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Key Insights into Bhavana Samskara in Ayurvedic Pharmacology

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ABSTRACT: *Samskara* is an important concept led by ancient Ayurveda scholars. *Bhavana* is one among the *Samskara* by which transformation of the inherent attributes (*Gunataradhanam*) of a substance occur and leads to the addition of new properties (*Gunotkarsha*) or change in the properties (*Gunavruddhi, Gunahani*). Soaking and levigation are the main principle of the *Bhavana*. Different *Bhavana Dravya* can be select on the basis of various pharmaceutical and therapeutical requirements of herbal, toxic, metallic, Herbo-metallic formulations. Amount of liquid should be added till powder become *Kardmabha*, *Samplavana*, *Ardra* and *Ekibhoota*. Total 118 herbal formulations and 97 *Rasayoga* are mentioned with various number and duration of *Bhavana*. Bhavana should be given till *Subhavita Lakshana* observed. Dissertation work and research article are mentioned that proves classical concept of *Bhavana* with modern analytical tools and clinical study. Number and duration of *Bhavana* have the kin role for the changes in physical and chemical form, inherent properties and potency of *Dravya.*

KEYWORDS: Samskara, Principle, *Bhavana Dravya*, Amount, Number, Duration, *Subhavita Lakshana*.

INTRODUCTION

There is nothing in the universe, which cannot be used as medicine, but is necessary to employ proper *Yukti* (intelligence) according to the need of the situation. Naturally available drugs need to be transformed into a definite form to render them fit to be used as medicine. This act of transformation of a crude drug into a suitable form is achieved through diverse processes called *Samskara*. *Samskara* is the fundamental concept of transforming the inherent attributes (*Gunataradhanam*) of a drug. Acharya Charaka stated 10 different pharmaceutical principles i.e. *Toya - Agni Sannikarsha* (water and heat treatment), *Shaucha* (purification), *Manthana* (*Churning*), *Desha* (regional effect), *Kala* (Seasonal effect), *Vasana* (impregnation of flavoring substances) and *Bhajana* (vessels) that enhances inherent characteristic to enhance safety, efficacy and suitability for therapeutic use.[1]

Bhavana is also considered as *Samskara* and widely used pharmaceutical technique since *Samhita* period. In this process, a drug is levigated with the liquid media of the same drug or other drugs to eradicate the toxicity or enhance the therapeutic properties and make them safe and appropriate for internal administration.

DEFINITION

द्रव्याणां द्रव्येण आलोडनात् दिवा दिवातपे शोषणं निशि निशि स्थापनं इति एव विधानं भावना।

(Gangadhara commentary, Cha. Vi. 1/22)

Acharya Gangadhara explains *Bhavana* as *Alodana* (mixing of *Dravya*) with liquids and its exposure to sunlight or moonlight until the complete dryness of the material.

दिवा दिवाऽऽतपे शुष्कं रात्रौ रात्रौ निवासयेत्। शुष्कं चूर्णीकृतं द्रव्यं सप्ताहं भावनाविधिः॥ (B.R. 4/61)

The dried powder is soaked into the liquid and then kept for drying in sunlight and at night. This process is repeated for six days.

यच्चूर्णितस्य धात्वादे द्रवैः संपेष्य शोषणम्। भावनं तन्मतं विज्ञै भावना च निगद्यते॥ (R.T. 2/49)

Triturating or grinding the powder of metal, etc., substances after adding liquid substances like water, decoction, fresh juice, etc., until the liquid portion gets dried is known as *Bhavana*.

OBJECTIVES OF *BHAVANA*

1. The therapeutic properties of the liquid media are conferred to the material. For instance, In *Amalaki Rasayana - Bhavana* of *Amalaki Svarasa,* In *Tribhuvankirti Rasa - Tulasi, Ardraka* and *Dhatura Svarasa that* provides a synergistic action to the drug enhancing therapeutic potential.
2. The objective is to ensure that minute particles of the drug come into contact with the liquid media.
3. The transformation of the drug material into an appropriate form is necessary to create an intermediate product essential for further processing. E.g. Preparation of *Bhasma, Kupipakva Rasayana, Parpati Rasayana, Pottali Rasayana.*
4. Continuation levigation lead to reduce the particle size. i.e. *Pishti Kalpana*

PRINCIPLE OF *BHAVANA*

Depending upon different references available in texts, the *Bhavana* process can be carried out by adopting these two principles.

Soaking[2]

The dried powder is soaked in the liquid media and then left to dry in the sunlight and moonlight for a specific period. E.g., in *Pippali Rasayana*, *Pippali* fruits were soaked in *Palasha Ksharodaka* and kept in the sunlight for complete drying.[3] This process is to be repeated seven times. When the specific time period is not mentioned, then soaking is to be done for 7 days. E.g. In *Bhallatakadi Mantha - Bhavana* of *Gomutra* and *Salasharadi Gana Kvatha* is given for seven days.[4]

Lavigation[5]

The powdered drug is ground with liquid media till the prescribed material becomes like dough or completely dry. The material is mixed with particular liquid media and ground continuously for a specific period. E.g. In *Arogyvardhini Rasa,* the ingredients are levigated with *Nimba Patra Svarasa* for 2 days.[6]

SELECTION OF *BHAVANA DRAVYA*

Bhavana Dravya stands out as a requisite factor in incorporating properties to the material. In addition to the mechanical process like grinding, *Bhavana* offers a multifaceted impact on the drug, an effect attains through liquids like *Svarasa*, *Kvatha*, *Kanji, Mastu, Dugdha*, *Mutra* and the others. The following factors should be considered when selecting the specific *Bhavana Dravya*

1. *Tulyaviryata* (Synergistic property)

भूयश्चैषां बलाधानं कार्यं स्वरसभावनैः। सुभावितं ह्यल्पमपि द्रव्यं स्याद्बहुकर्मकृत्॥

स्वरसैस्तुल्यवीर्यैर्वा तस्माद्द्रव्याणि भावयेत्। Cha.K.12/47-48

When the *Bhavana* given to the material using its own *Svarasa* amplifies its effectiveness and yields a greater therapeutic outcome with a reduced dose. The primary criterion for *Tulyaviryata* is the *Bhavana Dravya* having similar or synergistic properties (*Rasa, Guna, Virya, Vipaka*, and *Karma*) to the powdered drug.[7] Example: In *Amalaki Rasayana*, 21 *Bhavana* of *Amalaki Svarasa* is given to *Amalaki*.

2. *Gunotkarsha* (Potentiation)

The liquid's inherent properties are incorporated into the powdered drug, increasing its potency and making it more efficacious. Example: In *Pippali Rasayana*, seven *Bhavana* of *Palasha Kshara* is given to *Pippali.*

3. *Shodhana* (Removal of Impurities or eradication of toxicity)

If the powdered drug consists of toxic or mineral substances such as *Haratala*, *Manahshila*, *Ahiphena* and *Snuhi,* particular *Bhavana Dravya Churnodaka*, *Ardraka Svarasa* and *Chinchapatra Rasa* respectively are selected to eradicate or reduce their toxic effects, as a part of *Shodhana* (purification).

4. *Samyaka Dravyasvarupa* (Suitable physical form)

The powder of herbal, mineral or metal are essential for levigation ensuring that a soft, smooth paste can be formed to facilitate continuous trituration. For the preparation of *Vati/Guggulu, Chaturvidha Rasayana* and *Bhasma*, the material should be in fine powder form so that the proper levigation should be carried out.

5. *Anukta/Visheshokta Bhavana Dravya*

In cases where *Bhavana Dravya* (levigated liquid media) is not indicated, a liquid in the form of *Svarasa, Kvatha, Arka, Dugdha, Gomutra* or others should be selected that possesses properties similar to the drug and exerts the desired therapeutic effect. Specific *Bhavana Dravya* is explicitly stated in the Ayurvedic classics for the preparation of *Bhasma*, formulations or other processes. E.g. In *Sanjivani Vati, Gomutra*, in *Chitrakadi Vati*, *Matulunga* or *Dadima Svarasa*, for *Abhraka Bhasma* preparation*, Kasamarda Svarasa.*

QUANTITY OF *BHAVANA DRAVYA*

- ***Samplavana* (immersion)[8]**

द्रवेण यावता द्रव्यं चूर्णितं त्वार्द्रतां व्रजेत। तावानेव द्रवो देयो भिषग्भिर्भावनाविधौ॥ (R.T. 2/50)

Bhavana means adding liquid into the powdered material until it becomes completely wet and triturated till the complete drying of the material. The volume of liquid media should be as much that the material can get completely immersed.[9] Ex. *Vatsanabha Shodhana*, *Nimajjana* in *Gomutra*.

- ***Kardmabha* (mud like consistency)[10]**

Liquid media should be added to material in such quantity that the powdered material attains mud like consistency.

- ***Ardrata* (wetting), *Ekibhuta* (homogeneous mixture)[11]**

द्रवेण यावता द्रव्यमेकी भूयार्द्रतां व्रजेत्। द्रवप्रमाणं निर्दिष्टं भिषग्भिर्भावनाविधौ॥ (B.R. 4/62)

The volume should be taken as much as that the powdered drugs become completely wet. [12,13] Ex. In *Hingula Shodhana*, *Ardraka Svarasa Bhavana* is given.

- **Preparation of decoction for *Bhavana*-** The drug mentioned for *Bhavana* should be taken equal to the

quantity of the *Bhavya Dravya*, added 8 times of water and reduced to 1/8th and it should be filtered through a clean cloth.[14,15] In *Shilajatu Rasayana,* the drug indicated for *Bhavana* is taken equal to the quantity of the *Shilajatu,* added 4 times of water, reduced up to 1/4th and filtered through a cloth.[16] But for preparing *Triphala Kvatha* for *Loha Shodhana*, *Triphala Yavakuta* is taken 4 times to *Loha* and added 4 times water to that of *Triphala*.[17]

NUMBER AND DURATION OF *BHAVANA*

To prepare different formulations *Bhavana* is given in different numbers and duration are available in classical texts which are mentioned in table no. 1

Table No. 1: Number and duration of *Bhavana* in different formulations

Sr. No.	Name of formulation	Name of *Bhavana Dravya*	No. of *Bhavana*	Reference
Charaka Samhita				
1.	*Dvitiya Brahma Rasayana*	*Amalaki Svarasa*	One	Chi. 1/1/58
2.	*Apara Haritakyadi Churna*	*Amalaki Svarasa*	One	Chi. 1/1/77
3.	*Pippalyadi Churna*	*Matulunga Svarasa*	One	Chi. 5/75-78
4.	*Bilvadi Gutika*	*Aja Mutra*	One	Chi. 10/46
5.	*Drashtiprada Varti*	*Aja Kshira*	One	Chi 26/254-255
6.	*Arkadi Varti*	*Arka Kshira*	One	Chi 30/71
7.	*Ikshvaku Kalpa*	*Aja Kshira*	One	K. 3/9
8.	*Dhamargava Kalpa*	*Damargava Phala Kvatha*	One	K. 4/10
9.	*Snuhi Kalpa*	*Snuhi Kshira*	One	K. 10/19
10.	*Danti Dravanti Kalpa*	*Danti Kvatha*	One	K. 12/16
11.	*Lodhra Kalpa*	*Dashamula Kvatha*	Two	K. 9/4-5
12.	*Shatyadi Churna*	*Madhusukta*	Two	Chi. 5/88
13.	*Nishotha Kalpa*	*Nishotha Kvatha*	Six	K. 9/14
14.	*Udumbaradi Taila*	*Udumbara Kshira*	Six	Chi. 30/71
15.	*Shatyadi Churna*	*Matulunga Svarasa*	Five	Chi. 5/88
16.	*Pippali Rasayana*	*Palasha Ksharodaka*	Seven	Chi. 1/3/33
17.	*Shilajatu Rasayana*	*Vataghna, Pittaghna, Kaphaghna Dravya Kvatha*	Seven	Chi. 1/3/51
18.	*Udararoga Nashaka Yavagu*	*Gomutra*	Seven	Chi. 13/165
19.	*Gandhahasti Nama Agada*	*Gopitta* on 1st, 3rd, 5th, 7th day *Ashvapitta* on 2nd, 4th, 6th day	Seven	Chi. 23/71-76
20.	*Shirishapushpa Kalpa*	*Shirisha Pushpa Svarasa*	Seven	Chi. 23/193
21.	*Trivrutadi Churna*	*Amalaki Svarasa*	Seven	K. 7/925
22.	*Chitrakadi Lepa*	*Palasha Ksharodaka*	Eight	Chi. 7/85-68
23.	*Ashvakrida Churna*	*Vidanga Kvatha, Triphala Kvatha*	Eight or ten	Vi. 7/22

Sr. No.	Name of formulation	Name of *Bhavana Dravya*	No. of *Bhavana*	Reference
24.	*Shilajatu Vataka*	*Indrayavadi Kvatha*	Ten, twenty, thirty	Chi. 16/87-92
25.	*Lodhra Kampillaka Kalpa*	*Kampillaka Kvatha*	Ten	K. 9/10
26.	*Krimihara Basti*	*Vidanga Kvatha*	Twenty-one	Vi. 7/25
27.	*Amalaki Churna*	*Amalaki Svarasa*	Twenty-one	Chi. 1/2/8
28.	*Madana Phala Kalpa*	*Madanaphaldi Kvatha*	Twenty-one	K. 1/19
29.	*Danti Dravanti Kalpa*	*Gomutra*	Seven days	K. 12/23-26
30.	*Churna Anjana*	*Aja Mutra*	Three days	Chi. 26/249
31.	*Trivrita Kalpa*	*Gomutra*	Three days	K. 7/60
32.	*Loha Bhasma*	*Gomutra*	Seven days	Chi. 16/69
33.	*Snuhi Kalpa*	*Snuhi Kshira*	Seven days	K. 10/12-13
34.	*Vatsaka Kalpa*	*Arka Kshira*	Eight days	K. 5/9
35.	*Unmada Varti*	*Gopitta*	One month	Chi. 9/322
Sushruta Samhita				
1.	*Utkarika Yoga*	*Snuhi Kshira*	One	Chi. 14/10
2.	*Vidarikanda Churna*	*Vidarikanda Svarasa*	One	Chi. 26/23
3.	*Amalaki Leha*	*Amalaki Svarasa*	One	Chi. 26/24
4.	*Kumkumadi Agada*	*Jala*	One	K. 8/49
5.	*Manduradi Churna*	*Gomutra*	One	Ut. 44/23
6.	*Murvadi Leha*	*Gomutra*	One	Ut. 44/25
7.	*Mustadi Dhumapana*	*Aja Mutra*	One	Ut. 52/23
8.	*Krimighna Taila*	*Vidanga Kvatha*	One	Ut. 54/29
9.	*Ashva Shakruda Churna*	*Vidanga Kvatha*	One	Ut. 54/35
10.	*Shirishadi Varti*	*Aja Mutra*	One	Ut. 60/43
11.	*Brahmayadi Varti*	*Gaja Mutra*	One	Ut. 62/31-33
12.	*Gandha Taila*	*Godugdha, Yashtimadhu Kvatha*	Seven	Chi. 3/56
13.	*Bastada Yoga*	*Bastada Siddha Kshira*	Seven	Chi. 26/18
14.	*Shashkuli Yoga*	*Bastada Siddha Kshira*	Seven	Chi. 26/19
15.	*Shvavidha Churna*	*Vidanga Kvatha, Triphala Kvatha*	Seven	Ut. 54/30
16.	*Pippali Churna*	*Snuhi Kshira*	Twenty-one	Chi. 14/10
17.	*Bhallatakadi Mantha*	*Gomutra, Salasaradi Gana Kvatha*	Seven days	Chi. 10/4
18.	*Ksharanjana*	*Godugdha*	Seven days (soaking)	Ut. 11/11-12
19.	*Salasaradi Gana Churnakriya*	*Aragvadhadi Kvatha*	Multiple	Chi. 10/10
20.	*Pruthvikadi Churna*	*Matulunga Svarasa*	Multiple	Ut. 42/98
21.	*Putikitadi Churna*	*Aja Mutra* or *Avi Mutra*	Multiple	Ut. 50/24
Ashtanga Hridaya				
1.	*Lavanapanchadi Gulika*	*Dadimambu*	One	Chi. 10/15

Sr. No.	Name of formulation	Name of *Bhavana Dravya*	No. of *Bhavana*	Reference
2.	*Kshara Gutika*	*Vartaka Rasa*	One	Chi.10/59
3.	*Utkarika Yoga*	*Snuhi Kshira*	One	Chi. 15/44
4.	*Swarnakshiryadi Churna*	*Gomutra*	One	Chi. 16/8
5.	*Mritika Prayoga*	*Vidanga Kvatha, Chitrakamula Kvatha, Nimbapatra Svarasa, Patha Svarasa, Murva Svarasa*	One	Chi. 16/38
6.	*Goshringadi Dhupa*	*Aja Mutra*	One	U. 3/57
7.	*Naktamaladi Agada*	*Aja Mutra*	One	U. 5/43
8.	*Unmadsudani Varti*	*Gaja Mutra*	One	U. 6/40
9.	*Anjana Varti*	*Aja Kshira*	One	U. 11/50
10.	*Vimala Varti*	*Jala*	One	U. 13/70
11.	*Shashadantadi Varti*	*Stanya, Aja Kshira*	One	U. 13/72
12.	*Varti Anjana*	*Aja Mutra*	One	U. 13/74
13.	*Pillnashaka Anjana*	*Aja Mutra*	One	U. 16/53
14.	*Pippali Rasayana*	*Palasha Ksharodaka*	One	U. 39/97
15.	*Til Prayoga- Vajikarana*	*Bastanda Siddha Kshira*	One	U. 40/25
16.	*Tilwaka Kalpa*	*Dashamula Kvatha*	Two	K.2/39
17.	*Nimi Anjana*	*Triphala Svarasa*	Three	U. 11/26
18.	*Lakshadi Masi*	*Karpasa Pushpa Svarasa*	Seven	U. 16/57
19.	*Gokshuraka Rasayana*	*Gokshura Svarasa*	Seven	U. 39/56
20.	*Shilajatu Rasayana*	*Vata-Pitta-Kapha ghna Dravya Kvatha*	Seven	U. 39/135
21.	*Ashwa Shakrita Prayoga*	*Vidanga Kvatha*	Hundred	Chi. 20/27
22.	*Yava Churna*	*Triphala Kvatha*	One night (soaking)	Chi.12/15
23.	*Trivrutadi Churna*	*Gomutra*	Three days	K. 2/28
24.	*Loha Bhasma Prayoga*	*Gomutra*	Seven days	Chi.16/9
25.	*Indrayava Churna*	*Arka Kshira*	Seven days	K.1/46
26.	*Trivritadi Churna*	*Snuhi Kshira*	Seven days	K. 2/48
27.	*Pushpa Kasisa Anjana*	*Tulasi Svarasa*	Ten days	U. 9/20
28.	*Shilajatu Vataka*	*Indrayavadi Kvatha*	10/20/30 days	Chi.16/24
29.	*Shilajatu Prayoga* (*Prameha*)	*Vijayasara Kvatha, Khadirasara Kvatha*	Multiple	Chi. 12/35
30.	*Gulma Nashaka Churna*	*Nimbu Svarasa*	Multiple	Chi.14/30
31.	*Vidarikanda Churna*	*Vidarikanda Svarasa*	Multiple	U.40/26
Bhaishajya Ratnavali				
1.	*Mahamrityunjaya Rasa*	*Aja Mutra*	One	B.R. 5/514
2.	*Kayasthadi Varti*	*Aja Mutra*	One	B.R. 5/538
3.	*Paniya Vatika*	*Snuhi Kshira, Arka*	One	B.R. 5/675

Sr. No.	Name of formulation	Name of *Bhavana Dravya*	No. of *Bhavana*	Reference
		Kshira, Vatadugha, Changeri Svarasa		
4.	*Jatiphaladi Vati*	*Tambula Svarasa*	One	B.R. 7/128
5.	*Bhuvaneshvara Vati*	*Jala*	One	B.R. 7/148
6.	*Shilagandhaka Vati*	*Madhu*	One	B.R. 7/250
7.	*Purnalavatika Vati*	*Mastu, Jala*	One	B.R. 8/509-513
8.	*Shambukadi Vati*	*Madhu*	One	B.R. 8/514
9.	*Panchanana Vati*	*Goghrita*	One	B.R. 12/88
10.	*Siddharthaka Agada*	*Aja Mutra*	One	B.R. 24/18
11.	*Trivritadi Vati*	*Snuhikshira*	One	B.R. 31/33
12.	*Panchalavana Churna*	*Goghrita, Gomutra*	One	B.R. 31/35
13.	*Dugdha Vati*	*Go Kshira*	One	B.R. 42/74
14.	*Sarivadi Vati*	*Bhringaraja Svarasa, Arjuna Kvatha, Yava Ksharodaka, Kakamachi Svarasa, Gunjamula Kvatha*	One	B.R. 62/70
15.	*Rasanjanadi Varti*	*Gomaya Rasa*	One	B.R. 64/125
16.	*Kamini Modaka*	*Dhattura Bija Taila*	One	B.R. 74/68
17.	*Brahmi Vati*	*Brahmi Hima*	Three	B.R. 5/949
18.	*Tikshnadi Vati*	*Laksharasa*	Seven	B.R. 62/66
19.	*Shilajatu*	*Shalasaradi Dravya Kvatha*	Seven	B.R. 37/55
20.	*Takravati*	*Krashnajeeraka Kvatha*	Seven	B.R. 42/84
21.	*Bhukushmandadi Yoga*	*Shalmali Svarasa*	Seven	B.R. 74/57
		Mahisha Kshira	One	
22.	*Kalingadi Gutika*	*Tandulodaka*	One day	B.R. 6/42
23.	*Saindhvadi Varti*	*Sura Manda*	One day	B.R. 64/169
24.	*Jaya Vati*	*Aja Mutra*	Three days	B.R. 5/536
25.	*Nagarjuna Varti*	*Nabho Ambu*	Three days	B.R. 64/172
Ayurvedic Formulary of India				
1.	*Shulavajrini Vatika*	*Aja Kshira*	One	AFI part 1, p.543
2.	*Chandrodaya Varti*	*Aja Kshira*	One	AFI part 1, p.554
3.	*Sanjivani Vati*	*Gomutra*	One	AFI part 1, p.550
4.	*Sarshapadi Pralepa*	*Amla Takra*	One	AFI part 1, p. 492
Siddha Yoga Samgraha				
1.	*Mritsanjivani Gutika*	*Stanya*	One	S.Y. p. 252
2.	*Manasamitra Vataka*	*Stanya*	One	S.Y. p. 254

ROLE OF *BHAVANA* IN *RASOUSHADHI*

In *Rasashastra* the process of *Bhavana* used in many pharmaceutical procedures like *Shodhana, Marana, Amritikarana, Satvapatana, Lohitikarana* and *Nirutthikarana*. Its role and significance vary

according to the context of its use. The different perspectives of *Bhavana* are shown in Table No.2

Table No. .2: *Bhavana* used in different pharmaceutical procedures in the preparation of *Rasaushadhi*

In *Shodhana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Tuttha*	*Raktavarga*	R.R.S. 2/29
2.	*Chapala*	*Jambiri Nimbu Svarasa, Bhringaraja Svarasa*	R.R.S. 2/147
3.	*Gairika*	*Godugdha*	R.R.S. 4/49, R.P.Su. 6/71
4.	*Kasisa*	*Jambiri Nimbu Svarasa, Bhringaraja Svarasa*	R.P.Su. 6/65
5.	*Manahshila*	*Agatsyapatra Svarasa, Ardraka Svarasa*	R.R.S. 3/93, R.P.Su. 6/19
6.	*Anjana*	*Bhringaraja Svarasa*	R.R.S. 3/105
7.	*Kankushtha*	*Shunthi Svarasa, Shringavera Svarasa*	R.R.S. 3/114, R.Chu. 11/74
8.	*Hingula*	*Nimbu Svarasa, Lakucha Svarasa* *Ardraka Svarasa*	R.Chu. 11/110, R.T.
9.	*Abhraka*	*Kasmarda Svarasa* *Musta Svarasa*	R.Chu. 10/26 R.Chu. 10/30
10.	*Vimala*	*Lakucha Svarasa*	R.Chu. 10/88
11.	*Suvarna*	*Panchamritika, Matulunga Svarasa*	R.S.S. 257
12.	*Tankana*	*Jambiri Nimbu Svarasa, Gomutra*	R.S.S. 250
13.	*Nilanjana*	*Nimbu Svarasa*	R.S.S. 234
14.	*Kanta Pashana*	*Amla Varga*	R.S.S. 203
15.	*Kharpara*	*Kanji*	R.S.S. 203
In *Marana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Abhraka*	*Eranda Patra Svarasa*	R.R.S. 2/26
		Arkakshira, Nyagrodhamula Kvatha, Kadalimula Svarasa	R.T. 10/39-42
2.	*Vaikranta*	*Nimbu Svarasa*	R.R.S. 2/64
3.	*Makshika*	*Nimbu Svarasa*	R.R.S. 2/84
4.	*Vimala*	*Lakucha Svarasa*	R.R.S. 2/100
5.	*Shilajita*	*Matulunga Svarasa*	R.R.S. 2/119
6.	*Kasisa*	*Nimbu Svarasa*	R. Mr. 3/159
		Kanji	R.T. 29/255-258
7.	*Haratala*	*Palasha Twak Kvatha* *Arka Kshira*	R.R.S. 3/74-75 R.R.S. 11/35-38
8.	*Shringa*	*Arka Kshira*	R.T. 12/106
9.	*Mandura*	*Triphala Kvatha*	R.T. 20/129-131
10.	*Naga*	*Kanji*	Sha. Ma. 11/39
		Vasa Patra Svarasa	R.T. 19/24-28
11.	*Vanga*	*Amla Drava*	A.P. 3/179
		Kumari or *Satavari Svarasa* or *Kshira*	R.Mr. 3/94

12.	*Yashada*	*Kumari Svarasa*	R.T. 19/114
13.	*Pravala*	*Kumari Svarasa, Satavari Svarasa, Godugdha, Jayanti Svarasa*	R.T. 23/134-435
14.	*Tuttha*	*Lakucha Svarasa*	R.Chu. 10/76
15.	*Suvarna*	*Bijapuraka Svarasa*	R.P.Su. 14
		Snuhi Kshira	R.P.Su. 16
		Matulunga Svarasa	R.Chu. 14/17
		Kanchanara Drava, Tulasi Svarasa	R. Mr. 3/17
16.	*Rajata*	*Lakucha Svarasa*	R.Chu. 14/34
17.	*Tamra*	*Surana Drava*	Sha. Ma. 11/33
		Lakucha Svarasa	R.Chu. 14/34
18.	*Vajra*	*Matkuna Shonita*	R.P.Su. 7/27
19.	*Lauha*	*Ghritakumari*	R.Sa. 276
20.	*Ratna*	*Lakucha Svarasa*	R.R.S. 4/63
21.	*Mukta*	*Gulabajala*	R.T. 23/71
22.	*Muktasukti*	*Kumari Svarasa*	A.P. 2/330
23.	*Rajavarta*	*Bhringaraja Svarasa*	R.P.Su. 57
In *Amritikarana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Abhraka Bhasma Amrutikarana*	*Triphala Kvatha*	Ra.Chi. 4/32
2.	*Tamra Amritikarana*	*Nimbu Svarasa*	R.T. 17/43-44
In *Satvapatana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Abhraka*	*Musali Svarasa*	R.R.S. 2/28
2.	*Shilajita*	*Amla Dravya*	R.R.S. 2/122
3.	*Tuttha*	*Nimbu Svarasa*	R.R.S. 1/134 R.Chu. 10/78
4.	*Sphatika*	*Gopitta*	R.R.S. 3/65
5.	*Haratala*	*Arka Kshira* *Gomutra*	R.R.S. 3/80 R.Chi. 109
6.	*Manahshila*	*Ghrita*	R.T. 11/127
7.	*Bhunaga*	*Bhringaraja Svarasa* (3 days), *Nimbu Svarasa* (3 days), *Nirgundi Svarasa* (3 days)	R.R.S. 5/220
In *Lohitikarana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Abhraka Bhasma*	*Svarasa* of *Gangeruki, Musta, Vatakshira, Vatamulajala, Haridra, Samanga*	R.T. 10/67
In *Druti*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1.	*Suvarna Druti*	*Devadaliphala Drava*	R.R.S. 5/21
2.	*Raupya Druti*	*Naramutra*	R.R.S. 5/43
In *Nirutthikarana*			
Sr. No.	**Name of *Dravya***	***Bhavana Dravya***	**Reference**
1	*Lauha*	*Kumari Svarasa*	R.T. 20/80-81

Bhavana of different plant-based, animal-based, and mineral-based materials is given in varying numbers and durations to prepare the different *Rasayoga* mentioned in the table.3.

Table No.3: Number and duration of *Bhavana* in Rasa Shastra classics

Sr. No.	Name of formulation	Name of *Bhavana Dravya*	No. of *Bhavana*	Reference
1.	*Raktavarna Hemagarbha Rasa*	*Arka Kshira*	One	Y.R. Rajayakshma chi. /1-5
2.	*Brahmarandhra Rasa*	*Mahisha Pitta*	One	B.R. 5/618
3.	*Rasarajendra Rasa*	*Matsya, Varah, Mayura, Aja Pitta*	One	B.R. 5/678
4.	*Svedashaityari Rasa*	*Mayura Pitta*	One	B.R. 5/744
5.	*Tralokyachintamani Rasa*	*Sarpa Visha*	One	B.R. 5/770
6.	*Vadavanala Rasa*	*Arkakshira*	One	B.R. 5/778
7.	*Karpura Rasa*	*Jala*	One	B.R. 7/162
8.	*Piyushavalli Rasa*	*Bhringaraja Svarasa, Aja Kshira*	One	B.R. 8/334
9.	*Kravyada Rasa*	*Jambiri Svarasa, Amlavetasa Kvatha, Panchakola Phanta, Chanaka Ksharodaka*	One	B.R. 10/218
10.	*Krimikalanala Rasa*	*Aja Kshira*	One	B.R. 11/19
11.	*Navaratna Rajamruganka Rasa*	*Kasturi Jala*	One	B.R. 26/209
12.	*Ichchhabhedi Rasa*	*Arka Patra Svarasa*	One	B.R. 31/46
13.	*Hridyarnava Rasa*	*Triphala Kvatha*	One	B.R. 33/38
14.	*Mehakalanala Rasa*	*Madhu*	One	B.R. 37/59
15.	*Panchanana Rasa*	*Madhu*	One	B.R. 37/60
16.	*Vasantkusumakara Rasa*	*Go Kshira, Ikshurasa, Vasa Svarasa, Laksharasa, Udichya Kvatha, Kadalikanda Svarasa, Shatpatra Rasa, Malati Pushpa Svarasa*	One	B.R. 37/115
17.	*Varishoshana Rasa*	*Rohita Matsya Pitta*	One	B.R. 40/103
18.	*Ardhanaarishvara Rasa*	*Stanya*	One	B.R. 65/49
19.	*Ratnaprabha Vatika*	*Karpura Jala*	One	B.R. 66/61
20.	*Garbhachintamani Rasa*	*Jala*	One	B.R. 68/83
21.	*Makaradhwaja*	*Rakta Karpasa Kusuma Svarasa*	One	B.R. 74/237-246
22.	*Svarna Sindura*	*Vatapraroha Svarasa*	One	B.R. 74/247-249
23.	*Kamini Vidravana Rasa*	*Aphima Jala*	One	B.R. 75/23
24.	*Vasantamalati Rasa*	*Navaneeta*	One	R. Pa. p.167

25.	*Rasakarpura Gutika*	*Nimbu Rasa*	One	R.T. 6/85
26.	*Rasa Sindura*	*Vatankura Svarasa*	One	R.T. 6/162
27.	*Shankha Vati*	*Jala*	One	R.T. 12/16
28.	*Tutthodaya Vati*	*Jala*	One	R.T. 21/86
29.	*Ananda Bhairava Rasa*	*Jala*	One	R.T. 24/94
30.	*Ananda Bhairava Rasa*	*Jambiri Svarasa*	One	AFI part 1, p.663
31.	*Trunkantamani Pisti*	*Gulaba Arka*	One	AFI part 1, p.584
32.	*Pravala Pishti*	*Gulaba Arka*	One	AFI part 1, p.584
33.	*Manikya Pishti*	*Gulaba Arka*	One	AFI part 1, p.585
34.	*Mukta Pishti*	*Gulaba Arka*	One	AFI part 1, p.586
35.	*Akika Pishti*	*Kumari, Ketaki, Jalapippali, Kadali Svarasa*	One	AFI part 2, p.153
36.	*Vimala Varti*	*Himambu*	One	AFI part 1, p.559
37.	*Vasantakusumakara Rasa*	*Godugdha, Ikshurasa, Vasa Svarasa, Laksharasa, Udichya Svarasa, Kadalikanda Svarasa, Shatapatra Svarasa, Malati Svarasa, Kasturi*	One	AFI part 1, p.718
38.	*Rasadi Gutika*	*Kapi Pitta*	One	S.Y. p. 232
39.	*Suchimukha Rasa*	*Sarpa Pitta*	One	S.Y. p. 236
40.	*Kaphaketu Rasa*	*Ardraka Svarasa*	Three	B.R. 5/843
41.	*Pranavallabha Rasa*	*Aja Kshira*	Three	B.R. 12/82
42.	*Talakeshvara Rasa*	*Kusmanda Svarasa, Kanji, Amlamastu, Churnodaka, Punarnavamula Svarasa*	Three	B.R. 54/99
43.	*Indu Vati*	*Kakamachi Svarasa, Shatavari Svarasa*	Four	B.R. 62/76
44.	*Ardhanarinateshvara Rasa*	*Triphala Kvatha*	Five	R.S.S. 2/211
45.	*Gandhaka Shodhana*	*Bhringaraja Svarasa*	Seven	A.P. 2/30
46.	*Hingula Shodhana*	*Ardraka Svarasa*	Seven	B.R. 3/133
47.	*Kravyada Rasa*	*Panchakola Phanta*	Seven	B.R. 10/217
48.	*Nagarjunabhra Rasa*	*Arjuna Twak Kvatha*	Seven	B.R. 16/65
49.	*Vrishabhadhwaja Rasa*	*Vidari Svarasa, Ikshu Svarasa*	Seven	B.R. 19/25
50.	*Vata Vidhvansana Rasa*	*Eranda Taila*	Seven	B.R. 26/179
51.	*Dhatri Loha*	*Guduchi Svarasa*	Seven	B.R. 30/144
52.	*Kalyana Sundara Rasa*	*Hastishundi Svarasa*	Seven	B.R. 33/56
53.	*Ratnakara Rasa*	*Arjuna Tvak Svarasa, Godhuma, Yava Kvatha*	Seven	B.R. 33/59
54.	*Nagarjunabhra Rasa*	*Arjun Twak Kvatha*	Seven	B.R. 37/81
55.	*Mahavahni Rasa*	*Jayanti Svarasa, Snuhi Kshira, Bhringaraja Svarasa,*	Seven	B.R. 40/79

		Chitrakamula Kvatha, Eranda Taila		
56.	*Jaharamohara*	*Gulaba Jala*	Seven	AFI part 2, p.154
57.	*Taladi Ksharanjana*	*Ksharodaka*	Eight	B.R. 64/84
58.	*Trailokyachintamani Rasa*	*Palashamula Kvatha*	Seven	B.R. 5/770[12]
		Chitraka,ula Kvatha, Ardraka Svarasa, Pacha Pitta, Dundubha Sarpa Visha	Ten	
59.	*Bhaskaramritabharaka*	*Shatavari Svarasa*	Twelve	B.R. 56/37
60.	*Sudhanidhi Rasa*	*Gomutra, Bhringaraja Svarasa, Punarnavamula Kvatha, Nirgundipatra Svarasa, Mandukaparni Svarasa*	Fourteen	B.R. 42/105
61.	*Shitapittabhanjana Rasa*	*Bhringaraja Svarasa, Sharpunkha Svarasa*	Fourteen	B.R. 55/30
62.	*Talkeshwara Rasa*	*Kushmanda Svarasa, Kanji*	Eighteen	B.R. 54/101
63.	*Meghanada Rasa*	*Chitrakamula Kvatha*	Twenty	B.R. 37/137
64.	*Ashvakanchuki Rasa*	*Bhringaraja Svarasa*	Twenty-one	S.Y.S., *Jvaradhikara*, p. 6
65.	*Ahiphena Shodhana*	*Ardraka Svarasa*	Twenty-one	R.T. 24/242
66.	*Amalaki Rasayana*	*Amalaki Svarasa*	Twenty-one	C.H.K. 67/3
67.	*Ajirnakantaka Rasa*	*Kantakari Phala Svarasa*	Twenty-one	Sha. M. 12/226
68.	*Smritisagara Rasa*	*Brahmi Kvatha*	Twenty-one	RTS & SPS part 1, p.299
		Jyotishmati Taila	One	
69.	*Mahodadhi Vati-2*	*Ardraka Svarasa*	Twenty-three	B.R. 10/111
70.	*Talakeshvara Rasa*	*Kushmanda Svarasa*	Twenty-four	B.R. 54/91
71.	*Grahanivajrakapataa Rasa*	*Guduchi Svarasa*	Twenty-eight	B.R. 8/268
72.	*Mehabaddha Rasa*	*Bhringaraja Svarasa*	Thirty	Sha. M. 12/205
73.	*Mehavajra Rasa*	*Bhringaraja Svarasa*	Thirty	B.R. 37/81
74.	*Garbhachintamani Rasa*	*Brahmi Kvatha*	Thirty-five	B.R. 68/85
75.	*Amavateshvara Rasa*	*Guduchi Svarasa*	Thirty-seven	B.R. 29/80
76.	*Ajirnabalakalanala Rasa*	*Ardraka Svarasa*	Forty-one	B.R. 10/176
77.	*Gandhaka Rasayana*	*Godugdha, Chaturjata, Guduchi, Haritaki, Bibhitaki, Amalaki, Shunthi, Bhringaraja, Ardraka*	Sixty-seven	A.P. 2/48
78.	*Trailokyachintamani Rasa*	*Sarpa Visha*	Eighty-seven	B.R. 5/770
79.	*Virabhadrabhraka Rasa*	*Chitraka Mula Kvatha*	Ninety	B.R. 10/225
80.	*Bhimarudra Rasa*	*Aparajita Kvatha*	Hundred	B.R. 72/57

81.	*Swachhanda Bhairava Rasa*	*Dhattura Panchanga Svarasa*	Hundred	B.R. 5/480
82.	*Sahastra Puti Abhraka Bhasma*	67 different *Kvatha Dravya*	Thousand	A.S.S. *Shodhana-Marana Prakarana* p. 88
83.	*Vatakulantaka Rasa*	*Jala*	Three hours	B.R. 25/27
84.	*Agnikumara Rasa*	*Chitraka Kvatha*	Three hours	B.R. 8/238
85.	*Muktapanchamruta Rasa*	*Ikshu Svarasa*	Six hours	B.R. 14/220
86.	*Hemagarbha Pottali*	*Chitraka Svarasa*	Six hours	R.S.S. 2/35
		Kanchanara Svarasa	Three hours	R.P.Su. 8/73
87.	*Dwitiya Hemagarbha Pottali*	*Nimbu Svarasa*	Three hours	Sha. Ma. 12/108
88.	*Kubjavinoda Rasa*	*Bhringaraja Svarasa, Snuhi Kshira, Arka Kshira*	One day	B.R. 26/129
89.	*Kshayakesari Rasa*	*Aja Kshira*	One day	B.R. 14/90
90.	*Plihantaka Rasa*	*Eranda Taila*	One day	B.R. 41/68
91.	*Rajarajeshvara Rasa*	*Bhringaraja Svarasa*	One day	B.R. 54/136
92.	*Chaturmukha Rasa*	*Atasi Taila*	One day	B.R. 61/120
93.	*Arogyavardhini Rasa*	*Nimbapatra Svarasa*	Two days	R.R.S. 20/108
94.	*Manikya Rasa*	*Nimbapatra Svarasa*	Three days	B.R. 54/127
95.	*Jvaradhumaketu Rasa*	*Ardraka Svarasa*	Three days	B.R. 5/497
96.	*Shilagandhaka Vati*	*Bhringaraja Svarasa*	Seven days	B.R. 9/250
97.	*Tridosha Niharvinasha Surya Rasa*	*Chitrakamula Kvatha*	Eight days	B.R. 5/706

SAMYAKA BHAVANA / SUBHAVITA LAKSHANA

After proper levigation, *Subhavita Dravya* can be converted into the desired shape. If pressed in the middle of the fingertips, turns into a flat shape, and becomes smooth and soft in texture.[18]

ASAMYAKA BHAVANA / DURBHAVITA LAKSHANA

If the paste is sticky, watery or produces cracks on pressing between the fingers, it indicates that the *Bhavana* should be continued.[19]

DISCUSSION

Bhavana is regarded as a *Samskara*, that plays a crucial role in enhancing the characteristics of medications, thereby influences their therapeutic effectiveness. Acharya Gangadhara emphasized the dual exposure of materials to the sun and moon, recommending a seven-day period for optimal results, as described in the Bhaishajya Ratnavali. The Rasa Tarangini highlights Bhavana as a grinding method that reduces particle size, detoxifies substances, and amplifies bioactivity. Materials needed for *Bhavana* are (1) a single/compound powdered drug and (2) liquid media. Liquid media is an essential component, playing a major role in the outcome of *Bhavana*, apart from mechanical procedures such as grinding. Bhavana can be carried out by adopting two principles: (1) Soaking (immersion in a specified liquid) and (2) Levigation (Grinding the material with specified liquid media till the complete dryness) *Subhavita Lakshana* should be

carefully watched to ensure the completion of the process of successive cycles of levigation. At the end stage of levigation, the amalgam should become soft and fine in consistency and, on pressing between fingers, should turn into a flat cake, and pills can be made easily without sticking to the fingers.

Probable Role of Sunlight in *Bhavana*.[20] - *Bhavita* herbal formulations may be shade-dried, as hot sunrays may reduce volatile oil content and aromatic substances, and color changes may occur. Some chemicals may also undergo photodegradation by UV rays in sunlight and thereby forming new chemicals. Sunlight causes sterilization by UV rays. UV rays from sunlight are responsible for initiating photochemical reactions, in which photosensitizers are essential.

Importance of Wet Grinding Process in *Bhavana*. In pharmaceutics, microparticles and nanoparticles are generally produced by size reduction of larger particles under a top-down approach.[21] Wet grinding involves two simultaneous processes that is, pulp flow and stress application, which help in the transport of drug material between grinding surfaces, subsequent propagation, and initiation of cracks. The pulp flow process greatly relies on the nature of interactions between the particles and the grinding liquid media.[22] The presence of some amount of appropriate solvents helps to significantly improve the rate of product formation.[23] Moreover, wet grinding with organic liquids is reported to be more efficient than that with plain water.[24,25] This is suggestive of more efficacy of medicinal preparations prepared by wet grinding than dry grinding. Therefore, the wet grinding process adopted in Ayurvedic formulations could produce better particle size reduction alongside potentiation of the drug under processing. The comparative advantages of wet grinding over dry trituration are manifold, including smoother grinding, reduced dust hazards, improved particle fineness, and better chemical interactions. [26,27,28] Wet grinding has several applications in ancient and modern pharmaceutics, such as *Malahara* (ointment/liniment/gel/lotion/creams preparation), *Lepa* (medicated herbal/herbo-mineral paste for topical application), and *Kharaliya Rasayana*.

For *Bhavana*, different plant based liquid forms like *Svarasa*, *Kvatha*, *Hima, Phanta*, *Arka*, water, *Taila, Kanji, Sura*, *Tandulodaka*, animal products like *Godugdha*, *Gomutra*, Goghrita, bile, mineral origin like *Ksharodaka* are used. To prepare a decoction (as liquid media) for *Bhavana*, classical guidelines for extraction should be adopted.

In the Ayurvedic classics, *Bhavana Dravya* should be taken in that much of quantity which does *Samplavana* (immersion), *Kardmabha* (mire-like consistency), *Ardrata* (wetting) and *Ekibhuta* (homogeneous mixture).

The amount of liquid used in *Bhavana* and the process may be understood by Capillary properties**,** which describe the processes of interaction of porous powder materials with the liquid. Capillary attraction, or capillarity**,** is the ability of a liquid to flow in narrow spaces without the assistance and in opposition to external forces like gravity. It occurs because of intermolecular attractive forces between the liquid and solid surrounding surfaces. When a dry porous medium, such as a brick or a wick, is brought into contact with a liquid, it will start absorbing the liquid.

Bhavana Dravya should be selected based on some parameters like *Tulyaviryata* (Synergistic property), *Gunotkarsha* (Potentiation), *Shodhana* (removal of impurities or eradication of toxicity), to convert metallic compounds into an assimilable form. If the nature of liquids for *Bhavana* is not specified, it should be equal or similar in properties to powdered drugs and chosen as per the desired therapeutic indications.[29,30] So, for the validation of such parameters many dissertations and research works have been done in different institutes. Some of those are mentioned here to validate the *Bhavana* procedure.

- The study by Verma P. et al. (MD (Ayu) dissertation, 2013)[31] was done. In which *Rasayana Churna* (RC) was given one *Bhavana* (levigation) of decoction of *Rasayana Churna* ingredients to prepare *Bhavita Rasayana Churna* (BRC). In the preparation of decoction, RC and water were taken in 1:16

ratio, subjected to heat till it reduced to 1/8th part and filtered. In a clinical trial. Group A (n=30) was treated with *Bhavita Rasayana Churna* mixed with *Kupeelu* (BRCK) and Group B (n=31) was treated with *Rasayana Churna* mixed with *Kupeelu* (RCK). The drug was given in 3 g twice a day with honey and *Ghrita*, followed by lukewarm water orally for 28 days and with follow up of 14 days. Group A was found to possess a higher percent relief in almost classical and contemporary parameters of the disease. Complete remission was observed in 36.66% in Group A and in Group B it was 6.46%. the BRC was found more beneficial in comparison to plain RC in providing relief in symptoms of *Amavata*. Thus, this study proves some principles of *Bhavana* like *Tulyaviryata* of *Bhavana Dravya*, *Gunantaradhana*, *Gunotkarsha*, *Anukta Bhavana Dravya*, quantity of *Bhavana Dravya* adds till it becomes *Ardra*, *Ekibhoota* and consistency like *Karddmabha* achieved.

- P. B. Pimpalgaonkar et al. have done a work on "Evaluation of *Bhavana* samskara with reference to *Pippali Churna* and *Chausasta Pippali*." In the pharmaceutical preparation of *Chausatha Prahari Pippali* (CPP), with the number of *Bhavana* with *Pippali* decoction on *Pippali* powder, quantitative differences between "*Pippali* powder" and "CPP" were observed, along with the reduction of piperine content from 188.29 ng to 22.999 ng in CPP.[32] This study proves the *Tulyaviryata* of *Bhavana Dravya*, *Gunantaradhana*, and *Anukta Bhavana Dravya.*
- The study by Rajani J et al. (MD (Ayu) dissertation, 2012)[33] aimed to evaluate the *Rasayana* effect of *Amalaki Rasayana* in a stress-prone population. In group A, *Amalaki Rasayana* was prepared with seven *Bhavana* of *Amalaki Swarasa*. In group B, it was prepared with 21 *Bhavana* of *Amalaki Swarasa*. In group C, *Amalaki Rasayana* (21 *Bhavana*) was placed in Bhasma Rashi for four months. Analysis showed a decrease in gallic acid percentage and an increase in phenolic contents during successive *Bhavana* in *Amalaki Rasayana*. From this, it can be inferred that reductions in gallic acid highlight the importance of the *Bhavana* process. In this study, the impact of the number of *Bhavana* in the *Churnakriya* process was evaluated, which found a comparatively better effect in formulations prepared with more *Bhavana*. An experimental study also found that *Amalaki Rasayana* prepared with 21 *Bhavana* exhibited better immune-stimulant and cytoprotective activity, indicating increased drug potency with a higher number of *Bhavana*. Thus, this study proves some principles of *Bhavana* like *Tulyaviryata* of *Bhavana Dravya*, *Gunantaradhana*, *Gunotkarsha.*
- Neha R Patil worked on the topic "Comparative study of pharmacognostical and pharmaceutical evaluation of *Shwasahara Dashemani Churna* with different no of *Bhavana*"[34]. In this study Cluster of all drugs of *Shwasahara Dashemani* was taken as a single combination in the form of *Churna,* prepared with a single *Bhavana* and another prepared with 7 *Bhavana*. For *Bhavana* the decoction (*Kashaya*) of the same drugs was used. There was change in the HPTLC was noted, which suggests the role of *Bhavana* in altering the physicochemical parameters of the same drugs with multiple applications of *Bhavana*. Hence, it was concluded that *Bhavana Samskara* is very useful in diseased conditions and a greater number of *Bhavana* potentiate the drug to give effect with a minimum dose.
- Anusha KR et al, researched on "Pharmaceutico-Analytical study of *Palasha Kshara Bhavita Pippali*." [35]In which *Pippali* powder was given seven *Bhavana* of *Palasha Ksharodaka* by the levigation method in a mortar pestle. An analytical study shows that the colour of *Pippali* powder becomes dark brown after *Bhavana*, pH was increased after each *Bhavana*.
- Niraj Mendpara et al. conducted a clinical trial on "A Comparative Clinical Trial of Three Different Dosage form of *Guduchi* (Tinospora Cordifolia Willd.) in *Ekakustha* (Psoriasis)"[36] in which the efficacy of three different preparations of *Guduchi* in treating *Ekakustha* (Psoriasis): *Guduchi Ghana* from *Guduchi Svarasa* (Group A - GGGS), hydro-alcoholic extract (Group B - HAEG), and *Svarasa Bhavita*

Guduchi Churna (Group C - SBGC). Over 28 days, 45 patients received 4 capsules of each preparation thrice daily. Results showed significant improvement in 86.66% of patients treated with SBGC, while 20% in HAEG and 26.66% in GGGS showed mild to moderate improvement. SBGC demonstrated the highest efficacy, indicating that the *Bhavana* of *Guduchi Svarasa* enhances therapeutic outcomes.

***Bhavana* for Purification/Detoxification of Poisonous and Herbo-mineral Based Drugs.**

Bhavana is also advocated for *Shodhana* (purification/detoxification) of metals/minerals, aiming to minimize the toxic effects of a drug, besides changes in attributes and the addition of new desired qualities. Researches show that even simple immersion of aconite species in water reduces its toxicity.[37] The toxic constituents of the drug are transferred into the media, making the drug nontoxic, according to studies[38]

Research work shows the importance of *Bhavana* in the *Shodhana* of *Vishadravya*

- Shehraz Pasha has researched on "A critical review of *Vatsanabha Shodhana* from a Modern Perspective."[39] *Ashuddha Vatsanabha* (Aconite) is cardiotoxic, which is principally due to the alkaloid aconitine. Upon *Shodhana* by immersion in cow urine, the aconitine level becomes negligible/absent, and the drug becomes safe and cardioprotective in the mentioned doses. Aconitine percentage before *Shodhana* with cow urine was 0.113, and after *Shodhana*, it was 0.089. The effect of chronic toxicity and recovery period after chronic toxicity of raw *Vatsanabha*, *Gomutra Sodhitha Vatsanabha* revealed that raw *Vatsanabha* was highly toxic in chronic exposure, while *Gomutra Sodhitha Vatsanabha* showed no apparent toxicity.
- Swarnendu Mitra researched "Effect of *Shodhana* (processing) on *Kupeelu* (Strychnos nux-vomica Linn.) with special reference to strychnine and brucine content."[40] in which *Kupilu Shodhana* was done by 2 methods: 1) Purification with *Kanji* (*Kupilu* dipped in *Kanji* for 3 days), 2) Purification using *Ardraka Svarasa* (*Kupilu* dipped in *Ardraka Svarasa* for 3 days). HPTLC study shows the highest reduction of strychnine and brucine was found in the *Ardraka Svarasa* purified *Kupilu* seeds. It is possible that prolonged contact of the seeds with *Ardraka Svarasa* not only helped to diffuse some quantity of the alkaloids from the seeds but also converted some amount of strychnine and brucine into less toxic derivatives, such as isostrychnine, isobrucine, strychnine N-oxide, and brucine N-oxide.
- Various reference of *Bhavana* has been found after screening Ayurvedic classics. The data **(Table No. 1)** concerning the number of *Bhavana* with duration are summarized in **Table No. 4**

Table No. 4: Number of *Bhavana* with Duration from Ayurvedic classics

Sr. No.	Number of *Bhavana*	Cha.S.	Su.S.	A.H.	B.R.	AFI	S.Y.S	Total
1	One	10	11	15	16	4	2	**58**
2	Two	2	-	1	-	-	-	**3**
3	Three	-	-	1	1	-	-	**2**
4	Five	1	-	-	-	-	-	**1**
5	Six	2	-	-	-	-	-	**2**
6	Seven	6	4	3	4	-	-	**17**
7	Eight	2	-	-	-	-	-	**2**
8	Ten	3	-	-	-	-	-	**3**
9	Hundred	-	-	1	-	-	-	**1**
10	Twenty-one	3	1	-	-	-	-	**4**
11	One day	1	-	-	2	-	-	**3**
12	Three days	2	-	1	2	-	-	**5**
13	Seven days	3	2	3	-	-	-	**8**

14	Eight days	1	-	-	-	-	-	**1**
15	Ten days	-	-	1	-	-	-	**1**
16	Twenty days	-	-	1	-	-	-	**1**
17	Thirty days	1	-	1	-	-	-	**2**
18	Multiple	-	3	3	-	-	-	**6**
19	Soaking	0	-	1	-	-	-	**1**
Total		**37**	**21**	**32**	**25**	**4**	**2**	**121**

After screening above classical texts, it is observed that the reference of one *Bhavana* is maximum (58), 17 references for seven *Bhavana* was found.

Importance of *Bhavana* in *Shodhana* of *Rasadravya*

Toxic metals/minerals are triturated with the juice/paste of certain herbs under the heading of the *Shodhana* process, for example, for *Manahshila* (realgar): ginger juice, *Parada* (mercury): garlic paste, *Kasisa* (green vitriol): lemon juice, *Hingula* (cinnabar): ginger juice, and *Kamkushtha* (rhubarb): dry ginger decoction. Etc.

PSR (Particle Size Reduction) during *Bhavana* is of great importance in Ayurvedic pharmaceutics. Properties of metals get changed at the micro particle size level, and thus levigating them with organic moieties, as done in many Ayurvedic formulations, may lead to the invention of newer molecules with evident bio-efficacies. It may provide the basis for the invention of products of effects of new chemical moieties obtained after *Bhavana* due to processes like oxidation, hydrolysis, extractable ingredients, and so on. These nanoparticles possess biodegradable, biocompatible, and nonantigenic properties, which in general could be used to provide selective/targeted/controlled delivery of drugs to target action sites even across the blood-brain barrier. This may also help in reducing the chance of any peripheral side effects of drugs by trimming down the general drug dose requirement in the human body.[41] Some research works are mentioned below to evaluate the impact of *Bhavana* in the *Shodhana* of *Rasadravya*.

- Naveena Kodlady conducted research on "Pharmaceutical-analytic study of the Ayurvedic purification of *Manahshila* (realgar)"[42] in which *Ashodhita Manahshila* (AM) was purified by seven levigation with *Ardraka Svarasa* to prepare *Ardraka Shodhita Manahshila* (ASM). levigation with ginger changed the orange colour of the *Manahshila* powder to reddish yellow. The acid-insoluble ash content of AM was 0.84% while that of ASM was 0.42% suggesting that *Shodhana* offers the possibility of absorption. The particle size of AM was 54.18 µm while that of ASM was 15.55 µm, indicating possibly better absorption of the drug after purification. The sulphur-based amino acids cysteine and methionine act as phytochelatins, which are heavy metal-binding peptides and are suggested to detoxify heavy metals by chelation. Besides, cysteine, a methyl-donor peptide, helps in the process of methylation of arsenic present in *Manahshila*. Under these reactions, *Manahshila* becomes nontoxic and safer for therapeutic use.[43] This also supports the fact that the medicinal purification can also involve chemical purification.
- R. Surjith researched on "Impact of *Shodhana* w.s.r to Heavy Metal on *Hingula* with *Lakoochaphala Swarasa* (Artocarpus lakoocha)" [44]in which *Hingula Shodhana* was done by giving seven *Bhavana* of *Lakucha Svarasa*. ICP MS shows that in *Ashudha Hingula*, the PPM level of lead, arsenic and mercury was 28.99, 4.62 and 5 respectively, which were much higher than the API limits. In *Shuddha Hingula*, the PPM level of lead, arsenic and mercury was 0.63, 0.18 and 0.5 respectively, which were within the API limits. Thus, the method of *Bhavana* method of *Shodhana* proves effective in the removal of heavy

metals up to a decent quantity and makes it toxicity-free.

Importance of *Bhavana* in *Marana* of *Rasadravya*

Bhavana makes the drug "biocompatible" by converting it into an organometallic complex, especially in the preparation of *Bhasma*.[45] It combines organic elements and reactive substances, which may lead to the formation of metallic salts, metallic oxides, sulphates, and herbo-mineral compounds. It is reported that the elemental form of metals is not absorbable and may produce toxic effects.[46] Plants have the capacity to transfer them into a readily absorbable form. During the processing of metals with herbal liquid extracts in *Bhavana*, organometallic complexes are formed that aid in the assimilation and transport of the ingredient into the human tissues. Induction of organic molecules in the free lattice space during *Bhavana* can change the properties of the drug.[47,48] Most of the other Ayurvedic purification procedures (like *Nirvapana*, *Svedana*, *Dhalana*, etc.) are carried out mainly to convert the surface particles into organic material. However, *Bhavana* is a method in which a larger number and surface area of particles are likely to be subjected to the formation of organo-inorganic chemicals.

Many of the liquids used for *Bhavana* act as reducing agents. All plant extracts primarily possess carbon in one or the other form, and carbon is considered the best reducing agent. With their antioxidants, free radical scavenging properties may help in converting the drug chemically free from free radicals, thus preventing tissue damage due to oxidation.[49] Some research articles are mentioned below to evaluate the impact of *Bhavana* during *Marana* procedure.

- S. Bajaj and S. B. Vohora worked on "Analgesic activity of gold preparations used in Ayurveda and Unani-Tibb." The study mentioned that *Swarna Bhasma* (Au nanoparticles) is biogenic, traditionally prepared nanoparticles with quick and targeted action. This nanoparticle, at 27 ± 3 nm in size, is efficient in the treatment of arthritis. Whereas P. Mukherjee, R. Bhattacharya, N. Bone et al. worked on "Potential Therapeutic Application of Gold Nanoparticles in B-Chronic Lymphocytic Leukemia (BCLL): enhancing apoptosis." That study shows that, Swarna Bhasma at the size of 4nm was found to relieve the increased apoptosis in B-Chronic Lymphocytic Leukemia.
- S. K. Singh et al. researched on "Preparation and characterization of a mercury-based Indian traditional drug *Rasa Sindoor*." Study discussed that *Rasa Sindoor* is a sublimed mercury compound, structurally mercury sulphide, and 25–50 nm in size is coupled with several organic macromolecules derived from herbal extract used during *Bhavana* of the drug, which are bioavailable and responsible for adding to the bio efficacy of *Rasa Sindoor*. The organic molecules act as coating materials on the surface of the metallic compounds present in the drug, and the metal compounds act as the carrier of the organic matter (akin to the theory of novel drug delivery in contemporary medicine) obtained from botanicals. It is reported that when *Bhasma* nanoparticles are integrated with biological molecules (in organic liquid media), their stability, functionality, bioavailability, biocompatibility, and bio-efficacy are improved.[50,51]
- Nirali Shah, et al. have done research work on "Quality Assessment and Standardization of *Rakta Akika Bhasma* and *Pishti* - A Silicate formulation." [52] In this study, *Rakta Akika Bhasma* (RAB) was prepared using the classical *Puta* method, and *Pishti* (RAP) was prepared by levigation with *Gulab Arka* for 6 hours over 6 days. XRD study shows that RAP has a smaller crystallite size, indicating an optimal drug concentration and better bioavailability compared to RAB. The particle size of RAP (42.73 nm) is smaller than RAB (272.1 nm). The average yield percentage was increased in RAP as during *Bhavana*, the active principles of the liquid media impregnate to the material.

Liquid Media for *Bhavana*: As a Chelating Agent.

Liquid media are organic moieties and probably act as chelating agents and form a bonding with metals to reduce the untoward effect of absorption of the metal, help in its safe elimination from the body, and possibly provide some synergistic effects in therapeutics.

- B. Krishnamacharya worked on "*Bhanupaka*: a green process in the preparation of an Indian ayurvedic medicine, *Lauha Bhasma*" in which he discussed that during *Lauha Bhasma* preparation, during treatment of purified metallic iron with *Triphala* decoction (ellagic acid, chebulagic acid, and corilagin) chelates with iron to preserve the same in a bio-compatible form. These organic ligands generally convert to gallic acid, which exhibits hepatoprotective functions. The organic moieties of *Triphala* possess laxative properties and hence may avert constipation induced by the side effects of iron.

Bhavana* in *Rasayoga

In Rasa classics, *Bhavana* of various plant, animal and mineral based material is indicated to prepare different formulations in various numbers and duration are mentioned with different purposes like in formulations *Bhavana Dravya* works as a binding agent, to enhance or add the therapeutic values into the material, to reduce the particle size, to counter the toxicity of the toxic material. As described in table no..3, numbers of *Bhavana* like one, three, four, five, seven and others are mentioned to prepare *Rasa Yoga*.

Research work on *Rasaoshadhi* to evaluate the importance of *Bhavana*.

- Shuchi Mitra et al. investigated on Impact of *Bhavana Samskara* on physico-chemical parameters w.s.r to *Gandhaka Rasayana* prepared by different media and methods"[53]. The research examines the correlation between the number of *Bhavana* and the particle size of *Gandhaka*, employing X-ray photoelectron spectrometry for structural differentiation. Findings indicate notable color and taste variations based on *Bhavana* concentration, with the 11 *Bhavana* sample exhibiting cream color and mild astringency, while the 88 *Bhavana* sample showed a dark green hue and stronger astringency. Analytical assessments reveal reduced particle size and differences in element concentrations through AES ICP analysis and XPS, highlighting the importance of *Bhavana* in enhancing the physicochemical and biological attributes of the drug. The study concludes that *Bhavana* is a critical process in drug formulation, significantly influencing the properties of the dosage form.
- Nisha A. et al. worked under the title "Analytical and experimental evaluation of role of *Bhavana* in the assessment of antipyretic effect of *Hinguleshwara Rasa*"[54]. In this study, 3 samples of *Hinguleshwara Rasa* tablets were prepared by giving *Bhavana* with lemon juice, mixing with lemon juice and mixing with water. The results conclude that *Bhavana* enhances the therapeutic efficacy of the drug by reducing the particle size, increasing the rate of disintegration, and imparting more potency to the drug. *Bhavita Hinguleshwara Rasa* has got long and sustained antipyretic activity profile in comparison with the other two samples without *Bhavana*. These show the importance of *Bhavana* as a *Samskara* in increasing the therapeutic efficacy of the drug.
- Manisha B. Walunj has done the dissertation work on "Role of media in the preparation of *Laghumalini Vasanta Rasa*".[55] She concludes that in *Laghumalini Vasanta* (zinc-based herbo-metallic formulation), *Bhavana* of clarified butter is given to reduce *Rukshatva* (dryness of human tissues) of zinc calx and then *Bhavana* with lemon juice to reduce excessive *Snigdhansha* (unctuousness) and enhance *Deepana* (stomachic property) in the drug.

CONCLUSION

Bhavana Samskara stands as one of the most sophisticated and foundational procedures in Ayurvedic pharmaceutics. The more the number of *Bhavana* higher will be the potency, thereby the therapeutic efficacy. It makes toxic material safe for internal administration, reduces the toxicity, remove harmful substances or impurities present in the *Vishadravya*. In *Rasashastra*, *Bhavana* is used for different pharmaceutical procedures like *Shodhana*, *Marana*, *Amritikarana*, *Satvapatana*, *Lohitikarana*, *Druti*, *Nirutthikarana* and is therapeutically used to prepare various *Rasayoga*. Organic components of the liquid media are transferred to the material to make it organo-metallic or organo-mineral compounds, which are favorable to the body. The repeated cycles of trituration allow the drug to absorb the properties of the *Bhavana* medium while also breaking down particle size to submicron or nanoscales, enhancing surface area and enabling better pharmacokinetics. Thus, *Bhavana* process has got a tremendous role in changing the morphological cell structure of processed drugs, thereby enhancing the therapeutic efficacy of the formulation.

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