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Rohit Sharma

Ph.D. Scholar, Department of
Rasashastra & Bhaishajya
Kalpana, I.P.G.T. & R.A., Gujarat
Ayurved University, Jamnagar
361008, Gujarat, India

Prajapati PK

Prof. & Head, Department of
Rasashastra and Bhaishajya
Kalpana, I.P.G.T. & R.A., Gujarat
Ayurved University, Jamnagar
361008, Gujarat, India

Correspondence:

Dr. Rohit Sharma

Ph.D. Scholar, Dept. of Rasashastra
& Bhaishajya Kalpana, I.P.G.T. &
R.A., Gujarat Ayurved University,
Jamnagar 361008, Gujarat, India

Liquid media's in *Bhavana Samskara*: A pharmaceutico-therapeutic prospect

Rohit Sharma*, Prajapati PK

Abstract

Bhavana is a wet trituration process and also a size reduction technology, frequently used in Ayurvedic pharmaceuticals. It has multi-dimensional pharmaceutical and therapeutic implications. In the present review, data mining from available, screened Ayurvedic literature revealed use of various types of liquid media of plant, animal and mineral origin for *Bhavana*. The paper is a petite attempt to compile a variety of liquid media used in *Bhavana* especially in context to Pharmaceuticals and Therapeutics in brief.

Keywords: *Bhavana*, Levigation, Liquid media, Marana, *Samskara*, *Shodhana*.

Introduction

Samskara is an important concept led by ancient Ayurveda scholars and is defined as transformation (*Samskaro hi Gunantaradhanam uchyate*) of the inherent attributes (*Swabhavika Guna*) of a substance which leads to the addition of new properties. Various modes of *Samskara* are mentioned in Ayurvedic pharmaceuticals such as *Svedana* (boiling), *Mardana* (grinding), *Manthana* (churning), *Bhavana* (impregnation) etc.^{1,2} Amongst them, *Bhavana* is an important *Samskara* with the help of which, not only the potency of a drug can be altered, but is also capable to bring about changes in characteristics of drug viz. regulation, addition of new or deletion of undesirable characteristics.³ *Bhavana* is a unique pharmaceutical process in which a drug or mixture of drugs in powdered form is triturated with sufficient quantity of liquid media [viz. plant extractives (expressed juice, decoction etc) or animal products (urine, milk etc)] till liquid portion gets absorbed completely.^{4,5} *Bhavana* facilitates in mixing of ingredients of mixture for *Bhavana* and may account several chemical interactions in between them. The changes made by *Bhavana* in nature of drug can be preliminarily and easily perceived at pharmacognostic as well as chemical level;^{6,7} however its utility will be majorly dependent on therapeutic actions. Thus, it plays a pivotal role in the alteration of *Gunas* (properties) of drugs so as to fulfill therapeutic requirements.

In Ayurvedic literature, two methods of *Bhavana* are described- (1) Staged Levigation with particular liquid media and (2) Soaking with specified liquid.⁸ Liquid media is an essential material component of *Bhavana*, contributing major role in the outcome of *Bhavana* (subjected to variation in different contexts) apart from the mechanical procedure like grinding etc. Present review is an effort to assemble the scattered information of various liquid media for *Bhavana* in Ayurvedic literature, highlighting its pharmaceutical and therapeutic significance.

Methodology

The following are the process and eligibility criteria for the inclusion of data pertaining to this review: Information extracted from various Rasa classics and other Ayurvedic treatises, text books of Ayurvedic and modern pharmaceuticals, alchemy, Pharmacopoeias (Ayurvedic Formulary of India, Ayurvedic Pharmacopoeia of India), available dissertations/thesis were also investigated. A search was undertaken in Google scholar, MEDSCAPE, BMC, Science Direct, MEDLINE (www.pubmed.com)/pubmed database, SCOPMED, and other relevant databases, using keywords like *Bhavana*, *Samskara*, Liquid media for *Bhavana*, levigation, wet trituration, wet grinding, *Marana*, Ayurvedic pharmaceuticals, Rasa Shastra, and Bhaishajya Kalpana with their corresponding mesh terms in combination like OR, AND. Published articles relevant to topic were screened. All the identified articles using the online search were screened by reading the Title and Abstract. The articles and searched Ayurvedic informations not satisfying the search criteria were excluded from the final analysis. The information selected for inclusion at this stage was further screened for suitability by thorough

thorough reading. This search was undertaken in April-June, 2014.

Amount of liquid for Bhavana

The liquid added should be optimum in quantity so as to form soft or soggy mass and to keep the material wet throughout grinding. Quantity of liquid should be sufficient to fulfill the following criteria (observed in the drug under *Bhavana*): *Ardrata* (wetting), *Kardmabha* (mire like consistency), *Samplavana* (immersion), and *Ekibhoot* (becoming homogeneous mixture). The process is carried out till attainment of *Subhavit Lakshana* (confirmatory test for completion of levigation).⁴

Effect of Nature of drug in varying quantity of liquid: In case of many *Rasaushadhi*'s before *Marana*, *Bhavana* for *Rasagandha Kajjali* and *Dhatu Kajjali* in *Kharaliya Rasayana*, the quantity of *Bhavana drava* (Liquid media) varies greatly due to huge change in requirement of liquid; hence the *Subhavit Lakshana* should be carefully watched which majorly decides quantity and duration of *Bhavana* and possibly the nature of final formulation.

In *Parada Shodhana/Samskara* the processing of *Parada* with liquids such as *Triphala* decoction (in *Shodhana*),⁹ Honey (in *Uthapana*

Samskara),¹⁰ *Srishtyambuja* (in *Bodhana Samskara*)¹¹ etc., may be included under *Mardana*, not under *Bhavana*, as the media is not absorbed in the material or the '*Sampeshyet Shoshanama*' phenomenon is absent.

In case of drugs of plant origin, usually they require more quantity of liquid, hence where ever the above dimensions are not mentioned, nature of drug affect the procedure and product nature.

Number and duration of Bhavana

Different number of *Bhavana* is mentioned in classics ranging from one to even thousand times. In *Marana*, number of *Bhavana* may vary infinitely as per number of *Putra* e.g. 20, 60, 100, 500 etc. When any specification about duration of *Bhavana* is not mentioned, then it should be carried out for seven days.¹² Sometimes, instead of numbers (repetitive cycles) of *Bhavana*, duration of *Bhavana* in days or hours is quoted in texts under various terms such as *Yama* or *Prahara* or *Divas* (Table 1).¹³⁻²⁰ Examples of number/duration of *Bhavana* in *Rasa Shastra* classics and *Brihatrayi* are compiled in Table 1 and 2.^{21,22,23}

Table 1: Examples of number/duration of *Bhavana* in *Rasa Shastra* classics

<i>Bhavana</i>	Liquid media	Formulation	Reference
One	<i>Arka patra Swarasa</i>	<i>Ichhabhedi Rasa</i>	BR 31/46 ¹²
	<i>Triphala Kwatha</i>	<i>Hridyamava Rasa</i>	BR 33/38 ¹²
Three	<i>Ardraka Swarasa</i>	<i>Kaphaketu Rasa</i>	BR 5/843 ¹²
Four	<i>Kakmachi Swarasa, Shatavari Swarasa, etc</i>	<i>Indu Vati</i>	BR 62/76 ¹²
Five	<i>Triphala Kwatha</i>	<i>Ardhanarinateshwara Rasa</i>	RSS 2/221 ¹³
Seven	<i>Hastishundi Swarasa</i>	<i>Kalyana Sundar Rasa</i>	BR 33/56 ¹²
	<i>Ardraka Swarasa</i>	<i>Hingula Shodhana</i>	BR 3/133 ¹²
	<i>Guduchi Swarasa</i>	<i>Dhatri Loha</i>	BR 30/144 ¹²
	<i>Arjun Twaka Kwatha</i>	<i>Nagarjunabhra Rasa</i>	BR 37/81 ¹²
Eight	<i>Chaturjat, Guduchi, Triphala etc</i>	<i>Gandhaka Rasayana</i>	AP 2/48 ¹⁴
	<i>Ksharodaka</i>	<i>Taladi Ksharanjana</i>	BR 64/84 ¹²
Twelve	<i>Shatavari Swarasa</i>	<i>Bhaskaramritabharaka</i>	BR 56/37 ¹²
Fourteen	<i>Gomutra, Bhringaraja Kwatha etc</i>	<i>Sudhanidhi</i>	BR 42/105 ¹²
	<i>Bhringaraja Swarasa, Sharpunkha Swarasa</i>	<i>Shitapittabhanjana Rasa</i>	BR 55/30 ¹²
Eighteen	<i>Kushmanda Swarasa, Kanji etc</i>	<i>Talkeshwara Rasa</i>	BR 54/101 ¹²
Twenty	<i>Chitrakamula Kwatha</i>	<i>Meghanada Rasa</i>	BR 37/137 ¹²
Twenty one	<i>Bhringaraja Swarasa</i>	<i>Ashwakanchuki Rasa</i>	SYS, Jwaradhikara, p. 6 ¹⁵
	<i>Ardraka Swarasa</i>	<i>Ahiphena Shodhana</i>	RT 24/242 ¹⁶
	<i>Amalaki Swarasa</i>	<i>Amalaki Rasayana</i>	CHK 67/3 ¹⁷
	<i>Kantakari Phala Swarasa</i>	<i>Ajirnakantaka Rasa</i>	SS Madhyama Khanda 12/226 ¹⁸
Twenty three	<i>Ardraka Swarasa</i>	<i>Mahodadhi Vati-2</i>	BR 10/111 ¹²
Twenty four	<i>Kushamanda Swarasa etc</i>	<i>Talkeshwara Rasa</i>	BR 54/91 ¹²
Twenty Eight	<i>Guduchi Swarasa etc</i>	<i>Grahnivajrakapat Rasa</i>	BR 8/268 ¹²
Thirty	<i>Bhringaraja Swarasa</i>	<i>Mehabaddha Rasa</i>	SS Madhyama Khanda 12/205 ¹⁸
	<i>Bhringaraja Swarasa</i>	<i>Mehavajra Rasa</i>	BR 37/81 ¹²
Thirty five	<i>Brahmi Kwatha etc</i>	<i>Garbhachintamani Rasa</i>	BR 68/85 ¹²
Thirty seven	<i>Guduchi Swarasa etc</i>	<i>Amvateshwara Rasa</i>	BR 29/80 ¹²
Fourty one	<i>Ardraka Swarasa etc</i>	<i>Ajirnabalakalanala Rasa</i>	BR 10/176 ¹²
Eighty seven	<i>Sarpa Visha etc</i>	<i>Trailokyachintamani Rasa</i>	BR 5/770 ¹²
Ninety	<i>Chitraka Mula Kwatha</i>	<i>Virbhadrabhraka Rasa</i>	BR 10/225 ¹²
Hundred	<i>Aparajita Kwatha</i>	<i>Bhimarudra Rasa</i>	BR 72/57 ¹²
	<i>Dhattura Panchanga Swarasa</i>	<i>Swachhanda Bhairava Rasa</i>	BR 5/480 ¹²
Thousand	Total 67 different Kwatha Dravya	<i>Sahasra Puti Abhraka Bhasama</i>	ASS, Shodhana-Marana Prakarana, p.88 ¹⁹
Duration of Bhavana in days or hours			
1 Yama (3 hrs)	<i>Chitraka Kwatha</i>	<i>Agnikumara Rasa</i>	BR 8/238 ¹²
2 Yama	<i>Ikshu Swarasa etc</i>	<i>Muktapanchamrita Rasa</i>	BR 14/220 ¹²
1 day (in sunlight)	<i>Bhringaraja Swarasa</i>	<i>Rajrajeshwara Rasa</i>	BR 54/136 ¹²
2 days	<i>Nimbapatra Swarasa</i>	<i>Arogyavardhini Vati</i>	AFI part 1, p.664 ²⁰
3 days	<i>Nimbapatra Swarasa</i>	<i>Manikya Rasa</i>	BR 54/127 ¹²
	<i>Ardraka Swarasa</i>	<i>Jwaradhumketu Rasa</i>	BR 5/497 ¹²
7 days	<i>Bhringaraja Swarasa</i>	<i>Shilagandhaka Vatika</i>	BR 9/250 ¹²
8 days	<i>Chitrakamula Kwatha</i>	<i>Tridoshniharvinashsurya Rasa</i>	BR 5/706 ¹²

BR: Bhaishajya Ratnavali, RT: Rasa Tarangini, RSS: Rasendra Sara Sangraha, ASS: Ayurved Sara Sangraha, AP: Ayurved Prakash, SYS: Siddha Yoga Sangraha, SS: Sharangadhara Samhita, CHK: Chakradatta, AFI: Ayurvedic Formulary of India

Table 2: Examples of number/duration of *Bhavana* in *Brihatrayi*

S. No.	No. of <i>Bhavana</i>	Formulation	Reference
Charaka Samhita			
1	One	<i>Ashvakrida Churna</i>	<i>Vimana</i> 7/22
2	One	<i>Brahama Rasayana</i>	<i>Chikitsa</i> 1-1/58
3	One	<i>Pippalayadi Churna</i>	<i>Chikitsa</i> 5/75-78
4	One	<i>Drustiprada Varti</i>	<i>Chikitsa</i> 26/254-55
5	One	<i>Arkadi Varti</i>	<i>Chikitsa</i> 30/71
6	One	<i>Ikshvaku Kalpa</i>	<i>Kalpa</i> 3/9
7	One	<i>Dhamargava Kalpa</i>	<i>Kalpa</i> 4/10
8	One	<i>Snuhi Kalpa</i>	<i>Kalpa</i> 9/19
9	One	<i>Danti Dravanti</i>	<i>Kalpa</i> 12/16
10	Two	<i>Lodhra Kalpa</i>	<i>Kalpa</i> 9/4-5
11	Six	<i>Nishotha Kalpa</i>	<i>Kalpa</i> 9/14
12	Six	<i>Udumbaradi Taila</i>	<i>Chikitsa</i> 30/71
13	Seven	<i>Shatyadi Churna</i>	<i>Chikitsa</i> 5/75-78
14	Seven	<i>Udar-Roga Nashaka Yavagu</i>	<i>Chikitsa</i> 13/165
15	Seven	<i>Gandha-Hasti Namaka Agada</i>	<i>Chikitsa</i> 23/71-76
16	Seven	<i>Shirishapushpa</i>	<i>Chikitsa</i> 23/193
17	Seven	<i>Trivrutadi Virechana Yoga</i>	<i>Kalpa</i> 7/925
18	Seven	<i>Nishotha Snuhi Kalpa</i>	<i>Kalpa</i> 9/14
19	Eight	<i>Chitrakadi Lepza</i>	<i>Chikitsa</i> 7/85-68
20	Ten	<i>Shilajatu Vataka</i>	<i>Chikitsa</i> 16/87-92
21	Ten	<i>Lodra Kampillaka</i>	<i>Kalpa</i> 9/10
22	Twenty one	<i>Madana Phala Kapla</i>	<i>Kalpa</i> 1/19
23	One day	<i>Danti Dravanti</i>	<i>Kalpa</i> 12/23-26
24	Three days	<i>Churna Anjana</i>	<i>Kalpa</i> 26/249
25	Three days	<i>Trivrita Kalpa</i>	<i>Kalpa</i> 7/60
26	Seven days	<i>Loha Bhasma Prayoga</i>	<i>Kalpa</i> 16/69
27	Seven days	<i>Snuhi Kalpa</i>	<i>Kalpa</i> 9/12-13
28	Eight days	<i>Vatsaka</i>	<i>Kalpa</i> 5/9
29	one month	<i>Unmada Varti</i>	<i>Kalpa</i> 9/322
30	Soaking	<i>Shilajatu</i>	<i>Kalpa</i> 1-3/50-51
Sushruta Samhita			
1	One	<i>Samanya Udar Roga</i>	<i>Chikitsa</i> 14/10
2	One	<i>Kumkumadi Agada</i>	<i>Kalpa</i> 8/49
3	One	<i>Manduradi Prayoga</i>	<i>Uttara</i> 44/26
4	One	<i>Saindhava Mandura Prayaoga</i>	<i>Uttara</i> 44/38-39
5	One	<i>Mustadi Dhumapana</i>	<i>Uttara</i> 52/23
6	One	<i>Krimihara Pradhmana</i>	<i>Uttara</i> 54/35
7	One	<i>Shirishadi Varti</i>	<i>Uttara</i> 60/43
8	One	<i>Brahmayadi Varti</i>	<i>Uttara</i> 62/31-33
9	Four	<i>BhagnaSandhanKara Taila</i>	<i>Chikitsa</i> 4/55-59
10	Seven	<i>Shwavidha Dhuma (Krimi)</i>	<i>Uttara</i> 54/30-31
11	Seven days	<i>Yava Kalpa</i>	<i>Chikitsa</i> 10/4
12	Seven days	<i>Souvarchaladi Yoga</i>	<i>Uttara</i> 44/28
13	Seven days (soaking)	<i>Ksharanjana</i>	<i>Uttara</i> 11/11-12
14	Multiple	<i>Churnakriya-Kushtha</i>	<i>Chikitsa</i> 10/10
15	Multiple	<i>Prihwikadi Churna</i>	<i>Uttara</i> 42/98
16	Multiple	<i>Hikkahara Yoga</i>	<i>Uttara</i> 50/24
Ashtanga Hridya			
1	One	<i>Lavanpanchadi Gulika</i>	<i>Chikitsa</i> 10/15
2	One	<i>Kshara Gutika</i>	<i>Chikitsa</i> 10/59
3	One	<i>Snuhi Khira Prayoga</i>	<i>Chikitsa</i> 15/44
4	One	<i>Svarnakshirya Yoga</i>	<i>Chikitsa</i> 16/8
5	One	<i>Mritika Prayoga</i>	<i>Chikitsa</i> 16/38
6	One	<i>Goshringadi Dhupa</i>	<i>Uttara</i> 3/57
7	One	<i>Naktamaladi Agada</i>	<i>Uttara</i> 5/43
8	One	<i>Unmadsudani Varti</i>	<i>Uttara</i> 6/40
9	One	<i>Anjana Varti</i>	<i>Uttara</i> 11/50
10	One	<i>Vimla Varti</i>	<i>Uttara</i> 13/70
11	One	<i>Shashdantadi Varti</i>	<i>Uttara</i> 13/72
12	One	<i>Varti Anjana</i>	<i>Uttara</i> 13/74
13	One	<i>Pillnashaka Anjana</i>	<i>Uttara</i> 16/53
14	One	<i>Pippali Rasayana</i>	<i>Uttara</i> 39/97
15	One	<i>Til Prayoga- Vajikarana</i>	<i>Uttara</i> 40/25
16	Two	<i>Tilwaka Kalpa</i>	<i>Kalpasiddhi</i> 2/39
17	Three	<i>Nimi Anjana</i>	<i>Uttara</i> 11/26
18	Seven	<i>Lakshadi Masi</i>	<i>Uttara</i> 16/57
19	Seven	<i>Gokshuraka Rasayana</i>	<i>Uttara</i> 39/56
20	Seven	<i>Shilajatu Rasayana</i>	<i>Uttara</i> 39/135
21	Hundered	<i>Ashwa Shakrita Prayoga</i>	<i>Chikitsa</i> 20/27
22	One night (soaking)	<i>Yava Prayoga (Prameha)</i>	<i>Chikitsa</i> 12/15
23	Three days	<i>Sarvakalika Virechana</i>	<i>Kalpasiddhi</i> 2/28
24	Seven days	<i>Loha Bhasma Prayoga</i>	<i>Chikitsa</i> 16/9

25	Seven days	<i>Indrayava Prayoga</i>	<i>Kalpasiddhi</i> 1/46
26	Seven days	<i>Trivritadi Prayoga</i>	<i>Kalpasiddhi</i> 2/48
27	Ten days	<i>Pushpa Kasisa Anjana</i>	<i>Uttara</i> 9/20
28	10/20/30 days	<i>Shilajatu Vataka</i>	<i>Chikitsa</i> 16/24
29	Multiple	<i>Shilajatu Prayoga (Prameha)</i>	<i>Chikitsa</i> 12/35
30	Multiple	<i>Gulma Nashaka Churna</i>	<i>Chikitsa</i> 14/30
31	Multiple	<i>Vidarikanda Yoga</i>	<i>Uttara</i> 40/26

Variety of liquid media for *Bhavana*

Various types of liquid media are mentioned for *Bhavana* in Ayurvedic formulations, such as juice or decoctions of herbs, urine, milk etc (Table 3).¹³⁻²⁷ The liquids found are of plant, animal or mineral origin. Liquids in *Bhavana* for *Gunantaradhana* (change in properties) or *Gunotkarsha* (augmentation of qualities) of drug are

selected as per therapeutic indications. *Swarasa/Kwatha* or any other liquid used for *Bhavana* should be equal or similar in properties of *Bhavya Dravya* (wherever guidelines for selection are un-available).³ According to *Dalhana*, *Kwatha* is also called as *Swarasa*; therefore, it can be assumed that when *Swarasa* is not available for *Bhavana*, it may be replaced by *Kwatha*.²⁸

Table 3: Types of liquid media used as *Bhavana* Drava in various formulations

Category of media	Examples of media	Formulation	Reference
Plant origin			
Swarasa (extracted juice)	<i>Amalaki juice</i>	<i>Amalaki Rasayana</i>	CHK 67/3 ¹⁷
	<i>Ikshu juice</i>	<i>Vrishabhadrhawa Rasa</i>	BR 19/25 ¹²
	<i>Jambiri juice</i>	<i>Ananda Bhairava Rasa</i>	AFI part 1, p.663 ²⁰
	<i>Tambula juice</i>	<i>Jatiphaladi Vati</i>	BR 7/128 ¹²
	<i>Vatankura Rasa</i>	<i>Rasa Sindura</i>	RT 6/162 ¹⁶
Kashaya (decoction)	<i>Arjuna twak Kwatha</i>	<i>Nagarjunabhra Rasa</i>	BR 16/65 ¹²
	<i>Shalasaradi Dravya Kwatha</i>	<i>Shilajatu</i>	BR 37/55 ¹²
	<i>Krashmajeeraka Kwatha</i>	<i>Takravati</i>	BR 42/84 ¹²
	<i>Godhuma, Yava Kwatha</i>	<i>Ratakara Rasa</i>	BR 33/59 ¹²
Hima (cold infusion)	<i>Brahmi Hima</i>	<i>Brahmi Vati</i>	BR 5/949 ¹²
Phanta (hot infusion)	<i>Panchkola Phanta</i>	<i>Kravyada Rasa, Ajirnalakalanala Rasa, Amvateshvara Rasa</i>	BR 10/217, ¹² BR 10/179, ¹² BR 29/72 ¹²
Kshira (resinous secretion)	<i>Vata</i>	<i>Paniyavatika siddhphala</i>	BR 5/675 ¹²
	<i>Snuhi</i>	<i>Trivritadi Vati</i>	BR 31/33 ¹²
	<i>Arka, Snuhi</i>	<i>Vadwanal Rasa, Kubjavinoda Rasa</i>	BR 5/778, ¹² BR 26/129 ¹²
Taila (oils)	<i>Jyotishmati Taila</i>	<i>Smritisagara Rasa</i>	RYS vol 2, ver 2450, p 562; ²⁴ <i>Rasatantra Sara and Siddhaprayoga Sangraha</i> part 1, p.299 ²⁵
	<i>Atasi Taila</i>	<i>Chaturmukh Rasa</i>	BR 61/120 ¹²
	<i>Eranda Taila</i>	<i>Vata Vidhvansan Rasa, Mahavahni Rasa, Plihanataka Rasa</i>	BR 26/179, ¹² BR 40/79, ¹² BR 41/68 ¹²
	<i>Dhattura Bija Taila</i>	<i>Kamini Mada Vidhunana Rasa</i>	BR 74/68 ¹²
Arka (distillate)	<i>Gulaba Arka</i>	<i>Navratnarajmriganka Rasa, Mukta Pishiti, Praval Pishiti</i>	AFI part 1, p.687; ²⁰ AFI part 1, p.584; ²⁰ AFI part 1, p.586 ²⁰
Kanji (fermented sour gruel)	-	<i>Talkeshvara Rasa</i>	BR 54/99 ¹²
<i>Sura Manda</i> (Supernatant of <i>Sura</i>)	-	<i>Saindhvadi Varti</i>	BR 64/169 ¹²
<i>Laksha Rasa</i> (liquid formulation prepared from lac)	-	<i>Tikshnadi Vati, Vasantkusumakara Rasa</i>	BR 13/66; ¹² AFI part 1, p.718 ²⁰
Ksharodaka	<i>Yava Ksharodaka</i>	<i>Sarivadi Vati</i>	BR 62/70 ¹²
	<i>Chanaka Ksharodaka</i>	<i>Kravyad Rasa</i>	BR 10/218 ¹²
<i>Tandulodaka</i> (macerated liquid from rice)	-	<i>Kalingadi Gutika</i>	BR 6/42 ¹²
Drava Kalpa	<i>Karpura Jala</i>	<i>Ratnaprabha Vatika</i>	BR 66/61 ¹²
	<i>Aphima Jala</i>	<i>Kaminividravana Rasa</i>	BR 75/23 ¹²
Animal origin			
Kshira (milk)	<i>Go Kshira</i>	<i>Vasantkusumakara Rasa, Dugdha Vati</i>	BR 37/115, ¹² BR 42/74 ¹²
	<i>Mahisha Kshira</i>	<i>Bhukushmandadi Yoga</i>	BR 74/57 ¹²
	<i>Aja Kshira</i>	<i>Kshyakesri Rasa, Krimikalanala Rasa, Pranavallabha Rasa, Piyushavalli Rasa, Shulavajirini Vatika, Chandrodya Varti</i>	BR 14/90, ¹² BR 11/19, ¹² BR 12/82, ¹² BR 8/334, ¹² AFI part 1, p.543, ²⁰ AFI part 1, p.554 ²⁰
	<i>Nari Kshira</i>	<i>Ardhnaarishvara Rasa, Mritsanjivani Gutika, Manasmitra Vataka</i>	BR 65/49, ¹² <i>Sahasrayogam</i> p. 252, ²⁶ <i>Sahasrayogam</i> p. 254 ²⁶
Mutra (urine)	<i>Go Mutra</i>	<i>Sanjivani Vati, Sudhanidhi</i>	AFI part 1, p.550, ²⁰ BR 42/106 ¹²
	<i>Aja Mutra</i>	<i>Mahamrityunjya Rasa, Siddharthaka Agada, Jaya Vati, Kayasthadi Varti, Bilvadi Gutika</i>	BR 5/514, ¹² BR 24/18, ¹² BR 5/536, ¹² BR 5/538, ¹² Charaka Chikitsa 10/46, ²¹ AFI part 1, p.524 ²⁰
Ghrta (ghee)	Cow ghee	<i>Panchanana Vati, Panchalavana Churna</i>	BR 12/88, ¹² BR 31/35 ¹²
Navneeta (clarified butter)	Cow Navneeta	<i>Vasantmali Rasa</i>	<i>Rasapaddhati</i> p.167 ²⁷

<i>Gomaya Rasa</i>	Cow dung liquid	<i>Rasanjanadi Varti</i>	BR 64/125 ¹²	
<i>Pitta (Bile)</i>	One <i>Pitta</i>	<i>Rohit matsya</i>	<i>Varishoshana Rasa</i>	BR 40/103 ¹²
		<i>Go</i>	<i>Yonipichu prayoga</i>	BR 67/11 ¹²
		<i>Mahisha</i>	<i>Brahmarandhra Rasa</i>	BR 5/618 ¹²
		<i>Kapi</i>	<i>Rasadi Gutika</i>	<i>Sahasrayogam</i> p. 232 ²⁶
		<i>Sarpa</i>	<i>Suchimukha Rasa</i>	<i>Sahasrayogam</i> p. 236 ²⁶
		<i>Mayur</i>	<i>Svedashaityari Rasa</i>	BR 5/744 ¹²
	Two <i>Pitta</i>	<i>Marjara, Jambuka</i>	<i>Bhootbhairava Rasa</i>	<i>Sahasrayogam</i> p. 231 ²⁶
Four <i>Pitta</i>	<i>Matsya, Varah, Mayur, Aja</i>	<i>Rasarajendra</i>	BR 5/678 ¹²	
Five <i>Pitta</i>	Above four <i>Pitta</i> + <i>Mahisha</i>	<i>Suchikabharana Rasa, Mahamrityunjaya Rasa</i>	BR 5/642, ¹² BR 5/512 ¹²	
Six <i>Pitta</i>	Above five <i>Pitta</i> + <i>Sarpa</i>	<i>Trailokyachintamani Rasa</i>	BR 5/769 ¹²	
<i>Madhu</i> (honey)	-	<i>Shambukadi Vati, Mehakalanal Rasa, Panchanana Rasa, Ayastiladi Modaka, Chandramrita Rasa</i>	BR 8/514, ¹² BR 37/59, ¹² BR 37/60, ¹² BR 12/9, ¹² BR 14/115 ¹²	
<i>Ghee + Madhu</i>	-	<i>Shilagandhaka Vati</i>	BR 7/250 ¹²	
<i>Dadhi Mastu</i> (curd water)	-	<i>Talkeshvara Rasa, Purnakala vati</i>	BR 54/99, ¹² BR 8/509-513 ¹²	
<i>Amla Takra</i> (sour buttermilk)	-	<i>Sarshapadi Pralepa</i>	AFI part 1, p. 492 ²⁰	
<i>Madhu Shukta</i> (fermented product from honey)	-	<i>Shatyadi Churna</i>		
<i>Drava Kalpa</i> (liquid preparations)	<i>Kasturi Jala</i>	<i>Navratnarajmriganka Rasa, Vasantkusumakara Rasa</i>	BR 26/209, ¹² BR 37/115 ¹²	
<i>Visha</i> (poisons)	<i>Sarpa Visha (Dunduka variety)</i>	<i>Tralokyachintamani Rasa</i>	BR 5/770 ¹²	
<i>Kashaya</i> (decoction)	<i>Bhunaga</i>	<i>Venkaradi Matra</i>	<i>Sahasrayogam</i> p. 256 ²⁶	
Mineral origin				
<i>Jala</i> (water)	Jala	<i>Ananda Bhairava Rasa, Shankha Varti, Tuthodaya Vati, Karpur Rasa, Garbhachintamani Rasa, Vatakulantaka Rasa, Bhuvneshvara Vati</i>	RT 24/94, ¹⁶ RT 12/16, ¹⁶ RT 21/86, ¹⁶ BR 7/16, ¹⁶ BR 68/83, ¹² BR 25/27, ¹² BR 7/148 ¹²	
	<i>Nabho ambu</i> (rain water)	<i>Nagarjun Varti</i>	BR 64/172 ¹²	
	<i>Himambu</i> (cold water)	<i>Vimala Varti</i>	AFI part 1, p.559 ²⁰	
<i>Churnodaka</i> (lime water)	-	<i>Talkeshvara Rasa</i>	BR 54/99 ¹²	
<i>Nimbukamala</i>	<i>(Nimbu Rasa + Kathini Churna + Gandhakamla)</i>	<i>Bhootghana Chakrika</i>	RT 6/87 ¹⁶	

RRS: Rasa Yoga Sagar

Role of liquid media in Bhavana process

Bhavana with liquids, whether of herbal, animal or mineral origin, helps to bring minute particles of material in contact with each other as well as with liquid media. During wet grinding process, mixture gets properly mixed and material becomes soft, smooth and sticky, which facilitates better binding of material (especially in *Kharaliya Rasayana*) and pills or pellets can be made easily; thus facilitating further processing. As liquid media helps in easy and smooth grinding, it nullifies the problem of dust too. Wet trituration facilitates particle size reduction and homogenization leading to modification of properties (*Gunantatradhana*) of the end product. Liquid media may act as preservative for the material. In addition, finer particles can be achieved through wet grinding than dry grinding.²⁹ Liquid media adds bulk to final product thus altering percentage of constituents. Its quantity influences duration of *Bhavana* and imparts the effect (Extraction, Hydrolysis, Imparting characteristics of Liquid media in to product etc) of process '*Toya sammikarsha*'. Added liquids act as media for extraction of components of various ingredients as well as media for their chemical interaction. It may also play a role of buffering agent by maintaining of specific pH. Owing to binding capacity, hygroscopicity of liquid media especially its quantity may alter parameters of standardization of tablets, pills i.e. Hardness, Dissolution, Disintegration and Friability, ultimately interfering with kinetics of final product mainly absorption and thus therapeutics. It is possible to administer high doses of drugs used in the form of Liquid media for *Bhavana*, with better palatability. Ancient seers used drugs with non palatable attributes (in therapeutic doses) in the form of liquid media for *Bhavana*.

By default, as a rule, *Bhavana* should be carried out in sunlight, which is lacking in current practice of Ayurvedic industrial Pharmaceutics.

Chemical constituents of *Bhavana drava* and other drugs as well may undergo photolysis and thus composition of *Bhavita dravya* may get altered. This gives directions for further research as there are many drugs which are said to become more potent if triturated with liquids derived from them (*Swarasa, Kwatha* etc) e.g. *Vidari Churna Kalpa*,³⁰ *Amalaki Rasayana*,³¹ *Chaushashti Prahara Pippali*,³² etc. This change in potency apart from physical addition of drug may be due to Photolysis or Hydrolysis of chemical constituents of the drug most likely *Bhavana drava* if given *Bhavana* in sunlight and shade respectively apart from many other causes. In different contexts, *Bhavana* process is mentioned to be performed in bright sunny day (e.g. in *Arkamurti Rasa*,³³ *Prataplankeshwara Rasa*³³) or at night (in *Mukta* and *Praval Pishti* preparation).³⁴

Role of liquid media in Shodhana

Media plays an important role in *Shodhana* process hence specific media are used for *Shodhana* of particular substance. Media can act in different ways: Sometimes media act as solvent and helps to eradicate toxic substance from the drug. Sometimes media reduces toxicity of materials and induces desired qualities e.g. *Shodhana of Manahshila* (AS₂S₂). Volatile impurities can be removed during grinding process of *Bhavana* and percentage of thermo-labile substances may get reduce. Media can increase therapeutic efficacy of drug. Sometimes the *Rasavarga dravya* (metals or minerals) after only *Bhavana* can be used therapeutically e.g. *Gairika, Hingula*. Levigation processes in *Bhavana* helps in converting material in such state which is suitable for further proceedings e.g. *Marana* etc.³⁵ Usage of various Liquid media as *Bhavana Dravya* in *Shodhana* is enlisted in Table 4.¹³⁻³⁶

Table 4: Types of liquid media used as *Bhavana Drava* in *Shodhana*

Category of liquid media	Varieties of Media	Dhatu/Khanija/Visha dravya	Reference
Plant origin			
<i>Swarasa</i>	<i>Agastya patra</i> juice	<i>Manahshila</i>	RRS 3/93 ³⁶
	<i>Ardraka</i> juice	<i>Hingula</i> , Latex of <i>Ahiphena</i>	RRS 3/142, ³⁶ BR 3/265 ¹²
	<i>Bhringraja</i> juice (soaking)	<i>Kasisa</i>	RRS 3/45 ³⁶
	<i>Jambiri</i> juice	<i>Manahshila</i>	RT 11/111 ¹⁶
<i>Kanji</i>	Soaking in <i>Kanji</i>	<i>Sphatika</i> , Seeds of <i>Kupilu</i>	RRS 3/64, ³⁶ RT 24/172 ¹⁶
<i>Laksha Rasa</i>	-	<i>Tuttha</i>	RRS 2/129 ³⁶
Animal origin			
<i>Kshira</i>	<i>Go Kshira</i>	<i>Gairika</i> , <i>Bhanga</i>	RRS 3/49, ³⁶ RT 24/398 ¹⁶
	<i>Meshi Kshira</i>	<i>Hingula</i>	RT 9/14 ¹⁶
<i>Mutra</i>	<i>Go Mutra</i>	<i>Vatsnabha</i>	RRS 29/46 (<i>Atapashoshana</i>), ³⁶ RSS 1/380 (levigation) ¹³
<i>Dadhi</i>	<i>Go Dadhi</i>	<i>Hartala</i>	RT 11/83 ¹⁶
<i>Pitta</i>	Soaking in <i>Pitta</i>	<i>Kasisa</i>	RRS 3/45 ³⁶
<i>Artava</i>	Menstrual blood (soaking)	<i>Kasisa</i>	RRS 3/45 ³⁶
Mineral origin			
<i>Jala</i>	Water	<i>Mridarshringa</i>	RT 21/167-69 ¹⁶
<i>Churnodaka</i>	Lime water	<i>Hartala</i>	RT 11/25 ¹⁶
<i>Churnodaka</i>	Lime water (soaking)	<i>Manahshila</i>	RT 11/109 ¹⁶

RRS: Rasa Ratna Sammuchaya

Role of liquid media in *Marana*

Bhavana is an essential pretreatment of *Marana*. It is the process of transformation of *Rasavarga Dravya* by which *Shodhita* (purified) drugs are subjected for cycles of *Bhavana* and *Putana* (Incineration) thus transformed to efficacious, safe, absorbable, and bio-assimilable form (*Bhasma*). In this transformation, liquid media plays an important role which helps the process of *Marana*. Metals or minerals which have undergone the process of *Shodhana* are ground with

specified liquid; the process can be repeated several times and successive *Bhavana* are given after complete drying of previous one. Every liquid media possess some inorganic material. In *Bhasma* preparation, these inorganic contents are transferred to *Bhasma*. Besides, various herbal juices or decoctions, which are used in the process rendering metallic poison innocuous. Examples of various types of Liquid media for *Bhavana* in *Marana* are enlisted in Table 5.³⁷⁻⁴⁵

Table 5: Types of liquid media used as *Bhavana Drava* in *Marana*

Category of liquid media	Varieties of Media	Dhatu/Khanija/Visha dravya	Reference
Plant origin			
<i>Swarasa</i>	<i>Jambiri</i> juice	<i>Kasisa</i>	RT 21/255-58 ¹⁶
	<i>Kumari</i> juice	<i>Hartala</i>	RT 11/399-41 ¹⁶
<i>Kashaya</i>	<i>Palasha mula twaka Kwatha</i>	<i>Hartala</i>	RRS 3/74-75 ³⁶
	<i>Triphala Kwatha</i>	<i>Lauha</i>	RRS 5/125-26 ³⁶
<i>Kshira</i>	<i>Vata</i>	<i>Abhraka</i>	RRS 2/25 ³⁶
	<i>Arka</i>	<i>Hartala</i>	RT 11/35-38 ¹⁶
	<i>Snuhi</i>	<i>Abhraka</i>	RJN Vol 2, ch 1, p. 22 ³⁷
	<i>Kakodumbar</i>	<i>Parada</i>	RT 7/25 ¹⁶
<i>Taila</i>	<i>Eranda</i>	<i>Swarna makshika</i>	RRS 2/85 ³⁶
	<i>Dhattur</i>	<i>Parada</i>	PS 31/92 ³⁸
	<i>Bhallataka</i>	<i>Hartala</i>	Bhasma Vigyaniya p. 385 ³⁹
	<i>Kampillaka</i>	<i>Parada</i>	Bhasma Vigyaniya p. 121 ³⁹
<i>Sirka</i> (vinegar)	-	<i>Svarana</i>	Bhasma Vigyaniya p. 338 ³⁹
	-	<i>Abhraka</i>	Bhasma Vigyaniya p. 20 ³⁹
	-	<i>Kukuttanda Twaka</i>	Bhasma Vigyaniya p. 54 ³⁹
<i>Kanji</i>	-	<i>Kasisa</i> , <i>Abhraka</i>	RT 21/255-58, ¹⁶ BBR vol 5, p. 612 ⁴⁰
<i>Arka</i> (distillate)	<i>Gavjabana Arka</i>	<i>Sangeyashab</i>	RTS ²³
	<i>Gulab Arka</i>	<i>Mukta</i>	RT 23/41 ¹⁶
	<i>Pudina Arka</i>	<i>Hingula</i>	Bhasma Vigyaniya p. 401 ³⁹
	<i>Kevda Arka</i>	<i>Akika</i>	Bhasma Vigyaniya p. 9 ³⁹
<i>Madya</i> (liquor)	-	<i>Kukuttanda Twaka</i> , <i>Vanga</i>	Bhasma Vigyaniya p. 58, ³⁹ Bhasma Vigyaniya p. 256 ³⁹
<i>Drava Kalpa</i>	<i>Gulaba Jala</i>	<i>Akika</i>	Bhasma Vigyaniya p. 9 ³⁹
	<i>Guggulu</i> and <i>Shilajatu Drava</i>	<i>Vanga</i>	RC 14/142 ⁴¹
Animal origin			
<i>Kshira</i>	<i>Go Kshira</i>	<i>Mukta</i>	RT 23/70 ¹⁶
	<i>Nari Kshira</i>	<i>Trividha Loha</i>	RRS 5/113-15 ³⁶
	<i>Aja Kshira</i>	<i>Hartala</i>	Bhasma Vigyaniya p. 379 ³⁹
	<i>Avi Kshira</i>	<i>Hartala</i>	Bhasma Vigyaniya p. 385 ³⁹
<i>Kshira Malai</i> (milk cream)	-	<i>Abhraka</i>	Bhasma Vigyaniya p. 14 ³⁹
<i>Madhu</i>	-	<i>Yashada</i>	Rasamritam, ch 2, p.65 ⁴² Bhasma Vigyaniya p. 61 ³⁹

<i>Ghrita</i>	-	<i>Parada</i>	Anandkanda 23/43 ⁴³
<i>Mutra</i>	<i>Go Mutra</i>	<i>Abhraka</i>	RT 10/43 ¹⁶
	<i>Mahisha Mutra</i>	<i>Hartala</i>	RRS 3/74-75 ³⁶
	<i>Aja Mutra</i>	<i>Mrigshringa</i>	Bhasma Vigyaniya p. 306 ³⁹
	<i>Gardabha Mutra</i>	<i>Parada</i>	Bhasma Vigyaniya p. 120 ³⁹
	<i>Manduka Mutra</i> (soaking)	<i>Hiraka</i>	Bhasma Vigyaniya p. 289 ³⁹
<i>Rakta</i> (blood)	<i>Aja Rakta</i>	<i>Abhraka</i>	RT 10/57 ¹⁶
	<i>Matkuna Rakta</i>	<i>Hiraka</i>	RPS 7/27, ⁴⁴ RJN vol 3, ch 4, p. 173 ³⁷
	<i>Manduka Rakta</i> (soaking)	<i>Hiraka</i>	Bhasma Vigyaniya p. 287 ³⁹
<i>Artava</i> (Menstrual blood)	Soaking in <i>Artava</i>	<i>Hiraka</i>	Bhasma Vigyaniya p. 288 ³⁹
<i>Dadhi</i> (curd)	-	<i>Akika</i>	Bhasma Vigyaniya p. 10 ³⁹
	-	<i>Yashada</i>	Bhasma Vigyaniya p. 61 ³⁹
<i>Dadhi Mastu</i>	-	<i>Tuttha</i>	RT 21/120 ¹⁶
	-	<i>Hartala</i>	Bhasma Vigyaniya p. 372 ³⁹
<i>Kukkutanda Taila</i> (egg yolk)		<i>Loha</i>	Bhasma Vigyaniya p. 250 ³⁹
<i>Kwatha</i>	<i>Hasti Danta</i>	<i>Vaikranta</i>	Bhasma Vigyaniya p. 300 ³⁹
<i>Mamsa Rasa</i> (fish soup)	-	<i>Vanga</i>	Bhasma Vigyaniya p. 268 ³⁹
Mineral origin			
<i>Jala</i>	-	<i>Abhraka</i>	Bhasma Vigyaniya p. 13 ³⁹
<i>Drava</i>	<i>Tuttha Drava</i>	<i>Yashada</i>	Bhasma Vigyaniya p. 62 ³⁹
	<i>Svarna Jala</i>	<i>Vanga</i>	RK ⁴⁵
	<i>Tankana Jala</i>	<i>Abhraka</i>	BBR vol 5, p. 604 ⁴⁰
	<i>Svarjik Kshara Jala</i>	<i>Vanga</i>	Bhasma Vigyaniya p. 274 ³⁹

RJN: Rasa Jala Nidhi, RC: Rasendra Chudamani, PS: Parada Samhita, BBR: Bharat Bhaisajya Ratnakara, RK: Rasa Kamdhenu, RPS: Rasa Prakash Sudhakara

Examples of liquids for *Bhavana* in other pharmaceutical process

Various liquid media as *Bhavana Drava* are used in other pharmaceutical processes which are detailed in Table 6.³⁶⁻⁴⁶

Table 6: Various liquid media as *Bhavana Drava* in other pharmaceutical process

Pharmaceutical process	<i>Bhavana Dravya</i>	Drug/Formulation	Reference
<i>Samskara</i>	<i>Amalaki Swarasa</i>	<i>Amalaki Rasayana</i>	CHK 67/3 ¹⁷
<i>Amritikarana</i>	<i>Panchamrita, Kumari juice</i>	<i>Tamra</i>	RT 17/43-44 ¹⁶
<i>Lohitikarana</i>	<i>Rakta varga dravya</i>	<i>Abhraka</i>	RT 10/67 ¹⁶
<i>Satvapatana</i>	<i>Mushli Swarasa</i>	<i>Abhraka</i>	RRS 2/28 ³⁶
	<i>Panchagavya / Panchaaja</i>	<i>Abhraka</i>	RT 10/96 ¹⁶
	<i>Karanja Taila</i>	<i>Tuttha</i>	RT 21/139 ¹⁶
	<i>Kanji, Visha-Upavisha Kwatha</i>	<i>Chapala</i>	RRS 2/138 ³⁶
	<i>Eranda Taila, Madhu, Ghrita</i>	<i>Hartala</i>	RT 11/95 ¹⁶
	<i>Arka Kshira, Tila Taila</i>	<i>Hartala</i>	RRS 3/80-81 ³⁶
	<i>Ghrita</i>	<i>Manahshila</i>	RT 11/127 ¹⁶
<i>Nirutthikarana</i>	<i>Kumari Swarasa</i>	<i>Loha</i>	RT 20/80-81 ¹⁶
<i>Nirutthikrita Bhasma Pariksha</i> (free metal testing)	<i>Madhu, Ghrita in Mitrapanchaka</i>	<i>Loha</i>	RT 20/82 ¹⁶
<i>Kharaliya Rasayana</i>	<i>Nimbapatra Swarasa</i>	<i>Arogyavardhini Rasa</i>	AFI part 1, p.664 ²⁰
	<i>Sursa, Ardraka, Hema Swarasa</i>	<i>Tribhuvanakirti Rasa</i>	AFI part 1, p.684 ²⁰
	<i>Vacha Kwatha, Brahmi Kwatha, Jyotishmati Taila</i>	<i>Smritisagara Rasa</i>	RYS vol 2, ver 2450, p. 562, ²⁴ <i>Rasatantra Sara</i> and <i>Siddhaprayoga Sangraha</i> part 1, p.299 ²⁵
<i>Kupipakva Rasayana</i>	<i>Vatashringa, Kumari Swarasa</i>	<i>Rasasindoora</i>	RT 6/221 ¹⁶
	<i>Raktakarpara pushpa Swarasa</i>	<i>Makaradhvaja</i>	BR 74/114-123 ¹²
<i>Pishti</i>	Rose water	<i>Praval, Mukta</i>	ASS, Shodhana-Marana prakarana, p. 145 ¹⁹
<i>Nirvishikarana</i>	Soaking in <i>Gomutra</i>	<i>Vatsanabha</i>	BR 3/258 ¹²
<i>Matra Nirmana</i>	<i>Ardraka Swarasa</i>	<i>Gouripashana</i>	RT 11/147-49 ¹⁶
<i>Parada Bandha</i>	<i>Shilatoya,</i>	<i>Jala Bandha</i>	RRS 11/87 ³⁶
	<i>Dhatu+Vanaspati Bhavana</i>	<i>Abhasa Bandha</i>	RRS 11/67 ³⁶
<i>Mudra Nirmana</i>	<i>Atsi Taila</i>	<i>Madana Mudra</i>	Ayurvediya Rasashastra, p. 99 ⁴⁶
	<i>Shukara (pig) Rakta</i>	<i>Hatha Mudra</i>	Ayurvediya Rasashastra, p. 100 ⁴⁶
<i>Lepa Nirmana</i>	<i>Avalgujadi Lepa</i>	<i>Gomutra</i>	AFI part 1, p. 482 ²⁰
	<i>Dashanga Lepa</i>	<i>Goghrita</i>	AFI part 1, p.487 ²⁰

Role of liquid media in therapeutics

Media impregnates its active principles to the material and converts the inorganic material to organo-metallic or organo-mineral form which is suitable for body. Probable frequent alterations in Particle size during *Bhavana* and reduction at the end may increase absorption and improve bioavailability of the Drug. *Bhavana* can add some new properties to material and sometimes it enhances the original properties of drug to be levigated. Inclusion and induction of organic material and in *Bhasma* [product from chief inorganic material (*Rasavarga dravya*)] is possible by *Bhavana* with plant/animal origin liquids and thus their properties may also be introduced in to *Bhasma*. Induction of inorganic trace elements from liquid in to *Bhavita Dravya* may also help fulfilling trace element requirement of body and takes part in many physiological processes. Accordingly, the selection of media for levigation can change the therapeutic value too. Even the therapeutic action and palatability of drug can be improved and dose can be reduced by logical selection of liquid media and its quantity. In some formulations, the potency of single or compound drugs may be further potentiated by process of *Bhavana*, with their own juice or decoction.³ Here the levigation of powdered drug with liquid media having similar attributes, will not only yield combined effect of all ingredient drugs but can also change the effect of the drug (synergistic or change in action or addition of new action). Sometimes liquid media used in *Kharaliya Rasayana* may help in antagonizing action of some constituents of formulation e.g. *Bhavana* with *Gomutra* in *Sanjivani Vati*.²⁰

Discussion

Different pharmaceutical techniques are scientifically designed by ancient Ayurvedic scholars. Abundant examples of use of drug specific, motto specific liquids for *Bhavana* suggests the advancement of Ayurvedic Pharmaceutical science and may explore new horizon for finding relation between respective media and material. Maximum references of liquids for *Bhavana* in pharmaceutical preparations are of plant origin. Liquids extracted from different parts of plants viz. leaf, root, flower, fruit etc are advocated for *Bhavana*. Parts of plant origin drug and mineral origin drugs are usually processed to convert it to liquid for *Bhavana*; whereas, liquids from animal source are used in their native form. Different liquid media are from different sources and possess different physical, chemical and therapeutic properties and thus may influence the nature of the final product. Sometimes liquid media act as detoxifying agent and sometime help to augment the therapeutic efficacy of the drug. Ancient Ayurvedic seers had logically used specific liquid media for specific motto of *Bhavana* in case of certain drugs and certain indications e.g. *Triphala Kwatha* is widely used for *Bhavana* in *Loha Marana* where as *Amlavarga dravya* for *Marana* of drugs under *Sadharana Rasa*. *Hima*, *Phanta* and *Arka* are spared from *Bhavana* for *Marana* (*Agniputa*) etc. One can judiciously select liquid media, its quantity for *Shodhana*, *Marana*, *Bhavana* for *Samsakara* so as to achieve desirable physical, chemical or therapeutic characteristics in the final product (especially in case of *Kharaliya* formulations). Use of liquids for *Bhavana* in ancient classics lays many guidelines for further research e.g. *Bhavana* used for *dravya Shodhana* (*Nirvishikarana*) suggests desirable change in chemical constitution of *Visha dravya* rather than their extraction and removal.

On brief review of Ayurvedic classics it is noted that in case of *Kharaliya Rasa Kalpa* with *Bhavana*, therapeutic dose of individual ingredient is far more than their respective quantity in formulation in therapeutic dose. Thus possibly suggesting augmenting property of ingredients generated with *Bhavana*, and there is more possibility of generation of potent synergistic action in between constituents, as a result of *Bhavana* since there are only few *Kharaliya Rasa Kalpa* where *Bhavana* is not mentioned or is mentioned with water. The interaction of liquids of same drug or different drug in *Bhavana* process may give leads for development of newer pharmaco-kinetic-dynamic potent molecules.

As a general rule, *Bhavana* is advocated to be carried out in sunlight. Ultraviolet rays in sunbeam are photochemically active and said to be responsible to initiate chemical reactions. For photochemical reactions, photo sensitizers are essential; and earlier scholars had opined the probable role of *Bhavana drava* as photo sensitizers.⁴⁷ In few exceptions, *Bhavana* is indicated at night (in *Pishiti* preparations) probably to avoid contact of sunrays.

Thorough screening of compiled data revealed that, at least total number of 39 (Plant origin-15, Animal origin- 21, Mineral origin-3) variety of liquid media as *Bhavana drava* were found mentioned in ancient Ayurvedic classics. From pharmaceutical viewpoint *Bhavana* process has immense importance and utilized for various dosage forms.

Conclusion

Bhavana is unique and distinct pharmaceutical procedure in Ayurvedic Pharmaceuticals, which involves processing with various types of liquid media of - plant, animal or mineral origin, and enabling the physician to make desirable changes in the final product. Maximum examples of liquids used for *Bhavana* in pharmaceutical preparations are of plant origin, while maximum varieties of liquids used in Ayurvedic Pharmaceuticals are of animal origin.

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