

# A Review of Naga (Lead) through Rasa Shastra literature

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**Abstract- Rasa Shastra (Ayurvedic Pharmaceutics)** a branch of Ayurveda that deals with the processing of Mercury, Metals and minerals into herbometalic, herbomineral form i.e *bhasma* for therapeutic purpose. Based on their experiences, The ancient *Acharyas* of *Rasa shastra* have described several methods for preparation of *bhasma* of a single metal based on therapeutic utility and impregnate expected properties in respective metal. In present study critical review of pharmaceutical procedure of *nagabhasma* (Incinerated powder of Lead) is compiled from available classical text which include basic procedure like *sodhana* (purification), *jarana* (polling) and *maran* (incineration). Various researches have been carried on safety issue of naga bhasma are described in detail in this review. Meticulous observation of the literature reveals that *naga bhasma* is a mixture of PbO, Pb<sub>3</sub>O<sub>4</sub>, OH, (CO<sub>3</sub>)<sub>2</sub>, (SO<sub>4</sub>)<sub>2</sub> and (AsO<sub>4</sub>)<sub>3</sub> group. Naga bhasma is a free from toxic effect and it is used for Various therapeutic Purpose like prameha (Diabeties mellitus), Skin disorder and Aphrodisiac therapy. This review article is sincerely attempt to collect all the comprehensive information depicted in classics regarding the *naga*.

**Keyword:** Ayurveda, Lead, Naga Bhasma, Rasa shastra, , Rasa Ratnasamuchchaya,

## Introduction:

*Rasa Shastra* deals with Ayurvedic drug manufacturing and confirming their safety as well as efficacy. It is enriched with description of metallic, mineral and origin. it details the origin of raw material, varieties, acceptable characteristics, manufacturing techniques, properties, therapeutic uses, possibility of developing adverse effect, specification of doses, specification of duration, specific *anupana* (adjuvant) for particular disease and wide therapeutic applications. *Naga* (lead) is a heavy metal. Series of pharmaceutical procedures employed to prepare the *naga bhasma* to get the organo-metallic form like *shodhan*, *jaran* and *maranto* convert the toxic lead into non toxic *bhasma* form. Quality of *bhasma* depend upon quality of raw material, processing technique, herbal ingredients used for *bhavana* (levigation), duration of *bhavana* and *Putra* (quantum of the heat). *Putra* is very particular to specific material depends upon the physical and chemical properties of material to be processed. Naga bhasma has versatile therapeutic applications. it is especially used for the treatment of disease related to vrogenital system such as *Prameha* (Diabeties), *Pradara* (Leucorrhoea) *Amavata* (Rheumatoid arthritis), *VataRoga* (Nervous Disorder), *Vrana* (Non healing wounds), *Arsha* (piles) etc<sup>[1]</sup>. Ayurvedic text have described several method for quality control of Bhasma Pariksha like Varitaratvam, Nishchandratva, Nirutha etc. to achieve a Specific acceptable standard Bhasma<sup>[2]</sup>.

**Table. 1: Naga at a glance in treatise of Rasa Shastra**

Varga	Dhatu (Putiloaha)
Chemical name	Lead (Pb)
Ore	Galena (PbS), Cerusite, Anglesite, Matlockite (PbCl <sub>2</sub> PO), Lead Oxide(PbO)
Varna (Color)	Bhasmas are generally white, pale or red. The color of the preparation primarily depends on the parent material.
Types <sup>[3,4]</sup>	Rasarnava has mentioned that <i>naga</i> is of only one type, while other acharyas have mention two type viz <i>Kumara</i> and <i>Samala</i>
GrahyaSwaroopa <sup>[5]</sup> (Ideal Characteristics)	Sample of <i>naga</i> which melt easily on fire( <i>drutadravam</i> ), heavy in weight ( <i>mahabharam</i> ), the freshly cut surface shows a bright black metallic luster ( <i>Chhede Krishna samujwalam</i> ), emit foul smell while melting ( <i>Putigandhaka</i> ) and Externally black in color.

Specific Gravity	11.3
Hardness	1.5
Melting Point	327.5°C
Guna <sup>[6]</sup>	Rasa- Tikta, Katu, Lavana, Kshara, Guna- Usna, Laghu, Snigdha, sara, guru, Virya- Usna, karma- Balya, Dasa, Viryavardhana, Ayuvardhana, Vilekhana, Prabhava
VyadhiPrabhava <sup>[7]</sup>	Asrigdara, Meha, Arsas, Vatikaroga, vyana, Gulma, Grahni, Atisara, Krimi, Kamala, Kustha, Kusta, Visa, Swasa, medhoroga, Pandu.
Anupana <sup>[8]</sup>	Madhu, Ashokakwatha, GuduchiSatva

**Synonyms;** The synonyms of Naga According to various Rasa shastra texts viz Sisa<sup>[9]</sup>, Kutila (flexible)<sup>[10]</sup>, Ahi (Looks like cloud)<sup>[11]</sup>, Tannaga<sup>[12]</sup>, Phani<sup>[13]</sup>, Kari ( Can be scrawl by nail)<sup>[14]</sup>, Vraga (like snake), Bhujanga (like Naga)<sup>[15]</sup>, Jada( heavy), Shita (cool in touch), Paripishtha (Malleable)<sup>[16]</sup>, Naganamakam (Synonyms of Naga)<sup>[17]</sup>.

**Material and method;** In these review available classical literature was searched extensively and compilation of various information such as availability, ideal characteristics, varieties, pharmaceutical procedures, therapeutic indications, dose, duration is done for ready references of *naga* and its *hasma*.

### Pharmaceutical Processing

Pharmaceutical processing of naga includes the series of procedure like *shodhana* (Purification), *jarana* and *marana* (incineration) as per qualities mentioned in classical texts<sup>[18]</sup>.

#### 1. Shodhana

Ayurvedic *shodhana* process is one of the powerful methods of detoxification and purification. *Shodhan* means the purification of material by various pharmaceutical processes. In the broad sense, it is the procedure that is the base of all the pharmaceutical processes. It clears blemishes of material, makes it brittle, imparts the specific therapeutic property, and facilitates the material for further pharmaceutical processing. for the metals, there are two subtypes of *shodhan*, i.e., *samana shodhan* and *vishesh shodhan*<sup>[19]</sup>.

**i. SamanyaShodhana;** Samanyashodhana should be carried out by seven time quenching of melted Naga in tila tail (oil of sesamumindicum), takra (butter milk), gomutra (Cow urine), kanji ( Sour gruel) and kulathhakwath (Decoction of Dolicus biflorus) Respectively.

**ii. Visheshshodhana; Methode 1.** Raw *naga* should be take in a vessel containing *nirgundiswarasa* (juice extract of Vitex Nigundo) and this was exposed to sun light for seven days and left it until it dries completely or raw *naga* should take in iron pan and subjected to intense heat for melting. after that *nirgundichurna* (Powder of Vitex Nigundo) should add to it and roasted for seven days for *shodhana* (RHT-9/14).

**Methode 2.** Raw *naga* should be taken in a clean and dry iron pan and subjected to intense heat in charcoal furnace. Subsequently, after melting of *naga*, *nirgundimula churna*, *nirgundibijachurna*, *haridrachurna* should add to *naga* in 1/16th Part as *prakshepdravya* (sprinkle) and rubbed in iron laddle. after self cooling, *naga* should be collect from the *swarasa*, dried and the process of melting, roasting and quenching should repeated for 3-times. such *shodhit naga* used in therapeutics as it is free from adverse effect like *Murchha*, *sphota* (eruption, Nodules) etc (RRS-5/172).

**Table-2: Detail of samanyashodhana of naga mentioned in different texts.**

Sr.No.	Types of Procedure	media	Repetition	Reference
1.	<i>Bhavana</i>	<i>Jambira, Kakoti,</i>	-	<i>RM (1/54)</i>
2.	<i>Bhavana</i>	<i>Snuhi, ArkaKshar</i>	-	<i>Rasanava (7/116-117)</i>
3.	<i>Nirvapana/Dhalan</i>	<i>Sashakrakta, Samandarlavan, Triphalakwath</i>	7	<i>R.Chu(14/92-93), RPS (4/66-67), RRS (5/13)</i>
4.	<i>Nirvapana/Dhalan</i>	<i>Sashakrakta, Samandarlavan, Triphalakwath</i>	3	<i>R.Pa (Verse-5)</i>
5.	<i>Nirvapana/Dhalan</i>	<i>Takra, Kanji, Gomutra, Taila, Kulathakwath</i>	21	<i>Rasapaddhati (Verse-49)</i>
6.	<i>Nirvapana/Dhalan</i>	<i>Kanji, Takra, Kulatthakwath, Gomutra, Taila</i>	3	<i>R.T (15/456)</i>
7.	<i>Nirvapana/Dhalan</i>	<i>Taila, takra, Gomutra, Kanji, Arkakshira, kulatthakwath, jambira rasa</i>	7	<i>Rasaratnakara (3/105)</i>

8.	<i>Nirvapana/Dhalana</i>	<i>Taila, takra, kanji, gomutra, kulatthakwath, Arkkshira</i>	3	<i>Sha.ma (1/213)</i>
9.	<i>Nirvapana/Dhalana</i>	<i>karaviramulajala</i>	7	<i>R.Chi (6/5), A.P.</i>
10.	<i>Nirvapana/Dhalana</i>	<i>Taila, Takra, gomutra, kanji, kulatthakwath, varakwatha</i>	-	<i>Y.T (Verses 72-73), B.Y. T)</i>
11.	<i>Nirvapana/Dhalana</i>	<i>Kshara, Dugdhavarga, tailavarga, pushpaphala, raktavarga.</i>	10	<i>R.Pu (Verse-6)</i>

**Abbreviations\***; RM- Rasendra Mangala, R.Chu.- Rasendra Chudamani, R.P.S- Rasa Prakash Sudhakara, R.T- Rasa Tarangini, R.Chi- Rasendra Chintamani, Y.T- Yogatarangini, B.Y.T- Brihatyoga Tarangini, R.Pu- Rasendra Purana, R.H.T- Rasahridaya Tantra, R.R.S- Rasa ratna samuchchaya, A.K- Anand kanda, R.SK- Rasanketa kalika, RPS- Rasa Prakash Sudhakara, AP- Ayurveda Prakash, BRRS- Brihat rasa raja sundara.

**Table-3:Detail of visheshshodhana of naga mention in different texts.**

Sr.No.	Types of Procedure	Media	Repetition	Reference
1.	<i>Bhavana</i>	<i>Gauriphala, Rajani, ksharaka, kubarbija,</i>	-	<i>RM (1/64-65)</i>
2.	<i>Swedana</i>	<i>Sphatikajala</i>	-	<i>RM (1/65)</i>
3.	<i>Dhalana</i>	<i>Nirgundiswarasa, Nirgundimoolchurana</i>	7	<i>RHT(9/14), RRS(5/172)</i>
4.	<i>Dhalana</i>	<i>Hastimutra, Hasti-asthichurna</i>	-	<i>Rasarnava (7/112)</i>
5.	<i>Dhalana</i>	<i>Nirgundi rasa, Haridrachurna</i>	3	<i>R.Chu (4/148),RRS(5/172)</i>
6.	<i>Dhalana</i>	<i>Hastimutra, Haridra, Arkakshira</i>	7	<i>A.K (6/21-24)</i>
7.	<i>Dhalana</i>	<i>Kumari, Bhingraja, Palasha</i>	21	<i>R.S.K (VERSE-26)</i>
8.	<i>Dhalana</i>	<i>Tailadi, Arkakshira</i>	7	<i>R.Chi (6/6)</i>
9.	<i>Dhalana</i>	<i>Nirgundirasa</i>	7	<i>R.Chi (6/6)</i>
10.	<i>Dhalana</i>	<i>Arkakshira</i>	3	<i>RRS (1/289)</i>

**Jarana:** *Shodhitana* naga should be put in an iron vessel and heated over flame till it melted then equal quantity of herbal powders should be added to it and rubbed till it turned into powder form. In *jarana* process metal is heated in open iron pan and continuously rubbed with stem/root of same herbs till it gets converted into fine powder form followed by covering with earthen saucer and applying strong heat for 3hrs. *parad, arjuna, arka, aragvadha, dadima, apamarga- kshara* are the medias used for *jarana* of *naga*.

**Table-4:Different method for jarana of naga**

Sr.No	Types of Procedure	Media	Repetition	Colors	Reference
1.	<i>Jarana</i>	<i>Arka root, Manashila, Gandhaka, Kapoor, Kumkum, Nimbuswarasa</i>	-	<i>Sinduraruna</i>	<i>RJN(Part-iii) Chap-2, Pg.No 131)</i>
2.	<i>Jarana</i>	<i>Parad, arjuna, arka, aragvadha, dadima, apamargakshara</i>	21	<i>Rakta</i>	<i>R.Chu (1/38), RRS (5/174-179)</i>
3.	<i>Jarana</i>	<i>Palasha root</i>	-	<i>Raktabha</i>	<i>RPS(4/103-104)</i>
4.	<i>Jarana</i>	<i>Ashwath, chinch,manashila, nimbuswarasa</i>	3	<i>Sinduraruna</i>	<i>RJN (Chap-2, Pg.no- 126)</i>
5.	<i>Jarana</i>	<i>Churna, parthadanda</i>	6		<i>AK(6/28-30)</i>
6.	<i>Jarana</i>	<i>Kumari, Asana, Arka, Bahupad, Palashamula</i>	3	<i>Sinduraruna</i>	<i>AP(3/191)</i>
7.	<i>Jarana</i>	<i>Bhunaga, Agasti, Vasa, Apamargakshar</i>	7	<i>Sindura</i>	<i>R.Chi(6/52-54)</i>
8.	<i>Jarana</i>	<i>Kumari</i>	100	<i>Sindura</i>	<i>BRRS(no-81)</i>
9.	<i>Jarana</i>	<i>Ashwattha-twak-churna</i>	3	<i>Kajjalaprabha</i>	<i>RT(19/11-18)</i>
10.	<i>Jarana</i>	<i>Apamargachurna, Vasa</i>	3	-	<i>RT(19/24-28)</i>

**Marana (Incineration):**

Various common method for *marana* of *naga* from different texts are mention below

First of all take *sudhhanaga* in an iron vessel and heat it until it melts then *sudhhamanashila* to it in small quantity until *naga* turns into ash. after the vessel cools down take out the ash and put it in *khalvayantra* and add *sudhthagandhaka* to it. do *mardana* along with *nimbuswarasa* to form paste. dry the content in sunlight. Now put the *churna* in *samputa* and give 3 *puta* to obtain *bhasma* (R.T- 19/19-23).

**Table 5; Various methods of naga marana by applying puta method**

Sr.No.	Type	Media	No	Colour	Ref.
1.	Putra	Arkadugdha, Manahshila	-	-	RM (2/54), RRS (5/184)
2.	Putra	Sutabhasma	1	Sinduraruna	RSN (5/14-16)
3.	Putra	NagaranjitaRajata	-	Sinduraruna	RSN (5/75-78)
4.	Putra	Kumarimoola	100	Sinduraruna	Rjn(part-iii) Chap-2, Pg.no-132)
5.	Putra	Shila, Tambulirasa	32	-	AP (3/192), Sha.M. 11/10
6.	Putra	Manashila, Vasa	3	-	AP (3/201)
7.	Putra	Shila, Gandhaka, Vasa	3	-	YR (shloka no-1, page no-128)
8.	Putra	Shila, Tanduliya, Vasa	7	-	BRRS (pg.no-80-81)
9.	Putra	Shila, Gandhaka, Karpur, Kumkum	60	Vidyutabhasa	BRRS (no-81)
10.	Putra	Apamargapatra	-	Shweta	Anu.M. (5/9)

**Dose of nagabhasma** - Various therapeutic dose is mention by different texts.

e.g - 1/4<sup>th</sup> - 1 ratti (30 - 120 mg)<sup>[20]</sup>, 1/2 Valla (60 mg)<sup>[21]</sup>, and 24 Gunja (250 - 300 mg)<sup>[22]</sup>

**Table 6 : Some formulations containing Naga Bhasma and their Uses: Kharaliya Rasayana**

Sr. No	Formulation	Herbal Drug	Other metal & Mineral Ingredients	Indication	Dosage form	References
1.	Dipikarasa	Pippali, Chitraka	P, G, SL, SL	Sarvajwara	Churna	RRS (12/20-25) Page no-223
2.	Sarvajwarari rasa	Punarnavamool a	H, T, L,C, T, A, Kantalauha	Sarvajwara	Churna	RRS(12/4 3) page no-228
3.	Sannipatakutha rasa	Vatsanabha, Chitraka, trikatu, bhrigaraja, hastishundi, ativisha, jayaphala	V, P, M, G, T	Sannipatjwara	churna	RRS(12/1 29) page no- 242
4.	Jirnajwararira sa	Vatsanabha	V, RS, T, G, T, P, M, H	Jirnajwara	Vati	RRS(12/1 45-148), page no-245
5.	Sankheswarara sa	-	S, V, T, G, P, T	Rajyakshama	churna	RRS(14/1 8) page no-241
6.	Vaidhyanathar asa	-	S, V, T, H, G, T, R, P	Rajyakshama	churna	RRS(14/4 7-50) page no-275

7.	<i>Vajrarasa</i>	<i>Ankolabeeja, kangunibeeja</i>	<i>Swarna, kharparsatva, pravalabhasma, muktabhasma, tamrabhasma, abhrakabhasma, H, T, T, V</i>	<i>Rajyakshama</i>	<i>churna</i>	<i>RRS(14/5 8-67) page no-277</i>
8.	<i>Bhairavnatheepanchamrutaparpati</i>	-	<i>Suvarnabhasma, Rajatabhasma, Tamrabhasma, abhrakabhasma, vangabhasma, G, P,M, swarnamakshika, Nilanjana</i>	<i>Rajyakshma</i>	<i>parpati</i>	<i>RRS(14/8 0-100) page no-286</i>
9.	<i>Moolakuthararasa</i>	-	<i>Abhrakabhasma, tamrabhasma, tikshnalauhabhasma, H, G</i>	<i>Arsha</i>	<i>churna</i>	<i>RRS(15/2 9-36) page no-294</i>
10.	<i>Arkesharasa</i>	-	<i>G, P, S, S, Vida, Tuttha, sankhabhasma</i>	<i>Arsha</i>	<i>Vati</i>	<i>RRS(15/5 8-59) page no – 297</i>
11.	<i>Nagasundararasa</i>	-	<i>P, A, G</i>	<i>Atisara</i>	<i>Vati</i>	<i>RRS(16/3 2-37) page no-311</i>
12.	<i>Sarvarogyavati</i>	<i>Pippali, pippalimula, chavya, chitrakamula, shunthi, Maricha, kayaphala, mishi, ushira, vidanga, tumburu, bharangi, rasna, kankol, chorpuphi, kantkarimula, chirtikta, dhatturbija, vatsanabha, langali</i>	<i>P,G, H, M, Swarnamakshikabhasma, tikshnalohabhasma, yashadabhasma, abhrakabhasma, H, Shilajatu, Swarna, Rajata</i>	<i>Grahani</i>	<i>Vati</i>	<i>RRS(16/5 7-67) page no-316</i>
13.	<i>Pramehagajasmharasa</i>	-	<i>P, A, SU, V, T</i>	<i>Prameha</i>	<i>Churna</i>	<i>RRS(17/3 0-31) page no-346</i>
14.	<i>Mahavidhyaguti</i>	-	<i>Kantalauha, A, P, Rajavarta, swargairikabhasma, mandurabhasma, raupyamakshikabhasma, T, V, K</i>	<i>Prameha</i>	<i>Vati</i>	<i>RRS(17/3 2-36) page no-346</i>
15.	<i>Rasendranagarasa</i>	<i>Chincha, twakakshara</i>	<i>p</i>	<i>Prameha</i>	<i>Churna</i>	<i>RRS(17/5 1-53)</i>

						page no – 350
16.	<i>Kasisabaddha rasa</i>	<i>Kumbhikashaka patra, Ajirna, Gokshura, Arimeda, Kshitiruha, Swetagunjamoool a, swetagunjabeeja , kapitthaphalama jja, nagakesara, jambutwaka, katuki, bibhitaka, nagadamni</i>	<i>K, N, Gairika, krishnabhraka, kantalauiha, swarnamakshika, shilajita</i>	<i>Prameha</i>	<i>Vati</i>	<i>RRS(17/5 6-57) page no- 351</i>
17.	<i>Rasendrachuda mani rasa</i>	-	<i>P, A, V, Suvarna, kantalauiha, swarnamakshika, Raupyamakshika, vimala</i>	<i>Vajeekaran</i>	<i>churna</i>	<i>RRS(27/8 5-94) page no- 616</i>
18.	<i>Panchamaloha kalpa</i>	<i>triphala, daruharidra, nakulikanda, dhaturamoola</i>	-	<i>Prameha</i>	<i>Vati</i>	<i>RRS(28/7 4-75) page no- 635</i>
19.	<i>Chaturthalohak alpa</i>	<i>Nakulikandabeej a</i>	<i>V, Mrigashringabhas ma</i>	<i>Prameha</i>	<i>Churna</i>	<i>RRS(28/7 3) page no- 634</i>
20.	<i>Shathamalohak alpa</i>	<i>triphala</i>	-	<i>Prameha</i>	<i>Vati</i>	<i>RRS(28/7 6) Page no- 635</i>
21.	<i>Bheemprakram a rasa</i>	<i>Gunjabeeja, gandhanakuli, babbulaniryasa</i>	<i>P,G, Kantalauiha, abhrakasatva, rajavarta, shilajita</i>	<i>Prameha</i>	<i>churna</i>	<i>RRS(17/5 8-66) page no- 352</i>
22.	<i>Sanjeevana rasa</i>	-	<i>P, Rajavarta, V</i>	<i>Prameha</i>	<i>churna</i>	<i>RRS(17/6 7-70) page no- 353</i>
23.	<i>Mehamardana rasa</i>	-	<i>A, Kantalauiha, Shilajita</i>	<i>Prameha</i>	<i>churna</i>	<i>RRS(17/7 1-74) page no- 353</i>
24.	<i>Ramabana rasa</i>	-	<i>V, Swarna, P, Rajavarta, vaikranta, G, Swarnamakshika</i>	<i>Prameha</i>	<i>Churna</i>	<i>RRS(17/7 5-79) page no- 354</i>
25.	<i>Garudanjana</i>	<i>Rasanjana, kataka, trikatu, musta, karpura, samudraphena, vacha, triphala, yastimadhu</i>	<i>SL, T, sphatika, Varatikabhasma, tamrabhasma, lauhabhasma, narkapalasthibhas ma, P,T, Nilanjana</i>	<i>Netraroga</i>	<i>Churna</i>	<i>RRS(23/4 4-45) page no- 527</i>
26.	<i>Timirharaanja na</i>	<i>Karpura</i>	<i>P, Nilanjana</i>	<i>Timira</i>	<i>churna</i>	<i>RRS(23/4 6) page no-527</i>

27.	<i>Shambukadivarti</i>	-	<i>Shambuka, P, Kamsya, rasanjana</i>	<i>TimiraPilla</i>	<i>Varti</i>	<i>RRS(23/51-52) page no-528</i>
28.	<i>NagadiVarti</i>	<i>Karpura</i>	<i>P, T</i>	<i>Abhishyanda</i>	<i>varti</i>	<i>RRS(23/59) page no- 529</i>
29.	<i>Indradivarti</i>	<i>Karpura, yashtimadhu</i>	<i>Tamra, Rasanjana</i>	<i>Vatikaabhishyanda</i>	<i>Varti</i>	<i>RRS(23/60) page no- 529</i>
30.	<i>Shulbadivarti</i>	-	<i>Tamra, A, L, Nilanjana</i>	<i>kaphajaabhishyanda</i>	<i>churna</i>	<i>RRS(23/61) page no- 530</i>
31.	<i>Rasendravarti</i>	<i>Karpura, sarjaraja</i>	<i>P, nilanjana</i>	<i>sannipataabhishyanda</i>	<i>churna</i>	<i>RRS(23/62-63) page no-530</i>
32.	<i>Nagadivarti</i>	<i>Amalaki, karpura, pippali, SL, Jiraka</i>	<i>P, Muktabhasma, rasanjana</i>	<i>PittabhishyandaA dhimantha</i>	<i>varti</i>	<i>RRS(23/65) page no-531</i>
33.	<i>Tamradivarti</i>	<i>Lodhra, katurohini, karpura, pippali</i>	<i>Tamra, rajata, parada, shankhabhasma, kamsya</i>	<i>netraroga</i>	<i>varti</i>	<i>RRS(23/66) page no -531</i>
34.	<i>Paradivarti</i>	<i>Mridgamoola, Sarjarasa</i>	<i>P, Rasanjana, lauha</i>	<i>Timira, Armaroga, Pilla</i>	<i>varti</i>	<i>RRS(23/67-68) page no-531</i>
35.	<i>Ektrishangvarti</i>	<i>Lodhra, trikatu, Saptaparna, triphala, swetaparajita, dhaturamoola</i>	<i>P, Rasanjana, pravala, Kasisa, tamra, gairika, SL, T, Muktabhasma, Panchalavana</i>	<i>Pilla</i>	<i>varti</i>	<i>RRS(23/69-70) page no-531</i>
36.	<i>Shadangavarti</i>	<i>karpura, pippali</i>	<i>Anjana, Parada, lauha</i>	<i>kach, timira</i>	<i>churna</i>	<i>RRS(23/72) page no- 532</i>
37.	<i>Kalagni rasa</i>	<i>Jeeraka</i>	<i>P, G, SL, T</i>	<i>Bhagandara</i>	<i>lepa</i>	<i>RRS(24/114) page no- 556</i>
38.	<i>Ekvinsholohak alpa</i>	-	<i>lauha</i>	<i>Netraroga</i>	<i>Varti</i>	<i>RRS(28/98) page no- 639</i>

**Abbreviations;** P- Parad, G- Gandhaka, SL- SandhavaLavana, SL- Sauvarchalalavana, H- Hartala, T- Tamra, T- Tuttha, A- Abhraka, M- Manashila, L- Lauha, C- Chapala, KL- Kantalauha, V- Vanga, RS- Rasa sindura, S- Shankha, T- tankana, R- Rajata, RRS- Rasa RatnaSamuchaya

#### **Toxicity-**

Thus, histopathological Studies show that naga bhasma is non-toxic (6mg/100g per day), while crude lead (6mg/100g per day) is highly toxic. Thus it appears that in bhasmikiranana process the crude lead is converted in to Naga bhasma, Which is found to be non- toxic at lower dosages. In Rasashastra not only the toxic effect of many metal and mineral are discussed in detail but also the treatment of the poisoning is also mentioned. According to Rasashastra if Naga used without proper purification and incineration as per advised in classics, it will causes various diseases like Kushtha (Skin Diseases), Gulma ( Abdominal tumors), Ruja (pain), Meha (diabetes), Pandu (anemia), Jwara (Fever), Tridoshaprakopa<sup>[23]</sup>, Mrityu<sup>[24]</sup>, Udara (ascitis)<sup>[25]</sup>, Sandhishhula (joint pain), Pakshavadha (hemiplegia), Anaha (flatulence), Avabahuka (stiffness of shoulder)<sup>[26]</sup>, Kandu(Itching) and anilasada (anorexia)<sup>[27]</sup> etc. most of the symptoms mentioned in Ayurveda are same as mentioned in modern science, this indicates that the lead poisoning is nothing but the effect of impure lead or improperly proceed and administered lead without following specified

ayurvedic classical guidelines. This study clearly shows that the herbo-metallic preparations of ayurveda including Naga bhasma are safe and devoid of any major untoward effects. The direction given by Acharya Charaka support this theory that is even fatal poison when used with skill and knowledge proves to be a good medicine, and a medicine used ignorantly acts as a poison. For the better safety of ayurvedic herbo-metallic medicines, it is high time that instead of blindly following the text and prescribing the medicine, one should test it thoroughly for its side effects, dose, duration and toxicity in the target organ of the body. These tests will allow us to form some guidelines regarding contra-indications of our drug, and also unravel the myths and also unravel the myths and ambiguities about Rasaushadhis<sup>[28]</sup>.

**Table 7; Elemental assay of naga bhasma using acid digestion and alkali fusion method, ICP-AES technique<sup>[29]</sup>.**

Sr. No.	Element (Unit)	Naga Bhasma
1.	Lead (Pb) %	58.4
2.	Calcium (Ca) %	5.10
3.	Silica (Si) %	2.19
4.	Iron (Fe) %	1.44
5.	Aluminum (Al) %	0.60
6.	Arsenic (As) %	0.34
7.	Potassium (K) %	0.18
8.	Magnesium (Mg) %	0.96
9.	Nickel (Ni) Mg/g	79.9
10.	Manganese (Mn) mg/g	13.1
11.	Cadmium (Cd) mg/g	65.9
12.	Zinc (Zn) mg/g	77.1

**Table 8 ; Elemental Composition of Naga Bhasma<sup>[30]</sup>.**

Sample Name	% of Lead	% of Fe
Naga Bhasma (50 Puta)	14.118	1.391
Naga Bhasma (60 Puta)	13.872	1.618

## Discussions

*Bhasma* are unique ayurvedic metallic preparation used in the Indian subcontinent since, the seven century BC and widely recommended for treatment of a variety Chronic ailment<sup>[31,32]</sup>. The *bhasma* are in fact products of classical alchemy inorganic compounds of certain metals in a very fine powdered form, mostly oxides, made by vigorous calcinations process known as *marani.e. bhasmikarana*. It is believed that *bhasmikarana* process in which immense therapeutic properties will be enhance due to its minute particle size it facilitate fast actions and provide maximum bio-availability. The method of preparations of *naga bhasma* involve the 3- process of *shodhana*, *jarana* and *marana*. *Nagabhasma* is utilized in many ayurvedic formulations. There are 97 methods of *nagabhasma* described by different classics but it is not mentioned that which methods should be used to prepared *nagabhasma*. The *shodhana* treatment included media of acidic ( *takra*, *kanji*, *go-mutra*) and alkaline nature ( *churnodaka*) and performed by heating and quenching in to cold liquid media. This makes the material brittle, reduce particle size and thus exposes maximum drug to the purifying medium. In some texts seven times quenching is advised more the number of quenching more will be brittleness. *Jarana* process is essential pre- procedure of *marana* for all *putiloha*. The purpose of the *jarana* of *putiloha* is to increase the melting point for *putapka* of *putiloha* without *jarana* process it difficult to convert the raw drug into the *bhasma* form because the metal have less melting point.

## Conclusions:

*Naga* is one of the *putiloha* described in classics of Rasa Shastra, vigorous pharmaceutical series of procedure employed to convert this toxic material into non toxic *bhasma* form which are having significant therapeutic action in lesser dose, quicker in action, longer shelf life and greater palatability.

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