Int. J. Ayur. Pharma Research, 2014; 2(4): 135-140 **ISSN: 2322 - 0910**

International Journal of Ayurveda and Pharma Research

Research Article

PRELIMINARY ANALYTICAL STUDY OF *SAINDHAVADYA GHRUTA*

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Received on: 25/07/2014 Revised on: 17/08/2014 Accepted on: 28/08/2014

ABSTRACT

Ghruta is considered best among the *Snehas*. Its usage is being highlighted by our Acharyas in the disorders of brain like *Unmada, Apasmara* etc. This study focuses on one such preparation *Saindhayadya ghruta* mentioned in Yogaratnaka Apasmara chikitsa. Literary review done through various sources like books, journals and internet revealed that, no studies have been carried out on this formulation yet. Hence an attempt was made to study *Saindhayadya ghruta* through qualitative and quantitative analysis of Physico-chemical parameters and to develop fingerprints of High-Performance Thin Layer chromatography study (HPTLC). HPTLC densitometric scan of chloroform extract of unsaponifiable matter of *Saindhvadhya Ghruta* showed 9 and 6 spots at 254nm and 366nm respectively. To interpret the results, there are no previous standard markers established for *Saindhavadya ghruta.* This analytical profile may help in the identification of *Saindhavadya ghruta* in future and to maintain the standard quality of the formulation.

KEYWORDS: *Saindhayadya ghruta, Apasmara*, Physico-chemical, HPTLC.

INTRODUCTION

Sneha kalpana is one of the important dosage forms in Ayurveda which is emphasized in vast number of conditions both for its internal and external application. *Ghruta* is considered best among the snehas.[1] Because of its lipophilic action it crosses the blood brain barrier delivering the active principles of the ingredients at the specific sites of their action.[2] The more lipophilic the drug is, the more likely it is to cross the blood brain barrier.[3] Usage of *Ghruta* is being highlighted by our Acharyas in the disorders of brain like *Unmada, Apasmara* etc. In spite of continuous drug research, there is a lack of safe and effective anti convulsants to treat the condition of *Apasmara* in modern science. Even the long term usage of these drugs poses serious side effects to the individual.

Various *Ghruta* based formulations have been mentioned in Ayurveda classics which still remain unexplored. These have to be identified and studied with the present day analytical aids and standardised for the clinical use. Such a need prompted the study of *Saindhavadhya ghruta*, a formulation told in *Apasmara Chikitsa*. Here an attempt has been made to study *Saindhavadhya ghruta* analytically and to develop fingerprints of High Performance Thin Layer Chromatography study (HPTLC).

MATERIALS AND METHODS

Collection of raw drugs

Go *Ghruta* was obtained from genuine source and stored for a period of one year to make it *Purana* (old). *Gomutra* was collected from genuine sources in local areas of Moodbidri. Certified raw drugs were collected form ALVA Pharmacy, Mijar, Karnataka. All these raw drugs were identified as genuine samples by the department of Dravya Guna, Alva's Ayurveda medical college, Moodbidri, Karnataka.

Pharmaceutical study

Saindhavadhya ghruta was prepared in the Rasashastra and Bhaishajya Kalpana lab of Alva's Ayurveda medical college, Moodbidri, Karnataka.

Pharmaceutical study of *Saindhavadya ghruta* was divided into 2 parts, namely

1) Preparation of *Murcchita ghruta*
2) Preparation of *Saindhavadya ghruta* from *Murcchita ghruta*

1) Ghruta Murcchana

Reference: Bhaishajya Ratnavali Jwara chikitsa- 5/1285[4]

Ingredients:

Kalka dravya: *Amalaki, Hareetaki, Vibheetaki, Musta, Haridra* – 30g each

Matulunga Swarasa (instead *Nimbu swarasa*) – 30ml each

Sneha dravya*: Purana goghruta* -700g

Drava dravya: *Jala* – 2800ml

Method of preparation

Ghruta paka was done according to the classical procedure told by Acharya Sharangadhara.[5]

2) Preparation of Saindhavadya Ghruta from Murcchita Ghruta

Reference: *Yogaratnakara, Apasmara Chikitsa* [6]

Kalka dravya: *Pippali, Shodita hingu* and *Saindhava lavana* – 50g each

Sneha dravya: *Murcchita goghruta* – 600g

***Drava dravya*:** *Gomutra* – 2400ml

Table 1: Showing the Ingredients of *Saindhavadya ghruta*

Sl.No	Drug Name	Botanical Name	Family	Part Used	Quantity Used
1.	*Saindhava lavana* [7]				50g
2.	*Hingu* [8]	*Ferula narthex* Bioss	Umbelliferae	Resin	50g
3.	*Pippali* [9]	*Piper longum* Linn	Piperaceae	Fruit	50g
4.	*Moorchita Goghruta*				600g
5.	*Gomutra*				2400ml

Method of preparation

Initially *Shodana* of *Hingu* was done. *Hingu* was broken into small pieces and taken in a vessel. Go *Ghruta* was poured into it and fried well till it became brown and crispy. After cooling it was powdered. *Pippali* was made into fine paste with water and powdered. *Hingu* and *Saindhava lavana* were mixed with it and made *Kalka*. *Murcchita Goghruta* was taken in a wide mouthed vessel and heated to luke warm state and *kalka* was added slowly to it. Later *Gomutra* was added and boiling was continued for some time and it was kept as it is overnight. *Paka* was completed on the 5th day as per the reference of *Vaidyaka Paribhasha Pradeepa*.[10] The stages of preparation of *Saindhavadya ghruta* are shown in the figures 1 to 6.

Precautions taken during the preparation

Continuous stirring of the *Ghruta* was done as there was continuous frothing during the preparation due to the presence of *Gomutra* and *Lavana*. To avoid spillage due to frothing wide mouthed sufficiently big vessel was taken for the preparation.

Analytical study

Analytical study in the present study deals with the physical and chemical evaluation of the formulation. The tests were carried out at SDMCA analytical lab, Udyavara, Udupi, Karnataka.

Organoleptical parameters, Physico-chemical analysis were done as per the standard pharmaceutical laboratory process given in Appendix 3 (Physical test determination) of the Ayurvedic Pharmacopeia of India.[11] Various organoleptical parameters of the formulation, such as colour, odour and taste of the *Ghruta* were recorded.

HPTLC

Unsaponifiable matter of *Saindhavadya ghruta* was dissolved in 5 ml of chloroform. 5µl of the above sample was applied on a precoated silica gel F254 on aluminum plates to a band width of 4 mm using Linomat 5 TLC applicator. The plate was developed in Toluene – Ethyl acetate (8: 1) and the developed plates were visualized under 254 and 366 nm and after derivatisation in vanillin-sulphuric acid spray reagent and scanned under UV 254 and 366 nm.

Rf, colour of the spots and densitometric scan were recorded.

Results

The organoleptic characters of *Saindhavadya ghruta* - the colour was light brown, after cooling it attained slight yellow colour. It had a strong odour of *Gomutra* and *Hingu*. Taste was astringent and salty. It was unctuous, semi-solid and granular in consistency.

The results of physico-chemical parameters are shown in the table 2.

Table 2: showing the analytical results of physico chemical parameters of *Saindhavadya ghrutha*

PARAMETER	RESULTS
Loss on drying	0.18%
Refractive index	1.45
Specific gravity	0.92
Saponification value	195.27 mg/ml
Iodine value	5.14g / ml
Acid value	0.27g / ml
Ester value	194.99 g / ml
Unsaponifiable matter	0.60 g
Total fatty matter	99.39 m Eq/L
Free fatty acid	1.49 mEq/L
Viscoscity	40 min/ 50ml

HPTLC analysis of *Saindhavadya ghruta*

TLC Photodocumentation of chloroform extract of unsaponifiable matter of Saindhavadya ghruta is depicted in figure 7. HPTLC densitometric scan of chloroform extract of unsaponifiable matter of Saindhvadhya ghruta showed 9 spots and 6 spots at 254 nm and 366nm respectively. The Rf value of chloroform extract of unsaponifiable matter of Saindhvadya ghruta is shown in table 3 and the graphs of peaks at 254nm and 366nm are depicted in figures 8 and 9.

Table 3: showing the Rf value of chloroform extract of unsaponifiable matter at 254nm and 366nm

AT UV 254 NM	AT UV 366 NM	POST - DERIVATISATION
0.12 D Green	0.12 F Blue	0.12 Pink
0.15 D Green	0.15 F Blue	0.15 Pink
0.23 D Green	-	0.23 Blue
0.29 D Green	0.29 F L Blue	0.29 D Blue
0.33L Green	0.33 F L Blue	-
-	0.42 F M Blue	0.42 Violet
0.46 L Green	-	0.46Blue
0.48 L Green	-	-
-	0.51 F L Blue	0.51 L Pink
-	-	0.55 L Pink
-	-	0.62 L Pink
-	-	0.68 L Blue
0.76 L Green	0.76 F Blue	0.76 L Pink
-	-	0.87 Blue
-	-	0.97 Blue

D- Dark, L - Light, F- Flourescent

DISCUSSION

As per the reference, *Saindhavadya ghruta* was prepared with 1 part of *Murcchitha Go ghruta*, 1/4th part of *Kalka* (*Pippali, Hingu* and *Saindhava lavana*) and 4 parts of *Gomutra*. Collection of *Gomutra* was difficult as it had to be used in the fresh state. This may pose a problem if the preparation has to be taken for large scale production. At this point, there is a scope for further research by taking *Gomutra arka* instead of *Gomutra* in the preparation of *Saindhavadya ghruta*. *Gomutra arka* may be a better option due to the advantage of storage and easy availability

in market. But the efficacy of the preparation has to be assessed in comparison with *Gomutra* when *Gomutra arka* is used in the preparation.

The colour of the *Ghruta* was changing gradually after each *Paka*, which may be due to the chemical changes occurring in the *Ghruta* because of *Gomutra, Lavana* etc ingredients. The colour change probably is an indication of solubility of active principles more into *Ghruta* with the increased contact time.

Pharmaceutically, the presentation of the final product may be a problem due to the offensive odour of *Gomutra* and *Hingu*. *Murcchana* was helpful in reducing the odour to an extent but couldn't mask it completely. Attempts can be made in further studies to make it pharmaceutically more presentable by masking its odour by carrying out *Gandhapaka/ Patrapaka* with *Sugandhadravyas* like *Ela, Lavanga, Usheera* etc. drugs.

In analytical study of *Saindhavadya ghruta*, the loss on drying, iodine value and acid value were less than the plain go *Ghruta* indicating less chances of early rancidity and prolonged shelf life. The Rf values got can be considered as HPTLC fingerprinting for the *Saindhavadya ghruta*.

CONCLUSION

There are enumerable *Yogas* mentioned in the classics for the treatment of disorders like *Unmada*, *Apasmara* etc. These have to be brought into use after proper preparation and analysis. The data evolved in the present study will be very useful for routine quality control of *Saindhavadya ghruta* and also to control the batch to batch variation. Further studies should be carried out with huge samples of different batches to standardize the formulation.

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Cite this article as:
S. N. Shilpa, M. S. Krishnamurthy, B. Ravishankar, C. J. Shimi Ben. Preliminary Analytical Study of Saindhavadya Ghruta. Int. J. Ayur. Pharma Research. 2014;2(4):135-140.
Source of support: Nil, Conflict of interest: None Declared

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Photographs

Figure 1: Hingu shodhana

Figure 2: Addition of kalka

Figure 3: Addition of gomutra

Figure 4: Heating of ghruta

Figure 5 : Froathing during heating

Figure 6: Saindhavadya ghruta

PREPARATION OF SAINDHAVADYA GHRUTA

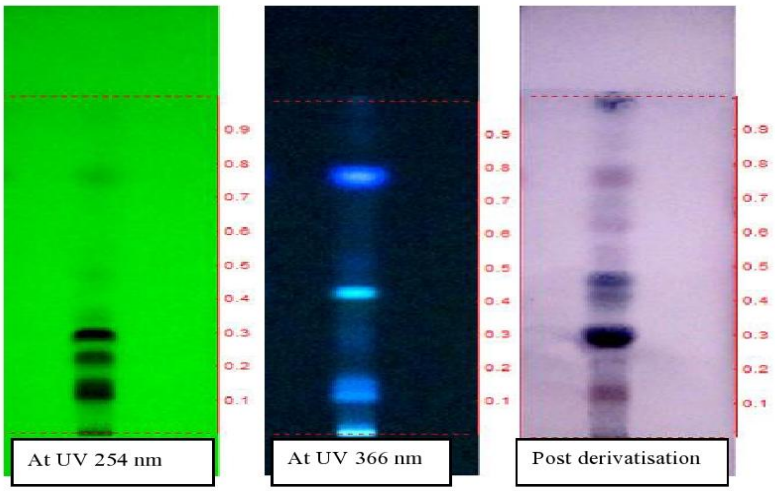
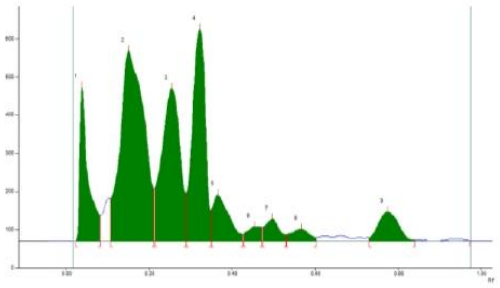
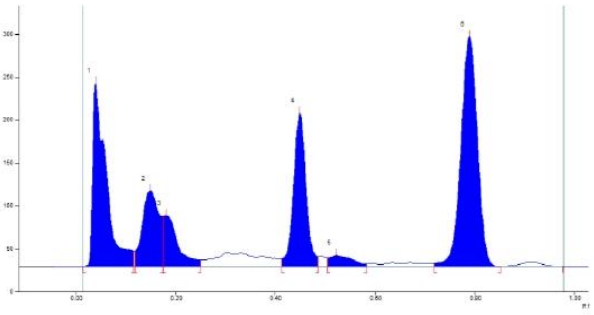


Figure 7: TLC Photodocumentation of chloroform extract of unsaponifiable matter of Saindhavadya Ghruta



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.02 Rf	0.2 AU	0.04 Rf	403.4 AU	18.50 %	0.08 Rf	68.1 AU	6731.4 AU	9.73 %
2	0.11 Rf	110.6 AU	0.15 Rf	497.9 AU	22.83 %	0.21 Rf	37.4 AU	23372.3 AU	33.78 %
3	0.21 Rf	138.4 AU	0.26 Rf	400.2 AU	18.36 %	0.29 Rf	23.9 AU	14401.7 AU	20.82 %
4	0.29 Rf	125.9 AU	0.32 Rf	554.2 AU	25.42 %	0.35 Rf	80.2 AU	14073.3 AU	20.34 %
5	0.35 Rf	82.0 AU	0.37 Rf	120.7 AU	5.54 %	0.43 Rf	18.9 AU	3828.9 AU	5.53 %
6	0.43 Rf	19.3 AU	0.45 Rf	37.7 AU	1.73 %	0.47 Rf	35.8 AU	1024.9 AU	1.48 %
7	0.47 Rf	36.1 AU	0.50 Rf	58.1 AU	2.66 %	0.53 Rf	17.3 AU	1588.7 AU	2.30 %
8	0.53 Rf	17.5 AU	0.57 Rf	31.8 AU	1.46 %	0.60 Rf	9.8 AU	1139.2 AU	1.65 %
9	0.73 Rf	9.6 AU	0.78 Rf	76.5 AU	3.51 %	0.84 Rf	2.5 AU	3019.7 AU	4.36 %

Figure 8: HPTLC Densitometric scan of chloroform extract of unsaponifiable matter of Saindhavadya Ghruta at 254 nm



Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.02 Rf	0.2 AU	0.04 Rf	214.0 AU	26.08 %	0.12 Rf	18.1 AU	4719.0 AU	23.84 %
2	0.12 Rf	18.2 AU	0.15 Rf	88.1 AU	10.74 %	0.17 Rf	58.0 AU	2401.3 AU	12.13 %
3	0.18 Rf	58.1 AU	0.18 Rf	58.9 AU	7.18 %	0.25 Rf	7.6 AU	1446.4 AU	7.31 %
4	0.41 Rf	9.3 AU	0.45 Rf	178.7 AU	21.78 %	0.49 Rf	11.9 AU	3582.3 AU	18.10 %
5	0.51 Rf	9.9 AU	0.52 Rf	12.9 AU	1.58 %	0.58 Rf	2.8 AU	482.6 AU	2.44 %
6	0.72 Rf	3.8 AU	0.79 Rf	267.7 AU	32.64 %	0.85 Rf	0.0 AU	7160.6 AU	36.18 %

Figure 9. HPTLC Densitometric scan of chloroform extract of unsaponifiable matter of Saindhavadya Ghruta at 366 nm