



Prasad Anjali Baijnath¹, Agrawal Sachin², Rothe Sheetal³, Rao K.Shankar⁴

¹M.D. (Ayu.) Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur.

²Lect. Rasashastra and Bhaishajya Kalpana, Shekhawati Ayurveda College, Pilani.

³M.D. (Ayu.) Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur.

⁴H.O.D. Dept.of Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur.

ABSTRACT

Bhringarajasava is one of the most efficient formulation used in *Saptadhatukshaya*, recommended as *Balavridhikar yoga* in *Rajayakshma*. *Bhringarajasava* has been documented for the first time in *Gadanigraha* by *Acharya Shodhala*, Then later in *Bharat Bhaishajya Ratanakara*. *Bhringarajasava* attracted most of the *Acharayas* as well as consumers because of its efficacy. The pharmaceutical procedure of *Bhringarajasava* was somewhat different than the other *Asava*. Thus a critical study of its pharmaceutical procedure and its analytical study was under taken to standardize the formulation. The parameters included are: Organoleptic parameters, Physical parameters like Weight per millilitre, Specific gravity, Determination of pH values, Determination of total solids, Determination of acid value, Determination of alcohol content, Estimation of sugars [Reducing sugars, Non-reducing sugars].

Keywords: *Bhringarajasava*, *Saptadhatukshaya*, *Balavridhikar*, *Rajayakshma*.

INTRODUCTION: *Ayurveda* the most primitive life science deals with every aspect of maintaining good health, be it preventive or curative as well¹. Curative aspect covers clinical treatment and pharmaceuticals. *Bhaishajya Kalpana* i.e. *Ayurvedic Pharmaceutics* is the art and science of preparing and dispensing medicaments. The Rationality of all formulations is laid with the fundamental principles of *Bhaishajya Kalpana*. *Sanskara* provides opportunity to design a new compound with improved palatability, therapeutics and superior nutrition.

Sandhan Kalpana (Asava/ Arishtha) one of the *Ayurvedic upakalpana* proved itself very valuable because of its utmost efficacy, quick action, long shelf life, palatability, safety and low dose *Bhringarajasava*² is one of such formula-

tion which is used vividly to improve the immunity of the patients. To validate this formulation a thorough pharmaceutical and analytical study was done.

MATERIALS AND METHODS:

Aim and objective: To standardize *Bhringarajasava*.

Procurement and preparation of raw drugs: The raw drugs were obtained from N.I.A. Pharmacy, Jaipur (Rajasthan), after proper authentication by the subject experts it was subjected to size reduction. R.O. potable water was used in the preparation of *kwatha*.

Preparation of Bhringarajasava: In the present study three types of *Bhringarajasava* were prepared by using same amount of *Guda* mentioned, half the amount of *Guda* and mixing *prakshepa* in the starting of procedure.

Table No 1 showing Ingredients of Bhringarajasava in sample B₁

S.No.	Sanskrit Name	Scientific Name	Family	Part used	Quantity
1.	<i>Bhringaraja</i>	<i>Eclipta alba</i>	<i>Asteraceae</i>	Wh.pl.	12.250lts.
2.	<i>Haritaki</i>	<i>Terminalia chebula</i>	<i>Combretaceae</i>	Fr.	384gms.
3.	<i>Pippali</i>	<i>Piper longum</i>	<i>Piperaceae</i>	Fr	96gms.
4.	<i>Jatiphala</i>	<i>Myristica fragrance</i>	<i>Myristicaceae</i>	Fr	96gms.
5.	<i>Lavanga</i>	<i>Sygzium aromaticum</i>	<i>Myrtaceae</i>	Fl.	96gms.

6.	<i>Twak</i>	<i>Cinnamomum zeylanicum</i>	<i>Lauraceae</i>	Br.	96gms.
7.	<i>Ela</i>	<i>Elatteria cardamom</i>	<i>Zingiberaceae</i>	Sd.	96gms.
8.	<i>Tamalapatra</i>	<i>Cinnamomum tamala</i>	<i>Lauraceae</i>	Lf.	96gms.
9.	<i>Nagakesara</i>	<i>Messua ferrea</i>	<i>Guttiferae</i>	Fl	96gms.
10.	<i>Guda</i>	Cane jaggery (Old)		--	9.600 kgs.

Table No. 2 Showing the Drugs used in fumigation (Dhoopana Sanskara)^{3, 4, 5}

Sr.No	Drugs	Latin Name	Family	Quantity used
1	<i>Jatamansi</i>	<i>Nardostachys jatamamsi</i>	Valeranceae	25gm
2	<i>Haridra</i>	<i>Curcuma longa</i>	Zingiberaceae	25gm
3	<i>Vacha</i>	<i>Acorus calamus</i>	Acoraceae	25gm
4	<i>Chandana</i>	<i>Santalum album</i>	Santalaceae	25gm
5	<i>Guggulu</i>	<i>Commiphora mukul</i>	Burseraceae	25gm
6	<i>Vidanga</i>	<i>Embelica ribes</i>	Myrsinaceae	25gm
7	Camphor (synthetic)	--	--	25gm
8	<i>Goghrita</i>	--	--	100ml

In present study five samples were prepared by using three different methods.

- **Sample B₁:** Prepared by the reference of *Gada Nigraha*. But *prakshepa* added at initial stage and half part of *Guda* added at initial stage and at final stage.

- **Sample B₂, B₃ and B₄:** Prepared by the reference of *Gada Nigraha*. But *prakshepa* added after completion of fermentation and half part of *Guda* added at initial stage and at final stage.

- **Sample B_{1/2}:** Prepared by the reference of *Gada Nigraha*. *Prakshepa* added

after fermentation with half part of *Guda* added at initial stage.

- **Sample B₅:** *Bhringaraja swarasa* only.

Procedure: All the ingredients were examined for any foreign matter and were powdered (*Haritaki* – coarse and *prakshepa dravya* – fine). Fine powder was made using the mixer grinder and sieved through mesh number 85 and kept separately. *Swarasa* of *Bhringaraja* was prepared by *Swarasa-abhava* method illustrated by *Acharaya Sharangadhara* by adding 8 times of water in raw drug and reduced to 1/4th of its volume⁶.

Table No. 3 showing details of *Swarasa* preparation with *Agni Sanskara* method illustrated by *Sharangadhar samhita*

Sr.No.	Material & method	Reference of <i>Sharangadhar</i>	Quantity used.
1	Material	1 part	25.370 kg
2	Water	8 part	203 lit
3	Reduced to	¼	50.6 lit
4	Type of <i>Agni</i>	<i>Mandagani</i>	<i>Mandagani</i>

The fermenting vessels (Food grade plastic vessel of 20 lt.) were properly washed with sodium carbonate solution (10 gm: 1 lt. water). After cleaning the containers were dried in drier to avoid contamination. The vessels were smeared with little amount of *Ghee* and then subjected to *Dhoopan* for 30 min with drugs like *Jatamansi* (*Nardostachys jatamansi*), *Haridra* (*Curcuma longa*), *Vacha* (*Acorus calamus*), *Chan-*

dana (*Santalum album*) and *Guggulu* (*Commiphora mukul*).

Swarasa was taken into clean and dry stainless steel vessel and the ½ part of the *Guda* was dissolved into it. Then *Haritaki* coarse powder and *Prakshepa* were added and mixed well, till it become homogenous. The mixture was poured into a 20 lit fumigated vessel with the help of funnel. Now the jar was covered with a tight lid (with tubes attached to it for

checking release of gases during fermentation process and the other side immersed in lime water a facilitating thermometer) to resist entry of any contaminants. The container was placed in a safe, dry, dark and hygienic place. *Kinwa* was added in to the vessel on third day to initiate fermentation. On 7th day lid was again removed to check proper initiation of fermentation. Lid was air sealed using plaster of paris. Vessels were placed in a clean, dry and shaded place. Artificial temperature regulation

was done using (100 W Bulb) inside the chamber.

After completion of fermentation process, the seal was removed. The supernatant fluid was filtered through a double folded cotton cloth in to another vessel and remaining half of the *Guda* was added and stirred till it gets dissolved in it. Then the material was transferred to another 20 lit vessel for the purpose of maturation. The details of the 1st, 2nd, and 3rd methods are shown in Table No. 4.

Table No.4 Observations after adding Prakshepa and Guda in all samples.

Sr. No	Observation		B1	B2	B3	B4	B1/2	
1	Addition of <i>prakshepa</i> after fermentation	1 st day	Not added	Added	Added	Added	Added	
		Observations	1 st day	-----	Floating	Floating	Floating	Floating
		15 th day	-----	Partially sink	Partially sink	Partially sink	Sink to bottom	
		1month later	-----	Sink to bottom	Sink to bottom	Sink to bottom	-----	
2	Addition of <i>Guda</i>	1 st day	Added	Added	Added	Added	Not added	
			15 th day	Dissolved partially	Completely dissolved	completely dissolved	completely dissolved	-----
			1month later	Completely dissolved	-----	-----	-----	-----

Before the onset of fermentation the colour of mixture was brown and taste was sweet and astringent. At onset of fermentation mild froath was started on day 3rd and Strong effervescence with hissing sound on 7th day.

After completion of fermentation on the 45th day, the mixture was clear, transparent and additives i.e. *prakshepa* and *Haritaki* powder were in sunken condition. After completion of fermentation process, it was gradually and gently filtered through a clean and dry cotton cloth. The finished product on filtration appeared with clear, sweet sour taste.

The filtrate obtained kept undisturbed for 15 days more. After 15 days it was again decanted and filtered. *Bhringarajasava* was filled in container (900ml

Food grade jar) and sealed. These vessels were kept in dark place.

Precautions: Utensils were well sterilized by washing and heating. Proper sanitation was maintained throughout the pharmaceutical procedure. Only three fourth 3/4 of the vessel was filled with mixture for the circulation of CO₂ gas liberated. The excess amount of sweetness in container leads to delay in fermentation process. Thus, half part *Guda* was added at beginning and half at end of the process. Filtration on maturation was useful to get more clear and transparent product and as well as to prevent further fermentation.

OBSERVATIONS AND RESULTS

Six samples (five prepared and B_s-*Bhringaraja swarasa*) were subjected to critical analytical study. The parameters included are Organoleptic parameters,

Physical parameters like Weight per millilitre⁷, Specific gravity⁸, Determination of pH values⁹, Determination of total solids¹⁰, Determination of acid value¹¹, Determination

of alcohol content¹², Estimation of sugars¹³ [Reducing sugars, Non-reducing sugars].

Table No. 5 showing organoleptic properties of Bhringarajasava

Characteristics	B ₁	B ₂	B ₃	B ₄	B _{1/2}	B ₅
Rupa (Colour)	Light brown	Light brown	Light brown	Light brown	Light brown	Light brown
Rasa (Taste)	<i>Madhur Kashaya</i>	<i>Madhur Kashaya</i>	<i>Madhur Kashaya</i>	<i>Madhur Kashaya</i>	<i>Kashaya</i>	<i>Kashaya Tikta</i>
Gandha (Odour)	Alcoholic	Alcohol and <i>prakshepa dravya</i>	Alcohol and <i>prakshepa dravya</i>	Alcohol and <i>prakshepa dravya</i>	Alcohol and <i>prakshepa dravya</i>	Odor of <i>Bhringaraja</i> plant
Sparsha (Consistency)	Thin++	Thin++	Thin++	Thin ++	Thin +++	Thin +++

Table No. 6 showing values of analytical tests of Bhringarajasava

PARAMETERS	B ₁	B ₂	B ₂ '	B ₃	B ₃ '	B ₄	B ₄ '	B _{1/2}	B ₅
Weight(gm)/ml	1.0295	1.1352	1.0199	1.1285	1.1252	1.1257	1.1011	1.0290	1.0695
Sp. Gravity	1.0365	1.1372	1.0330	1.1339	1.1310	1.1315	1.1298	1.0450	1.1029
pH (5% dil.)	4.33	4.31	4.21	4.42	4.28	4.38	4.29	3.79	4.58
pH (10% dil.)	4.38	4.41	4.30	4.58	4.31	4.42	4.31	3.85	4.47
Final weight	24.91	24.46	19.16	24.54	19.76	24.19	18.99	15.31	5.15
Total solids	49.82	48.92	38.32	49.09	39.52	48.59	37.98	30.62	10.31
Acid value %	21.84	21.32	13.18	20.76	14.561	21.43	14.14	20.19	19.63
Sp. Gr (Distillate)	0.9939	0.9927	0.9924	0.9937	0.9921	0.9945	0.9937	0.9912	1.0008
Alcohol (%)	4-5	5	5-6	4-5	5-6	4	4-5	6-7	-----
Total Sugar (%)	51.49	52.68	30.62	53.08	31.03	52.79	30.91	28.78	5.04
Red. Sugar %	10.03	10.01	2.59	9.98	3.34	9.82	3.69	0.62	1.34
Non-Red.Sugar %	41.46	42.67	41.35	43.1	28.69	42.97	28.23	27.65	3.7

Samples B₂, B₃, B₄ are the samples before adding *prakshepa* and *Guda* and Sample B₅ is *Bhringaraja Swarasa*. pH of all samples were found between 4 to 5 except for sample B_{1/2} which was 3.85. Total solid of the all samples found below 50%, in sample B_{1/2} it was 30.62%. It was found that % acid value in all samples before adding *Prakshepa* was less. Alcohol % in all samples ranges from 5-6 except

sample B_{1/2} has higher % of alcohol in between 6 -7 %.

DISCUSSION: Wt/ml and the Specific gravity of the samples were found maximum after addition of *Prakshepa*. Sp. gravity (1.0365) & wt/ml (1.0295) of sample B₁ was found very less as compared to the other samples. pH of B_{1/2} was slight acidic where as pH of all samples ranges from 4-5 suggestive of alcoholic fermentation. Total solid was

less in sample B1/2, because only 1/2 *Guda* was added to it. Addition of *Prakshepa* increases the acidic value. % of reducing sugar was less than that of non-reducing sugar suggesting reducing sugar was consumed during fermentation process. Sample B1/2 shows reducing sugar also, this was due to addition of 1/2 *Guda*. *Prakshepa* addition has increased the acid value of the samples. % of alcohol was found well within the limit and is good for oral administration.

CONCLUSION: *Bhringarajasava* can be prepared by using *Bhringaraja Kwatha*. Analytical study shows that not a significant difference found between all lots of *Bhringarajasava* prepared by different method and textual method. Only minute difference in total solid, % alcohol, and total acid was observed. Addition of *Guda* in the end of fermentation results in increased amount of reducing sugar.

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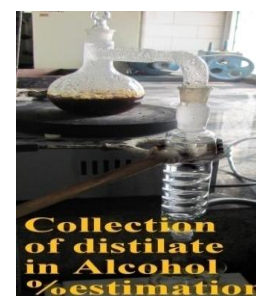
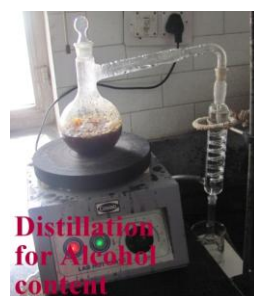
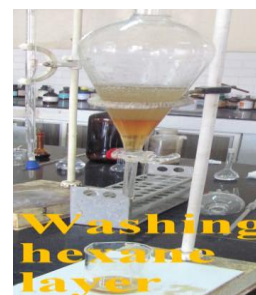
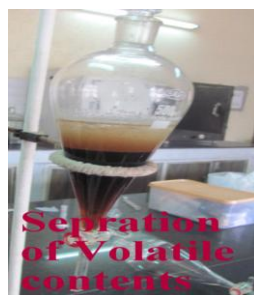
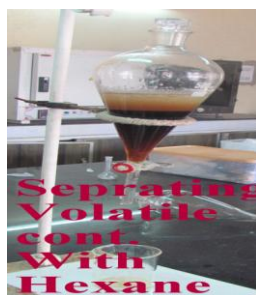
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Corresponding Author:

Prasad Anjali Baijnath

PG- Scholar, Dept. of . Rasashastra and Bhaishajya Kalpana, National Institute of Ayurveda, Jaipur, India.

ANALYTICAL STUDY PHOTOGRAPHS



TLC MAPING

