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Research Article

PHARMACEUTICAL AND ANALYTICAL STANDARDIZATION OF *MAHA SHANKHA VATI*

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ABSTRACT

Khalveeya Rasa is the combinations of herbal, mineral and animal products, so that we can have the effects of all collectively in a single formula. it preserve the properties of freshly added *Churna, Swarasa* etc with the help of *Moorchita Parada* i.e., *Kajjali, Rasashindura & Hingula* etc. because of which *Khalveeya Rasaushadhies* occupies greater portion in therapeutics as compare to other *Kalpana,* Such as *Vati, Gutika, Taila, Ghrita* etc. In the present study three sample of "*Maha Shankha Vati"* have been prepared by adopting method describe in Ayurvedic Formulary of India (A.F.I.) Vol. 2 approved by government of India with some desire changes.

AIMS: The aim of this study is to prepare three sample of *"Maha Shankha Vati*" for it's Pharmacoanalytical standardization. And also prepare "*Shankha Bhasma*", "*Hingullotha Parada"* and processing of last three *Sanskara* of parada. Analytical Standardization of self made *Maha Shankha Vati* & market sample of *Maha Sankha Vati* to compare analytically.

RESULT: After evaluating organoleptic characters of the first three samples of self made *Maha Shankha Vati* revealed black colored substance in the form of *Vati* having *Amla-Katu Rasa*, *Amla* smell and smooth touch having pH 3.39. Similarly in case of market sample (fourth sample) shows black in colored in the form of *Vati* with *Lavan-Katu* in Rasa, *Amla* Smell and smooth touch having pH 4.37. Further the XRD pattern analysis of the combined sample of *Maha Shankha Vati,* reveals the presence of HgS, $Caco_3$, NaCl. Same observation found in market sample.

KEYWORDS: Maha Shankha Vati, GMP (Good manufacturing practice), SOP (Standard operative procedure).

INTRODUCTION

Khalveeya Rasa is the combinations of herbal, mineral and animal products, so that we can have the effects of all collectively in a single formula. These are administered in smaller doses, to get faster relief and combating many ailments by proper *Anupana* and *Sahapana*. It takes less space for manufacturing and storing. The most important aspect is that, it preserve the properties of freshly added *Churna, Swarasa* etc with the help of *Moorchita Parada* i.e., *Kajjali, Rasashindura* & *Hingula* etc. because of which *Khalveeya Rasaushadhies* occupies greater portion in therapeutics as compare to other *Kalpana,* Such as *Vati, Gutika, Taila, Ghrita* etc.

"*Maha Shankha Vati*"[(1)] selected for the present study is also a compound drug which comes under "*Khalveeya Rasa Kalpana*". Most of the *Khalveeya Rasa* comes under "*Sagandha and Niragni Moorchhana"* preparation. Maha Shankha Vati is one of such preparation. However some *of Khalveeya Rasa* are seen prepared with Agni such as *Putapaka, Puta, Valuka* & *Yantra Vidhi* etc. some *Khaveeya Rasa* viz., *Kafaketu Rasa, Bhuvneshwar Rasa* etc termed as *Rasayoga* but are not having *Moorchhita Parada*.

In the present study three sample of "*Maha Shankha Vati*" have been prepared by adopting method describe in Ayurvedic Formulary of India (A.F.I.) Vol. 2[(2)] approved by government of India with some desire changes. Efficacy and potency of the drug remain same. As in A.F.I. quoted that this formulation taken from *Bhaishajya Ratnavali* but it is actually coming in practice from *Rasendra Chintamani*[(3)].

Aims and objectives

1. To prepare three sample of "*Maha Shankha Vati*" for it's Pharmacoanalytical standardization.
2. To compare self made *Maha Shankha Vati* with Market Sample[(4)] of *Maha Shankha Vati*.
3. To prepare "*Shankha Bhasma*", "*Hingullotha Parada*" and processing of last three *Sanskara* of *Parada*.

4. Analytical Standardization of self made *Maha Shankha Vati* & market sample of *Maha Sankha Vati* to compare analytically.

MATERIALS AND METHODS

A. Collection and authentication of raw drugs

B. Pharmaceutical preparation of *Maha Shankha Vati*

C. Analytical Standardization of self made *Maha Shankha Vati* & market sample of *Maha Sankha Vati*.

A. Collection and authentication of raw drugs

Ingredients and their proportion

The authentic ingredients were procured from N.I.A. pharmacy except *Chincha* (*Tamarandus Indica*) for *Kshara preparation*. *Chincha Panchanga* procured from Nagpur, Maharashtra. and were thoroughly checked and botanically identified by Dr the experts in the N.I.A.

B. Pharmaceutical preparation of *Maha Shankha Vati*

Reference: AFI, Part-2, Edi.2nd Pg.179 (*Bhaisajyaratnavali, Agnimandyarogadhikara*; 186-187).

Table 1: Showing about the amount of ingredients of three samples of *Maha Shankha Vati*

S.No.	Ingredients	Sample 1	Sample 2	Sample 3
1.	*Kajjali*	50 gm	50 gm	50 gm
2.	*Shankha bhasma*	25 gm	25 gm	25 gm
3.	*Shuddha Vatsanabha*	25 gm	25 gm	25 gm
4.	*Shuddha Hingu*	25 gm	25 gm	25 gm
5.	*Cincha ksara*	25 gm	25 gm	25 gm
6.	*Sunthi*	25 gm	25 gm	25 gm
7.	*Maricha*	25 gm	25 gm	25 gm
8.	*Pippali*	25 gm	25 gm	25 gm
9.	*Sandhava lavana*	25 gm	25 gm	25 gm
10.	*Samudra Lavana*	25 gm	25 gm	25 gm
11.	*Vida Lavana*	25 gm	25 gm	25 gm
12.	*Sauvachala Lavana*	25 gm	25 gm	25 gm
13.	*Romak Lavana*	25 gm	25 gm	25 gm
	Total Wt.	350 gm	350 gm	350 gm

Table 2: Showing drugs using for *Bhavana* in *Maha Shankha Vati*

Bhavana dravya	Part used	Usable form	Amount for 7 *Bhavana* in all 3 samples
Chitraka	Root	*Kwath*	7.350 Lt
Apamarga	Plant	*Kwath*	7.350 Lt
Nimbu	Fruit	*Swaras*	7.350 Lt

Equipments: Pestle & Mortar, Spatula, Weighing Machine, Heating Apparatus, Storage Tank, Hot Plate, Spoon, Beaker, Measuring cylinder, Knife, Petri dish, pH paper, Cloth, S. S. Vessels etc.

S.O.P. (Standard Operative procedure): S.O.P. can be divided into four steps.

Procedure:

A. Preparation of *Kajjali* and its division into 3 samples of equal weight.

B. Processing of remaining ingredients into there usable form.

C. Preparation of three Samples of *Maha Shankha Vati*

D. *Bhavana* of drugs

A) *Kajjali* Formation[4]:

Ingredients and their proportion: *Parada* - 180 gm, Gandhaka - 180 gm

Procedure: Initially equal amount of *Suddha & Sanskarita parada* and *Suddha gandhaka* were taken and fine *Kajjali* was made by grounding for at least 6 hrs a day. *Mardana* should be done until symptoms are appeared of *Kajjali*. Lastly *Kajjali* was weighted and kept used for further processing.

Result: Yield : 350 gm Loss : 10 gm (2.86%).

B) Processing of remaining ingredients: Includes Extraction of *Hingula* with last three *sanskara,* Preparation of *Shankha Bhasma* & *Chincha Kshara, Vatsanabha Shodhana, Gandhak Shodhana* & *Hingu Shodhana,* also included preparation of fine powder of Herbal Drugs & *Lavana*.

In Ayurvedic text Some author claim that "*Hingullotha Parada*" property are equivalent to *Sama guna* as well as, *Shada Guna gandhaka Jeerna Parada*[5]. So considering above facts, for the present study *Hingullotha parada* was used and for removal of the impurities which may left after extraction & also for *Gunavardhan*, last 3 *Sanskaras* was done.

- Extraction of *Hingula*[6] was done two times. Both times yield revolving nearly towards 41% that was not too much. It may be because of instrumental error and improper heat.

- While doing last three *Sanskara* which are *Bodhan*[7], *Niyaman*[8], *Dipana*[9] of *Parada* total loss was occurs (4.21gm=2.24%). It may be because of *Jala* & *Hansa Gati of Parada*.
- In the present study total loss occurs during *Gandhak Shodhana*[10] (3.19%). *Gandhak Shodhana* wasn't done in one day, it was done one time in one day and completed in three days for proper drying and to avoid loss, *Ghrita* was used in small amount for purification and after purification *Gandhaka* was washed well with warm water, to remove the remaining part of *Ghrita* and Milk.
- *Shankha Bhasma*[11] was prepared within three *Gajaputa*, after second *Gajaputa Bhasma* was cleared *Rekhapurnatwa pariksha*, but proper color of *Bhasma* was not shows, it may be because of improper heat. To clear this third *Puta* was given (maximum temperature during *Putapaka* was 800^{o}c maintained for 2 hours) and total loss during the procedure was 15.95%.
- In the present research work *Vatsanabha* was used after *Shodhana*[12], total loss was found up to 59.41%. Loss may be occurs because of volatile substances and water soluble substances present in *Vatsanabha,* as well as covers also included into it. After completion of total work, we get an experience that, removing of *Vatsanabha* cover is not a compulsory procedure, because remaining covers of *Vatsanabha* can be separated while preparation of fine powder in the form of residue.
- During the procedure of *Chincha Kshara* preparation[13], white ash was obtained upto 5.04%. After preparation of the white ash of *Chincha Panchanga*, some unburned particles were left in the form of coal. It may be because of *Chincha* fruits, even after drying, some moisture was left in *Chincha* fruits. Total *Kshara* prepared in this procedure was 13.22% of the white ash.

Table 3: showing observations after powdering of Ingredients

S. No.	Name	Wt. of Raw Drug	Wt. of Powdered Drug	Loss/ Gain	Wt. after sieving
1.	*Maricha*	406 gm	393 gm	-13 gm	363 gm
2.	*Pippali*	429 gm	412 gm	-17	400 gm
3.	*Sunthi*	410 gm	388 gm	-20	390 gm
4.	*Saindhava Lavana*	402 gm	400 gm	-2	399 gm
5.	*Sauvarchala Lavana*	220 gm	219.20gm	- 0.80 gm	218 gm
6.	*Vida Lavana*	280 gm	267 gm (After *Nirmalikarana*)	-13 gm	267 gm
7.	*Samudra Lavana*	220 gm	219 gm	-1	218gm
8.	*Romak Lavana*	200 gm	200 gm	0	200gm

C) Preparation of three Samples of *Maha Shankha Vati:* Three Samples of *Maha Shankha Vati* were prepared by using same ingredients in same proportion for the purpose of standardization. Each drug was taken 25gm in each sample, by this way total weight of each sample was 350gm.

(D) *Bhavana* of Drugs[14,15]

Material required: 1. Ingredients - 350 gm in each sample (3 Sample), 2.*Bhavana Drugs* - 3 Drugs (As mentioned below)

Table 4: Showing various aspects of *Bhavana* in *Maha Shankha Vati*

Name of the drug	Required raw drug for 7 *Bhavana*	Ratio of drug: water	Amount of decoction / *Swaras*	S1	S2	S3
Chitak (rt)	7,350 kg	1:8 – 1/4	14,700 lt	700 ml / *Bhavana* – 7	700 ml / *Bhavana* – 7	700 ml / *Bhavana* – 7
Apamarga (pl)	7,350 kg	1:8 – 1/4	14,700 lt	700 ml / *Bhavana* – 7	700 ml / *Bhavana* – 7	700 ml / *Bhavana* – 7
Nimbu (Fr)	17 Kg	------	7,350 lt	350 ml / *Bhavana* – 7	350 ml / *Bhavana* – 7	350 ml / *Bhavana* – 7

Procedure

- At first *Kajjali* (150 mg) was divided into three equal parts of 50 gm each and was assigned names as Sample 1, Sample 2, Sample 3 were kept in separate *Khalvas* respectively for further processing.
- Second step was addition of remaining ingredients into respective *Khalva* with the aim of preparation of three samples.
- There were 3 drugs in all for *Bhavana* in which one was to be used fresh (*Nimbu*).
- Decoction of dried drug (*Chitrak, Apamarga*) was making by following ratio of 1:8 – ¼ left.
- After filtration of decoction it was kept settled for one day for the purpose of standardization.
- Sample for decoction (100 ml) were stored for calculating the extract values.

- Each sample contains 350 gm total drug material. In which only 125 gm material was herbal material and 700 ml *Kwatha* in each sample was too much for *Bhavana* because of this *Kwatha* was used for further processing of *Rasa kriya* on water bath.
- *Rasa kriya* which was formed was divided into 3 equal parts and poured into respected *Khalvas* and *Mardana* should be done for 3 hrs in each *Khalva.*
- After giving *Bhavana* material took much more time to dry because of this after each *Bhavana* material was spread on iron tray for purpose of drying. Material was dried in shades under the fan.

Observations regarding process of *Bhavana*

Table 5: Showing physical characteristic of decoction/*Swarasa* used in *Bhavana*

S.No.	Name	Color	pH	Taste	Appearance	Odor/Smell
1.	*Chitraka*	Dark Brown	6	*Katu*	Thin Liquid	Mild, Not Specific
2.	*Apamarga*	Slight Brown	7	*Katu*	Thin Liquid	*Tikshna*
3.	*Nimbu*	Pale Yellow	2.5	*Amla*	Thin Liquid	*Amla*

Apart from above description, other observation mentioned as under

1) In case of *Nimbu Swarasa*, a yield of 43.24% that is 7,350 lt of juice was obtained from 17 Kg of fresh fruit.

2) In last *Bhavana* (*Nimbu Swarasa*), mixture completely failed to dry and it turns to black color, sticky appearance with thick consistency.

Precaution regarding process of *Bhavana*

- ❖ In the preparation of decoction coarse powder of the drug should be soaked overnight in water for proper yield of extract value.
- ❖ In order to calculate % increase in the starting material, weight of medicine should be recorded after each *Bhavana*. (This was not followed in the present study to avoid handling loss).
- ❖ Decoction should be made on law flame.
- ❖ *Raskriya* (concentrated decoction) should be done on a water bath on a mild heat.
- ❖ Decoction prior to *Raskriya* formation should be kept for sometime undisturbed & superficial fluid should be taken for further use, it is for proper standardization.
- ❖ Proper *Mardana* is mandatory for homogenous mixture of medicine.

Table 6: Showing extract value of the decoction used in *Bhavana* at a Glance

Name of Drug	*Kwath/ Swaras* Sample solution x (ml)	E1 (gms)	E2 (gms)	E3 (gms)	Mean (E) gms	% of Extract (x)
Chitraka	10 ml	0.260	0.215	0.220	0.232	24.65%
Apamarga	10 ml	0.200	0.220	0.210	0.210	22.29%
Nimbu	10ml	0.500	0.510	0.490	0.500	53.06%

Observations regarding finished product

1. Final yield of *Maha Shankha Vati* after making pills in respective samples is as follows:
   i. Sample 1 : 712 gm
   ii. Sample 2 : 700 gm
   iii. Sample 3: 689 gm
2. Physical characteristics of the pills in all 3 samples:
   i. Color: Black
   ii. Odor: *Amla* (Lemon Flavored)
   iii. Taste: Mainly *Amla* minutely *Tikta & Katu*
   iv. Solubility: Dissolved in water leaving residue in the bottom of the vessel.
   v. Appearance: Smooth Appearance
   vi. pH: 3.31

Table 7: Showing weight added by decoction on the basis of their extract values

S. No.	Name of the Drug	% extract	Solid weight of the *Kwatha* / Amount of *Kwatha* (gms)
1.	*Chitraka*	24.65	341.40
2.	*Apamarga*	22.29	308.7
3.	*Nimbu*	53.06	735

Probable yield of *Maha Shankha Vati*: 2435.10 gm

i. Weight of extract of *Bhavana* Drugs :- 1385.10 gm
ii. Weight of *Kajjali*: 150 gm
iii. Weight of other Drugs: 900 gm

Actual yield of *Maha Shankha Vati*: 2101 gm

Result

Loss of Weight: 2435.10 - 2101 = 334.10

% of Loss: 13.72 %

D. Standardization of *Maha Shankha Vati*

Parameters Studied:

1. Organoleptic Characters

2. Physico Chemical Parameters

- ✓ pH Value
- ✓ Loss on drying
- ✓ Determination of Ash: 1)Total Ash

2) Acid Insoluble Ash

3) Water soluble ash

- ✓ Determination of extract value :

1) Alcohol Soluble Extractive

2) Water Soluble Extractive

- ✓ Disintegration time

3. Other Analytical Test including:

- ✓ Microbial limit test for four pathogens:

4. Assay for Elements:

- ✓ XRD (X – ray diffraction)

Physico Chemical Parameters done by following the method of API (Ayurvedic Pharmacopeia of India) and Microbial limit test done by USP method.

Table 8: Showing Organoleptic characters of 4 sample of *MahaSankha Vati*

S. No.	Parameters	Observation			
		S1	**S2**	**S3**	**S4**
1.	Color	Black	Black	Black	Black
2.	Odour	Leman Flavored	Leman Flavored	Leman Flavored	*Amla*
3.	Taste	*Amla-Katu*	*Amla-Katu*	*Amla-Katu*	*Lavan-Katu*
4.	Touch	Smooth	Smooth	Smooth	Smooth

Table 9: Showing Physico-chemical parameters of 3 sample of *Mahasankha Vati* (Self made)

S. No.	Parameters	S1	S2	S3	Mean
1)	Description	Black Color	Black Color	Black Color	
2)	pH Value	3.39	3.23	3.32	3.31
3)	Loss on drying	6.50%	6.36%	6.64%	6.50%
4)	Total Ash	26.24%	24.21%	25.46%	25.30%
5)	Water soluble Ash	5.05%	4.97%	5.53%	5.18%
6)	Acid Insoluble Ash	2.8%	2.5%	1.93%	2.41%
7)	Alcohol soluble extractive	19.12%	20.09%	18.37%	19.19%
8)	Water soluble extractive	67.77%	72.62%	70.63%	70.34%
9)	Disintegration time	50-55 min	50-55 min	42-47 min	
10)	Citric Acid Content	22.4%			
11)	**Microbial limit test** • Staphylococcus Aureus • E. coli • Salmonella spp. • Pseudomonas Aeruginosa	 Absent Absent Absent Absent			

Table 10: Showing Physico-chemical parameters of one market sample of *Mahasankha Vati*

S. No.	Parameters	S
1)	Description	Black Color
2)	pH Value	4.37
3)	Loss on drying	5.82%
4)	Total Ash	32.44%
5)	Water soluble Ash	6.7%
6)	Acid Insoluble Ash	1.43%
7)	Alcohol soluble extractive	6.25%
8)	Water soluble extractive	46.46%
9	Disintegration time	50-55 min
10)	Citric Acid Content	7.8%
11)	**Microbial limit test** • Staphylococcus Aureus • E. coli • Salmonella spp. • Pseudomonas Aeruginosa	 Absent Absent Absent Absent

SCAN: 5.0/59.98/0.02/3(^{0}/m), Cu, l(max)=137, 04/26/10 15:12

PEAK: 29-pts/Parabolic Filters, Threshold=2.0, Cutoff=1.5%, BG=7/1.0, Peak-Top=Summit

NOTE: Intensity = Counts, 2T(0)=0.0(^{0}), Wavelength to Compute d-Spacing = 1.54056A(Cu/K-alpha…….)

Table 11: Showing results of X-ray diffraction of sample 1

S.No	2-theta	d(A)	BG	Height	I%	Area	I%	FWHM	XS(A)
1	23.297	3.815	6	17	13.5	302	23.7	0.302	285
2	26.579	3.351	4	53	42.1	1221	95.7	0.392	216
3	28.519	3.127	6	36	28.6	448	35.1	0.212	440
4	31.860	2.806	11	126	100.0	1276	100.0	0.172	590
5	32.201	2.547	9	11	8.7	21	1.6	0.031	>1000
6	40.740	2.213	6	18	14.3	363	28.4	0.343	258
7	43.899	2.061	6	19	15.1	277	21.7	0.248	378
8	45.559	1.989	7	30	23.8	402	31.5	0.228	421
9	51.960	1.758	7	9	7.1	230	18.0	0.434	209
10	56.620	1.624	5	12	9.5	172	13.5	0.244	406

SCAN: 5.0/59.98/0.02/3(^{0}/m), Cu, I(max)=281, 04/26/10 15:56

PEAK: 29-pts/Parabolic Filters, Threshold=2.0, Cutoff=1.5%, BG=7/1.0, Peak-Top=Summit

NOTE: Intensity = Counts, 2T(0)=0.0(^{0}), Wavelength to Compute d-Spacing = 1.54056A (Cu/K-alpha…….)

Table 12: Showing result of X-ray diffraction of sample 2

S.No.	2-theta	d(A)	BG	Height	I%	Area	I%	FWHM	XS(A)
1	23.140	3.840	9	21	7.8	501	18.1	0.406	206
2	26.420	3.371	9	97	36.1	2267	81.8	0.397	212
3	27.421	3.250	8	14	5.2	101	3.6	0.123	>1000
4	28.400	3.140	7	19	7.1	45	1.6	0.038	>1000
5	29.440	3.031	7	24	8.9	174	6.3	0.123	>1000
6	30.618	2.917	12	12	4.5	220	7.9	0.312	279
7	31.779	2.813	12	269	100.0	2771	100.0	0.175	575
8	40.539	2.223	9	10	3.7	145	5.2	0.247	376
9	43.739	2.068	8	30	11.2	892	32.2	0.505	173
10	45.500	1.992	8	137	50.9	1473	53.2	0.183	563
11	51.860	1.762	9	22	8.2	675	24.4	0.522	173
12	53.917	1.699	8	11	4.1	149	5.4	0.217	464
13	56.521	1.627	7	30	11.2	343	12.4	0.194	541

DISCUSSION

Maha Shankha Vati was prepared in four steps. First step was *Kajjali* formation. Second step includes processing of all ingredients to converts into useable form. Third steps include preparation of three samples of *Maha Shankha Vati* and finally in fourth step *Bhavana* was given.

Processing of *Maha Shankha Vati* was started with formation of *Kajjali. Kajjali* was easily formed in 8hrs after extensive *Mardana,* finally lusterless black color fine powder was obtained. At the end of the process reveals loss of 10gm (2.09%), which was due to handling loss and in later stage *Kajjali* becomes very fine and spills during *Mardana.*

After this we come to the second procedure which involves processing of all ingredients into their useable form. Total 14 ingredients (drugs) were involved in each sample. Each drug was taken 25gm in each sample; by this way total weight of each sample was 350gm. Third step includes preparation of three samples. Finally comes to the last aspect of procedure, named as *Bhavana,* which involves 7 *Bhavana* of 3 drugs each in three respective samples.

Decoction was made by following the ratio of 1:8 and 1/4th left, considering the method regarding *Anukala paviddhi* for *Swarasa.*

But because of time limitation, we realized that it was not possible to give 7 *Bhavana* of each drug to each sample separately. To avoid this, it was planned to reduce the amount of liquid to be used for 2 *Bhavana* in the form of "*Rasakriya*" before addition into three samples.

In the present study weight of material was not recorded after each *Bhavana,* so as to prevent handling loss and it can be rationalized by the fact that, at the end probably extract value added by herbal extracts could be calculated. Also there should be slight change was done in the procedure with *Maha shankha Vati.*

Analytical study in the present research work was carried out on the basis of standards laid down in CCRAS that is, Central Council for Research in *Ayurveda* and *Siddha,* concentrating mainly on *Shankha Vati*, because standards of *Maha Shankha Vati* are not yet decided.

After evaluating organoleptic characters of the first three samples of self made *Maha Shankha Vati* revealed black colored substance in the form of *Vati* having *Amla-Katu Rasa*, *Amla* smell and smooth touch having pH 3.39. Similarly in case of market sample (fourth sample) shows black in colored in the form of *Vati* with *Lavan-Katu* in *Rasa*, *Amla* Smell and smooth

touch having pH 4.37. Further in case of *Shankha Bhasma,* shows that it is a grayish white colored fine powder which is odourless, tasteless and it also complies the test of *Rekhapurnatwa* which are indicatives of lightness and fineness in the particles of *Bhasma*.

Samples of *Maha Shankha Vati* when subjected to physiochemical analysis mainly loss on drying, total ash, acid soluble ash, water soluble ash, water soluble extractive, alcohol soluble extractive and disintegration time. It was a evident from table no.9 mentioned in the chapter of analytical study that, there was not much more variation in the values of loss on drying within first three sample of *Maha Shankha Vati,* implying that, there was uniformity in the procedure three samples of self made *Maha Shankha Vati,* with the average of 6.50%. Similarly in case of market sample value of loss on drying is 5.82%, it means in both self made and market sample not showing much more variation. Likewise comparison in case of total ash value, it was observed that, in three samples of self made *Maha Shankha Vati* not found much more variations with average value is 25.30%, but in case of market sample it was 32.44%. By this way the variations in the total ash value between two self made & market sample is 7.14%w/w, it may be because of instrumental error, because more organic substances present in self made samples in the form of *Bhavana.* The maximum value of alcohol soluble extractive detected in self made sample no.2 and the average value of self made three samples is 19.19%, in case of market sample it shows 6.25%, having variations of 12.94%. Further considering acid insoluble ash value of self made three samples, negligible variation even less than 1% (mean value 2.41), in case of market samples it was found 1.43%. likewise on considering water soluble ash value of self made three samples mean average value was found to be 5.18%w/w, having variation of 1.07%w/w, with market sample 6.25%w/w.

As evident from the analytical values, there was not much more variation found in the readings of all self made three samples of manufacturing of these samples.

Further the XRD pattern analysis of the combined sample of *Maha Shankha Vati*, as per the report attached in the appendices, reveals the presence of HgS, $Caco_3$, NaCl. Same observation found in market sample.

SUMMARY

The present study entitled "Pharmaceutical & Analytical Standardization of *Maha Shanka Vati"* has been planed with an attempt to contribute to the ongoing process of standardization of compound formulations as well as to validate the efficacy of herbomineral compound mainly *"Maha Shannkh Vati*" through pharmaceutical.

The pharmaceutical section deals with the processing carried out during the preparation of three samples of *Maha Shankha Vati*, further it also contain descriptions of preparation of *Sankha Bhasma*, extraction of *Hingulllatha Parada* with its last three *Sanskara* which was carried out after extraction, preparation of *Chincha kshhara* & *Hingu Shodhana.*

Three samples were prepared of *Maha Shankha Vati*, to check the uniformity of the procedure as a part of the standardization of the drug.

In the analytical study three samples of *Maha Shankha Vati* and one market sample were subjected to organoleptic examination, physiochemical examination and elemental analysis.

CONCLUSION

- *Maha Shankha Vati* is a herbomineral compound having its first description found in *Rasendra Chintamani.*
- Total four references of *Maha Shankha Vati* and ten references of *Shankha Vati* have been found.
- Total two references of S.O.P. have been found, and in each S.O.P. variation found in processing of *Shankha Bhasma*.
- *Maha Shankha Vati* was prepared by following the method prescribed in A.F.I. volume 2nd with required changes in S.O.P.
- Increase of the final product is approximately two times the initial material due to addition of weight of extract during seven *Bhavana* of three herbal drugs.
- Analytical study of *Maha Shankha Vati* reveals that, the uniformity in the procedure of three self made samples of *Maha Shankha Vati* as evidenced by observation of the analytical values of three samples were not much more variation found.
- Citric acid present in self made samples is much (22.4%) and in case of market samples it was 7.8% having variation of 14.60%. it may be because of more extract added by *Nimbu Swarasa* during seven *Bhavana.*
- Absence of any live pathogen in three self made samples of *Maha Shankha Vati* & one market sample proves the bacterostatic & bactericidal effect of herbomineral formulation, especially due to presence of *Kajjali.*

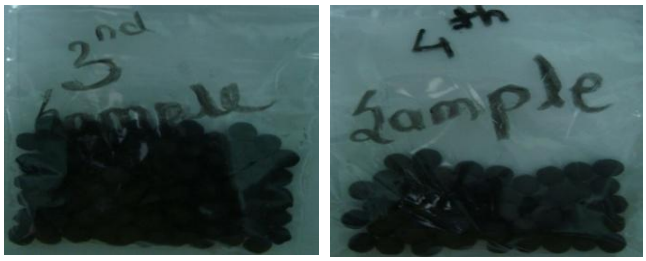

Figure: Samples of *Maha Shankha Vati*

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