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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

Greentree Group

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INTRODUCTION

Kuchala is mentioned as a Vanaspatija Visha and has been mentioned as one of the 11 Upavisha in Rasatarangini[1].It is described as Phala Visha in Sushruta Samhita[2]. It is included in Surasadi Gana in Sushruta , Amradi Phala Varga in Bhavaprakash [3] and in Vishatindukadi Varga in Nighantu Adarsh[4]. Modern toxicology has classified Strychnos Nux vomica as a Neurotic Spinal Excitant poison[5]. 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[6]. In *Agadtantra*, Kuchala (Strychnos Nux–Vomica) is classified in to Sthavar Upvisha & also Phalavisha. In modern toxicology Kuchala is classified as a spinal poison[7]. 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

अन्नम् शाल्यादि सन्सिध्दम् प्रक्शिप्तम् त्रिगुनए जले ।

धान्यम्लम् सन्धितम् प्रोत्कमारनालम् च काञ्जिकम् ॥

शालिकोद्रवमन्दैर्वा सन्दितम् काञ्जिकम् भवेत|

(द्रव्यगुणविग्यान)

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)विषतिंदुकबीजानि विन्यसेद् ग्रुहवारिणि ।

दिनत्रयं प्रयत्तेन त्वपनीय बहिस्त्वचम्॥१७२॥

निदाये चाश संतोष्य चूण्रेयेत विषजांवरः ।

एव विशुध्दिमायाति सर्व विषतिनम्दुकम् ॥१७३॥ रसतरंगिणी 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

Group1st (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

कारस्करस्य बिजनि त्वतिमंदाग्नियगतः ।

निधाय पिष्टपचने तावदाज्येन भर्जयेत् ॥ १७४॥

यावद् बहिस्त्वचा किंबिज्याजते कपिशप्रभा ।

कुचेलमेवं त्वरितं शुद्धिमायात्मनुत्त्माम् ॥१७५॥

रसतरंगिणी अध् २४ (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 – Rasatarangi

विषतिन्दुकबीजानि पात्तेल्यां विन्यसेद् भिषक्।

स्वेदयेत् गव्यपयसा दोलिकायंत्र मार्गातः ।।१७६॥

एवं यामैकमात्रेण शुद्धिमायात्सनुत्तमाम् ।

शोधितं तिन्दुकं त्वेकं वीतशंकाः प्रयोजयेत् ।।१७७॥ रसतरंगिणी अद् २४(१७६\१७७)

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 – किंचिदाज्येन संभ्रुष्टो विषमुष्टो विशुध्यति ।४४। ब्रुहदयोगतरंगिणी 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 shodhit samples were compared with standard strychnine.

Table 1 The quantification of strychnine by HPTLC

No	Sample	Strychnine %
1	RM	0.191
2	SKJ	0.147
3	SGG	0.089
4	SGD	0.104
5	SW	0.049

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

No	**Sample**	**No.of peaks**	**RF value**
1	**Standard**	**3**	**0.55**
2	**RM**	**10**	**0.55**
3	**SKJ**	**7**	**0.54**
4	**SGG**	**7**	**0.54**
5	**SGD**	**7**	**0.54**
6	**SW**	**7**	**0.54**

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 R_f 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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