



PRELIMINARY PHYSICO-CHEMICAL EVALUATION OF HARATALA BHASMA

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Abstract: Haratala Bhasma a ayurvedic formulation recommended by rasendra sara sangraha page no.348 written by idradev tripathi in the management of vatarakta chikitsa. The present study deals with development of preliminary pharmaceutical profile of drugs which includes Heavy metal analysis, Microbial overload, Particle size, SEM, EDAX. Where carried out after pharmaceutical procedure followed by classical as well as modern parameters.

Keywords: Vatarakta, Physico-chemical parameters, Rasendrasara sangrah, Haratala Bhasma.

Introduction: The prime objective of pharmaceutical research is to produce a safe, effective and quality drug. Safety and efficacy depend solely on the quality of the raw drug and its standard methods of preparation. The branch *Rasashastra* and *Bhaishajya Kalpana*, emphasizes on following standard pharmaceutical procedures during drug development. Most important fundamental principles of *Rasashastra* and *Bhaishajya Kalpana* like *Shodhana*, *Jarana*, *Marana*, *Bhavana* etc. are the integral part of drug development and they not only include the drug manufacturing and enhance the properties of the medicament but also include in their dispensing to the patient in most suitable, attractive and palatable form.

Haratala Bhasma preparation needed preliminary treatment like *shodhana* & *marana*. It has been commonly used in various diseases specially *vatarakta* (gout) *chikitsa*. These days there are lot of works and discussion are going

on globally about heavy metal and toxicity of heavy metal poisoning such as mercury, lead, arsenic, cadmium. Hence now a day's present era it has become very important to understand a drug by carrying out certain important chemical study as such study provide a clear judgement and revalidate the efficacy of ayurvedic drug. Haratala Bhasma is a very popular formulation used in clinical practice but this particular preparation poses different pharmaceutical methods described in classics showing wide variation in therapeutic side.

Aims and Objective

1. Standard Pharmaceutical Procedure
2. Preliminary Physico-chemical evaluation of drug

Materials and Methods

Test Drug: Raw Haratala (Orpiment) was collected from sundar ayurved pharmacy, Nadiad, Gujarat, considering *grah lakshanas*. Preparation of Haratala Bhasma as per *Rasendra sara sangraha* in three batches.

Results and Observations

Table-1: Ingredients of *Haratala Shodhana* ^[1]

No.	Name	Batch I	Batch II	Batch III
1	<i>Asudhdha haratala</i>	100 gm.	100 gm.	100 gm.
2	<i>Kushmanda rasa</i>	1 liter	1 liter	1 liter
3	<i>Churnodaka</i>	1 liter	1 liter	1 liter
4	<i>Tila taila</i>	1 liter	1 liter	1 liter
5	<i>Sudhdha haratala</i>	83.75 gm.	85.5 gm.	82 gm.
6	Weight loss	16.25 gm.	14.5 gm.	18 gm.

Procedure

- Take Sudhdha Haratala powder 100gm. & Sudhdha Vatsnabha (*Aconitum ferox*) powder 20gm. in clean khalvyantra and mix it well.
- Freshly prepared ankola swarasa 32ml. Mix it in a khalvyantra gradually for bhavana.
- Then make a one bolous of it.
- Take sharava samputa then firstly add Palash bhasma 200gm. then place a bolous and then add Apamarga bhasma 300gm. in it.
- Then do 7 layers of kapadmitti on sharav samput and put it in sunlight for drying.
- After that put this sharav samputa on L.P.G. for continuous 24hrs. On mild heat (mrudu agni).
- After self cooling slowly removed kapadmitti and open upper part of sharav with care then we got white colour bolous in it.
- Take this bolous in clean khalvyantra in powder it well & store it in clean & dry glass bottle.
- While giving *Bhavana* of Ankola *Swarasa* it takes 1.5 hr to attain paste like consistency.
- Sharav samputa will take 4hrs. Time to dry in sunlight.
- During *Putapaka* dense fumes of sulphur were observed at the temp. 400⁰ C.
- Cracks were observed on *Sharava* after taking out from L.P.G.
- Ash colour of Tal Bhasma was obtained.

Precautions

- Cap, mask, goggles and gloves should be used while performing all the procedures.
- Sufficient amount of Ankola rasa should be taken for *Bhavana*.
- Bolous should be dried well.
- *Sharava samputikarana* should be done properly.
- As far as possible exposure to fumes of sulphur should be avoided.
- Puta should be removed when temperature come down to room temperature (*Swangasheeta*).

Observations**Table-2: Ingredients of Haratala Bhasma** ^[2]

No.	Name	Batch I	Batch II	Batch III
1	Sudhdha Haratala	100gm.	100gm.	100gm.
2	Sudhdha Vatsnabha (<i>Aconitum ferox</i>)	20gm.	20gm.	20gm.
3	Ankola rasa (<i>Alangium salvifolium</i>)	32ml.	32ml.	32ml.
4	Palash bhasma (<i>Butea monosperma</i>)	200gm.	200gm.	200gm.
5	Apamarga bhasma (<i>Achyranthes aspera</i>)	300gm.	300gm.	300gm.
6	<i>Haratala Bhasma</i>	68gm.	72gm.	64gm.

Table-3: Organoleptic parameters for Haratala Bhasma

No.	Parameter	<i>Haratala Bhasma</i>
1	Varna	White
2	Sparsha	Smooth
3	Rasa	Tasteless
4	Gandha	Odourless
5	Shabda	soundless

Table-4: Classical parameters Haratala Bhasma

No.	Parameter	<i>Haratala Bhasma</i>
1	Rekhapurnatva	Positive
2	Varitaratva	Positive
3	Sukshmatva	Positive
4	Shlakshnatva	Positive
5	Mridutva	Positive
6	Nirdhumatva	Positive
7	Nishchandratva	Positive
8	Apunarbhavtva	Positive
9	gatarastva	Positive

Table-5: pH value of Ashuddha Haratala, Shuddha Haratala, Haratala Bhasma ^[3]

No.	Name of the Test-pH value	Ashuddha Haratala	Shuddha Haratala	Haratala Bhasma
1	Batch No. I	4.05	4.02	7.45
2	Batch No. II	4.01	3.98	7.33
3	Batch No. III	4.03	4.00	7.39
4	Average	4.03	4.00	7.39

Table-6: Loss on Drying value Ashuddha Haratala, Shuddha Haratala, Haratala Bhasma ^[4]

No.	Name of the Test- Loss on Drying value	Ashuddha Haratala	Shuddha Haratala	Haratala Bhasma
1	Batch No. I	99%	99.10%	6.20%
2	Batch No. II	99.22%	99.20%	6.0%
3	Batch No. III	99.44%	99.15%	6.10%
4	Average	99.22%	99.15%	6.10%

Table-7: Ash value Ashuddha Haratala, Shuddha Haratala, Haratala Bhasma ^[5]

No.	Name of the Test-Ash value	Ashuddha Haratala	Shuddha Haratala	Haratala Bhasma
1	Batch No. I	0.88%	0.95%	96%
2	Batch No. II	0.78%	0.85%	97%

3	Batch No. III	0.68%	0.75%	96.5%
4	Average	0.78%	0.85%	96.5%

Table-8: Acid Insoluble Ash value Ashuddha Haratala, Shuddha Haratala, Haratala Bhasma ^[6]

No.	Name of the Test-Acid Insoluble Ash value	Ashuddha Haratala	Shuddha Haratala	Haratala Bhasma
1	Batch No. I	4.05	4.02	7.45
2	Batch No. II	4.01	3.98	7.33
3	Batch No. III	4.03	4.00	7.39
4	Average	4.03	4.00	7.39

Table-9: Water soluble Ash value Ashuddha Haratala, Shuddha Haratala, Haratala Bhasma ^[7]

No.	Name of the Test-Water soluble Ash value	Ashuddha Haratala	Shuddha Haratala	Haratala Bhasma
1	Batch No. I	0.78%	0.38%	22.68%
2	Batch No. II	0.68%	0.48%	22.28%
3	Batch No. III	0.58%	0.28%	22.48%
4	Average	0.68%	0.38%	22.48%

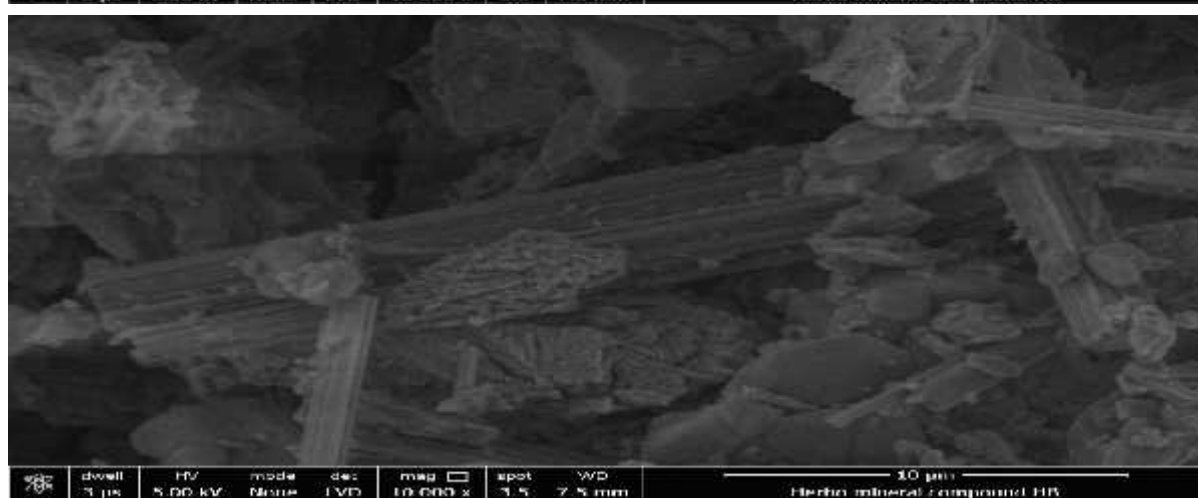
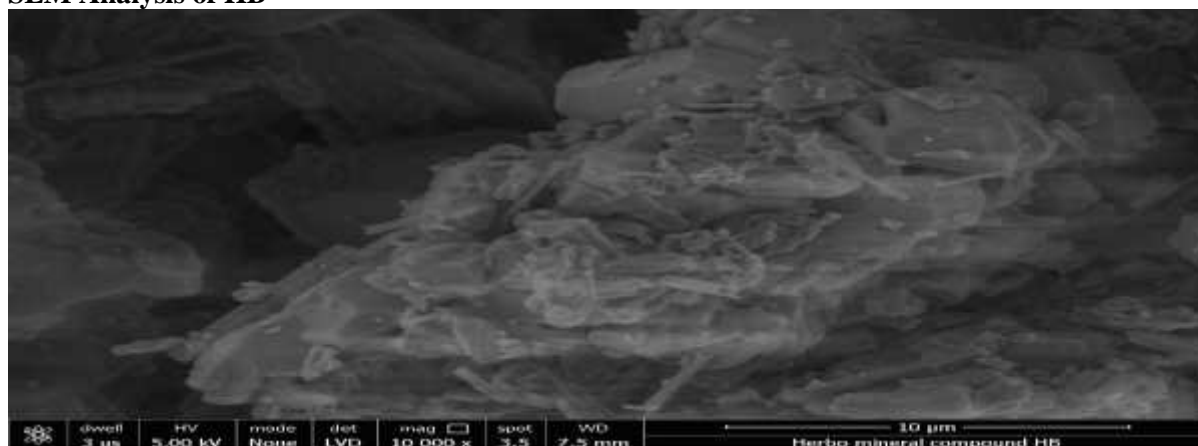
Table-10: Heavy Metal analysis ^[8]

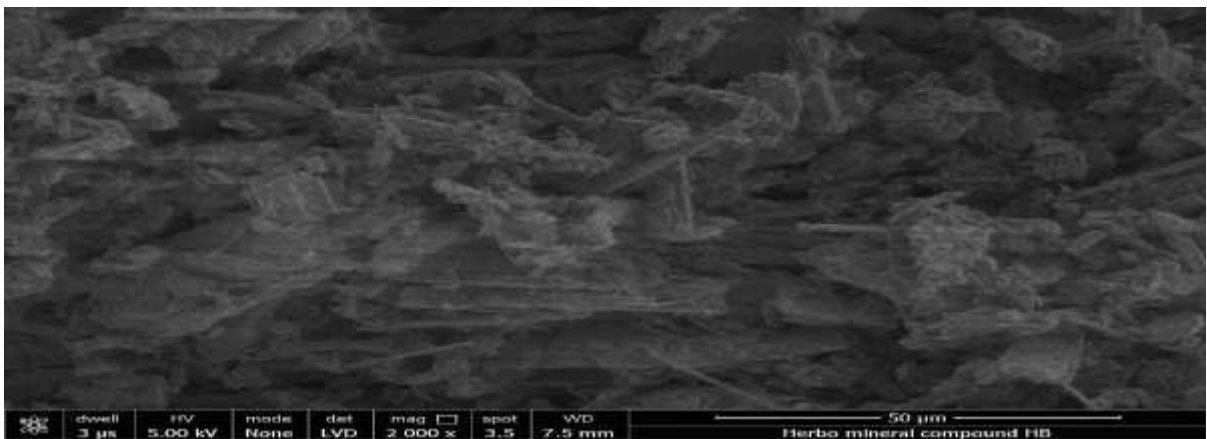
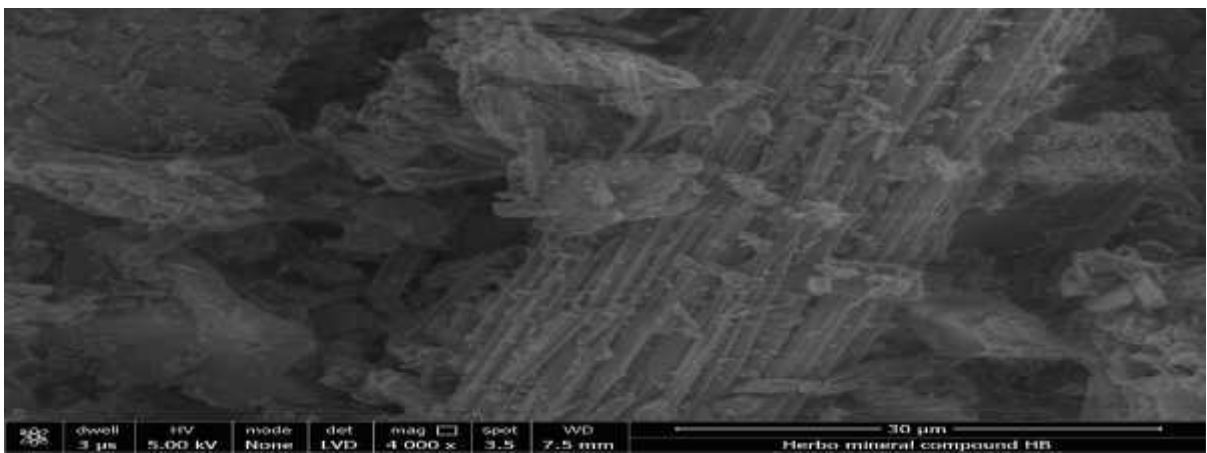
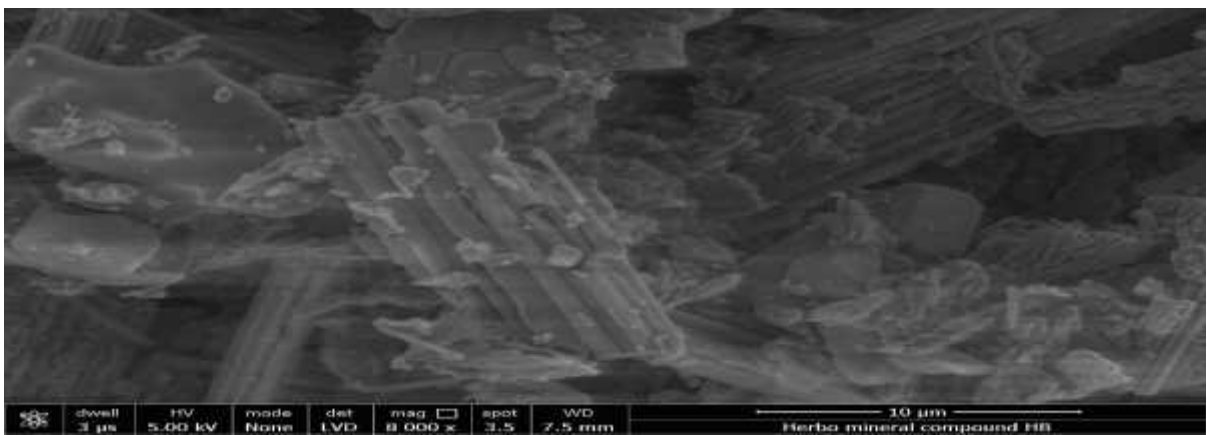
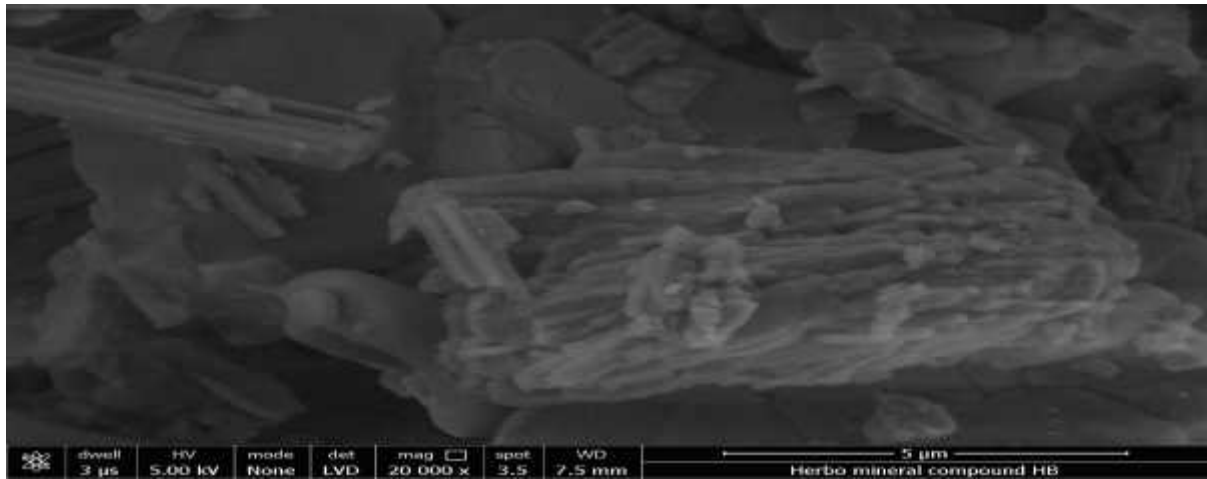
No.	Heavy Metal contents	Permissible limits	Result	Test Method Reference
1	Lead (Pb)	10 ppm	4.327ppm	A.P.I., Part- II, Vol. - III
2	Arsenic (As)	3 ppm	2.061ppm	
3	Cadmium (Cd)	0.3 ppm	0.264ppm	
4	Mercury (Hg)	1 ppm	0.647ppm	

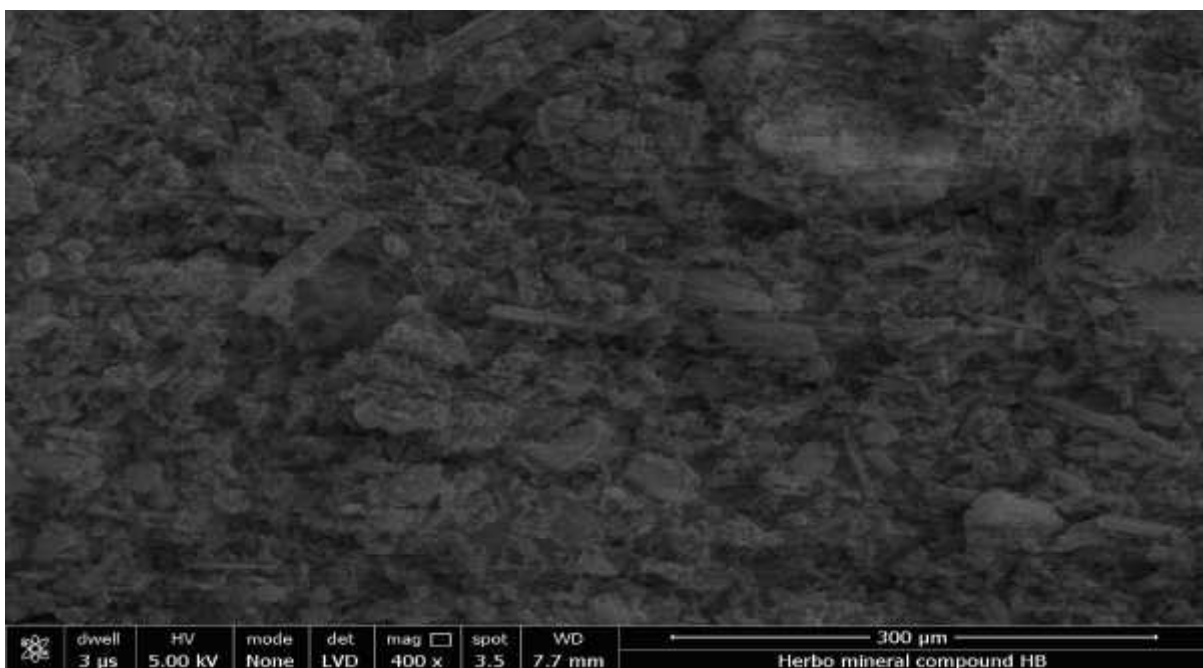
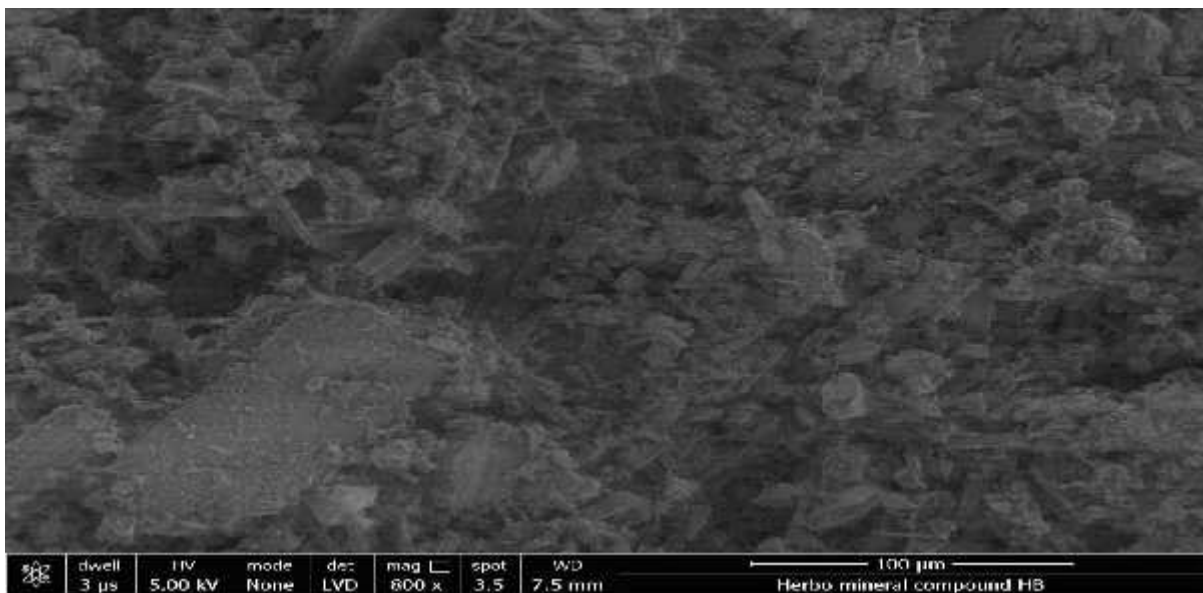
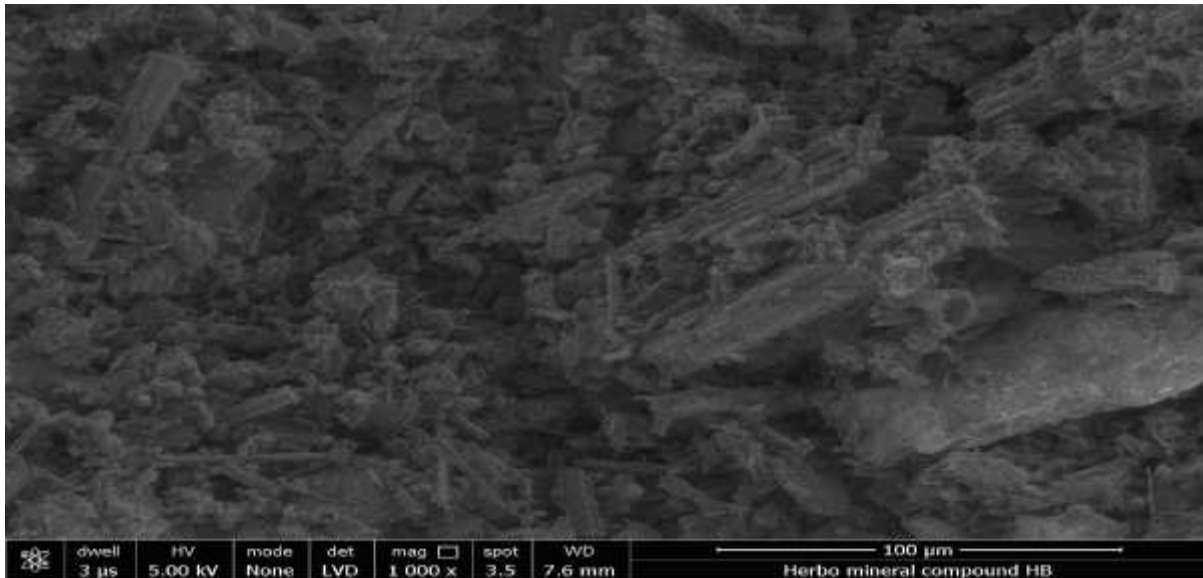
Table-11: Microbial Limit test ^[9]

Sr No.	Parameters	Permissible limit	Result	Test Method Reference
1	Total Plate Count	NMT10 ⁵ cfu/g	267 cfu/g	A.P.I., Part- II, Vol. - III
2	Total Yeast & Mould Count	NMT10 ³ cfu/g	127 cfu/g	
3	Escherichia coli	Absent	Absent	
4	Salmonella sp.	Absent	Absent	
5	Staphylococcus aureus	Absent	Absent	
6	Pseudomonas aeruginosa	Absent	Absent	

SEM Analysis of HB







XRD Analysis of HB

Pos. [$^{\circ}$ 2Th.]	FWHM [$^{\circ}$ 2Th.]	d-spacing [Å]	Height [cps]	Rel. Int. [%]	Significance
22.9842	0.3444	3.86952	15.07	2.63	2.7299
25.3946	0.2952	3.50744	573.02	100.00	14.7132
28.0266	0.2952	3.18376	18.85	3.29	2.2758
31.4880	0.3444	2.84123	92.02	16.06	9.8156
31.8792	0.2952	2.80725	17.77	3.10	2.6736
36.3630	0.2952	2.47073	68.13	11.89	4.0503
38.7082	0.3444	2.32627	107.04	18.68	7.9502
40.9004	0.2952	2.20650	125.40	21.88	6.1670
41.3694	0.2460	2.18256	58.31	10.18	2.1257
43.4130	0.3444	2.08445	79.80	13.93	6.2980
44.5748	0.3936	2.03278	29.57	5.16	3.9385
45.4746	0.2460	1.99463	31.42	5.48	1.4498
46.8739	0.2952	1.93830	30.21	5.27	2.2852
48.7507	0.2952	1.86798	155.51	27.14	5.5154
52.3348	0.3444	1.74817	183.16	31.96	9.1555
55.7980	0.3444	1.64760	159.74	27.88	7.7511
57.8692	0.3444	1.59347	29.86	5.21	2.6384
59.0987	0.3444	1.56322	62.25	10.86	4.5126
60.7708	0.2952	1.52415	72.47	12.65	3.5857
62.3549	0.3444	1.48919	59.35	10.36	4.3065
65.5415	0.3936	1.42429	23.87	4.17	1.1834
66.9406	0.4920	1.39788	35.01	6.11	5.8988
68.7859	0.5904	1.36481	6.72	1.17	1.1775
71.5177	0.3444	1.31925	49.86	8.70	3.5663
72.9923	0.2952	1.29620	20.57	3.59	1.2402
74.3098	0.4428	1.27645	92.30	16.11	7.9059
77.0950	0.3936	1.23713	14.82	2.59	0.8871
78.7135	0.3600	1.21470	41.99	7.33	1.8031

Practical Size Analysis of HB

X_{10}	6.16 μm
X_{16}	8.66 μm
X_{50}	25.20 μm
X_{84}	67.08 μm
X_{90}	84.02 μm
X_{99}	154.52 μm
SMD	13.51 μm
S_v	0.44 m^2/cm^3
VMD	36.69 μm
S_m	1638.89 cm^2/g

Conclusion: The three experimental group prepared and compared on phytochemical basis as well as another sophisticated parameters like heavy metal analysis, Particle size analysis, Microbial overload, SEM, XRD etc shows the SMP of haratala Bhasma on above evidence base. Organoleptic parameters of *Haratala Bhasma* show positive result on classical basis. Microbial overload of prepared sample shows absent of particular hazards of microbes in the sample. On the basis of all evidence clinically used in gout patient shows the significant result.

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