



Research Article

www.ijrap.net



**PHARMACEUTICO-ANALYTICAL STUDY OF TRIVIDHA SNEHA PAKA OF
KSHEERA BALA TAILA**

Anand Kumar*, Sudheendra Honwad, Radhika Ranjan Geethesh P., Seema M.B
Dept. of PG Studies in Bhaishajya Kalpana, SDM College of Ayurveda, Kuthpady, Udupi, Karnataka, India

Received on: 07/08/12 Revised on: 22/10/12 Accepted on: 03/11/12

***Corresponding author**

E-mail: anand.sajjan85@gmail.com

DOI: 10.7897/2277-4343.03644

Published by Moksha Publishing House. Website www.mokshaph.com

All rights reserved.

ABSTRACT

To assess the differences between trividha paka of Ksheera bala taila namely Mrudu paka, Madhya paka and Khara paka it was subjected to pharmaceutical and analytical studies through organoleptic, physico-chemical and chromatographical methods.

The results were significant which revealed. Pharmaceutical study with maximum output of Ksheera bala taila obtained in Mrudu paka and minimum output in Khara paka. Analytical study revealed maximum extraction of unchanged-form active principles found in Madhya paka through the chromatographical method (HPTLC) and refractive index. Saponification value revealed shorter, medium and longer chain fatty acids presence in the Khara paka, Madhya paka and Mrudu paka respectively which has importance in its unique rate of absorption into the body.

Keywords: Ksheera bala taila, Trividha paka, HPTLC, Taila paka.

INTRODUCTION

Sneha kalpas are a group of products of medicated ghee (ghrita) and oil (taila). They have a better pharmacokinetic action in comparison to other dosage forms because of the lipid nature of bio-membranes of our body. Therapeutic utility of sneha (taila) is described on the basis of three types of sneha paka namely Mrudu, Madhya and Khara paka which are indicated respectively for nasya, abhyantara and abhyanga purposes. These different paka highlights the importance of pharmaceutical aspect of the formulation. Ksheera bala taila is one of sneha kalpa prepared by using Go ksheera, Bala moola kalka and Tila taila. To assess the importance of trividha paka, Ksheera bala taila was prepared and subjected for analysis.

MATERIALS AND METHODS

Materials required for the preparation of Ksheera bala taila were collected from SDM Ayurveda Pharmacy, Udupi. Preparation of Trividha paka of Ksheerabala taila was done in the Department of Bhaishajya kalpana, SDM College of Ayurveda, Udupi, Karnataka, India

The references followed for the preparation of Ksheera bala taila was done as per Sahasra yoga¹, Taila prakarana and for the assessment of its trividha paka was done according to Sharangdhara samhita², Madhyama khanda, 9 Adhyaya.

Analytical studies^{5,6} were conducted in Govt. College of pharmacy, Bangalore and SDM Research for Allied sciences, Udupi, Karnataka, India

Table 1: Ingredients and their quantity used for the preparation of Ksheera bala taila

Dravya	Matra	Quantity taken
Bala moola Kalka ³	5 Pala	240 g
Tila Taila	1 Prastha	770 ml
Go Ksheera	1 Aadhaka	3075 ml
Jala	1 Aadhaka	3075 ml

RESULTS AND DISCUSSION**Pharmaceutical Study**

Pharmaceutical study of Ksheera bala taila was divided into 3 Steps, namely

- Churna preparation.
- Kalka preparation.
- Taila paaka⁵.

Table 2: Weight variation observed during preparation of Churna

Quantity of drug taken (In grams)	Quantity of drug gain (In grams & %)	Quantity of drug loss (In grams & %)
500 g	450 g (90 %)	50 g (10%)

Table 3: Weight variation observed during the preparation of Kalka

Quantity of drug taken	Quantity of milk taken	Quantity of kalka obtained	Quantity of Drug loss
120 g	150 ml	240 g	30 g

Table 4: Observations made during Taila Paka

Time	Kalka lakshana	Sneha laskhana
Before heating the taila.	-	No bubbles or sound. Colour was light yellow.
During heating the taila for 20 minutes.	-	Small bubbles, sound appreciated. Colour was slight red.
45 minutes	Kalka sunk to the bottom.	The colour of mixture was white.
1 hour	The particles of kalka was seen throughout	The colour of mixture was pink.
3 hours	Homogenous mixture with no visible particles present on surface.	Colour was brown.
6 hours	Kalka sticking to bottom of the vessel.	Scum was present.
12 hours	Kalka colour was brown.	Vapour was present when mixture stirred.
24 hours	Kalka was settling to the bottom.	Colour was reddish brown.
36 hours	Kalka was rough, sticky.	Colour was brown.
40 hours	Kalka was oily.	Colour was brown.
45 hours.	Kalka was black.	Colour was brown.
47 hours.	Kalka soft and sticky.	Taila was clear and brown.
48 hours.	Kalka was absorbing taila.	
48hours 30 minutes	Separation of taila from kalka	
On further heating	Kalka was soft and sticky	Frothing present. Colour was light brown.
On further heating no. (1)	Kalka was hard	Frothing decreased. Colour was brown.
On further heating no. (2)	Kalka was powdery	Frothing absent. Colour was dark brown.

Table 5: Weight/volume variations obtained during preparation of Ksheera bala taila

Name of paaka	Gain (ml)	Gain (%)	Loss (ml)	Loss (%)	Kalka weight (g)	Duration of paka (hours)
Mrudu paaka	570	74	200	26	285	54
Madhya paaka	530	69	240	31	320	59
Khara paaka	490	63.6	280	36.4	365	61

Analytical Study

Analytical study shown following results -

Table 6: Organoleptic characters of 3 samples of Ksheera bala taila

Paaka features	Mrudu paaka	Madhya paaka	Khara paaka
Colour	Light brown	Brown	Dark brown
Odour	Less aromatic	Aromatic	Less aromatic
Taste	Bitter, Sweet	Bitter, Sweet	Bitter, Sweet
Froth	Thick Dense	Less dense	No
Nature of Varti	Flattened on pressure	Did not Flattened on pressure	Powdered on pressure
Sound by putting kalka on fire	Present	Absent	Absent

Table 7: Physico-chemical parameters of the 3 samples of Ksheera bala taila

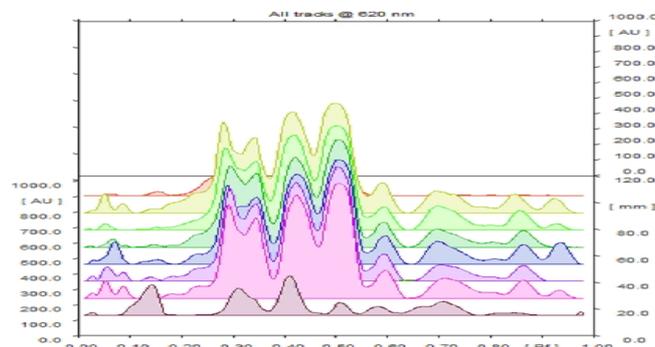
Parameters	Mrudu Paka	Madhya Paka	Khara Paka
Loss on drying	2.1 %	2.2 %	2.2 %
Acid Value	5.6260 mg/g	5.1799 mg/g	5.1238 mg/g
Viscosity	0.08024 Pa S	0.08500 Pa S	0.08525 Pa S
Iodine Value	37.8908 mg/g	37.4036 mg/g	37.2916 mg/g
Peroxide Value	5.2 mg/g	2.73 mg/g	2.46 mg/g
Specific Gravity	0.9716 mg/g	0.9750 mg/g	0.9964 mg/g
Saponification Value	232.3475 mg/g	338.47 mg/g	380.545 mg/g
Ash Value	0.17 %	0.18 %	0.18 %
Refractive index	1.46867	1.47017	1.46967
Unsaponifiable matter	3.260 %	2.606 %	2.429 %
Rancidity	-	-	-

Table 8: Physico-Chemical parameters of Ksheera bala taila – “Kalka”

Parameters	Mrudu Paka	Madhya Paka	Khara Paka
Density	1.2202704 g/m ³	1.201468 g/m ³	1.200968 g/m ³
Loss on drying	27.147 %	7.367 %	8.89 %
Ash value	0.32 %	0.32 %	0.33 %

Table 9: Number of spots detected on HPTLC chromatogram under different UV densitometric scan

Type of paka	UV 254 nm	UV 366 nm	UV 620 nm
Mrudu paka	10	8	10
Madhya paka	12	7	13
Khara paka	8	4	15



HPTLC photodocumentation of Ksheera Bala Taila, Khara-Madhyam-Mrudu paka

DISCUSSION

Pharmaceutical Study

Quantity of ksheera bala taila was maximum in mrudu paka (74%), minimum in the khara paka (63.6%). Loss of taila may be due to absorption by kalka.

Weight of kalka was maximum in Khara paka and was less in Mrudu paka.

Duration of paka was maximum for Khara paka (61 hours) and less was for Mrudu paka (54 hours). It was due to the serial order of Mrudu, Madhyama and Khara paka and was marked variation due to maintaining manda agni (60 to 80°C) throughout the process.

Analytical Study

Acid value indicates the presence of free fatty acids in the oil sample.

It implies Mrudu paka – (5.6260) is more susceptible for rancidification than the other 2 paka.

Viscosity is resistance of a liquid to flow. The higher value indicates the more the solutes or the concentration of that liquid. As the extractible constituents in the oil are more in Khara paka- (0.08525) than the other paka, which may be because of longer time required for its preparation.

Iodine Value indicates the degree of unsaturation, which in turn denotes the rancidification of oils. It signifies the susceptible nature of Mrudu paka- (37.8908) to undergo rancid than the Khara paka- (37.2916), greater the unsaturation leads to faster rancid.

Peroxide Value indicates the degree of rancidification of oils. The increase value shows that the oil is turned rancid or spoiled. As the normal peroxide value ranges in any oil is below 10 that is within the permissible limits of unrancidification. Neither of any of the sample or paka crossed the limit. So neither of samples got rancid.

Specific Gravity indicates the presence of solutes (soluble or insoluble) content in a solvent.

Here solvent is oil and the solutes refer to the extracted active principles from the Bala drug (kalka) and Ksheera (milk). The specific gravity of khara paka of ksheera bala taila was 0.9964 and of mrudu paka was 0.9716, this change was may be due to the excess time required for khara paka preparation.

Saponification Value indicates the average molecular weight/chain length of all fatty acids present. Mrudu paka (232 mg/g) has got less saponification value and Khara paka (380 mg/g) has highest saponification value. Khara paka is indicated for the external purposes, the short chain fatty acids are found maximum in this paka which will have faster rate of absorption through the skin. As the

bioavailability of a drug is least through the skin, a faster absorption of same will increase its bioavailability. Mrudu paka is used for nasya where drug is directly absorbed from the mucuous membrane and hence long chain fatty acids are easily absorbed.

Ash Value indicates the percentage of inorganic content of the sample. Ash value of kalka was not significantly varied between the samples of all paka. The increased loss of oil in the further paka of kalka did not made much difference in the ash value as oil was organic in nature which burns on ignition during the test.

Density indicates weight of a given substance per volume of that substance.

The increase in density signifies addition of taila weight to the kalka in successive paka from Mrudu, Madhya and Khara paka. It shows the loss of taila in those respective paka.

Loss on Drying signifies the moisture content of the substance.

There was more moisture content in Mrudu paka kalka i.e, 27 %, which was maximum when compared to madhyama and khara paka.

Unsaponifiable Matter indicates the non-fatty matter or the substance devoid of fats or oils.

The unsaponified matter containing any volatile principles may be lost on continued heating process in the successive paka, hence Mrudu paka was having maximum value and Khara paka was having least value.

High Performance Thin Layer Chromatography (HPTLC) The densitometric scan shows maximum of 6 spots in Madhya paka, maximum of 4 spots in Khara paka, and maximum of 4 spots in Mrudu paka of Ksheera bala taila which corresponds to the retardation factor (Rf) (in the peak table at different UV) of the Bala extract. The greater the number of spots indicates the maximum quantity of active ingredient extracted in that respective paka which is present in Madhya paka.

CONCLUSION

For preparation of 770 ml of ksheera bala taila, the procedure took more than 2 days for its completion with the temperature of 60 to 80°C.

Mrudu paka of ksheera bala taila yielded maximum quantity of taila and Madhyama paka of taila yielded maximum unsaponifiable matter. The maximum quantity of loss of taila and duration of paaka was more in Khara paka.

HPTLC showed the maximum spots of unchanged form of drug into the Madhyama paaka suggesting the

maximum therapeutic value. Saponification value shows the presence of long, medium and short chain fatty acids in Mrudu, Madhyama and Khara paka respectively suggesting its therapeutic utility.

REFERENCES

1. Dr. R. Vidyanath and Dr. K. Nishteshwar, Sahasra Yoga, Central Council of Indian Medicine, Taila prakarana, 2nd edition, p. 122.
2. Sharangdhara acharya, Sharangdhara samhita with the commentary Adamalla's Deepika and Kashiram's Gudatha deepika, Chaukhamba Orientalia, Varanasi, U.P., 2005, 6th edition, p. 398, 212.
3. Sri Bhavamisra, Bhavaprakash Nighantu commentary by K.C.Chunekar edited by Dr.G.S.Pandey, Chaukhamba Bharati Academy, Varanasi, U.P. Reprint 2006. p 984, 779.
4. Kaviraj Govinda das sen, Bhaishajya Ratnavali commentary by Siddhi Nandan Mishra, Chaukhamba Surabharati Prakashan, Varanasi, U.P. Reprint edition 2007. p. 1196, 206.
5. The Indian Pharmacopoeia of India, Volume I, Government of India, Ministry of Health and Family Welfare, 2007 1st edition, p. 356.
6. The Ayurvedic Pharmacopoeia of India Part I, Volume I, Government of India, Ministry of Health and Family Welfare, 1990 1st edition, p. 356.
7. Dr. Anand kumar et. al. "Pharmaceutico-analytical study of trividha sneha paka w.s.r. To ksheera bala taila, P.G. dissertation submitted to R.G.U.H.S. Bangalore during 2012.

Cite this article as:

Anand Kumar, Sudheendra Honwad, Radhika Ranjan, Geethesh P. Pharmaceutico-analytical study of Trividha sneha paka of Ksheera bala taila. Int. J. Res. Ayur. Pharm. 2012; 3(6):884-887

Source of support: Nil, Conflict of interest: None Declared