STANDARDIZATION OF THE PREPARATION OF A HERBO-MINERAL FORMULATION SWASANANDA GULIKA

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ABSTRACT

Swasananda Gulika is mentioned in Arogyaraksha Kalpadruma, as a remedy for Kasa, Swasa and Hikka. In present study Swasananda Gulika was prepared according to the Standard Operative Procedures (SOPs) mentioned in classics. It is important that crude drugs of both herbal and mineral origin should be subjected to Sodhana (purification) before using internally or in the preparation of any other compound form of drugs. The ultimate objective of sodhana process is to increase the bio-availability of the drug and further potentiating the biological efficacy. There are many methods for the sodhana process of each ingredient of Swasananda Gulika. Each process imparts specific properties to the drugs. So it is a difficult task to select a proper sodhana method. Of the various sodhana methods, the method which is suitable for the preparation of Swasanandagulika was chosen here. To standardize a process, proper analysis should be done in each step. Analytical study of each sodhana procedure during the preparation of Swasanandagulikawas conducted in present study and observations were noted carefully. In current study, best method for Hingulasodhana was done, in which hingula becomes physically more pure and after sodhana, the weight of purified hingula was found to be increased by 1.4 gm (3%). The weight gain may be due to the presence of organic matter in the bhavanadravya which was added during sodhana. It may be starch or other particles. During purification, sodhana drugs will attribute some properties to the drugs to be purified. In this study it has been observed that nimajjana in gomutra for 3 times, mentioned in the classics was found to be more accurate method for Vatsanabhasodhana. For the preparation of the medicine for Swasa, the drug of choice of Vatsanabhasodhana was gomutra compared to godugdha, since gomutra has Vatakaphahara property. In this study it has been also found that, there was a weight gain of Swasanandagulika (18%), compared to the total weight of ingredients which may be from the Triphalakashaya added for bhavana.
Keywords: Swasananda Gulika, Sodhana, Hingula, Vatsanabha, Triphalakashaya.

INTRODUCTION

The Aim of Ayurveda is not only to treat the patient but to preserve and promote health. To fulfill this aim, ancient seers tried innumerable measures and found that the drugs of different origins are suitable to achieve the same. During the initial days kashtousadhis (herbal drugs) were used mainly for therapeutic purpose. In due course of time, drugs of other origin like mineral, animal etc, were introduced into the system and countless Rasaushadhis (herbo-mineral formulations) came in to existence. Rasaushadhis are popular because of their small dose, tastelessness, quick action, effective in dreadful diseases without producing any discomfort to patients and long shelf life\(^1\). Many types of Rasaushadhis, based on their preparatory methods like kharaleyarasayana, Parpati, Pottali, Kupipkwarasayana etc. are explained in Rasashastra\(^2\). Of which Swasanandagulika is a kharaleeyarasayana. It is important that crude drugs of both herbal and mineral origin should be subjected to Sodhana process (purification) before using internally or in the preparation of any other compound form of drugs. Sodhana is a method in which different drugs are treated with various processes such as grinding and mixing with other drugs with a view to remove their toxicity and make it effective for therapeutics\(^3\). In Ayurvedic classics many sodhana procedures for drugs are explained. Each process imparts specific properties to the drugs. It is the duty of the Physician to decide proper sodhana method which is suitable for specific medicine preparation.

With the advent of a new drug delivery system, strict guidelines are needed for drug approval. To accept a drug globally, it is desirable to study the principle and practice of Ayurveda by utilizing the facilities of modern methods. Now a day, scientific validation (standardization) of a process is necessary for its acceptance. To standardize a process, proper analysis should be done in each and every step. Hence a detailed practical study has been carried out in the purification of the ingredients and during the preparation of Swasanandagulika.

AIMS & OBJECTIVES

1. To identify and collect genuine samples of raw drugs (Hingula, Vatsanabhaand Karpara) and Bhavanadravyas (Triphala) of Swasanandagulika.
2. To purify Hingula and Vatsanabha as per classical method.
3. To prepare Triphalakashaya for bhavana as per classical method.
4. To prepare Swasanandagulika as per classical method.

MATERIALS & METHODS

Swasanandagulika is mentioned in ArogyarakshaKalpadruma 6\(^{th}\) chapter, as a remedy for Kasa, Swasa and Hikka\(^4\). In present study Swasanandagulika was prepared according to the Standard Operative Procedures (SOPs) mentioned in classics. Swasanandagulika comes under the category of both Gu ikakalpana and Kharaleeyarasayana. The ingredients of Swasanandagulika are given in Table no:1.
Table 1: Showing the list of Ingredients

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Sanskrit name</th>
<th>Scientific name/ botanical name</th>
<th>Parts used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sodhita Hingula</td>
<td>Sulphatum hydrargyrum (Cinnabar / Red sulphide of mercury)</td>
<td>Whole part</td>
</tr>
<tr>
<td>2</td>
<td>Sodhita Vatsanabha</td>
<td>Aconitum chasmanthum Stapf. ex Holmes</td>
<td>Dried Tuberous root</td>
</tr>
<tr>
<td>3</td>
<td>Karpura</td>
<td>Cinnamomum camphora</td>
<td>Extract</td>
</tr>
</tbody>
</table>

*Bhavanais done with the Kashaya of following drugs:

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Ingredients</th>
<th>Scientific name/ botanical name</th>
<th>Parts used</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Haritaki</td>
<td>Terminalia chebula Retz.</td>
<td>Pericarp of dried Fruit.</td>
</tr>
<tr>
<td>5</td>
<td>Vibhitaki</td>
<td>Terminalia belerica Roxb</td>
<td>Pericarp of dried Fruit.</td>
</tr>
<tr>
<td>6</td>
<td>Amalaki</td>
<td>Emblica officinalis Gaertn.</td>
<td>Pericarp of dried Fruit.</td>
</tr>
</tbody>
</table>

Above drugs were procured from a renowned raw drug procuring and distributing agency, Anchery drugs, Thrissur, Kerala. All the drugs were identified by the botanist for their genuineness, before starting the practical. All the ingredients were checked for physical impurities and subjected to the pharmaceutical processing. Pharmaceutical processing of *Swasanandagulika* was done in the Teaching Laboratory of the P.G. Department of *Rasashastra* and *Bhaishajya Kalpana*, Amrita School of Ayurveda, Kollam, Kerala.

Table 2: Showing the list of Practicals

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hingula Sodhana</td>
</tr>
<tr>
<td>2</td>
<td>Vatsanabha Sodhana</td>
</tr>
<tr>
<td>3</td>
<td>Preparation of Triphala Kashaya</td>
</tr>
<tr>
<td>4</td>
<td>Preparation of Swasananda Gulika</td>
</tr>
</tbody>
</table>

*Sodhana (Purification) of constituent drugs*

It is important that crude drugs of both herbal and mineral origin should be subjected to *Sodhana* process before they are used internally or in the preparation of any other compound form of drugs. Hence a detailed practical study has been carried out in their purification point of view.

Practical No: 1

<table>
<thead>
<tr>
<th>Name of the Practical</th>
<th>:Hingula Sodhana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>: Rasatarangini- 9/16 – 17</td>
</tr>
<tr>
<td>Date of beginning</td>
<td>: 13/05/2015</td>
</tr>
<tr>
<td>Date of Completion</td>
<td>: 06/06/2015</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Unpurified Hingula</td>
<td>: 45 gm</td>
</tr>
<tr>
<td>2) Nimbuswarasa</td>
<td>: 45 ml in each time (total 315 ml).</td>
</tr>
</tbody>
</table>

| Method         | : Bhavana for 7 times, followed by kshalanawith water. |
| Apparatus      | : Mortar and pestle, vessels, cloth, measuring cylinder etc. |
**Procedure:** 45 gm of impure *Hingula* was weighed and kept in a clean mortar and fine powder was made. Initially 120 gm *nimbu* (4 lemons) was taken and squeezed out the juice. For first *bhavana* 45 ml *swarasa* (the quantity sufficient to immerse the *hingulachurna*) was added. The mixture was subjected for continuous trituration till *swarasa* dried up which is considered as the completion of first *bhavana*. The same process repeated for 6 times and totals 7 *bhavanas* were given. Every time fresh *swarasa* was used. After 7 *bhavanas* the mixture was washed with water (1 litre) and poured into a vessel which was kept undisturbed for the sedimentation of *hingula*. Next day water was decanted and pH of decanted water was checked. The washing process was repeated (4 times) till the pH of decanted water became neutral. The wet *hingula* powder obtained at the bottom of the vessel was kept for drying in sunlight. Dried *hingula* was collected and weighed.

**Observations**
- The colour of *asuddhahingulawas* shining dull red which became brighter and brighter after each *bhavana*.
- During washing of *hingula* after 7 *bhavanas*, it was found that each time the pH of decanted water was increased and after 4 times it became neutral, i.e. equal to the pH of normal water.
- The weight of purified *hingula* after complete drying was found to be increased.

**Result**
- Time taken for practical: 24 days
- Quantity of *Hingula* taken: 45 gms
- Quantity of *Hingula* obtained: 46.4 gms
- Wt. gain: 1.4 gms (3%)

**Table 3:** Showing the Physical Characters of *Hingula*.

<table>
<thead>
<tr>
<th>Sl No:</th>
<th>Tests</th>
<th>AsuddhaHingula</th>
<th>SuddhaHingula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consistency</td>
<td>Shining blocks</td>
<td>Lusterless powder</td>
</tr>
<tr>
<td>2</td>
<td>Colour</td>
<td>Dull red</td>
<td>Red</td>
</tr>
<tr>
<td>3</td>
<td>Touch</td>
<td>Hard, Solid</td>
<td>Soft, Fine</td>
</tr>
<tr>
<td>4</td>
<td>Odour</td>
<td>No specific odour</td>
<td>No specific odour</td>
</tr>
</tbody>
</table>

**Table 4:** Showing the pH of decanted water after *HingulaSodhana*.

<table>
<thead>
<tr>
<th>Kshalana (times)</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>2.61</td>
</tr>
<tr>
<td>Second</td>
<td>3.52</td>
</tr>
<tr>
<td>Third</td>
<td>6.98</td>
</tr>
<tr>
<td>Fourth</td>
<td>7.05</td>
</tr>
</tbody>
</table>

**Practical No: 2**
- **Name of the Practical:** *VatsanabhaSodhana.*
Ingredients

1) Asuddha Vatsanabha : 100 gm.
2) Gomutra : 400 ml each time (total 1200 ml).

Method: Nimajjana for 3 times followed by Soshana (drying).

Apparatus: mud vessel, knife, Jar, Porcelain tray etc.

Procedure: Vatsanabha was cut into small pieces and kept in a mud pot. Cow’s urine was poured to dip these pieces and kept soaked (Nimajjana) overnight. Next day gomutra was exchanged with fresh one. The procedure was repeated twice. Each time analysis (pH and T.S.S) of gomutra was done. After doing the procedure of nimajjana for 3 times, vatsanabha was removed from gomutra and dried in sunlight. After proper drying, it was powdered and weighed.

Observation

- Colour of gomutra was changed from light yellow to dark brown.
- pH of gomutra was found to be decreased (became more acidic) after each sodhana.
- T.S.S of gomutra after first and second sodhana was found to be increased when compared to fresh gomutra. But after third sodhana, T.S.S was same as that of fresh-gomutra.

Result

- Time taken for practical : 21 days
- Quantity of Vatsanabha taken : 100 gms
- Quantity of Vatsanabha obtained : 75 gms
- Weight loss : 25 gms

Table 5: Showing the Analysis of Gomutra.

<table>
<thead>
<tr>
<th>Times of sodhana</th>
<th>Gomutra before Sodhana</th>
<th>Gomutra after Sodhana</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pH</td>
<td>Total Soluble Solids (T.S.S)</td>
</tr>
<tr>
<td>Sodhana1</td>
<td>6.50</td>
<td>4.75</td>
</tr>
<tr>
<td>Sodhana2</td>
<td>6.52</td>
<td>4.5</td>
</tr>
<tr>
<td>Sodhana3</td>
<td>8.06</td>
<td>4.75</td>
</tr>
</tbody>
</table>

Table 6: Showing the Physical Characters of Vatsanabha.

<table>
<thead>
<tr>
<th>Tests</th>
<th>AsuddhaVatsanabha</th>
<th>SuddhaVatsanabha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency</td>
<td>Hard tuberous root</td>
<td>Soft fine powder</td>
</tr>
<tr>
<td>Colour</td>
<td>Black</td>
<td>Light brown</td>
</tr>
<tr>
<td>Odour</td>
<td>No specific odour</td>
<td>Characteristic of gomutra</td>
</tr>
</tbody>
</table>

Practical No: 3

Name of the Practical : Preparation of TriphalaKashaya (for bhavana).

Reference : Bhaishajyaratnavali - 4/119.

Date of beginning : 01/07/2015
Date of Completion: 01/07/2015

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Haritaki</td>
<td>80 gm</td>
</tr>
<tr>
<td>2) Vibhitaki</td>
<td>80 gm</td>
</tr>
<tr>
<td>3) Amalaki</td>
<td>80 gm</td>
</tr>
<tr>
<td>4) Water</td>
<td>1920 ml (8 times)</td>
</tr>
</tbody>
</table>

**Method:** Open pan boiling.

**Apparatus:** Pounding machine, gas stove, vessel, cotton cloth, measuring cylinder, stainless steel ladle and stainless steel vessel.

**Procedure:** Triphala was cleaned and separately pounded to coarse powder. Then this powder was taken in a vessel containing 1920 ml (8 times) water and boiled over mild flame till the volume of water reduced to its 1/8th, i.e. 240 ml. Then the vessel was taken out of fire and the content was filtered into another vessel through a clean cloth. This Triphalakashaya was taken for bhavana of Swasananda Gulika.

**Result**
- Time taken for practical: 1 day
- Quantity of Triphala taken: 240 gm
- Quantity of water added: 1920 ml
- Quantity of Triphalakashaya obtained: 240 ml
- Loss in weight: 1680 ml

**Table 7:** Showing the Organoleptic & Physico-Chemical characters of Triphalakashaya.

<table>
<thead>
<tr>
<th>Organoleptic characters</th>
<th>Observations</th>
<th>Physico-Chemical characters</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Blackish brown</td>
<td>pH</td>
<td>2.79</td>
</tr>
<tr>
<td>Odour</td>
<td>Pleasant</td>
<td>Total Soluble Solids (T.S.S)</td>
<td>17</td>
</tr>
<tr>
<td>Taste</td>
<td>Astringent</td>
<td>Refractive index</td>
<td>1.359</td>
</tr>
</tbody>
</table>

**Practical No: 4**

**Name of the Practical:** Preparation of Swasananda Gulika


Date of beginning: 01/07/2015
Date of Completion: 06/08/2015

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) SodhitaHingula</td>
<td>40 gm</td>
</tr>
<tr>
<td>2) SodhitaVatsanabha</td>
<td>40 gm</td>
</tr>
<tr>
<td>3) Karpura</td>
<td>40 gm</td>
</tr>
<tr>
<td>4) Triphalakashaya(for bhavana)</td>
<td>240 ml</td>
</tr>
</tbody>
</table>

**Method:** Trituration.

**Apparatus:** Khalwayantra and porcelain tray.

**Procedure:** First sodhitahingula powder was added in a khalwayantra. To this finely powdered shodhitavatsanabha added and mixed well. Then powdered Karpura was added and mixing continued. This mixture was levigated by adding Triphalakashaya little by little and trituration was continued for 24 hours. Then rolling of the gutika was done. After that dry-
ing of guṭika was done and continued till there was no more weight difference. Then the tablets were counted and preserved in air tight glass bottles.

**Observation**
The Guṭika was found to be round in shape and reddish brown in colour.

**Result**
- Time taken for practical: 37 days
- Quantity of ingredients taken: 120 gms
- Quantity of Triphalakashaṭa added: 240 ml
- Quantity of SwasanandaGulika obtained: 142 gm or 1333 number.
- Wt. gain: 22 gm (18%).

**DISCUSSION**

A) **HingulaSodhana**
- Three important Sodhana (purification) methods of Hingula, are explained in classics:

1. Bhavana with swarasa of ardraka for 7 times and then drying. (R.R.S)
2. Bhavana with swarasa of lakuca for 7 times and then drying. (R.R.S)
3. Bhavana with swarasa of nimbu for 7 times and then washing with water repeatedly up to the removal of amlata (acidity) and finally drying in sunlight. (Rasatarangini)

Literary study revealed that, in first 2 methods, the material used for bhavana, is dried along with hingula itself. But in the third method, after nimbuswarasabhavana, repeated washing is done to achieve niramalata (deacidification). Hence, in this method Hingula becomes physically more pure. This was the reason for selecting this procedure for Hingulasodhana.

- During Hingulakshalaṇa, the pH of decanted water was checked and in each time the pH was found to be increased. But after the fourth time, it became neutral, i.e. equal to the pH of normal water. From this it can be concluded that after kshalaṇa with water for 4 times, hingula became niramla (de-acidified). In Rasatarangini, kshalaṇa of hingula with bahushovari (repeated washing with water) is mentioned. The purpose of the procedure might be de-acidification of hingula. To standardize the procedure this method of pH estimation of decanted water can be used.

- The weight of purified Hingula after complete drying was found to be increased by 1.4gm (3%). The reason for weight gain may be due to the presence of organic matter which was added during sodhana in the form of bhavanadṛavya. It may be starch or other particles.

B) **Vatsanabha Sodhana**
- During purification, sodhana drugs will attribute some properties to the drugs to be purified. There are 3 important methods for Vatsanabhasodhana. But, for the preparation of the medicine for swasa, the drug of choice of vatsanabha sodhana was goṣṭhara compared to gogudha, since gomutra has Vatakaphaḥara property. This was the reason for choosing this method for Vatsanabhasodhana.

- During Vatsanabhasodhana, each time after gomutramajjana, analysis of gomutra was done. pH of gomutra was found to be decreased (became more acidic) after each sodhana. T.S.S of gomutra, after first and second sodhana was found to be increased compared to fresh gomutra. But after third sodhana, T.S.S was same as that
of fresh gomutra. This indicated that no other soluble solids were present in vatsanabha after third sodhana. From this it can be concluded that nimajjana in gomutra for 3 times, mentioned in the classics was found to be more accurate method for vatsanabhasodhana.

C) Preparation of Swasananda Gulika

- The total weight of the finished product, i.e. Swasanandagulika (142 gm) was found to be increased, compared to the total weight of ingredients (120 gm). The weight gain was 22 gms (18 %). 240 ml Triphalakashaya was taken for bhavana. T.S.S of Triphalakashaya was found to be 17% and it can contribute 21% to Swasanandagulika. From this it can be concluded that, weight gain of Swasanandagulika may be from the Triphalakashaya.

CONCLUSION

Pharmaceutical procedure adopted in the present study was ‘Sodhanasamskara’ by ‘Bhavana’ method. Samskara is defined as ‘Guantaradhana’ i.e. enhancement of the qualities of a drug. The ultimate objective of Sodhana process is to increase the bioavailability of the drug and further potentiating the biological efficacy. Various sodhana methods are mentioned for the purification of the ingredients of Swasanandagulika. But to choose a proper method, suitable for medicine preparation is a difficult task. To standardize a process, proper analysis should be done in each step. So a detailed analytical study of each procedure during the preparation of Swasanandagulika was conducted in present study and observations were noted carefully. In current study, best method for Hingulasodhana was done, in which hingula became physically more pure. After sodhana, the weight of purified Hingula was found to be increased by 1.4 gm (3%). The reason for weight gain may be due to the presence of organic matter which was added during sodhana process. It may be starch or other particles. In case of Vatsanabha, it has been found that nimajjana in gomutra for 3 times, mentioned in the classics was found to be more accurate method for sodhana. For the preparation of the medicine for Swasa, the drug of choice of vatsanabhasodhana was gomutra compared to godugdha, since gomutra has Vatakaphahara property. In present study it has been found that, there was a weight gain of Swasanandagulika (18%), compared to the total weight of ingredients which may be from the Triphalakashaya added for bhavana.

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RAW DRUGS OF SWASANANDA GULIKA

1: Raw Hingula

2: Raw Vatsanabha

3: Karpura

4: Haritaki

5: Vibhitaki

6: Amalaki
PHARMACEUTICAL STUDY

Hingulasodhana

7: Addition of nimbuswarasa  
8: Trituration (bhavana)  
9: Washing of Hingula

Vatsanabha sodhana

10: Pouring of gomutra  
11: Soaking in gomutra  
12: Drying of Vatsanabha

Preparation of Triphalakashaya

13: Kashaya processing  
14: Triphalakashaya
PREPARATION OF SWASANANDA GULIKA

15: Shodhita raw drugs
(from left Karpura, Vatsanabha & Hingula)

16: Addition of Triphalakashaya
17: Trituration (Bhavana)

18: Rolling of gulika
19: Finished product (SwasanandaGulika)

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Conflict Of Interest: None Declared