



## Review Article

www.ijrap.net



### CRITICAL REVIEW AND CONCEPT OF MARANA WITH SPECIAL REFERENCE TO LAUHA

Namrata Joshi<sup>\*1</sup>, Manoj Kumar Dash<sup>2</sup>, L.K Dwivedi<sup>3</sup>

<sup>1</sup>Lecturer, P.G Department of Rasashastra & Bhaishajya Kalpana, Rishikul Government Ayurveda College, Haridwar, Uttarakhand, India

<sup>2</sup>Lecturer, P.G Department of Rasashastra & Bhaishajya Kalpana, Government Ayurveda College Raipur, Chhattisgarh, India

<sup>3</sup> Department of Rasashastra & Bhaishajya Kalpana, G. J. Patel institute of Ayurvedic Studies & Research, Anand, Gujarat, India

Received on: 09/01/15 Revised on: 17/03/15 Accepted on: 02/04/15

#### \*Corresponding author

Dr. Namrata Joshi, Lecturer, P.G Department of Rasashastra & Bhaishajya Kalpana, Rishikul Government Ayurveda College, Haridwar, Uttarakhand, India E-mail: drnamratajoshi@gmail.com

DOI: 10.7897/2277-4343.06379

#### ABSTRACT

Marana (Incineration) is an essential step to be performed on substances especially related to Rasashastra. It is very important pharmaceutical process, applicable to the original minerals/metals for their conversion into fine ash form (Bhasma form). Due to Marana, the minerals and metals are converted in such a form, So that, the same will not be converted back to its original form and will be easily absorbed and assimilated into body. This form of drug also called "Rasa" form. The present paper gives the details of different Marana treatments and their applied aspect with special reference to Lauha. In the present paper an attempt is made to review and put forth the concept of Marana with special reference to Lauha bhasma. The information available in this review could be helpful to scientist, drug designers to do more Ayurvedic research towards concept of Marana. More literary research is needed on Marana to establish different bhasma claimed therapeutic potential.

**Key words:** Marana, Lauha, Putapaka, Sthalipaka, Bhanupaka

#### INTRODUCTION

Rasa Shastra, an offshoot of Ayurveda popular from medieval period, mostly deals with therapeutic utilization of metals and minerals<sup>1, 2</sup> known as the Rasaushadhis (herbo-mineral-metallic compounds). The master drug of this ancient science is Parada (mercury), while the other drugs are used as its subordinate. The internal administration of all metals and minerals became possible because of the invention of pharmaceutical technology of converting metals and minerals into Bhasmas. Bhasmas (calx) are peculiar Rasa preparations in which metals and minerals are processed after various Samskaras (processing) like detoxification, (Shodhana) converting into powders (Jarana, causing decay of metals) and incineration (Marana, killing metallic properties) methods. The process of Shodhana removes impurities which are likely to bring about certain toxic effects.<sup>3,4</sup> Purified substance, whether it is Rasa-Uparasa or Dhatu after maceration with some drugs, when subjected to heat treatment or puta termed as 'Marana'. The word "Marana" is derived from the root word 'Mriya-Marne' which literally means - 'to kill'. Thus the process by which Lauha (shada Lauha all dhatus), are transformed to a microfine stage for easy assimilation in the body (at cellular level), without any untoward side effect is considered to be 'Marana'. Acharya Nagarjuna the foremost scholar of Indian alchemy has elaborated importance of Marana. The metal after proper incineration achieves the state of rasibhavana i.e. colloidal state. If,

administered with proper norms, can alleviate diseases or if they are utilized in a regular basis, protects undue graying of hair, formation of disease and degenerative process of ageing or in other words it fulfills all the properties of dhatus in the body<sup>5</sup>. Nearly similar view is mentioned in text like Rasamava,<sup>6</sup> Rasa Ratna Samuchhaya<sup>7</sup> etc. Though the word 'Putapaka' commonly used for 'Marana', But practically and specifically in context of Lauha (Iron), it is rather a complex procedure that involves Bhanupaka. Sthalipaka and Putapaka as mentioned by Nagarjuna under description of Amritsara Lauha<sup>8</sup>.

#### Classification

Although there is no clear-cut classification for the process of Marana, but for the purpose of ease, it can be understood as Samanya Marana (collective approach for all metals) and Vishesha Marana (Individualistic approach for particular metal). Vishesha Marana for Lauha (Iron) can further be divided into two groups, common processes of Marana for all varieties of Iron and Marana specific to Mundadi varieties.

#### Samanya Marana

##### 1. Ayaskriti

The earliest reference of Marana is seen from samhita period, where metals are made into powder for internal administration by means of a process called

‘Ayaskriti.’ ‘Ayaskriti’ literally means -‘Making of Lauha’ is a process where disintegration of metal is done by means of addition of some organic material through intense heat treatment. Charak Samhita & Sushruta samhita emphasizes the need to observe great caution while using metals, and directs that they should be reduced to micro-fine powders through the specially designed process 'Ayaskriti'. The process governed in Ayaskriti includes intense heating of the metal followed by repeated quenching into some organic media till the metal is transformed into its finest form<sup>9-15</sup>. In Charak samhita under rasayana Chikitsa, for preparation of Louhadi rsayana, lauha is reduced into powder form by heating & quenching in different liquid media like Triphala, Gomutra, saindhav lavana, yavakshara, ingudi kshara and kinshuka kshara till it is converted to anjanavat~ fine powder. Anjanavat louha patra are made into powder form in a khalva yantra and then filtered. This is churna form of Ayaskriti Kalpana.<sup>10</sup> This filtered churna is added to some liquid media like Amalaki swaras and madhu, kept under heap of Paddy for 1 Year resulting in avaleha form of Ayaskriti.<sup>11</sup> In sushruta samhita also under Kustha chikitsa both churna<sup>12</sup> as well as leha<sup>13</sup> form of Ayaskriti are mentioned. Reference of Asava<sup>14</sup> form of ayaskriti is seen in Ashtanga Hridaya under Premha chikitsa. Acharya Sushruta has advocated this process of transformation for all metals prior to their internal administration.<sup>15</sup>

## 2. Parada as a best maraka Dravya

With the advent of Rasa-shastra the importance of mercury in various metallurgical processes is universally accepted by all. This in turn has laid the foundation of the fundamental principle for incineration of metals which says – Marana process where rasa bhasma is used as a maraka drug is considered to be the best followed by marana with herbal drugs. This fact is further made authenticated by saying that metals leave their evil properties, when incinerated with mercury<sup>16</sup>. Marana with gandhaka is supposed to be inferior, while marana with ariloha is worst of all. Similar is the view of Siddha Laxmishavara as mentioned in Rasendra Chintamani and Ayurveda Prakash. Examples of Incineration of metal with their Arilauha, i.e. the metal possessing antagonistic properties although exist right from the time of Rasendramangala<sup>17</sup> and was later followed by most of the scholars even then some authors are of view that Marana with Arilauha is worst of all. The original verse quoting this fact is firstly seen in Rasendra Chudamani<sup>18</sup> and was accepted by some of the scholars of later period<sup>19,20</sup>.

## 3. Gandhaka or Makshika as ‘Maraka-Dravya’

Gandhaka (sulphur) and Makshika (Chalcopyrite) have been advocated as a Lauha maraka dravyas for all metals<sup>21</sup>.

## 4. Marana by Surya Puta

The bhasma made by this process comes with various names in different texts as Swayamagni rasa in Rasa

Ratnkar;<sup>22, 23</sup> Somamrita Lauha, Suryatapi Lauha bhasma in Ayurveda Prakash<sup>24</sup> and Yogaratanakar;<sup>25</sup> Lauha rasayana, Swayamagni rasa and Varitara Lauha in Shraghdhar Samhita.<sup>26</sup> In some texts it is supposed to be for Lauha (Iron) only where as some others advocate this method for all Lauha (Shad Lauha~ all metals). In this method, kajjali is prepared by mixing Parada and Gandhak in ratio of 2:1. To this kajjali equal amount i.e 3 parts of Lauha is added. The material is impregnated with kumari swarasa in either tapta khalva or under sunlight. The material is made into bolus and wrapped in leaves of eranda, kept in copper / bronze vessel under intense sunrays for about 3-6 hours. Finally the vessel is buried under heap of paddy for 3 days. (Table 1)

## Other Methods for Samanya Marana

- 5) Incinerate Metal along with parada and gandhak in sikata yantra for 4 yama (12 hrs). Gandhaka may be added from 1 fold to 6 fold to further potentiate the efficacy<sup>38</sup>.
- 6) Metal triturated with Manahshila and Gandhak impregnated with latex of Ark is subjected to puta for 12 times. Rasa Tarangini advised to continue the process till complete bhasmikaarana takes place<sup>39</sup>.
- 7) Equal part of Gandhak, Manahshila, Hingula and Parada are impregnated with lemon juice, made into paste and smeared over metal. The metal is subjected to 7 putas to prepare good quality Lauha bhasma<sup>40</sup>.
- 8) Equal part of Gandhak, Tuttha are added to the Metal and impregnated with Kumari Swarasa for 1 day and subjected to gajaputa<sup>41</sup>.
- 9) Triturate metal and mrita rasa in Juice of drug of amla varga and subjected to puta heating system for 8 times to prepare good quality bhasma<sup>42</sup>.
- 10) Mix equal parts of Metal, Parada, Gandhak and Tapija. Apply heat by puta system<sup>43</sup>.
- 11) Parada Gandhak and metal are triturated properly and subjected to puta (Heat) causes rapid incineration<sup>44</sup>.
- 12) Rasopnihat recommended herbal drugs for both shodhana as well as Marana of Lauha<sup>45</sup>.

## Visesha Marana

Medicines in which iron is the leading ingredient, are better than others, therefore it is to be incinerated very carefully<sup>46</sup>. There are numerous ways for incineration mentioned in the various texts where ‘Marana’ is achieved by simply impregnating the Lauha with some suitable media, may it be herbs, minerals or animal product, followed by heat treatment till the Lauha fulfill the criteria of proper incineration. On going through the literature carefully one can easily draw a conclusion that this process is rather a complex one and involves various intermediate processes like Bhanupaka, Sthalipaka, Putana and finally Pradhana paka or a sort of Amritikarana as described by Nagarjuna in context of ‘Amritsara Lauha’. Due to unavailability of Loha-shastra of Nagarjuna today, this process can be understood by going through the text like Chakradatta<sup>47</sup> Rasendra Chintamani<sup>48</sup> where it has been concisely mentioned. Nearly similar concept of Marana is also seen in Lauha

Sarvasvam whereas the texts of later period like Rasendra Sara Sangraha and latest period Rasa Tarangini have also classified the drugs for Lauha Marana according to involvement of dosha.

### MARANA

This is the preliminary procedure in Lauha Marana and can assume to be the process for bringing iron to a micro fine stage. Here Iron is smeared with some drugs and then quenched in a liquid media, mainly Triphala. This procedure is chiefly mentioned in the texts specifically dealing with Lauha like Lauha shastra of Nagarjuna, Lauha sarvasvam etc. The process of quenching is repeated for seven times<sup>49</sup>. If iron is not powdered even after quenching into Triphala, it should be discarded considering it to be material other than Lauha<sup>50</sup>. Drugs which are prescribed for smearing includes Kutharchinna, Triphala, Girikarnika, Asthi-sanhara, Karikarnika, Shatavari, Kesharaja, Shalinch shaka, Kasa, Punarnava, Bhringraja<sup>51</sup> Gandirika, Mahoushadhi, Shalincha Shaka, Hastiparni, Changeri, Kutharika, Vikankata, Rakta marisha, Twacha, Manahshila, Hingula, Swarna makshika<sup>52</sup> etc.

### BHANUPAKA

Heating iron under intense Sunrays after impregnating with some liquid media is termed as Bhanupaka<sup>53</sup>. For bhanupaka Chiefly Triphala<sup>54</sup> is mentioned. However at some places water,<sup>55</sup> and kanji are also prescribed<sup>56</sup>. The process is either performed continuously for 3 days<sup>57</sup> or repeated for 7 times<sup>58</sup>.

### STHALIPAKA

Boiling iron in a vessel called Sthali with some liquid media till all the liquid gets evaporated is known as Sthalipaka<sup>59</sup>. Lauha Sarvasvam recommends to keep the sthali buried under bhugarbha for the period of one year<sup>60</sup>. Quantum of heat to be given for Sthalipaka is either Kharagni<sup>61</sup> or Sukhagni<sup>62</sup>. Triphala<sup>63</sup> (Ratio of triphala should be twice of Lauha) is mainly advocated for Sthalipaka. Gajakarna, Shatavari, Bhringraja, Kesharaja,<sup>64</sup> Palasha<sup>65</sup> are other prescribed drugs. In Rasendra Saar Samgrhaya,<sup>66</sup> Rasa Tarangini<sup>67</sup> and Rasa Jala Nidhi<sup>68</sup>, drugs according to the dosika involvement for particular disease has also been specified. Rasendra Chintamani<sup>69</sup> and Chakradatta<sup>70</sup> recommends to select the drugs according to the disease or prakriti of the patient. Lauha Sarvasvam advised swarna makshika and hingula for sthalipaka apart from Triphala.<sup>71</sup>

### PUTAPAKA

The measure of deciding the degree of paka is called as 'puta-paka'. Among the various intermediary processes involved in the incineration of Lauha, the 'puta' is of paramount importance owing to the property of bringing Lauha to that state from where it cannot be restored further. This process not only removes blemishes but also increases the therapeutic potential of the Lauha<sup>72</sup>. In other

words, it is by means of incineration the unwanted metallic properties of Lauha are removed, thus making it suitable for bodily assimilation. The importance of putapaka can be estimated by going through the preparation named 'Sudha-Sagar-Lauha' which is prepared after giving 4380 putas and is therapeutically advocated to take after a gap of 20 years that too in a meager dose of 1 yava (41.6 mg)<sup>73</sup>.

### How long Puta is to be given

Therapeutic efficacy of Lauha increases with the increase in number of putas. Accordingly for curing ailments 10-100 putas while for Vajikarana 10-500 and for Rasayana 100-1000 putas<sup>74</sup> are generally advocated in case of iron. According to some authors Puta should be given till the bhasma becomes microfine so as to float over the surface of water or till it gets properly incinerated<sup>75</sup> or becomes niruttha. (i.e. do not retain its parental form) According to Rasa Tarangini minimum 60 puta and maximum 1000 putas are required for incineration of Lauha<sup>76</sup>. Ayurvedic Formulary of India recommends 60 putas for incineration but further recommended to give 100 or 1000 puta for better efficacy<sup>77</sup>. Ayurveda Prakash has clearly indicated Gajaputa for all types of Lauha bhasma. The various views of different texts in this regard is shown in Table 2.

### Drugs prescribed for Putapaka

In context of Amritsara Lauha Triphala, Bhringraja, Nagakeshar, Shatavari, Maankanda, Bhallataka, Karikarna, Punarnava are advocated individually or collectively for for putapaka<sup>109</sup>. These drugs can be used according to the doshika involvement or prakriti of the patients<sup>110</sup>. Under description of Sudha-sagara Lauha, Rasa Jala Nidhi has advocated to use the juice of a new tree or herb or grass for about 12 years i.e. 4380 drugs are to be used in processing of Lauha with out any repetition<sup>111</sup>. Rasa Tarangini includes Triphala, Shatamuli, Sinhika, Talmulika, Neelotpala, Hribera, Dashamula, Punarnava, Vriddadaru, Bhringaraja, Vishva, Vidanga, Karanja, Shigru, Nirgundi, Tulsi, Eranda, Hastikarnapalasha, Parpatata, Chandana etc. as Lauhamaraka gana<sup>112</sup>. Apart from the above mentioned drugs some specific Lauha maraka groups are also classified as Vatahara gana,<sup>113</sup> Pittahara gana,<sup>114</sup> and Kaphahara gana<sup>115</sup>. Further in situation of non availability of above-mentioned drugs, Triphala alone can be used for incineration<sup>116</sup> In Rasendra-Sara sangraha following gana are prescribed for incineration.

Triphaladi Gana<sup>117</sup>  
Erandadi Gana<sup>118</sup>  
Kiratadi Gana<sup>119</sup>  
Shringaberadi Gana<sup>120</sup>  
Gokshuradi Gana<sup>121</sup>  
Patoladi Gana<sup>122</sup>  
Kinshukadi Gana<sup>123</sup>  
Shatavaryadi Gana<sup>124</sup>  
Vidarikandadi Gana<sup>125</sup>

For Samanya Puta paka  
Specifically Vata Vikara  
Specifically Pitta Vikara  
Specifically Kapha Vikara  
Specifically Vata-Kapha Vikara  
Specifically Pitta-Kaphaja Vikara  
Specifically Tridoshika Vikara  
For Vajikarna  
For Rasayana karma

Table 1: Lauha Bhasma Nirman Vidhi

Name of the Text	Type of Lauha	Name of The Formulation	Duration For Levigation	Vessel used	Kept under sunrays	Kept under Dhanyarashi
Aanadkanda (Kriya) <sup>27</sup>	For all types	-	2 yama	Tamra	½ yama	3 days
Rasa Ratnakar (Rasa) (Rasayana) <sup>28</sup>	Lauha only	Swayamagni rasa	1 day	Tamra	½ yama	2 days
Sharagdhar Samhita <sup>29</sup>	For all types	Varitara Lauha	2 yama	Tamra	½ yama	3 days
	For all Lauha	Swayamagni rasa	2 yama	Tamra	½ yama	1 day
	Lauha only	Lauha rasayana	1 prahara	Tamra	3 days	3 days
Rasa Ratna Samucchaya <sup>30</sup>	For all Lauha	-	2 yama	Kansya	½ yama	3 days
Rasa Paddati <sup>31</sup>	Kanta	-	-	-	-	14 bhanu paka
Rasa Manjari <sup>32</sup>	Lauha only	-	2 yama	Tamra	2 yama	3 days
Rasendra Sara Samgraha <sup>33</sup>	Lauha only	-	2 yama	Tamra	2 yama	3 days
Ayurveda Prakash <sup>34</sup>	All types	Suryatapi Lauha bhasma/Somamrita Lauha bhasma	2 yama	Tamra	2 yama	3 days
Yoga Ratnakar <sup>35</sup>	Lauha only	Somamrita Lauha	2 yama	Tamra	2 yama	3 days
Rasa Jala Nidhi <sup>36</sup>	All types of Lauha	-	2 yama	Tamra	2 yama	3 days
Rasamritam <sup>37</sup>	For Lauha only	Swayamagni rasa	2 yama	Tamra	2 yama	3 days

Table 2: Puta advocated in preparation of Lauha bhasma

Type of Puta	Reference texts
Surya Puta	Rasa Ratnakar, <sup>78,79</sup> Aanadkanda, <sup>80</sup> Rasa Ratna Samucchaya, <sup>81</sup> Sharagdhar Samhita, <sup>82</sup> Rasendra Mangal, <sup>83</sup> Rasendra Chintamani, <sup>84</sup> Rasendra Sara Samgraha, <sup>85</sup> Ayurveda Prakash, <sup>86</sup> Yogaratnakar, <sup>87</sup> Rasa Jala Nidhi <sup>88</sup>
Puta with 7 prastha cow-dung cakes	Siddha Bhesajya Manimala <sup>89</sup>
Puta with 10 prastha cow-dung cakes	Rasamritam <sup>90</sup>
Kukkuta Puta(12 angula)	Rasamritam
Shodhasa-angula puta (16 angula-12x12x12inches)	Rasa Ratnakar, <sup>91</sup> Aanadkanda, <sup>92</sup> Rasa Ratna Samucchaya, <sup>93</sup> Lauha Sarvasvam, <sup>94</sup> Rasa Samketa Kalika, <sup>95</sup> Rasa Kamadhenu <sup>96</sup>
Hasta-Pramana (24 angula-18x18x18 inches)	Chakradatta, <sup>97</sup> Lauha Sarvasvam, <sup>98</sup> Rasendra Sara Samgraha, <sup>99</sup> Rasa Jala Nidhi <sup>100</sup>
Ardha Gaja Puta	Rasamritam
Gajaputa (30 angula-22x22x22 inches)	Aanadkanda, <sup>101</sup> Rasa Ratnakar, <sup>102</sup> Rasa Ratna Samucchaya, <sup>103</sup> Ayurveda Prakash, <sup>104</sup> Rasa Jala Nidhi, <sup>105</sup> Rasa Tarangini, <sup>106</sup> Ayurvedic Formulary of India <sup>107</sup>

Table 3: Herbs Specifically Prescribed for Specific Diseases<sup>108</sup>

Disease	Herbs prescribed
Jeerna Jwara	Guduchi
Kasa, shwasa	Vyaghri
Yakshma, Raktavikara, Pitta vikara	Vasa, Bala
Nasa vrana, Rakta srava	Durva Swarasa
Pradara	Kankola
Pravahika	Nichula dala
Grahani	Mustaka
Atisara	Kutaja
Meha	Vara
Mutrakriccha	Pashana bheda
Swayathu	Punarnava+Sunthi kwatha
Udara Roga, Apasmara, Pandu	Gomutra
Rakta Vikara	Maankanda
Gulma	Rohitaka Kwatha
Hikka-shwasa	Bharangi-Brahmi Swarasa
Ama-Vikara	Eranda-Nagara Kwatha
Shula	Dashamula-Gomutra, Palandu
Yakrit-Plecha vikara	Kanya-Arka Rasa
Krimi	Devadaru, Vidanga, Palasha
Kushta	Shampaka, Nimba, Saptaparna, Atarushaka, Bhallataka, Bakuchi Vrindaka, Arka
Tridoshika mula stambha	Ikshu, Abhiru, Varuna
Ashmari, Mutraghata	Ksheeri vriksha, Draksha, Abhiru, Dasha moola
Kshaya	Vajigandha
Amlapitta	Shatavari
Kalpa-Krama	Mundika, Shatamuli, Chitranga, Karikarna Kesharaja, Madhuka, Guduchi, Markava, Mushli
Rasayana	Nagbala, Hayagandha, Gokarana, Vriddhadaru, Amalaki
Vajikarana	Vaanari, Shatamulika, Kshurika

## DISCUSSION

On surveying the literature it is evident that the internal use of metals dates back from thousands years ago, when it was used in the form of micro fine powder obtained by heating and quenching the metal into some liquid media, better known as 'Ayaskriti'. This process of 'Ayaskriti' itself gone through various stages of changes giving rise to new dimensions in the pharmaceutical dosage forms of metals viz. Leha Ayaskriti and Asava Ayaskriti apart from pre existing churna type of Ayaskriti. With the wit of men this inevitable continuous process keeps on changing from the primordial form of 'Ayaskriti' to a well sophisticated science of Lauha-Shastra aiming at Lauha vedha i.e. conversion of lower metals into higher ones as well as Deha vedha to make the fragile body stable so as to enable one to strive for worldly enjoyment. But this science of Indian alchemy was very complicated and difficult to understand thus came to a verge of extinction, which was later revived in the form of Amritsara Lauha of Nagarjuna as came across in the texts of later period viz. Vangsena Samhita, Chakradatta, Rasendra Chintamani etc. Till date this process of pharmaceutical science is changing, adopting fundamentals of Lauha shastra of Nagarjuna with required amendments in the process of Shodhana, Bhanupaka, Sthalipaka, and Putana specifically in context of Lauha. The process of Shodhana or purification is the preliminary stage in the processing of the metal. Here purity does not signify a stage of attaining chemical purity devoid of other elements rather a state of incorporation of other materials into the substance purified. The elevated temperatures and the carbon formed while heating will help in reduction of the material<sup>126</sup>. Similarly the trace elements present in the prescribed liquid media as well as pH of the liquid media will all help in either dissociation or elimination of the impurities if present. These observations are supported by the following explanation given on modern texts too. On heating a metal to a desired level, the metal expands with alteration of grain boundary and grain boundary energy. The crystal lattice gets disturbed with relatively jumping of the electrons from their relative shell. This, in turn, creates some vacancies in the crystal lattice structure. On quenching such metal in to a liquid media immediately develops fracture in the crystal structure owing to the fact of sudden temperature change. Further the organic material from quenching media then filled up the vacancies, which were created on the verge of heating process. This successive process of heating and quenching thus disintegrates the metal further. Considering organic solvents (liquid media) prescribed for this special purpose, it is evident that they either come under Kshar varga, Amla varga, Lavana varga or Vida varga i.e. either they are, basic, acidic or neutral in nature These varga are specifically delineated for Shodhana, Jarana, Dravana, Putana, Bhasmikarana karma which are nothing but the ways to subtilize the metal. The metal in the context has been subjected to the intermediary processes like Bhanupaka and Sthalipaka prior subjecting it to the process of Marana. Here, the underlying idea in the processing of the metal by these processes is to render the metal to reduce completely. In

these processes the Lauha is exposed to an open atmosphere i.e. open air in wet condition without subjecting to heat and after application of direct heat as in Bhanupaka and Sthalipaka respectively. Gradual weathering of rock in the Earth crust due to various chemicals and/or physical changes undergoing in open atmosphere might be the fundamental idea for undergoing the process of Bhanupaka to subtilize the metal further. In process undergone iron reacts with moist air in an open condition with some reacting liquid media for prolonged period converts the iron into its oxide form.

The resultant product is then subjected to Sthalipaka to further hasten the process by subjecting it to direct heat to convert any remaining Lauha into its oxide form totally.

Like wise acidic pH that contributes in the assimilation of iron in the body,<sup>127</sup> Triphala being acidic in nature might contribute to some specific reaction in the metal basing upon the principle and thus is chiefly advocated not only for Bhanupaka but for almost all procedures involved in processing of Lauha (Shada Lauha).

After Sthalipaka, next comes the process of Putana where the metal is subjected to heating system in a closed chamber in the absence of air after being treated with some herbal liquid media. The herbal material present in the liquid media gets carbonized during the heating process and this carbon helps in reducing the metal properly. This process is hastened by the quantum of heat that has been applied for.

It is the Marana process after Sthalipaka which is given paramount importance in the processing of any metal. Moreover, properly incinerated Lauha bhasma is claimed to be even more efficacious than that of jarita Rasa (Jirna Parada)<sup>128</sup> Other points to ponder in context of Marana are the media used for levigation, heat treatment and methods adopted for undergoing the process of Marana.

Putana or the methods of incinerations is an important aspect for estimating therapeutic efficacy of a metal and it is the process of Putana that brings micro fine stage to a metal thus making it suitable for short acting pharmacokinetics<sup>129</sup>. But in context of Lauha (iron) type of puta to be advocated itself is a big question mark. Varieties of puta ranging from Gajaputa, Ardha gajaputa, Hasta pramana puta, Kukkuta puta, Shodasha angula puta, Puta with seven prastha or ten prastha cow dung cakes or even Surya puta has been advocated in different texts under different methods of incineration. All these Putas show a wide variation in terms of their dimension, amount of the heat supplied or amount of metal to be incinerated. Even in terms of the Puta recommended by government-approved formulary viz. Gaja puta different opinions came across.

The scholars of Rasa shastra, with reference to incineration process i.e. Marana have recommended four basic media. The bhasma manufactured in association with either Parada (mercury), Moolika (herbal drugs),

Gandhaka (sulphur) and its products are accepted beyond doubt as therapeutic agents whereas incineration with Arilohas (antagonistic metal) is supposed to be worst of all as such bhasmas may produce undesirable effects in the body.

This view was firstly quoted in Rasendra Chudamani<sup>130</sup>, which was later followed in Rasa Ratna Samucchaya<sup>131</sup>, Rasa Padatti, Rasa Kamadhenu<sup>132</sup> etc. The same fact has also been mentioned by Ayurveda Prakash<sup>133</sup>, quoted it to be the view of some other Acharyas. Prof. Kulkarni, on his commentary on Rasa Ratna Samucchaya, further elaborated this fact and included drugs like Haritala, Manashila Gandhaka, Srotoanjana etc. among Ari -Lauha (Ari enemy, Lauha – metal). According to him although these materials disintegrate the metal far more easily but impart some of there antagonistic properties to incinerate metal which is not desirable for the human body and should not be practiced. On surveying the texts of still earlier period viz. Rasendra Mangalam<sup>134</sup>, Rudrayamala tantra<sup>135</sup>, Rasadhyaya<sup>136</sup>, Rasa Ratnakara<sup>137</sup> etc. an entirely different picture may suggestive of use of these materials in the process of incineration of almost all metals and infact helps in achieving the stage of ‘Niruthaghata’ i. e. conversion of metal to a stage from where it could not acquire its parental form- the ultimate aim of the process of ‘Marana’ to achieve the state of Rasibhavana in order to impart best Rasayana effect to the human body<sup>138</sup>.

Interestingly, in contrary to their own view about Arilauha, the texts like Rasa Padatti, Rasa Ratna Samucchaya, Ayurveda Prakash<sup>139,140</sup> have also advocated the use of Manashila for Naga, Haritala for Vanga, Hingula for Lauha etc.

There are several other eminent texts of Rasa Shastra like Sharangadhar Samhita, Rasendra Chintamani, Yoga Ratnakara, Vaidya Chintamani where literature of Arilauha is not touched but methods of Lauha Marana using these Arilauha are well mentioned Sharangadhar Samhita<sup>141</sup>, Rasendra Chintamani<sup>142</sup>. Phala shruti like ‘maryeta putapaken niruttham bhasma jayete’,<sup>143</sup> vinihanti sadhya,<sup>144</sup> vitashanka prayojyeta,<sup>145</sup> in context of Arilauha, justifies their use for marana. They may be termed as Lauha mitra rather than Arilauha to overcome the controversy, as is the opinion of Sarlarth prakashini Sanskrit commentary on Rasa Ratna Samucchaya.

## CONCLUSION

The present literary research work was carried out for clearing the confusion on Marana process. The pharmaceutical science of Ayurveda is an open field for research. The trividha Lauha Kalpana described in Lauha shastra of Nagarjuna is an indication for the development of new formulations of Lauha kalp from existing one’s utilizing the fundamental principles<sup>146</sup>. as evident in Amritsara Lauha of Nagarjuna. Hence these understanding on Marana may be helpful as a tool for assistance for the manufacturers in developing SOP of Lauha Bhasma.

## REFERENCES

- Gupta KL, Chinta S, Reddy KR. Importance of Ananda kanda in the history of Indian alchemy. Bull Ind Inst Hist Med Hyderabad 2006;36:159-66.
- Madhavacharya. Sarva Darshana Samgraha, (Raseshwara Darshana) verse 9/18 In: Umashankar Sharma Rishi, editor. Varanasi: Choukhamba Vidya Bhavan; 1964. p. 383.
- Rasa Tarangini: Shri Sadananda Sharma, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup>. New Delhi: Motilal Banarsidas, 2/52,22
- Acharya Somadeva, Rasendra Chudamani by Siddhinandan Mishra, Ed.-1<sup>st</sup>, Varanasi: Chaukhamba Orinetalia, 1984.14/128, 263
- Nagarjuna, Rasendra Mangalam, Translated by Kvj. H.S. Sharma, Ed. 1<sup>st</sup>, Varanasi: Chaukhambha Orientalia, 2003.2/56-56 ½, 45
- Tripathi I., editor, Rasarnava of Nagarjuna, (4<sup>th</sup> ed.) Varanasi: Chaukhamba Sanskrit series, 2001, 7/151, 109
- Vagbhatacharya, Rasa Ratna Samucchaya by Ambika Datta Shastri, Ed.-8<sup>th</sup>, Varanasi: Chaukhamba Amarbharati Prakashan, 1988, 28/104, 584
- Chakrapanidatta, Chakradatta, with Ratnaprabha commentary by Shri Nischalakara, Edited by Prof. Priyavrat Sharma, Ed.-1<sup>st</sup>, Jaipur: Swami Jaya Ramdas Ramprakash trust V.S. 2050.
- Agnivesh, Charaka Samhita (Uttaradha) Revised by Charaka and Dridhabala, with Hindi commentary by Dr. Brahmanand Tripathi, Vol.-I Ed.-4<sup>th</sup>, Varanasi: Chaukhambha Surbharti Prakashana, 1995. chikitsa sthan 13/73, 485
- Agnivesh, Charaka Samhita (Uttaradha) Revised by Charaka and Dridhabala, with Hindi commentary by Dr. Brahmanand Tripathi, Vol.-I Ed.-4<sup>th</sup>, Varanasi: Chaukhambha Surbharti Prakashana, 1995.1-3/15-23 Ch.Chi.-1-3/15-17, 46
- Agnivesh, Charaka Samhita (Uttaradha) Revised by Charaka and Dridhabala, with Hindi commentary by Dr. Brahmanand Tripathi, Vol.-I Ed.-4<sup>th</sup>, Varanasi: Chaukhambha Surbharti Prakashana, 1995.1-3/15-23 Ch.Chi.-1-3/15-23, 46
- Maharshi Sushruta, Susruta Samhita, Hindi Commentary by Dr. Bhaskar Govind Ghanekar, Ed.-5<sup>th</sup> and reprint, Delhi: Motilal Banarsidas, 1997. chikitsa sthan.10/11. 433
- Maharshi Sushruta, Susruta Samhita, Hindi Commentary by Dr. Bhaskar Govind Ghanekar, Ed.-5<sup>th</sup> and reprint, Delhi: Motilal Banarsidas, 1997. chikitsa sthan.10/12. 433
- Vagbhata, Ashtang Hridaya, Hari Shastri Paradakara, Vaidya, editor, ed. 9<sup>th</sup>, Varanasi: Chaukhambha orientalia, 200. chikitsa sthan 12/29-32, 679
- Maharshi Sushruta, Susruta Samhita, Hindi Commentary by Dr. Bhaskar Govind Ghanekar, Ed.-5<sup>th</sup> and reprint, Delhi: Motilal Banarsidas, 1997. chikitsa sthan.10/11. 433
- Shri. Kayastha Chamunda, Rasa Samketa Kalika, by Dr. Indradeva Tripathi Published by Vd. Yadavji Trikamji Acharya Ed. 1<sup>st</sup>, Varanasi: Chaukhamba Amarbharti Prakashan, 1984. 2/3
- Nagarjuna, Rasendra Mangalam, Translated by Kvj. H.S. Sharma, Ed. 1<sup>st</sup>, Varanasi: Chaukhambha Orientalia, 2003.1/56. 45.
- Acharya Somadeva, Rasendra Chudamani by Siddhinandan Mishra, Ed.-1<sup>st</sup>, Varanasi: Chaukhamba Orinetalia, 1984.14/14, 232
- Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed., Varanasi: Chaukhambha Bharti Academy, 1999.3/192, 383
- Vagbhatacharya, Rasa Ratna Samucchaya, Ambikadatt Shastri, editor, Ed. 9<sup>th</sup>, New Delhi: Meharchand Lakshmandas Publication, Chaukhamba Amarbharti Prakashan, 1995, 28/10- 15, 571-572
- Tripathi I., editor, Rasarnava of Nagarjuna, Ed. 4<sup>th</sup> Varanasi: Chaukhamba Sanskrit series, 2001, 7/150, 109
- Nityanatha Siddha, Rasa Ratnakara, by Indra Dev Tripathi, Part-1<sup>st</sup>, Rasa khand, Ed.-1<sup>st</sup>, Varanasi: Published by Chaukhamba Amar Bharti Prakashan, 1985.9/47-50, 81
- Nityanatha Siddha, Rasa Ratnakara, Yadav ji Trikam ji, editor, Rasa chandrika hindi commentary by Indra Dev Tripathi, Part-4<sup>th</sup>, Rasayana khand, Ed.-2<sup>nd</sup>, Varanasi: Chaukhamba Amar Bharti Prakashan, 1982. 2/101-108, 27,28
- Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed., Varanasi: Chaukhambha Bharti Academy, 1999. 3/257-260, 399
- Mayurpada Bhikshu, Yogrtnakar, by Vaidya Lakshmiapati Shastri, Ed.-8<sup>th</sup>, Varanasi: Chaukhambha Sanskrit Sansthan, 2004. 134
- Sharangdhara Acharya, Sharangdhar Samhita, by Kasiram, Edited by Pandit Parasuram Shastri, Vidyasagar, Ed.-5<sup>th</sup>, Varanasi:

- Chaukhamba Orientalia, 2002.11/48-51, 12-153-161, 12/275-289, 247,273,283-284
27. Manthan Bhairava, Anandakandam by Shri. Radhakrishna Shastri, S. Gopalan, 1st edition, Tanjore:T.M.S.S.M. Library, 1952.5/45-49
  28. Nityanatha Siddha ,Rasa Ratnakara:,by Indra Dev Tripathi, Part-1<sup>st</sup>, Rasa khanda, Ed.-1<sup>st</sup>, Varanasi: Chaukhamba Amar Bharti Prakashan, 1985.9/47-50, 81
  29. Sharangdhara Acharya,Sharangdhar Samhita:, by Kasiram, Edited by Pandit Parasuram Shastri, Vidyasagar, Ed.-5<sup>th</sup>, Varanasi: Chaukhamba Orientalia, 2002.11/48-51, 247
  30. Vagbhtacharya ,Rasa Ratna Samucchaya,by Prof. Dattatreya Anant Kulkarni, Vol-I, Reprint ed., New Delhi: Meharchand Lakshmandas Publication 1998.5/131-135. 117
  31. Acharya Bindu,Rasa Paddati by Dr. Siddhinandan Mishra, Ed.-1<sup>st</sup>, Varanasi: Cahukhambha Orientalia, 1987.1/54, 66
  32. Acharya Shalinath, Rasa Manjari, Prof. Siddhi Nandan Mishra, commentator, Ed.2<sup>nd</sup>, Varanasi:Cahukhambha Orientalia, 2003.5/52-55, 65
  33. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/340-342, 195
  34. Acharya Sri Madhava ,Ayurveda Prakash by Shri Gulraj Sharma Mishra Reprint ed., Varanasi: Chaukhambha Bharti Academy, 1999.3/257-260, 399
  35. Mayurpada Bhikshu ,Yogratnakar:,by Vaidya Lakshmiapati Shastri, Ed.-8<sup>th</sup> Varanasi: Cahukhambha Sanskrit Sansthan, 2004. 134
  36. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi:Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004. 21-22
  37. Rasamritam, Yadav Ji Trikam ji , reprint ed., Varanasi:Krishnadas Academy, 2001, 3/137-140
  38. Anantadeva Suri ,Rasa Chintamani,by Acharya Siddinandan Mishra, Ed. 1<sup>st</sup>, Varanasi:Chaukhambha Orientalia, 1990.6/21-22
  39. Sharangdhara Acharya, Sharangdhar Samhita,by Pandit Parasuram Shastri, Vidyasagar, Ed.-5<sup>th</sup> Varanasi: Chaukhamba Orientalia, 2002.11/52-52½, 247
  40. Shri Bhojaraja ,Rasa Kaumudi,by Pavani Prasad Sharma, Edited by Bramhashankar Mishra, ed.-1<sup>st</sup>,V.S.-2023.3/23-26
  41. Acharya Shalinath, Rasa Manjari, Prof. Siddhi Nandan Mishra, commentator, Ed.2<sup>nd</sup>, Varanasi:Cahukhambha Orientalia, 2003.5/64, 67
  42. Nityanatha Siddha ,Rasa Ratnakara,by Indra Dev Tripathi, Part-1<sup>st</sup>, Rasa khanda, Ed.-1<sup>st</sup>, Varanasi: Chaukhamba Amar Bharti Prakashan, 1985.8/4-5, 57
  43. Vagbhtacharya ,Rasa Ratna Samucchaya, by Ambikadatt Shstri, Ed. 9<sup>th</sup>, New Delhi:Meharchand Lakshmandas Publication Chaukhamba Amarbharti Prakashan, 1995.28/9, 571
  44. Shri. Kayastha Chamunda ,Rasa Samketa Kalika, by Dr. Indradeva Tripathi Published by Vd. Yadavji Trikamji Acharya, Ed. 1<sup>st</sup>, Chaukhamba Amarbharti Prakashan, 1984.2/55
  45. Nityanatha Siddha, Rasaopnishad, by Indra Dev Tripathi, Part-1<sup>st</sup>, Ed.-1<sup>st</sup> Varanasi: Chaukhamba Amar Bharti Prakashan, 1985.1-16/188
  46. Kulkarni D.A. Vidyotini Hindi comm., Ras Ratna Samuchchaya of Acharya Vagbhata, New Delhi: Meharchand publication, 1998.,5/97, 113
  47. Chakrapanidutta, Chakradatta, Bhimshankar Mishra editor, ed.-5, Chaukhamba Sanskrit series, 1983, Rasayanadhikar 121-122. 562
  48. Dhundhukanāth, Rasendra Chintāmani,by Vaidya Srinath Sharma, 1<sup>st</sup> Ed., Published by Vaidya Maniram Sharma, Ratangarh (Rajasthan), 1933.8/103-192, 129-145
  49. Dhundhukanāth ,Rasendra Chintāmani,by Vaidya Srinath Sharma, Published by Vaidya Maniram Sharma, Ratangarh (Rajasthan), 1<sup>st</sup> Ed., 1933.8/106, 129
  50. Dhundhukanāth ,Rasendra Chintāmani,by Vaidya Srinath Sharma, Published by Vaidya Maniram Sharma, Ratangarh (Rajasthan), 1<sup>st</sup> Ed., 1933.8/131, 134
  51. Anantadeva Suri ,Rasa Chintamani:,by Acharya Siddinandan Mishra, Ed. 1<sup>st</sup>, Varanasi: Chaukhambha Orientalia, 1990.8/124-125,
  52. Shri Sureswara, Lauha Sarvasvam,by Shri Pavani Prasada Sharma, Edited by Shri Brahmarshankar Mishra, Ed.-1<sup>st</sup>, Varanasi: Chaukhambha Vidyabhawan, 1965.1/25-29
  53. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/300, 184
  54. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/300, 184
  55. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi: Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004. 41-42
  56. Shri Sureswara ,Lauha Sarvasvam:,by Shri Pavani Prasada Sharma, Edited by Shri Brahmarshankar Mishra, Ed.-1<sup>st</sup>, Varanasi :Chaukhambha Vidyabhawan, 1965.1/37
  57. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/303-304, 184
  58. Rasa Tarangini: Shri Sadananda Sharma, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas,20/23, 497
  59. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/308, 186
  60. Shri Sureswara ,Lauha Sarvasvam:,by Shri Pavani Prasada Sharma, Edited by Shri Brahmarshankar Mishra, Ed.-1<sup>st</sup> Varanasi: Chaukhambha Vidyabhawan, 1965.1/38-39
  61. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas, 20/25, p.no.497
  62. Chudamani Mishra ,Rasa Kamdhenu, Edited by Vaidya Yadavji Trikamji Acharya, Ed.-1<sup>st</sup> Varanasi: Chaukhambha Orientalia, 1927.2-1/777
  63. Dhundhukanāth ,Rasendra Chintāmani:, Translated By Acharya Siddinandan Mishra with Siddiprada Hindi Commentary, Ed. 1<sup>st</sup>, Varanasi:Chaukhambha Orientalia, 2000,8/106, 129
  64. Chakrapanidutta, Chakradatta, Bhimshankar Mishra editor, ed.-5 Chaukhamba Sanskrit series, 1983, Rasayanadhikar 71. 555
  65. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi: Chaukhambha Sanskrit series, 1994.1/309-310, 187
  66. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi: Chaukhambha Sanskrit series, 1994.1/309-310, 187
  67. Shri Sadananda Sharma, Rasa Tarangini:, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas, 20/29-30, 498
  68. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi: Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004. 42-43
  69. Dhundhukanāth ,Rasendra Chintāmani:, Translated By Acharya Siddinandan Mishra with Siddiprada Hindi Commentary, Ed. 1<sup>st</sup>, Varanasi: Chaukhambha Orientalia, 2000,8/144, 136
  70. Chakrapanidutta, Chakradatta, Bhimshankar Mishra editor, ed.-5, Chaukhamba Sanskrit series, 1983,Rasayanadhikar77.555
  71. Shri Sureswara, Lauha Sarvasvam:, Vidyotini Hindi Commentary by Shri Pavani Prasada Sharma, Edited by Shri Brahmarshankar Mishra, Ed.-1<sup>st</sup>, Varanasi :Chaukhambha Vidyabhawan, 1965.1/32-48
  72. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/312, 188
  73. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi: Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004.70
  74. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentator, ed. 1<sup>st</sup>, Varanasi:Chaukhambha Sanskrit series, 1994.1/314-315.188
  75. Shri Sadananda Sharma, Rasa Tarangini:, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup>New Delhi:Motilal Banarsidas, 15/8. 363
  76. Shri Sadananda Sharma, Rasa Tarangini:, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup>. New Delhi: Motilal Banarsidas, 21/36-37. 499
  77. Ayurvedic Formulary of India, Part-I, ISMH, Govt. of India, Ed.-2<sup>nd</sup>, 2003.18/14
  78. Nityanatha Siddha ,Rasa Ratnakara:,by Indra Dev Tripathi, Part-1<sup>st</sup>, Rasa khanda, Ed.-1<sup>st</sup>, Varanasi:Chaukhamba Amar Bharti Prakashan, 1985.9/47-50. 81
  79. Nityanatha Siddha ,Rasa Ratnakara,Yadav ji Trikam ji, editor, Rasa chandrika hindi commentary by Indra Dev Tripathi, Part-4<sup>th</sup>, Rasayana khanda, Ed.-2<sup>nd</sup>, Varanasi:Chaukhamba Amar Bharti Prakashan, 1982. 2/101-108. 27,28

80. Manthan Bhairava, Anandakandam by Shri. Radhakrishna Shastri, S. Gopalan, 1st edition, Tanjore:T.M.S.S.M. Library, 1952,5/45-49
81. Vagbhtacharya ,Rasa Ratna Samucchaya, Prof. Dattatreya Anant Kulkarni Reprint ed., New Delhi:Meharchand Lakshmandas Publication, 1998.5/131-135.117
82. Sharangdhara Acharya, Sharangdhar Samhita,by Pandit Parasuram Shastri, Vidyasagar, Ed.-5<sup>th</sup>, Varanasi: Chaukhamba Orientalia, 2002, 11/48-51.247
83. Nagarjuna, Rasendra Mangalam,Translated by Kvj. H.S. Sharma, Ed. 1<sup>st</sup>, Varanasi: Chaukhamba Orientalia, 2003.5/52-55.45
84. Dhundhukanāth, Rasendra Chintāmani, siddhiprabha Commentary by Siddhinandan Mishra, 1<sup>st</sup> Ed., Varanasi: Chaukhambha Orientalia, 2000. 6/59-62.79-80
85. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/340-342.195
86. Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed.,Varanasi: Chaukhambha Bharti Academy, 1999, 3/257-260.399
87. Mayurpada Bhikshu ,Yogratnakar.,by Vaidya Lakshmiapati Shastri, Ed.-8<sup>th</sup> Cahukhambha Sanskrit Sansthan, 2004.134
88. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi: Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004.p.no. 21-22
89. Shri Krishna rama Bhatt, Siddha Bhesajya Manimala: with Manicchata Hindi Commentary by Devendra Prasad Bhatt, Ed.-2<sup>nd</sup> Jaipur:Shri Krishna granthamala, 1994 ·5/54-55. 347
90. Rasamritam, Yadav Ji Trikam ji , reprint ed., Varanasi:Krishnadas Academy, 2001.3/142-146
91. Nityanatha Siddha ,Rasa Ratnakara.,by Indra Dev Triphati, Part-1<sup>st</sup>, Rasa khanda, Ed.-1<sup>st</sup>, Varanasi: Chaukhamba Amar Bharti Prakashan, 1985, 9/35-42. 79-80
92. Manthan Bhairava ,Anandakandam by Shri. Radhakrishna Shastri, S. Gopalan, 1st edition, 1952, Tanjore:T.M.S.S.M. Library, Amritikaran 7/118, Kriyakaran 5/37-44
93. Vagbhatacharya, Rasa Ratna Samucchaya 28/104, by Ambika Datta Shastri, Chaukhamba Amarbharati Prakashan, Varanasi, Ed.-9<sup>th</sup>, 1985,28/28-31. 574
94. Shri Sureswara ,Lauha Sarvasvam., Vidyotini Hindi Commentary by Shri Pavani Prasada Sharma, Edited by Shri Brahmashankar Mishra, Chaukhambha Vidyabhawan Varanasi, Ed.-1<sup>st</sup>, 1965.1/50-51
95. Shri. Kayastha Chamunda ,Rasa Samketa Kalika,by Dr. Indradeva Tripathi Published by Vd. Yadavji Trikamji Acharya at Chaukhamba Amarbharti Prakashan, Ed. 1<sup>st</sup>, 1984.2/3
96. Chudamani Mishra ,Rasa Kamdhenu -, Edited by Vaidya Yadavji Trikamji Acharya, Chaukhambha Orientalia, varanasi, Ed.-1<sup>st</sup> 1927, 2-1/781-785½,2/41,42
97. Chakrapanidutta ,Chakradatta, Bhimshankar Mishra editor, Chaukhamba Sanskit series, ed.-5, 1983,Rasayanadhikar|121-122.562
98. Shri Sureswara ,Lauha Sarvasvam., Vidyotini Hindi Commentary by Shri Pavani Prasada Sharma, Edited by Shri Brahmashankar Mishra, Chaukhambha Vidyabhawan Varanasi, Ed.-1<sup>st</sup>, 1965.1/51
99. Rasendra Sara Samgraha: Gopal Krishna Bhatt, with Satyarth ,Reprint-2000, 1/336-337.193
100. Bhudeb Mookharji,Rasa Jala Nidhi:, Shrigokul Mudranalaya, Varanasi, Vol.-2<sup>nd</sup> and 3<sup>rd</sup> Ed.-2<sup>nd</sup>, 1984.Vol-III, Ch.-1. 56
101. Manthan Bhairava ,Anandakandam by Shri. Radhakrishna Shastri, S. Gopalan, T.M.S.S.M. Library, Tanjore, 1st edition, 1952, Kriyakaran vishranti, 5/28-31, 34-36, 52-55
102. Indra Dev Triphati, editor, Rasa Ratnakara of Nityanatha Siddha , Part-1<sup>st</sup>, Rasa khanda, Ed.-1<sup>st</sup>, Varanasi :Chaukhamba Amar Bharti Prakashan, 1985, 9/13-15, 22-24, 25-28, 29-32, 45-46 p.76,78,79,81
103. Vagbhatacharya, Rasa Ratna Samucchaya, by Ambika Datta Shastri, Chaukhamba Amarbharati Prakashan, Varanasi, Ed.-8<sup>th</sup>, 1988, 5/125-126, 113-115
104. Acharya Sri Madhava ,Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed., Varanasi: Chaukhambha Bharti Academy, 1999, 3/264-266, 267-269, 272.p.400-402
105. Bhudeb Mookharji,Rasa Jala Nidhi:, Vol.- 3<sup>rd</sup> Ed.-2<sup>nd</sup>, Varanasi:Shrigokul Mudranalaya, 1984. Ch.-1, p.no.-31, 34, 35, 73
106. Shri Sadananda Sharma, Rasa Tarangini:, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Ed.-11<sup>th</sup> Edited by Pt. Kashinath Shastri, Motilal Banarsidas, New Delhi, 20/61-63, 20/72-79, p.504-506
107. Ayurvedic Formulary of India, Part-I, ISMH, Govt. of India, Ed.-2<sup>nd</sup>, 2003.18/14
108. Shri Sureswara, Lauha Sarvasvam., Vidyotini Hindi Commentary by Shri Pavani Prasada Sharma, Edited by Shri Brahmashankar Mishra, Ed.-1<sup>st</sup>, Varanasi:Chaukhambha Vidyabhawan, 1965.1/23-24
109. Chakrapanidutta ,Chakradatta, Bhimshankar Mishra editor, Chaukhamba Sanskit series, ed.-5, 1983,Rasayanadhikar/71 p.555
110. Chakrapanidutta ,Chakradatta, Bhimshankar Mishra editor, Varanasi: Chaukhamba Sanskit series, ed.-5, 1983,Rasayanadhikar/77 p.555
111. Bhudeb Mookharji, Rasa Jala Nidhi, Varanasi: Chaukhambha orientalia Ed.-4<sup>nd</sup>, Vol.- 3<sup>rd</sup> 2004.p. 70
112. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi; Motilal Banarsidas, 20/42-44, p.500
113. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup>. New Delhi: Motilal Banarsidas, 20/45-46, p.501
114. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas, 20/47-48, p.501
115. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi:Motilal Banarsidas, 20/49-50, p.501
116. Shri Sadananda Sharma ,Rasa Tarangini,by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas, 20/51-52, p.502
117. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/319-322, p.190
118. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/323-324, p.191
119. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/324½-325, p.191
120. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/326-327, p.191
121. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> ,Varanasi:Chaukhambha Sanskrit series, 1994.1/328, p.192
122. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed.1<sup>st</sup> , Varanasi:Chaukhambha Sanskrit series, 1994.1/329, p.192
123. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> , Varanasi:Chaukhambha Sanskrit series, 1994.1/330, p.192
124. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> , Varanasi:Chaukhambha Sanskrit series, 1994.1/332, p.192
125. Gopal Krishna Bhatt, Rasendra Sara Samgraha, Satyarth Prakash commentrator, ed. 1<sup>st</sup> , Varanasi:Chaukhambha Sanskrit series, 1994.1/333-334, p.193
126. Singh Neetu, Reddy K.R.C. Particle size estimation and elemental analysis of Lauha bhasma, International journal research in Ayurveda & Pharmacy 2(1);2011: 30-35
127. Principles of Internal Medicine: Harrison, Published at Mc-Graw-Hill, Medical Publishing division, Ed.-14<sup>th</sup> 1998.p.660
128. Shri Sureswara, Lauha Sarvasvam., Vidyotini Hindi Commentary by Shri Pavani Prasada Sharma, Edited by Shri Brahmashankar Mishra, Ed.-1<sup>st</sup>, Varanasi:Chaukhambha Vidyabhawan, 1965.1/49
129. Acharya Somadeva, Rasendra Chudamani:,by Siddhinandan Mishra, Ed.-1<sup>st</sup>, Varanasi: Chaukamba Orinetalia, 1984.5/146, p.96
130. Acharya Somadeva, Rasendra Chudamani:,by Siddhinandan Mishra, Ed.-1<sup>st</sup>, Varanasi: Chaukamba Orinetalia, 1984.14/14, p.232
131. Vagbhtacharya, Rasa Ratna Samucchaya,by Prof. Dattatreya Anant Kulkarni, Reprint ed.New Delhi:Meharchand Lakshmandas Publication, 1998.5/14.p.94
132. Rasa Kamdhenu - Chudamani Mishra.by Vaidya Yadavji Trikamji Acharya, Ed.-1<sup>st</sup> Varanasi:Chaukhambha Orientalia, 1927.

133. Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed., Varanasi:Chaukhambha Bharti Academy, 1999.3/44,354
134. Nagarjuna, Rasendra Mangalam., Translated by Kvj. H.S. Sharma, Ed. 1<sup>st</sup>, Varanasi:Chaukhambha Orientalia, 2003.2/54-57, p.45
135. Parada kalpa P.61/31
136. Acharya Champaka, Rasadhyaya, Ram Krishna Sharma, editor, Rasaprabha Hindi Commentary by Tripathi I., Varanasi, Ed.-2<sup>nd</sup>, Chaukhamba Sanskrit Sansthan, 1982,5/270-271, p.58
137. Nityanatha Siddha, Rasa Ratnakara, by Swaminath Mishra, Riddhikhanda, Ed.-1<sup>st</sup>, Varanasi:Chaukhamba Orientalia, 1991.3/109-127, p.38-41
138. Nagarjuna, Rasendra Mangalam, Translated by Kvj. H.S. Sharma, Ed. 1<sup>st</sup>, Varanasi:Chaukhamba Orientalia, 2003.2/55<sup>1/2</sup>, p.45
139. Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed., Varanasi:Chaukhambha Bharti Academy, 1999.3/192, p.383
140. Acharya Sri Madhava, Ayurveda Prakash, by Shri Gulraj Sharma Mishra, Reprint ed. Varanasi :Chaukhambha Bharti Academy, 1999.3/162-166, p.377
141. Sharangdhara Acharya, Sharangdhar Samhita, by Adhamalla and Gudharth Dipika by Kasiram, Edited by Pandit Parasuram Shastri, Vidyasagar, Ed.-5<sup>th</sup>, Varanasi:Chaukhamba Orientalia, 2002.11/7-9, p.242
142. Dhundhukanāth, Rasendra Chintāmani: with Mani Prabhā Commentary of Manrām Sharma, Samsodhana by Vaidya Srinath Sharma, 1<sup>st</sup> Ed., Published by Vaidya Maniram Sharma, Ratangarh (Rajasthan), 1933.6/24
143. Rasarnava of Nagarjuna, Tripathi I., editor, 4<sup>th</sup> ed. Varanasi: Chaukhamba Sanskrit series, 2001, 7/151, p.109
144. Manthan Bhairava, Anandakandam by Shri. Radhakrishna Shastri, S. Gopalan, 1st edition, Tanjore: T.M.S.S.M. Library, 1952, Amritikaran 7/28
145. Rasa Tarangini: Shri Sadananda Sharma, with Sanskrit Commentary Prasadani by Shri Haridatt Shastri and Hindi Rasa Vigyana Commentary by Pt. Dharmananda Shastri, Edited by Pt. Kashinath Shastri, Ed.-11<sup>th</sup> New Delhi: Motilal Banarsidas, 18/36-38, 19/17 p.442,459
146. Dhundhukanāth, Rasendra Chintāmani: with Mani Prabhā Commentary by Maniram Sharma, Samsodhana by Vaidya Srinath Sharma, 1<sup>st</sup> Ed., Published by Vaidya Maniram Sharma, Ratangarh (Rajasthan), 1933.8/117

**Cite this article as:**

Namrata Joshi, Manoj Kumar Dash, L.K Dwivedi. Critical review and concept of marana with special reference to lauha. Int. J. Res. Ayurveda Pharm. 2015;6(3):404-412 <http://dx.doi.org/10.7897/2277-4343.06379>

Source of support: Nil, Conflict of interest: None Declared