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Modification Of Dosage Form Of Shadanga Paniya (Sharkara) And Its Pharmaceutical, Analytical Standardization

Dr. Vishal Kumar Tanwar[1], Prof. (Dr.) Vidushi Tyagi[2]

1. PG Scholar, PG Department of Rasa Shastra Evum Bhaishajya Kalpana
2. Chairperson, PG Department of Rasa Shastra Evum Bhaishajya Kalpana

Institute for Ayurved Studies and Research, Faculty of Ayurved, Shri Krishna AYUSH University, Kurukshetra, Haryana 136118

Corresponding Author
Name- Dr. Vishal Kumar Tanwar

Abstract

In this study an effort was made to modify the Shadanga Paniya (a medicated water) into Sharkara Kalpana (syrup) to increase its palatability, shelf life, therapeutic use and standardized this formulation. The Shadanga Paniya (medicated water) has bitter and astringent taste which hampers the palatability and has low shelf life. Whereas Sharkara kalpana (syrup) is widely acceptable dosage form due to its palatability, wide therapeutic applicability, longer shelf life, reduced dose and easy administration.

The raw materials were collected, authenticated and standardized as per API guidelines. These were evaluated for foreign matter, pH, total ash, loss on drying, acid-insoluble ash, alcohol-insoluble extract, water-soluble extract and TLC. Several trial batches of Shadanga Paniya Sharkara were formulated, of these with the most pleasant taste and stable formulation was chosen. Then final 5 batches were prepared and standardized for various evaluation parameters such as Organoleptic characters, Physico-chemical parameters, heavy metals, aflatoxins, microbial contamination, pesticides residue and HPTLC.

Keywords : *Ayurvedic formulation, Standardization, Shadanga Paniya, Sharkara Kalpana,*

Introduction

Most of the traditional systems of medicine are effective but they lack proper standardization. Standardization is an important step for the establishment of a consistent biological activity, a consistent chemical profile or simply a quality assurance program for production and manufacturing of herbal formulations. Shadanga Paniya is a kind of independent Yoga (formulation). It is considered as 'Aushadh Siddha Paniya Kalpana' (Medicated Water). The Shadanga word represents six different ingredients.i.e Musta, Parpatak, Ushira, Chandana, Uddichya, Nagar.[1] The second word, Paniya, literary means liquid media or water as a medium. It is useful in

Pipasa, Daha and Jwara as mentioned in Charaka Samhita.[2] The Shadanga paniya (medicated water) has bitter and astringent taste which hampers the palatability and has low shelf life. Whereas Sharkara kalpana (syrup) is widely acceptable dosage form due to its palatability, wide therapeutic applicability, longer shelf life, reduced dose and easy administration.

Objectives

- ✓ To collect the raw material from reliable sources.
- ✓ To prepare Shadanga Paniya (sharkara).
- ✓ To standardize the pharmaceutical method of Shadanga Paniya (Sharkara).
- ✓ To fix the standards of Analytical parameters of prepared medicine.

Material and Methods

➢ **Collection, Identification and Authentication of Raw Drugs**

The raw materials used to prepare Shandanga Paniya, Musta (Cyperus rotundus), Parpatak (Fumaria parviflora), Ushir (Vetiveria zizanioides), Rakta Chandan (Pterocarpus santalinus), Udichiya (Pavonia odorata) and Shunthi (Zingiber officinalis) was procured from the local vendor of Ayurvedic herbs from Kurukshetra market. Raw drugs was identified by PG department of Dravyaguna, IASR, SKAU, Kurukshetra on the basis of their macroscopic charcters mentioned in API. Authentication of raw drugs was on the basis of the parameters mentioned in API4 i.e. Foreign matter, total ash, acid insoluble ash, loss on drying, water soluble extractive, alcohol soluble extractive, pH, TLC carried out in Government Drug Testing Laboratory, Kurukshetra and Satiate Research and Anatech Pv. Ltd., Panchkula.

➢ **Pharmaceutical Study of Shadanga Paniya Sharkara**

The five batches of *Shadanga Paniya Sharkara* was prepared in Shri Krishna AYUSH Pharmacy with Lic no. 1300-ISM-(HR), PG Department of Rasa Shastra evum Bhaishajya Kalpana, IASR, SKAU, Kurukshetra.

Total 15 trial batches were made following different methodology in order to form a Standard Operating Procedure (SOP) for *Shadanga Paniya Sharkara*.

मुस्तपर्पटकोशीरचंदनोदीच्यनागरैः।श्रृतशीतंजलंदध्यातपिपासाज्वरशान्तये।।(चक्र०१/१९)

यदप्सुश्रृतशीतासुषडंगादिप्रयुज्यतेाकर्षमात्रंततोद्रव्यसाधयेतप्रास्थिकेऽम्भसि।(चक्र०१/२१)

हिमेफाण्टेश्रृतेऽर्केवाशर्कराद्विगुणंक्षिपेत्।मंदेऽग्नौसाधितंपूतंपटात्तच्छार्करंस्मृतं। (द्र०गु०वि०उ०२/५६)

When the syrup trial batches of Shadanga Paniya were prepared according to the reference of Chakradutta and Dravyaguna Vigyaniya book by Acharya Yadav Ji Trikam ji, the crystals were formed and the original taste of Shadanga Paniya was disappeared. For this, 3 batches were prepared or repeated and in all the 3 batches the problem of crystallisation and loss of taste & colour of Shangapaniya was present.

➢ **Equipments required for the preparation of final batches of Shadanga Paniya (Sharkara): -**

Table 1

S.no.	Equipment	Dimension	Wt.	Quantity
1	Weighing balance	21.5cm* 22cm	1.2kg	1
2	Tray for drying	38 cm* 33cm *6cm	665gm	1
3	Tray for weighing	15.5cm* 15.5cm* 3cm	100gm	1
4	Imamdasta Musal	Depth- 26.2cm Dia- 21.5cm Length- 38.5cm Dia- 3cm	6 kg	1
5	Sieve	Dia- 20.5cm Height – 6cm Depth – 5cm	300gm	1
6	Kadahi	Dia.- 26cm Depth- 9.5cm	1280gm	1
7	Spoon	Length- 20 cm Mouth- 4.5cm* 3cm, Length- 16 cm Mouth- 5 cm* 3.5cm	35gm 33gm	1 1
8	Digital Thermometer	24 cm with 15 cm nobe	22gm	1
9	Induction Stove			1
10	Muslin cloth	40cm* 45cm		1
11	Beaker	Height- 11.8cm Dia- 8.5cm	287gm	1
12	Glass bottle	Height- 10cm Dia- 5cm		5

➢ **Formula for Shadanga Paniya Sharkara**

Table 2

	Ingredients	Botanical name	Family	Part used	Quantity
1.	*Musta*	*Cyperus rotundus*	Cyperaceae	Rhizome	1 part
2.	*Parpatak*	*Fumaria parviflora*	Fumariaceae	Whole plant	1 part
3.	*Ushir*	*Vetiveria zizanioides*	Graminae	Root	1 part
4.	*Rakta Chandan*	*Pterocarpus santalinus*	Fabaceae	Wood	1 part
5.	*Udichiya*	*Pavonia odorata*	Malvaceae	Root	1 part
6.	*Shunthi*	*Zingiber officinale*	Zingiberaceae	Rhizome	1 part
7.	*Mishri*	*Saccharum officinarum*			1.5 parts
8.	*Water*				768ml (812gm)

Method of Preparation[3,4]

1. The ingredients of *Shadanga Paniya* were washed, dried.

2. Then Ingredients were coarsely powdered with the help of *Imamdasta* separately.

3. 2gm Coarse powder of each drug total 12gm (1 tola) was soaked in (64 tola) 768ml (812gm) of water overnight.

4. The next day it was taken in a stainless-steel vessel and boiled on mild heat at a temp. of 100^0 C.

5. Water was slowly evaporated and reduced to ½ of the original volume i.e. 384 ml (422gm)

6. Decoction was filtered through single folded cotton cloth.

7. This filtrate was collected as *Shadanga Paniya.*

8. The *Shadanga Paniya* was taken and 1.5 times of *mishri* was added to it along with 1.5gm of citric acid.

9. Then it was again boiled on mild heat at a temp. 100^0 C and stirred continuously.

10. Boiling was continued till it attained the one thread or honey like consistency.

11. Then after attained desired consistency it was filtered through muslin cloth and kept for some time to cool down.

12. After self-cooling it was then collected in a glass jar.

➢ **Analytical study of Shadanga Paniya Sharkara**

Analytical parameter tests of Shadanga Paniya Sharkara[5] included description, colour, odour, taste, consistency, composition, total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive, reducing sugar, non-reducing sugar, total sugar, losss on drying, total solid, acid value, pH, heavy metal test, microbial test, aflatoxins, pesticide residue test, HPTLC were carried out at Government Drug Testing Laboratory, Kurukshetra, Intersteller Testing Centre, Panchkula, Vardan Envirolab, Gurugram.

Result and Observation

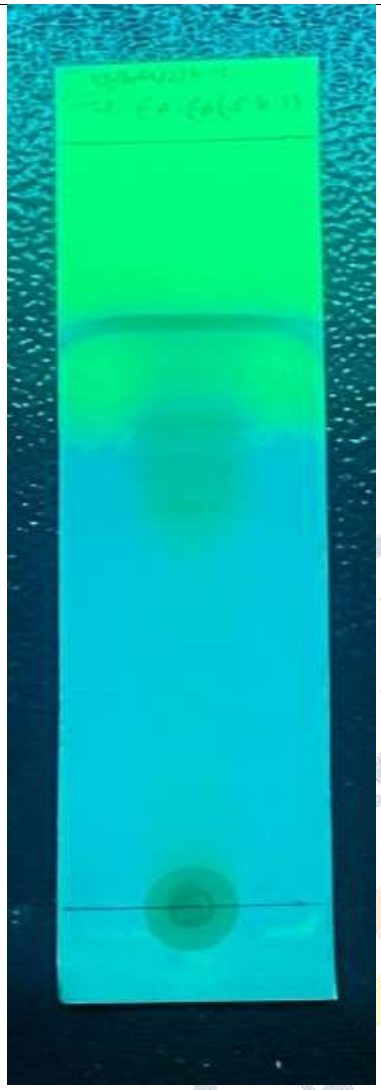
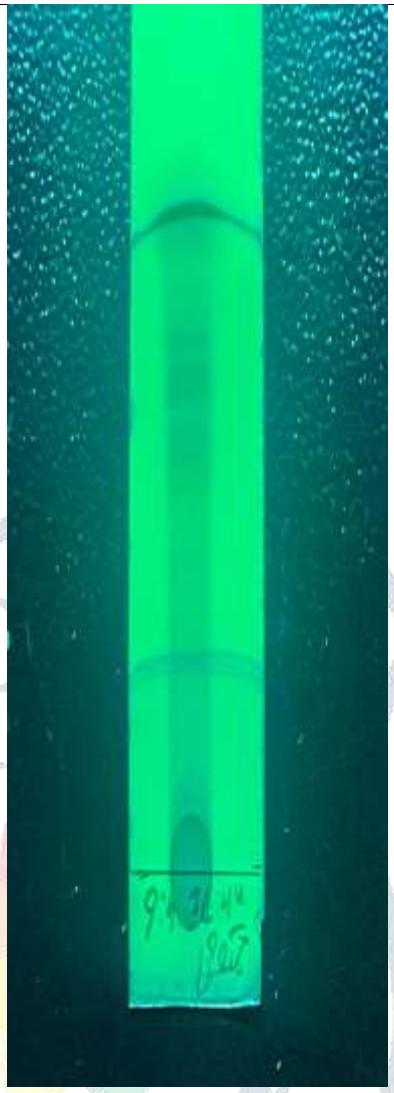
Analysis of Raw Drugs

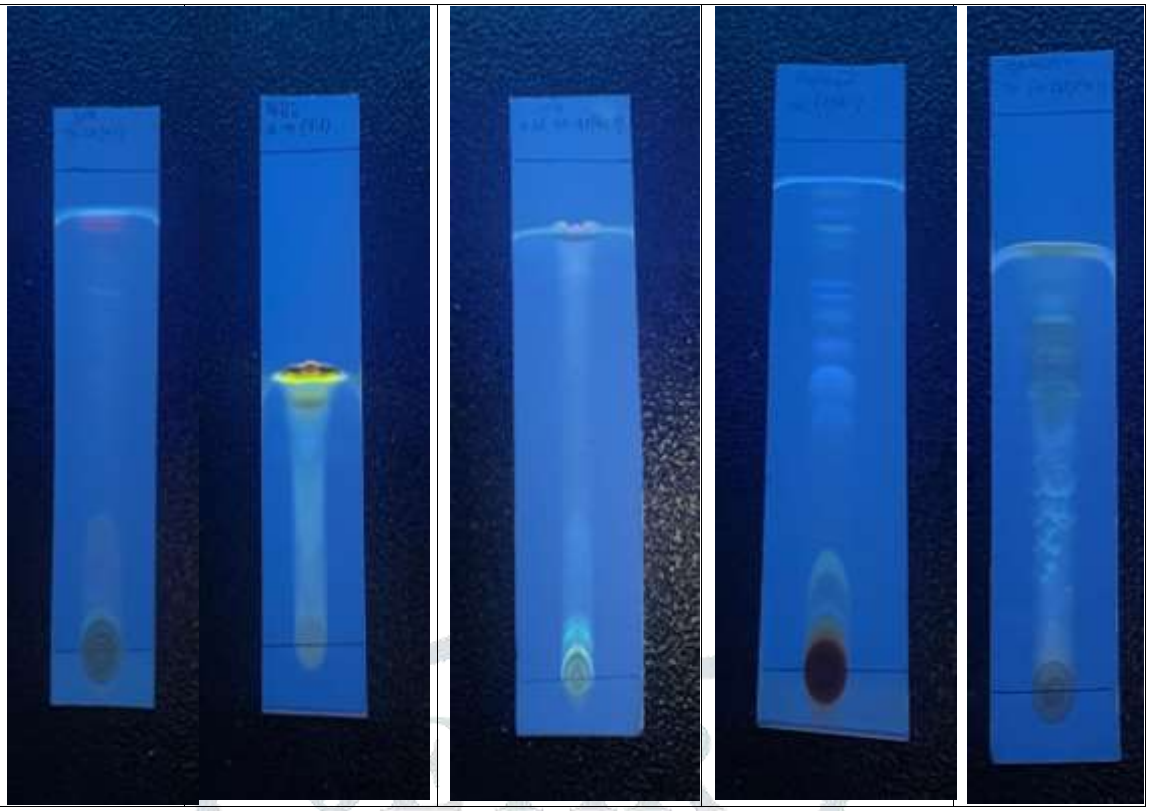
Table 3

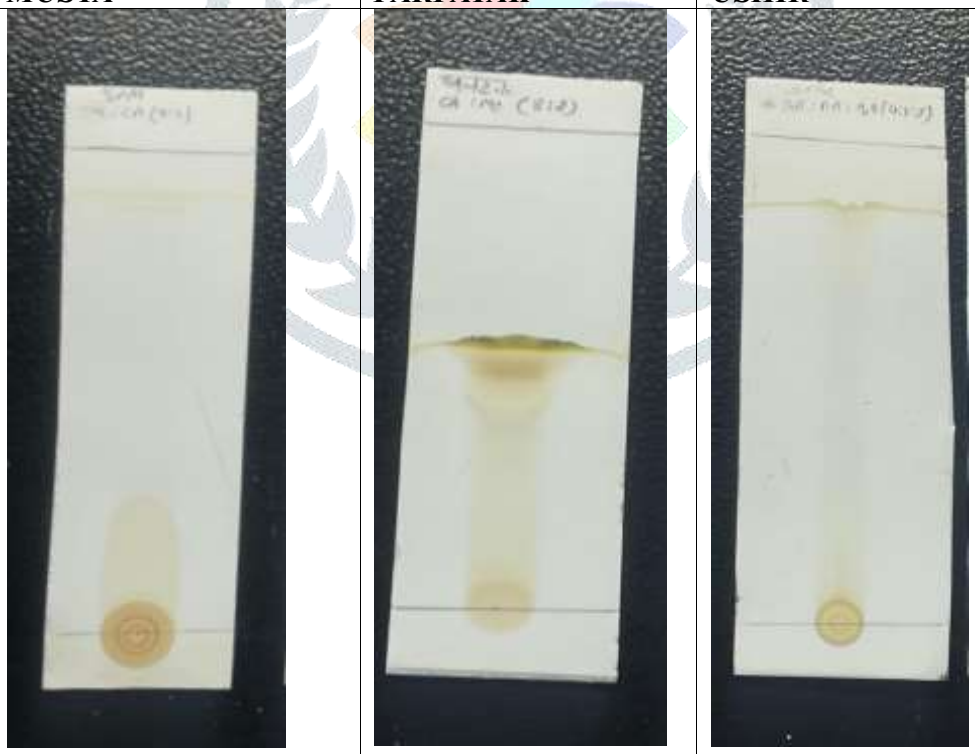
Sr.No.	Name of Raw Drug	Foreign Matter (% By mass)	Loss on Drying at 105^0C	Total Ash (%)	Acid Insoluble Ash (%)	Water soluble extract (%)	Alcohol Soluble extract (%)	pH	TLC (Rf)
1.	***Mustak***	0.44	5.24	6.82	0.94	20.71	14.5	5.5	0.44, 0.73 0.88
2	***Parpatak***	0.32	4.88	8.82	1.14	35.26	12.6	7	0.13, 0.67 0.93
3.	***Ushir***	0.72	5.40	8.91	1.88	9.67	5.7	6	0.28, 0.19 0.49, 0.22 0.94
4.	***Rakta Chandan***	Nil	5.37	1.17	0.10	5.23	14.3	6.1	0.14, 0.18 0.50, 0.76 0.82
5.	***Sugandh bala***	0.13	5.08	4.78	0.85	24.56	15.5	5	0.7,0 .83,0 .44,0 .43 0.62 0.64
6.	***Shunthi***	Nil	5.42	5.25	0.71	19.10	15.3	4.7	0.60, 0.54, 0.77

TLC Plates of Raw Drugs: Observations of TLC plates are shown below

Table 4

	SUGANDHBALA		*SHUNTHI*		
At 254 nm uv light					
	MUSTA	***PARPATAK***	***USHIR***	***RAKTA CHANDAN***	***SUGANDH BALA***

At 366 nm uv light	

	MUSTA	***PARPATAK***	***USHIR***
At visible light			
	RAKTA CHANDAN	***SUGANDHBALA***	***SHUNTHI***

At visible light	  

Pharmaceutical Study Of Shadanga Paniya Sharkara

Observations During Preparations

Table 5

	Batch 1	**Batch 2**	**Batch 3**	**Batch 4**	**Batch 5**
Kwatha	380ml = 410gm	385ml = 412gm	380ml = 410gm	382ml = 411gm	384ml = 412gm
Mishri	576gm + 200ml water	576gm + 200ml water	576gm + 200ml water	576gm + 200ml water	576gm + 200ml water
Total quantity	1156ml	1161ml	1156ml	1158ml	1160ml
Citric acid .2%	2.3gm	2.3gm	2.3gm	2.3gm	2.3gm
***Syrup* yield**	520ml = 769gm	540ml = 799gm	500ml = 740gm	530ml = 784gm	520ml =769gm
Temp.	100^0 C	100^0 C	100^0 C	100^0 C	100^0 C
Time	65min	60min	70min	65mn	65min
Loss	636ml	621ml	656ml	628ml	640ml
Loss%	55%	53.4%	56.7%	54.2%	55%
Odour	Characteristics	Characteristics	Characteristics	Characteristics	Characteristics
Colour	Reddish - brown	Reddish - brown	Reddish - brown	Reddish - brown	Reddish - brown
Taste	Desirable	Desirable	Desirable	Desirable	Desirable
Consistency	Honey like	Honey like	Honey like	Honey like	Honey like

Pounding of *Musta*

Pounding of *Parpatak*

Pounding of *Rakta chandan*

Pounding of *Sugandhbala*

Pounding of *Shunthi*

Shadanga Paniya preparation at 100^0 C

Shadanga Paniya

Mishri

Citric acid

Adding *mishri*

Heating at 100^0 C

Stirring properly

Boils at 100^0 C

Sharkara (syrup)

Filteration

After filteration

Transfer to air tight glass bottle

Kept in air tight glass bottles

Confirmatory Test of Sharkara

1. The mixture attains 1-2 thread consistency.
2. During Sharkara Paka, a part of paka material settles down without spreading when put in a bowl of water.
3. The mixture attains honey like consistency.
4. The product possess the desired odor and colour of the liquid preparation used.

All the confirmatory tests were present in all the 5 batches.

1 thread consistency

Honey like consistency

Analytical Study of Shadanga Paniya Sharkara

Organoleptic Characters of Shadanga Paniya Sharkara Batches

Table 6

Batch	Description	Color	Odour	Taste	Consistency
1	*Shadanga Paniya Sharkara*	Reddish-brown	Characteristic	Sweet	Semi liquid
2	*Shadanga Paniya Sharkara*	Reddish-brown	Characteristic	Sweet	Semi liquid
3	*Shadanga Paniya Sharkara*	Reddish-brown	Characteristic	Sweet	Semi liquid
4	*Shadanga Paniya Sharkara*	Reddish-brown	Characteristic	Sweet	Semi liquid
5	*Shadanga Paniya Sharkara*	Reddish-brown	Characteristic	Sweet	Semi liquid

All the Batches shows the same organoleptic characters i.e. description, colour, odour, taste, consistency.

Physico-chemical Parameters

Observations of Physico-chemical parameters of all batches

Table 7

Batch	1	2	3	4	5
pH	5.40	5.38	5.35	5.45	5.41
Reducing sugar	51%	53.04%	55.72%	55.20%	55.43%
Non-reducing sugar	8%	8.59%	8.16%	8%	8.07%
Total sugar	59%	61.63%	63.88%	63.20%	63.50%
Total solids	63.39%	66.90%	67.18%	66.52%	68.27%
Specific gravity	1.394	1.373	1.443	1.384	1.476

The findings related to physico-chemical parametrs of *Shadanga Paniya (Sharkara)* batches reveals that the pH lies in between 5.35 to 5.45, while reducing sugar is in between 51% to 55.72%, while non reducing sugar varies in between 8% to 8.59% while total sugar is in between 59% to 63.88% while the total solids lie in between 63.39% to 68.27% and specific gravity varies in between 1.373 to 1.443.

Tests for Heavy metals[6]

Lead, Arsenic, Cadmium, Mercury was analysed in prepared batches of *Shadanga Paniya (Sharkara).* The quantity of heavy metals present in it are below the limit mentioned in API. The amount of Lead present is less than 10 ppm and other heavy metals are below the limit of quantification.

Table 8

Heavy Metals	Batch 01	Batch 02	Batch 03	Batch 04	Batch 05
Lead	0.15 ppm	0.19 ppm	0.13 ppm	0.15 ppm	0.18 ppm
Cadmium	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)
Mercury	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)
Arsenic	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)	BLQ(LOQ:0.10)

Test for Aflatoxins[7]

Test was performed for B1, B2, G1, G2 and these were not detected in *Shadanga Paniya (Sharkara)*

Table 9

Aflatoxins	Batch 01	Batch 02	Batch 03	Batch 04	Batch 05
B1	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
B2	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
G1	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
G2	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Test for Microbial contamination[8]

Total microbial count, total fungal count, E-coli, Salmonella, Pseudomonas aeruginosa, Staphylococcus aureus count was calculated by following the method mentioned earlier and the values comes out are within the limit of microbial count mentioned in API. Total microbial count and total fungal count are below the NMT 100000/gm and NMT 1000/gm resp. and specific pathogens is found absent.

Table 10

Microbial contamination	Batch 01	Batch 02	Batch 03	Batch 04	Batch 05
Total viable aerobic count	25 cfu/ml	20 cfu/ml	30 cfu/ml	25 cfu/ml	30 cfu/ml
Total Fungal count	<10cfu/ml	<10cfu/ml	<10cfu/ml	<10cfu/ml	<10 cfu/ml
E. coli	Absent/ml	Absent/ml	Absent/ml	Absent/ml	Absent/ml
Salmonella	Absent/ml	Absent/ml	Absent/ml	Absent/ml	Absent/ml

Staphylococcus aureus	Absent/ml	Absent/ml	Absent/ml	Absent/ml	Absent/ml
Pseudomonas aeruginosa	Absent/ml	Absent/ml	Absent/ml	Absent/ml	Absent/ml

Test for Pesticide Residues[9]

Pesticide residues were quantified in *Shadanga Paniya (Sharkara*) Batches and they were found below the detection limit.

Table 11

Pesticide Residues	**Batch 01**	**Batch 02**	**Batch 03**	**Batch 04**	**Batch 05**
Bromopropylate	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Chlordane (Sum of cis, trans and oxythlordane)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Cypermethrin (and isomers)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
DDT (its isomers)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Deltamethrin	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Dichlorvos	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Dithiocarbamates (as CS2)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Endosulfan	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Endrin	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Ethion	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Fenitrothion	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Fonofos	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Heptachlor	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Hexachlorobenzene	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Hexachlorocyclohexane Beta Isomer	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Malathion	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Methidathion	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Parathion	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Parathion methyl	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)

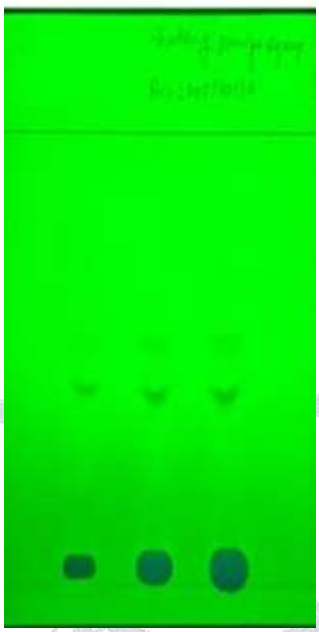
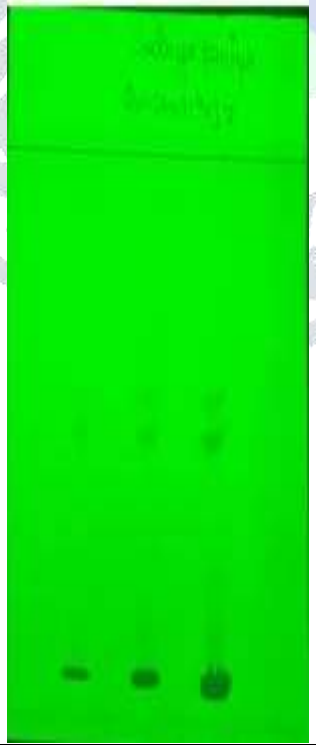
Permethrin	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Phosalone	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Piperonyl butoxide	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Primiphos-methyl	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Pyrethrins	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Quintozene	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Alachlor	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Aldrin & Dieldrin	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Azinphos-methyl	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Chlorfenvinphos	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Chlorpyriphos	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Chlorpyrifos-methyl	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Lindane (y-hexachlrocyclohexane)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)
Diazinon	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)	BDL(DL:0.005)

HPTLC

Different chromatograms have been developed by using HPTLC techniques. Mobile Phase used for this was Toluene:Ethyl acetate:Formic acid:Methanol (6:4:1:0.4), Scanning wavelength 254nm, 366nm, 500nm. The Rf value obtained from the HPTLC was analysed, matched with the Rf of raw drugs used for preparation of *Shadanga Paniya (Sharkara)* and found that the raw drugs can be easily identified in finished product.

HPTLC plates at 254nm of final batches

Table 12

1		2		3	
4		5			

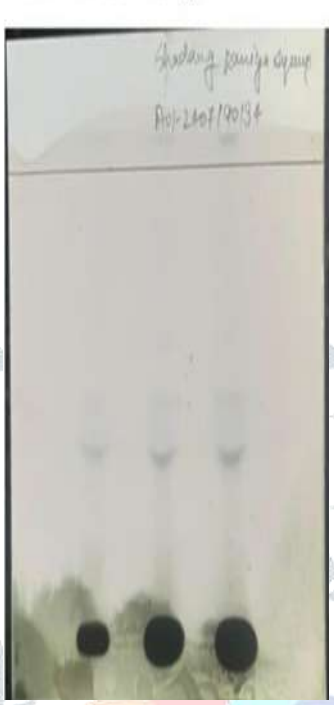
HPTLC plates at 366nm of final batches

Table 13

1		2		3	
2		5			

HPTLC plates at visible light of final batches:

Table 14

1		2		3	
4		5			

HPTLC Rf values of final batches are shown below

Table 15

Drugs	API Rf	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
Musta	0.44,0.55 0.73,0.88	0.44 0.55 0.73	0.44 0.55	0.44	0.4, 0.55	0.44 0.55
Parpatak	0.07,0.10 0.13,0.19 0.20,0.29 0.50,0.60 0.67,0.79	0.07,0.10 0.19,0.50 0.60,0.67	0.07 0.19 0.29 0.60	0.10 0.13 0.19	0.10 0.19	0.07 0.10 0.19
Ushir	0.19,0.22 0.28,0.33 0.49,0.73 0.75,0.94	0.19 0.28 0.49 0.73	0.22 0.28 0.33	0.19 0.28 0.33	0.19 0.22	0.19 0.22 0.33
Rakta Chandan	0.04,0.07 0.13,0.16 0.26.0.3 0.37,0.43 0.57,0.74	0.04 0.07 0.31 0.57	0.04 0.15 0.31 0.54	0.13 0.26 0.37 0.57	0.04 0.16 0.26	0.16 0.57
Sugandh bala	0.15,0.18 0.22,0.24 0.31,0.38 0.40,0.43 0.44,0.54 0.62,0.64 0.7,0.76 0.80,0.87	0.24 0.31 0.64	0.15 0.31 0.43 0.54	0.15 0.18 0.40	0.15 0.18 0.22 0.24	0.22 0.24 0.18
Shunthi	0.16,0.22 0.27,0.54 0.60,0.63 0.68,0.77	0.27 0.63 0.68	0.16 0.27 0.60	0.16 0.27 0.22	0.16 0.22 0.27	0.16 0.22

There was small difference in the physico-chemical parameters of *Shadanga Paniya* and *Shadanga Paniya Sharkara* as shown below in the table.

Table 16

Sr. No.	*Shadanga Paniya*	*Shadanga Paniya Sharkara*
pH	4.2	5.35 (Av.)
Total solids	81.2%	65% (Av.)
Specific gravity	1.0083	1.42 (Av.)

Conclusion

Lastly, In the context of the present work entitled, "Modification Of Dosage Form Of *ShadangaPaniya (Sharkara)* And Its Pharmaceutical, Analytical Standardization", is considered a promising aspect in the future clinical medicine.

From the observations, results and discussion,the following conclusion can be drawn:

The *Shadanga Paniya Sharkara* was prepared by utilising the authenticated and tested raw drugs. Adopted procedure for the preparation of *Shadanga Paniya Sharkara* can be suggested as its SOP (Standard Operating Procedure). The *Shadanga Paniya Sharkara* was reddish-brown coloured, characteristic odour, sweet in taste with semi liquid in consistency.

In the study, determination of physical and chemical parameters that are essential for the identification of raw drugs on the basis of available standard data was done.

The **determination of foreign matter** in the raw material showed that all ingredients were free from contaminants, confirming their high quality and purity. The **pH analysis** indicated that most raw ingredients are slightly acidic, supporting their potential antimicrobial properties in the *Shadanga Paniya* formulation. *Shunthi* exhibited the most acidic nature with a pH of 4.7. The **total ash content** revealed varying inorganic residue levels among the raw materials. *Ushir* had the highest total ash content 8.91%, while *Rakta Chandan* showed the lowest 1.17%, reflecting differences in mineral content. The **loss on drying** analysis showed moderate moisture content across all raw materials, with *Shunthi* exhibited the highest moisture content at 5.42%. This factor influences the formulations stability and shelf life. The **acid-insoluble ash** analysis demonstrated minimal contamination across most raw materias, with *Rakta Chandan* showed the lowest content at 0.10%, indicating fewer non-organic impurities. The **alcohol-soluble extract** analysis highlighting that *Sugandhbala* had highest 15.5% and *Ushir* had lowest 5.7% content. The **water-soluble extract** analysis showed that *Parpatak* (35.26%) and *Sugandhbala* 24.56% had the highest water-soluble extractive values, contributing to the properties of formulation. The **TLC results** revealed diverse bioactive compounds across the raw drugs, with multiple Rf values indicating the presence of a broad spectrum of active ingredients in the formulation.

The **HPTLC analysis** also identified diverse bioactive compounds in all the batches of the finished product *Shadanga Paniya Sharkara* and confirmed good separartion of these components. Lead, Arsenic, Cadmium, Mercury was analysed in prepared batches of *Shadanga Paniya (Sharkara).* The quantity of **heavy metals** present in it were below the limit mentioned in API. The amount of Lead present is less than 10 ppm and other heavy metals were below the limit of quantification. Test was performed for **B1, B2, G1, G2** and these were not detected in *Shadanga Paniya (Sharkara).* **Total microbial count**, total fungal count, E-coli, Salmonella, Pseudomonas aeruginosa, Staphylococcus aureus count was calculated by following the method mentioned earlier and the values came out were within the limit of microbial count mentioned in API. Total microbial count and total fungal count were below the NMT 100000/gm and NMT 1000/gm resp. and specific pathogens is found absent. **Pesticide residues** were quantified in all *Shadanga Paniya (Sharkara*) Batches and they were found below the detection limit.

The result obtained from the conducted tests found to be within the limit, as mentioned in guidelines given by CCRAS and Ayurvedic Pharmacopoeia of India.

Study revealed that the *Shadanga Paniya* Syrup prepared was of standard quality and a proper SOP was followed in its manufacturing and will be very useful for quality control of Shadanga Paniya (Sharkara), also to control the batches variation.

***Shadanga Paniya* can be converted into *Shadanga Paniya* Syrup.**

In Ayurvedic texts, *Shadanga Paniya* is used in *Trishna, Daha* and *Jwara*, Therefore *Shadanga Paniya* Syrup can also be used for the same with a dose of 40 ml dissolved in 250 ml of glass as per requirement of patient.

It is necessary to note here that the syrup cannot be used in diabetic patient and patients having improper carbohydrate metabolism.

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