A SYSTEMATIC OVERVIEW ON –PARPATI KALPANAS

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ABSTRACT

Rasa Shastra (science of alchemy) deals with Parada (mercury) and it is considered to be the heart of Rasa Shastra. In fact, the whole science is under the influence of physical and chemical properties of Parada. Rasa Shastra, one of the Pharmacotherapeutic branches of Ayurveda, incorporates many of the Herbo-mineral-metallic pharmaceutical preparations prepared out of the Parada namely Khalviya Rasayana [medicine is prepared grinding the ingredients in a Khalva Yantra (comparable with mortar and pestle)], Parpati Rasayana (thin flake like medicines), Pottali Rasayana (medicines prepared in cloth) and Kupipakwa Rasayana (Medicines prepared in bottle) respectively. The Historical evidences of Parpati Kalpana ways back in the 11th Century having references from Chakradatta written by Acharya Chakrapani. The term Parpati (thin flake like medicine) has been used in many context of Rasa Shastra. Parpati is a thin Flake like preparation consisting of Parada, Gandhaka (sulphur) and other drugs which are developed from Parada. This Preparation of Parada consist therapeutically effective minerals and metallic formulations which includes both Sagandha (with sulphur) and Nirgandha (without sulphur) Parada Murchita Yoga (medicines prepared out of mercury). Parpati Rasayanas have high therapeutic value, potency, less toxicity and cost effective preparations. Many works have been done on Parpati related to its pharmaceutical, clinical and literary part but so far, there is no work on Parpati Kalpana. Considering detailed review on Pharmaceutical and Analytical Parameters applicable for Parpati preparations. So, in this paper an honest attempt has been made to have a systematic overview of Parpati Kalpanas.

KEY WORDS: Rasa Shastra, Parpati Kalpanas, Murchita Parada Yogas, Pharmaceutical and Analytical Parameters.

INTRODUCTION

Rasa Shastra, a boon of Ayurveda popular from medieval period, mostly deals with therapeutic utilization of metals and minerals, numerous formulations are mentioned in our Shastra with the permutation and combination of Parada along with other ingredients. According to recent concepts, mercury and its compounds are highly toxic. As per Rasa Shastra, Parada i.e. Mercury is considered as most potent substance. It has Shadraša (6 tastes) and balances Tridoshas (three Bodily humours). These properties are exhibited in compound form such as Khalviya Rasayana, Parpati Rasayana etc. Parada is mainly used after subjecting to Moorchana. Sagandha Moorchana is preferred as it is more efficient.¹,² The compounds prepared with Parada (mercury) are considered to be the best. It has been a practice for many years to combine Mercury and Sulphur with other drugs or metals for enhancing their potency. Parpati Kalpana is a well known and successfully used preparation for the management of Grahani (sprue syndrome). Before the invention of Parpati, Grahani was considered difficult to cure but after the invention of Parpati it became curable. The use of Parpati was found beneficial for alleviating associated symptoms of Grahani.
as well as various other diseases like Rajayakshma (tuberculosis), Kustha (skin disorders), and Gulma (tumor) etc. Parada Moorcha Yamas classification is mentioned in Figure no-113.4)

A. Etymology

The Sanskrit word “Parpati” denotes a thin flake like preparation. “Parpati” indicates a preparation which is thin, brittle and has a shape of thin Papad. By heating Kajjali (HgS) is transformed into a thin, flat preparation. In practice though it possesses a thin, flat shape, it is first powdered and then used for medicinal purpose. The texts like “Rasatarangini” also mention “Parpati” as “Parpatika”, meaning the same. But a reference in “Bharat Bheishajya Ratnakara” denotes “Parpatika” as the bits and fragments left in an iron vessel, while preparing the Parpati. As it undergoes more heating, than required, it loses its medicinal value. Parpati is a thin flake like preparation which is developed from “Pota Bandha”, consisting of Parada, Gandhaka and other drugs [It may be dhatu-bhasmas (ash of metals-non metals) or Kashthaushadhis (ash of herbal drugs)].[6]

B. History

Acharaya Nagarjuna’s treatise written in 8th Century named Rasendra Mangala explanations of Parpati in Kushta Roga is found. Later, Chakradatta written by Acharaya Chakrapani which is considered to be the treatise of 11th Century has explained Parpati and highlighted it as Rasa Parpati which is indicated in the Grahani Roga. Thereafter, Bhaishajya Ratnavali written by Acharaya Govind Das Sen which is the text of 19th Century explains many Parpati and while explaining Rasa Parpati he has mentioned that Shivatsanka Nirmita Rasa Parpati is considered to be the best showing the invention of Parpati.[6]

C. Synonyms

- Parpati: like Papad
- Parpati: thin flake
- Parpatika: thin and brittle flake
- Pota Bandha: adhesions or to give support

D. Nomenclature of different Parpati Kalpanas

- If Parada and Gandhaka is used then it is called as- Rasa Parpati.

- If Parada- Gandhaka is mixed with any dhatu/loha, then it is named on the basis of dhatu bhasma used. Ex-
  - Use of Lauha Bhasma- Lauha Parpati
  - Use of Tamra Bhasma- Tamra Parpati
  - Use of Suvarna Bhasma- Suvarna Parpati.

- Depending upon number of ingredients used like- Panchamrita Parpati (use of 5 drugs), Saptamrita Parpati (use of 7 drugs).
- Depending upon the results like- Kusthanta Parpati(Useful in Skin disorders)
- Depending upon the colour and quality of ingredients like- Shweta Parpati (White in colour)
- Depending upon the person who prepared the Parpati like- Bhairvnatha Parpati.

MATERIALS AND METHODS

A. Importance of Parpati Preparation

- Parpati Kalpana is one such method described among the 25 other Parada Bandha methods, which means to control the movement and fragility of the Parada.
- In the procedure of Parpati Kalpana, heat application is conducted; therefore heat energy may enhance its therapeutic efficacy in treating many GIT disorders.
- Application of Gomaya (cow dung), which comes from the alimentary canal of the cow and may have some enzymatic activity.
- With the use of Ghee smeared leaves we can easily scrap out the Parpati, and also ghee is useful in treating indigestion, hence may have a synergistic effect along with Parpati.[7]

B. Basic Principles behind preparation of Parpati Kalpana

1. Samanaya (general purification) or Vishesh Shodhan (special purification) of the ingredients.
2. Homogeneous mixture of the ingredients.
3. Main preparation of the Parpati.[8]
TABLE NO-1 DIFFERENT TYPES OF PARPATI (BASED ON THE DRAVYA USED)

<table>
<thead>
<tr>
<th>Type-1. Based upon use of Kajjali and other ingredients</th>
<th>Type-2. Based on procedure and ingredients used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Parpati containing only Kajjali (Parada and Gandhaka)- Ex. Rasa Parpati</td>
<td>Saganda Parpati: Containing Parada and Gandhaka- ex: Rasa Parpati, Tamra Parpati, Loha Parpati, Bola Parpati, Panchamrita Parpati etc.</td>
</tr>
<tr>
<td>2. Parpati containing Kajjali with one or more loha / dhatu - Ex. Tamra Parpati, Panchamrita Parpati, Loha Parpati, Vijaya Parpati etc.</td>
<td>Nirganda Parpati: Without Parada and Gandhaka- ex: Shweta Parpati, Malla Parpati etc.,</td>
</tr>
<tr>
<td>3. Parpati containing Kajjali and one or more Kasthushadhi. - Ex: Pranada Parpati, Bola Parpati.</td>
<td></td>
</tr>
</tbody>
</table>

C. Methodology

(General Method of Parpati Preparation)

After performing the purification methods of Parada and Gandhaka, they are taken in an iron mortar and Kajjali is prepared till all Lakshanas are achieved For E.g.- Physical Signs like Kajjalabhasa (Blackish), Slakshan (smooth), Anjan Sadrisha (like Collyrium), Sukshma (minute), Rekhapurnatva (Grooves in lines of fingers), Chemical Signs like Jala Pareeksha, Agni Pareeksha, Loha Pareeksha etc. Thereafter as per the requirement and depending upon the type of Parpati Kalpana, other drugs are added to and proper Mardan (trituration) in an iron mortar is carried out till it becomes a uniform homogeneous mixture.

Later on, the mixture is taken in a ghee smeared iron pan and heated over Mandagni (Low fire). After achieving uniform melting immediately the melted contents to a clean Kadali patra (banana leaf) placed over a bed prepared out of Gomaya (cow dung). Then cover the content with another Kadali patra and little amount of fresh Gomaya is spread over it then pressed gently and allowed it to cool and flakes of Parpati are taken out. Colour and Appearance of the Parpati depends upon the kind of ingredients used in the pharmaceutical preparation. With the pressing of Kadali Patra, the impression should be seen on the Parpati prepared. After the completion of the procedure, the flakes are kept for drying and powdered and preserved in an air tight glass bottle/jar. [9,10]

D. Precautions

- Gandhaka (Sulphur) is highly combustible substance. Hence Parpati should not be prepared on Teevragni (High grade fire) as there are chances of catching fire.

- Some amount of Sneha is to be smeared to the iron pan (Lauha Darvi) and Kadali Patra used for preparation.

- Kajjali is heated up to semisolid form or till it becomes Pankavatta (Like Mud).

- Press Kajjali immediately after transferring on to the Kadali Patra which is spread over bed of Gomaya.

E. Use of materials and their importance in the Parpati Kalpana preparation

1. Lauha Darvi (iron pan): - To prepare Parpati, Kajjali is liquefied on Agni with the help of Lauha Darvi. In some texts, use of even Tamra Darvi (copper vessel) is also advised. (Lauha Darvya Kshipeta- in Rasa Tarangini) and (Lauha Patre athva Tamre- in RasaYoga Sagar)

2. Agni: - It plays a very important role in the preparation of Parpati. Mridu Agni (Low fire) is required to liquefy Kajjali. Paka Karma (Cooking) is done till Kajjali attains Pankvatta stage i.e. Muddy appearance. (Sutam Panka samam vilapayam ruchiram paka kriya kovidam- in Rasa Tarangini)

3. Ghrita: - Prevention of adherence of Kajjali to the Iron pan and preventing the Kadali Patra from burning. It also plays an important role of giving soumya and snehatva quality to the Parpati.

4. Gomaya (cow dung): - Gomaya bed acts as a cushion for pressing and moreover Parpati kalpana is usually prescribed for the treatment of the Pittaja Vyadhis (diseases of Pitta origin) and Jatharagni mandya rogas (Diseases of Digestive fire). Use of Fresh Gomaya increases the potency of the medicine. It contains maximum ratio of...
biliary products which in turn during preparation of Parpati gets absorbed in to the heated Kajjali through the Patra media and thus helps to regulate the biliary ailments and other Pittajanya vyadhis (diseases).

Properties of Cow dung- The main constituent of cow dung is debris from cells within the digestive tract and secretions from the body such as salts, sloughing of animal cells and mucus. Feces also include undigested diet comprising cellulose and lignin, originating from the cell walls of the plants.

5. Patra: - Use of Patras (leaves) like Kadali Patra (banana leaf), Eranda Patra (castor leaf) etc in the preparation increases the potency of the drug. Use of Kadali Patra gives the Kashaya quality to the Parpati. Use of such leaves which are highly rich in chlorophyll gets absorbed into the formulation and exerts therapeutic effects on human systems especially on G.I.T.

Properties of Chlorophyll- One of the best Anti-oxidants, able to neutralize the negative effects of free radical in the body, helps prevent many degenerative diseases and maintain the body stronger. Chlorophyll helps cleanse the body toxins. [11, 12]

F. Parpati Paka

While describing Parpati preparations, 3 Pakas (stages) have been mentioned in the texts i.e., Mridu (soft) Madhyama (medium) and Khara (severe) paka. In these Mridu and Madhyama paka preparations are the best to be used in therapeutically. The Parpati paka lakshanas (Stages of Parpati cooking) are mentioned in Figure No-2 [13, 14]

<table>
<thead>
<tr>
<th>Paka Kalina Pareeksha</th>
<th>Paka Paschata Pareeksha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mridu paka: When melted Kajjali attains Mayura Chandrika varna (like peacock feather).</td>
<td>Mridu paka: It is very soft smooth and bends on breaking, black in colour and shining is less.</td>
</tr>
<tr>
<td>Madhyama paka: If melted Kajjali attains Taila (oily) consistency.</td>
<td>Madhyama paka: Black coloured with proper shining. I.e. while breaking, on the edges shining silver colour is seen.</td>
</tr>
<tr>
<td>Khara paka: If melted Kajjali attains Rakta varna (Reddish colour).</td>
<td>Khara paka: It attains the blackish brown colour instead of black colour. Mostly burnt pieces and powder will be observed. It should be discarded because it can acts as Visha.</td>
</tr>
</tbody>
</table>

G. Doses and Rules for Parpati Kalpana intake

In our classics we can get many references regarding matra (dose) and how to use Parpati preparations internally, but basically there are 2 types of Parpati intake regimens.

1. Samanya prayoga (General use)
2. Kalpa or Vardhamana prayoga (Gradual use)
   - Samanya Prayoga: - Parpati is prescribed in a dose of 1-2 Ratti (125-250 mg) mixed with fried Jeerak (Cumin seeds) and Hingu (Asafetida) in divided doses. In this way of use dietetic restriction is not necessary, in case of Unmada (Insanity) and Apasmara (Epilepsy) the starting dose mentioned is 8 Ratti per a day.
   - Kalpa Prayoga or Vardhamana Prayoga: - Many references we can get from our classics, these are highlighted below:

1. Reference from Rasa Tarangini: -In the text it has been stated that 2 Ratti (250 mg) Parpati preparations is given as a starting dose and increased gradually up to 10 Ratti (2500 mg). [14]
2. According to Acharaya Chakrapani: - Parpati dose is started from the dose of 2 Ratti (250 mg) and then increased gradually up to 12 Ratti (3000 mg) [15]

Description of Kalpa Prayoga/ Vardhamana Prayoga

Parpati preparations should be administered in 2 Ratti dose (250 mg) initially and then increase it by 1 Ratti (125 mg) daily or alternate days till 10 Ratti (2500 mg) is reached. This dose should be continued till the ailment is cured and then the dose may be reduced by 1 Ratti (125 mg) daily till it becomes again 2 Ratti.
(250 mg). This is a common procedure to be followed for all types of Parpati while using as Kalpa Prayoga. In this way it takes around 40 days for a Kalpa Prayoga usage.

Depending upon the severity of disease and strength of the patient, it can be used for 36 days, 40 days, 60 days or 96 days. This 36/40/60/96 day’s scheduled period is called as Mandala/Chakra. The quantity of Parpati consumed when used for 36 days chakra is 188 Ratti, for 40 days 310 Ratti, 60 days – 480 Ratti, 90 days – 768 Ratti. Now which type of Mandala is to be used for the patient depends upon the physician to decide. If needed, it can be repeated for 2, 3 or more times as per requirement. [16-18]

H. Pathya- Apathya (Do’s and Don’ts) during Parpati intake as medication

1. Pathya

In Rasa Tarangini there are list of drugs mentioned which are to be taken during Parpati sevan, they are, Kakamachi (Black night shade), Patola (Pointed gourd), Pugiphal (Betel nut), Ardrak (Ginger), Kadali pushpa (Banana flowers), Brinjal, Old Shalidhanya, Godugda with Sharkara.

1. Uses of Parpati preparations in different diseases along with various Anupanas (Vehicles) [22-23]

| Disease Type                  | Parpati Preparation | Ingredients and Quantity | Dose and Anupana | Anupana \n|------------------------------|---------------------|-------------------------|------------------|----------------
| Unmada Roga (Insanity)       | Parpati             | Sh. Parada-4 Masha      | 2 Ratti (250 mg) with Ghee, Ksheer, Madhu | Bhaishyja Ratnavali-Grahani 468-479 |
| Apasamra Roga (Epilepsy)     | Parpati             | Sh. Gandhaka-8 Masha    |                  |               |
| Sangrahani Roga (type of GIT disorder) | Parpati             | Loha Bhasma-2 Masha    |                  |               |
| Udara shula (Abdominal pain) | Parpati             | Abhrak Bhasma-1 Masha  |                  |               |
| Pandu with shotha (Anemia with Inflammation) | Parpati             | Tamra Bhasma-1         |                  |               |
| Kushta (Skin disorders)      | Parpati             | Nimba panchanga, Bakuchi and Bhringaraj churna |                  |               |
| Vatajwara (Vatik type of fever) | Parpati             | Dashmala Kwatha        |                  |               |
| Kasa (Cough)                 | Parpati             | Trikatu Churna         |                  |               |

2. Apathya

In Rasa Tarangini there is mentioning of avoidance of river water or well water for drinking during Parpati Kalpana medication as it increases the severity of disease. Patient is advised to drink plenty of Takra (Buttermilk). There are certain things which are contraindicated like Amla sevana (Intake of Sour things), Shita Jala Snana (Bathing with cold water), sita vayu sevana (Exposure to cold winds), krodha (Anger), chinta (Tension/Pressure), usna dravya sevana (Intake of hot substances), tikta dravyas (bitter drugs) like Nimba (Neem), sweet substance like Guda (Jaggery), Anupa mamsa (Aquatic/frozen meat), stree sambhasana (Sexual activities) etc.

According to Acharaya Chakrapani, after intake of Parpati preparation the patient should chew lots of betel nut in a day. On 3rd day patient is allowed to take meat, ghee, milk but avoid Vidahi anna, sexual intercourse, banana root, mustard oil, small fish and aquatic birds. The patient should take water after waking up in early morning. [19-21]

J. Parpati preparations classification

Many different Parpati preparations are mentioned in our classics which are having different ingredients and are being used in different ailments. Such classification is mentioned below in Table No-3; [24-27]

<table>
<thead>
<tr>
<th>S.No</th>
<th>Type of Parpati preparation</th>
<th>Ingredients and Quantity</th>
<th>Dose and Anupana</th>
<th>References</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Panchamrita Parpati</td>
<td>Sh. Parada-4 Masha</td>
<td>2 Ratti (250 mg) with Ghee, Ksheer, Madhu</td>
<td>Bhaishyja Ratnavali-Grahani 468-479</td>
<td>Grahani, Aruchi, Chardi, Dushta Arsha, Atisara, Raktapittta</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sh. Gandhaka-8 Masha</td>
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<td></td>
<td></td>
<td>Loha Bhasma-2 Masha</td>
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<td></td>
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<td>Abhrak Bhasma-1 Masha</td>
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<td>Tamra Bhasma-1</td>
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</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td><strong>Loha Parpati</strong></td>
<td>Sh. Parada Sh. Gandhaka Kanta Loha Bhasma (All equal parts)</td>
<td>1-2 Ratti (125-250 mg) with Sheeta Jala, Dhanyaka and Jeerak kwath</td>
</tr>
<tr>
<td>3.</td>
<td><strong>Swarna Parpati</strong></td>
<td>Sh. Parada- 4 parts Sh.Gandhaka- 4 parts Swarna bhasma - 1 part</td>
<td>1 Ratti (125 mg) with Brishta Jeeraka churna and Madhu</td>
</tr>
<tr>
<td>6.</td>
<td><strong>Gagana Parpati</strong></td>
<td>Sh. Parada - 1 part Sh. Gandhaka - 2 parts Abhraka bhasma - 1 part</td>
<td>1-3 Ratti (125-375 mg) with Brishtha jeeraka, Takra, Dugdha, Madhu and Dadimaswarasa</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Shweta Parpati</strong></td>
<td>Surya kshara - 1 part Spathika - 1/8 part Navsadara - 1/16 part</td>
<td>5-10 Ratti (625-1125 mg) with sheeta jala, Narikela Jala, Sharkara yukta dugdha, mutral kwatha,</td>
</tr>
</tbody>
</table>
K. Information of some of the work carried out on Parpati Kalpanas


2. Vijayamahantesh S. Hiremath, Preparation and Physico-Chemical Analysis of Shweta parpati and its clinical efficacy on Mootakrichra, Department of Rasashastra, Shri D. G. Melmalagi Ayurvedic Medical College, Gadag, Dissertation submitted in Rajiv Gandhi University of Health Sciences, Bangalore, Karnataka, 2005.

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L. Analytical Parameters/ Modules for Parpati Kalpana preparations

The Standard Operating Procedure (SOP) of Parpati formulation is mentioned below: [28-31]

1. Description
   Colour, Odour and Taste

2. Identification
   Microscopy (wherever possible), Colour test, Chemical test (Group test) and TLC/HPTLC

3. Physico-chemical Parameters
   Loss on drying at 105°C, Total ash, Acid insoluble ash, Total solid, Water-soluble extractives, Alcohol-soluble extractives, pH and Volatile oil

4. Particle size
   Bulk density and Tap density

5. TLC/HPTLC – Profile with marker (wherever available)

6. Assay for Constituents (Marker %, Major compounds like Alkaloids, flavonoids/saponin compounds)

7. Tests for heavy/toxic metals

<table>
<thead>
<tr>
<th>Test for heavy/Toxic metals</th>
<th>As per WHO / FDA (Permissible limit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>10.0 ppm</td>
</tr>
<tr>
<td>Cadmium</td>
<td>0.30 ppm</td>
</tr>
<tr>
<td>Mercury</td>
<td>1.00 ppm</td>
</tr>
<tr>
<td>Arsenic</td>
<td>10.0 ppm</td>
</tr>
</tbody>
</table>

8. Microbial contamination
   Total viable aerobic count, Total enterobacteriaceae and Total fungal count

9. Test for specific pathogen
   E. coli, Salmonella spp., S. aureus and Pseudomonas aeruginosa

10. Pesticide residue
   Organochlorine pesticides, DDT (all derivatives), HCH (all their Isomers), Endosulfan, Alderin used as standard, Organophosphorus pesticides, Malathion, Parathion and Pyrethroids
11. Test for Aflatoxine (B1, B2, G1, G2)
12. Lethal dose
13. Optimum effective dose/ Mode of administration
14. Shelf life
15. Packing and Labeling [32,33]

M. Glimpses of Analytical Study Conducted on Parpati Kalpana:

Parpati, Payodhar; Sahoo, G.; Das, K.; Ghosh, Sudipto; Panigrahi, S. C. on Synthesis of Black and Red Mercury Sulfide Nano-Powder by Traditional Indian Method for Biomedical Application. The study revealed following things [34]:

1. In the present investigation, the same method was followed to synthesize the sulfides and the product was characterized using modern methods like XRD, SEM and HRTEM.
2. With increase in milling time the fineness of the powder increases, which increases the efficacy of the medicine, and free mercury, which is not desirable for medicinal application is found to decrease.
3. The powder obtained at the end of 48 hours of milling is found to be of a size finer than 10nm.
4. Mercury sulfide, mercuric sulfide, or mercury (II) sulfide is a chemical compound composed of the chemical elements mercury and sulfur.
5. It is represented by the chemical formula HgS.
6. It is virtually insoluble in water.
7. HgS is dimorphic with two crystal forms.
8. Red cinnabar (α-HgS, hexagonal, hP6, P3221), is the form in which mercury is most commonly found in nature.
9. Black, Meta cinnabar (β-HgS), is less common in nature and adopts the Zinc Blende (T2d-F-43m) crystal structure.
10. Crystals of red, α-HgS, are optically active. This is caused by the Hg-S helices in the structure.

CONCLUSION

Parpati for the first time was formulated in 8th century, in the name of Rasa Parpati. It is a Murchana variety, attaining vyadhiharana (destroying the disease) property. Mandagni, Gomay, Kadali, Parpatakara have their own significances in Parpati nirmana. Mridu and Madhyama Paka Parpati are to be used Khara paka is tyajya (discarded). Its prime importance is in Grahni vikara. Parpati is a prestigious and dependable preparation in Rasa Shasta for the management of Grahan. It should be prepared carefully following the guide-lines given by various classical texts in regards to purification of mercury, sulphur and other materials and proper incineration of minerals and metals which are used for preparation of various Parpati kalpana. Then only Parpati becomes safe, effective and beneficial for therapeutic purpose.

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PHOTOGRAPHS OF PARPATI KALPANA PREPARATIONS (RASA PARPATI)

Kajjali added in ghrit lipta darvi

Proper mixing and avoiding lumps to form

Making Kalavata (Like muddy appearance)

Proper pressing to make flakes

Proper Parpati preparation is achieved

Formation like Papad (Flakes)