

# Sensory Analysis of Different *Rasasindura* Samples by Two Alternative Forced Choice (2-Afc) Method

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**Abstract:-** Sensory analysis is a scientific method that provide useful information about the relationships between product characteristics and human perception. *Rasasindura* is one of the *kupipakava Rasayana* which is use in different diseases conditions. Present study has been planned to evaluate the discrimination between different sample of *Rasasindura* and *Hingula* through sensory parameters. *Samguna Balijarit Rasasindura*, *Chaturguna Balijarit Rasasindura*, *Panchguna Balijarit Rasasindura*, *Shadguna Balijarit Rasasindura* and *Hingula* were evaluated through two alternative forced choice (2-AFC) Method. Result shows that samples which were taken for the sensory analysis are comparatively different. Two alternative forced choice (2-AFC) Method for this purpose was sensitive and specific to discriminate the all samples.

**Keywords:-** Sensory analysis, *Balijarit*, *Rasasindura*, alternative forced choice (2-AFC), *Discriminate*.

## I. INTRODUCTION

*Rasasindura* (Red sulphide of Mercury is a well-known *Kupipakwa Rasayana* which is prepared by *Parada* (mercury) and *Gandhak* (sulfur). *Rasasindura* (Red sulphide of Mercury) is useful in the management of, *Prameha* (diabetes), *Shula* (pain), *Bhangandra* (fistula), *Jwara* (fever) [1,2]. AS per different classical text *Rasasindura* be Darker red in colour [3]. Sensory tests provide useful information about the human perception of product changes due to ingredients, processing, packaging, or shelf life [4].

Hence, an attempt was made to validate sensory parameters to differentiate the samples of *Rasasindura* (Red sulphide of Mercury) and *Hingula* (Cinnabar) in compact and powder form.

## II. MATERIAL AND METHOD

### A. Preparation of Samples:

*Samaguna balijarita Rasasindura* was prepared with equal quantity of mercury and sulphur then the first sublimated product was triturated with equal quantity of *Shuddha Gandhak* to form *kajjali* and again *kupipaka* was done. The same process was repeated for 4 times more to get *Shadguna Balijarita Rasasindura* with 6 times sublimation. Then samples were stored in airtight glass container and labelled accordingly [5].

### B. Samples used for sensory analysis:

SRS (*Samguna Balijarit Rasasindura*), CRS (*Chaturguna Balijarit Rasasindura*), PRS (*Panchguna Balijarit Rasasindura*), ShRS (*Shadguna Balijarit Rasasindura*) H (*Hingula*) was subjected for the analysis in Compact form. whereas SRS-P (*Samguna Balijarit Rasasindura-Powder*), ShRS-P (*Samguna Balijarit Rasasindura- Powder*), H-P (*Hingula-Powder*) in powder form.

### C. Questionnaire

SRS sample was compared with other samples to determine if a difference exists between all other samples with SRS. Special proforma was prepared for evaluating Darker red colour, Less lustrous, More crystallinity, Smaller lustrous particle/crystals, Smaller particle/crystals size.

Special proforma was prepared for evaluating intensity Darker red colour, Less lustrous, More crystallinity, Smaller lustrous particle/crystals, Smaller particle/crystals size.

### D. Training of assessors

30 volunteers were pre-trained on the attributes, depending on the test objectives for about 2 h in three-time exposures of the standard sample.

### E. Assessing samples

Assessors were presented with five compact and three powder blind coded samples followed by two alternative forced choice (2-AFC) method [6]. In experiment, participates were asked to identify the sample having more Darker red colour, Less lustrous, More crystallinity, Smaller lustrous particle/crystals, Smaller particle/crystals size. All participates were given enough time for each task.

## III. RESULT

The panel for sensory analysis consisted of 30 assessors each assessor was asked to identify the correct attributes of the samples as given in the Performa/Questioner. Table 1 describes the comparative sensory analysis data of SRS with other sample of *rasasindura* and *hingul* on the basis of different attributes like Darker red colour, less lustrous, More crystallinity, Smaller lustrous particle/crystals, smaller particle/crystals size in compact form.

Attributes	1 <sup>st</sup> comparison		2 <sup>nd</sup> comparison		3 <sup>rd</sup> comparison		4 <sup>th</sup> comparison	
	SR S	CR S	SR S	PR S	SR S	Sh RS	SR S	H
Darker red colour	2	28	1	29	-	30	29	1
Less lustrous	27	3	29	1	28	2	-	30
More crystallinity	2	28	4	26	-	30	30	-
Smaller lustrous particle/crystals	30	-	29	1	30	-	2	28
Smaller particle / crystal size	30	-	27	3	30	-	1	29

Table 1: Sensory analysis data of product in compact crystalline form

SRS (*Samguna Balijarit Rasasindura*), CRS (*Chaturguna Balijarit Rasasindura*), PRS (*Panchguna Balijarit Rasasindura*), ShRS(*Shadguna Balijarit Rasasindura*) H(*Hingula*)

Table 2 describes the comparative sensory analysis data of SRS-P with ShRS-H, *hingul* and ShRS-P with H-P on the basis of different attributes like Darker red colour and less lustrous in powder form.

Character	1 <sup>st</sup> comparison		2 <sup>nd</sup> comparison		3 <sup>rd</sup> comparison	
	SRS-P	SHRS-P	SRS-P	H-P	SHRS-P	H-P
Darker red colour	30	-	29	1	29	1
Less lustrous	1	29	-	30	-	30

Table 2: sensory analysis data of products in powder form

SRS-P (*Samguna Balijarit Rasasindura-Powder*), ShRS-P (*Samguna Balijarit Rasasindura- Powder*), H-P(*Hingula-Powder*).

The confuse matrix was applied for the individual attributes i.e., Darker red colour, less lustrous, more crystallinity, Smaller lustrous particle/crystals, smaller particle/crystals size on the basis of response and the results are depicted in table 3 and 4.

Discrimination Attributes	Dark er Red Colour	Less Lust er	More Crysta linity	Smaller Lustrous particle/ crystals	Smaller particle/ crystals Size
<b>SRS vs. CRS</b>					
Acuracy	0.93	0.96	0.93	1	1
Sensitivity , precision, Specificity	0.93	0.96	0.93	1	1
Misclassification	0.13		0.13	0	0
<b>SRS vs. PRS</b>					
Acuracy	0.96	0.96	0.86	0.96	0.9
Sensitivity , precision, Specificity	0.96	0.96	0.86	0.96	0.9
Misclassification	0.06	0.06	0.26	0.06	0.2
<b>SRS vs. Shrs</b>					
Acuracy	1	0.93	1	1	1
Sensitivity , precision, Specificity	1	0.93	1	1	1
Misclassification	0	0.13	0	0	0
<b>SRS vs. H</b>					
Acuracy	0.96	1	1	0.93	0.96
Sensitivity , precision, Specificity	0.96	1	1	0.93	0.96
Misclassification	0.06	0	0	0.13	0.06

Table 3: Result of confused matrix applied on given attributes of products in compact crystalline form

SRS (*Samguna Balijarit Rasasindura*), CRS (*Chaturguna Balijarit Rasasindura*), PRS (*Panchguna Balijarit Rasasindura*), ShRS(*Shadguna Balijarit Rasasindura*) H(*Hingula*)

	Darker Red Colour	Less Lustrous
<b>SRS-P vs. ShRS-P</b>		
Acuracy	1	0.96
Sensitivity, precision, specificity	1	0.96
Misclassification	0	0.6
<b>SRS-P vs. H-P</b>		
Acuracy	0.96	1
Sensitivity, precision, specificity	0.96	1
Misclassification	0.06	0
<b>ShRS vs. H-P</b>		
Acuracy	0.96	1
Sensitivity, precision, specificity	0.96	1
Misclassification	0.06	0

Table 4: Result of confused matrix applied on given attributes of products in powder form

SRS-P (*Samguna Balijarit Rasasindura*-Powder),  
ShRS-P (*Samguna Balijarit Rasasindur*

#### IV. DISCUSSION

Sensory analysis is an important tool which could range from basic discrimination testing to descriptive analysis. Discrimination testing is a technique employed in sensory analysis to determine whether there is a detectable difference among two or more products. The test uses a group of assessors (panellists) with a degree of training appropriate to the complexity of the test to discriminate from one product to another through one of a variety of experimental designs [7,8]

In this experiment discrimination test was performed to differentiate the samples of *rasasindura* on the basis of certain attributes. For those five attributes were taken into consideration to identify differences between all samples. These were Darker red colour, Less lustrous, More crystallinity, Smaller lustrous particle/crystals, Smaller particle/crystals size. From the present study it was found that in case of compact form, SRS sample is less dark red in colour, less lustrous and less crystalline in comparison to CRS, PRS, ShRS samples whereas SRS is more darker red in colour more lustrous and more crystalline in compare to the H sample. Smaller lustrous crystals and crystals size are found in SRS in comparison to CRS, PRS, ShRS samples whereas H sample is having smaller lustrous crystals and crystals size is in comparison to the SRS. In case of powder form, it was found that SRS-P is darker red in colour in comparison to ShRS-P and H-P samples whereas ShRS-P and H-P sample is less lusturous in comparison to the SRS - P sample. It was also found that ShRS-P sample is more darker red and less Lustrous in comparison to the SRS-P sample.

Two samples differ in specific sensory attribute, then the two alternative forced choice (2-AFC) method is used. Sensory tests are designed to measure small differences among samples. considering this, two- alternative forced choice (2-AFC) method <sup>[6]</sup> (type of discrimination method was adopted for sensory analysis in the present study).

#### V. CONCLUSION

2- AFC method is sensitive and specific to differentiate SRS (*Samguna Balijarit Rasasindura*), with CRS (*Chaturguna Balijarit Rasasindura*), PRS (*Panchguna Balijarit Rasasindura*), ShRS(*Shadguna Balijarit Rasasindura*), H(*Hingula*) in powder and compact form of the samples.

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#### REFERENCE

- [1.]Jha CB. Ayurvediya Rasashastra. Varanasi: Chowkambha Surabharati Prakashana, 2000, pp. 173.
- [2.]Sharma S. Rasa Tarangini. 11th Edition, 5<sup>th</sup> chapter, New Delhi: Motilala Banarsidas, 2004, pp. 101.
- [3.]Ibidem (2). Rasa Tarangini, 6/140.
- [4.]Food sensory analysis. Intertek, Total Quality, Assured. Available from: <https://www.intertek.com/blog/2020-12-15-food-sensory/>. Accessed date-21-02-2022.
- [5.]Ibidem (2). Rasa Tarangini, 6/168-176.
- [6.]Ennis DM. Relative power of difference testing methods in sensory evaluation: Food Tech. 1990; 44(114): 116-117.
- [7.]Sensory analysis. Wikipedia. Available from: [https://en.wikipedia.org/wiki/Sensory\\_analysis](https://en.wikipedia.org/wiki/Sensory_analysis). Accessed date-21-02-2022
- [8.]Discrimination testing Wikipedia. Available from: <https://en.wikipedia.org/wiki/Discrimination>. Accessed date-21-02-2022