“PHARMACEUTICAL STANDARDIZATION OF ASHWAGANDHADI YOGA”

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ABSTRACT:

Rasa Shastra and Bhaishajya Kalpana is a branch of Ayurveda dealing with the pharmaceutical processing of Ayurvedic Medicines using specialized techniques mentioned in classics. In the present study, the work done on Pharmaceutical study of Ashwagandhadi Yoga under the post graduate research program is being presented. Ashwagandhadi Yoga is a Herbo-mineral compound indicated in Sweta Pradara taken from the reference of Rasa Tantra Sara Va Siddha Prayoga Sangraha part-2, Stree Rogadhikara. The ingredients are Ashwagandha, Vidari, Brihat Ela, Kukkutanda Twak Bhasma, Vanga Bhasma, Mishri. The pharmaceutical processes involved are Shodhana, Jarana, Marana, Bhavana, Swarasa Nirmana, Churna Nirmana. The aim of present study is to standardize the Pharmaceutical preparation of Ashwagandhadi Yoga as per classics.

Key words: Ashwagandhadi Yoga, Sweta Pradara, Shodhana, Jarana, Marana.

Introduction:

Rasa Shastra is the pharmaceutical branch of Ayurveda which deals with the mercurial, mineral and metallic processing and their therapeutic applications. However, most of the drugs as such are not absorbed into the biological system, until and unless they undergo certain processing techniques. The integral part of Rasa Shastra lies in the successful pharmaceutical processing.

It has been stated in classics that strong poison could be the best medicine after proper detoxification and in proper therapeutic dose. By adopting specialized pharmaceutical procedures like Shodhana, Marana, Jarana, Murcchana etc, they are converted into non-toxic, safe, efficacious, absorbable and potent therapeutic forms.

AIM & OBJECTIVES:

Pharmaceutical standardization of various steps involved in the preparation of Ashwagandhadi Yoga.
MATERIALS AND METHODS:

Collection of Drugs:

*Kukkutanda Twak* was collected from local fast food centres. The raw materials like *Vanga, Ashwagandha, Vidari, Brihat Ela, Mishri* were purchased from Vijaywada market, Andhra Pradesh. Drugs were identified macroscopically from PG Department of *Dravyaguna*, S. V. Ayurvedic College, TTD, Tirupati.

All pharmaceutical processes involved in the preparation of *Ashwagandhadi Yoga* were carried out in PG Department of *Rasa Shastra & Bhaisajya Kalpana*, S.V. Ayurvedic College, TTD, Tirupati.

Chief Reference:

The present formulation was taken from the reference –

*Rasa Tantra Sara Va Siddha Prayoga Sangraha – Streeroga Adhikara, Part 2.*

The entire pharmaceutical study was carried out in four stages

**STAGE 1**

- Shodhana of *Kukkutanda twak*
- Marana of *Kukkutanda twak*

**STAGE 2**

- Shodhana of *Vanga – Samanya and Visesha*
- Jarana of *Vanga*
- Marana of *Vanga*

**STAGE 3**

- Preparation of *Ashwagandha churna*
- Preparation of *Vidari churna*
- Preparation of *Brihat Ela churna*
- Preparation of *Mishri churna*
Preparation of homogeneous mixture.

1. **Kukkutanda twak Shodhana**

**Reference:** Rasa Tantra Sara Va Siddha Prayoga Sangraha, Bhasma prakarana, Part 1.

**Materials:** Kukkutanda Twak - 1000g, Saindhava Lavana - 90g, Navasadara - 90g, Water-3L.

**Principle:** Soaking

**Apparatus:** Stainless steel vessel, measuring jar.

**Procedure**

Kukkutanda twak was taken in a steel vessel and soaked in the solution of Saindhava lavana and Navasadara for three days.

On fourth day, the inner membranous layer of the eggshell was removed carefully, washed with hot water and dried under sunlight.

**Observation**
- After the completion of procedure, colour of eggshell become brighter and smooth.

**Precautions**
- Inner membranous layer was removed carefully to avoid the wastage.

**Result:**

<table>
<thead>
<tr>
<th>Table No 1: showing the result of Kukkutanda twak Shodhana</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial weight</strong></td>
</tr>
<tr>
<td>1000g</td>
</tr>
</tbody>
</table>

**Reason for loss:** Loss is due to removal of inner membranous layer.

2. **Kukkutanda twak Marana**

**Reference:** Rasa Tantra Sara Va Siddha Prayoga Sangraha, Bhasma prakarana, Part 1.

**Materials:** Shodhita Kukkutanda twak - 800g, Changeri Swarasa - Sufficient quantity

**Principle:** Marana

**Apparatus:** Khalwa yantra, sharava, spoon, fuller’s earth, cloth, cow dung cakes.

**Procedure:**
- Changeri Swarasa needed for Bhavana was prepared according to classics.
- Shuddha Kukkutanda twak was taken in khalwa vantra and made into powder form.
- Changeri Swarasa was added to it and triturated well.
- Then uniform sized Chakrika were prepared and kept in sharava, another sharava having the same dimensions was placed over it in such a way that the mouth of both sharava come in contact and sandhi badhana was done with a cloth smeared with multanimitti. Then it was allowed for drying.
After drying, it was subjected to Gaja puta. Complete procedure was keenly observed and the temperature pattern was noticed and noted.

Sharava was collected after self-cooling. Sandhi bandhana was removed carefully and the drug was collected.

The same procedure was repeated for one more time.

White coloured Kukkutanda twak bhasma was obtained.

**Observation**

- Maximum temperature attained during the puta was 1003°C.
- The reduction in the weight of Kukkutanda twak was noticed.
- White colour bhasma was obtained after second puta.

**Precautions**

- Sandhi bhandhana should be done properly.
- Temperature should be noted at regular intervals

**Result**

**Table No 2: Showing the result of Kukkutanda twak marana**

<table>
<thead>
<tr>
<th>Puta</th>
<th>Weight of Shodhita Kukkutanda twak</th>
<th>Quantity of Changeri Swarasa taken</th>
<th>Weight of Chakrika</th>
<th>Weight of Chakrika after Puta</th>
<th>Colour</th>
<th>Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1800g</td>
<td>1200ml</td>
<td>2400g</td>
<td>1100g</td>
<td>white</td>
<td>soft</td>
</tr>
<tr>
<td>2.</td>
<td>1100g</td>
<td>550ml</td>
<td>1500g</td>
<td>720g</td>
<td>white</td>
<td>soft</td>
</tr>
</tbody>
</table>

**Reason for Loss**:
The loss in weight was incurred due to procedures and handling

**Table No. 3: Showing the values of temperature at regular time intervals during Gajaputa**

<table>
<thead>
<tr>
<th>Time (min)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>60</td>
<td>295</td>
</tr>
<tr>
<td>120</td>
<td>660</td>
</tr>
<tr>
<td>180</td>
<td>967</td>
</tr>
<tr>
<td>240</td>
<td>1003</td>
</tr>
<tr>
<td>300</td>
<td>747</td>
</tr>
<tr>
<td>360</td>
<td>535</td>
</tr>
<tr>
<td>420</td>
<td>327</td>
</tr>
<tr>
<td>480</td>
<td>156</td>
</tr>
<tr>
<td>540</td>
<td>80</td>
</tr>
<tr>
<td>600</td>
<td>42</td>
</tr>
</tbody>
</table>
3. Vanga Samanya Shodhana 4

Reference: Rasaratna Samucchaya 5/13

Materials: Vanga - 1000g, Tila taila - 5L, Takra - 5L, Gomutra - 5 L, Kanji - 5L, Kulattha Kwatha - 5L

Principle: Dhalana

Apparatus: Gas stove , Pittara yantra , steel vessels , Weighing Machine , iron pan.

Procedure:

- Initially Kanji, Kulutta Kwatha were prepared according to classics and were kept ready.5,6
- Vanga was melted in an iron pan. It was immediately poured into Pittara Yantra containing sufficient quantity of Tila taila. The procedure was repeated for 6 more times. *Note – Each time the Tila taila was changed.
- In the same way, the procedure was repeated with Takra, Gomutra, Kanji and Kulattha Kwatha subsequently.

Observations:

- Initially Vanga looked silvery white in colour.
- On quenching in Tila taila, cracking sound was produced. Later when Vanga was melted in iron pan, flame is produced with dense fumes. The colour of oil turned into dark black.
- Vanga melted in 4.50 minutes at the time of first Dhalana and it took 8 minutes to melt in 7th Dhalana
- On quenching in other liquids, bubbling sound was produced with liberation of vapour.
- On quenching in Takra, it turned to thin watery liquid, devoid of opacity.
- On quenching in Gomutra, it became dark red and turbid.
- The media became very hot after Dhalana.
- Vanga turned into coarse powder by the end of the procedure.

Precautions:

- While pouring molten Vanga care should be taken so that it should not spill and cause burns.
- Before every quenching it must be ensured that Vanga should be heated till it melts completely.
- Amount of liquid taken for quenching should be sufficient for complete immersion of Vanga.
- Utmost care should be taken to prevent the loss of Vanga during Dhalana.

Reasons for Loss: Due to handling during Dhalana.

4. Visesha Shodhana of Vanga 7

Reference: Rasa Tarangini 18/11-12

Materials: Vanga - 850g, Nirgundi Swarasa - quantity sufficient, Haridra churna - quantity sufficient

Principle: Dhalana

Apparatus: Gas stove , Iron pan, Pittara yantra, Weighing machine, Steel vessel.
Procedure:

- Nirgundi Swarasa was prepared and Haridra was added to it.
- Samanya Shodhita Vanga was taken in a clean iron pan and heated to melt.
- The molten Vanga is poured through Pithara yantra into a vessel containing Haridra yukta Nirgundi Swarasa.
- The solidified Vanga is collected back, melted again and poured in fresh Haridra yukta Nirgundi Swarasa.
- This process is repeated for 3 times to obtain the Shodita Vanga.
- Later it was dried and stored as Shuddha Vanga.

Observations:

- Vanga melted in four minutes at the time of first Dhalana and it was seven and half minute at the time of 3rd Dhalana.
- The Haridra yukta Nirgundi Swarasa became hot but do not spill over.
- Smell of Haridra is observed after Dhalana.

Results:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Initial weight</th>
<th>Final weight</th>
<th>Loss in weight</th>
<th>Loss percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Samanya Shodhana</td>
<td>1000g</td>
<td>735g</td>
<td>185g</td>
<td>18.5%</td>
</tr>
<tr>
<td>2. Visesha Shodhana</td>
<td>735g</td>
<td>700g</td>
<td>35g</td>
<td>4%</td>
</tr>
</tbody>
</table>

Reasons for loss: Due to handling during Dhalana

5. Jarana of Vanga

Reference: Rasa Tarangini 18/29

Principle: Shuddha Vanga – 790, Aswattha Twak Yavakute Churna

Time taken for completion: 17 hours


Procedure:

- Ashwatta Yavakuta Churna was prepared and kept ready.
- The Shodhita Vanga was taken in the Loha Kadhai and heated to melt.
- Ashwatta twak Yavakuta Churna was added to the molten Vanga repeatedly and rubbed continuously with iron ladle till Vanga gets converted into powder form.
When Shodhita Vanga completely transformed into powder form, it was collected at the centre of kadhai and closed with a sharava and intense heat was given till the bottom of the vessel became red hot.

When the powder at centre of kadhai became red hot, then kadhai was kept for self-cooling.

After self-cooling the powder was sieved through cloth, metal particles left on it were separated and again subjected to the same procedure.

Powder which was obtained was washed repeatedly with water for complete removal of alkali content.

For washing, powder was dissolved in water and left undisturbed for 3 hours and the clear supernatant liquid was removed.

After complete reduction of alkaline content of Vanga, it was dried and stored.

Observations:

- Vanga gradually converted to ash coloured powder.
- While adding Aswattha twak yavakuta churna, fumes are observed.

Precautions:

- Aswattha twak yavakuta Churna should be added little by little throughout the procedure.
- Continuous stirring of the contents should be done.
- Care should be taken to avoid spilling.

Results:

<table>
<thead>
<tr>
<th>Table No 5: Showing the result of Vanga Jarana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial weight</td>
</tr>
<tr>
<td>700g</td>
</tr>
</tbody>
</table>

Reason for Gain: Gain in weight was due to addition of Aswattha twak Yavakuta Churna.

6. Vanga Marana

Reference: Rasamrutham 3/88-94

Materials: Jaritha Vanga – 740g, Kumari Swarasa – sufficient quantity

Principle: Marana

Apparatus: Khalwa yantran , Sharava , Spatula , Cloth, multtani mitti , Cow dong cakes.

Procedure:

- Kumari Swarasa was prepared initially and kept ready.
- Jaritha Vanga was taken in Khalwa yantra , sufficient quantity of Kumari Swarasa was added to it and triturated.
- Chakrika of uniform size were prepared, dried and were kept in a sharava. Sandhi bandhana was done.
- Sharava samputa was kept in sunlight for drying
After drying, it was subjected to Ardha Gaja puta.

Whole procedure was repeated until all the Bhasma lakshana were attained as mentioned in the classics.

Observations:
- Maximum temperature attained during the puta was 700°c.
- The reduction in weight of Vanga has been noticed throughout the process.
- Nischandratwa was obtained after 4th puta.
- Rekhapurnatwa was obtained after 2nd puta.
- Varitaratwa was obtained after 7th puta.

Precautions:
- Chakrika of uniform size and shape must be prepared.
- Sandhi bandhana should be done properly.
- Cow dung cakes should be placed uniformly on all sides.
- Temperature should be noted at regular intervals.

Results:

Table No 6: Showing the change in weight of Vanga Bhasma with respect to puta

<table>
<thead>
<tr>
<th>Puta No.</th>
<th>Weight of Chakrika after Bhavana (g)</th>
<th>Weight of Chakrika after puta (g)</th>
<th>Loss in weight(g)</th>
<th>Loss percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>740</td>
<td>690</td>
<td>21</td>
<td>2.83%</td>
</tr>
<tr>
<td>2</td>
<td>731</td>
<td>709</td>
<td>22</td>
<td>3.0%</td>
</tr>
<tr>
<td>3</td>
<td>722</td>
<td>698</td>
<td>24</td>
<td>3.32%</td>
</tr>
<tr>
<td>4</td>
<td>711</td>
<td>691</td>
<td>20</td>
<td>2.81%</td>
</tr>
<tr>
<td>5</td>
<td>693</td>
<td>674</td>
<td>21</td>
<td>3.03%</td>
</tr>
<tr>
<td>6</td>
<td>687</td>
<td>663</td>
<td>24</td>
<td>3.49%</td>
</tr>
<tr>
<td>7</td>
<td>675</td>
<td>651</td>
<td>24</td>
<td>3.55%</td>
</tr>
</tbody>
</table>

Table No 7: Showing the result of Vanga Marana

<table>
<thead>
<tr>
<th>Initial weight</th>
<th>Final weight</th>
<th>Loss in weight</th>
<th>Loss percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>740g</td>
<td>651g</td>
<td>89g</td>
<td>12.02%</td>
</tr>
</tbody>
</table>
Table No 8: Showing the temperature at regular time intervals during *Ardha Gaja Puta*

<table>
<thead>
<tr>
<th>Time in minutes</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>49°C</td>
</tr>
<tr>
<td>60</td>
<td>700°C</td>
</tr>
<tr>
<td>120</td>
<td>349°C</td>
</tr>
<tr>
<td>180</td>
<td>94°C</td>
</tr>
<tr>
<td>240</td>
<td>26°C</td>
</tr>
</tbody>
</table>

Table No 9: Showing the colour of *Vanga Bhasma* during Puta

<table>
<thead>
<tr>
<th>Puta Number</th>
<th>Colour</th>
<th>Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Grey</td>
<td>Hard</td>
</tr>
<tr>
<td>2</td>
<td>Grey</td>
<td>Slightly hard</td>
</tr>
<tr>
<td>3</td>
<td>Grey</td>
<td>Soft</td>
</tr>
<tr>
<td>4</td>
<td>Whitish Grey</td>
<td>Soft</td>
</tr>
<tr>
<td>5</td>
<td>Remained as the same</td>
<td>Soft</td>
</tr>
<tr>
<td>6</td>
<td>Remained as the same</td>
<td>Soft</td>
</tr>
<tr>
<td>7</td>
<td>Creamy white</td>
<td>Very soft</td>
</tr>
</tbody>
</table>

Table No 10: Showing *Varitaratwa*

<table>
<thead>
<tr>
<th>No of Puta</th>
<th>Varitaratwa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 4</td>
<td>-</td>
</tr>
<tr>
<td>5th</td>
<td>+</td>
</tr>
<tr>
<td>6th</td>
<td>++</td>
</tr>
<tr>
<td>7th</td>
<td>++++</td>
</tr>
</tbody>
</table>

Table No 11: Showing *Rekapurnatwa*

<table>
<thead>
<tr>
<th>No of Puta</th>
<th>Rekhapurnatwa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st to 2nd</td>
<td>No change</td>
</tr>
<tr>
<td>3rd</td>
<td>+</td>
</tr>
<tr>
<td>4th</td>
<td>++</td>
</tr>
<tr>
<td>5th</td>
<td>+++</td>
</tr>
<tr>
<td>6th</td>
<td>++++</td>
</tr>
<tr>
<td>7th</td>
<td>++++</td>
</tr>
</tbody>
</table>
Reason for Loss:
The loss in weight was incurred due to procedures and handling.

7. Churna Nirmana of Ashwagandha, Vidari, Brihat Ela, Mishri\textsuperscript{13}

Reference: Sharangdhara Samhita Madhyama Khanda 6/1
Materials: Ashwagandha – 500g, Vidari – 500g, Brihat Ela – 150g, Mishri – 500g.
Principle: Pounding, sieving
Apparatus: Khalwa yantra, Stainless steel vessel, spoon.
Procedure:
- Dried Ashwagandha roots, Vidari tubers, Brihat Ela seeds, Mishri were taken, checked for any external impurities, worms and insects then cleaned and dried.
- Then they were taken in Khalwa yantra and pounded individually.
- Pounded material was sieved through a clean cloth to obtain very fine powder.
- Then they were stored in an airtight containers seperately.

Observations:
- Very fine powders of cream coloured Ashwagandha, white coloured Vidari, brown coloured brihat ela, white Mishri were obtained.

Precautions:
- While pounding care should be taken to avoid spillage.
- Sieving should be done properly to get fine powder.

Result:
Table No 12: Showing the result of preparation of Ashwagandha churna

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Initial weight</th>
<th>Final weight</th>
<th>Loss in weight</th>
<th>Loss in percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ashwagandha</td>
<td>500g</td>
<td>480g</td>
<td>20g</td>
<td>4%</td>
</tr>
<tr>
<td>2. Vidari</td>
<td>500g</td>
<td>480g</td>
<td>20g</td>
<td>4%</td>
</tr>
<tr>
<td>3. Brihat ela</td>
<td>150g</td>
<td>140g</td>
<td>10g</td>
<td>6%</td>
</tr>
<tr>
<td>4. Mishri</td>
<td>500g</td>
<td>480g</td>
<td>20g</td>
<td>4%</td>
</tr>
</tbody>
</table>

Reason for loss: Loss was incurred due to spillage during pounding and seiving

8. Preparation of Homogenous mixture\textsuperscript{14}

Materials: Ashwaganda Churna – 300g, Vidari Churna – 300g, Brihat Ela Churna – 75g, Kukkutanda Twak Bhasma – 75g, Vanga Bhasma – 37.5g, Mishri – 300g.
Principle: Mardhana /Mixing
Apparatus: Khalwa yantra, spoon.
Procedure:
- Fine powders obtained after practical No. 3, 4, 5, 6, 7, 8 were added one by one in *Khalwa yantra* and mixed well.
- Mixing was carried out till a homogeneous mixture was obtained.
- It was collected and preserved in an air tight glass container.

**Observations:**
- Very fine homogeneous mixture was obtained.

**Precautions:**
Careful mixing of all the *Churna* has to be done.

**Results:**

Table No. 13: Showing the result of mixing of component drugs of *Ashwagandhadi Yoga*.

<table>
<thead>
<tr>
<th>Initial weight</th>
<th>Final weight</th>
<th>Loss in weight</th>
<th>Loss in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1090 g</td>
<td>1070 g</td>
<td>20 g</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Reason for loss:** Loss was incurred due to spillage while mixing.
Figure 1 Kukkutanda Twak

Figure 2: Soaking in the solution of Saindavam and Navasadara

Figure 3 Kukkutanda Twak washed with hot water and dried under sunlight

Figure 4 Shuddha Kukkutanda Twak Churna

Figure 5 Bhavana with Changeri Swarasa

Figure 6 Chakrika Nirmana

Figure 7: Sharava Samputa

Figure 8: Gaja Puta
Figure 9: *Kukkutanda Twak Bhasma*

Figure 10: *Ashodhita Vanga*

Figure 11: *Samanya Shodhita Vanga*

Figure 12: *Visesha Shodhita Vanga*

Figure 13: *Jarana using Ashwattha Twak Yavakote Churna*

Figure 14: *Rubbing using Iron ladle*

Figure 15: Bottom of Pan becomes red hot

Figure 16: *Jaritha vanga After self cooling*

Figure 17: *Washing with water*

Figure 18: *Bhavana using Kumari Swarasa*
Figure 19: Chakrika Nirmana

Figure 20: Sarava Samputikarana

Figure 21: Ardha Gaja Puta

Figure 22: Vanga Bhasma

Figure 23: Ashwagandha roots

Figure 24: Ashwagandha Churna

Figure 25: Vidari Tubers

Figure 26: Vidari Churna

Figure 27: Brihat Ela seeds

Figure 28: Brihat Ela Churna
DISCUSSION:

The Pharmaceutical procedures adopted in this Study are – Shodhana (Samanya & vishesha), Jarana, Bhavana, Marana, Swarasa Nirmana, Churna Nirmana.

Shodhana

All the pharmaceutical procedures such as washing (Kshalana), trituration (Mardana), heating, dipping (Nirvapana) etc are carried out over a medicinal drug with the intention of getting it purified is called as Shodana\(^5\).

Significance of Shodhana:

Most of the materials of Rasa Shastra are obtained from mineral sources containing various impurities which are responsible for causing toxic effects to body tissues. Therefore Rasa dravya are purified first by a specialized processing technique known as Shodhana before subjecting them for the main processing.

Here Nimajjana for Kukkutanda twak Shodhana and Dhalana for Samanya and Visesha Shodhana of Vanga was adopted.

Nimajjana is a process where any dravya is kept immersed in the prescribed in the prescribed liquid for specific period. Kukkutanda twak was soaked in the solution of Saindhava lavana and Navasadara for three days\(^6\). During Shodhana procedure, it was observed that the colour of solution was changed from translucent to opaque and hazy white. The remnant portions of egg yolk and egg albumin were found floating on the surface of water and foul smell was observed during Shodhana process.

After Shodhana, it was noticed that Kukkutanda twak pieces became brighter and smooth. The inner membraneous layer of egg shell could also be easily removed. The average weight loss observed was 30 percent. It may be due to removal of inner membraneous layer. Some small particles of eggshell get lost during washing with hot water.

Samanya Sodhana

Samanya Sodhana is common for all dhatu and it is aimed to eliminate specific, unwanted impurities along with enhancement of general properties.
Vishesa Sodhana

Vishesa Sodhana is specifically indicated for individual dhatu aimed to eliminate or to reduce toxic effects and eradicate the specific unwanted property and to promote specific therapeutic properties. It is aimed at preparing drug for next pharmaceutical procedures.

Dhalana is a process in which melted dravya is poured into prescribed liquids. Samanya Shodhana of Vanga was done using Taila, Takra, Gomutra, Kanji, Kuluatha Kwatha, each for 6 times. Visesha Shodhana of Vanga was done using Hardrayukta Nirgundi Swarasa for 3 times. Pittara Yantra was used in this procedure. By the end of this process, solid Vanga gradually turns into coarse powder. Loss of Vanga was more due to spillage during quenching.

Jarana:

Jarana is an intermediate process between Sodhana and Marana where the low melting point metals are converted into powder form.

Significance of Jarana:

- To obtain powder form of Putiloha.
- Makes suitable for the further processing.

The Shodhita Vanga was taken in the Loha Kadhai and heated to melt. Ashwatta Twak Yavakute Churna was added to the molten Vanga repeatedly and rubbed continuously with iron ladle till Vanga gets converted into powder form. Increase in weight of Vanga was observed due to addition of Ashwatta twak yavakute Churna during the process.

Swarasa Nirmana

Swarasa is the juice extracted from freshly collected plant drugs by pounding and straining through cloth. Green coloured Changeri Swarasa required for Bhavana of Shodhita Kukkutanda Twak and translucent greenish tinge Kumari Swarasa for Shodhita Vanga Bhavana were obtained through this process.

Marana:

The process of converting the purified metals and minerals into bhasma form by triturating with specific liquids and subjecting to contact with fire is known as Marana.

Significance of Marana:

- The heavy, hard and rough substances get converted into light, soft and smooth forms.
- The metals and minerals get converted into ash form.
- Increases the therapeutic qualities and shelf life of drug.
- Elements get converted into compound form.
- Dose is reduced.
- The metals and minerals get converted into such forms that they are easily absorbable, adoptable, and assimilated in the body.

Marana includes four steps - Bhavana, Chakrika Nirmana, Sharava samputikarana, Putapaka.
Bhavana\textsuperscript{22}:

*Bhavana* is the process in which the powders of minerals and metals are added with prescribed liquids till they become completely wet and grinding is carried out in *Khalwa yantra* till the mass is suitable for *Chakrika Nirmana*.

**Significance of Bhavana:**
- Impregnation of properties of the media to the material.
- Transformation of the coarse powder to finer state.
- To facilitate the material for further processing.
- Induction of organic qualities into inorganic substances.

*Shodhita Kukkutanda Twak* was subjected to *Bhavana* using *Changeri Swarasa*. *Bhavana* was done with *Kumari Swarasa* in *Vanga Marana*.

**Chakrika nirmana:**

In this phase *Bhavitaha dravya* was made into uniform sized *chakrika*. Generally the *chakrika* are small, round and flat.

The *Chakrika* should be made for below mentioned reasons:
- To facilitate uniform heat and helps in chemical reactions at the time of *Putapaka*.
- This helps to achieve homogenous heat pattern to whole of the mass with increased surface area.
- It makes easy collection of materials after *Putapaka*.
- In metallic *Bhasma*, *Chakrika* facilitates to examine the effect of *Puta* (whether it is soft or not).

*Chakrikas* were prepared after *Bhavana* and dried well. They were white in colour.

**Sharava Samputikarana:**

Earthen *Sharava* were used for incineration because of their inert nature, easy availability and uniform distribution of heat to the substance. Well dried *Chakrikas* were kept in a *Sarava* which was covered by another *Sharava* of same dimensions and *Sandibandhana* was done with mud smeared cotton cloth. After complete drying of first layer of mud smeared cloth, next layer of it was applied over it.

**Putapaka:**

*Puta* is the heating system which indicates the quantum of heat required by *Rasadhi dravya* for their conversion into suitable form (*bhasma*).

- In this phase, the *Sharava samputa* was subjected for *putapaka*.
- In *puta* system of heating, there is gradual rise and fall of temperature which helps in making the material more *agnisthayi* (heat stable). It cannot regain its form back after complete procedure.
According to classics, Gajaputa is advised for Kukkutanda twak Marana and Ardha Gaja puta for Vanga Marana. This heating pattern is specified depending upon the melting point and hardness of the dravya.

The maximum temperature attained during the puta was 1003°C in Kukkutanda Marana and 700°C in Vanga Marana. After that gradual fall in temperature was noted.

Finally white coloured Kukkutanda twak bhasma, cream coloured Vanga Bhasma were obtained. Loss in Weight of Bhasma may be due to procedures and handling.

**BHASMA PAREEKSHA**³³: The prepared Bhasma was subjected to the following tests to ascertain whether the Bhasma was prepared properly or not.

- **Rekhapurnatwa:** After trituration, small amount of Bhasma was taken between thumb and index finger. It filled into the fine lines of finger.
- **Varitaratwa:** After proper trituration, small amount of Bhasma was sprinkled on the surface of water. Bhasma being light floated on the surface of water.
- **Nischandratwa:** Small quantity of Bhasma was observed under bright sunlight for presence of any free shiny metal particle. There was no shining observed in the Bhasma.
- **Niswadu Pareeksha:** When a small amount of the Bhasma was kept on tongue, there was not any feeling of taste/ untoward sensation.

All the above said Bhasma Pareeksha were positive for Kukkutanda Twak Bhasma and Vanga Bhasma.

**Churna Nirmana**³⁴

The Churna is a fine powder of completely dried drug. Dried Ashwagandha roots and Vidari tubers, Brihat Ela seeds and Mishri were made into Churna seperately by pounding in Khalwa yantra and filtering through a clean cloth.

Creamish White Ashwagandha Churna, White coloured Vidari Churna, Brownish Brihat Ela Churna and White Mishri Churna were obtained and stored in air tight containers. Here reduction in weight was observed which was due to spillage while pounding and during filtration.

**Preparation of Ashwagandhadi Yoga**³⁵

Ashwagandhadi Yoga was prepared according to Rasa Tantra Sara Va Siddha Prayoga Sangraha – Streeroga Adhikara, Part 2. 75g of Kukkutanda Twak Bhasma, 37.5g Vanga Bhasma, Churna of 300g Ashwagandha, 300g Vidari, 75g Brihat Ela, 300g Mishri were taken in Khalwa yantra and Mardana was done till homogenous mixture was formed. Creamy White coloured Ashwagandhadi Yoga was obtained and stored.

**Conclusion:**

The Beauty of Rasashastra mainly lies in the processing of Rasaoushadis. Bhasma shows good therapeutic efficacy and fast action in small dosage when prepared properly and effectively. Ashwagandhadi Yoga
containing kukkanu and twak Bhasma, Vanga Bhasma and other ingredients shows its significant effect in Sweta pradara.

References: