ABSTRACT

Rasa Shastra is the Pharmaceutical branch of Ayurveda which deals in detail about the preparation of various metals and minerals to achieve their utmost therapeutic effect. Loha (iron) is one among the most important Rasa Dravya which is known for its hardness. As free molecule of Loha (iron) is non homologous and very toxic to the human body, it must be converted into homologous form called LohaBhasma [bio-metallic(iron) medicinal powders]. Bhasmas are nanoparticles in nature and are well known for their lower dose, quick action, and a longer shelf life. Lohabhasma is widely used for the treatment of wide range of diseases like Pandu Roga (anaemia), Kamala (jaundice), Shwetpradara (Leukaemia), Ganda mala (goitre), Anartava (Amenorrhoea), diseases of liver, Hrudroga (cardiac diseases), Vishamajvara (fever), all types of Shosha(emaciation) etc. Hence an attempt has been made to give the detailed description about Lohadhatu available in Ayurvediya Rasa Shastra classics like Loha synonyms, classifications, sub-classifications, Detoxo-purification (shodhana), Marana (incineration), Aruteekarana, Dosage, adjuvants, Pharmacological actions, therapeutic indications, adverse effects and management of adverse effects, etc.

Keywords: Loha, Loha Shodhana, Loha Marana, Loha Bhasma.

INTRODUCTION
The first reference of Loha is found in Yajurveda. Loha is one of the important metals used in Ayurvedic classics which is known for its hardness. In Samhitas references are available about the uses of Loha in powdered form called as Aayakriti. But in Rasa Shastra detailed descriptions available about the preparation of Loha Bhasma and their therapeutic uses. Iron supplementation is required for the formation of hemoglobin in blood. The majority of iron in the body is contained within hemoglobin, an erythrocyte protein that transfers oxygen from the lungs to the tissues. The iron contained in hemoglobin is also responsible for the red color of blood. Iron is an essential component of myoglobin, a protein that provides oxygen to muscles. And also, it is most essential component for maintaining various physiological conditions like metabolisms, encompassing full range of cellular processes, energy production, biosynthesis, replication and locomotion. Despite being so important, it has toxic properties when presented on its free form. Hence it should be converted into Bhasma wherein chemically it will be in oxidized form of Fe_{2+} and Fe_{3+}, to mediate its regular activity of electron transfer. To prepare Loha Bhasma a series of pharmaceutical procedures are explained like Shodhana (Detoxification), Marana (incineration), Amruteekarana, so that its therapeutic benefits can be achieved in various disease conditions.

**Synonyms**:
Loha, Shastraka, Teekshana, Pinda, Kaalayasa, Aayasa

**Vernacular names**:
Sanskrit- loha; Kannada- kabbina; Hindi- lohah; Gujarati- loddhan; Marathi- lokhand; Telugu- demmu, chummu; Malayalam- Irumbu; Oriya- luha; Urdu- loha, ain.

**Classifications**: 3,4,5
1) Munda Loha (Cast Iron)
2) TeekshnaLoha (Iron turnings)
3) KaantaLoha (Magnetic ore of Iron)

**Among three types**;
1. Kaanta Loha is best therapeutically (Kaantaloha is 1000 times better than TeekshanaLoha)
2. Teekshna Loha is better (TeekshanaLoha is 100 times better than Munda Loha).

3. Munda Loha is less useful therapeutically (Munda Loha is ten times better than Mandura).

**Sub Classifications**:

**Munda Lohabheda**:
There are three subtypes of Munda Loha
1. Mrudu- it melts quickly, when attempts to break it doesn’t break and it possess a glassy surface.
2. 2)Kuntha- when hammered expands with difficulty.
3. 3)Kaadar- when hammered breaks easily with black surfaces.

**Teekshna Loha Bheda**:
There are 6 subtypes of TeekshnaLoha
1. Kharaloha- rough, breaks easily on bending, on breaking gives mercuric luster, does not have hair like lines.
2. Saara loha- when hammered breaks by side, has hair like lines.
3. Hrunnalal oha- blackish white color, shows break like hair lines, very difficult to break.
4. Taaravatt loha- color like sky, glossy, shows clear hair lines on the surface.
5. Vaajira loha- smooth, blue in color, glossy, very fine hair like lines on the surface and does not rust.
6. Kaala loha- bluish black in color, slimy, heavy, and does not break on hammering.

**Kaanta loha Bheda**:
There are 5 subdivisions of kaanta loha
1. Bhramaka Kaantaloha- makes to move all kinds of iron on attraction (produces magnetic attraction).
2. Chumbaka Kaantaloha- attracts iron scraps and catches them.
4. Draavaka Kaantaloha- melts at once other pieces of iron without applying heat.
5. Roma Kaantaloha- on breaking shoots forth hair like filaments.

**Ashuddha Loha Dosha**:
In Ayurveda Prakash 7 types of Loha Dosha are mentioned.
1. Gurutaa (heaviness)
2. Drudata (Stiffness)
3. Utkleda/ Utklesha (Nausea)
4. Glani (timidness)
5. Dahakarita (burning sensation)
6. Ashmadosha (undigestiveness)
7. Durgandhata (bad smelling)

Ashuddha Loha Sevana Dosha:

Ashuddhaloha is not good for health. It destroys Aayu, Bala and Kaanti and Causes Shandatva, Kushtha (skin diseases), Hrudroga (cardiac pain), Shoola (various types of pain), Ashmari (calculus), and Apaatavroga in Shareera and even Mrityu.

Table 1: Samanya Loha Shodhana (Detoxo-Purification):

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Procedure</th>
<th>Duration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Nirvaapa (heating and quenching) in Kadalimoolajala.</td>
<td>7 times</td>
<td>R.Sa.San 1/296</td>
</tr>
</tbody>
</table>

Table 2: Vishesha Loha Shodhana (Detoxo-Purification):

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Procedure</th>
<th>Duration</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Loha is heated red hot and quenched in Triphalakashaya.</td>
<td>7 times</td>
<td>R.T 20/15, A.P 3/241-243</td>
</tr>
<tr>
<td>2.</td>
<td>Lohachurna is taken in iron vessel, heated to red hot and Quenched in Kadali moola jala for 7 times. Each time fresh Kadali moola jala is taken</td>
<td>7 times</td>
<td>R.T 20/17</td>
</tr>
<tr>
<td>3.</td>
<td>All types of iron follicles are applied with Shasha rakta (rabbit's blood) then heated to red hot.</td>
<td>3 times</td>
<td>R.R.S 5/101</td>
</tr>
<tr>
<td>4.</td>
<td>5 pala of iron follicles are added into iron pan containing TriphalaGomutra Kwath and boiled. It is stirred continuously till it gets dried to such an extent that when dried grass is put on this Churna should get burnt. This procedure is repeated for 5 times. Now it should be triturated with Aamlaki Swaras or Triphala Kwatha and subjected to 4 puta. Vaaritara Lohabhasma.</td>
<td>5 times</td>
<td>R.R.S 5/107</td>
</tr>
<tr>
<td>5.</td>
<td>If any drug is unavailable then, loha is heated red hot and quenched in Dugdha, Ghruta, TailaandGomutra.</td>
<td>-</td>
<td>Ayu.Pra 3/ 247</td>
</tr>
</tbody>
</table>

LohaTrividhaPaaka: Shodhita Loha is subjected to TrividhaLohaPaaka to obtain best Bhasma.(R.T 20/22-31)

1. BHAANUPAAKAVIDHANA: Shuddha loha Choorna is washed with water, mixed with Triphala kashaya and dried under sunlight. When Triphala kashaya evaporates, again it should be added, this is repeated for 7 times.

2. STHAALIPAAKAVIDHANA: Bhamupaakita Loha Churna is boiled with Triphalakashaya/ Shatavari, Hastikarnaka, Palash moola swarasas taken in equal quantity to that of Lohachurna and Sthalipaaka is done in an iron pan (sthaali) till the water part evaporates.

3. PUTAPAAKA VIDHAANA: After Sthalipaaka of Lohachurna, required Doshahara drugs Swaraasa, Kashaya etc are added, triturated, pallets prepared, dried and enclosed in Sharaavasamputa. Subjected to 60/100/1000 Puta.
### Table 3: Loha Marana (Transfer Mechanism Of Quantum Of Heat/Incerination):

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Procedure</th>
<th>Puta</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shuddha loha churna is triturated with Tinduka rasa for 1 day. Then it is triturated with Triphala, Bhrungaraj and Kanthakari rasa and subjected to Puta. Loha Jalatara bhasma is obtained</td>
<td>3Gaja Puta</td>
<td>Ayu.Pra3/248-254</td>
</tr>
<tr>
<td>2.</td>
<td>Shuddha Loha churna is triturated with one among the following: Triphalakashaya or Raktapurnarnavapatra rasa or Girikarnikarasa or Changeri rasa or Salila rasa or Jalavetasa rasa and subjected to 30 putas. Jamuna varna Bhasma is obtained which should be jalatara.</td>
<td>30 Puta</td>
<td>Ayu.Pra 3/261</td>
</tr>
<tr>
<td>3.</td>
<td>Loha heated to red hot and quenched in Triphalakwaatha for 100 times. If it doesn't turn into powder again it is heated to red hot and quenched in Triphalakashaya. Then it is boiled in Gomutra. Again, triturated with Triphalakashaya and subjected to Puta till Niruthhalohabhasma is obtained, then it is triturated with Ghruta and honey and used.</td>
<td>Till Niruthha LohaBhasma is obtained.</td>
<td>Ayu.Pra3/270</td>
</tr>
<tr>
<td>4.</td>
<td>Shodhita Loha churna should be triturated with Aamlaki Swaras or Triphala Kwatha and subjected to puta. By this Vaaritara Loha bhasma will be obtained.</td>
<td>4 Gajaputa</td>
<td>R.R.S 5/107</td>
</tr>
<tr>
<td>5.</td>
<td>Lohachurna triturated with Triphalakwatha, Chakrikas are prepared. Enclosed in Sharavaa samputa Subjected to putas. By this method red colored Bhasma is obtained.</td>
<td>5 Puta</td>
<td>R.R.S 5/119-120</td>
</tr>
<tr>
<td>6.</td>
<td>Loha puta paka: Depending on the vitiated Doshas or disease condition, Lohachurna is processed with particular Aushadhis. If the specific Aushadhi is not available than Triphalakashaya is used and subjected to 100 or 1000 Putas. This Lohabhasma is used for various disease conditions.</td>
<td>100 or 1000 Putas.</td>
<td>R.T 20/50-51</td>
</tr>
<tr>
<td>7.</td>
<td>Bhanupakita and Sthalipakit Lohachurna is taken with equal quantity of shuddha hingula and Ghrutakumari swarasa, triturated and dried under sunlight. Enclosed in Sharavaa samputa subjected to Gaja puta. After Swaang sheet Lohachurna is taken mixed with 1/20th part of hingula and triturated with Triphala kashaya or Bhrungaraj rasa. Chakrikas are prepared, enclosed in sharaavasamputa and subjected to Gajaputa. Like this 1/20th parts of Hingula mixed and processing is done for 40 Gajaputa. Red lotus like (Rakta Varna) Bhasma is obtained.</td>
<td>40 Gaja puta</td>
<td>R.T 20/53-55</td>
</tr>
</tbody>
</table>

**Mruta Loha Pariksha**[^10][^11](Confirmation Test):

- Prepared Loha Bhasma is mixed with Mitrapanchaka enclosed in Sharaava samputa and subjected to Puta, if the Bhasma remains in its same physical form without any changes then it indicates properly prepared Bhasma (NiruththaBhasma).
- Honey, ghee, Loha Bhasma and Rajata are enclosed in Sharaava samputa and subjected to agni. If the quantity of Rajata remains same as placed in Sharaava then the obtained Lohabhasma is Uttama. OR

[^10]: Transfer Mechanism Of Quantum Of Heat/Incerination)
[^11]: (Confirmation Test)
Apakawa Loha Bhasma Niruthikaranar12,13: If Bhasma is improperly prepared, then.
- Lohabhasma + GoGhruta+ ShuddhaGandhaka are taken in equal parts and triturated with Kumari swarasa made into fine powder. It is enclosed in Sharava sampata and subjected to Gajaputa. After 1 Gajaputa Lohabhasma becomes Niruthha.
- Loha Bhasma is added with equal quantity of Shuddha Gandhaka and triturated with Kumari swarasa for 1 day in taptakhalwa yantra, mixture is enclosed in Sharava sampata and subjected to Gajaputa. Lohabhasma becomes Niruthha.

Pharmacological And Therapeutic Properties Of Loha1 14,15:
- Rasa- Tikta, Kashaya
- Guna- Guru, Rooksha, Lekhana and Sara.
- Virya- Sheeta
- Vipaka- Madhura
- Karma- Nirutha Lohabhasma is considered as Amruta (nectar) and is Rasayan (immunity booster). It is Vru shya (aphrodisiac), Balya (improves physical strength,) Netrya (beneficial for eyes), Varnya (provides good body complexion), Medhya (promotes intellect), Deepana(carminative), Lekhana, Vatala and Kapha Pitta Shamaka.

Therapeutic Indications Of Lohabhasma16:
Pandu Roga (anaemia), Kushtha Roga (Skin diseases), Gulmaroga, Pneumaroga (spleen diseases), Udara ja KrimiRoga (ascariasis), KshayaRoga (emaciation/ tuberculosis), Medoroga, Premeha(diabetes mellitus), Garavishna (combats toxic effects), Arsha (hemorrhoids), Chardi (Vomiting), ShwasRoga (respiratory conditions), VisarpaRoga (Herpes zoster), all types of Shoola, Shotha (inflammations), Sthoulya(obesity), Atisara (dysentery), Gandamala (goiter), Rajava radhi (amennorhoea), Vrukashto (nephritis), Hrudroga (cardiac ailments), Vishmahavara (fever), Phirangga (Syphilis), Kamala (jaundice), Halimaka (chronic obstructive Jaundice), Shwetpradara (leucorhoea), Maamsataana (diphtheria), Madhumeha, all types of Shosha, sutikajwara (puerperal diseases), Aamavata (rheumatoid arthritis), diseases of liver, Bhagandara (fistula), Pina sa (allergic rhinitis), Am-lapitta (acid peptic disorders), It prevents the bleeding from ears, nose, uterus etc. of adolescent age, gastric and intestinal ulcer and there bleeding will be corrected by the use of Loha bhasma. It is helpful in managing bone deformity due to Aamavata, both physical and psychological disturbance of menopause. Its regular use strengthens the nervous system and helps in all types of Vataroga. It is beneficial in reinstating the physical strength after suffering with any of the chronic or acute ailments.

LOHA BHASMA MATRA (Dosage)17: 1/4 to 2 Ratti as per Rogarogibala.

or

Dosage: 1 Nishk (3 grams)

Anupana (adjuvant)18: Trikatu, Vayvidanga, honey or Ghruta.

Loha Upadra Parihar19: Vayvidanga is triturated with Agastyarasa and advised to lick it with Agastya rasa, and patient is asked to sit under sunlight for certain period. This will detoxify the toxicity of Loha. When the toxicity reduces patient feels lightness of body, Mala pravrutti, abdominal comfort, and relaxed mind. Along with Vayvidanga any Shoolagha Aushadha can be mixed with Agastya rasa. Virechana is done with Aaragvadha Majja.

Loha Sevana Varjya Vastu20: Pumpkin, Tilataila, Masha, Madhya, Aamla Rasa Dravyas, Mandoora all these are Contra indicated during Loha Sevana.

Loha Bhasma Amrutikaranar21: Lohabhasma is boiled in double quantity of Triphala kashaya. It is suitable to cure all diseases.

Loha Druti22: Gandhaka is triturated with Devadaali for 7 days. When It’s Prativap is given, Loha becomes thin like that of Paarada. Devadaali bhasma is sieved through Naramootra And Prativap is given for 21 times. Loha Druti is obtained.

Loha Dravana23: Gandhaka is given Bhavana with Devalirasa for 7 days and added into melted Loha. By this Loha gets liquefied like that of Parada.

DISCUSSION

Loha (iron) is one among the most important Rasa Dravya which is used in the treatment of various diseases either as a single drug or as an ingredient of

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compound formulations because of its immense medicinal properties. The majority of iron in the body is contained within hemoglobin, an erythrocyte protein that transfers oxygen from the lungs to the tissues. The iron contained in hemoglobin is also responsible for the red color of blood. Iron is an essential component of myoglobin, a protein that provides oxygen to muscles.24,25

Mainly Loha is of 3 types; Munda Loha (Cast Iron), Teekshna Loha (Iron turnings) & KaantaLoha (Magnetic ore of Iron) and Among these three types; kaantalaoha is best therapeutically, Teekshna Loha is better, Munda Loha is less useful therapeutically. In short these are better in qualities in increasing order. But practically Teekshana Loha is used for the preparation of Bhasma, as Kanta Loha is rarely available.

As free molecule of iron is very toxic to the human body it must undergo a series of pharmaceutical procedures like Samanya Vishesha Shodhana, TrividaLoha Paaka, Marana, Amrutakaran etc. to prepare LohaBhasma [bio-metallic(iron) medicinal powders] in order to achieve its utmost medicinal benefits. Tests for the confirmation of Loha Bhasma are given and in case if appropriate Bhasma is not prepared, procedures are explained to achieve required results. Dosage, adjuvants, Pharmacological actions, therapeu- tic indications, adverse effects and management of adverse effects, Loha Amruteekarana, Loha Druti and Loha Dravana, are discussed in detail.

CONCLUSION

Loha is hardest metal which is non homologous to the human body, it must be converted into homologous form called Loha Bhasma. Loha samanya and Vishesha Shodhana should be carried out followed by the specific methods of marana to obtain the good quality of Bhasma. And after the formation of Bhasma its Amruteekarana should be done in order to make it therapeutically more potent. As lohabhasma possesses the pharmacological properties like Rasa-Tikta Kashaya, Guna-Guru, Rooksha, Lekhana, Sara, Sheetavirya and Madhura Vipaka it is indicated in wide range of diseases like Pandu Roga (anaemia), Kushtha Roga (Skin diseases), Udaraja Krimi Roga (~ascarias), Kshayaroga (~emaciation/ tuberculosis), Prameha (diabetes mellitus), Sthoulya (obesity), Atisara (dysen- tery), Anartava (amenorrhea), Hrudroga (cardiac ailments), Vishamajvara (fever), Phiranga (Syphilis), Kamala (jaundice), Swetpradara (leucorrhoea), Aamavata (rheumatoid arthritis) etc.

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