

CONCEPT OF MARANA PRAKRIYA WITH SPECIAL REFERENCE TO DHATU MARANA

Dr. Bodhakar Kishor N.^{1*}, Dr. Urmale Rajesh R.² and Dr. Fulzele Pranali S.³

¹Associate Professor, Rasashastra- Bhaishajyakalpana Department, Bhausaheb Mulak Ayurved College and Research Hospital, Butibori, Nagpur (Maharashtra).

²Professor, Rasashastra- Bhaishajyakalpana Department, Bhausaheb Mulak Ayurved College and Research Hospital, Butibori, Nagpur (Maharashtra).

³Assistant Professor, Rasashastra- Bhaishajyakalpana Department, Bhausaheb Mulak Ayurved College and Research Hospital, Butibori, Nagpur (Maharashtra).

Article Received on
05 June 2020,

Revised on 26 June 2020,
Accepted on 16 July 2020,

DOI: 10.20959/wjpr20208-18150

*Corresponding Author

Dr. Bodhakar Kishor N.

Associate Professor,
Rasashastra-
Bhaishajyakalpana
Department, Bhausaheb
Mulak Ayurved College and
Research Hospital, Butibori,
Nagpur (Maharashtra).

ABSTRACT

Marana prakriya (incineration process) is an essential step in *Rasashastra* for *Bhasma nirmana*. It's very important process for the conversion of original metals/minerals into *Bhasma* form (ash form). Due to *Marana* metals and minerals converted into such a form which can be easily absorbed and assimilated in body and which cannot be converted into its original form. *Shodhit dravya* (purified drug) either it is *Maharasa*, *Dhatu*, *Ratna* or any mineral after the *Mardana* (trituration) and *Bhavana* (lavigation), when subjected to *Putra* or heat given to it termed as *Marana*. In present study attempt is taken for review of *Marana prakriya* with special reference to *Dhatubhasma nirmana*. It will help to *Ayurvedic* scholars to reach towards the concept of *Marana* process of *Dhatu*. The process by which *Dhatu* transferred to microfine stage for easy assimilation in body without

unwanted effects is considered to be *Dhatu Marana*. Literary reviews needed on *Marana* to establish different *Bhasma* to claim their therapeutic potential. *Ayurvedic* and Modern *bhasma pariksha* (examinations) is important to check the stability of *Bhasma*.

KEYWORDS: *Shodhana*, *Marana*, *Dhatubhasma*, *Ayurvedic bhasma pariksha*.

INTRODUCTION

Birth of *Acharya Nagarjuna* was miracle for *Ayurveda*, because he was the person who developed the high quality of metals from low quality of metals known as “*Dhatuvada*”^[1]. He also focused on Mercurial preparations and attention towards the preparation of minerals and Herbo-mineral compound known as “*Dehavada*.” After this great achievement, the minerals and metals processed with different plant juices, liquid media like *Swarasa* (plant juice), *Kwatha* (decoction), *Kanji* by different procedures known as *Shodhana* (purification), *Marana*, etc. and converted the highly poisonous and dangerous substances into qualified and effective life-saving drugs. These life-saving drugs are known as *Rasaushadhi*’s and science of *Rasaushadhi* preparation is known as “*Rasashastra*” by which *Ayurveda* becomes very popular. *Shodhana* is a process of removal of impurities from *Dhatuadi dravya* by means of pharmaceutical processing of *Swedana*, *Mardana*, *Nirvapana*, etc. with particular drugs. The process of *Shodhana* removes impurities which are likely to bring about certain toxic effects.^[2] *Shodhit dravya* (purified drug) either it is *Maharasa*, *Dhatu*, *Ratna* or any mineral after the *Mardana* (trituration) and *Bhavana* (levigation), when subjected to *Putra* or heat given to it termed as *Marana*. The *Marana* word is derived from ‘*Mriya-Marne*’ which means ‘to kill’. The process by which *Dhatu* transferred to microfine stage for easy assimilation in body without unwanted effects is considered to be *Dhatu Marana*. When it administered with proper dose and *anupana*, eliminates the various diseases. There are four types of *Dhatubhasma* mentioned in *Rasaratnasamuchhaya*. When *Dhatu Marana* done by *Parada* or *Rasabhasma* it’s called as *Shreshtha prakar* (high quality type), when done by *kashtaushadhi* it’s called as *Madhyam prakar* (medium quality), when done by *Gandhakadi dravya* it’s called as *Kanishtha prakar* (lower quality) and *Dhatu Marana* done by *Ariloh* (enemy of *Dhatu*) it’s called as *Durgunaprad prakar* (not useful). Before *Dhatu Marana*, we have to perform *Shodhana* of *Dhatu* which includes *Samanya* and *Vishesh Shodhana* of *Dhatu*. *Dhatu bhasma* is said to be a quality *bhasma*, when it passes all *bhasma pariksha* by *ayurvedic* and modern aspect.

MATERIAL AND METHODS

Concept of *Marana*- The process which converts the purified metals and minerals into *Bhasma* after subjecting them to levigation and incineration is called as *Marana*. *Marana* is a process of transformation by which purified and detoxified materials are transformed into absorbable, adaptable and assimilable form with the help of fire in measured manner.

OBJECTIVES

- (1) Reduction in particle size.
- (2) Elimination of certain unwanted elements.
- (3) Transformation into suitable compound form.
- (4) To make the material non-irritant to the G.I. tract.
- (5) To increase potency and quality of the material.
- (6) Conversion into absorbable, adaptable and assimilable form.^[3]
- (7) To make the material suitable for therapeutic uses.

Historical Background- a) *Vedic* period- evidences of therapeutic use of metals. *Atharvaveda* has mentioned the use of *Swarna* for internal use. b) *Samhita* period- Use of *Ayaskriti* found in *Sushrutasamhita*. *Charaka* mentioned the use of *Tamrachurna* incase of *Garvisha* for *hrudayavishodhana*. *Rasarnava* in 7th – 14th century has described *Marana* of different metals and minerals and various equipments like *musha* and *puta* for *marana*.

Types of *Marana* according to procedure

(1) *Putapaka* method: Purified and detoxified material is mixed with drug for incineration (*Maraka Dravya*) and is levigated with particular liquid media for specific period. Pellets are made from the doughy mass after *Bhavana*. These pellets are kept in one earthen saucer allowed to dryness and covered by another earthen saucer and junction is sealed by mud smeared cloth. This *Sharavasamputa* is subjected to *Putra* for incineration. After self-cooling the pellets are collected and ground to powder form. This process is repeated for specified times. e.g. - *Lauha Marana*, *Abhraka Marana*, *Sankha Marana*.

Shudhha dravya and maraka dravya mishrana → *Bhavana* → *Chakrikakaran* → *Samputikaran* → *Shushkana* → *Putapaka* → *Mardana* and *Grahana*.

(2) *Kupipakwa* method: Purified and detoxified material is mixed with specified substances and is levigated by particular liquid media for certain period. It is allowed to complete dryness and filled in a *Kachkupi* covered by seven layers of mud smeared cloth. The bottle is then subjected to *Valukayantra* for indirect and homogeneous heating for a certain period. After self-cooling the bottle is broken and prepared drug is collected from neck or bottom of the bottle and ground to powder form. e.g. *Parada Marana*, *Tamra Marana*.

Mishrana (Kajjali preparation) → *Bhavana* → *Shushkana* → *Kupipurana* → *Kupipaka* (in *Valukayantra*) → *Kupitadana* → *Grahana*.

(3) '*Niragni*' method: Purified and detoxified material is mixed with specified substances (mainly *Kajjali*) and is levigated by particular liquid media for certain period. The round masses (*Golaka*) are prepared and kept on a copper saucer and are covered by some specific leaves. Then the saucer is subjected to sunlight for complete dryness. Then the saucer is covered by another saucer and junction is sealed by mud smeared cloth. The *Samputa* is subjected in *Dhanyarasi* for a specific period. There after the round masses are collected and ground to powder form. e.g. - *Lauha Marana*.

Shudhha dravya and marak dravya mishrana → *Bhavana* → *Golokikarana* → *Shushkana* → *Samputikarana* → *Niragnipaka* in *Dhanyarashi* → *Grahana* and *Mardana*.

General Marana Prakriya of Dhatu- After *Samanya* and *Vishesh Shodhana* of *Dhatu*, in *Shudhha Dhatuchurna maraka dravyas* are added and triturated it with specific liquid media in *Khalvayantra*. After that small *chakrikas* (circular cakes or pellets) of near about 1 inches diameter are made. Such *chakrikas* are placed in *Sharava* (earthen plate) and allowed to dry in shade. Later on another *Sharava* placed on it and *Sandhibandhana* (packing) with 7 layered of *multani mitti* and cloth (*Sharavasamputa*) done and dried. After that, *Sharavasamputa* placed in suitable *Putra* according *Dhatu Marana*. In *Putra* fill 2/3rd volume of cow dung cakes (*upal*) first and placed *Sharavasamputa* over it and fill remaining cow dung cakes. After that lit it with fire and after complete burning of cow dung cakes allow it for self-cooling. After self-cooling *Sharavasamputa* removed from *Putra* and *Chakrikas* collect and powdered it. The whole procedure repeated several times till *Bhasma* passes all *Pariksha* (tests) which are considered as basic standardization to use it therapeutically. In case *Dhatu churna* not prepared after *Shodhana* means when it is in *Dhatupatra* form, firstly triturate *maraka dravya* and *bhavana dravya* together and prepare paste of it. Apply this paste over *Dhatupatra* and give 1st *puta*. When it's converted into *churna* form give the *puta* by above said method. Thus the *Marana* procedure is carried out in 8 unique steps as follows-

- 1) *Shodhana* of *Dhatu*.
- 2) Trituration with *Marana dravya* and *Bhavana*.
- 3) *Chakrika nirmana*.
- 4) *Sharavasamputikarana*.
- 5) *Putra*.
- 6) Self-cooling.
- 7) Collection of *Chakrika* from *puta* and powder formation.
- 8) Repetation of procedure till *Bhasma* formation.

Dhatu Marana- There are 9 *Dhatu*s according to *Rasaratnasamuchhaya*. *Swarna*(gold), *Rajat* (silver), *Tamra* (copper), *Loha* (iron) are called as *Shudhha Loha*. *Naag* (lead), *Vanga* (tin) are called as *Putiloha* and *Kansya* (bronze), *Pital* (brass) and *Vartaloha* (bronze) are called as *Mishraloha*.^[4] There is another *Dhatu*, *Yashad* which includes under *Putiloh*. *Loha* is synonym for *Dhatu*. *Dhatu Marana Prakriya* or *Dhatubhasma nirmana prakriya* includes following points.

1. *Shodhana*.
2. Some *Dhatu*s like *Putilohas* (*Naag*, *Vanga*, *Yashad*) require *Jarana prakriya*.
3. *Dhatu Marana*.

1. Samanya Shodhana

Taile takre gavamutre hyaaranale kulatthaje/

Kramannishechayet taptam drave drave tu saptadha//

Swarnadilohapatranam shudhhiresha prashasyate//^[5] (RRS 5/13)

Dhatu requires *Shodhana prakriya* before *Marana* or *Bhasma nirmana*. *Shodhana* of all *Dhatu* were done by *Nirvapana prakriya* (Heating and quenching). For this all *Dhatu*s required to be red hot on *agni* and quenched in different liquid media like *Tila Tail* (sesame oil), *Takra*, *Gomutra* (cow urine), *Kaanji*, *Kulitha kwatha* (decoction). Every time fresh liquid media should be used. It means every *Dhatu* undergoes 35 times *Nirvapana*. *Shodhana* of *Putilohas* done by *Dhalana* method in *Haridrachurna mishrit Nirgundi swarasa* with the help of *Pitharyantra*.^[6]

2. Vishesh Shodhana- For *Vishesh Shodhana* of *Dhatu*, different procedures follow. Below table shows *Vishesh Shodhana* (specific purification) of all *Dhatu*s according to *Yogaratanakara*.

<i>Dhatu</i>	<i>Vishesh Shodhana Procedure</i>	<i>Dravya used for Shodhana</i>
<i>Swarna</i>	<i>Nirvapana</i>	<i>Kanchnar patraswarasa</i>
<i>Rajat</i>	<i>Nirvapana</i>	<i>Agastipatra swarasa</i>
<i>Tamra</i>	<i>Pachana/Swedana</i>	<i>Gomutra</i>
<i>Loha</i>	<i>Nirvapana</i>	<i>Triphala Kwath</i>
<i>Naaga</i>	<i>Dhalana by Pitharyantra</i>	<i>Arkadugdha</i>
<i>Vanga</i>	<i>Dhalana by Pitharyantra</i>	<i>Haridra and Nirgundi ras</i>
<i>Kansya</i>	<i>Like Tamra shodhana</i>	<i>Like tamra shodhana</i>
<i>Pital</i>	<i>Like Tamra shodhana</i>	<i>Like Tamra shodhana</i>

3. Putiloha like *Naag*, *Vanga* and *Yashada* Requires intermediate process called as *Jarana prakriya* to convert *Putilohas* in *Churna* form before *Marana prakriya*.

4. Dhatu Marana- There is one principle for *Dhatu Marana*, which is as follows-

Lohanam maranam shreshtham sarvesham rasabhasmanam|

Mulibhirmadhyamam prahu kanishtham gandhakadibhi||

Arilohen lohasya maranam durgunapradam||^[7] (RRS 5/14)

It means when *Dhatu Marana* done by.

1. *Parada* or *Rasabhasma* (*rasasindur*) *Maarit*- It's called as *Shreshtha prakar* (high quality type), because of *Parada* use the *bhasma* becomes highly potential. As *Parada* having quality of mixing easily with other metals and forms amalgam. When it subjected to *Putra*, helps in disintegration into finer particles of metals and also traces of *Parada* not present in final product.

2. *Kashthaushadhi* (herbal drugs) *Maarit*- It's called as *Madhyam prakar* (medium quality), because of *kashthaushadhi* and its *kshar* this *bhasma* is potentially medium quality. It contains acidic and alkaline contents which also used in disintegration into finer particles, but due to herbal contents after burning leaving traces of inorganic material which is mixed with the *bhasma*.

3. *Gandhakadi dravya* *Maarit*- It's called as *Kanishtha prakar* (lower quality), as it prepared by *gandhak* like drugs, it contains some part of it and that's why it is not used in every disease or condition. Hence the *bhasma* are given least therapeutic importance.

4. *Ariloh* (enemy of *Dhatu*) *Maarit*- It's called as *Durgunaprad prakar* (not useful). These *Arilohas* like *Manahshila*, *Hartal* are likely to affect properties of original *dravya* to great extent by forming compounds like sulphides. If arsenic found in *bhasma* can produce hazardous effects. As it is prepared by *Ariloh*, *Dhatu* loses all its properties like it loses good conduction of heat and electricity, flexibility, produces bad effect on body, so it's not useful or recommended. In *Rasendra mangal grantha* and *Anandkand*, specific *maraka dravya* has been used for specific *Dhatu marana*. Below table gives idea about *Maraka dravya* used for *Dhatu marana*.

Table 1: Marana dravya suggested for Dhatu marana.^[8]

<i>Dhatu</i>	<i>Swarna</i>	<i>Rajat</i>	<i>Tamra</i>	<i>Loha</i>	<i>Naag</i>	<i>Vanga</i>
<i>Maraka Dravya</i>	<i>naaga</i>	<i>Makshik</i>	<i>Gandhak</i>	<i>Hingul, stree dugdh</i>	<i>Manah Shila</i>	<i>Hartal</i>

Table 2: Maraka dravyas for Dhatu Marana according to Anandkand.^[9]

<i>Dhatu</i>	<i>Ariloh</i>	<i>Synonyms</i>
<i>Swarna</i>	<i>Nilanjan</i>	<i>Swarnaghna</i>
<i>Rajat</i>	<i>Haratal</i>	<i>Tarari</i>
<i>Tamra</i>	<i>Gandhak</i>	<i>Shulbari</i>
<i>Loha</i>	<i>Makshik</i>	<i>Loharipu</i>
<i>Naag</i>	<i>Manahshila</i>	<i>Naagaripu</i>
<i>Vanga</i>	<i>Haratal</i>	<i>Vangari</i>
<i>Kansya</i>	<i>Gandhak</i>	<i>Taamrabahulyaat</i>
<i>Pital</i>	<i>Gandhak</i>	<i>Taamrabahulyaat</i>
<i>vartaloh</i>	<i>Gandhak</i>	<i>Taamrabahulyaat</i>

In *Paradasamhita* it is mentioned that without *Parada*, *Marana* should not be done. All *Dhatu*s when combined with *Parada*, they loose their bad quality and *Doshas* and becomes more potent, so it's necessary to do *Dhatu Marana* by *Parada*. In *Rasarnava* it is mentioned that *marana* of *Dhatu* can be done by using only *Gandhak* or *Makshik*^[10] as a *maraka dravya*. *Bhavana* of *nimbura* (citrus fruit) should be given. In *Rasatarangini* it is mentioned that the *Marana* of all *Dhatu*s can be done by following method. *Shudhha Dhatu*+ *Shudhha Manahshila*+ *Shudhha Gandhak*= *Mardana* in *Khalvayantra*- *Sharavasamputa*-*Putra*- repeat the procedure till *Bhasma* formation.^[11] *Marana* of *Dhatu*s are as follows.

1. *Swarna Marana*- a) *Paste* of *Bijaura Nimbu swarasa*+*Paradabhasma*-apply over *Shudhha Swarnaparta*-10 *puta*.^[12] b) *Shudhha Swarna*+melted in *musha*+equal quantity of *Paradabhasma*=*mardana*. After that add equal quantity of *Hingul*+*bijaura nimbu ras bhavana*-*Chakrika*-12 *kukkutaputa*. *Kesar* or *Kumkum* colour *bhasma* obtain.^[13]
2. *Rajat Marana*- a) *shudhha swarnamakshik*+*bijaura nimbura*s=paste apply on *rajatpatra*-30 *puta*.^[14] b) *Shudhha Rajatpatra churna* + *Kajjali* + *kumariswarasa*- *mardana*-*sharavasamputa*- *laghuputa*.^[15]
3. *Tamra Marana*- a) *kajjali*+*bijaura nimbura* paste= paste apply on *shudhha tamrapatra*-3 *gajputa*.^[16]
4. *Loha Marana*- *shudhha hingul*+*stree dugdh*=paste apply on *shudhha lohapatra*-*gajputa*-after self-cooling *lohachurna* +*hingul*- *triphala kwatha*, *nimbura*s, *kanji bhavana*-*mardana*-*chakrika*-40 *puta*.^[17]

Loha trividha paaka^[18]- A) *bhanupaka*-*shudhha lohapatra*-*mardana* in *khalva*-pour *triphala kwatha* in it-evaporate in sun rays for 3-7 days. B) *sthalipaka*- *lohachurna* after *bhanupaka*-*triphala kwatha*-heat till it becomes dry. Repeat procedure for 3 times. C) *putapaka*- *puta* given to *lohachurna* obtained after *sthalipaka* by mixing it with *doshahar swarasa* or *kwatha*.

5. *Vanga Marana*- a) *Shudhha vanga* melted+*shudhha parada*+*shudhha hartal*-*mardana* by *vanakarpas stem* till *bhasma* formation-put *sharava* over it-*tivragni-vangabhasma*.^[19] b) *alash kwatha* or *swarasa*+*hartal*=paste apply on *vangaparta*-3 to 4 *laghuputa*.^[20]
6. *Naaga Marana*- a) Melt *shudhha naaga* on *bhrashtrayantra*+*shudhha parada*-*mardana*+add *kshar* of *arjun*, *behada*, *amaltas*, *anar*+21 days heat+*mardana*= *paravatprabh* (pigeon colour) *naagabhasma*.^[21] b) *shudhha naaga*+*pipal twaka ash* -*mardana* in *kadhai*-after vigorous mixing and *churna* formation add *manahshila-nimbura*s or *kanji bhavana*-60 *puta*.^[22]
7. *Yashad Marana*- melt *shudhha yashada* on *agni*+*shudhha parada*-*mardana* in *khalvayantra* till *pishti* formation-*mardana* of *pishti* by *nimbura*s-*prakshalana*-obtained *yashad*+*shudhha gandhak*-*mardana*-*puta*.^[23]
8. *Kansya Marana*- *Shudhha manahshila*, *shudhha gandhak*+*kumariswarasa* paste+apply on *shudhha pitalpatra*-3 *gajputa*.^[24]
9. *Pital Marana*-*Shudhha manahshila*, *shudhha gandhak*+*nimbura*s paste+apply on *shudhha pitalpatra*-8 *puta*.^[25]
10. *Vartaloha Marana*- *Shudhha hartal*, *shudhha gandhak*+*nimbura*s paste+apply on *shudhha pitalpatra*-5 *gajputa*.^[26]

Role of Bhavana (Levigation) in Marana- *Bhavana* is the process in which *Churna* of metals or minerals are subjected to *mardana prakriya* with specific liquid media until it gets dried up.^[27] In *marana prakriya*, *bhavana prakriya* is initial and important stage as.

1. It helps in *chakrika nirmana* (pellets preparation) of *shodhit dravya*.
2. To impart organic properties to inorganic materials.
3. For the preparation of finer particles.

Example- In *Tamrabhasma nirmana*, *Jambiri nimbu swarasa* is used as *Bhavana dravya*. *Jambiri nimbu swarasa* helps for *Chakrika nirmana* and finer particles of *Tamra*. By this procedure *Tamrabhasma* acts as *lekhana*. In *Lohabhasma nirmana*, *Triphala kwatha* is used as *bhavana dravya* which is used for *Chakrika nirmana*. Also helps to prevent the *constipation* which can be occur by *Lohabhasma*.

Role of Puta in marana- This is actual stage of *Marana prakriya*. Which type of *Putam* should be given to *Dhatu bhasma* is depend upon the hardness of *Dhatu*. *Rasaratnasamuchhaya* defines the *Putam* as.

Rasadidravayapakanam praman gyapanam putam

Neshto nyunadhiakm pakam supakam hitam aushadham||^[28]

The knowledge of how much amount of heat is required for *paka* of *Rasa*, *Maharas*, *Dhatu*, etc *dravya* is called as *Putra*. It is advised that the heat given by *puta* should be in appropriate in required temperature and heat should not be less or more. Below table shows the *puta* requirement for specific *bhasma nirmana* according to *Rasaprakash sudhakar* and *Rasaratnasamucchaya*.

Table no. 3: Description of various *puta* for *Dhatu Marana*.

<i>Putra</i> name	No of <i>vanopalas</i>	Size of pit	Average temperature in °C	Uses
<i>Mahaputra</i>	1500	2 <i>hasta</i> = 91 cms, L×B×H	1000-1200	<i>Abhrak</i> , <i>Loha</i>
<i>Gajaputra</i>	1000	1 <i>rajhasta</i> =57 cms, L×B×H	800-1000	<i>Abhrak</i> , <i>Loha</i> , <i>Tamra</i> , <i>Makshik</i> , <i>Shankh</i> , etc.
<i>Varahputra</i>	500	1 <i>aratni</i> = 42 cms, L×B×H	600-750	<i>Shankh</i> , <i>Shukti</i> , <i>Varatika</i>
<i>Kukkutputra</i>	200	2 <i>vitasthi</i> = 24 <i>angul</i> L×B×H	400-500	<i>Swarna</i> , <i>Rajat</i> , <i>Naag</i> , <i>Vanga</i>
<i>Kapotputra</i>	8		200-300	<i>Paradabhasma</i> , <i>Parada jarana</i>

The *bhasma* is said to be best quality, when it prepared by using appropriate *puta* which is having so many quality like *Bhasma* becomes *Rekhaapurna*, *Vaaritara*, *Apunarbhava*, *Nishachandra*, *sookshma*, *shlakshna*, *Shighravyapi*.^[29] *Yogaratanakar* describes *dhatubhasma varna* (colour) after *Marana*, which states that the *swarnabhasma varna* is *gairik* or *champakpushpavat* (golden), *rajatbhasma* and *tamrabhasma varna* is *krishna* (black), *kansyabhasma varna* is *Dhusar*, *naagabhasma varna* is *paaravatprabh*, *vangabhasma varna* is *shwet* (white), *lohabhasma varna* is *pakvajambuphal varna* (purple) and *varna* of *abhrakabhasma* is *ishtikachurnavat* (brick red).^[30] *Rasendrasamgraha* states that *bhasma* prepared by *Putra* becomes devoid of *Doshas* and enhanced by therapeutical properties. *Mardana* is very much needed after every *puta* for good quality of *Dhatubhasma*. According to *Rasendrachudamani* more number in *putas* helps making the *bhasma* more *sukshma*, *shlakshna*, *laghu* and more potent. According to *Rasendrasarsamgraha* *bhasma* prepared by 10-100 *putas* are said to be *bhasma* has disease removing property. When *bhasma* prepared by 100-1000 *putas*, it claimed to produce *Rasayana* property and when *bhasma* prepared by 10-500 *putas*, it claimed to produce *Vaajikaran* property.^[31] Specific type of *putas* required for specific *Dhatu marana*.

Standardization of Marana prakriya- *Bhasma parikshas* are told by our ancient *Acharyas* are to check whether the prepared *Bhasma* of metals/minerals are standard or not? All the tests mentioned in *Ayurved Granthas* are aimed to make the *Bhasma laghu* from *guru*, fine from bulky, digestable and absorbable from undigestable and unabsorbable, to bring them to irreversible form. Also these tests are done for not produce any side effects or harmful effects by prepared *Bhasma* to body on consumption like nausea, vomiting, etc. Some important *Bhasma parikshas* (tests) are.

The physical tests like 1. *Vaaritaratva*, 2. *Rekhapurnatva*, 3. *Nishchandra* and the chemical tests like 4. *Apunarbhavatva*, 5. *Niruthha*, 6. *Dadhi Pariksha*.

1. *Vaaritaratva*- When *bhasma* floats on surface of water, it is suggested that the *Bhasma* is of standard quality and we can use it for internal use. This tests is applicable for all *bhasmas*. Here surface tension of water plays an important role as *Bhasma* particles cannot break the surface tension and floats over it. If some *Bhasma* particles sink in water, it means some more *Putas* required to *Bhasma* to become standard.

2. *Rekhapurnatva*- This test indicates the fineness of *Bhasma*. Prepared *Bhasma* rubbed in between the thumb and index finger and if *Bhasma* fills the lines of fingers then it means *Bhasma* is of standard quality. It shows that the *bhasma* is very fine, *marana prakriya* completed and it can well absorbed in body.

3. *Nishchandra*- This test is not applicable for all *bhasmas*. It is applicable for only those *bhasmas* which contains shine or *marana* done by shining *dravya*. It is specially indicated for *Dhatu bhasmas* and *Abhraka* and copper containing *Bhasmas*. This test performed by rubbing the prepared *bhasma* in between thumb and fingers and the rubbed portion should be examined in sun rays. If not showed in shine then it is of standard quality and can be used for internal use. If shows any shine then it should be subjected for further *putas* till it becomes lustreless.

4. *Apunarbhava*- This is most important test for *Dhatu bhasma* as if *Dhatubhasma* not passes this test and ingested to body, it can produce harmful effects. Original *Dhatu* cannot be re-obtained even after mixing it with *mitrapanchaka* (*gunja*, *guggul*, *ghrita*, *madhu*, *tankan*) and blowing it in fire. If *Bhasma* does not showed any *Dhatu* particles after this test, it is said to be standard. This indicates the complete oxidization of *Dhatu*.

5. *Niruthha*- This test is performed by mixing of *Raupya patra* (silver thin plate) or coin with *Dhatubhasma* and high heat is given like *Putra* given to that *Dhatubhasma*. If there is no

weight gain in Silver coin or not even little amount of *bhasma* mixes with it, then it is said to be standard quality. If weight gain obtained then it is subjected for further *puta*.

6. *Dadhi pariksha*- This test is specially indicates for *Tamrabhasma* (copper). It is performed by putting pinch of *tamrabhasma* in *Dadhi* or *amladravya* and observed it for 72 hours. If *Green* colour not found then it is said to be standard quality. If green colour found in it then it is subjected to further *putas*. Below table shows some *Ayurvedic Bhasma Pariksha* as well as modern tests for *bhasma*.

Table no 4: Ayurvedic and modern parameters of Bhasma pariksha.

S.N.	Ayurvedic Bhasma pariksha	Modern tests
1	<i>Rekhapurnatva</i>	Description, colour, odour
2	<i>Vaaritaratva</i>	Identification
3	<i>Nishchandra</i>	Particle size
4	<i>Apunarbhavatva</i>	Loss on drying at 105 ⁰ C
5	<i>Niruthhatva</i>	Total ash
6	<i>Dadhi pariksha</i>	Water soluble ash
7	<i>Nirdhuma</i>	Acid insoluble ash
8	<i>Niswadu</i>	Assay for elements
9	<i>Dantagrekachakachabhas</i>	

DISCUSSION

Dhatubhasmas are one of the most potent weapon in treatment of diseases for *Ayurvedic* physicians. It acts in low dose and quick action being helpful in managing *asadhya vyadhi* (incurable diseases). *Acharyas* mentioned the ill effects of *Rasadi dravya* if they used in natural form or *ashudhha* form. Specific methods and techniques are required to convert them into absorbable and assimilated form in body. Herbal drugs used during *shodhana* plays important role in size reduction, removing ill effects, particular compound formation and stability of compound formed in next process. *Shodhana*, *Marana*, *Kupipakva* methods are the different methods to convert *Rasadi dravya* into absorbable form in body. *Marana* is a process of transformation by which purified and detoxified materials are transformed into absorbable, adaptable and assimilable form with the help of fire in measured manner. *Dhatubhasma* prepared by using *Parada* or *Rasabhasma* is said to best quality. Probable reason behind this is *Parada* acts as reducing agent and it forms amalgam with *Dhatu* imparting therapeutic attribute to the *Dhatubhasma*. *Parada* acts as catalyst and helps in easy *bhasma* formation. It imparts its properties in *bhasma* like *yogavahitva* (synergistic action), *Rasayana* (rejuvenetor), *laghutva* (lightness), so it is best among *Dhatubhasma* prepared by various methods. In *Paradasamhita* it is mentioned that without *Parada*, *Dhatu marana*

should not be done and without *Abhraka*, *Parada sevana* should not be done. If we do so then it is going to do the *Vedha* that is damage to cells. Also *Bhasma* prepared without using *Parada*, if administered to the body is going to be deposited as *kitta*^[32] (waste product) in stomach. *Dhatu Marana* done by *Kashthaushadhi* (herbal drugs) is considered as *Madhyam* quality, because number of *puta* and time required for the *bhasma* preparation is more in this case. Also temperature required for *bhasma* preparation is more by this method. Herbal drugs required for *marana* also not available in every season. Though acid and alkaline contents of herbal drugs helpful in disintegration of *Dhatu*, this type of *bhasma* is inferior than *Parada maarit bhasma*. This is because of some organic matter of herbal drugs may present in *bhasma* as impurity. Though it is in less quantity but it may affect the *bhasmas* efficacy. Another method of *Bhasma* preparation is using of *Gandhak*, *Hartal*, *Manhashila*, etc. drugs as a *marana dravya*. Though these type of *bhasmas* are therapeutically useful, but it is less efficient than *bhasma* prepared by using *Parada* and Herbal drugs. Though the *Gandhaka* acts as reducing agent and facilitates easy *bhasma* formation, but it is not get evaporate easily and completely. It may changes the properties of *bhasma*, so less efficient than first types of *bhasma* preparation. Last type of *bhasma* preparation is *Marana* by *Ariloh*. *Ariloh* means any *Loha (Dhatu)* which is enemy of other *Dhatu* or *Dhatu* properties. *Ariloh* may have less melting point than as compared to main *dhatu*, so when *bhasma* prepared by *Ariloh*, their melting point also decreases. Also *Ariloh* may not kill only metallic properties of *Dhatu*, but also kills therapeutic properties of *Dhatu*. They might also found such compounds that might not absorbed and assimilate in body and produce toxic or hazardous effects in body. *Arilohas* can be useful in combination of two *Dhatu*, as they can decrease the melting point of *dhatu* having higher melting point.

CONCLUSION

Marana is the process which converts the purified metals and minerals into *Bhasma* after subjecting them to levigation and incineration. *Marana* results in reduction in particle size and elimination of certain unwanted elements. Also it acts as transformation into suitable compound form and to increase potency and quality of the material. After *marana Dhatuadi dravya* converted into absorbable, adaptable and assimilable form. *Marana* helps to make the material suitable for therapeutic uses. *Rasashastra* not only deals with potential effect of *dravya* but also to reduce the ill effects of *dravya* on body. *Marana* is essential method of medicine preparation from metals and minerals and other *Rasadi dravya*. *Ariloha maarit dhatu* can be used in *Parada Garbhadruti* and *Dhatuvada* or combination of two *dhatu*

having different melting points. Prepared *dhatu bhasma* by *Gandhakadi dravya* have inferior therapeutic efficacy. *Dharu marana* or *dhatubhasma* prepared by *Kashthaushadhi* is superior than *bhasma* prepared by other *Gandhakadi dravya* and *Ariloha*. *Parada maarit* or *Rasabhasma maarit Dhatubhasma* is considered as excellent therapeutic properties and superior among all types of *Dhatu marana*.

ACKNOWLEDGEMENT

I would like to Thank our Professor and HOD Dr. Rajesh Urmale sir for his expert advice and encouragement throughout this article preparation as well as our Assistant professor Dr. Pranali Fulzele for her brilliance in finding references for article. I would like to express my thanks to my parents, friends, specially my Wife Mrs. Preeti K. Bodhakar and my daughter Miss Lavanya K. Bodhakar who helped me lot in finishing this article in less time and helped me during the preparation of article.

Regards- Dr. Bodhakar Kishor N.

REFERENCES

1. Dr. Indradev Tripathi, Pt Taradatta Panta. Rasarnavam edited with Rasachandrika Hindi Commentory. 4th ed., Varanasi; Chaukhamba Sanskrit series, 2001; 9.
2. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 2/52: 22.
3. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; Adhyay 2: 21.
4. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/1: 85.
5. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications: 2010; 5/13: 93.
6. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/156: 124.
7. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/14: 94.
8. Nagarjuna. Rasendra mangal with Aihore commentary of HS Sharma. chapter no 2, 53-55 reprint 2008. Varanasi; Chaukhamba orientalia, 2008; 45.
9. Shreebhairava, Siddhinandan Mishra. Anandkand Kriyakarana vishranti with siddhaprada commentary. 1st ed., Varanasi; Chaukhamba Orientalia, 2008; 7/27-28: 732.

10. Dr. Indradev Tripathi, Pt Taradatta Panta. Rasarnavam edited with Rasachandrika Hindi Commentory. 4th ed., Varanasi; Chaukhamba Sanskrit series, 2001; 7/150: 109.
11. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 15/8: 363.
12. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/15: 95.
13. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 15/8: 363.
14. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications: 2010. 5/36: 98.
15. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications: 2009. 16/26-28: 390.
16. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications: 2010. 5/53: 101.
17. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/113-115: 115.
18. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 20/20-38: 496-499.
19. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 18/15-18: 439.
20. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/161: 125.
21. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/174-179: 127.
22. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/181-183: 127.
23. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 19/104-107: 476.
24. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 22/35: 575.
25. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/198-199: 129.
26. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 5/215-216: 130.

27. Sadanand Sharma, Kashinath Shastri. Rasatarangini. 11th ed., Varanasi; Motilal Banarasidas publications, 2009; 2/49: 21.
28. Tripathi Indradev. Rasaratnasamucchaya. ed 2012 reprint., Varanasi; Chaukhamba Sanskrit bhavan, 2012; 10/47: 114.
29. Vagbhata, Kulkarni Dattartey A. Rasaratnasamucchaya. 3rd ed., New Delhi; Meharchand Laxmandas publications, 2010; 10/48-50: 187.
30. Vaidya Shri Lakmipatishastri, Bhisagratna Bramhashankar Shastri. Yogaratnakara. reprinted 2018 edition., Varanasi; Chaukhamba prakashan: 2018. Purvardha Dhatu prakaran, saptadhatu varna, 1-2: 128.
31. Gopal Krishna Bhatt, Satyarth Prakash. Rasendra Sarsamgraha. 1st ed., Varanasi; Chaukhamba Sanskrit series, 1994; 1/314-315: 188.
32. Niranjan Prasad Gupta. Paradasamhita with Hindi Tika. reprint 2002 ed., Mumbai; Khemaraja Shreekrishnadasa, Shree Venkateshwara press, 2002; 56/17-18: 491.