

## PHARMACEUTICAL PROCESSING AND STANDARDIZATION OF INDRA VATI

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### ABSTRACT

*Ayurveda* is the most ancient system of life, health and cure. It is highly evolved and codified system of life and health science, based on its own unique and original concepts and fundamental principles. *Rasa shastra*, which starts with a pledge to render a happy, healthy and prosperous life can be considered as an advanced stage of Indian system of medicine. *Rasa shastra* has large number varieties of *Rasaushadhi* aiding on *Madhumeha (Diabetes Mellitus)* but among them '*Indra Vati*' is one of the significant ones. Though this preparation is not formulated by any pharmacy. CCRAS and DPT. of AYUSH declared standards for some Ayurvedic drugs and formulations in *Ayurvedic Pharmacopoeia* of India but there is no matter regarding standards of *Indra Vati* found in it. So, here an attempt has been made to see all the factors are integrated and a strategic approach to validate such a process for *Indra vati* preparation and *Standardization* in terms of *Ayurvedic* as well as Modern science and technology.

**Keywords:** *Ayurveda, Rasa Shastra, Rasa Aushadhi, API, Indra Vati, Standardization*

### INTRODUCTION

The *Rasa Aushadhi* are known for smaller dosage and don't cause any nauseating sensation during consumption. These medicines provide quick results

and also good appetizers and digestive<sup>1</sup>. *Rasashastra* stands for proper identification, collection, preservations & standardization of the drugs. *Shodhana*

(Purification) and *Marana* process of the substances are done with some special procedure and can be used therapeutically. But, the therapeutic efficacies of Ayurvedic medicines specially mineral or metallic preparations are always questioned now a days. These questions are raised due to present trend of commercialization, improper methods of preparations, Ignorance of scientific fundamentals behind these processing, as well as therapeutic effects of drugs. In present study an attempt has been made to see all the factors are integrated and a strategic approach to validate such a process for *Indra vati* preparation and standardization.

### Aim and Objectives:

To prepare *Vanga bhasma*, *rasa sindoora* and *Indra vati* and standardized through classical and modern parameters.

### Material and Method

*Indra vati* formulation was mentioned in various text of *Rasa shastra* like *Rasendra sara samgraha* (16<sup>th</sup>)<sup>2</sup>, *Rasa Kamdhenu* (17<sup>th</sup>)<sup>3</sup>, *Rasendra Chintamani* (15<sup>th</sup>)<sup>4</sup>, *Rasa raja sundar* (19<sup>th</sup>), *Bhaishajya ratnavali* (19<sup>th</sup>)<sup>5</sup>, *Rasa yoga sagara* (1927-1930)<sup>6</sup>. Here, *Bhaishajya ratnavali*'s reference has been taken for present study. *Indra vati* consists of *Vanga bhasma*-1 part, *Rasa sindoora*-1 part, *Arjuna kwath* and *Mocha rasa kwatha*-for *Bhavana* (Trituration). Preparation of *Indra vati* has been done under following headings- Preparation of *Vanga bhasma*, Preparation of *Rasa sindoora*, Preparation of *Arjuna kwatha* and *Mocha rasa kwatha*, Preparation of *Indra vati*.

#### 1. Preparation of *Vanga Bhasma*:-

*Vanga shodhana Jarana*  $\rightleftharpoons$  *Marana*,  $\rightleftharpoons$

*Shodhana*- *Samanya shodhana* [AFI (S.S.M.K. 11/2)]<sup>7</sup>

Material- *Ashuddha vanga Pithara yantra*, liquid media, iron ladle, *Angardhanika*, spoon. For *Samanya shodhana* of *Vanga*, it was taken in a long iron ladle and heated until melted then immediately poured in the very first *Tila taila* media, kept on *Putra yantra*. This procedure is repeated 2 times more. Then the same procedure repeated in the sequence *Takra*, *Go mutra*, *Kanji*, *Kulattha kwatha* for 3 times. For *Vishesha shodhana* the same procedure is done as *Samanya Shodhana* in *Haridra yukta nirgundi swarasa* for 3 times.

**Jarana** – [ R.J.N. vol 3 p.n. 103]<sup>8</sup>

Material – *Shuddha vanga*, *Shodhita hartala*, *Hingulottha parada*, Iron ladle, *Angardhanika*, Steel vessel, spoon. For the *Jarana* process of *Vanga*, firstly *Shuddha Parada* was procured from *Shodhita Hingula* and *Haratla* was purified. *Shodhita vanga* was taken in a long-handled iron ladle and heated it till melts, simultaneously *Shodhita Haratala* and *Hingulottha parada* was added on it and rubbed it by back side of *Lauha darvi* until the *Vanga* was converted to powder form. The procedure was done for 2-3 hours to get powdered *Vanga*. By this process of *Jarana*, Black colour of powder was formed.

**Marana** – Material- *Jarita vanga*, *Kharala*, *Kumari swarasa*, spoon, plate. *Jarita vanga* was taken in *Kharala* (*Mortar and pestle*) then *Mardana* (*Rubbing*) properly with *Kumari swarasa*. *Chakrika* (*Pellets*) were made and they were put on *Sharava*. After *Sharava Samputa*, those were kept on fire containing commercially made cow dung cakes, through *Ardha Gajaputa*. Such a procedure was done for 10 more times to get *Vanga Bhasma*.



**Preparation of Rasa sindoora** – [ R.S.S -1/69-71]<sup>9</sup>

Material, 7-layer clay smeared *Kacha Kupi* (Glass Bottle), *Brastri* (Furnace), Iron *Shalaka* (Rod), Cork, Torch, Pyrometer. For this preparation, *Gandhaka shodhana* was done. Then *Shodhita Gandhaka* and *Hingulottha parada* was taken in *Kharala* and

*Mardana* was done to get *Kajjali* then it was *Mardana (Continuous Rubbing)* through *Vatankura swarasa*. This *Vatankura Bhavita Kajjali* was taken in *Kanch kupi* and that was kept on *Valuka yantra (Sand Pot)* and heated in *Kramagni* pattern for getting *Rasa sindoora*. This procedure was done for 12 hours.



2. **Preparation of Arjuna and Mocha rasa Kwatha-3.** [S.S.M.K.1/9]<sup>10</sup>

Material- Steel vessel, iron ladle, Induction, Water, *Arjuna Yavakuta* (Coarsely pounded) and *Yava Kuta Churna* of *Mocha rasa*. *Yavakuta Churna* of *Arjuna* was taken on a steel vessel and water was added on it then heated till decoction was made. Same procedure was done for *Mocha rasa kwatha*.

**Preparation of Indra Vati-**

Material- *Kharala*, spatula, measuring cylinder, plate. 1 part of *Vanga Bhasma* and 1 part of *Rasa sindoora* was taken in *Kharala* the *levigated* properly through *Arjuna* and *Mocha rasa Kwatha*. When the mixture was doughy like then 250 mg *vati* was formed<sup>11</sup>.



**Observation and Results-**

**Table 1:** Changes in weight of *Vanga* in *Samanya Shodhana*

S.N.	Liquid media	Weight of <i>Vanga</i> (gm)		Avg. Loss of <i>Vanga</i> (%)
		Before <i>Shodhana</i>	After <i>Shodhana</i>	
1.	<i>Tila taila</i>	2000	1990	1%
2.	<i>Takra</i>	1990	1980	1%
3.	<i>Go mutra</i>	1980	1960	2%
4.	<i>Kanji</i>	1960	1930	3%
5.	<i>Kulattha kwatha</i>	1930	1900	3%
				<b>Total – 10%</b>

**Table 2:** Showing observation during *Vishesh shodhana* of *Vanga*

<i>Nirgundipatra Swarasa + Haridrachurna</i>	Process stage	Weight of <i>Vanga</i> (gm)	Average loss of <i>Vanga</i> (%)
7.3 litre +25gm	Before <i>Shodhana</i>	1900gm	2%
	After <i>Shodhana</i>	1880gm	

**Table 3:** Showing observation in *Jarana* process

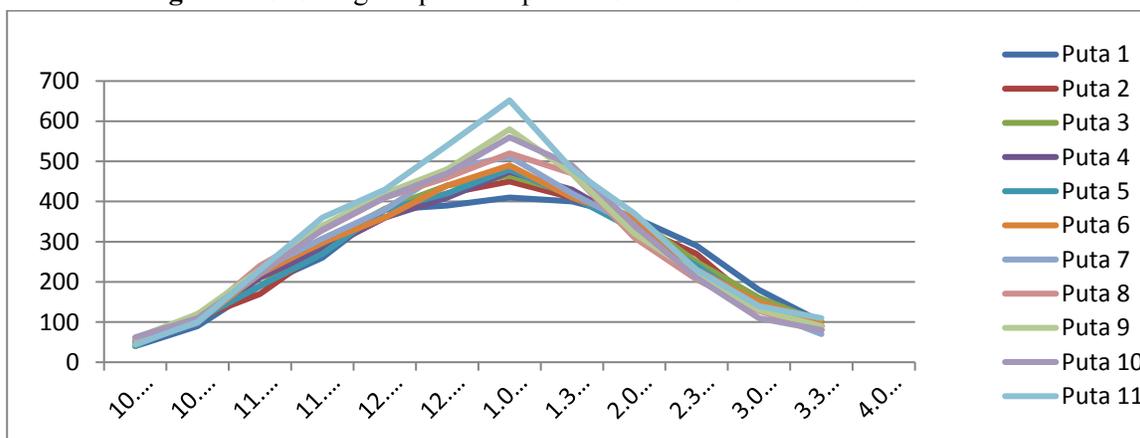
Weight of <i>Vanga</i> (gm)	Weight of <i>Shuddha Parada</i> and <i>Haritala</i>	Weight of <i>Jaritavanga</i> (gm)	Loss in %	Colour of <i>Jaritavanga</i>
1880gm	120 gm + 40 gm	1740gm	7.5%	Blackish

**Table 4:** Showing observation during *Putra*

Putra	<i>Vanga</i> (gm)	Kumari <i>Swarasa</i> (ml)	Weight of <i>Chakrika</i> after bhavana (gm)	Weight of used cow dung cakes (kg)	Wt. of <i>Chakrika</i> After <i>Putra</i>	Loss of avg. wt. of <i>Vanga</i> in %
1	1740	2180	1900	2.5	1732	0.45%
2	1732	2160	1760	3	1730	0.11%
3	1730	2050	1750	3.5	1724	0.34%
4	1724	1850	1750	4.5	1720	0.22%
5	1720	1610	1740	5	1720	0%
6	1720	1550	1735	6	1715	0.29%
7	1715	1520	1730	7.5	1710	0.29%
8	1710	1500	1730	8.5	1708	0.15%
9	1708	1480	1720	11	1705	0.17%
10	1705	1200	1720	13	1703	0.15%
11	1703	1130	1730	17	1690	0.74%

weight loss of *vanga* after *putra* in % = 3%

**Figure 1:** Showing temperature pattern of *Putra* at 30 minutes interval in °c



**Table 5:** Showing properties of *Marana* observations

Putas	Rekha Purnatva	Colour	Sukshma	softness	slakshna	varitara	Unnama
1	-	Blackish	+	+	+	-	-
2	-	Blackish	+	+	+	-	-
3	+	Blackish	++	++	+	-	-
4	+	Slight blackish	++	++	+	-	-
5	+	Dark grey	+++	++	+	-	-
6	++	Dark grey	+++	+++	+	-	-
7	+++	Grey	+++	+++	++	-	-
8	+++	Greyish	+++	+++	+++	+	-

9	++++	Greyish	++++	++++	+++	+	-
10	++++++	Light grey	++++	++++	++++	++	-
11	+++++++	Greyish white	++++++	+++++	+++++	++++	++

**Table 6:** Showing observation during *Rasa Sindoor* preparation

Time	Temp.	Observation
7.05 am	45	Heating started
7.30 am	53	Kajjali was dry and in powdered form
8.00 am	78	Kajjali was dry
8.30 am	110	Kajjali was dry
9.40 am	120	White fumes started coming out
10.30 am	190	Melting of kajjali along with yellowish white fumes start
11.50 am	225	Melting of kajjali along with fumes
1.30 pm	290	Kajjali liquefied and fumes increased
2.15 pm	365	Kajjali melted completely and fumes increased
2.50 pm	410	Kajjali was boiling and yellow colour fumes increased
4.20 pm	480	Flame appears and fumes disappeared
5.30 pm	500	Flame disappeared
6.20 pm	525	Corking was done immediately
6.30 pm	610	Temp. was increased after corking for one hour and then left for self-cooling

## Results –

### Table 7: Organoleptic Characters-

#### I. Organoleptic characters of *Vanga Bhasma* –

Parameters	<i>Vanga Bhasma</i>
<i>Sparsh</i>	Soft, no coarse particle found in touch
<i>Rupa</i>	Greyish white in colour
<i>Rasa</i>	Tasteless
<i>Gandha</i>	Not specific

#### II. Organoleptic evaluation of *Rasa Sindoor*-

Parameters	<i>Rasa Sindoor</i>
<i>Sparsh</i>	Soft
<i>Rupa</i>	Shiney, reddish Crystalline, amorphous
<i>Rasa</i>	Tasteless
<i>Gandha</i>	Not specific

#### III. Organoleptic evaluation of *Indra Vati*-

Parameters	<i>Indra Vati</i>
<i>Sparsh</i>	Smooth in touch
<i>Rupa</i>	Reddish brownish pills
<i>Rasa</i>	Not clearly defined
<i>Gandha</i>	Not specific

**Table 8:** Classical Analytical test of *Vanga Bhasma* -

Classical Parameters	<i>Vanga Bhasma</i>
<i>Varna</i>	Greyish white
<i>Varitara</i>	+ <sup>ve</sup>
<i>Nishchandravta</i>	+ <sup>ve</sup>
<i>Unnama</i>	+ <sup>ve</sup>
<i>Rekha Purnatva</i>	+ <sup>ve</sup>



**Table 9:** Physico-chemical Parameters –

A. Physico- chemical parameter of *Vanga Bhasma* –

Parameters	<i>Vanga Bhasma</i>
Loss on drying (%W/W)	0.48
Total Ash (%W/W)	99.62
Acid insoluble ash (%W/W)	85.37
Water soluble ash (%W/W)	13.9

B. Physico-chemical parameter of *Rasa sindoor*-

Parameters	<i>Rasa Sindoor</i>
Loss on drying (%W/W)	3.75
Water soluble ash(%w/w)	99.66
Acid insoluble ash (%w/w)	0.05
Total ash (%w/w)	0.45
Loss on Ignition	99.54

C. Physico-chemical parameter of *Indra Vati* –

Parameters	<i>Indra Vati</i>
Loss on drying	3.4
Total ash	53.3
Acid insoluble ash	47.4
Water soluble ash	51.4
Disintegration time	< 1.0 min
Hardness (kg/cm <sup>2</sup> )	1.5

**Table10:** Quantitative Analysis of Tin, Hg, S –**a) Determination of Tin –**

Sample name	Percentage (%)
Raw Vanga (% w/w)	88.9
Vanga Bhasma (%w/w)	65.42
Indra Vati (%w/w)	32.40

**b) Determination of Hg and S –****i. In Rasa Sindoor –**

Sample name	Percentage (%)
% of Hg (%w/w)	82.26
% of S (%w/w)	14.62

**ii. In Indra Vati –**

Sample name	Percentage (%)
% of Hg (% w/w)	40.24
% of S (%w/w)	6.96

**DISCUSSION**

*Indra vati* formulation was mentioned in various text of *Rasa Shastra* like *Rasendra sara samgraha* (16<sup>th</sup>), *Rasa Kamdhenu* (17<sup>th</sup>), *Rasendra Chintamani* (15<sup>th</sup>), *Rasa raja sundar* (19<sup>th</sup>), *Bhaishajya ratnavali* (19<sup>th</sup>), *Rasa yoga sagara* (1927-1930). Here, *Bhaishajya Ratnavali*'s reference has been taken for present study. but according to its content it is very significant one. It is *Kharaliya Rasayana* containing *Kupipakwa rasayana* and *Bhasma*. When *Rasa Sindura* combined with other *Bhasma*, it increases their activity, minimises dose and gives quicker results, due to its *Sukshma* and *Srotogami* property acts in *Samprapti Vighatana* of deeply seated *Doshas* and correcting the pathology (*Madhumeha*). Presence of above-mentioned values in final product is applicable for authentication and standardization of *Indra vati* to develop standards. Further study is required because the standards for *Indra vati* are not mentioned in the “*Pharmacopoeial standards for the Ayurvedic formulations*” by C.C.R.A.S.

**CONCLUSION**

After Analyzing the study on the basis of Conceptual, Pharmaceutical, Analytical Study; it could be concluded that, After *Samanya Shodhana* 10% Loss After *Vishesha Shodhana* 2% Loss in *Jarana* process,

7.5% Loss. In whole *Marana* process i.e. from 1<sup>st</sup> to 11<sup>th</sup>puta 3% loss of *Vanga Bhasma* was observed it means more loss was seen in *Jarana* process as compared to *Marana*. 64% *Rasa Sindoor* was obtained. After *Bhavana (Levigation)*, reddish brown colour of *Vati* (Tablets) was obtained weighted 250 mg. The compound in the final product, *Vanga bhasma* and *Rasa Sindoor* confirming all the traditional as well as modern scientific parameters. At last We concluded that *Pharmaceutical method* and *Phyico-chemical* results of *Indra Vati* gives leads to different pharmaceutical industries to standardize this well-known formulation for the benefit of diabetic patients.

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