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Bhawana - Importance in Pharmaceutics of *Rasaushadha*

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ABSTRACT

Bhawana is an important *Samskara* mentioned in classics by which even a small dose of a drug may be made to produce a very high result i.e. to increase its potency. *Bhawana* is a process of wet trituration. The *Shodhita* metals and minerals with specified liquid media for specified time duration and convert them into finer assimiliable form. Liquid media help in conversion of course powder to finer state. Impregnation of properties of media to the material which lead to unique and suitable physiochemical changes helping in incorporation of organic properties to inorganic substances. It is a systematic procedure of enhancing therapeutic qualities in individual drug as well as formulations. *Bhawana* exert constant pressure and frictional force. The toxic effects and unwanted properties may be neutralized because of influence of *Bhawana dravya*. Therefore, knowing of *Bhawana Dravya* mentioned during various *Bhasma* and formulation preparation has an important role. By virtue of which it loses and decrease the soluble impurities/ toxic property of the material and results in impartation of desirable therapeutic effects.

Key words: *Bhawana, Samskara,* Pharmaceutics.

INTRODUCTION

The procedure of steeping the powder of *Dhatus* and herbs with liquid substances like *Swarasa, Kwatha, Taila, Ghrita* etc. followed by trituration in *Khalva-Yantra* to dryness is known as *Bhawana*[1]

Bhavana is a soggy triturition method and also a technique used to reduce particle size, used in Ayurvedic pharmaceutics. It has multi - dimensional pharmaceutical and therapeutic implications. Ayurvedic literature revealed use of differant types of liquid media of plant, animal and mineral origin for *Bhavana*. *Acharya Charaka* defines *Samskara* as transformation of the inherent attribute and addition of extra properties to substance. Various modes of *Samskara* are mentioned in Ayurvedic pharmaceutics, viz *Svedana* (boiling), *Mardana* (grinding), *Manthana* (churning), *Bhavana* (impregnation).

It helps in increasing the properties and potency of a drug (*Guna Vriddhi*), but is also capable to bring about changes in characteristics of drug viz. regulation, addition of new qualities and / or deletion of undesirable characteristics (*Gunantaradhana*).[2]

It is not a single process but a combination of small stepwise processes like;

1. Combination (*Sanyoga*) of low potency drugs with specified liquid Medias to bring drugs of higher potency.
2. Modification in properties (*Gunantaradhana*)

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3. Trituration (*Mardana*) which produce the assimiliable particle size of the drug.
4. *Agnisannikarsha* occurs, as tritutaion produce heat by friction due to which causes chemical and physical bonding and there is conversion of properties from its previous form (transformed).

The selection of *Bhavana Dravya* depends on the habitat (*Desha*) of drug i.e. for giving *Bhavana* of *Shita Virya Dravya* they should be taken from Himalayan region and if *Bhavana* of *Ushna Virya Dravyas* has to be given, then they are collected from *Vindhya Pradesha.*

The duration and number of *Bhavanas* is also of great importance, as these are separately specified for specific drugs (*Dravyas*).

Bhawana is a process in which a drug or mixture of drugs in powdered form is triturated with sufficient quantity of liquid media (viz. plant expressed juice, decoction etc.) or animal products (mainly cow urine, milk etc. or as advised) till liquid portion gets absorbed completely and mixture gets dried.

Bhawana facilitates in proper mixing and firm binding between all components of ingredients of mixture, which leads to interaction between them or with liquid may results in physical as well as chemical interactions between them.

Quantity of media in *Bhavana*

The quantity of *Kasaya Dravya* must be equal to the quantity of the is added in the *Kwatha* prepration. Here the heat produced during grinding and the atmospheric heat helps in drying the materials quickly. By applying *Bhawana* the drugs are rendered fine and potentiated.[3]

If *Kwatha* is employed for *Bhawana* process it should always be *Astamamsa - Asasesita Kashaya* (reduced to 1/8th part)[4]

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 fulfil the following criteria (observed in the drug under *Bhawana*): *Ardrata* (wetting), *Kardmabha* (clay 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).

Cycles and duration of *Bhavana* [5]

1. Number of *Bhavana* - *Gandhaka Rasayana* - 84
2. Duration of *Bhavana* in days or hours is quoted in texts under various terms such as *Yama* or *Prahara* or Divas - *Aganikumar rasa (3 Yama).*
3. Types of liquid media - *Anand Bhairav Rasa (Jambiri juice), Brahmi Vati (Brahmi Hima), Kravyada Rasa (Panchkola Phanta Kalpna)*
4. Animal origin - *Vasantmalati Rasa* (Cow navneeta).
5. Mineral origin - *Karpur Rasa* (*Jala*).

Materials and Methods

In *Rasashastra* literature, the method of *Bhawana* is described as - Soaking of liquid media in chronological order with the *Rasaushadha Dravya* and grinding simultaneously. Liquid media is an essential material component of *Bhawana*.

Physiochemical changes induced by *Bhawana* in drug manufacturing

Bhawana 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.

Owing to binding capacity, hygroscopicity of liquid media especially its quantity may alter parameters of

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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 *Bhawana*, with better palatability. Ancient seers used drugs with non palatable attributes (in therapeutic doses) in the form of liquid media for Bhawana. *Bhawana Dravya* plays an important role in *Shodhana* process.

Sometimes media reduces toxicity of materials and induces desired qualities. Volatile impurities can be removed during grinding process of *Bhawana* and percentage of thermo-labile substances may get reduce. Media can increase therapeutic efficacy of drug.

Role of *Bhawana* in *Rasoushadhi* as per different context;

1. *Shodhana*
2. *Marana*
3. *Amrutikaran*
4. *Satawpatan*
5. *Aoushadh Yoga Nirman*
    a. *Pishti Nirmana*
    b. *Parpati kalpana*
    c. *Kupipakva Rasayana*
    d. *Pottali Rasayana*
    e. *Kharaleeya Rasayanas*

Bhawana Dravya in Shodhana

Sl.	Name of *Rasa Dravya*	*Bhawana Dravya*	Reference
1.	*Tuttha* (Copper sulphate or Blue vitriol)	*Rakta varg*	R.R.S. 2/29
2.	*Chapal* (Bismuth ore)	*Jambiri nimbu Swarasa* , *Swarasa* (Eclipta karkotika)	R.R.S.2/147
3.	*Gairik* (Ochre or Haematite)	*Gavya dugdha*	R.R.S.4/49 R.P.Su. 6/71
4.	*Kasis* (Ferrous sulphate or Green vitriol)	*Jambari nimbu Swarasa*(Citrus limon), *Bhrangaraj alba*)	Br.R.R.Su R.P.Su.6/65
5.	*Manah*-shiila (Realgar, Red arsenic)	*Agastya patra* swairasa(Sesbania grandiflora) *Agastya piatra Swarasa ,Adarak Swarasa*(Zingiber officinale)	R.R.S.3/93 R.P.Su.6/19, R.Chu.11/58
6.	*Anjana* (Lead & Antimony ore or compound , Collyrium)	*Bhrangaraj Swarasa* (Eclipta karkotika)	R.R.S.3/105
7.	*Kankutha* (Ruhbarb)	*Sunthi Swarasa* (*Zingiber* officinale) *Shrangver Swarasa* (Zingiber officinale) Shrestha-ambu	R.R.S.3/114 R.Sa.283 R.Chu.11/74
8.	*Hingula* (Cinnabar, Red sulphide)	*Nimbu swasasa* *Adarak Swarasa*, L *akuch Swarasa*	A. P. R.Chu.11/110
9.	*Abhrak* (Mica)	*Kasmard Swarasa* (Cassia occidentalis) *Nagarmotha Swarasa* (Cyperus rotundus), *Choarai Swarasa*, *Haritaki* (Terminalia chebula) *Swarasa*, *Amalki Swarasa* (Emblica officinalis) *Gavya dugdha*	R.Chu.10/26 R.Chu.10/30 R.Chu.10/34

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10.	*Vimal* (Iron Pyrite)	*Lakuch Swarasa* (Artocarpus lakoocha)	R.Chu.10/ 88
11.	*Swarna* (Gold, Aurum)	*Panchmaratika*, *Matulung Swarasa* (Citrus medica)	R.Sa.S.257
12.	*Sadharan Rasa*	*Matulung Swarasa* (Citrus medica)	R.Chu.11/ 113
13.	*Kharpar* (Zine ore or Calamine)	*Jau Kangi*	R.Sa.S.203
14.	*Tankan* (Borax , Sodium pyro borate)	*Jambiri* , *Nimbu Swarasa* (Citrus limon), *Gomutra* (Ropya yantara)	R.Sa.S.250
15.	*Nilanjana* (Galena)	*Nimbu Swarasa* (Citrus limon)	R.Sa.S.234
16.	*Kant-Pashan* (Lead stone)	*Amla- varga*	R.Sa S. 203

Bhawana Dravya in Marana

Sl.	Name of *Rasa Dravya*	*Bhavana Dravya*	Reference
1.	*Abhraka* (Mica)	*Erand Patra Swarasa* (Ricinus communis)	R.R.S. 2/26
2.	*Makshik* (Pyrite)	*Nimbu Swarasa* (Citrus limon)	R.R.S2/84 R.Sa.282
3.	*Vimal* (Iron Pyrite)	*Lakuch Swarasa* (Artocarpus lakoocha)	R.R.S.2/10 0
4.	*Shilajit* (Asphaltum, Panjabinum, (Bitumen)	Matuilung *Swarasa* (Citrus medica)	R.R.S2/119
5.	*Kasis*	*Kangi*	R.T.29/255 -58
6.	Harital (Orpiment, Yellow arsenic)	*Peepal Twak Kwatha* (Ficus religiosa) *Arka Dughda* (Calotropis procera) *Kumari Swarasa* (Aloe vera) *Nimbu Swarasa* *Churanodak*	R.R.S.11/3 0-34 R.R.S.11/3 5-38 R.R.S.11/3 9-41 R.Sa. 385 R.Sa.S.199 R.Sa.S.199
7.	*Mandur* (Iron oxide)	*Triphala kwatha*	R.T.20/129 -131
8.	*Naag Dhatu* (Lead , plumbum)	*Vasa patra Swarasa* (Adhatoda vasica)	R.T.19/24-28
9.	*Prawal* (Coral)	*Kumari swasara* (Aloe vera) *Satawari Swarasa* (Asparagus racemosous), *Gavya dugdh*, *Jyanti Swarasa* (Sesbania sesban)	R.T.23/134 -135
10.	*Tutth* (Copper sulphate or Blue vitriol)	*Lakuch Swarasa*	R.Sa. 283 R.P Su.73 R.Chu.10/ 76
11.	*Swarna* (Gold, Aurum)	*Bijora nimbu Swarasa* *Snuhi Kshira*(Euphorbia neriifolia) *Matulung Swarasa*	R.P.Su.14 R.p.Su.16 R.Chu.14/ 17
12.	*Rajat* (Silver, Argentinum)	*Lakuch Swarasa*	R.Chu.14/ 34
13.	*Tambra* (Copper, Cuprum)	*Lakuch Swarasa*	R.P.Su.36 R.Chu.14/ 34
14.	*Heera* (Diamond)	*Matkun Shonita* *Lakuch Swarasa*	R.P.Su.7/2 7 R.Chu.12/

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			32
15.	*Ratna* (Gems)	*Lakuch Swarasa*	R.R.S.4/63 R.P.Su.7/27
16.	*Loaha* (Iron, Ferrum)	*Gharat Kumari*	R. Sa. 276
17.	*Rajavart* (Lapis, Lazuli)	*Bharngraaj Swarasa*	R.P.Su.57

Bhawna Dravya in Amritikarana

Sl.	Name of *Rasa Dravya*	*Bhawana Dravya*	Reference
1.	*Tamra Amritikarana*	*Nimbu Swarasa*	R.T.17/43-44

Bhawna Dravya in Satwapatana

Sl.	Name of *Rasa Dravya*	*Bhawana Dravya*	Reference
1.	*Shilajit* (Asphaltum, Panjabinum, (Bitumen or Mineral pitch)	*Amal Dravya*	R.R.S 2/122
2.	*Tuttha* (Copper sulphate or Blue vitriol)	*Nimbu Swarasa*	R.R.S.1/134 R.Chu.10/78
3.	*Vish* and *Upvish*	*Kanji*	R.R.S.2/148
4.	*Saphatika* (Potash Alum)	*Gavya Pitta*	R.R.S.3/65
5.	*Hartaal* (Orpiment, Yellow arsenic)	*Arak Dughda* *Gomutra* *Kulath Kwatha*	R.R.S.3/80 R.Chi.109 R.Chu.
			11/36
6.	*Sadharan Rasa*	*Matulung Swarasa*	R.Chu. 11/114

Bhawana Dravya in other formulations

a. *Pishti Nirmana*

b. *Parpati Kalpana*

c. *Kupipakva Rasayana*

d. *Pottali Rasayana*

e. *Kharaleeya Rasayana's*

Sl.	Name of *Rasa Dravya*	*Bhawana Dravya*	Reference
1.	*Abharak Rasayan*	*Bhrangaj Swarasa, Chitrak Swarasa, Nirgundi Swarasa*	R. Sa. 369-370
2.	*Moti Rasayan* (pearl)	*Adarak Swarasa*	R.Chu.13/10
3.	*Prawal Rasayan* (Coral)	*Matulung Swarasa*	R.Chu.13/12
4.	*Marakat* (Emerald, Beryl, Aqua marina)	*Ambu*	R.Chu.13/32
5.	*Pushpraag* (Topaz)	*Ambu*	R.Chu.13/37
6.	*Gomeda* (Zircon, Agate, Cinnamom stone)	*Lakuch Swarasa*	R.Chu.13/58
7.	*Vang* (Tin, Stannum)	*Kumari Swarasa*	R.Chu.14/140
8.	*Naag* (Lead, Plumbum)	*Triphala Kwatha*	R.Chu.14/157
9.	*Ras-pottali*	*Tambul Patra Swarasa*	R.P.Su.28
10.	*Ras-parpati*	*Bhrangraaj*	R.P.Su.58

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		Swarasa	
11.	*Swarna Nirmana*	*Palash Twak Swarasa, Kumari Swarasa, Peet-kasis*	R.Chi.16
12.	*Roupya Nirman*	*Nimbu Swarasa*	R.Chi.31
13.	*Ras-sindur Nirman*	*Bargad Jaaja Kwath*	R .Sa .S. 68
14.	*Ras-maanikya Nirman*	*Kushmand Swarasa, Dadhi*	R.Sa.S.101
15.	*Hingul se Parad Nishkasan*	*Jambiri Nimbu Swarasa, Changeri Swarasa*	R.Sa.S.55
16.	*Parad*	*Nimbu Swarasa*	R.Chi.16

R.R.S. – Rasaratnasamucchaya
R.Pra.Su. – Rasprakashasudhakara
R.Sa.S. – Rasendrasarasamgraha
R.T. – Rasatarangini
R.Chi. – Rasachintamani
R.P.Su. - Rasa Prakash Sudhakaar
R.Sa. – Rasayana Saar

Discussion

A distinct principle of producing a drug, compatible with human body, is observed in the processing of mineral substances and *Bhavana* is one of such processes needed to prepare various effective dosage forms. The mineral or metallic material is treated with plant or animal substances, compatible with the body. In certain cases substances non-compatible with the human body such as minerals like orpiment (*Hartaal*), realgar (*Manshila*) were also used in processing. However in such cases the ultimate object of the processing is to produce an assimilable product for the human body, without producing harm in therapeutically effective doses. During manufacturing of various *Rasaushadhis* and other herbo-mineral formulations it is important to properly regulate and supervise the process of *Bhavana* in a standardized manner.

Honey is self preserving mainly due to its high osmotic pressure which prevents most microorganisms being viable in it. However if diluted (eg. with water) it is an excellent medium for microbial growth.[6] The reason that honey can have preservative properties is that it contains very small amounts of chrysin, pinobanksin, catalase, pinocembrin, and ascorbic acid (possibly due to their natural presence in the nectar that bees collect from plants), and these substances can have antioxidant properties.[7]

Lemon juice's high acidity means that it has a high concentration of hydrogen ions. Like other acidic substances, lemon juice is sour and can corrode metals. Its corrosive properties make it a useful ingredient in cleaning products, because it softens the minerals in hard water, allowing the cleaning agents to work more effectively.[8] It is a natural preservative which is present in citrus fruits.[9]

Milk is an emulsion of fat globules and a suspension of casein micelles (casein, calcium, phosphorous), all of which are suspended in an aqueous phase that contains solublized lactose, whey proteins and some minerals.[10] As milk is taken as a purifying **a**gent and is rich in calcium. Generally, calcium is a reducing agent, used for reduce metals.

Conclusion

Bhavana plays a very important role in making the Ayurvedic metallic and mineral preparations free from toxicity and making the easily absorbable into the system. Remove harmful substances or impurities present in the drugs. The natural properties are also enhanced and even new properties are also inducted. During wet grinding method, combination gets correctly uniform and substance becomes pliable, silky and gummy, which facilitates improved required of material (especially in *Kharaliya Rasayana*) and tablets or pellets can be made easily.

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