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Comparative Study of Shodhan of Sthavar upvisha Kuchala (Strychnos Nux vomica) Seeds in Kanji, Goghrita, Godugda & Water w.s.r. to its HPTLC

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ABSTRACT

Kuchala is mentioned as a Vanaspatija Visha and has been mentioned as one of the 11 Upavisha in Rasatarangini. It is described as Phala Visha in Sushruta Samhita. It is included in Surasadi Gana in Sushruta, Amradi Phala Varga in Bhavaprakash and in Vishatindukadi Varga in Nighantu Adarsh. Modern toxicology has classified Strychnos Nux vomica as a Neurotic Spinal Excitant poison. It is toxic in nature due to presence of alkaloids named as Strychnine but can produce miraculous therapeutic effect after going through a specialized procedure mentioned in Ayurveda known as shodhana (detoxification).

The process of Shodhana (purification) of Kuchala is done by four different methods. It is purified by using Kanji, Goghrita, Godughda & water. (kanji, Goghrita, Godughda & water). On estimation by HPTLC, before & after its shodhana, it was found that shodhana process reduce the amount of strychnine in the Kuchala

KEYWORDS

Kuchala, Shodhana, Strychnine, HPTLC of Kuchala
INTRODUCTION

Kuchala is mentioned as a Vanaspatija Visha and has been mentioned as one of the 11 Upavisha in Rasatarangini. It is described as Phala Visha in Sushruta Samhita. It is included in Surasadi Gana in Sushruta, Amradi Phala Varga in Bhavaprakash and in Vishatindukadi Varga in Nighantu Adarsh. Modern toxicology has classified Strychnos Nux vomica as a Neurotic Spinal Excitant poison. It is toxic in nature due to presence of alkaloids named as Strychnine but can produce miraculous therapeutic effect after going through a specialized procedure mentioned in Ayurveda known as shodhana (detoxification).

The process of Shodhana (purification) is done by four different methods. It is purified by using Kanji, Goghrita, Godughda & water. (kanji, Goghrita, Godughda & water). It is rightly mentioned in Charaka Samhita that even a poison can be converted into nectar like effective medicine, if it is properly processed and judiciously administrated. In Agaditantra, Kuchala (Strychnos Nux-Vomica) is classified in to Sthavar Upvisha & also Phalavisha. In modern toxicology Kuchala is classified as a spinal poison. Kuchala is used in various preparations, eg AGANITUNDI RASA, VISHTINDUK VATI. Kuchala is purified by four different methods. Shodhana is a process of detoxification and making them suitable for human consumption in therapeutic dosage. But sometimes it is noted that some commonly used drugs show Adverse Drug Reaction. This may be due to utilisation of improper “Shodhan” procedure. Therefore, at this stage it becomes mandatory to compare different Shodhan vidhi.

NEED FOR STUDY: Many toxic drugs are used in Ayurvedic formulation after proper purification but sometimes it is noted that some commonly used drugs show adverse drug effect (ADS). This may be because of the improper shodhana procedure. So at this stage it becomes necessary to compare the effect of different media on chemical constituents after shodhana processes & validate the best shodhana media for particular toxic substance.

AIM

To study the effectiveness of shodhan procedure.

“A Comparative study of sthavar upvisha Kuchala (Strychnos Nux vomica) seed shodhan in Kanji, Goghrita, Godugda & water w.s.r. its HPTLC"
OBJECTIVES

i) To carry out Shodhana of Kuchala Seeds by four different methods in different media (Lanji, Godhrita Godughda & Water) mentioned in the classics.

ii) To compare physicochemical & Chromatography of Ashudhha samples of Kuchala Seeds with shodhit samples of Kuchala seed.

iii) Evaluating the best method for Kuchala shodhan among above four different media.

MATERIALS & METHODS

MATERIALS:
Kuchala Seeds were collected from reliable known sources & authenticated after confirming the identity

- Goghrita
- Godughda
- Dolayantra
- Kanji

b) METHODS: kanji preparation

Rice was cooked in a pot. Water was removed from the cooked rice and water (3 times) was added in it. Then the pot was sealed with matkapad at the lid of pot. It was kept for Sandhan process for 15 days and then filtered. In this way KANJI was prepared.

1) Shodhan in kanji – (SKJ)

Reference -

1) विषतिक्षितक्षित्कुम्बिनि किन्येद्विन्येद्रित्यामि ||

दिनत्रायं प्रयत्तत्त्व त्वप्नीय

बहित्वचम् ||१७२||

निदाये चाश संतोष्य चूर्णेऽऽेत

विषजािंििः ||

एव विशुध्ददमायाति यथा

विषतिक्षितक्षित्कुम्बिनि ||१७३||

रसस्तराणितिः

२४/१७२,१७३

Principle – Nimajjana (dipping)

Ingredients – Ashudha Kuchala seeds

100 gm, kanji (4 L), container.

Media – kanji prepared by above mentioned method

Method –

Raw seeds are processed by dipping in 1 litter

Group 1st (SKj)
Kuchala seeds were put in “kanji” for 3 days then made it coverless & dried in sunlight as per above reference.

2) Shodhana in Goghrita – (SGg)
Reference - Rasatarangini
कारकरस्य बिजनि त्वतिमंदाधिनिगतः।

निधाय पिष्टपचने तावदायज्ञेन भर्जयेत्। १७४॥

यायद् बहिस्त्वचा किंविज्ञाजते कपिश्रभा।

कुचेलमें त्वरिंतं शुद्धिमायात्मनुत्तमाम्। १७५॥

रसतरंगिणी अद्ध २५ (१७४/१७५)

Principle- Bharjana (roasting)
Ingredients- frying pan, steel spatula, digital weighing machine gas stove. Goghrita (cow ghee approximately 25 ml), ashudha Kuchala seed 100gm,

Shodhan material – Goghrita was procured from local market

Method- Kuchala seed were crushed & roasted in Goghrita till it got brown and then seed cover was removed & powdered.

3) Shodhana in Godughda –(SGd)
Reference – Rasatarangini
विषतिन्दुकबीजानि पातेल्यां

विन्यसदं भिषक।

स्वेदयेऽ गत्यपयसा दोलिकायंत्र

मार्गात: १७६॥

Principle – Swedana (boiling)
Ingredient – stainless steel container capacity of 7L, stainless steel rod (30cm), cotton threads (30cm) measuring mug, muslin cloth (45cm), ashudha Kuchala seeds 100gm ,Godughda (cow milk)6L ,

Method -Kuchala Seeds were subjected to Swedana in Dola Yantra with Godugda for 1 prahar (3 hours) ,then collected from pottali & dried & powdered them & then used.

4) Shodhan in water (SW)
Reference – ककिंगचदाज्येि जिंभ्रुष्टो वि्षमुष्टॊ विशु्दयत। ४४॥

ब्रुिद योि इिंगििी अद् ४३ (४४)

Principle – Nimajjana & bharjana (dipping & frying)
Equipment – container, raw seeds of Kuchala 100gm, RO water 7L(1l/day),Goghrita 25 ml

Shodhan media- R.O. water from the RO plant used as the media for shodhan
Method - Kuchala Seeds were put in water for 8 days. Then cover was removed & crushed seed was roasted in Gogrhit & then used.

OBSERVATION:
HPTLC estimation of strychnine was done in PUNE Pharmacy College as follows. Pure standard strychnine was obtained from SIGMA ALDRICH U.S.A. in which raw & all four different shodhita samples were compared with standard strychnine.

Table 1 The quantification of strychnine by HPTLC

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Strychnine %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RM</td>
<td>0.191</td>
</tr>
<tr>
<td>2</td>
<td>SKJ</td>
<td>0.147</td>
</tr>
<tr>
<td>3</td>
<td>SGG</td>
<td>0.089</td>
</tr>
<tr>
<td>4</td>
<td>SGD</td>
<td>0.104</td>
</tr>
<tr>
<td>5</td>
<td>SW</td>
<td>0.049</td>
</tr>
</tbody>
</table>

Table 2 The no. of peaks & RF value of all samples

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>No.of peaks</th>
<th>RF value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Standard</td>
<td>3</td>
<td>0.55</td>
</tr>
<tr>
<td>2</td>
<td>RM</td>
<td>10</td>
<td>0.55</td>
</tr>
<tr>
<td>3</td>
<td>SKJ</td>
<td>7</td>
<td>0.54</td>
</tr>
<tr>
<td>4</td>
<td>SGG</td>
<td>7</td>
<td>0.54</td>
</tr>
<tr>
<td>5</td>
<td>SGD</td>
<td>7</td>
<td>0.54</td>
</tr>
<tr>
<td>6</td>
<td>SW</td>
<td>7</td>
<td>0.54</td>
</tr>
</tbody>
</table>

RESULTS
HPTLC profiles of raw and Shodhita Kuchala indicate that some peaks disappeared and some new peaks appeared after Shodhana processes. In raw sample, total 3 peaks were found whereas 3-10 peaks were observed in the purified samples under 254 nm. This disappearance and appearance of new peaks suggest the extraction of some components like strychnine and formation of some new compound during Shodhana process. The Rf values of Strychnine standard was found to be 0.55 which is also present in raw samples & 0.54 nearest in all shodhita sample as per mention in table no.2 Decrease in Strychnine content was found in all the Shodhita samples as compared to the raw drug. Strychnine content was found to be lowest in the sample purified by water (sw) when compared to the other samples. It might be due to the reason that during Shodhana processes, some amount of Strychnine was removed by diffusion process into water. Further frying in Goghrita also initiated more diffusion of the alkaloids from the seeds as well as some amount of Strychnine might have been converted into their N-oxidative derivatives with lesser toxicity. Removal of some constituents from the raw seeds were also confirmed by observing the changes in organoleptic characters like color, odor & taste occurred in the media as well as in the samples during Shodhana process.

SUMMARY & CONCLUSION
HPTLC profiles of raw and Shodhita Kuchala indicate that some peaks disappeared and some new peaks appeared after Shodhana processes. In raw sample, total 3 peaks were found whereas 3-7 peaks
were observed in the purified samples under 254 nm. This disappearance and newly appearance of peaks suggest the extraction of some components like strychnine and formation of some new compound during Shodhana process. The Rf values of Strychnine standard is found as 0.55 which is also present in raw sample & 0.54 nearest in all shodhit sample as per mention in table no.2 Decrease in Strychnine content was found in all the Shodhita samples when compared to the raw drug Table no 1. Strychnine content was found to be lowest in the sample purified by water (SW) when compared to the other samples. It might be due to the reason that during Shodhana processes, some amount of Strychnine was removed by diffusion process into water. Further frying in Goghrita also initiated more diffusion of the alkaloids from the seeds as well as some amount of Strychnine might have been converted into lesser toxicity. Removal of some constituents from the raw seeds were also confirmed by observing the changes in organoleptic characters like color, odor & taste occurred in the media as well as in the samples during Shodhana process.

**CONCLUSION**

- Based on the yield of final product, water (GR IV SW ) may be considered as best media for Shodhana in respect to others three.
- *Goghrita (GR II SGg)* may be considered as the better media for Shodhana when compared to the others on the basis of easy applicability, time saving and cost effectiveness than other two gropes.
- Highest reduction in the toxic strychnine contents was observed in the Water procedure group IV (first dipping in water for 8 days followed by roasted on Goghrita) of Kupeelu Shodhana. Hence, it may be concluded that alkaloids present in the Kuchala may be most of water soluble. This Shodhana method is more cost effective & easy applicable than the other three. So this method is best classical text method that can be used for shodhan of drug Kuchala.

**Further scope of study:**

From this topic it may be concluded that drugs contains toxic alkaloids which are most of water soluble may be purified by above method i.e. dipping in water for 8 days & (then after making it coverless )followed by Bharjana (roasting)on Goghrita. Further study can be done on this topic.
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