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Preparation and Physio-Chemical Analysis of Vibhitaki Kshara Sootra

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ABSTRACT
Ksharasootra is a unique para surgical procedure described in Ayurveda,indicated in management of bhagandara ,nadivrana ,arsha and other conditions requiring controlled chemical cauterization .Traditionally ,aparmargaksharasootra has been the most extensively studied and practiced form.However ,recent research has explored alternative formulations using different ksharadravyas to enhance efficacy ,biocompatibility and availability of raw materials.amongthese,vibhitakiksharasootra prepared from vibhitakiphala has shown promising results . sootra preparation was carried out on surgical linen thread no.20 employing consecutive coatings of snuhiksheera ,haridra and vibhitakikshara under controlled conditions.The finished ksharasoootra was assessed for physicochemical parameters including tensile strength,diameter , pH ,ash value ,loss on drying and kshara content .the prepared ksharasootra exhibited uniform layering,optimal tensile strength,and a strongly alkaline PH consistent with therapeutic expectations.physicochemical values remained with acceptable pharmcopeial limits. Preliminary observations suggest potential for enhanced wound healing and cauterizing properties due to bioactive tannins and alkaloids of vibhitaki

Key words: Ksharasootra, vibhitakiphala, standardization, Terminalliabellerica, susruthasamhitha

I. INTRODUCTION

Ksharasootra is a unique para surgical formulation described in ayurvedic literature ,especially in susruthasamhitha ,for the management of anorectal disease,chronicsinuses,non- healing wounds and various inflammatory conditions .It is traditionally prepared using snuhiksheera ,apamargakshara and haridrachoorna which together impart potent cutting ,scrapping ,debridement and healing properties .the alkaline nature of ksharasootra enables controlled chemical cauterization while the latex and herbal alkalies contribute to sustained antimicrobial and tissue regenerative effects.

Vibhitaki one of the constituents of the classical triphala formulation is well known for its anti-microbial ,anti-inflammatory ,astringent and wound healing properties .the fruit of vibhitaki contains bioactive tannins and phenolic compounds which can contribute to alkaline strength and therapeutic potency when converted into kshara .Using vibhitaki in ksharasootrapreparation not only aligns with classical principles of ksharanirmana but also offers the potential for enhanced pharmacological activity and broader clinical applicability

Traditional apamargaksharasootra has been widely studied ,literature on vibhitakiksharasootraremains limited .scientific assessment of its physicochemical parameters is essential to ensure standardization,reproducibility ,quality control and therapeutic reliability.parameters such as pH, tensile strength ,ashcontent ,loss on drying ,diameter and microbial load offer insight into the formulationsstability ,chemicalcomposition ,alkalinity and safety

Therefore the present study aims to prepare vibhitakiksharasootra by following classical vibhitakiksharasootra by following classical ayurvedic guidelines and to evaluate its physicochemical characteristics based on standard analytical methods .Establishing these parameters will contribute to the development of a scientifically validated and potentially more effective ksharasootra variant for clinical practice.

Aims and objectives :

- Preparation of vibhitakiksharasootra
- Develop analytical profile of vibhitaki kshara sootra

II. MATERIALS AND METHODS

The study is aimed to conduct the preparation and physico chemical evaluation of vibhitaki kshara sootra

A.**COLLECTION OF RAW DRUGS**

The raw drugs required for the preparation of ksharasootra are collected directly from the source and drug identification done from Dravya gunadepartment,GAVC TVM

Sl no.	Raw drugs	Collection method
1.	Vibhitaki (Terminalia bellerica)	Directly from source
2.	Haridra (Curcuma longa)	Directly from the source
3.	Snuhi(Euphoria nerifolia)	Directly from the source

Table No 1:Raw drug and collection method

B.**PREPARATION OF MRIDU VIBHITAKI KSHARA**

Preparation of pratisaraneeyakshara is the burning of raw drug into fine ash.For the complete burning of raw drugs constant fire is needed for a long time

Materials required

- Dried vibhitakiphala
- Vessels –stainless vessel (2 in number)
- Lighter
- Sieving mesh
- Stainless steel spatula
- Clean cotton cloth (2 folded)
- Measuring glass cylinder
- Water sufficient quantity
- Heating device –gas stove
- Weighing balance
- Airtight glass container

Preparation of mriduvibhitakikshara

Kshara is prepared by burning vibhitakiphala and ash collected in a vessel ,then ash was mixed with 6 parts of water ,the ash allowed to settle down ,the supernatant water is collected and filtration was repeated for 21 times using double layered clean cloth.The liquid was then evaporated slowly on mandagni..By evaporating a uniform fine clear light greenish yellowpowder, mridukshara was produced at the end of boiling. The alkaline kshara, with a pH of 9.8 is sealed in glass bottle

C. **PREPARATION OF KSHARA SOOTRA**

Materials needed for vibhitakiksharasootra preparation

1. Barbours surgical linen thread no 20
2. Mriduvibhitakikshara
3. Sterile glove
4. Haridra powder
5. ksharasootra hangers
6. ksharasootra cabinet with ultraviolet light
7. Snuhiksheera
8. Glass tube for packing prepared ksharasootra
9. Sterile steel vessel

- Barbour linen surgical thread no 20 is fixed to ksharasootra hangers,
- snuhiksheera smeared on the thread and dried in the ksharasootracabin
- The same process is repeated for 11 times,then 7 coating with vibhitakiksharaand snuhiksheera repeated for 7 times,then remaining 3 coatings with snuhiksheera and haridrachoorna

- When all hangers are processed,the cabinet should be closed properly and let it for UV sterilization

Method of analysis of vibhitakiksharasootra

Chemical parameters were tested from:

1.	Loss on drying at 105 degree celsius	Drug testing lab,Govt Ayurveda college ,TVM
2.	pH	Drug testing lab,Govt Ayurveda college,TVM
3	sodium	CSIR NIIST pappanamcode,TVM
4.	potassium	CSIR NIIST,pappanamcode,TVM
5.	Total alkalies	CSIR-NIIST,pappanamcode,TVM
6.	curcumin	Niogenix research center,valiyavila PO thirumala,TVM
7	Min.breaking load	HINDUSTAN LATEX LIMITED

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		(HLL) Akkulam factory ,TVM
8.	Diameter or thickness	HINDUSTAN LATEX LIMITED (HLL) Akkulam factory ,TVM
9.	Tensile stength	HINDUSTAN LATEX LIMITED (HLL) Akkulam factory ,TVM

Table No 2: list of analytical parameters and laboratories

Observations and results

sample	Weight of raw drug in wet form	Weight of raw drug in dry form	Amount of ash obtained	Amount of water added	Amount of ksharodaka after filtration	Amount of kshara obtained
Terminalia bellerica	5 kg	1 kg	50 g	960 ml	450 ml	10 g

Table no 3: weight of sample and obtained kshara


Fig 1


fig 2


fig 3

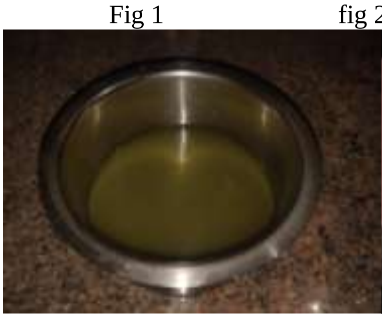
Fig 4


fig 5


fig 6

Fig 1: vibhitaki collected directly from the source
Fig 2: burning of dried vibhitakiphala
Fig 3: ashes obtained
Fig 4: mixed with water
Fig 5: filtration
Fig 6: ksharasootra preparation with vibhitakimridukshara,snuhiksheeraand haridrachoorna

characteristics	Vibhitakiksharasootra
colour	Light yellowish green
Taste	pungent
odour	Strong odour
appearance	Sticky thread

Sl .no	Parameters tested	unit	Result in vibhitakiksharasootra
1	Loss on drying @ 105 degree celsius	%	21.82
2	pH		9.8
3	sodium	%	0.262
4	pottasium	%	153.7
5	Sulphated ash	%	14.69
6	Total alkalies	%	28
7	curcumin	%	0.801
8.	Length of thread	cm	30
9.	weight	g	0.26
10.	Diameter	mm	.85
11.	Tensile strength	kg	774.2 kgf/cm^2

III. DISCUSSION

The preparation of vibhitakiksharasootra in the present study followed classical ayurvedic principles and the resulting formulation demonstrated physicochemical characteristics comparable to standard ksharasootra preparations described in pharmacopeial guidelines.

The alkaline ph observed in the prepared sootra aligns with the expected properties of ksharawhich is essential for its cheda,bhedana and lekhanaactions.the alkalinity likely reflects the presence of sodium, potassium derived from the ash of Terminalia bellericafruits. these components contribute to chemical cauterization and aid in sloughing necrotic tissue a key mechanism underlying ksharasootra therapy

Tensile strength and diameter measurements are critical for practical application as the thread must be durable enough to withstand mechanical tension during clinical use.the prepared vibhitakiksharasootra exhibited satisfactory tensile strength suggesting that the layering process with snuhiksheera was uniform and structurally reinforcing .

Snuhi latex acts only as a binding agent but also enhances antimicrobial and proteolytic effects supporting both stability and therapeutic efficacy

Physicochemical parameters such as loss on drying, ash value and ksharacontent were within acceptable limits indicating proper preparation and adequate layering .A controlled moisture level is particularly significant for preventing microbial contamination

Vibhitaki's inherent pharmacological properties such as antimicrobial ,anti-inflammatory and wound healing effects may further augment the therapeutic potential of ksharasootra .the presence of bioactive compound like tannins and phenolics could provide additional astringent and antioxidant actions which may contribute to faster wound healing and better local tissue response .with appropriate validation, vibhitakiksharasootra possess favourable physicochemical properties and holds potential as an effective para surgical formulation.

IV. CONCLUSION

The present study successfully prepared vibhitakiksharasootra following classical ayurvedic procedures and evaluated its physicochemical characteristics .the formulation demonstrated strong alkalinity ,uniform coating ,adequate tensile strength indicating good stability ,safety and manufacturing feasibility .the presence of bioactive constituents in terminalia bellerica suggests potential additional benefits such as antimicrobial, astringent and wound healing activities which may enhance the therapeutic effect of sootra. however further studies including detailed pharmacological evaluation, stability analysis and controlled clinical trials are required to confirm its therapeutic efficacy and establish role in clinical practice

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