PHYSICO-CHEMICAL PROPERTIES OF FRESH AND PRESERVED KSHARSOOTRA

*Dudhamal TS, ¹Lakade BK, ²Lakade MB and ³Khadkutkar DK

¹Assistant Professor, Institute for Post Graduate Teaching and Research in Ayurveda (I.P.G.T. & R.A.), Gujarat Ayurved University, Jamnagar, Gujarat-361008

²Medical Officer, Pune, Maharashtra

³Assistant Professor, Dept. of Shariakriya, Yashwant Ayurved College, Kodoli, Kolhapur, Maharashtra

³M.D. (Scholar), Late Kedari Redekar Ayurveda College, Gadhinglaj, Kolhapur, Maharashtra

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. 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 saviryataavadhiof churna (powder) is 2-3 months and of Vati (tablet) up to 1 years. In the gazette notification by Govt. of India the shelf life or expiry date of churna has mentioned as one year. On the basis of this it can be considered that saviryataavadhi 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 ApamargKshara (Achyranthus aspera Linn.), latex of Snuhi (Euphorbia nerifolia Linn.) and Haridra powder (Curcuma longa Linn.) was prepared by adopting standard guidelines. Dried and disinfected Ksharsootra were packed in the test tube and closed with the help of rubber cark. 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 circumin 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

<table>
<thead>
<tr>
<th>Parameter for K.S.</th>
<th>X</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>0.111</td>
<td>0.038</td>
<td>0.005</td>
<td>23.07</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diameter</td>
<td>0.007</td>
<td>0.003</td>
<td>0.0004</td>
<td>16.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Weight</td>
<td>0.072</td>
<td>0.033</td>
<td>0.004</td>
<td>17.09</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table1: Physical properties of fresh and preserved Ksharsootra

<table>
<thead>
<tr>
<th>Parameters for K.S.</th>
<th>X</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>0.054</td>
<td>0.0167</td>
<td>0.00748</td>
<td>7.216</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>Potassium %</td>
<td>0.114</td>
<td>0.0577</td>
<td>0.0258</td>
<td>4.417</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>Curcumin %</td>
<td>0.022</td>
<td>0.0130</td>
<td>0.00583</td>
<td>3.772</td>
<td>&lt;0.02</td>
</tr>
</tbody>
</table>

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 Ksharsootrawas 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 physic-chemical properties of fresh and preserved Ksharsootra and need to be clinical evaluation.

**REFERENCES**


