

MONTH: JULY: AUGUST 2014

VOLUME: 2 ISSUE: 4

ISSN: 2348 – 1846



Punarna V

AN INTERNATIONAL PEER REVIEWED AYURVED JOURNAL
ON LINE BI-MONTHLY AYURVED JOURNAL

www.punarnav.com

Email: explore@punarnav.com, punarnav.ayu@gmail.com

TITLE: CRITICAL REVIEW OF PHARMACEUTICAL PROSPECTS OF NAGA
BHASMA (INCINERATED LEAD)

Dhiraj Singh Rajput ¹, Peavin Mesram ², Patgiri B.J ³

Punarna V Ayurved Journal Punarna V Ayurved Journal
Punarna V Ayurved Journal Punarna V Ayurved Journal
Punarna V Ayurved Journal Punarna V Ayurved Journal



CRITICAL REVIEW OF PHARMACEUTICAL PROSPECTS OF NAGA BHASMA (INCINERATED LEAD)

Dhiraj Singh Rajput ¹, Peavin Mesram ², Patgiri B.J ³

¹Assistant Professor, Department of RS & BK , ARAC, Manchi hills Sangamner , Dist- Ahmednagar (MH), India , ² PhD scholar, Department of Koumarbhritya, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, India

³Associate Professor, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar.

ABSTRACT:

Bhasma's occupied significant place in Ayurvedic system of medicine. Rasashastra is a branch of Ayurveda that primarily utilizes metals and minerals in the form of Bhasma for therapeutic purpose. Based on their experiences, the ancient Acharya's of Rasashastra have described several for preparing Bhasma of single metal based on the therapeutic utility and to impregnate expected properties in respective metal. Even in one text these methods differs between themselves in terms of accompaniments and process detail. Correspondingly, the processing of certain metals lead to Bhasmas with different forms and colours. Hence it is important to know the various ways of processing the single metal. Naga Bhasma is one of such preparation basically indicated for the treatment of Prameha (Diabetes mellitus), various skin diseases and for aphrodisiac therapy. Therefore in this paper, attempt has been made to decipher the different preparative procedure of Naga Bhasma according to different classical text of Rasashastra. Present work aimed to compile different pharmaceutical procedure of Naga Bhasma preparation along with their probable therapeutic aspect.

Critical review of pharmaceutical procedure of Naga Bhasma is compiled from available classical text which includes basic procedure, material used for the procedure, number of incineration cycles and colour of final product. Attempt has been made to withdraw possible interpretation between rationality of different methods and therapeutic indications. There are 97 methods of Naga Bhasma preparation which includes Puta (31), Jarana followed by puta (31), Jarana (15), Lepa followed by Puta (7), Dhamana (3), Damaru Yantra Patana (3), Lepa-Jarana followed by Puta (2), Pishti followed by Puta (3) and Utthapana (2). Therapeutic indications of Naga Bhasma depend on the method and media utilized for Bhavana and incineration cycles.

Key Words: Ayurveda, Lead, Naga Bhasma, Pharmaceuticals, Rasashastra.

INTRODUCTION

The material medica of Ayurvedic system of medicine essentially deals with three

major sources of medicine, plant origin, animal origin and metals-minerals

origin.^[1] Therapeutically more suitable forms of metals were developed after evolution of *Rasashastra*. Ancient *Acharya* of *Rasashastra*, have discovered several methods of processing metals such as *Shodhana* (Ayurvedic purification methods), *Jarana* (open pan frying), *Marana*(incineration) etc to convert them into therapeutically useful dosage form. It is understood that these methods were developed based on their individual experiences as well as the purpose for which the metal would be utilized. e.g. Naga Bhasma prepared by triturating with juice of *Ahiphen* (*Papaver somnifera*) possesses more aphoristic property while the Naga Bhasma prepared from *Manahashila*, *Gandhaka* and *Vasa* (*Adhatodia vasaica*) is more effective in skin diseases.^[2] Therefore numerous methods of processing of single metals are found mentioned in different *Rasashastra* text. There are several methods described for same metal even in one classical text which consequence in the formation of Bhasma of varying physico-chemical properties. Thus it is crucial to know these different pharmaceutical process and rationality behind their application.

Naga Bhasma is one of the potent medicine prepared through subjecting Lead metal to special procedures such as *Shodhana*, *Jarana* and *Marana*. There are

97 methods narrated by different text. Till date no published review work is found on the various pharmaceutical procedure of Naga Marana. This work is a first attempt and hence may prove a torch bearer for future research work on *Naga Bhasma*.

MATERIAL AND METHODS

Careful review of available classical text was done by compilation of various methods of Naga Bhasma preparation from available classical texts. Compiled pharmaceutical procedures of Naga Bhasma are categorized according to the involved principal process. Several claims are made regarding specific indication of specific process based on the therapeutic properties of media utilized for Naga Marana. These claims can be considered as hypothesis for further research.

OBSERVATION AND RESULTS

According to different classics there are twelve principle procedures utilized for Naga Marana. In many methods more than one procedure are combined but to facilitate the description each procedure is separately explained below.

1. *Bhavana* (levigation): The procedure of steeping powders of metals and herbs with liquid substances like *swarasa* (juice), *kwatha* (decoction) etc followed by trituration in mortar and pestle up to dryness is known as

Bhavana.^[3] Here the heat produced during grinding and the atmospheric heat helps in drying the materials quickly. By applying *Bhavana* the drug are rendered fine and potentiated. *Bhavana* is utilized in nearly all procedures of Naga *Bhasma* preparation except in *Lepa* (paste) and *Pishti* (amalgam) method.

2. *Jarana* (J): *Jarana* literally means becoming old, decomposition, digestion or way in which an eclipse is supposed to end.^[4] In *Jarana* process metal is heated in open iron pan and

continuously rubbed with stems or roots of some herbs till converted into fine powder form followed by covering with earthen saucer and applying strong heat for three hours. Arka root (root of *calotropis procera*), *Manaihashila* (orpiment), *Gandhaka* (sulfur), *Palasha* root (root of *abutilon indicum*), *Chincha* (*Emblica officinalis*), *Vasa* stem (*Adhatoda vasaica*) and *Apamanga Kshara* (ash obtained from *Achiranthus aspera*) are the mostly utilized media for *Jarana* of Naga. (Table 1)

Table No.1:- Various methods of Naga Marana by applying Jarana method.

Sr.	Type	Media	Putra	No.	Colour	Ref.
1	J	Arka root, Manashila, Gandhaka, karpur, kumkum, Nimbu swarasa.	-	--	Sinduraruna ,Pitabha	RJN(part-III) (Chapter-2,pg.no-131)
2	J	Parada, Arjuna, Aksha, Aragvadha, Dadima, Apamarga-Kshara	--	21	Rakta	R.Chu (1/38), RRS 5/174-79
3	J	Palasha root	--	--	Raktabha	RPS (4/103-104)
4	J	Chincha,Aksha,Ikshu,Bhallat,Vasa,Vajrilata,Apamarga,As hwattha-Bhasma; Palashadanda	--	--	--	AK (6/31-32)
5	J	J- Vasa, Ajmoda; Vasakashtha	--	--	--	Vasavarajiyam (25-Chapter,pg.no-403)
6	J	J- ChinchatwakBhasma	--	--	--	Vasavarajiyam (25-Chapter,pg.no-403)
7	J	J-Raktashakini, Apamarga,KutajaBhasma	--	--	--	Vasavarajiyam (25-Chapter,pg.no-403)
8	J	J-Bhunaga, Agasti, Vasa, Apamanga Kshara	-	-	-	R.Chi (6/49)
9	J	Ahiphena,Nimbakashtha	--	--	Shweta	BRRS (2 nd Method,pg.no-50)
10	J	Arkamula	--	--	Harita	BRRS (no-81)
11	J	Gandhaka	--	--	--	RT (19/41-42)
12	J	Muli, Palash	-	-	Raktabh	RPS 4/103-104
13	J	Arka Mula	-	-	Harita	R.Sambh.

						verse 365, RJN pp 131
14	J	Parada, Arjun, Bibhitaka, Amlaki	-	-	Rakta	R.Chu. 14/141-47
15	J	Kshara of Chinchha, Bibhitaka, Ekshu, Bala, Asthisamhara, Apamarga, Arjun, Ashvattha	-	-	-	RJN pp 126

3. Puta (incineration cycles): Puta (P) is knowledge of quantity of heat applied to various substances. The heat thus applied should never be less or more than optimally required as such optimally heated substances are useful to the body.^[5] In present days quality, quantity and period for which is to be applied can be precisely measured and controlled however that was not the case in ancient times. The heat control was obtained and derived by limiting quantity of fuel and type of fuel used. Such devices

which known quantity of fuel could be burned to produce exact amount of required heat for conversion of raw substances into drug were known as "Puta". There are 31 methods of Naga Marana through Puta procedure which involves Bhavana of some specific media followed by incineration either by Laghu Puta, Varaha Puta or Gaja Puta. Mostly utilized media for Naga Marana includes Parada (mercury), Gandhaka, Manahashila, Arkadugdha (milk of calotropis procera) and Vasa swarasa (juice of Adhatoda vasaica). (Table 2)

Table No.2:- Various methods of Naga Marana by applying Puta method;

Sr.	Type	Media	Puta	No.	Colour	Ref.
1	P	Arkadugdha, Manahshila	--	--	--	RM. (2/54)RRS (5/184).
2	P	Ahimararasa	--	--	--	RHT (3/25)
3	P	Lohaparpati, Tapyra, Kankushtha, Vimala, Abhraka, TamraBhasma, Shilasatva, Snuhi & Arkal-kshira, Hingula.	--	--	--	Rasarnav. (7/46-47),(6/10-33),(7/87-88)
4	P	Mritagolaka, Hemagolaka, Matulunga	--	--	Shukragopanibh	Rasarnav (7/78)
5	P	SutaBhasma	-	1	Sinduraruna	Rasarnav (5/14-16)
6	P	Nagaranjita Rajata	-	--	Sinduraruna	Rasarnava (5/75-78)
7	P	Kumarimoola		100	Sinduraruna	RJN(part-III) (Chapter-2,pg.no-132)
8	P	Shila, Vasarasa	Varaha	3	--	RPS (4/98-102)
9	P	Trikshara, panchalavana, Jambira	Gajaputa	--	--	Rasaratnakara (2/7-9)
10	P	Shila, Tambulirasa	--	32	--	AP (3/192), Sha.M. 11/10, BRRS pp 81
11	P	Manashila, Gandhaka, Nimbu	-	-	-	AP 3/200
12	P	Manashila, Vasa	Gaj	3	-	AP 3/201

13	P	Shila, Gandhaka, Vasa	Gaja	3	--	YR (shaloka no-1,pg.no-128)
14	P	Shila, Tanduliya, Vasa	--	7	--	BRRS (pg.no-80-81)
15	P	Shila, Gandhaka, Karpura, Kumkum	--	60	Vidyutabhasa	BRRS (no-81)
16	P	Parada, Gandhaka	Laghu	3(tika)	Kajjalaprabha	RT (19/29-33)
17	P	Gandhaka, Tuttha, Kumari	Gaja	1 or 2	-	R.Manjari 5/64
18	P	Vasaswarasa, Manashila	-	3	-	R.Sa.S. 1/294-95
19	P	Manashila, Vasa	Varaha	3	-	RPS 4/98-99, RSS 1/285
20	P	Manashila, Vasa swarasa	Gaj	3	-	R.Sambh. verse 364, BRRS pp 80
21	P	Manashila, Gandhaka, Kapura, Keshar, Jambir Nimbu	Gaja	60	Pita	R.Sambh. verse 366-67
22	P	Manashila, Gandhaka, Arka dugdha	-	12	-	AP 3/56, R.Chi. 6/20
23	P	Shweta Jiraka, Endrajao, Palash, Latakaranj, Koshataki, Hasti mutra	Gaja	21	Shweta	Rasopanishad 7/13-15
24	P	Mritagolaka, Hemagolaka, Nimbu, Tambul, Vrishchikali patra	-	-	Vir bahuti	Rasarnava 12/92-93
25	P	Apamarga patra	-	-	Shweta	Anu.M. 5/9
26	P	Arka dugdha, Kumari, Palash	-	-	Rakta	R.Ndi. pp 223
27	P	Churnodaka	-	-	Krishna-shweta	R.Ndi. pp 223
28	P	Apamarga, Pipal, Chinchu	-	-	Krishna	R.Ndi. pp 223
29	P	Hingula, Manashila, Gandhaka, Jambir	Laghu	7	Pink	Bh.Ras. pp 515
30	P	Parada, Manashila, Jambir	-	21	Rakta	Bh.Ras. pp 516
31	P	Shad-lavana, Devi swarasa	Laghu	3	-	RHT 5/8-9

4. Dhamana (to burn to ashes): No classical text has defined Dhamana, although based on the procedure it can be defined as strong heating of metal in a closed crucible till it get converted into Bhasma form.^[6] Rasachintamani (12th century AD) and Rasopanishada (8th century AD) are the only classics in which this method is found mentioned. (Table 3)

Table No.3:- Various methods of Naga Marana by using Dhamana and Pachana method;

Sr.	Type	Media	Duration	No.	Colour	Ref.
1	Dhaman	Musha of Bhunaga Mruttika	-	-	Pita	Rasa.Chi (5/153-55)
2	Dhaman	Parada, Gandhaka, Vatsanabh	-	-	Swarna varna	Rasopanishad 7/20-21
3	Pachana	Parada, Gandhaka	-	-	-	R.Chi. 6/21

5. Pachana (cooking): This procedure is mainly indicated for the matters

which can be purified by vapour of specific liquid media.^[7] However

regarding the context Bhasma preparation Pachana means heating of metal in Valukayantra (instrument which contain sand as heating medium) with Parada and Gandhaka for twelve hours.^[8] Only one classic has narrated this method and the procedure is similar to Jarana except that

intense heating and rubbing is not advised. (Table 3)

6. Damaru Yantra Patana (DYP): An apparatus, in which one pot is kept in inverted position over another pot with joints sealed, is termed as Damaru Yantra^[9] and distillation process done

by using Damaru Yantra is known as Damaru Yantra Patana. Rasayansara is the only classic in which three methods of DYP are mentioned. In first method only DYP is advised while in other two methods Jarana is advised followed by DYP. (Table 4)

Table No.4:- Various methods of Naga Marana by applying Damaru Yantra Patana method;

Sr.	Type	Media	No.	Colour	Ref.
1	DYP	Parada, Gandhaka; Gunja, Vasa, Nimbu, Kumari	--	--	Rasayanasara (Shloka no.189-190,pg.no-256)
2	J, DYP	J- Arka; DYP- Shila, Hingula, Gandhaka	--	Sindura	Rasayanasara (Ist part, Shloka no.187-188,pg.no-256)
3	J, DYP	J- Ashwatthakshara etc; P- Parada, Shila	--	Sindura	Rasayanasara (2 nd part, Shloka no.197,pg.no-259)

7. Jarana followed by Puta (JP): Naga (lead), Vanga(tin) and Yashada (zink) are the metals which are mostly subjected for Jarana

followed by Puta for incineration. There are 31 methods of Naga Marana through JP. This is an easy method as many classics have advised it and also mentioned the procedure in detail. (Table 5)

Table No.5:- Various methods of Naga Marana by applying Jarana followed by Puta method

Sr.	Type	Media	Puta	No.	Colour	Ref.
1	J,P	Ashwath,Chincha,Manashila,Nimbu Swarasa.	-	3	Sinduraruna	RJN (Chapter-2,pg.no-126)
2	J, P	J-Ashwattha,Chincha; P- Shila, Jambira/ Kanji	--	60	--	RRS (4/103-104) AK (6/25-27) Sha (11/37)
3	J, P	J- Palashadanda; P-Shila	Gajaputa	60	--	Rasaratnakara (3/109-110)
4	J, P	J-Churna,Parthadanda; P- Chitrakadrava	Laghu	6	--	AK (6/28-30)
5	J, P	J- Agasti,Bhunaga,vasa, Chincha-Kshara, Vasakashtha; P- Shila, Tapy, Vasakshara	--	21	Sindura	AK (6/33-36)
6	J, P	J- Kumari, Asana, Arka, Bahupad, Palashamula; P- Shila, Kumarirasa	Karishagni	3	Sinduraruna	AP (3/191)
7	J, P	J- Chincha, Ashwattha; P- Shila, Tushodaka, Gandhaka	Gajaputa	60	--	R.S.K (shloka no,31-32,pg.no-31)
8	J, P	J- Shila; P- Gandhaka, Nimburasa	--	--	--	R.Chi (6/48)

CRITICAL REVIEW OF PHARMACEUTICAL PROSPECTS OF NAGA BHASMA

9	J, P	J- Tala; P- Gandhaka, Nimburasa	--	--	--	R.Chi (6/48)
10	J, P	J- Bhunaga, Agasti, Vasa, Apamargakshara; P- Vasarasa	--	7	Sindura	R.Chi (6/52-54)
11	J, P	Kumari	--	100	Sindura	BRRS (no-81)
12	J, P	J- Ashwattha-twak-churna; P-Shila, Nimbu/ Kanji	--	3	Kajjalaprabha	RT (19/11-18)
13	J, P	J- Apamargachurna, Vasa; P-Shila, Vasarasa	--	3	--	RT (19/24-28)
14	J, P	J- Apamargadichurna; P- Tala	--	--	--	RT (19/34-36)
15	J, P	J-Shila, P-Shila, Arka-kshira	--	--	--	RT (19/37-40)
16	J, P	J- Arka, Kumari; P- Ahiphena, Arka	Varaha	6/2/3	--	Rasayanasara (2 nd part, Shloka no.193, pg.no-257)
17	J, P	J- Ashwattha, Chinchu; P- Shila, Kanji	Gaja	6	--	R.Pu (16/17)
18	J, P	J- Parada, Khakhasa; P- Shila, Vasarasa	Laghu	7	--	Rasamritam (Shloka, 104-106, pg.no-73)
19	J, P	J-Manashila, P-Vasapatra	Gaja	3	-	R.Manjari 5/39
20	J, P	J-Bhunaga, Agasti, Vasa, Apamarga. P-Vasa swarasa	Gaja	7	Sindura	R.Manjari 5/40-42 R.Sa.S. 1/291-93
21	J, P	J-Kumarimula, Ashvatthamula, Vatamula, Palasha P- Manashila, Kumari swarasa	Kukkut	4	-	Rasapaddhati 60
22	J, P	J-Manashila, P-Gandhaka, Nimbu swarasa	-	-	-	R.Sambh. verse 359
23	J, P	Kumari Mula, Kumari Swarasa	Gaja	60	Rakta	R.Sambh. verse 368
24	J, P	J- Ahiphen, P-Manashila, Vasa	Laghu	7	-	Rasamruta 3/104-06
25	J, P	J-Ashvattha, Chinchu P-Manashila, Nimbu Swarasa	-	6	-	RJN pp 125
26	J, P	J-Manashila, P-Tanduliyaka, Vasa	-	7	-	RJN pp 130
27	J, P	J-Manashila or Hartala, P-Gandhaka, Nombu swarasa	-	-	-	RJN pp 130
28	J, P	J-Chinchu, Pipal twaka, P-Manashila, Kanji	-	60	-	AP 190-91
29	J, P	J-Vasa, Apamarga kshara, P-Vasa	-	7	Sindura	RSS 1/282-84
30	J, P	J-Kshara of Chinchu, Pipal, P-Hartala, Palash kwatha	Gaj	10	-	RSK 2/27-29
31	J, P	J-Churnodaka, P-Churnodaka	Gaj	7	Shweta	Bh.Ras. pp 514

8. Lepa(paste) followed by Puta (LP): In this procedure metal is first converted into sheets followed by

application of thick layer of specified media and then subjected for Puta. Manashila (orpiment) is the common media utilized in LP. (Table 6)

Table No.6:- Various methods of Naga Marana by applying Lepa followed by Puta method

Sr.	Type	Media	Puta	No.	Colour	Ref.
1	L,P	L-Tuttha	-	-	-	Rasopanisad 8/10
2	L,P	L-Swarna Makshika, Madhu, Ghrita	-	-	Kumkum	Rasarnava 17/33-34
3	L,P	L-Manashila, Arka dugdha	-	10	-	RRS 5/184

4	L,P	Parada, Hingula, Kankushta, Lohaparpati, Abhraka Satva, Tamra Bhasma, Makshika satva Bhasma, Manashila, Vimal, Snuhikshir, Arkakshira	-	32	-	AK Amritikarana Vishranti 4/256-59, RHT 5/19-21
5	L,P	L-Manashila, Makshika, Arka dugdha	-	-	-	RJN pp 128
6	L,P	Manashila, Arka dugdha	-	-	-	RJN pp 129
7	L,P	L-Manashila, Gandhaka, Karpura, Kumkuma, Jambir limbu	-	60	Pita	RJN pp 131

9. Lepa followed by Jarana and Puta (LJP): It involves similar procedure as mentioned in Lepa and Puta except that Jarana procedure is done after Lepa and then metal is subjected for Puta. LJP method is not found mentioned before 18th

century AD and hence it can be assumed that LP method is difficult or time consuming as it require 10 to 60 Puta hence, the author of Ayurved Prakash (18th century AD) and Rasa-Jala-Nidhi (19th century) incorporated Jarana method in LP. (Table 7)

Table No.7:- Various methods of Naga Marana by applying Lepa-Jarana followed by Puta method

Sr.	Type	Media	Puta	No.	Colour	Ref.
1	L,J,P	L-Bhunag, Agasti, J-Vasa, Palash kshara, P-Manashila, Vasa swarasa	-	7	Sindura	AP 3/193-97
2	L,J,P	L-Kharpara, J-Chincha mula, Arjuna danda, P-Chitraka kwatha	Laghu	6	-	RJN pp 126

10. Pishti(amalgam) followed by Puta: The floor like substance which is produced after grinding Parada with metal is known as Pishti.^[10] Naga Pishti can be prepared by heating of Naga till complete melting, pouring melted Naga in mortar which contain advised media and instantly triturating up

to conversion into soft mass. It is observed that Naga Pishti can be easily prepared with Parada but author of Ayurved Prakash advised decoction of some herbs. (Table 8) Preparation of Naga Pishti by reference of Ayurved Prakash appear difficult as well as controversial because Naga quickly regains its solid nature after pouring in herbal decoction and it is very hard to triturate solidified Naga.

Table No.8:- Various methods of Naga Marana by applying Pishti followed by Puta method

Sr.	Type	Media	Puta	No.	Colour	Ref.
1	Pishti,P	Pishti-Parada, P-Gandhaka, Nimbu swarasa	Laghu	3	Kapot	RT 19/29-33

2	Pishti,P	Pishti-Kumari, Pipal, Arka, Vata or Palash, P-Manashila, Kumari	Gaja	3	Sindura	AP 3/198-99
3	Pishti,J,P	Pishti-Parada, J-Ahiphen, P-Manahshila, Vasa swarasa	Laghu	7	-	Rasamruta 3/104-06

11. Pishti followed by Jarana and Puta:

There is single method in which Naga Pishti prepared with Parada is firstly subjected for Jarana and then after triturated with Manahashila and Vasa Swarasa subjected for seven Laghuputa. (Table 8)

12. Utthapana(obtaining again):

Utthapana literally means Swarupapadanam (regaining original state).^[11] Naga Bhasma which has attained the state of fine Varitar(float on water) ash is brought back to its original state by the help of strong heating in sublimation apparatus and then again subjected for repeated ten cycles of intense heating. It is apprized that each heating should be done for continuous twenty one days. (Table 9)

Table No.9:- Various methods of Naga Marana by applying Utthapana method

Sr.	Type	Media	Putra	No.	Colour	Ref.
1	Utthapana	Repeat method for 10 times	-	10	-	RRS 5/180
2	Utthapana	--	--	10	--	R.Chu (14/155)

DISCUSSION

Bhasmas are unique Ayurvedic metallic preparations used in the Indian subcontinent since the seventh century BC and widely recommended for treatment of a variety of chronic ailments.^[12] The Bhasmas are in fact products of classical alchemy inorganic compounds of certain metals and gems in a very fine powdered form, mostly oxides, made in elaborate calcinations process known as Marana which is also known as Bhasmikanarana. It is believed that bhasmikanarana process converts the metal into its specially desired chemical compound which eliminates the

toxicity of the metal and has the necessary medicinal benefits^[13,14]. The methods of Bhasma preparation vary so much for each metal such that Bhasma with different colours are produced. The resultants are considered to be same medicinal substances with the ascribed indications even though these may differ in the chemical composition between them. However it is a well-known fact that if two compounds have different chemical composition then their pharmacodynamic and pharmacokinetic action will be different.

Naga Bhasma is utilized in many *Ayurvedic* formulations. There are 97 methods of *Naga Marana* described by different classics but it is not mentioned that which method should be used to prepare *Naga Bhasma* which is included as an ingredient in specific formulation. The attributes of media used for *Bhasma* preparation are impregnated in the *Bhasma* and also enhance its therapeutic properties. Therefore it is advisable that *Naga Bhasma* prepared by using specific media should be utilized in specific formulation indicated for specific disease. There are twelve principle procedures of *Naga Marana* which utilizes four types of media. The *Marana* of *Lohadi Dhatus* is said to be of best quality (*Shreshtha*) when done along with *Parada* or *RasaBhasma*, of medium quality (*Madhyam*) when done with herbs (*Muli*), of low quality (*Kanishtha*) when done with *Gandhakadi Dravyas* and worse quality (*Durgunaprada*) when done with *Ariloha*.^[15] The type of media and its correlation with therapeutic properties are interpreted below.

Parada or Rasa Bhasma media: In this category *Parada* and mercurial compounds such as *Kajjali*, *Hingula*, *Rasasindura* are included. *Naga* easily make amalgam with *Parada* and while incineration *Parada* also help in disintegrating *Naga* particles into finest form. *Parada* possesses *Yogavahi*

(carrier of therapeutic properties)^[16] and *Rasayana* (rejuvenation)^[17] property. Thus *Naga Bhasma* prepared by using *Parada* media can be used for *Rasayana* purpose and to treat chronic diseases such as diabetes. Here to avoid any untoward effect it is appreciable that does and don'ts advised in the context of internal use of *Parada* should be followed while therapeutically employing *Naga Bhasma* prepared by *Parada* media.

Muli (herbal) media:

Naga is a quick melting metal. If high temperature given for first incineration then there is possibility that *Naga* will regain its metallic nature. Therefore *Jarana* procedure is advised before incineration cycles while preparing *Naga Bhasma* with herbal media. During *Jarana*, strong heating up to 750 °C in open iron pan and continuous rubbing with fresh herbal stem causes strong chemical reaction between melted *Naga* and oxygen present in wet herbal stem as well as the oxygen in open air. After some hours all *Naga* get converted into yellowish powder which is lead oxide (*PbO*) with mixture of organic ash. It is difficult to decide actual nature of *Jarita Naga* but it can be assumed that *Jarita Naga* must be in organo-metallic form. Some weight gain after *Jarana* also suggests its compound form.

Jarana helps to reduce particle size and

thereby facilitate Bhavana (trituration) process. Trituration impregnate chemical constitute present in herbal media on the surface of metallic particles and thus create a herbo-metallic complex. Some chemical reaction occurs on faster rate when this mixture subjected for incineration cycle. Repetitions of this process result in formation of organo-metallic compound which is known as Bhasma. As Bhasma prepared from herbal media contain more proportion of organic ash hence can be considered as safe and effective. It is understood that every herb has its specific utility in some disease conditions and thus Bhasma prepared from a herb can be said to better effective in respective disease condition in which the utilized herb is indicated. Therefore it can be claimed that Naga Bhasma prepared from Ahiphen will be more effective for aphrodisiac purpose while Naga Bhasma prepared from Vasa media will be more effective in disease of respiratory system.

Gandhakadi Dravyas (sulfur and other minerals):

Utilization of mineral media such as sulfur, Hartala (arsenic bisulfide), Hingula (cinnabar) etc leads to prepare Naga Bhasma within less number of incineration cycles. These minerals get easily reacted with surface particles of Naga and while incineration, separate such particles from

core particles by oxidation or reduction mechanism. This results in conversion of metallic Naga into micro and nano particles. It is found that Bhasma possesses significant percentage of nano particles along with micro particles. As such Bhasma contain significant proportion of other minerals hence can't be considered as complete safe. Therefore Bhasma prepared from mineral media can be used for short duration or in acute conditions. Sulfur, arsenic bisulfide and cinnabar are mostly utilized mineral media in Naga Bhasma preparation. These media possesses antibacterial, antifungal and anti-infective properties. Thus Naga Bhasma prepared from these media can be utilized in some infective conditions such as Rajayakshama (tuberculosis), Jwara (fever), Krimi (helminthic condition) and various skin diseases.

Ariloha media: Literally Ariloha means enemy metal or killing metal. There are some metals and minerals which are mentioned to have properties to convert other metal very easily into Bhasma form. Manahashila (arsenic trisulfide or orpiment) is mentioned as Ariloha for Naga. The classical test mentioned that Bhasma prepared from Ariloha are not much useful and have untoward effects. However, nearly 60% of Naga Bhasma preparation method utilizes orpiment as

media. It is a confusing point that whether such claim was made for Lohavada (conversion of lower metal into precious metal) or Dehavada (therapeutic application of metals and minerals to maintain healthy and long life). It is clear from the literature that utilization of Ariloha for Bhasma preparation is easy and common method. Here it can be interpreted that for safety purpose, it looks better to avoid administration of Bhasma prepared from Ariloha for longer duration or administration during functional impairment of vital organs. It can be claimed that to avoid any risk, Naga Bhasma prepared from orpiment can be used for local application in some skin diseases such as Shvitra Kushtha (leucoderma). Further research is required to test this claim.

For Naga Bhasma preparation, maximum numbers of method involve Puta (31) and Jarana followed by Puta (31). As repeated incineration cycles help to impregnate chemical constitute of other drugs in Bhasma so these two principal methods are more suitable for therapeutic purpose. Only Jarana procedure is indicated in 13 methods. Jarana comprise strong heating in open iron pan and thus creates oxide form of metal with mixture of organic ash. There is no data available to make any comment on therapeutic utility of Bhasma

prepared by only Jarana process. As this method is easy, time saving and economically chief therefore further research is necessary to establish importance and benefit of such methods. Other methods which comprise incineration cycles include Lepa followed by Puta, Damaru Yantra Patana, Lepa-Jarana followed by Puta and Pishti followed by Puta. Dhamana and Utthapana are the two rarely utilized methods. According to classical text, repeated incineration cycles are intended for Doshavinash (destroying unwanted effect) and Gunaodaya (initiation of new properties) but no such evident is found mentioned regarding Dhamana and Utthapana. Hence these two methods appear controversial. In present work a critical review of pharmaceutical prospect of Naga Bhasma has been presented and discussed in detail. This study may be useful as torch bearer for future research in context of Naga Bhasma preparation.

CONCLUSIONS

There are 9 principle methods occupying 97 methods of Naga Bhasma preparation. Various methods result in formation of Naga Bhasma with different colour which indicates their different chemical nature and different physico-chemical as well as therapeutic properties. Media used for Bhavana, adopted method of Bhasma

preparation and number of incineration cycles are related with therapeutic indications and utility of Naga Bhasma, hence these points should be considered before utilization. Naga Bhasma prepared

from Parada media and herbal media can be used for longer duration while Naga Bhasma prepared from Gandhakadi media and Ariloha media should be used for short duration only.

REFERENCES

1. Agnivesha, Charaka Samhita, Chaukhamba Sanskrita sansthana, Varanasi, 2nd edition, 2000, Sutra 1/69, p 12.
2. Rasoushadhi Nirmana, S. D. Kulkarni, Continental Publication Maharashtra Vidyapitha, Pune, 1st edition, 1981, 4th chapter, p 93
3. Sadananda Sharma, Rasatarangini, Kashinath Shastri, editor, Motilal Banarasidas Publication, Delhi, 11th edition, 1979, 2/49-50, p. 21.
4. A Sanskrita English Dictionary, Sir Monier Williams, Shri Satguru Publication, Delhi, Reprint 2005, p 413
5. Rasaratna Samuchchaya, Suratnojjvala commentary by Ambikadatta Shastri, Chaukhamba Amarbharati Prakashana, Varanasi, 9th edition 1995; 10/47, p 164
6. Anananta Dev Suri, Rasa Chintamani, Hindi commentary by Siddhinandan Mishra Chaukhamba Orientalia Varanasi 1st edition 1990, 5/153-55, p 115
7. Rasaushadhi Nirmana, S D Kulkarni, Maharashtra Vidyapith Granthanirmiti, 1st edition 1981, Shodhana vidhi, 3rd chapter, p 65
8. Dhundukanatha, Rasendrachudamani, Hindi commentary by Siddhinandana Mishra, Chaukhamba orientalia Varanasi, reprint 2006, 6/21, p 72
9. Rasaratna Samuchchaya, Suratnojjvala commentary by Ambikadatta Shastri, Chaukhamba Amarbharati Prakashana, Varanasi, 9th edition 1995; 9/57, p 154
10. Rasaratna Samuchchaya, Suratnojjvala commentary by Ambikadatta Shastri, Chaukhamba Amarbharati Prakashana, Varanasi, 9th edition 1995; 8/8, p 135
11. Rasaratna Samuchchaya, Suratnojjvala commentary by Ambikadatta Shastri, Chaukhamba Amarbharati Prakashana, Varanasi, 9th edition 1995; 8/65, p 142

12. Arun Rasheed, Anvesh Marri, M. Madhu Naik, Standardization of Bhasma-importance and prospects. J Pharmacy Res. 2011,4(6),1931-1933, 2007, Meherchanda Lachamandasa Publications, New Delhi, 1/68-74, p 10
13. Tripathi YB, Singh VP, Sharma GMK, Sinha RK, Singh D, X-rays diffraction and microscopic analysis of tamra bhasma: An Ayurvedic metallic preparation, Indian J. Traditional Knowledge, 2:2003:107–117.
14. Wadekar MP, Patel RK, Preparation and characterization of a copper based Indian traditional drug: Tamra bhasma, Journal of Pharmaceutical and Biomedical Analysis, 39, 2005, 951–955
15. Rasaratna Samuchchaya, Suratnojjvala commentary by Ambikadatta Shastri, Chaukhamba Amarbharati Prakashana, Varanasi, 9th edition 1995; 5/13, p 96
16. Ayurvediya Rasashastra, Siddhinandana Mishra, Chaukhamba Orientalia Varanasi, Reprint 2007, 3/8, p.149
17. Vagbhatacharya, Rasaratnasamuchchaya, Vidhnyanbodhini Hindi Commentary by Prof. Dattatraya Ananta Kulkarni, Reprint Edition-

