



Historical Review of Lead (Pb) based ancient Ayurvedic medicine *Naga Bhasma*

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Abstract:

Lead (Pb), known as *Naga Dhatu*, is one of the oldest metals used for medicinal purposes in human beings to treat many disease entities such as diabetes, obesity, joint disorders, eye diseases, skin diseases, anemia, sexual disorders, diseases of old age group, etc. The ancient scholars were well aware of its different types, toxicity, and management, pharmaceutical processes to remove its toxic effects and to make it safe for internal administration and their various formulations to manage disease conditions. In the present review, all the historical aspects of *Naga* have been discussed elaborately, and different ancient methods of preparation of *Naga Bhasma* by its *Shodhan* and *Marana* procedures with applications of the *Naga* and its medicinal forms have also been reviewed in the present article.

Key words: *Naga*, Lead, *Shodhan*, *Bhasma*, *Marana*

1. Introduction:

From the period of *Atharveda* (1200–900 BC) to the period of *Rasatarangini* (19th century), a metal known as lead (Pb) is used with the name of '*Naga Dhatu*' for various medicinal uses. The history of the *Naga* can be traced from many ancient texts of Ayurveda. *Naga* has been used for many purposes in its different medicinal forms. Being a heavy metal, it has toxic manifestations. Therefore, *Naga* has been treated with diverse pharmaceutical processes to make it safe for internal administration. *Naga* has been used for external as well as internal uses. The ancient classification of metals also includes *Naga* in the then-classified groups of metals such as *Dhatu Varga*, *Putiloha Varga*, etc. Different types of *Shodhan* and *Maran* processes have also been

mentioned in ancient texts. In the present review article, all the information related to *Naga* from various available texts of Ayurveda has been collected and discussed with its pharmaceutical and therapeutic aspects.

2. *Naga* in ancient literatures:

The use of metals in the Vedic period was prevalent, and this science was known as "Daksayani Vidya"¹. Direct references in *Atharvanaveda*, *Manusmriti*, and *Grahya sutra* are available regarding the internal administration of *Suvarna*¹.

Atharvana Veda - A description of *Naga* is available along with *Suvarana*, *Loha*, *Vanga*, etc.¹

Yajurveda - A description of 6 metals is also available in *Yajurveda*².

3. *Naga* in *Samhitas*:

3.1 *Yagnavalkya Samhita* –

There is a description of 6 metals such as gold, silver, copper, iron, tin, and lead. When metals are subjected to fire, there is decay in metals. In the case of lead, it is about four times more than the silver².

3.2 *Manusmriti* – There is a description of the common method of purification for metals by heating in fire and dipping in water¹.

3.3 *Charak Samhita* – *Sisa churna (Naga)* is indicated for *mandal kustha* for external applications. Tongue cleaners made out of different metals are also mentioned³.

3.4 *Sushruta Samhita* – *Sisa (Naga)* is explained as *krimihara* under *Trapwadi gana*, and the properties are *katu* and *lavana rasa*, *lekhana* and *bhedana action*, *vatahara* and indicated in *pandu* and *krimi roga*. Further, a description of *asta loha* in *sutrasthan* is also available⁴.

3.5 *Astanga sangraha* – In this text, it is said that *sisa (Naga)* possesses *tikta* and *lavana rasa*, *lekhana* and *bhedana action*, *vatahara* and indicated in *pandu* and *krimi roga*⁵.

4. *Rasendra Mangala*:⁶

Rasendra Mangala, written by *Nagarjuna*, is the earliest authentic text of all the *Rasa Shastra* texts. The author has mentioned the purification process for all metals, including the general and specific purification of *Naga*. Also, *marana* of all the metals by general methods and specific methods and *bhavana* drugs to be used for *marana* have been described in *Rasendra Mangal*. In this context, the author has mentioned that for *Naga Bhasma*, *manashila* should be used as a medium and *arkashira (Ravidugdha)* as a *bhavana dravya* for *marana*. *Abhishyandahara varti* is one of the *Naga* preparations described in *Rasendra Mangala*.

5. *Rasa Hridya Tantra*:⁷

Govindapada has mentioned that all the essence of herbs gets into *Naga* and that of *Naga* into *Vanga*, of *Vanga* into *Tamra*, of *Tamra* into *Rajata*, of *Rajata* into *Swarna*, of *Rajata* into *Swarna* into *Parada*. So, *Naga* has the capacity to absorb all the herbs, and *parad* can ultimately absorb everything in it. *Naga* is purified by pouring melted *Naga* in *aranala* and repeating the same process one hundred times. *Naga* and *vanga* should be used for the transformation of metals (into gold and silver) and should not be used for *Rasayana* purposes. *Naga* is purified by immersing melted in *nirgundi swarasa*. *Naga Marana*, using *Parad* and *Manashila*, is also described.

6. *Rasarnava*:⁸

In *Rasarnava*, six metals have been mentioned, *Viz. Swarna, Rajata, Tamra, Tikshna, Vanga, and Naga*. Metals when heated, there is a loss in the weight of metals. This loss is noted in ascending order. *Naga and vanga* are included under *Putilooha*. There is only one type of *Naga*. *Naga* of good quality is defined as soft, heavy in nature, and melts quickly. The purification of *Naga* is done by immersing it in elephants' urine with the powder of elephants' bones. In another method, the purification is done by immersing it seven times separately in juices or decoctions of *Haridra, Apamarga, Palasha, Tankana*, etc. *Marana* of *Naga* is done using *Manashila* and *Arkashira*, by *putpaka* method.

In another context, the different colored fumes for different metals have been narrated. If the *musha* containing *Naga* is kept on fire, it will release dirty and smoky fumes. *Vajra, Makshika, Tikshna loha, and Abharak* are preferred for internal administration, and for the transformation of the metals, *Naga, Vanga, and Souvira* are employed.

7. *Rasendra Chudamani*:⁹

The author has explained the different preparations of *Naga* like *Loha Naga, Shulva Naga, Guhya Naga, Vara Naga, Naga sambhuta capala*, etc. The author has mentioned nine metals and classified *Naga* of good quality. It should have a foul smell, be heavy, black in appearance, and after taking the central section, it should be black and bright. The *Naga Bhasma* possesses *Tikta Rasa, Atiushna*, and *Snigdha Guna* and has *dipana* action, effective for *Vata, Kapha Prameha Roga, Jaladosha, and Amavata*.

It is purified by melting and pouring into the decoction of *Nirgundi* and *Haridra Churna*. If it is not purified properly, causes *Murcha* (unconsciousness), *Sphota* (eruptions), etc. For *Marana*, a special type of *Yantra* has been mentioned known as *Bhrashtra Yantra*, the vessel which is smeared with except mouth portion, tilted, and kept on fire. This *Yantra* is supposed to be good for *Marana*. In *Bhrashtra Yantra*, 80 *tolas* of purified *Naga* is taken and melted on *Tivragni* (intense heat), when *Naga* is melted, one part of purified *parad* is added and stirred well. Then *kshara* of *Arjuna, Argwadha, Dadima, and Apamarga*, each four *tolas* (48 gms), are added and rubbed well with a strong, big, and long-handed iron ladle. This process is continued for twenty days.

Naga Bhasma is either Red or Pigeon in color. Thus, prepared *Naga Bhasma* is again converted into its original form (a process known as *utthapana*) and again subjected to the *marana* process. The process is repeated ten times. This *Naga Bhasma*, devoid of all *doshas*, acts as *Rasayana*. *Naga Rasayana* is a compound preparation of *Bhasma* of *Naga*, *Swarna*, *Makshika*, *Tamra*, *Rajata*, *Kanta loha*, *Abharak-satva*, and *sphatika*. In proportion, one part of *Naga Bhasma*, half part of *Swarna Makshika Bhasma*, and the rest each one-fourth of *Naga Bhasma*, triturated with *Triphala decoction*, subjected to *puta* using thirty *aranyouपाला* (cow dung cakes) and repeated for 30 times. This *rasayana* is given in the dose of 2 *rattis* (240 grams) with *Trikatu* and *Vidanga churna*, four *rattis* each mixed with honey and ghee. *Naga Rasayana* is indicated in 80 types of *Vata rogas*, especially *Dhanurvata*, all *Kapha rogas*, *Mutra roga*, *Swasa*, *Kasa*, *Pandu*, *Sotha*, *Sitajwara*, *Grahani*, *Amadosha*, *Agnimandya*, *Arsha*, etc.

8. *Anand kanda*:¹⁰

The author has explained 12 types of *loha*. He has counted *Naga* as one of the twelve types.

For purification, different methods have been mentioned:

- (1) Melted *Naga* is poured into a liquid containing *Nirgundi*, *Mulachurna*, and *Arkadugdha*. It is repeated seven times.
- (2) Melted *Naga* poured into a decoction containing *Haridra*, *Tumburu bija*, *Kokilaksha*, *kuberaksha*, *Gauriphala*, and *Mallika*.
- (3) Melted *Naga* poured with *mahisa asthi churna* into *Mahisamutra* for seven Times.

The different *Marana* processes described are as follows: In the first method of *marana*, it is advised to treat with one-fourth quantity of *manashila* and triturated with *jambira swaras*, and finally subjected to *puta*. The process is repeated 60 times, but after the first *puta*, 1/20th of *manashila* is used for subsequent *putas*. *Bhasma* prepared is known as *Shastiputa Naga Bhasma*.

In the second method, the *Naga* is treated with *citraka drava* stirred with *Arjuna Danda* for sixteen *yamas* (48 hrs). Then it is triturated with *citraka drava* and subjected to six *putas*.

In the third method, *Naga* is treated with *Cinca*, *Bhallatak*, *Apamarga*, *Arjuna*, *Aswattha*, etc., and stirred with *palasa danda* for seven days.

In the fourth method, a paste of *Agastya* and *Bhunaga* is smeared on the inner surface of the utensil, melted *Naga* is poured and treated with *vasa* and *cinca kshara* and stirred with *vasa danda* for one *yama* (3hrs), then mixed with *manashila* and *vasa kshaya Bhavana* is given and subjected to *puta*. For subsequent *putas* 1/4th of *manashila* should be used. The process is repeated for 21 times.

9. *Rasaprakasa Sudhakara*:¹¹

In the fourth chapter, specific purification of *Naga* is mentioned by the *dhalana* of melted *Naga* in *Haridra Swarasa*. Two types of *Marana* have been explained. In the first method of purification, *Naga* is converted into thin sheets, *Manashila* in 1/4th quantity of *Naga* is added and triturated with *vasa patra swarasa* for three hours, and this paste is smeared on *Naga Patras* and subjected to three *Varah putas*.

The second method, wherein *Naga* is melted in an iron bowl and mixed with *palash mula churna*, is rubbed with a long-handled iron ladle, where it is completely converted into *bhasma*. The fire intensifies and results in red-colored *Bhasma*. The author *Yashodara* has said there are many other methods to prepare *Naga Bhasma*. However, the strong notion is that the *marana* of *Naga*, *Parad*, and *Sambhu* (lord Shiva) is impossible. Various *Naga yoga* are described in it. The use of *Naga* and different processes have been narrated in detail in the context of *lohavada*. Regarding the preparation of *Naga Bhasma*, another reference is available in the context of *lohavada*. In this method, *Marana* of *Naga* is done using *Manashila* and *kumari swarasa*.

10. *Rasa Ratan Samuchaya*:¹²

The author has followed the authors of *Rasarnava* (12th century), *Rasendra chudamani* (12th century), and *Rasaprakash Sudhakar* (13th century). A good number of *Naga yogas* have been mentioned, especially in the context of *Prameha Chikitsa*. The preparation of *Naga Bhasma* by using *Parada* in the context of *Prameha* has been explained under the name of *Rasendra Naga Rasa*.

11. *Rasendra Chintamani*:¹³

The purification of *Naga* is done by melting *Naga* and immersing it in *Nirgundi Rasa*. Different methods of *Naga Marana* have been explained.

In the 1st method, *Naga* is mixed with *Manashila*, *Gandhak* and triturated with *Nimbu Swaras*, and subjected to *puta*.

In the 2nd method, *Haratala* is taken instead of *Manashila*, and the rest is the same as that of the 1st method.

In the 3rd method, *Naga* is smeared with *Agastya patra kalka*. Then, it is melted, and *Vasa* and *apamarga* in ¼th quantity are added. Finally, it is subjected to fire for 3 hrs and rubbed well with *Vasadanda*. Then, it is triturated with *Vasa Kwatha* and subjected to seven *putas*. Through this process, it gets *Sindura varna Naga Bhasma*.

In another method of purification, melted *Naga* or *Vanga* is poured into *Arkakshira* seven times.

Naga Bhasma increases *Kanti*, *Virya*, *Ayu*, alleviates diseases, *Trishna*, *Ama*, *Sotha*, *Shula*, *Arsha*, *Kustha*, *Pandu*, *Meha*, etc. It is *Guru*, *Caksusya*, *Medo hara*, and *Vata hara*. The properties of *Naga* are similar to that of *Vanga* (Tin).

12. *Rasendra Sara Sangraha*:¹⁴

The process of *shodhan*, methods of *marana*, and properties of *Naga bhasma* are mentioned in the text. The purification of *Naga* is done by pouring melted *Naga* into a utensil containing *Arkakshira*. The vessel is covered by a lid with a small hole in the center. Melted *Naga* is poured through this hole. This process is repeated three times. For *Marana*, *Nagapatra* smeared with *Agastya patra Kalka* is melted, wherein 1/4th of the quantity

of *Vasa* and *Apamarga* are added and rubbed with *Vasa Danda* for one *Prahara* (3 hrs). It is then triturated with *Vasa Swarasa* and subjected to *Putas*. It gets *Sindura Varna*.

In the second method, *Naga* is triturated with *Manashila* and *Vasa swarasa* and subjected to *Gajaputa* three times.

As regards the properties, it is used in *Loha Vada* for *Tara ranjan*, and in *Deha Vada*, it is said that it gives strength, and increases vitality, longevity, and complexion. It is *Mehahara*, *Vata*, *Pitta*, *Kaphahara*, *Visahara* and used in *Grahani*, *Kustha*, *Gulma*, *Arsa*, *Sosha* and *Vrana*.

13. *Rasa Kamdhenu*:¹⁵

The author has compiled the subject matter of *Rasa Sastra* from different texts. For the process of *Marana* compilation from *Vaidya Kalpadruma*, he has mentioned that *Naga* treated with *Aswattha* and *Cincha Kshara* should be mixed with half the quantity of *Gandhaka* and half of *Manashila*, triturated with any *Amla dravya* and subjected to sixty *Laghu putas*.

For the second method, a compilation from *Rasa Sara*, he has said that *Naga* is treated with *Palasa* and *Vasa Kshara*, each one-fourth quantity, and stirred with *Vasa danda* for three days. Then it is washed with water and mixed with one-fourth of *Manashila*, and *Kumari Rasa Bhavana* is given, subjected to thirty *Laghu Putas*. This method is supposed to be the best one.

From *Rasa Manjari*, the author has compiled a process of *Naga* smeared with *Agastya Kalka* and treated with *Vasa* and *Apamarga kshara* and stirred well with *Vasa Danda* for one *Prahara*. Then it is triturated with *Vasa swarasa* and subjected to seven *putas*. It gets *Sindura Varna*. This is again triturated with *Kumari Svarasa* and subjected to one hundred *Putas* in *Gajaputa*.

14. *Ayurveda Prakash*:¹⁶

The author has grouped the metals under *Dhatu*s (seven in number). He has included *Yasada* also in them. Hence the *Sapta Dhatu*s are *Swarna*, *Rajata*, *Tamra*, *Loha*, *Vanga*, *Naga* and *Yasada*.

The properties of *Naga* are *Vata Pitta Kaphahara*, *Sarva Pramehara*, *Usna*, *Sara*, etc. It is supposed that it gives strength of one hundred elephants. The harmful effects of consuming improperly purified and improperly prepared *Naga Bhasma* are also mentioned.

In one of the methods of *Marana*, he has advocated *Tambula Patra Swarasa Bhavana* and *Manashila* as a medium and thirty-two *Putas* should be given to get the final *bhasma*.

He refers to a quotation from *Rasa Paddati* in the context of the administration of *Naga Bhasma*, "It has always been the opinion of physicians that *Naga Bhasma*, *Rajata Bhasma*, and *Bhasmas of Upadhatus* should not be used individually" if used it will not be much effective. Hence, they should be used in combination with other drugs. He has also mentioned about *Nageshwara Rasa*, a preparation of *Naga Bhasma*.

15. *Rasa Tarangini*:¹⁷

Purification of *Naga* is described by pouring melted *Naga* into *Nirgundi Mula Rasa* seven times and another by pouring into *Curnodaka* (lime water) seven times.

Various processes of *Marana* are also described. The properties of *Naga Bhasma* are *madhura* and *tikta*, *snigdha*, *ushna*, *guru*, *lekhna*, *sara*, *agni dipana*. It can be used in *prameha*, *grahani*, *arsa*, *kapha roga*, *vrana*, *gulma* and *Rakta pradara*.

The dose mentioned is $\frac{1}{4}$ ratti to one ratti (30-120mg) with suitable anupana, which should be used for treating different diseases. For example, in *prameha*, *haridra* and *amalaki churna* with honey, and in *vataj prameha*, *guduchi satwa* with honey are advised for internal administration.

A few preparations of *Naga* are also mentioned.

Shuddha gandhak is mentioned as an antidote for various untoward reactions if caused by consuming improperly prepared *Naga Bhasma*.

16. *Rasamrita*:¹⁸

Naga is treated with $\frac{1}{4}$ of *Parad* and triturated with an equal quantity of *manashila* with *vasa swarasa Bhavana*. Finally, subject to seven *laghu putas*.

In *siddha yoga sangraha*, the author has followed the general method of purification by immersing melted *Naga* seven times in each of the liquid media such as *tila*, *takra*, *gomutra*, *kanji*, and *kulattha kwatha*.

For *Naga Marana*, melted *Naga* is treated with *ashwattha* and *cincha bark* and later treated with $\frac{1}{8}$ th of *gandhak* till it gets red coloured. Then triturated with $\frac{1}{12}$ th of *manashila* with *Vasa swarasa bhavana*. It is subjected to forty-one *putas*. *Agni* should be gradually increased as the number of *putas* increases, *Naga* gets the capacity to resist the temperature. *Manashila* is added for first ten *putas* only. Thereafter, *sandhi bandhana* is also not recommended. By this process, *Bhasma* becomes red color. The quantity of *Naga* for *Marana* should be 40-60 tolas and should not exceed that. The dose of *Naga Bhasma* is $\frac{1}{2}$ Ratti (60mgs). The *Anupana* should be according to the disease. The general *anupana* is one part of honey and two parts of ghee. The indications are *Madhumeha*, *Shukrameha*, and *Shweta pradrara*.

17. *Rasa Tantra Sara & Siddhaprayoga Sangraha*:¹⁹

For the process of *Marana*, melted *Naga* is treated with an equal amount of *manashila* added little by little and stirred with *vasa danda*. A portion that is not converted into *bhasma* is removed (by sieving it through cloth). *Bhasma* triturated with an equal quantity of *gandhak* and triturated with *nimbu swaras* and subjected to *puta*. For subsequent *puta* $\frac{1}{8}$ th of *Manashila* with *vasa swaras bhavana* was given for twelve hours and subjected to *Gajaputa*. It is repeated twenty-one times. The dose is $\frac{1}{2}$ -1 Ratti (60-120mg). The *shilajatu* is used as *anupana* for *Madhumeha*.

18. *Sharangdhar Samhita*:²⁰

For *Marana*, *Naga patras* are smeared with *kalka* made out of equal quantity of *manashila* using *tambula Rasa* and subjected to two *putas*. In the second method, melted *Naga* is treated with $\frac{1}{4}$ th of *aswattha* and cincha bark, and it is triturated with an equal amount of *Manashila* and *kanji* and subjected to *Gajaputa* for 60 times.

19. *Bhav Prakash Nighantu*:²¹

Bhava misraha classified metals under the heading *Dhatus*. He has described *Naga* (similar to vanga), diseases caused by consuming *ashuddha Naga*, sources of *Naga*, and general therapeutic effects.

Discussion:

The literary review reveals that *Naga* is an ancient metal known since the Vedic period. During the early era (before the 10th century A.D.) of *Rasa Shastra*, *Naga* was employed more in alchemy than in medicine. It was only after the 12th century A.D. the *Naga bhasma* was practiced after the proper purification and incineration of the *Naga*. *Parad* and *Manashila* are also used for the *marana* procedure of *Naga* with *Gandhak*. In ancient textbooks of *Rasashastra*, the common method of *samanya shodhana* of *Naga* is done using Tila tail, Takra, Gomutra, Kanji, etc. Then *Churnodaka* was employed for *shodhana* of *Naga*. The common method of *jarana* is by using *Manashila* and *Apamarga panchanga churna*. The common method of *marana* is by using *Manashila* and *Nimbu swarasa* as *bhavana dravya*. Other methods of *marana* are mentioned using *Parad*, *Gandhak*, *Hartala*, *Ghritakumari*, etc. Many diseases can be produced by consuming *ashuddha* or *apakwa Naga Bhasma*. The chief antidote is *shuddha Gandhak* and *Swarnabhasma* with *Haritaki* and *Sita*. The dose of *Naga Bhasma* is $\frac{1}{4}$ -1 ratti (30-120 mg).

Conclusion:

Although *Naga* comes under highly toxic heavy metals, it is being used as a medicine in Ayurveda since many centuries. The pharmaceutical processing such as *Shodhana* and *Marana*, makes it safe. Different methods have been discussed elaborately in ancient texts to make suitable changes in *Naga*. It can be concluded that *Naga* is an important metal having wide therapeutic uses and can be converted to its safe and effective medicinal forms by adopting different pharmaceutical processes as reviewed in the present article.

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