

STANDARDIZATION OF LAGHU SUTA SHEKHARA RASA – AN ANALYTICAL STUDY

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ABSTRACT

Two samples of *Gairika* were collected keeping the *grahya laxanas* in mind for the present study. Both the samples were subjected to *shodhana* by two different methods like *Bharjana* with *goghrita* and *Bhavana* using *godugdha*. *Laghu Suta Shekhara Rasa* was prepared as per *Rasa Tarangini* reference with other ingredients like *shunti churna* and *nagavalli swarasa*. *Vatis* of two *ratti pramanas* were prepared as per the dosage explained in the classic. The samples were subjected to Qualitative and Quantitative analysis before and after *shodhana* after the preparation of *Laghu Suta Shekhara Rasa*. Herbal drugs were subjected to T.L.C, other values like alcohol soluble extractive value, ash value etc. were determined and were compared with the standards. *Godugdha* and *Goghrita* were analysed qualitatively and quantitatively. Two samples of *Laghu Suta Shekhara Rasa* where *gairika* was purified in both the ways were analysed qualitatively and quantitatively. The percentage of iron in these samples showed a slight increase with a slight decrease in the percentage of other elements like Silica and Alumina. X-Ray Diffraction and *Namburi* Phased Spot Tests were carried out where the results matched well with the standards.

Key words: *Godugdha*, *Goghrita*, *Gairika*, *Suta shekhara*, diffraction

INTRODUCTION

The science of mercury, *Rasa shastra* is an important branch of Ayurveda where maximum number of *rasa yogas* contains mercury and sulphur as chief ingredients, yet there are many formulations which are though devoid of mercury and sulphur are equally effective in various disorders. *Laghu Suta Shekhara Rasa* is one such formula indicated in *amla pitta*, *sheeta pitta*, *udarda*, *pittaja unmada* etc disorders. *Laghu suta shekhara rasa* a well known, very commonly used *rasa yoga* among the practitioners containing very

few ingredients like *S.Gairika shunti churna* and *nagavalli swarasa*, was selected for the present study. An effort to standardize the ingredients, process involved, and the final product was carried out with the necessary analysis at each step at J.S.S Ayurveda Medical College, Mysore.

Pharmaceutical Study

For the present study *Gairika* from two different places were collected. Both were tested for the *grahya laxanas* like *snigdha*, *masrina*, *mrudu*, *rakta varna* etc. as in classics

and were subjected to two different types of *shodhana* like 1. *bharjana* with *Go-Ghrita* 2. *Bhavana* with *Go-Dugdha*.

Wet, fresh ginger was bought from the market, washed and the outer skin was scraped off. Ginger was cut into small pieces and was dried in shade. After complete drying ginger was finely powdered using pulveriser and was used for the preparation of *Laghu Suta Shekhara Rasa*.

Nagavalli leaves with size varying from 7.5 – 20.0 cm, ovate, cordate, glabrous, with good colour well grown leaves were hand plucked and selected for the study. Leaves were cleaned, washed and *swarasa* was extracted for the preparation.

Quantity Of Ingredients Taken

S.Gairika – 100gms

Shunti chura – 50gms

Nagavalli swaras – 50 (approximately 63gms of *swarasa*)

Method Of Preparation

Shodhita Gairika was mixed with *shunti churna* were taken in a *khalwa*, sufficient quantity of *Nagavalli swarasa* was added and *bhavana* was given for three days (6hrs a day). On the third day *vatis* were prepared with an approximate weight of 250mg and were dried in shade.

ANALYTICAL STUDY

Steps Carried Out In The Standardization

*Raw drug standardization- Raw samples of *Gairika* were qualitatively and quantitatively analysed for

- Iron estimation
- Estimation of other elements
- Loss on ignition etc.
- Standardization of herbal ingredients
- Standardization of the formulation

Table 1: TEST RESULTS – RAW ORE 1

TESTS	RESULTS
Loss on ignition	5.74%
Silica as SiO ₂	15.37%
Alumina as Al ₂ O ₃	12.45%
Calcium as CaO	1.12%
Magnesium as MgO	0.45%
Sodium as Na ₂ O	0.035%
Potassium as K ₂ O	0.064%
Iron as Fe ₂ O ₃	54.25%

Table 2: RAW ORE 2

TESTS	RESULTS
Loss on ignition	6.28%
Silica as SiO ₂	24.94%
Alumina as Al ₂ O ₃	12.37%
Calcium as CaO	1.56%
Magnesium as MgO	0.31%
Sodium as Na ₂ O	0.05%
Potassium as K ₂ O	0.08%
Iron as Fe ₂ O ₃	54.38%

Table 3: QUALITATIVE AND QUANTITATIVE ANALYSIS OF SHUNTI CHURNA

TEST PARAMETERS	RESULTS
Foreign matter	Absent
Total ash	1.82%
Acid Insoluble ash	0.34%
Water Soluble Ash	0.22%
Alcohol Soluble Extract	3.34%
Water Soluble extract	0.08%
Ether Soluble Extract	3.57%
Moisture content	3.56%

T.L.C of alcohol extract of the drug on Silica gel 'G' plate using Benzene: ethyl acetate (9:1) in visible light 4 spots were seen at R_f 0.16, 0.35, 0.63 and 0.69.

Table 4: QUALITATIVE AND QUANTITATIVE ANALYSIS OF NAGAVALLI

TEST PARAMETERS	RESULTS
Foreign matter	Absent
Total Ash	0.96%
Acid Insoluble Ash	0.22%
Water soluble ash	0.16%
Alcohol Soluble Extract	4.02%
Water Soluble Extract	0.13%
Ether Soluble Extract	4.32%
Moisture content	4.06%

Table 5: QUALITATIVE AND QUANTITATIVE ANALYSIS OF SHODHITA GAIRIKA

TEST PARAMETERS	RESULTS
Loss on ignition	6.17 %
Silica as SiO ₂	24.94%
Alumina as Al ₂ O ₃	12.37%
Calcium as CaO	1.56%
Magnesium as MgO	0.34%
Sodium as Na ₂ O	0.05%

Table 6: PARTICLE SIZE ESTIMATION (eye piece calibration 9.4mm for each division)

SAMPLE	MINIMUM	AVERAGE	MAXIMUM
SHODHANA WITH GHRITA	9.4 mm	56.4 mm	28.2 mm
LAGHU SUTA SHEKHARA RASA	9.4 mm	13.16 mm	28.2 mm

ANALYSIS OF LAGHU SUTA SHEKHARA RASA (VATI FORM)

Adopted parameters:

1. Disintegration
2. Friability
3. Hardness
4. Weight variation
5. Particle size

Disintegration: The Disintegration apparatus, where in each tube (total of 6 tubes) single vati was placed, covered with plastic discs. Media used was distilled water.

Temperature maintained: 37c

Sieve No: 20

Observation: Vatis did not disintegrate fully even after 45mins. Vatis did not pass through the test.

Potassium as K ₂ O	0.08%
Iron as Fe ₂ O ₃	54.44%

T.L.C of the alcoholic extract of nagavalli on silica gel ‘G’ using Toluene: Ethyl Acetate (9:1) shown in visible light five spots at Rf. 0.11(green),0.18 (light green),0.23(yellow),0.34(grey) and 0.61(greyish green)further spots were noted by exposing the sample on Iodine vapour and also by spraying vanilline sulphuric acid. Spots were noted with respect to the Rf values.

T.L.C of alcoholic extract of ginger on Silica gel ‘G’ plate using Benzene ; ethyl acetate (9:1)in visible light 4 spots were seen at Rf. 0.16, 0.35, 0.63and 0.69 with blue, grey and light grey colours respectively. Further the samples were exposed to Iodine vapour with 11 spots and after spraying with vanilline sulphuric acid and heating at 110degrees centigrade 8spots were obtained.

Friability:

Apparatus: Friabilator

Procedure: 6 vatis were weighed and placed in the apparatus. The apparatus was operated till 100 rounds were reached.

Calculation: weight of 6 vatis before tapping – 1.047 gms

After tapping – 1.046 gms

% of friability = $\frac{\text{Initial weight} - \text{final weight}}{\text{Initial weight}} \times 100$

$$\begin{aligned}
 &= \frac{1.047 - 1.046}{1.047} \times 100 \\
 &= \frac{0.001}{1.047} \times 100 \\
 &= 0.096
 \end{aligned}$$

Result: The drug passes through the test

Hardness:

Apparatus: Hardness tester

Procedure: The *vati* was held in the space provided and was pressed till the *vati* got fractured. The reading was noted.

Observation: 11 Kgs.

Weight variation test: 20 *vatis* were weighed in bulk, again each *vati* was weighed separately and the calculation was done.

Total weight of 20 *vatis* – 3385gms

Average = total weight of 20 *vatis*/20 = 3.385/20 = 169.25

$$169 \pm 16.9$$

Lower limit = 169.0 – 16.9

$$=142.1$$

Upper limit = 169.0 + 16.9

$$= 185.9$$

Variation in each *vati* was calculated

Average – wt of each tab = X

Variation = X x 100/169.25

$$\begin{aligned} \mathbf{1^{st} vati:} & 169.25 - 163.00 \\ & = 6.25 \times 100/169.25 \\ & = 3.69\% \end{aligned}$$

This was calculated for each *vati*.

Result: *vatis* passed through the test as all came under $\pm 10\%$

NAMBURI PHASED SPOT TEST

This test was carried out to

1. Test the genuinely of *Gairika*.
2. To standardize the ore of *gairika* i.e., Red ochre

Namburi phased spot test was carried out using chemicals like

1. Potassium iodide _ 10%
2. Potassium ferro cyanide – 2.5%
3. Conc. Hcl _ 5%
4. Samples of *S.gairika*

Table 7: Observations

SAMPLES	IMMEDIATE REACTION	AFTER 20 mins	AFTER 24 hrs
<i>Dugdha shidhita gairika</i>	Pot.fer.cya – Deep blue centre spot, white irregular periphery Pot.iod – Deep brown central spot	Deep blue central spot light brown periphery white border Light brown spot with dark brown ring	Well formed dark blue spot, lighter outer area, white lining Light brown ring with colourless hallow centre
<i>Ghrita bharjita gairika</i>	Pot. Fer.cya – Blue spot, blue periphery with white border Pot.iod – Light brown ring	Deep blue central spot with wider blue periphery Faded, light brown hallow ring	Dark blue spot, tapering blue shade, white lining Widened light brown ring

RESULTS – THE SAMPES CORRESPOND WELL WITH THE STANDARDS.

DISCUSSION

Every ingredient used in the formulation was subjected to qualitative and quantitative analysis at every step of the pharmaceutical work. Effect of *shodhana* over the mineral was noted for any increase or decrease in the percentage of iron and other trace elements. It was noted that there was slight increase in the percentage of Iron after

shodhana, after the preparation of *Laghu Suta Shekhara Rasa*, with slight decrease in the percentage of trace elements like silica, calcium and magnesium. Most of the elements had got oxidised after *shodhana* the absorbable form by the human body. The disintegration time of the *vatis* were found to be high along with the hardness. Different parameters like T.L.C, Qualitative and Quantitative analysis along with Namburi phased spot test reveal the genuinity of the

ingredients and hence can be adopted for other *rasa yogas* as well.

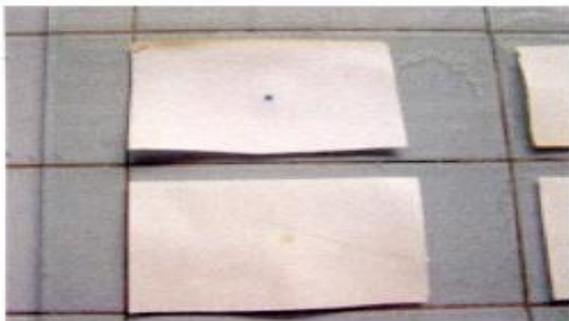
CONCLUSION

Rasa tarangini is the only classic of *Rasa shastra* which explains in detail about the preparation, indication, *matra* along with *anupana* for *Laghu Suta Shekhara Rasa*. *Shodhana* of *gairika* can be carried out by two simple methods but *bharjana* with *goghrita* can be preferred as *bhavana* with *godugdha* is slightly a lengthier one and chances of fungal growth is high if not dried properly. *Laghu Suta Shekhara Rasa* an easier preparation which is widely used for its efficacy over many of the *pittaja* disorders and a safer medicine to prescribe for any period of time for any age group patients was hence taken up for the study efforts to standardize the medicine has been done.

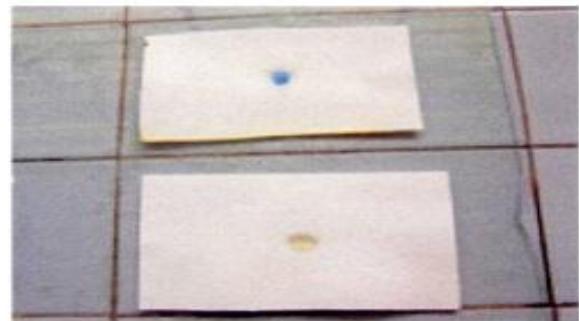
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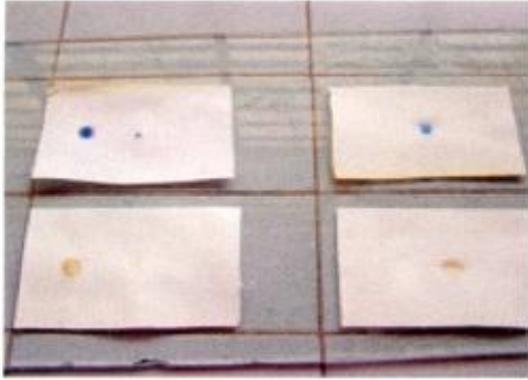
RESULTS



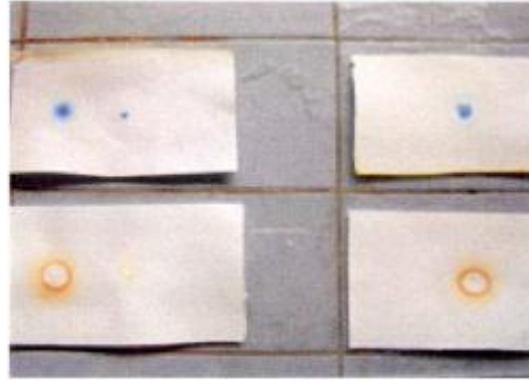
I PHASE



I PHASE



II PHASE



III PHASE

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