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Research Article

PHARMACEUTICAL AND ANALYTICAL STUDY OF *SANNIPATA BHAIRAVA RASA*

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ABSTRACT

Sannipata Bhairava Rasa is an Ayurvedic formulation quoted in *Bhaishajya Ratnavali Jwaradhikara* used in the treatment of *Jwara* (fever). There is no scientific documentation regarding the standard method of preparation and analytical profile of *Sannipata Bhairava Rasa.* The aim of the study is to prepare *Sannipata Bhairava Rasa* and analyse it using various physico-chemical methods. *Sannipata Bhairava Rasa* was prepared as per the classical reference in *Bhaishajya Ratnavali*. During the pharmaceutical procedure, all the ingredients were taken as per reference, mixed uniformly and triturated with *Nimbu swarasa* (lemon juice) to make *Vati* of one *Ratti* (125mg). Medicines prepared in the form of tablet or pills are known as *Vati* or *Gutika*. The physico– chemical and microbial analysis of the prepared formulation was carried out. The pharmaceutical and analytical parameters were compiled, and data was recorded. The values of physico-chemical parameters of *Sannipata Bhairava Rasa* were as follows- total ash 11.16%, acid insoluble ash 0.63%, alcohol soluble extractive 7.68%, water soluble extractive 20.56%, loss on drying 6.34%. Data generated from pharmaceutical, analytical studies and TLC can be used to develop a preliminary standard profile for the formulation *Sannipata Bhairava Rasa*.

INTRODUCTION

Sannipata Bhairva Rasa is an Ayurvedic preparation mentioned in *Bhaishajya Ratnavali jwara chikitsa prakarana*[1]. It is indicated specifically in the treatment of *Sannipata jwara*. This formulation has an excellent combination of herbal and mineral ingredients to treat *Jwara* (fever). It contains *Shudha hingula, Shudha gandhaka, Shudha tankana, Shudha vatsanabha* and *Shudha dhathura beeja* triturated with *Nimbu swarasa* (lemon juice) to make pills of one *Ratti* (125mg).

Preparation of a good quality and effective drug is the first step for treating a disease. It starts with the collection of good quality raw materials and extends up to the manufacture of the final product. There is no scientific documentation regarding the standard method of preparation and analytical profile of *Sannipata Bhairava Rasa.*

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Therefore, in the present study *Sannipata Bhairava Rasa* is prepared following the classical methods and analysed the physico- chemical parameters in order to develop a preliminary standard profile for the formulation.

AIMS AND OBJECTIVES

This study is aimed to develop standard manufacturing procedure and analytical profile of *Sannipata Bhairava Rasa.*

MATERIALS AND METHODS

Collection of Raw Materials

50gm each of *Hingula, Gandhaka, Tankana, Vatsanabha* and *Dhatura beeja* were collected from local store in Kannur, Kerala.

Authentication of Raw materials

The mineral drugs were identified and authenticated with their mineralogical characteristics from the Department of Rasashastra evam Bhaishajya Kalpana and the herbal drugs were identified with their morphological characteristics from the Department of Dravyaguna, Government Ayurveda College, Kannur. The raw drugs were subjected to organoleptic analysis. Foreign matters were not detected in the raw drugs which prove good quality.

Place of Study

Pharmaceutical study was done at Pharmacy, Dept. of Rasashastra evam Bhaishajya Kalpana, Govt. Ayurveda College, Kannur.

Analytical study: Physico-chemical Analysis like total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive, loss on drying, average weight and microbial analysis like total aerobic microbial counts, total yeast and mould counts, test for specific pathogens: Escherichia coli, Salmonella typhi, Pseudomonas aeruginosa, Staphylococcus aureus and TLC were done at quality control lab, Aryavaidyashala, Kottakkal.

Pharmaceutical Study

Preparation of *Sannipata Bhairava Rasa* involves the following steps:

1. *Shodhana* of *Hingula, Gandhaka, Tankana, Vatsanabha* and *Dhathura Beeja*.
2. All the ingredients are finely powdered and weighed accurately.
3. The homogeneous mixture of *Shudha hingula, Shudha gandhaka, Shudha tankana, Shudha vatsanabha* and *Shudha dhatura beeja* was made.
4. It was taken in a grinding stone and sufficient quantity of *Nimbu swarasa* was poured till the powder gets completely immersed.
5. It was triturated until pill rolling consistency was obtained.
6. Pills of one *Ratti* (125mg) size each were rolled out of it, dried in shade and stored in an air tight container.

Table 1: Showing Method of *Shodhana* of Ingredients

S.No.	Drug	Method of *Shodhana*	Media	No. of times/ Duration
1.	*Hingula*[2]	*Bhavana* (trituration)	*Ardraka swarasa*	7
2.	*Gandhaka*[3]	*Dhalana* (melting and pouring in a liquid media)	*Ghrita, Godugdha*	7
3.	*Vatsanabha*[4]	*Atapa sthapana* (keeping in sunlight)	*Gomutra*	3
4.	*Dhatura*[5]	*Dolayantra swedana* (boiling)	*Godugdha*	3 hours
5.	*Tankana*[6]	*Nirjalikarana* (frying)		Until it puffs up and cracking sound stops

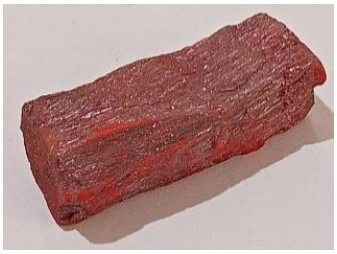
Table 2: Showing Ingredients with their Quantity Used in *Sannipata Bhairava Rasa* Preparation

S.No.	Ingredients	Chemical Formula/ Latin Name	Proportion	Quantity
1.	*Shudha Hingula*	HgS (Cinnabar)	27 parts	27 g
2.	*Shudha Gandhaka*	S (Sulphur)	12 parts	12 g
3.	*Shudha Vatsanabha*	Aconitum napellus	12 parts	12 g
4.	*Shudha Dhatura beeja*	Datura metel	9 parts	9 g
5.	*Shudha Tankana*	$Na_2B_4O_7.10\ H_2O$	6.5 parts	6.5 g
6.	*Nimbu swarasa*	Citrus limon	Q. S	Q. S

Precautions

1. All ingredients should be dried and finely powdered.
2. Trituration should be done properly without any spilling of the ingredients.
3. *Vati* should be prepared only after the pill rolling consistency is attained.
4. Uniformity of weight should be maintained while preparing the *Vati.*

Fig. 1. Images of Pharmaceutical Study



Raw *Hingula*

Powdered *Hingula*

Bhavana in *Ardraka swarasa*

Shudha *Hingula*

Raw *Gandhaka*

Powdered *Gandhaka*

Gandhaka melted in *Goghrita*

Shudha gandhaka after *Dalana* in *Gokshira*

Vatsanabha

Atapa sthapana in cow's urine

Shudha vatsanabha after removing its peel

Dhatura beeja

Swedana of *Dhatura* in *Gokshira*

Shudha Dhatura beeja

Raw *Tankana*

Frying *Tankana*

Shudha Tankana

Bhavana of ingredients in *Nimbu swarasa*

Pills rolled and dried in shade

OBSERVATION AND RESULTS

Pharmaceutical Study

After mixing homogenously the whole mixture turned to reddish brown colour. It required almost 5 hours of trituration to attain the pill rolling consistency. *Vati* is reddish brown in colour with characteristic smell of ginger.

Table 3: Showing Yield After *Shodhana* Procedure of Each Ingredient

S.No.	Drug	Initial weight	Final weight	Loss/gain	Total yield
1.	*Hingula*	50 g	52 g	2 g	104%
2.	*Gandhaka*	50 g	34 g	16 g	68%
3.	*Vatsanabha*	50 g	30 g	20 g	60%
4.	*Dhatura*	50 g	35 g	15 g	70%
5.	*Tankana*	50 g	43 g	7 g	86%

Table 4: Showing the Result of Preparation of *Sannipata bhairava rasa*

Quantity taken	*Shudha hingula*	27 g
	Shudha gandhaka	12 g
	Shudha vatsanabha	12 g
	Shudha dhatura beeja	9 g
	Shudha tankana	6.5 g
	Jambeera swarasa	Q. S
Finished product obtained		75 g
Loss		-
Gain		8.5
Percentage gain		12.78%
Time duration		5 hours

Table 5: Showing The Result of Test for *Subhavitha Lakshana* as per R.T.

Tests	Findings
Rolling	Can be done
On touching	Soft and non-sticky
On pressing	Flattens

Table 6: Showing The Organoleptic Characters of *Sannipata Bhairava Rasa*

Organoleptic characters	Results
Rupa (colour)	Reddish brown
Rasa (taste)	*Tikta Kashaya* (bitter)
Gandha (smell)	Smell of ginger
Sparsha (touch)	Hard to touch

Analytical Study

The results of physico-chemical analysis of *Sannipata Bhairava Rasa* are given in the following tables.

Table 7: Showing Analytical Result of *Sannipata Bhairava Rasa*

Parameter	Result
Appearance	Reddish brown pills
Total ash	11.6 % w/w
Acid insoluble ash	0.63 % w/w
Alcohol soluble extractive	7.68 % w/w

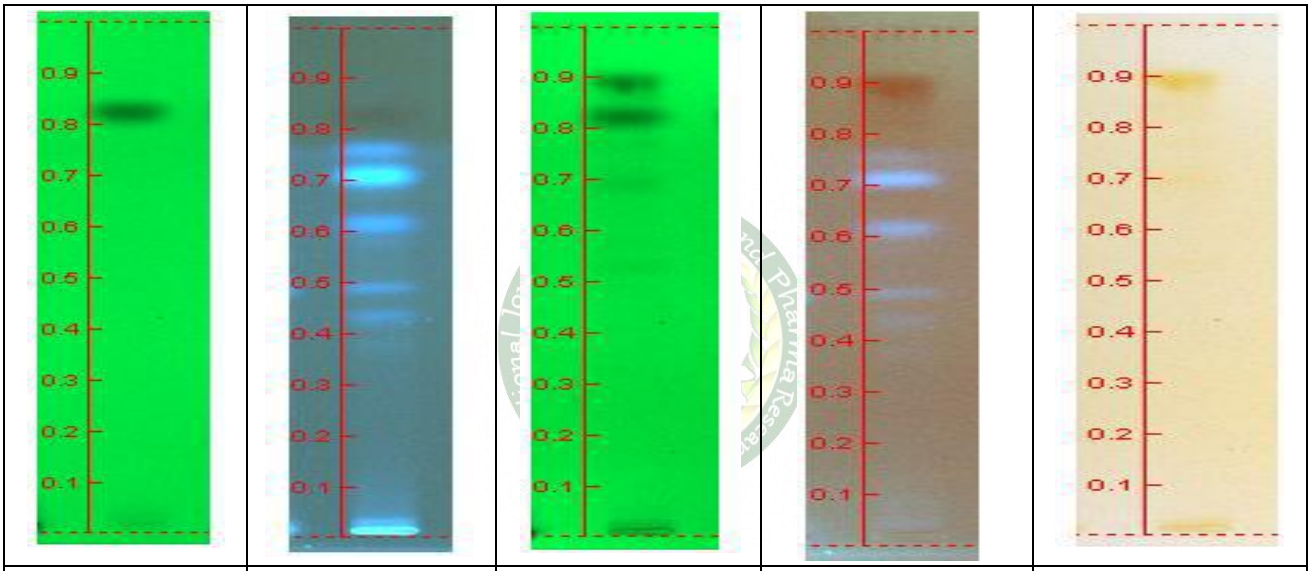
Water soluble extractive	20.56 % w/w
Loss on drying	6.34 % w/w
Average weight	0.093 g

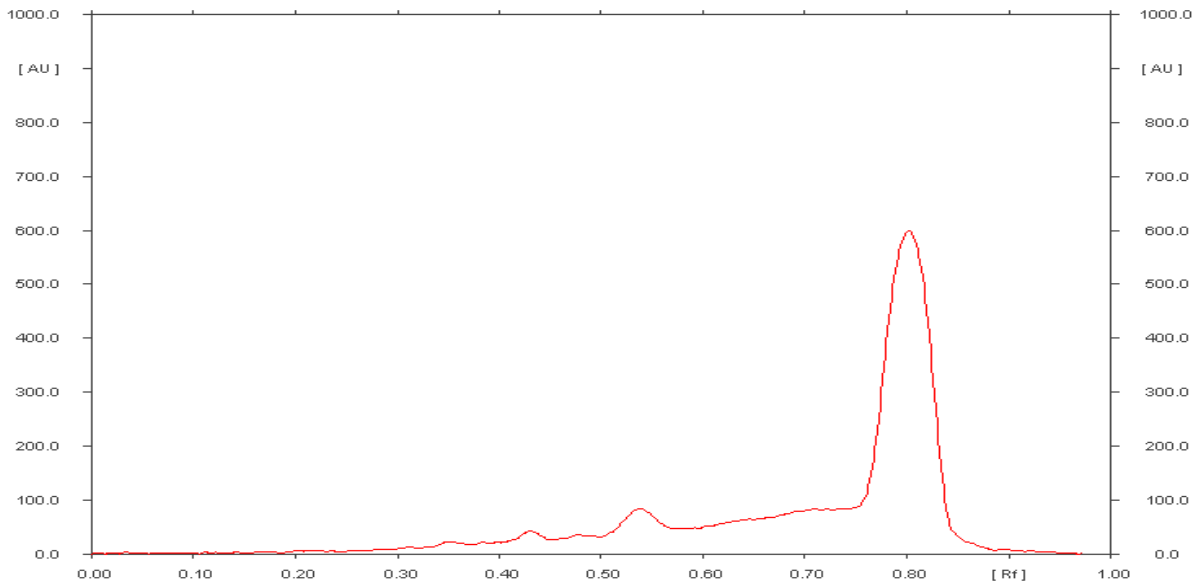
Table 8: Showing Result of Microbial Analysis

S.No.	Test parameter	Result	Standard
1.	Total bacterial count	50 cfu/g	NMT 100000 cfu/g
2.	Total yeast and mould Count	10 cfu/g	NMT 1000 cfu/g
Result of Test for Specific Pathogen			
3.	Escherichia coli	Absent	Should be absent in lg
4.	Salmonella typhi	Absent	Should be absent in 10g
5.	Pseudomonas aeruginosa	Absent	Should be absent in lg
6.	Staphylococcus aureus	Absent	Should be absent in lg

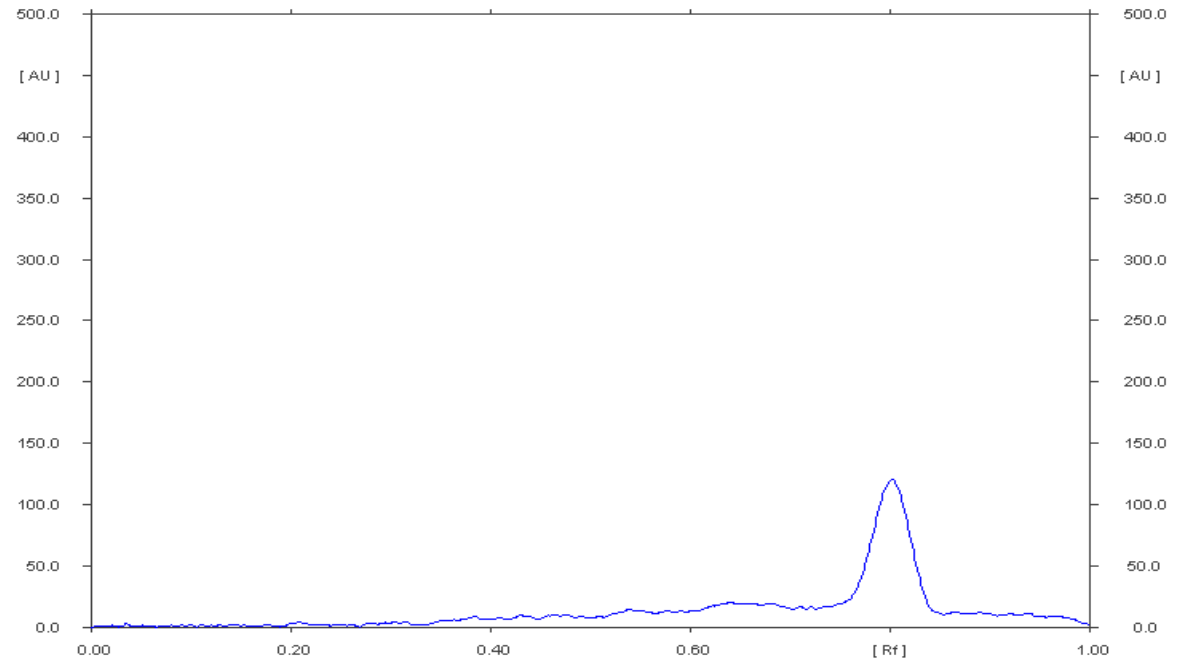
Cfu - colony-forming units

Fig 2: TLC Plate Views of *Sannipata Bhairava Rasa Gutika* Sample





Graph 1: Overview Graph of *Sannipata Bhairava Rasa Gutika* Sample at 254nm



Graph 2: Overview Graph of *Sannipata Bhairava Rasa Gutika* Sample at 366nm

DISCUSSION

Sannipata Bhaiarava Rasa is a *Kharaleeya rasa* yoga with an excellent combination of herbal and mineral ingredients to treat *Jwara.* It is quoted in *Bhaishajya Ratnavali Jwara chikitsa prakaranam*. The ingredients of this formulation are *Shudha hingula* (27 parts), *Shudha gandhaka* (12 parts), *Shudha vatsanabha* (12 parts), *Shudha dhatura beeja* (9 parts) and *Shudha tankana* (6.5 parts). *Sannipata Bhairava Rasa* was prepared by mixing the ingredients homogeneously, and triturating with sufficient quantity of *Nimbu swarasa* until pill rolling consistency was attained.

After the preparation of *Sannipata Bhairava Rasa*, 12% gain in total weight was observed. This could be due to trituration. Wet trituration is an effective method to reduce particle size and achieve homogenization, which can significantly modify the properties and increase the bioavailability of formulation. Liquid media increases the bulk of the final product and alters the percentage of constituents. The added liquid serves as a medium for their chemical interaction. It may also play the role of a buffering agent by maintaining a specific pH. The media infuses its active components into the material, transforming the inorganic material into an organo-metallic composition that is suitable for the body.

Total ash of the sample was 11.16%. The ash value of a drug is a crucial factor in determining its purity. The acid-insoluble ash can indicate the percentage of impurities and sand present. Higher purity is typically indicated by a lower value of acid-insoluble ash. Acid insoluble ash was found to be 0.63%. The extractive value of a drug determines the quality as well as the purity of the drug material. The evaluation of drugs relies heavily on water-soluble extractive value. A lower extractive value can suggest the presence of exhausted material, adulteration, or incorrect processing during drying or storage. Water soluble extractive was 20.56%. The alcohol soluble extractive value is a measure of the percentage of various organic plant constituents, including alkaloids, phenols, flavonoids, volatile oils, resins, steroids, glycosides, carotenoids, and terpenoids, found in a drug. Alcohol soluble extractive was 7.68%. Additionally, the loss on drying at 105°Celsius indicates the percentage of moisture within a sample. It was 6.34%.

The report of microbial analysis reveals that total bacterial count is 50cfu/g and total yeast count is 10cfu/g, which is much less than the standard. This indicates that there is no microbial contamination in the *Gutika* and it is prepared in a hygienic way with good quality raw drugs. The test for specific pathogens shows that E. coli, S. typhi. P. aeruginosa and S. aureus are absent in the *Gutika.*

In the TLC plate view at 254 nm five peaks were obtained and only one peak was obtained at 366nm. Common Rf value of 0.80 was obtained in both wavelengths. Rf value of 0.80 showed the highest peak covering an area of 70.17% at 254 nm. Other peaks seen at 254 nm were at Rf values corresponding to 0.35, 0.43, 0.54, 0.71.

CONCLUSION

This study deals with the pharmaceutico-analytical evaluation of *Sannipata Bhairava Rasa.* Final product sample of *Sannipata Bhairava Rasa* was fine, reddish brown in colour with characteristic smell of ginger and *Tikta-kashaya rasa* (bitter taste). Physico-

chemical analysis helps to generate a preliminary standard analytical profile for *Sannipata Bhairava Rasa* as there is no standard profile of the formulation in the pharmacopoeia. So, data generated by this study can be used as reference for the identity and purity of the formulation.

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