

**QUALITY CONTROL PARAMETERS OF NAGVALLI SWARAS
BHAAVIT LAGHU SUTASEKHARA RASA - A COMPOUND
AYURVEDIC FORMULATION**

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ABSTARCT

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Aim: The present study was carried out to standardize the finished product *Laghu Sutasekhara Rasa* to confirm its authenticity identity, purity and quality. **Materials and Methods:** The raw drugs are identified and authenticated, and powder microscopy was done in the Pharmacognosy Laboratory, Institute for Post Graduate Teaching and Research in Ayurveda (IPGT), Gujarat Ayurved University (GAU), Jamnagar, Gujarat, India. The study mentioned the organoleptic and microscopic characteristics. Physico-chemical parameters and high-performance thin layer chromatography (HPTLC) studies carried out at

pharmaceutical laboratory, IPGT and RA, GAU, Jamnagar, Gujarat, India. *Bhavana of Nagavalli Swarasa* (Piper betle Linn.) was given to enhance the potency of *Laghu Sutasekhara Rasa*. **Results and Discussion:** The pharmacognostical results of *Laghu Sutasekhara Rasa* showed oleoresin content of *Sunthi*, dark brown content of *Gairika*, Trichome of betel leaves loaded by *Gairika*, stomata with epidermal cells of betel leaves, fragments of annular vessels of *Sunthi*, etc. Physico-chemical analysis of *Laghu Sutasekhara Rasa* revealed loss on drying 5.14% w/w, water-soluble extract 11.6% w/w, etc. In HPTLC, almost all spots were merging in sample showing common characters in both the wavelengths. **Conclusion:** Key For present study, the values for *Laghu Sutasekhara Rasa*, ash values are 57.95% w/w, acid insoluble ash value 25.2% w/w, water-soluble extract are 11.6% w/w, and methanol-soluble extract are 2.2% w/w, loss on drying values 5.14% w/w, iron estimation values 6.1% w/w. High Performance Thin Layer Chromatography (HPTLC)

at 254 nm and 366 nm resulted into 8 & 6 spots respectively. The physicochemical analysis are inferred that the formulation meets maximum qualitative standards.

KEYWORDS: *Laghu Sutasekhara Rasa*, Pharmacognosy, Pharmaceutics, HPTLC.

INTRODUCTION

Laghu Sutasekhara Rasa - a herbo-mineral-powder formulation has been mentioned in *Rasatarngini*.^[1] The trial compound has contents, which are *Gairika* (Fe₂O₃) and *Sunthi* (*Zingiber officinale* Roxb.) and *Nagvalli swarasa bhavana*. All the contents are easily available. *Laghu Sutasekhara Rasa* is mentioned in *Rasatantrasara* and *Siddhayogasangraha* book with special indication to *Ardhavabhedaka* (Migraine). It is one of the formulation which takes therapeutic action on the vitiated Pitta Dosha. According to *Acharya Sushruta*, pathologically it is a *Tridoshaja* disease^[1] and according to *Acharya Charaka* it is *Vataja* or *Vatakaphaja*.^[2] If one half of the head develops severe tearing and pricking pain, giddiness and piercing pain, suddenly after a fortnight or ten days. This should be diagnosed as *Ardhavabhedaka* (Migraine) caused by all the three *Doshas*. *Katu Rasa* and *Tikta Rasa*, *Ushna virya* have *Deepana – Pachana Karma*, which causes *Amapachana* and thus provides proper metabolism and ultimately balances the *Agni*. Thus these *Rasa* works at *Agni Dushti* stage in the *Samprapti* of *Ardhavabhedaka* and pacify the *Kapha Dosha*. *Laghu Sutashekhara* relieves *Amlata* and *Tikshanta* of *Pitta* by acting on *Amashaya* and *Pakvashaya*. Thus it regularizes *Pittotpati*. The driver *Dosha Vata* also gets pacified by the contents hence *Chhardi* (vomiting) and *Bhrama* (vertigo) subsides in *Ardhavabhedaka* by use of *Laghu Sutashekhara Rasa*.

The Pre-clinical studies of *Laghu Sutasekhara Rasa* have already been carried out; in which standardization, pharmaceutical, pharmacological studies and also clinical observations on healthy volunteers were done. To maintain the therapeutic activity of the drug standardization is very much necessary.

MATERIALS AND METHODS

Drug Material

Raw drug materials were collected from the pharmacy of Gujarat Ayurveda University. The ingredients and the part used are given in table no.^[1]

METHOD OF PREPARATION

Laghu Sutashekhara Rasa^[3]

A. Betel leaf juice extraction

- Betel leaves were washed with water and chopped into small pieces and grinded in grinder machine. Small visible suspended particles in the juice was strained through a fine mesh.

B. Procedure of Trituration

Accurately weighed Pure *Suvarna Gairika* and *Sunthi* (2:1 ratio) were taken in *Khalvayantra* and mixed well till mortar form. For 1st *Bhavana* of betel leaf juice was added into mortar. The mixture was subjected for Trituration until mixture was dried.

When the powder was totally dried up, it was consider as the completion of 1st *Bhavana*. Then again betel leaf juice was added and mixture was triturated. The same process was repeated for more 3 times.

C. Observations

For 1st *Bhavana* the quantity of Betel leaf juice required was quite more than the subsequent *Bhavana*. The colour of *Gairika* was red, which was changed after every *Bhavana*. The colour of *Gairika* became darker after 3rd *Bhavana*.

Therapeutic benefits of *Laghu Sutasekhara Rasa*

Ardhavabhedaka (Migraine) is clinically *Pitta* dominantly *Tridoshaja Vyadhi*. *Laghu Sutasekhara Rasa* acts as *Rakta Pitta Shamaka*, *Udara Roga*, *Triptighana*, *Vedanasthapaka*, *Shothhara* helpful in *Agnimandya*.

Pharmacognostical study

Raw drugs were identified and authenticated by the Pharmacognosy laboratory, I.P.G.T&R.A., Jamnagar. The identification was carried out based on the morphological features, organoleptic features and microscopic study of the drugs was studied under the microscope attached with camera, with stain and without stain.^[4] The microphotographs were also taken under the microscope.

Physicochemical Evaluation

Laghu Sutasekhara Rasa was analyzed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent system with Methanolic

extract of *Laghu Sutasekhara Rasa* at the Pharmaceutical Chemistry lab, I.P.G.T. & R.A. Gujarat Ayurveda University, Jamnagar.

OBSERVATION AND RESULTS

Organoleptic Evaluation

Various parameters of the material such as colour, odour, touch and taste of the *Laghu Sutasekhara Rasa* were observed and recorded.^[5] Touch were analyzed with the help of *Darshana*, *Sparshana*, *ghrana* and *Rasana Pareeksha* mentioned in Ayurved. (By sensory observations). Results were mentioned in the Table no.(2).

Microscopic study

The powder microscopy of *Laghu Sutasekhara Rasa* confirmed the presence of Starch grains of *Sunthi* and another cellular particles of *Gairika* Trichome of betel leaves loaded by *Gairika*, stomata with epidermal cells of betel leaves, Oil Globule of betel leaves, Stomata with epidermal cells of betel leaves, Prismatic crystals of Betel leaves, Fragments of annular vessels – *Sunthi*, Cork cells of *Sunthi* loaded by *Gairika*. (Plate No.1).

Physico-chemical Analysis

Physico-chemical analyses were carried out by following the parameters. Physico-chemical analysis like, pH value 4.5, ash values are 57.95% w/w, acid insoluble ash value 25.2% w/w, water-soluble extract are 11.6% w/w, and methanol-soluble extract are 2.2% w/w, loss on drying values 5.14% w/w, iron estimation values 6.1% w/w. Results are mentioned in the table no. (3).

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Laghu Sutasekhara Rasa*. On performing HPTLC, visual observed extract on under UV light showed few spots but on analyzing under densitometer at 254 nm and 366 nm it resulted into 8 and 6 spots respectively. Results of HPTLC are given in Table no. 4 and densitogram is shown in plate 2.

DISCUSSION

Pharmacognosy and pharmaceutical evaluation of *Laghu Sutasekhara Rasa* was performed which can be a effective medicine in the management of *Ardhavyabhedaka* (Migraine). In physiochemical analysis; ash values are helpful in authenticating the quality and purity of

crude drugs, especially in powder form. The objective of ashing vegetable drugs is to remove all traces of organic matter, which may otherwise bother in an analytical determination and extracting values are useful for determining of crude drugs and it gives an idea about the nature of the chemical constituents present. Though the groundwork requisites for the standardization of *Laghu Sutasekhara Rasa* are covered in the current study, additional important analysis and investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy. Migraine is a disabling medical illness. *Ardhavabhedaka* is clinically *Pitta* dominantly *Tridoshaja Vyadhi*. It can be used as *Doshapratynika* and *Vyadhipratynika Chikitsa* in *Ardhavabhedaka*.

CONCLUSION

Pharmacognostical study findings confirm that all characters were found in ingredient drugs of *Laghu Sutasekhara Rasa*. The physicochemical analysis are inferred that the formulation meets maximum qualitative standards and all the parameters discussed here may be used as identifying tools for the quality assessment of *Laghu Sutasekhara Rasa*. Thus Outcome of the study may be taken as standard references for the further studies.

Contents of Drugs

1. Laghu Sutashekhara Rasa

No.	Sanskrit Name	Latin/English Name	Part used	Ratio
1	Gairika (Fe₂O₃)	Oxide of Iron	-----	2 parts
2	<i>Shunthi</i>	<i>Zingiber officinale</i> Roxb.	Rhizome	1 part
3	<i>Nagavalli</i>	<i>Piper betle</i> Linn.	Leaves	As per required

Table N0. 2: Organoleptic Characters Of Laghu Sutashekhara Rasa.

Sr. No.	Characters	Observed characters of LSR
1	Colour	Brick red
2	Odour	Aromatic
3	Taste	Astringent with piercing nature
4	Touch	Hard
5	Sound	Light crispy

Table No. 3: The test drug *Laghu Sutashekhara Rasa* was subjected to various analytical experiments such as.

Sr. No.	Test	Result
1	Uniformity of tablet	
	a. Highest weight	509 mg
	b. Lowest weight	486 mg
	c. Average weight	500.6 mg
2	Tablet hardness	2.05 kg/cm ²
5	Methanol soluble extract	2.2% w/w
7	Acid insoluble ash value	25.2%w/w
8	pH	4.5
9	Iron estimation	6.1%w/w
10.	Loss on drying (%w/w)	5.14
11.	Water soluble extractive (%w/w)	11.6
12.	Ash value	57.95% w/w

Table 4: Results of HPTLC of: Solvent system *Laghu Sutashekhara Rasa* – Toluene: Ethyl acetate: Acetic Acid (7:2:1).

Wave Lengths	Short UV (254nm)	Long UV (366nm)
No of Spots	8	6
Max. Rf value	0.00,0.12,0.20,0.29,0.33,0.43,0.76,0.83	0.00,0.12,0.21,0.27,0.33,0.43

Plate No.1 Microphotographs of *Laghu Sutashekhara Rasa*.

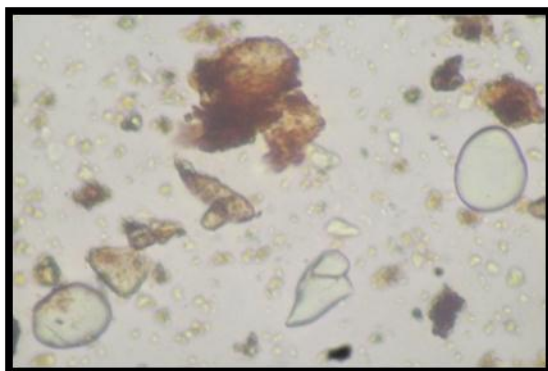


Figure-1 Starch grains of *Sunthi* and another cellular particles of *Gairika*.

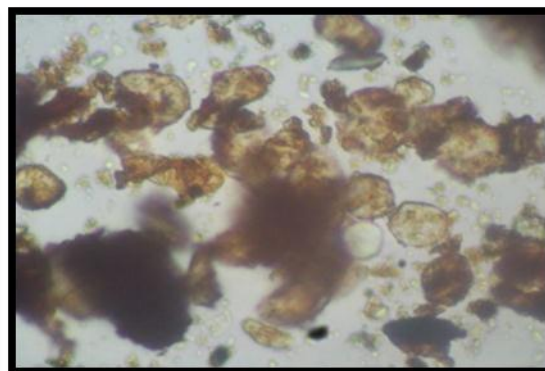


Figure-2 *Gairika* particles are loaded on other particles of *Sunthi*.



Figure-3 Trichome of betel leaves loaded by *Gairika*.

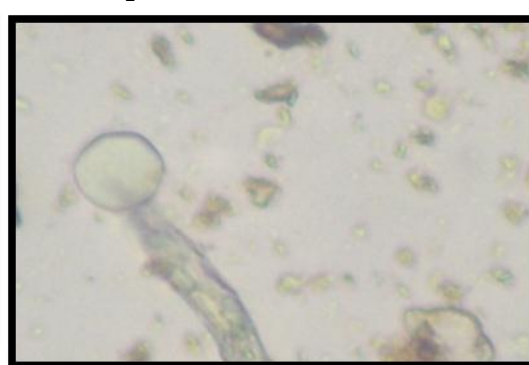


Figure-4 Oil Globule of betel leaves.

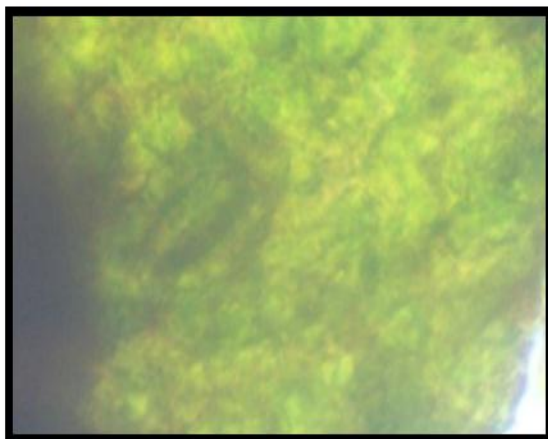


Figure-5 Stomata with epidermal cells of betel leaves.



Figure-6 Prismatic crystals of Betel leaves.



Figure-7 Fragments of annular vessels – *Sunthi*.

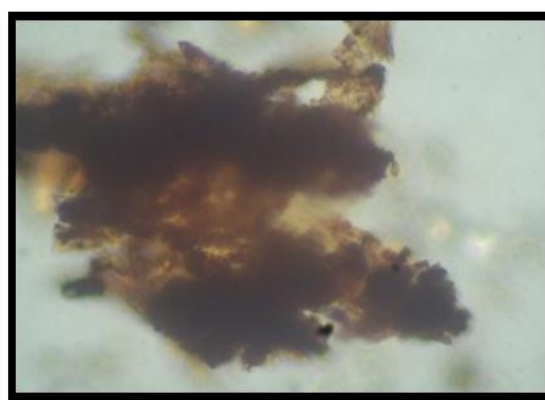
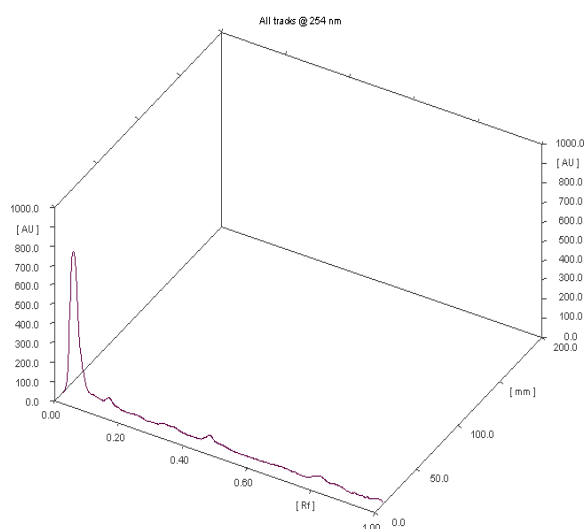
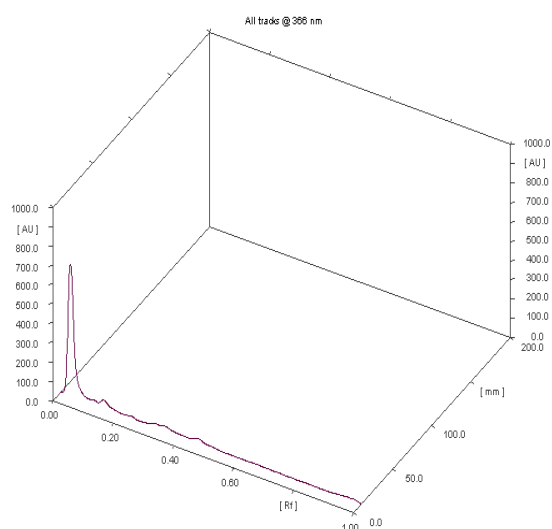


Figure-8 Cork cells of *Sunthi* loaded by *Gairika*.

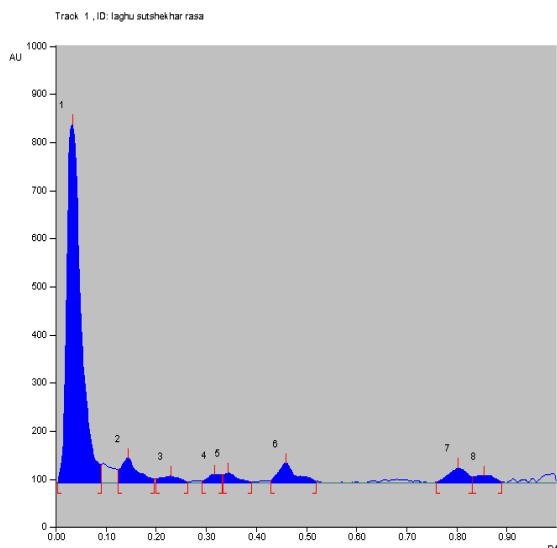
Plate No. 2: HPTLC evaluation of *Laghu Sutasekhara Rasa*.



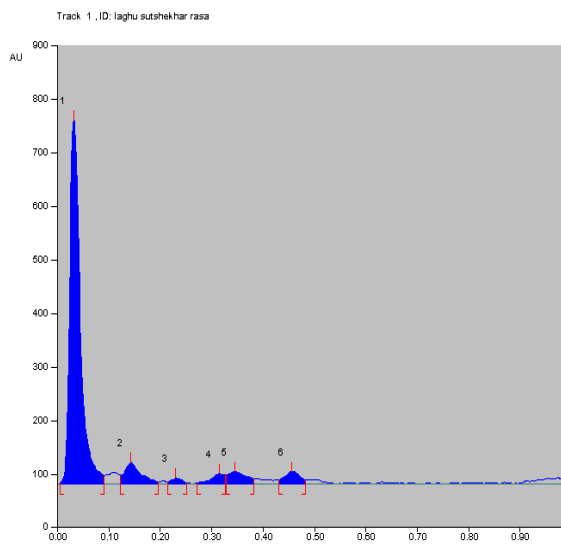
3D Graph: 254nm of *Laghu Sutasekhara Rasa*.



3D Graph: 366 nm of *Laghu Sutasekhara Rasa*.



Chromatographic Results (Peak display) of *Laghu Sutasekhara Rasa* at Short ultra violet (254 nm)



Chromatographic Results (Peak display) of *Laghu Sutasekhara Rasa* at Long ultra violet (366nm)

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