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STANDARDIZATION OF RASAPARPATI

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ABSTRACT

In Ayurveda, the Pharmaceutics of metals / minerals is dealt under the head of Rasashatra. Rasashastra deals wide ranges of medicinal preparations, they are Kharaleeya, Pottali, and Parpati etc. preparations. The preparation which are prepared thin flakes form (sheet) are termed as Parpati and the entire operation comes under parpati kalpana.

In Ayurvedic Rasashatra three paka (stages) have been mentioned for Rasa parpati preparations. These are Mridu, Madhya and Khara pakas. Parpati obtained by Mridu, Madhya pakas are considered to be of therapeutic value and are advocated for clinical usage, but those obtained by Kharapaka is not recommended. The reason for this is not known and there is no report in the literature explaining the rationale for the preference of parpati obtained by Mridu and Madhaya paka only.

In the present study, an attempt has been made to standardize the procedure, stages of parpati with reference to Rasaparpati to know the difference between trividha pakas.

During the study, it was observed that the time between the stages (pakas) are very short, the sulphur is in more free form in the Kajjali as compared to parpati. No bile salts / bile pigments and chlorophyll were transferred from cow dung and banana leave respectively.

Key Words: Parpati, Rasparpati, Mridupaka, Madhyapaka, Kharapaka, Standardization.

INTRODUCTION: Ayurveda is a science of positive health and its origin is almost as old as human race or even beyond that[1]. In Vedas and Ayurveda there are ample of documented evidences depicting the presence of elementary knowledge of metal and few minerals[2].

During the process of evolution and development of civilization, the scarcity of herbs, led to the development of new theme of approach for treating the diseases. Thus, for prevention and treatment of diseases and to maintain positive health and long life span a new branch known as Rasashastra has developed in Ayurvedic system of medicine[3].

In Ayurveda, the Pharmaceutics of metals / minerals is dealt under the head of Rasashatra. Rasashastra deals wide ranges of medicinal preparations, they are Kharaleeya, Pottali, and Parpati preparations etc.. The preparation which are prepared thin flakes form (sheet) comes under parpati kalpana[4].

In Ayurvedic Rasashatra three paka (stages) have been mentioned for Rasa parpati preparations. These are Mridu, Madhya and Khara pakas. Parpati obtained by Mridu, Madhya pakas are considered to be of therapeutic value and are advocated for clinical usage, but those obtained by Kharapaka is not recommended[5].

The reason for this preparation is not known and there is no report in the literature explaining the rationale for the preference of parpati obtained by Mridu and Madhaya paka only. Keeping immense qualities of parpati in view, many drug industries are manufacturing a number of parpati preparations but which

are not assessable to know the specific stage of parpati preparation i.e. Mridu, Madhya and Khara pakas. With an objective to find out this reason and to ascertain difference between these stages of parpati obtained by different pakas are required standardization in this technologically advanced era to ensure safety and efficacy of Parpati. For the present study Rasaparpati has been selected.

METHODS & MATERIALS: The required materials were obtained from the N.I.A, Pharmacy, Jaipur and the preparation Rasaparpati and its stages were prepared in our laboratory as per the reference of Rasatarangini and the prepared samples were subjected for physico chemical analysis. The analysis included :

1. Qualitative analysis
2. Quantitative analysis
3. Detection of free mercury
4. Detection of free sulphur
5. Estimation of Mercury
6. Estimation of Sulphur

Spectroscopical studies etc

Pharmaceutical Preparation of Rasa Parpati: (Reference Rasatarangini)

Some fresh cow dung placed over the floor

↓ Over it

A green Banana leaf is placed

↓

Darvi yantra smeared with ghee & Kajjali is kept in it.

↓ Heated on mild fire

Kajjali turned completely into liquified form

↓

Melted material immediately pressed by another lump of fresh dung kept in banana leaf.

(Mridu, Madhya and Khara paka of Rasaparpati were prepared by adopting above mentioned method).

OBSERVATIONS: The observations of different stages of pakas along with parameters are shown in the table No. 1.

Table No. 1 Showing various parameters for standardization of Rasaparpati & its stages.

Parameters	Starting state	Mridu Paka	Madhya paka	Khara Paka
Consistency	Fine, smooth powder	Soft on touch	Little Soft on touch	Reddish powder
Temperature	32˚c ± 2˚c	116˚ - 120˚c	120˚ –124˚c	124˚c & above
Colour	Black	Shining black	Like peacock feather	Reddish
Breakable	-	Not easily	Easily	Turns into powder
Total loss	-	4 gm.	5 gm.	7 gm.

Physical Analysis:

Table 2. showing inference of physical analysis of prepared Rasaparpati & its stages.

S.No.	Parameters	Inference
1.	Colour	Black
2.	Smell	Sulphurous
3.	Appearance	Blackish
4.	Touch	Smooth
5.	Taste	Tasteless
6.	Clarity	No clarity
7.	Opalescence	No opalescence

Chemical Analysis: To carry out the study in a better way the chemical analysis is divided into two main groups they are:

A) Qualitative **B) Quantitative**

For the qualitative and quantitative analysis standard procedures adopted as mentioned in the spot test in inorganic analysis by Fezer and Vogel)[6].

Table No. 3. showing various samples of Rasaparpati and its ingredients.

S.No.	Sample No.	Sample
1.	**1**	Impure Parad
2.	**2**	Purified Parad
3.	**3**	Impure Gandhaka
4.	**4**	Purified Gandhaka
5.	**5**	Kajjali (Intermediate product)
6.	**6**	Mridu Paka Rasa Parpati
7.	**7**	Madhya Paka Rasa Parpati
8.	**8**	Khara Paka Rasa Parpati

Table No.4. showing qualitative detection of different samples Rasaparpati.

S.No.	Sample No.	Inference
1.	**1**	Hg, Pb in traces
2.	**2**	Hg, Pb in traces
3.	**3**	-
4.	**4**	-
5.	**5**	Hg, Pb in traces
6.	**6**	Hg, Pb in traces
7.	**7**	Hg, Pb in traces
8.	**8**	Hg, Pb in traces

Qualitative detection of free mercury in Kajjali and in different stages of Rasaparpati:

Principle: When cuprous iodide comes into contact with the vapours of free mercury on heating at 110˚c temperature in an oven for 5 minutes gives a reddish color on the spot plate by reacting with free metallic mercury due to formation of cuprotetra iodomercuriate (red). The positive of this test is an indicative of free mercury.

$2Cu_2I_2$ + Hg = Cu_2 (HgI_4) + 2 Cu

(Cuprotetra Iodo mercuriate (Red))

Table No. 5. showing observations of qualitative of free mercury in Kajjali (After 15 minutes).

Sl.No.	Sample No.	Color on spot plate
1	2	Deep reddish color
2	5	Slightly reddish color
3	6	No color change
4	7	No color change
5.	8	No color change

Table No. 6. Showing Qualitative detection of free Sulphur in Kajjali and different samples (Ignition method).

Sl.No.	Sample No.	Color on spot plate
1.	3	Sulphur present
2.	4	Sulphr present
3.	5	Sulphr present
4	6	Sulphr present

5	7	Sulphr present
6	8	Sulphr present

B. Quantitative: Quantitative estimation of the constituents were carried out with the standard methods as mentioned in the Vogel.

Table No. 7. showing Quantitative detection of free Mercury & free Sulphur in the samples.**:**

Sample No.	**1**	**2**	**5**	**6**	**7**	**8**
Name of Sample	Impure Hg.	Pure Hg.	Kajjali	Mridu Paka	Madhya Paka	Khara Paka
% of Free Hg.	–	–	Nil	Nil	Nil	Nil
% of Total Hg.	95.067	97.86	49.12	47.09	45.09	44.02
% of Free Sulphur	–	–	43.32	28.64	26.04	22.82
% of Total Sulphur	–	–	49.62	49.862	48.862	48.324
% of Total Ingredients	95.067	97.86	98.74	96.952	94.722	92.344
% of unidentified Ingredients	4.933	2.14	1.26	3.046	5.278	7.656

Detections of Bile Salts / Pigments in samples (Hay's Test):

Principle: Bile salts consist of glycoholic acid and taurocholic acid. The lower of the surface tension of the fluid and this causes Sulphur particles to sink.

The test showed negative i.e. absence of Bile salts and Pigments in samples 6, 7 & 8.

This proves, that the saying of Bile travels through the cow dung into Parpati, is completely a myth. There was no transference of Bile salts / Pigments into the Parpati. The cow dung is used just a gentle media for pressing the Kajjali.

Detection of Chlorophyll in different samples :

Principle: When dried leaves were powdered and then digested with ethanol a 'Crystalline Chlorophyll was obtained after concentration of solvent. If however ether or aqueous acetone is used instead of ethanol then the product is 'amorphous' chlorophyll(Willstalter et. al.). The extraction of chlorophyll is also accompanied by the extraction of two other pigments carotene and xanthophyllene.

METHOD:

Crystalline chlorophyll (Extraction of Chlorophyll by ethanol)

Amorphous chlorophyll (Extraction by aqueous acetone)

RESULTS: Chlorophyll is absent in sample 6, 7, 8.

Spectroscopical study: The absorption characters of the sample (6,7,& 8) in the visible / Ultra voilet and IR region of the spectrum were studied.(Fig1.).

A solution of the sample in Carbon-di-sulphide were nearly transparent. A weak absorption maxmima was discernable around 400 nm, in Mridu, Madhya & Kharapaka of Rasaparpati. In Mridu paka the peak was observed rather flat.

In Infra Red region, Mridu, Madhya & Kharapaka of Rasaparpati shows different peaks. These peaks represent different group of fatty acids.

Peaktable of 1. 10 peaks.

Threshhold: 100, Noise: 5, No range selection.

Nr.	**Pos. (1/cm)**	**Inten (%T)**
1.	609.5	18.199
2.	1163.0	59.401
3.	1386.7	85.486
4.	1460.0	68.313
5.	1652.9	45.387
6.	1743.5	18.392
7.	2146.6	16.663
8.	2233.7	9.185
9.	2852.0	6.850
10	2922.0	4.341

Table No. No.8. Showing results of IR studies.

Group	**Frequency**
O > C	1743.5
- CH2 -	2922 (Asym structure) 2852.5
- C = C <	1650 (Unsaturated fatty acid)
> C = S	1163 (Interaction with Sulphur)

The frequency 1163 shows interactions with Sulphur. Reduction in number of Peaks due to decomposition of fatty acid, is observed in sample.

CONCLUSION:

- The pharmaceutical study suggests the one should be very careful regarding identification of particular stage of paka, because the time between different stages of paka is quite short, especially when the amount of preparation is small.

- The physical and chemical characters of different stages of Rasa Parpati were examined & found that trituration & temperature variation causes difference in % of Hg. & Sulphur in compound & Free state as compared to Kajjali (less percentage).
- The sample 5 (Kajjali) revealed presence of free metallic mercury where as samples (6,7 & 8) of Rasaparparti's found free from metallic mercury. Hence, we can safely use the medicine with good efficacy.
- In addition to these lead was also found present in fine traces.
- UV / visible & IR spectral studies revealed that reduction in number of peaks due to decomposition of fatty acids is observed in Madhya and Khara Paka Rasa Parpati
- Chlorophyll test is shown absent in all the samples. This indicate that there is no any chemical role of Kadali patra in the Rasparpati.
- The Test of Bile salts / Bile Pigment shown absent in all the samples.

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