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### Review Article

#### PERIODICAL DEVELOPMENT OF TRADITIONAL FERMENTED AYURVEDA FORMULATION *LOHASAVA*

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#### ABSTRACT

Ayurveda comprises of a range of medicines including the fermented forms specifically *Arishtas* (fermented decoctions) and *Asavas* (fermented infusions). *Lohasava* are derivatives of primitive form of processing of iron i.e. '*Ayaskriti*'. The resemblance between the constituents of *Lohasava* shows the progressive development of *Lauhakalpa* basing upon fundamental principles of Rasashastra. In this paper details about *Lohasava*, their different pharmaceutical variations apart from other relevant information have been highlighted. This paper covers all the essential details of *Asavarista* (classification of *Sandhana kalpana*, Indication of *Sandhana prakriya*, S.O.P. For form of Iron to be used etc.) physicians to prescribe and a teacher to educate his pupils about *Lohasava*.

**KEYWORDS:** *Lohasava*, Periodical, *Asav*, *Arista*.

#### INTRODUCTION

The deliberate advice of *Acharya Sushruta* to the for coming scholars to adopt their pharmaceutical skills in designing newer preparations utilizing the basic fundamental principles has laid in the genesis of countless number of preparations. This list is even good enough with regard to the formulations where two different dosage forms are prepared with little variation in their constituents, used for the common ailments. *Lohasava* is a peculiar formulation governing *Sandhana prakriya* (fermentation reaction) where metallic properties of *Lauha* (iron) are utilized and incorporated by means of production of self generated alcohol.

#### Historical Background

The common belief regarding '*Lohasava*' is that it firstly came into existence around 12<sup>th</sup> century, when *Acharya Shodhala* quoted it in *Gada-Nigraha*. However if the developmental sequence is deeply studied, one can easily infer that although it is not mentioned in *Samhita period* by the name of '*Lohasava*' the milestone still lies there in form of *Ayaskriti*. *Ayaskriti* has been discussed earlier in context of *Lauha bhasma*. It is a process of converting iron into a powder form (microfine) just to make it

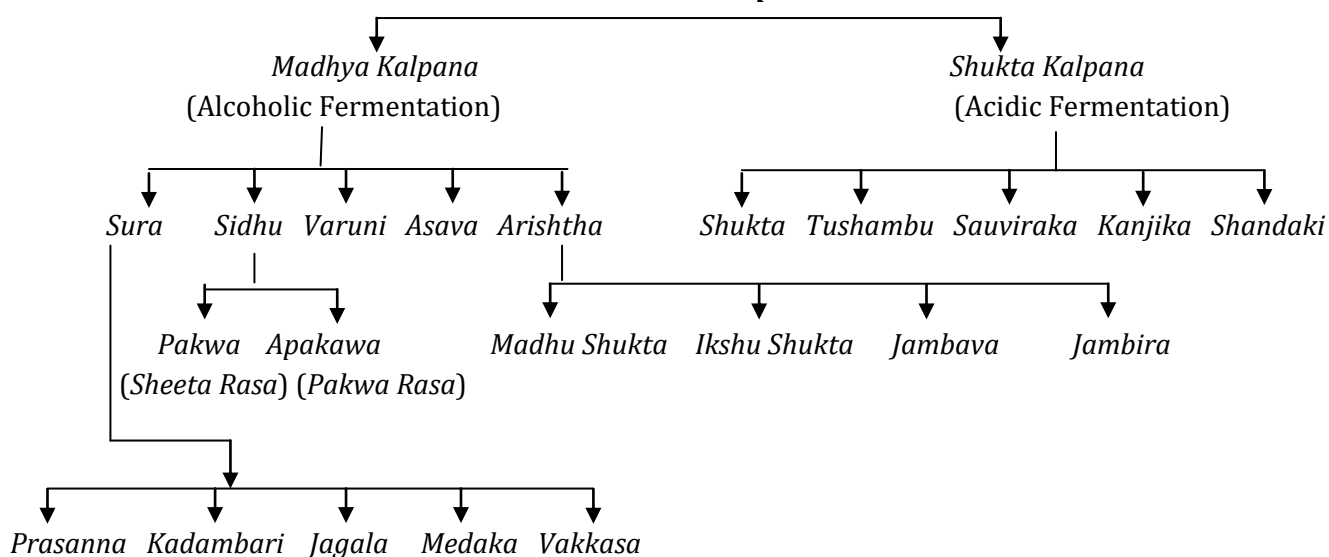
easy for assimilation in the body, which is further of three types viz., *Churna*, *Leha* or *Asava*.

#### *Sandhana Kalpana*

*Sandhana* refers to Joining/Union/Mixing/Compounding/Distillation/Fermentation/ Spirituous liquor.<sup>[1]</sup> The process of preparing the medicine by soaking the drug either in powdered form or in form of decoction in a solution of sweetening agent for a desired period of time during which the active principles contained in the drug are extracted out by means of generation of alcohol is denoted as *Sandhana Kalpana*. The drugs soaked in a particular formulation include *Pradhana dravya* (chief ingredient), *Prakshepa dravya* (supportive ingredients), *Sandhana dravya* (fermentation initiators), *Madhura dravya* (sweetening agents), *Drava dravya* (chiefly *Jala* or decoction of herbs). However this differentiation is merely a broad one and the drugs included among one group can fall in another.

#### Classification

No clear-cut demarcation is found in respect of *Sandhana Kalpana* in ancient literature. *Acharya Yadavji* has broadly classified it as shown.

**Sandhan Kalpana**

Being integral part of *Madhya Kalpana*, *Asava-Arishtha* assumes a specific place among the divisions of *Sandhana Kalpana* and possesses characteristic properties that make them short acting thereby potentiates their therapeutic values. During *Samhita* period the terms *Asava* and *Arishtha* are apparently used as synonyms and it was during the period of *Sharangadhara* viz., 13<sup>th</sup> century when clear-cut demarcation between these two is made on the account of heat treatment.

*Asava* is the medicinal preparation obtained by undergoing fermentation reaction in raw form or without heat treatment is '*Asava*'.

*Arishtha* is the medicinal preparation obtained by undergoing heat treatment is "*Arishtha*".

**General Rule with regards to a *Sandhana Kalpana*:** If the quantity of *Drava dravya* is not specified it should be 1 *Drona* and *Guda* (jaggery) is 1 *Tula*, *Kshoudra* (honey) is to be added 1/2 to *Guda* i.e., 1/2 *Tula* and *Prakshepa dravya* should be 1/10 of *Guda*. *Deepika* commentary on S.S.M.K. 10/3 advocates taking 2 *Drona* of *Drava dravya*. *Jala* is to be used when *Drava dravya* is not prescribed.<sup>[2]</sup>

**Indication of *Sandhana prakriya*:** *Bheshaja Samhita* has quoted the specific indications specifying the extent of reaction, which is otherwise not seen in texts of ancient period. Appearance of *Budbuda* (effervescence) is due to CO<sub>2</sub> gas which tries to come out of the vessel generated as a result of the process of fermentation. Appearances of typical smell or colour. Similarly, the indication of completion of fermentation reaction has also been described in a brief manner quoting to keep the medicine for reaction till fermentation<sup>[3]</sup> is attained. The developmental sequence of *Lohasava* as well as the

other preparations which has laid the idea of '*Lohasava*' is as under

***Triphaladyarishtha***<sup>[4]</sup>**Ingredients**

*Pradhana dravya* - *Lauha raja*, *Prakshepa dravya* - *Phalatrika*, *Deepyaka*, *Chitraka*, *Pippali*, *Vidanga*, *Madhura dravya*-*Madhu*, *Guda*, *Drava dravya*-Not specified (*Jala*). For *Deepyaka* most of the authors advised to take *Yavani* whereas some others suggest to take *Jiraka*.<sup>[5]</sup> According to *Shaligram aushadha shabda sagar*, *Deepyaka* is *Yavani* or *Ajmoda* whereas *Jiraka* is *Dipya* rather than *Deepyaka*<sup>[12]</sup>. Further *Jeeraka* is *Grahi*<sup>[13]</sup> and *Yavani* is *Vatanulomaka*<sup>[14]</sup> (carminative) in action, which is most suited to achieve the indication of the disease and thus should be strongly recommended.

***Loharishtha -A***<sup>[15-22]</sup>**Ingredients**

*Pradhana dravya* - *Teekshna Lauha*, *Prakshepa dravya*-*Drugs of Pippalyadi gana*, *Madhura dravya* -*Madhu*, *Guda*, *Drava dravya* - *Decoction of drugs of Salasaradi gana*.

***Loharishtha -B***<sup>[25, 26]</sup>**Ingredients**

*Pradhana dravya* - *Teekshna Lauha*, *Prakshepa dravya*-*Drugs of Vatsakadi gana*, *Madhura dravya*-*Guda*, *Madhu*, *Drava dravya*-*Decoction of Asanadi gana* 1:8 → ¼

***Manduradyarishtha***<sup>[23-29]</sup>**Ingredients**

*Pradhana dravya*-*Mandura*, *Lauha*, *Prakshepa dravya* -*Kola*, *Danti*, *Chitraka*, *Vidanga*, *Pippali*, *Triphala*, *Madhura dravya*- *Guda*, *Drava dravya*-*Jala*.

**Lohasava –I** [30-32]**Ingredients**

*Pradhana dravya-Lauha Churna, Lauha Kitta, Prakshepa dravya- Triphala, Nimba, Patola, Musta, Patha, Amrita, Chitraka, Chandan, Vella, Samanga, Madhukshara, Karchura, Vasa, Trivrita, Haridra, Duralabha, Parpataka, Kantakari, Shakrashana, Yasaka, Charmaranga, Shashanklekha, Kapikacchu, Methi, Bilva, Kutaja, Tikta, Triyantika, Pushkaramula, Kebuka Jeevaniya., Sandhana dravya - Khadira sara, Madhura dravya-Not specified, Drava dravya- Not specified. As Drava Dravya and Madhura Dravya are not prescribed here, it should be taken according to the definition. For Madhura dravya some texts suggest to take Guda while others prescribed Guda as well as Madhu. Lauha kitta, which is prescribed in Tula pramana, is supported to be 1 Pala by V.A.A.V.*

**Controversies regarding Kebuka-jeevaniya**

According to Vidyotini Hindi translation of Gada-Nigraha by Indra deva Tripathi *Kebuka-jeevaniya* refers to *Kebuka and Jala. Kaviraj Devi Singh Vitthal* interpreted it as *Shalinch shaka* and drugs of *Jeevaniya gana*. He further recommended the substitutes of these drugs as mentioned in Bhava-Prakash or the drugs used for them in Unani pharmacopoeia or even drugs with same pharmacological properties in case of scarcity. The drug *Kebuka* itself lies in controversy as some suggest it to be *Shalinch shaka* (mentioned above) whereas according to some other it is a drug found in hilly areas and locally popular as '*Kemua*' and interpreted as beet root. According to Shaligram aushadha shabda sagara *Kebuka* is interpreted as "*Kemuka*" a type of tree where as drugs of *Jeevaniya gana* is to be taken with *Jeevaniyam*.<sup>[33]</sup>

**Lohasava –II** [34-43]**Ingredient**

*Pradhana dravya- Lauha churna, Drava dravya- Jala, Prakshepa dravya- Triphala, Trikatu, Yavani, Vidanga, Mustaka, Chitraka, Dhataki, Madhura dravya- Madhu, Guda*

**Lohasava-IIa** : Same formulation as *Lohasava-II* but without *Dhataki*.<sup>[44, 45]</sup>

**Lohasava-IIb**

Same formulation as *Lohasava-II* but without *Dhataki* and containing *Yavasa* in place of *Yavani*.<sup>[46]</sup>

**Points worth consideration regarding SOP during pharmaceutical operation as mentioned in Ayurvedic literature**

For any pharmaceutical operation certain *Purva karma, Pradhana karma* and *Pashchat karma* have been advocated. These procedures play immense role especially in the process undergoing

*Sandhana prakriya* as slight mismanagement can cost a lot damaging the final product.

**Bhajana or choice of container**

Ancient text suggests using either earthen pot or wooden pot if not specified. Apart from these containers made up of Gold, Silver, Iron etc were also used earlier. These days, double-jacketed stainless steel container or food grade P.V.C. containers are also in use.

**Lepana or Dhupana Sanskara**

These *Sanskara* are specifically recommended in ancient literature to achieve sterilization. Specifically drugs of aromatic nature like *Pippali, Maricha, Jatamansi, Guggulu* etc. possessing *Krimighna* potential are used for this purpose.

Further, *Ghrita* is also advised by many for *Lepana* purpose.

**Optimum place**

Ideally the process of *Sandhana* (fermentation) takes place at a temperature around 35°C. To achieve this optimum environment various modes like keeping the preparation under heap of *Yava, Bhugarbha, Kosthagara* etc. are advised.

**Duration for fermentation Reaction**

In general the fermentation reaction starts on 3<sup>rd</sup> day and comes to an end by 7 to 30 days. This further depends upon the climatic condition, nature of the media and ratio of drugs added which directly act to initiate the reaction. Literature reveals this period to be as short as 3-7 days as in *Yogarajasava* to as long as till 3-4 months as in *Loharishtha*.

**S.O.P. – For form of Iron to be used**

In preparation of *Lohasava-Lauha churna, Mandoor churna, Lauha druti, Kasisha* etc. are used in practice. But dissolution of metal in such a form is doubtful. To overcome this dilemma most of scholars are of the view of taking *Lauha bhasma* which is to be further refined prior to use. The various views in this regard are summed up as. Iron subjected to *Bhanupaka* or *Sthalipaka* after *Shodhana* can be used. *Lauha bhasma* kept in the decoction of *Haritaki* for 3 days and there after mixed powder of *Amalaki* and *Bibhitaka* for 2 days can be used on the 4<sup>th</sup> day of the preparation *Lauha churna* mixed with powder of *Triphala* in water and kept for 7 days. *Lauha bhasma* prepared after levigation with *Ghritakumari* and then kept under sunrays with the decoction of *Haritaki* or *Triphala kwatha* for 7 days. *Lauha bhasma* prepared with 3-4 *Putra* (calcination) with *Triphala kwatha*. The quantity in which *Lauha bhasma* is to be added in *Lohasava* is in accordance to 4g/L. Although A.F.I. too suggests to take *Lauha bhasma* in place of *Lauha churna* in all preparations containing iron used for internal application but with reference to the

quantity specified, it has suggested to deduce it from ½ Tula to ½ Pala, in context of Kumaryasava but kept silence with reference to Lohasava.

**Dose and Mode of Administration**

Much information is not available to recommend a fixed dose as well as mode of administration for Asava-Arishtha. In context of Loharishtha Acharya Sushruta advocate it according to the strength of the individual.<sup>[60]</sup> Acharya Sharangdhara advised a common dose of 1 Pala (48 gm) <sup>[61]</sup> for all such preparations. Adhamalla in his Deepika commentary on Sharangdhara samhita suggested taking it with equal quantity of water to avoid of incidence of Madatyaya due to over indulgence. He also mentioned a general rule of consumption of Asva Arrishta according to day schedule.

Dose	Time	Anupana
2 Pala	Morning	with Upadansha,
4 Pala	Afternoon	with oily meals
8 Pala	Evening	As Rasayana

The author of Asava-Arishtha Vigyaniam recommended 4 Pala to be the Pravara, 2 Pala to be Madhyama and 1 Pala as Avaramatra of Asava-Arishtha whereas Vrihat Asava-Arishtha vigyaniam suggests taking it till symptoms of Madatyaya appear. Some other views of scholars of recent period with proper schedule and Anupana are as under.

**DISCUSSION**

The formulation with the name of Lohasava, a refined form of Ayaskriti, firstly came in Gada nigraha of Shodhala although the basic concept was mentioned in Samhita period itself by the names of Triphalarishta, Manduradyrishta or Punarnavarishta etc. By the names of Lohasava two formulations came across. The first

one was mentioned by Shodhala in Gada Nigraha whereas the other formulation was quoted by Sharagadhar.

The second Lohasava as mentioned in Sharangadhara Samhita itself underwent some changes with the pace of time like omission of Dhataki or use of Yavasa in place of Yavani Dhataki mainly serves to enhance the process of fermentation but formulation even without Dhataki successfully undergo fermentation reaction due to the presence of Madhura dravya (sweetening agent) providing nutritive media to fermentation organism. Thus presence or absence of Dhataki does not make any big difference in the product. Similarly in some of the texts instead of Yavani, Yavasa has been recommended. Yavani is Vatanulomaka<sup>[24]</sup> thus counteracts the constipative property of Lauha and thereby helps in potentiating the action of the formulation. Contrary to it, as Yavasa neither possesses any such properties nor do exert any effect in fermentation initiation strongly recommends the use of Yavani in the formulation. Further, in Bhavaprakash Nighantu one synonym for Yavani is Yavsahva which might be mistakenly interpreted for Yavasa by those scholars.

**CONCLUSION**

The study demonstrates the therapeutic potential of Lohasava. Lohasava rather to be called as product of Sandhana Kalpana (as in practice) should be considered as a type of 'Ayaskriti' dealing with Sandhana prakriya. Apart from Ayaskriti there lies other evidences of developmental sequence of Lohasava during Samhita period by the name of Triphalarishta, Loharishtha, Manduradyarishtha with different constituents but consuming Lauha and/or Mandura as a chief drug and indicated for almost common ailments, specifically Pandu roga.

**Table 1: Constituents of textual variations of Lohasava-II**

S. No.	Formulation	Pradhana Dravya Lauha Churna	Prakshepa dravya											Madhura Dravya		Drava Dravya		
			Pippali	Maricha	Shunthi	Haritaki	Bibhitaka	Amalaki	Vidanga	Mustaka	Chitraka	Yavani	Yavasa	Sandhan dravya Dhataki	Madhu	Guda	Jala	
1	Lohasava- II	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	Lohasava -IIa	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	✓
3	Lohasava- IIb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓
Ratio		1	10											1	16	25	128	

**Table 2: SOP during pharmaceutical operation as mentioned in Ayurvedic literature**

Formulation	Bhajana or container specified	Lepana/Dhupana	Desha (optimum place)	Kala (duration for fermentation)
Triphalarishtha	Specified N.S.	Smearred with Ghrita	Yava rashi	1 month
Loharishtha-I	N.S.	Smearred with Pippali + Madhu previously rubbed with Ghrita	Yava rashi	3-4 month
Loharishtha-II	Made up of Laksha	Smearred with Pippali + Madhu previously rubbed with Ghrita	Yava rashi	N.S.
Manduradyarishtha	N.S.	N.S.	Yava rashi	15 days
Lohasava-I	N.S.	N.S.	Alternately under sunrays and moon rays	21 days
Lohasava-II	N.S.	Smearred with Ghrita	N.S.	1 month till fermentation

**Table 3: Therapeutic Indication**

S.No.	Formulation	Indications																									
		Pandu	Shwvathu	Gulma	Jathar roga	Arsha	Kushtha	Pleha-vikar	Kandu	Kasa	Shwasa	Bhagandar	Arochaka	Grahini	Hrid roga	Iwara	Prameha	Koshtha badhta	Shakha gata	Hikka	Kilasa	Halimaka	Abhishyanda	Sthaulaya	Agni vardhan	Krimi	Kapha vikar
1	Triphalarishtha	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-
2	Loharishtha-I	✓	✓	✓	-	-	✓	✓	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-	✓	✓	✓	-	-
3	Loharishtha-II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Manduradyarishtha	✓	✓	-	-	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓
5	Lohasava-I	Sarva roga nashana																									
6	Lohasava-II	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
7	Lohasava-IIa	✓	✓	✓	✓	✓	-	✓	-	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	-	-

**Table 4: Dose schedule for Lohasava**

Text	Dose	Schedule	Anupana (vehicle)
A.A.V.	20-25 gm	Two times after principle meal	Equal quantity of water
A.A.V.	1-1½ Tola or according to Bala, Vaya etc.	N.S.	With equal half or double the quantity of water
V.A.A.V	1-2 Tola or 2-10 drops	Two times after principle meal or according to need	N.S.
R.T.S. and S.Y.S	1-2 Tola	Two times after principle meal	Equal quantity of water
B.S.	1-2 Tola	N.S.	Jala
A.S.S	1-2 Tola (strong person) 2-4 Tola (weak person) 3-6 Masha (children) 15-30 drops (infant)	N.S.	With equal or double the quantity of water
A.F.I	12-24 ml	N.S.	N.S.

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