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# Pharmaceutical Standardization of *Lauha Bhasma* and its Herbo-Mineral Formulation *Vidangadi Lauh*

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**ABSTRACT**
*Effort has been made to lay down pharmaceutical standards for Vidangadi Lauh which is used in treatment Shoth, Anemia and Jaundice etc. There is shift towards use of herbal medicine. Consumers prefer products with established standards. Therefore it is prime need to standardize Ayurvedic preparation to insure their purity, safety, potency and efficacy. Now a day, herbal medicines are being manufactured on large scale. Manufacturers face many problems such as low quality raw materials, lack of authentication of raw materials, non-availability of standards, proper standardized methodologies of single drugs and formulations and lack of quality control parameters.*
**Key words:** *Vidangadi Lauh, quality control, standardized methodologies, Anemia.*

## INTRODUCTION

Ayurvedic physicians profusely use metals and minerals. In the current era, Rasaushadhies have given Ayurveda a complete health care. Manufacturers face many problems such as lack of proper standardized methodologies and lack of quality control parameters. The present study has been planned to accomplish following aims and objectives:

- To procure standard basic materials *(Lauha)* and other raw drugs used in the preparations.
- To validate the process of *Shodhana* and *Marana* of *Lauha.* and introduce a S.O.P. for preparation of *Lauha Bhasma*.
- To prepare herbo-mineral drug *Vidangadi Lauh.*

## MATERIALS AND METHODS

The whole pharmaceutical study can be described under following subheading:

1. **Collection of raw materials**

All the raw materials were obtained from P.G. Deptt. of Rasa Shastra, Govt. Ayu. College, Patna. These were identified by experts of the Department to confirm them as a genuine drug.

2. **Pharmaceutical processing**

A. *Samanya Shodhana* of *Lauha*
B. *Vishesha Shodhana* of *Lauha*
C. *Marana* of *Lauha*
D. Preparation of *Vidangadi Lauh*

**A. Samanya Shodhana of *Lauha***

**Reference:** Rasatarangini : 15/7
**Material:** Raw *Lauha*
**Media:** *Kadalikanda Swarasa* (Root of medium sized Kadali plant was taken. After

cleaning it was made into small pieces. Pieces of Kadalikanda were crushed with the help of mixer machine and made into paste. Then Swarasa was got by percolating through the cloth.)

**Principle:** *Nirvapa* (heating and quenching)

**Procedure:** The reference of amount of liquid media is not found in the classics, so equal amount of liquid media is taken for the quenching (Anukt mana). *Lauha* was taken in iron pan and was heated on gas stove up to red hot and then quenched in *Kadalikanda Swarasa*. Process was repeated for seven times. Every time fresh *Kadalikanda Swarasa* was taken.[1]

**Observations**

Brittleness of *Lauha* was increased after each *Nirvapa* due to which its some part changed to coarse powder. *Lauha* accumulated together during heating and also got attached with the Pan.

Some particles were coming out from the vessel with vapour during quenching.

Colour of *Lauha* changed grayish black to blackish brown.

When red hot Lauha was quenched in *Kadalikanda Swarasa*, it started to boil.

Colour of *Kadalikanda Swarasa* changed dark reddish brown to blackish brown.

During quenching a specific smell emerged.

**B. Vishesha Shodhana of *Lauha***

**Reference:** Rasa Ratna Samuchhaya: 5/103

**Material:** Samanya Shodhita *Lauha*

**Media:** *Triphala Kwatha* (Reference: Rasa Ratna Samucchaya: 5/102.

**Principle:** *Kwathana* (boiling).

**Procedure:** *Haritaki, Amalaki* and *Bibhitaki* were taken in same amount and crushed to remove the seeds and made to Yavakuta. 8 times water was taken in a big clean stainless steel vessel. *Yavakuta Triphala* 24.8 kg was poured into the vessel and kept for whole night. Next day it was mixed and was heated on gas stove in open air in mild fire till the liquid part was diminished to 1/4th. It was percolated by cloth and the liquid part was collected for *Shodhana process*.)

**Procedure:** Samanya Shodhita *Lauha* was taken in iron pan and was subjected to heat with the help of gas stove. When Lauha turned to red hot. Then it was quenched in *Triphala Kwatha,* which was taken in a stainless steel vessel. After cooling down *Lauha* was removed from the vessel and kept for drying. Process was repeated for seven times. Every time fresh *Kwatha* was prepared.[2]

**Observation**

During heating when Lauha became red hot a flame was observed.

Some particles of *Lauha* got attached to the pan.

A cracking sound was observed during heating.

Light particles of *Lauha* was coming out from the vessel during quenching.

Particles size was decreased due to brittleness.

After Shodhana *Lauha* became more black.

Triphala kwatha started to boil during quenching and overflowed from the vessel.

Colour of Kwatha changed brown to blackish.

**C. Marana of Lauha**

**Reference:** Rasendra Sara Sangraha (1/343)

**Materials:** Shodhita *Lauha*- 1 part

**Drugs for incineration:** Shudha *Hingula*- 1/12 part

(**Shodhana of Hingula:** Reference: Rasatarangini : 9/16;

**Material :** Ashudha Hingula and Nimbu Swarasa;

**Method:** Bhavana process (wet grinding);

**Procedure:** Hingula was taken and prepared fine powder, juice was extracted from Nimbu. Then Hingula was levigated by this juice. Then it was kept in sunlight for drying. Same process was repeated for seven times. For Bhavana every time fresh Nimbu Swarasa was used.)

**Method:** *Putapaka* ( *Gajaputa* )

**Procedure:** Shuddha *Lauha* and Shuddha *Hingula* were mixed together properly. This mixture was levigated by adding *Kumari Swarasa.* After 6hrs *Chakrika* were prepared and retained on butter paper which was kept on a tray. After complete drying *Chakrika* were kept on the *Sharava* which was topped by another *Sharava* and junction was

closed by double folded clay smeared cloth and kept for drying. Then *Sharava* Samputa was subjected for *Putapaka (Gajaputa).* After self-cooling, *Sharava* was removed from Puta. The *Chakrika* were collected. Process was repeated for 15times.[3]

**Chakrikakaran:** Levigated pasty mass of *Lauha* was taken in hand and round and flat *Chakrika* was prepared. *Chakrika* measurement: Diameter 2 cm & Thickness 0.5 cm.

**Observation:** On levigation with kumari Swarasa powdered *Lauha* became paste.

Colour of the paste became black to blackish brown.

In some cases *Sharava* was broken during *Putapaka.*

Whenever cracks were seen on the *Sharava,* some ash part entered into the *Sharava.*

Sandy sensation was felt during levigation till 4th Puta.

*Chakrikas* were got broken during incineration in some *Sharavas* after 7th Puta and this is due to their softness.

After 4th Puta, metallic shining was not observed during levigation.

After 5th Puta, metallic shining was not observed on dried *Chakrikas.*

The *Chakrikas* became softer with each Puta. After 10th Puta the *Chakrikas* became so soft that they were broken after applying little pressure.

After 5th Puta colour of *Lauha Bhasma* became purple (Pakwa Jambu Phala Varna).

The *Lauha Bhasma* turned to more smooth and fine after each Puta.

Smell of $So_2$ was observed.

**D. Preparation of *Vidangadi Lauh***

**Reference:** Rasendra Sara Sangrha (Pandu-Kamala Chikitsa)

**Ingredients:** *Lauha Bhasma,Vidanga, Haritaki, Bibhitaki, Amalaki, Shunthi, Pippali* and *Maricha.*

**Procedure:** All herbal drugs were converted into fine powder separately. These powders were sieved in mesh no. 80 to remove the coarse particles present in it.

Ingredients were taken in specific amounts (*Lauha Bhasma* 7parts and each *herbal drug* 1parts) separately in clean and dry plates. Then taken in clean and dry stone mortar and mixed properly till it became a homogenous powder. Then it was kept in a closed jar.


**Fig.1 Shodhita Lauha**

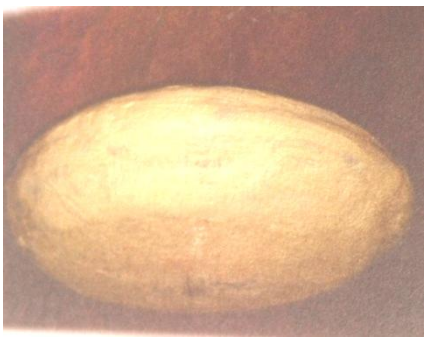

**Fig.2 Sharava Samputa**


**Fig.3 Lauha Bhasma**


**Fig.4 Vidangadi Lauh**

## RESULTS

In the process of *Smanya Shodhana* of *Lauha Bhasma* there was 210gm increase in weight (Table no.1). It may be due to Ghana part of *Kadalikanda Swarasa*. There was 630gm increase in weight of *Lauha Bhasma* (Table no.2). It may be due to Ghana part of *Triphala Kwatha.* For the process of *Marana* 3200 ml *Kumari Swrasa* is required for levigation and making pellets for 8kg of *Shodhita Lauha.* It requires 15 putas for complete conversion of raw *Shodhita Lauha* to *Bhasma* form (Table no.3). The maximum temperature attained during putas was 900-995$^0$C.

**Table :** Results of *Samanya Shodhana*

| Wt. of *Lauha* before *Samanya Shodhana* | Total *Kadalikanda Swarasa* taken for 7 times *Nirvapa* process | Wt. of *Lauha* after *Samanya Shodhana* | Increase in Wt. |
|---|---|---|---|
| 7.520 kg | 56 L | 7.730kg | 210gm |

Table 2 : Results of *Vishesha Shodhana*

| Wt. of *Lauha* before *Vishesha Shodhana* | Total Wt. of *Triphala Kwatha* taken for 7 times of *Nirvapa* process | Wt. of *Lauha* after *Vishesha Shodhana* | Increase in Wt. |
|---|---|---|---|
| 7.730 Kg | 347.4 L | 8.360 Kg | 630gm |

**Table No. 2.6** After each Puta, Specific observation of *Lauha Bhasma*

| No. of puta | *Chakrika* consistency after Puta | *Chandrika* | Colour of *Lauha Bhasma* | Highest Temperatue |
|---|---|---|---|---|
| 1$^{st}$ | Very hard | + + | Black | 940$^0$C |
| 2$^{nd}$ | Very hard | + + | Black | 920$^0$C |
| 3$^{rd}$ | Hard | + + | Blackish brown | 950$^0$C |
| 4$^{th}$ | Hard | + | Blackish brown | 970$^0$C |
| 5$^{th}$ | Soft | + | Purplish brown | 930$^0$C |
| 6$^{th}$ | Soft | - | Purple | 900$^0$C |
| 7$^{th}$ | Very soft | - | Purple | 965$^0$C |
| 8$^{th}$ | Very soft | - | Purple | 985$^0$C |
| 9$^{th}$ | Very soft | - | Purple | 915$^0$C |
| 10$^{th}$ | Very soft | - | Purple | 932$^0$C |
| 11$^{th}$ | Very soft | - | Purple | 945$^0$C |
| 12$^{th}$ | Very soft | - | Purple | 940$^0$C |
| 13$^{th}$ | Very soft | - | Purple | 995$^0$C |
| 14$^{th}$ | Very soft | - | Purple | 915$^0$C |
| 15$^{th}$ | Very soft | - | Purple | 965$^0$C |

## DISCUSSION

*Shodhana* of *Lauha* was done by the *Nirvapa* process. *Nirvapa* process is performed in two phases, in first phase metals or minerals are heated upto red hot, and in second phase, red hot Metals or Minerals are quenched in liquid media. When Metals or Minerals heated, these expand and leads to reduction in hardness, increased brittleness and reduction in particle size. In red hot state metals react with atmospheric oxygen, forming compound on surface. Expansibility of Metals differs from compounds. So on repeated intermolecular spaces increase. On application of heat, the tension in matter is increased, causing increase in inter-atomic space. After immediate cooling in liquid media tends to decrease in tension and increase in compression force. Repeated heating and cooling causes disruption in compression

heating cracks are observed on the surface leads to separation of compound part.

In process of *Marana*, there are three process where physical change in material occurred. During mixing surface phenomena takes place and

breaking of the material takes place by rubbing action. In levigation process liquid media is used. It is observed that finer particles are achieved by wet grinding process. During *Putapaka*, expansion in metal and compound observed which is different in metal and compound. This difference in the expansion causes separation of compound from metal. Repetition of *Marana* process leads to reduction in size and fineness of particles. During *Marana* the metals generally converted to their compound form, which is biologically acceptable for body.

**Table:** SOP for preparation of *Lauha Bhasma*

| | |
|---|---|
| *Samanya Shodhana* of *Lauha Bhasma* | Reference: Rasatarangini 15/7<br>Process: *Nirvapa*,7 times in *Kadalikand Swaras* |
| *Vishesha Shodhana* of *Lauha Bhasma* | Reference: Rasa Ratna Samucchaya5/103<br>Process: *Nirvapa*,7 times in *Triphala Kwath* |
| *Marana* of *Lauha Bhasma* | Reference: Rasendra Sara Sangraha 1/343<br>Materials: *Shudha Lauha* 1part; *Shudha Hingula* 1/12part; *Kumari Swarasa*<br>Levigation for 6 hrs.<br>*Chakrika* of 2cm diameter and 0.5cm thickness.<br>In *Gajaputa*: complete fill up with cow dung cakes.15 putas.<br>Collection of *Chakrika*: after self cooling. |

## CONLUSION

Reference of Rasatarangini (15/7) may be considered as standard process for Samanya Shodhana of Lauha.

Reference of Rasa Ratna Samucchaya (5/103) may be considered as standard process for Vishesha Shodhana.

The method for Marana of Lauha [reference of Rasendra Sara Sangraha (1/343)] may be considered as accessible, acceptable and standard method.

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