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VISHESH SHODHANA OF RAW *VANGA BY DHALANA* METHOD WITH SPECIAL REFERENCE TO *RASTARANGINI:* PHARMACEUTICO-ANALYTICAL STUDY

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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, Trapasva* etc.[3] According to descriptions in Rasa *Vagbhata*, there are two varieties of *Vanga* viz. *Khuraka and Mishraka*, where *Khuraka* is considered as *Shrestsa*. *Vanga* is having *Tikta, Ushna, Ruksha 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, Sangamner 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]

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

2) *Suryadugdha* for 7 times (figure 2):[7]

Figure 2: *Vishesh shodhana of raw Vanga by Surya Dugdha*

3) ***Haridrayukta Nirgundi Swaras*** **for 3 times (figure 3):**[8]

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

4) ***Vishesh shodhana*** **of** ***Vanga*** **in** ***Amla Takra & Kumari Swaras*** **(Aloe Vera juice) for 3 times (figure4):**[9]

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

Results: a.Organoleptic character:

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

Organoleptic	**Colour**		**Taste**		**Smell**		**Touch**		**Sound**	
Medias	BVS	AVS	BVS	AVS	BVS	AVS	BVS	AVS	BVS	AVS

Churnodhaka (lime water)	Sil	WC	NT	NT	NS	NS	Rof	Sm	M	M
Suryadugdha	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 Suryadugdha, 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*

	Weight in gm		Weight lost (%)
Medias	BVS	AVS	
Churnodhaka (lime water)	136.1	142.3	+ 6.2 (4.5%)*
Suryadugdha	136.9	127.8	9.1 (6.64%)
Haridrayukt nirgundi	136.7	136.2	0.5 (0.36%)
Amla Takra + Kumari Swaras	136.7	107	29.7 (21.7)

***-weight gain was observed**

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

Physical properties	**Form**		**Shape**		**Melting point °C**	
Medias	**BVS**	**AVS**	**BVS**	**AVS**	**BVS**	**AVS**
Churnodhaka (lime water)	Solid	Powder	Irregular	Granular	245	240
Suryadugdha	Solid	Mix	Irregular	Granular	240	245
Haridrayukt nirgundi	Solid	Mix	Irregular	Granular	240	238
Amla Takra +Kumari Swaras	Solid	Mix	Irregular	Granular	240	238

c.Chemical properties:

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

Chemical properties	**Lead (Pb/ppm)**		**Zinc (Zn/ppm)**	
Medias	BVS	AVS	BVS	AVS
Churnodhaka (lime water)	0.880	0.390	0.047	0.019
Suryadugdha	0.880	0.020	0.047	0.010
Haridrayukt nirgundi	0.880	0.300	0.047	0.005
Amla Takra + Kumari Swaras	0.880	0.280	0.047	0.014

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), Suryadugdha, Haridrayukt Nirgundi and Amla Takara + Kumari Swaras*, respectively.

During *Suryadugdha and Amla Takra shodhana*, we observed the smell of *Suryadugdha 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*

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