ABSTRACT
Background: Shodhana is a process which separate mala by doing Peshana, Khalana, Mardana, Dhalana, Nirvapana, Swedhana etc.
Objective: to study the physical, chemical changes in raw Vanga before and after Vishesh shodhana
Materials & Methods: In the present study, Vanga shodhana is carried out by Dhalana method in different media in Churnodhaka (lime water) (Lime water 7 times), Suryadugdha (7 times), Amla Takra (butter milk) and Kumari Swaras (Aloe Vera juice) (3 times).
Results and conclusions: physical changes take place in metal useful for further process.
Removal of zinc and lead from the raw Vanga shows the importance of Malavicchedana (purification) property of Shodhana.
Vanga under goes the oxidation as a chemical change which quickens the further process of Jarana and Marana
Key words: Vanga, Vishesh, Shodhana, Pharmaceutico-analytical and Rasatarangini.

INTRODUCTION: Rasashastra is a branch of Ayurveda which deals with the usage of various minerals by their identification, purification, incineration etc. For the therapeutic usage of minerals, Ayurvedic classics describe several methods to facilitate the processing of the raw minerals, and Shodhana is one among them. During Shodhana, minerals are processed in stipulated manner and brought into refinement .The process of Shodhana is carried out to remove the impurities and convert them best suitable for further therapeutic use.1

Vanga is one of the Puti Lohas was known to ancient Indian physicians by the name of Trapu.2 In Charaka Samhita, the metal is categorized under Parthiva Dravyas. Vanga is having synonyms like Ranga, Shukra loha, Trapāsva etc.3 According to descriptions in Rasa Vagbhata, there are two varieties of Vanga viz. Khuraka and Mishraka, where Khuraka is considered as Shresta. Vanga is having Tikta, Ushna, Raksha Guna & Medogdhna krumingdhna activates. Samples with the characteristics, bright white in color (Dhavalam), soft (Mridulam), shiny, smooth (Snigdham), easily melts (Drutadravam), and heavy (Guru) are identified as Khura Vanga and should be preferred for therapeutic purposes. Formulations of 'Vanga' are variously beneficial in diseases such as: Prameha, Kasa, Shwasa, Krimi, Ksaya, Pandu, Pradara, etc. Singly or in combination with other Puti Lohas, it is beneficial in disorders of the Genito Urinary Tract.4 Ashuddha Vanga causes Kusta, Kilasa, Gulma, Prameha, Moha & Vanga shodhita cures all the above said diseases. Shodhana is a process which separate mala by doing Dhalana – Washing, Nirmajjana - To dip into liquids, Nirvapana - Heating a metal and dip into liquids, Pacana - Digestion by giving heat, Patana – Distillation, Bhavana - Trituration With liquids Swedhana - Heating by vapor’s or directly by liquids etc.5 Various studies has been undertaken for the study of Vanga Marana, but it is necessary to establish the relative difference in qualities acquired by Vanga when subjected to different types of shodhana & also evaluate the effect of shodhana karma.
Though there are number of shodhana vidhi’s are advocated in classical texts. The present study was conducted with objective to carry out Vanga Shodhana by Vishesh shodhana methods, in which separate physical and chemical analysis was carried out for each methods of Shodhana in order to establish and record the data related to qualitative and quantitative comparative changes occurred in final product to validate for wide clinical usage practice.

**AIM:** Vishesh shodhana is carried out to remove the impurities of Samanya Shodhit Vanga and convert it best suitable for further therapeutic use with special reference to Rastarangini”

**OBJECTIVE OF THE STUDY**

I. Study the organoleptic characters before and after Vanga shodhana

II. Study the physical properties before and after Vanga shodhana

III. Study the chemical properties before and after Vanga shodhana

**MATERIALS & METHODS: PLACE OF STUDY**

Necessary processing of raw materials and preparation was carried out in Pharmacy section of Rasashastra and Bhaishajya Kalpana Department at Ashvin Rural Ayurvedic College, Manchi Hill, Sanganner district Ahmednagar & chemical test was done by Atomic absorption spectroscopy (AAS) at Geology Department, Savitribai Phule Pune University, Pune. Study was conducted from 2014 to 2015

**Method**- Vishesh Shodhana of raw Vanga with definite quantity measured and taken in Darvi Yantra, it was melted in Madyamagni, it was carefully poured in to the Pitara Yantra containing raw Vanga. Shodhana is carried out by Dhalana method in different media in Churnodhaka (lime water), Suryadugdha (7 times), Sinduvara Drava (3 times), Amla Takra and Kumari Swaras (Aloe Vera juice)(3 times).

1) Vishesh Shodhana was carried out in Churnodhaka (lime water) for 7 times without subjecting it to Samanya shodhana of Vanga(figure 1).6

2) Suryadugdha for 7 times (figure 2):’

Figure 1: Vishesh shodhana of raw Vanga by Churnodhaka (lime water)

“Vishesh Shodhana of raw Vanga by churnodhaka.”

[Image: Churnodhaka Shodhit Vanga]

Figure 2: Vishesh shodhana of raw Vanga by Surya Dugdha
3) **Haridrayukta Nirgundi Swaras** for 3 times (figure 3):

Figure 3: *Vishesh shodhana of raw Vanga by Haridrayukta Nirgundi Swaras* 

**“Vishesh Shodhana of Raw Vanga by Haridrayukta nirgundi swaras”**

4) **Vishesh shodhana of Vanga in Amla Takra & Kumari Swaras** (Aloe Vera juice) for 3 times (figure 4):

Figure 4: *Vishesh shodhana of raw Vanga by Amla Takra & Kumari Swaras* 

**“Vishesh Shodhana of raw Vanga by Amla Takra & Kumari swaras”**

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**Results:**

**a. Organoleptic character:**

**Table no. 1: Organoleptic Characters before and after Vishesh shodhana on raw Vanga**

<table>
<thead>
<tr>
<th>Organoleptic Character</th>
<th>Colour</th>
<th>Taste</th>
<th>Smell</th>
<th>Touch</th>
<th>Sound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medias</td>
<td>BVS</td>
<td>AVS</td>
<td>BVS</td>
<td>AVS</td>
<td>BVS</td>
</tr>
</tbody>
</table>

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Churnodhaka (lime water) | Sil | WC | NT | NT | NS | NS | Rof | Sm | M | M
---|---|---|---|---|---|---|---|---|---|---
Suryadugda | Sil | Csil | NT | NT | NS | SS | Rof | SmS | M | M
Haridrayukt nirgundi | Sil | SilGt | NT | NT | NS | NS | Rof | Rof | M | M
Amla Takra + Kumari Swaras | Sil | Wsil | NT | NT | NS | ST | Rof | Sm | M | M

BVS:-Before Vishesh Shodhana, AVS:- After Vishesh Shodhana, Sil-silvery, WC-white cement, Csil-creamy silvery, SS-Smell of Suryadugda, SmS-Smooth & Sticky, SilGt-Silvery with gold tinge, Wsil-white silvery, ST-smell of Takra, Gr-Granular, NT-no test, Rof-rough, M-Metallic

b. Physical properties: Table no. 2: Shows percentage weight lost before and after Vishesh shodhana

<table>
<thead>
<tr>
<th>Medias</th>
<th>Weight in gm</th>
<th>Weight lost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Churnodhaka (lime water)</td>
<td>136.1</td>
<td>142.3</td>
</tr>
<tr>
<td>Suryadugda</td>
<td>136.9</td>
<td>127.8</td>
</tr>
<tr>
<td>Haridrayukt nirgundi</td>
<td>136.7</td>
<td>136.2</td>
</tr>
<tr>
<td>Amla Takra + Kumari Swaras</td>
<td>136.7</td>
<td>107</td>
</tr>
</tbody>
</table>

*-weight gain was observed

Table no.3: Physical properties before and after Vishesh shodhana

<table>
<thead>
<tr>
<th>Physical properties</th>
<th>Form</th>
<th>Shape</th>
<th>Melting point °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medias</td>
<td>BVS</td>
<td>AVS</td>
<td>BVS</td>
</tr>
<tr>
<td>Churnodhaka (lime water)</td>
<td>Solid</td>
<td>Powder</td>
<td>Irregular</td>
</tr>
<tr>
<td>Suryadugda</td>
<td>Solid</td>
<td>Mix</td>
<td>Irregular</td>
</tr>
<tr>
<td>Haridrayukt nirgundi</td>
<td>Solid</td>
<td>Mix</td>
<td>Irregular</td>
</tr>
<tr>
<td>Amla Takra + Kumari Swaras</td>
<td>Solid</td>
<td>Mix</td>
<td>Irregular</td>
</tr>
</tbody>
</table>

c. Chemical properties:

Table no.4: Chemical properties before and after Vishesh shodhana

<table>
<thead>
<tr>
<th>Chemical properties</th>
<th>Lead (Pb/ppm)</th>
<th>Zinc (Zn/ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medias</td>
<td>BVS</td>
<td>AVS</td>
</tr>
<tr>
<td>Churnodhaka (lime water)</td>
<td>0.880</td>
<td>0.390</td>
</tr>
<tr>
<td>Suryadugda</td>
<td>0.880</td>
<td>0.020</td>
</tr>
<tr>
<td>Haridrayukt nirgundi</td>
<td>0.880</td>
<td>0.300</td>
</tr>
<tr>
<td>Amla Takra + Kumari Swaras</td>
<td>0.880</td>
<td>0.280</td>
</tr>
</tbody>
</table>

DISCUSSION: In the present study, we found that silvery Colour of raw Vanga was changed to white cement, creamy silvery, silvery with golden tinge and white silvery in process with Churnodhaka (lime water), Suryadugda, Haridrayukt Nirgundi and Amla Takara + Kumari Swaras, respectively. During Suryadugda and Amla Takra shodhana, we observed the smell of Suryadugda and Amla Takra, respectively. Before Vishesh shodhana touch of raw Vanga was rough and irregular but after Vishesh shodhana touch was changed to smooth in all process of Vishesh shodhana except in Haridrayukt Nirgundi Swaras. The metallic sound was not changed before and after Vishesh shodhana. After Vishesh shodhana weight of measured Vanga was lost in all process except in Churnodhaka (lime water). The maximum weight lost was found in Amlatkara + Kumari Swaras (Aloe Vera...
juice) i.e. 29.7 gm (21.7%) followed by Suryadugdha 9.1 gm (6.4%). Solid form of Vanga was changed to mix form (Powder and solid) after Vishesh shodhana. After shodhana the irregular form of Vanga changed to granular form was observed in all process. The Repetition of heating and cooling cause’s disruption in compression tension equilibrium leads to increased brittleness, reduction in hardness and finally reduction in the particle size. The concentration of the lead was decreased in all observation after Vishesh shodhana. The highest reduction was observed in Suryadugdha (0.02/ppm) followed by Amla Takra + Kumari Swaras (Aloe Vera juice) (0.28/ppm). The concentration of the Zinc was decreased in all observation after Vishesh shodhana. The highest reduction was observed in Haridrayukt nirgundi (0.050/ppm) followed by Suryadugdha (0.02/ppm) (0.010/ppm).

CONCLUSION: Rough raw Vanga was changed to soft granular form. The maximum removal of lead was found in Vishesh shodhana of raw Vanga with Suryadugdha i.e. 0.02/ppm. The maximum removal of zinc was found in Vishesh shodhana of raw Vanga with Haridrayukt Nirgundi Swaras. Removal of Zinc and lead from the raw Vanga shows the importance of Malavicchedana (purification) property of Shodhana. Vanga under goes the oxidation as a chemical change which quickens the further process of Jarana and Marana.

REFERENCES:

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