seviryataavadhi* (expiry date/ potency of the drugs) of *Ksharsootra* in any text. Sushruta has been described that, when the *kshara* become less potent then *ksharodaka* should be added and boiled while Vagbhata advised to add *tikshna* drugs like *danti*, *chitrak*, etc and then again heated to made strong.^[1-2] Acharya Siddinandan Mishra has been explained expiry date of *kshara* as one year to five years. He also added that preserved *Ksharsootra* can be used up to four to six months. Sharangdhar described *saviryataavadhi* of *churna* (powder) is 2-3 months and of *Vati* (tablet) up to 1 years.^[3-4] In the gazette notification by Govt. of India the shelf life or expiry date of *churna* has mentioned as one year.^[5] On the basis of this it can be considered that *saviryatavadhi* of *Ksharsootra* should be between two month to one year. *Ksharsootra* that is sealed inside a glass tube can retain its properties and potency for longer period than the one which has come in contact with atmosphere. (Prof. P. J. Deshpande).

The processed *Ksharsootra* exposed to ultra-violet rays and each *Ksharsootra* (medicated thread) should be sealed into glass test tube. The tube is broken and thread taken out at the time of its use for experimental use. The purpose of *Ksharsootra* sealing and keeping them as such till use is to maintain the potency. *Ksharsootra* being hygroscopic in nature does not mean that it loses its property when inserted in the fistulous tract and the material coated on the thread is wasted out. The process of debridement is gradual and is spread over the weak. Once exact expiry period of *Ksharsootra* is known, it will become easier to preserve the *Ksharsootra* for the recommended period. Hence in-vitro study was planned to find the expiry period of *Ksharsootra*.

MATERIALS AND METHODS

***Ksharsootra* preservation:**

Ksharsootra having ingredients Apamarg *Kshara* (*Achyranthusaspera* Linn.), latex of *Snuhi* (*Euphorbia nerifolia* Linn.) and *Haridra* powder (*Curcuma longa* Linn.) was prepared by adopting standard guidelines.^[6] Dried and disinfected *Ksharsootra* were packed in the test tube and closed with the help of rubber cork. Air tight packing was confirmed by deeping the packed test tube in the water. Then each tube was labelled with batch numbers and date of manufacture. Thus *Ksharsootra* preserved up to 7th days from the date of manufacture has been considered as fresh *Ksharsootra*. *Ksharsootra* preserved for 60 to 67 days from the date of manufacture has been considered as preserved *Ksharsootra*.

Physico-chemical properties of *Ksharsootra*:

The physico-chemical changes in the *Ksharsootra* due to preservation have been observed by parameters like tensile strength, diameter, weight, pH, potassium percentage and curcumin percentage of the

Ksharsootra of the selected batches from fresh and preserved *Ksharsootra*. Physical procedures were performed in the physics department of science institute and analysis was done in the FDA approved laboratory.

Physical properties: The mean diameters of ten readings from randomly selected *Ksharsootra* from each selected batch were recorded. This was performed with the help of travelling microscope. The weight of each thread of both fresh and preserved *Ksharsootra* (length 30cm) was taken and compared. The tensile strength was measured by applying the weight in the pan to the *Ksharsootra*.

Chemical properties: Coated material of fresh and preserved *Ksharsootra* was used to measure pH, potassium percentage and curcumin percentage adopting the standard procedure. [7]

RESULTS AND DISCUSSION

Parameter for K.S.	\bar{X}	SD	SE	t	p
Tensile Strength	0.111	0.038	0.005	23.07	<0.001
Diameter	0.007	0.003	0.0004	16.8	<0.001
Weight	0.072	0.033	0.004	17.09	<0.001

Table1: Physical properties of fresh and preserved *Ksharsootra*

Parameters for K.S.	\bar{X}	SD	SE	t	p
pH	0.054	0.0167	0.00748	7.216	<0.02
Potassium %	0.114	0.0577	0.0258	4.417	<0.02
Curcumin %	0.022	0.0130	0.00583	3.772	<0.02

Table2: Chemical properties of fresh and preserved *Ksharsootra*

Sixty one batches of fresh *Ksharsootra* i.e. F-1 to F 61 was tested for tensile strength, diameter and weight in the laboratory of physics department. Same batches from preserved *Ksharsootra* i.e. P-1 to P-61 was

also tested. The difference observed in the tensile strength, diameter and weight between the fresh and preserved *Ksharsootra* was statistically ($P<0.001$) highly significant (Table 1). It means, the changes in the physical properties of preserved *Ksharsootra* as compared to fresh *Ksharsootra* were significant.

Five batches of fresh *Ksharsootra* i.e. F-56, F-57, F-58, F-59, F-60 were analyzed for pH, potassium percentage and curcumin percentage in the laboratory. Same batches from preserved *Ksharsootra* i.e. P-56, P-57, P-58, P-59, P-60 were also analyzed. The coated material of randomly selected *Ksharsootra* was used for the analysis from each batch. The difference observed in the pH, potassium percentage and curcumin percentage between the fresh *Ksharsootra* and preserved *Ksharsootra* was found statistically ($P<0.02$) significant (Table 2). It means that preservation of *Ksharsootra* for 60 to 67 days was made significant changes in the pH, potassium percentage and curcumin percentage of *Ksharsootra*.

The changes in physico-chemical properties in both *Ksharsootra* indicate that, there will be an expiry date if *Ksharsootra* are preserved for long time. The study can be concluded that preservation of *Ksharsootra* for 60-67 days makes significant changes in the physico-chemical properties and need to study clinically in cases of fistula-in-ano. In the present study sample size was very small and the period of study was limited so it is suggested that further study can be done with larger sample, longer duration and pharmaco-dynamic studies to find out expiry period of *Ksharsootra*.

CONCLUSION

The study concluded that there is significant difference in the physico-chemical properties of fresh and preserved *Ksharsootra* and need to be clinical evaluation.

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