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Review Article

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EFFECT OF NO OF PUTA ON PARTICLE SIZE OF LAUHA BHASMA

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ABSTRACT

India has an ancient heritage of traditional medicine 80% of the population living in developing countries relies on traditional medicine for their primary health care needs (WHO). Ayurveda is accepted to be oldest treatise medical system. Medicinal use of metals and minerals is since time immemorial due to their special properties. Bhasmas are unique herbomineral high potency preparation recommended for the management of almost all disease condition. *Lauha Bhasma* (LB) is a complex herbomineral preparation widely used as an Ayurvedic hematinic agent. It is an effective remedy for Aneamia (*pandu*), chronic fever (*jīrṇa jvara*), phthisis (*kṣaya*), Breathlessness (*śvāsa*) etc., and possesses vitality enhancing (*vājīkara*), strength promoting and anti aging (*rasāyana*) properties. Mainly *Gaja Puta* have been described for *Marana* of *Lauha* using a variety of levigation media. The number of *Puta* to be given also varies in relation to type of *Puta* and levigation media to be used. In this study, three samples S1, S2 and S3 of *Lauha Bhasma* were prepared by using *Gomutra Nirmit Triphala Kwath* as levigation media at 600-850C temperature using Electric Muffle Furnace. They were given 5, 10,20 and 30 *Puta* respectively. All the Four samples were analyzed at a Govt. approved laboratory by HELOS Particle Size Analyzer. The Volumetric Mean Diameter of the Four samples S1, S2 and S3 and S4 was found to be 7.63 µm, 6.07 µm and 4.86 µm respectively. It was found that number of *Puta* given to *Lauha Bhasma* directly affects on its particle size. More number of *Puta* results in finer *Bhasma*. So, 30 *Puta* is more convenient for *Marana* in reference to particle size of *Lauha Bhasma*.

KEYWORDS: *Bhasma*, *Puta*, *Marana*, Particle size, Volumetric Mean Diameter.

INTRODUCTION

Treatment of various diseases or aliment with Ayurvedic drugs is becoming more and more popular day by day.[1] In Ayurveda, metals such as Iron, Copper, Zinc, and Lead, etc., are used in many preparations, after transforming the metals into nonmetallic forms.[2] It is observed that herbomineral complexes are more stable and more interactive compared to plain herbs as these result in faster therapeutic action and have a longer shelf life.[3] *Bhasmas* are unique preparations involving metallic/mineral preparations calcined using heat to transform metals into non-toxic organometallic forms.[4] Concept of reduction of particle size of metals is prevailing since *Charak Samhita* (1500 BC) for a metallic preparation i.e. *Lauhadi Rasayan*. For purification, a mineral/metal is heated upto when it becomes red hot and quenched in some liquid media immediately until flakes of metal become fine powder.[5] When the rasas, Maharasas,and uprasas undergo any heating procedure, the proper stage of the end product obtained should be optimum. It should not more or less, and the formation of such paka is the most senstitive index of optimum heating.6.

Aims and Objectives

To observe the effect of number of *Puta* on the particle size of *Lauha Bhasma.*

Materials

The raw material *Kant Lauha* (Magnet) was procured from local market. Other herbs like *Triphala* and materials used during *Shodhana* (Purification) were procured from Govt. Herbal Garden. The samples of these materials were authenticated and identified from accredited institutes.

METHODS

Preparation of *Kant Lauha Bhasma*

Preparation of *Kant Lauha Bhasma* involves three stages:
1. *Shodhana*[6]: For *Samanya Shodhana*, the raw material was subjected to heat treatment in different treating liquids.

This procedure is called *Dhalana* (Quenching). In this, the raw material was heated till the Magnet pieces become red hot and poured in sufficient quantity of treating liquid. The solid particles were recovered by filtration while the spent liquid was rejected. This procedure was repeated seven times by using fresh treating liquids each time. The treating liquids used were *Til* (*Sesamum indicum* L.) oil, *Takra* (butter milk), *Go-mutra* (cow urine), *Kanji* (rice gruel) and decoction of *Kulattha* (*Dolichos biflorus* L.).

***Marana*[9]:** The material obtained after *Shodhan stage* is expected to be soft enabling mixing by levigation with *triphala kwath prepared with gomutra*. A paste was obtained after levigation with *Aloevera*, which was then made into thin flat discs called *Chakrikas*. These were dried under sunlight and taken in earthen plates, covered with another earthen plate with interface between them sealed with a clay-smeared cloth. This arrangement is referred to as *Sarava samputa* in *Ayurveda*. *Putapaka* (calcination) was carried out in Electric Muffle Furnace by placing *Sarava samputa* into it. It was heated at temperature ranging from 6000 C to 8500 C the temperature was stable to the highest temperature for 1hr, it was then allowed to self cooling.

The material was recovered by breaking *Sarava samputa*. The temperature profile during *Puta* was monitored using a K-type thermocouple connected to a digital temperature indicator.

In this way, 4 different samples of *Vang Bhasma* were prepared by using 5, 10, 20 and 30 Puta respectively.

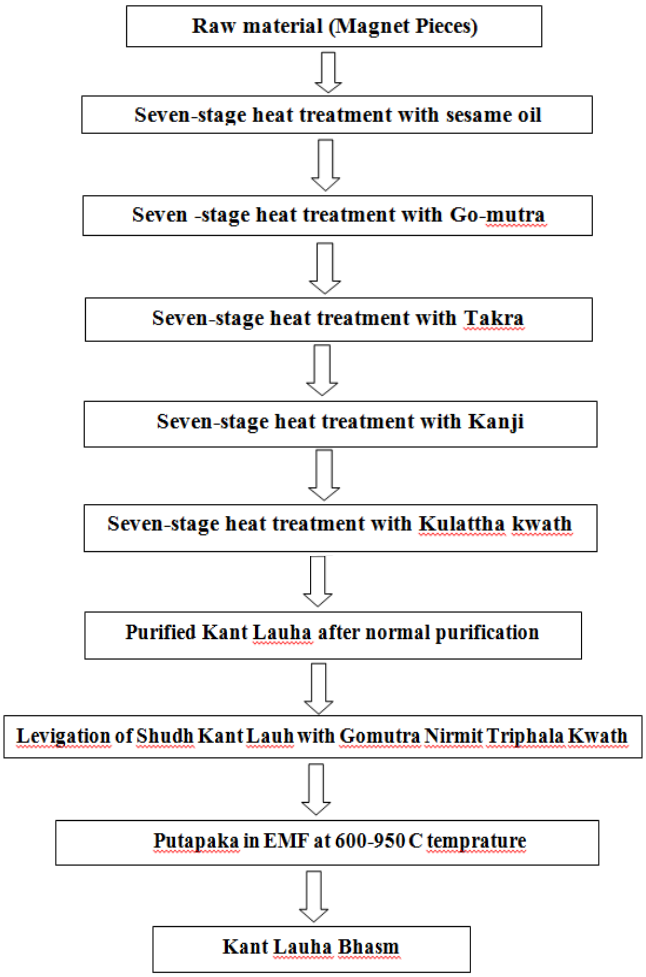
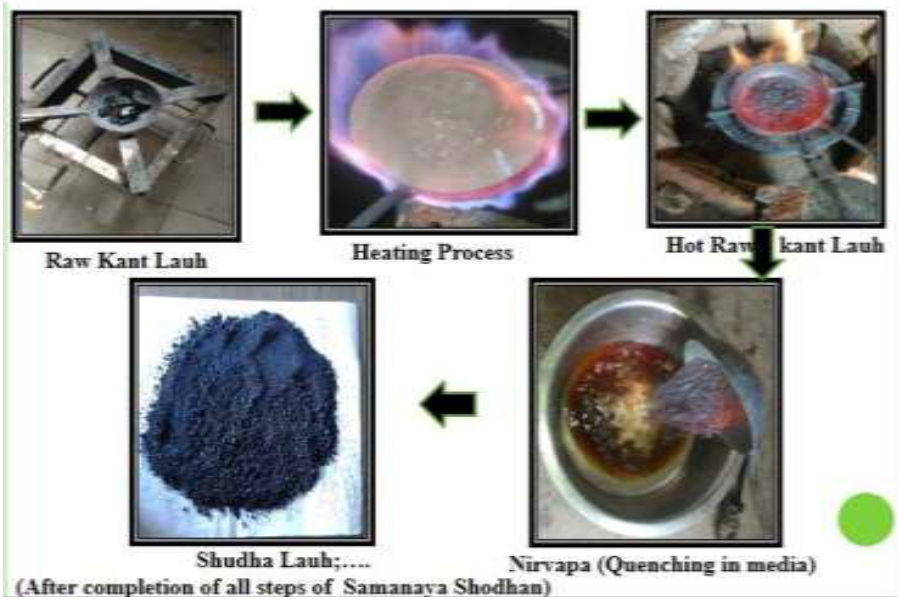


Table 2: *Shodhana of Lauh.*

Media Used for Shodhan 1
Tila Taila (sesame oil)
Takra (butter milk)
Gomutra (cow's urine)
Arnal/Kanji (sour gruel)
Kultha Kwath (decoction of *Dolichos biflorus*)



Images 1: Flow Chart.

Table 3: *Marana of Lauh 7*: - Flow Chart Image-2,3,43.

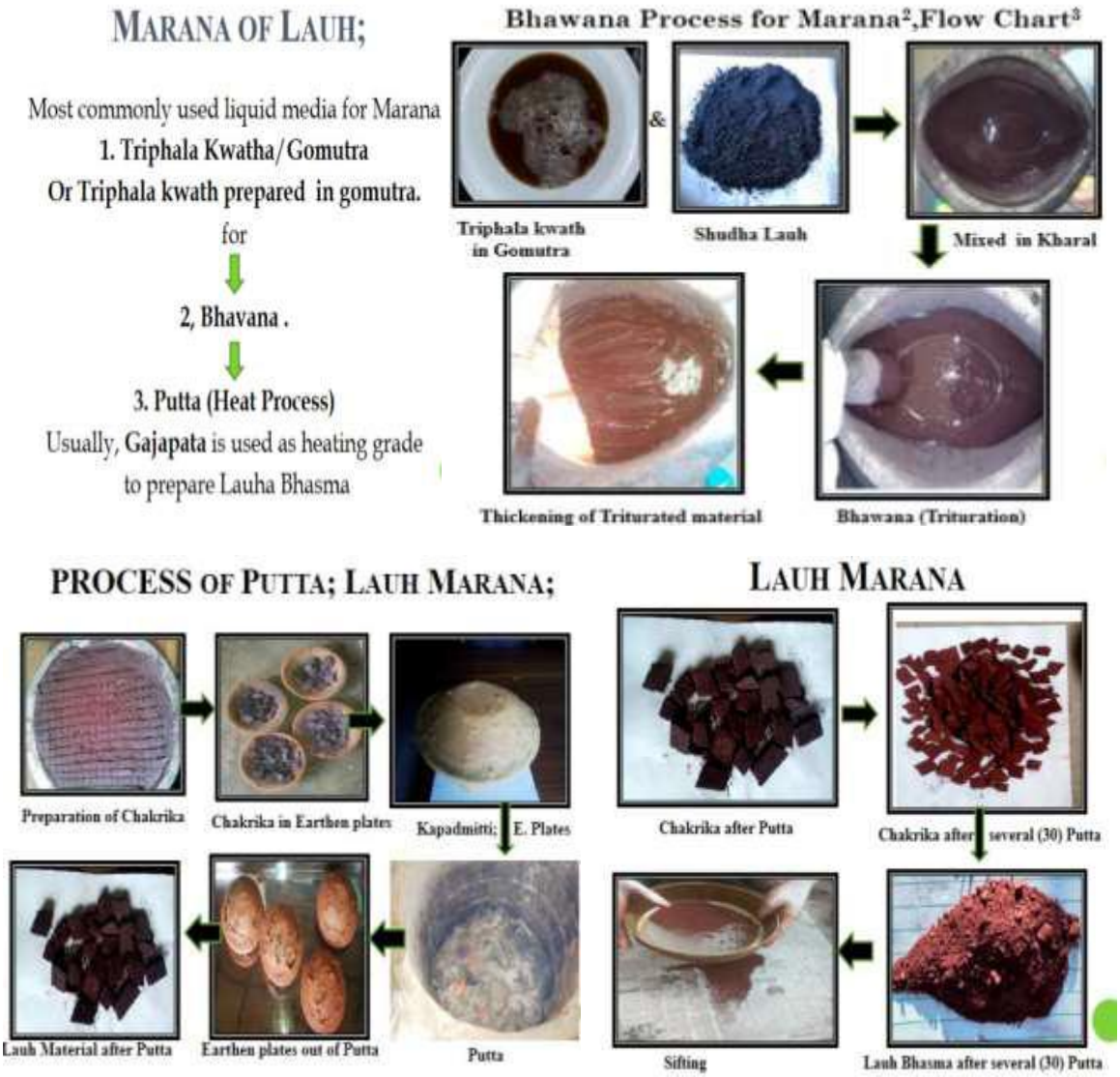


Image 4.

ANALYSIS OF KANT LAUHA BHASMA
ON THEBASIS OF CLASSICAL PARAMETERS

Image 5: Bhasma Priksha Classical Methods.

Characterization of *Bhasma*[11]
Description, Colour, Odour, Identification (chemical), Particle size or mesh size, Loss on drying at 1050C, Total ash, Acid insoluble ash, Water soluble ash, Assay of element, *Ayurvedic* specifications, Lustreless (*Nishchandrica*), Fine enough to enter the crevices of finger(*Rekha purnatva*), Floats on water (*Varitara*), Smokeless (*Nirdhoom*), Tasteless (*Niswadu*) and Irreversible (*Apunarbhav*).

Particle Size Analysis of *Kant Lauha Bhasma*
The particle size analysis of *Kant Lauha Bhasma* was done at a Govt. approved laboratory using HELOS (H1004) & SUCELL Particle Size Analyzer (Sympatec Gmbh, Germany).

OBSERVATIONS AND RESULTS

The observations and results of *Kant Lauha Shodhana* (Table- 1), and *Marana* of *Shudh Kant Lauh* (Table- 2) for all the four samples were documented. Maximum temperature given to all the Four samples of *Kant Lauh Bhasma* was also recorded and is shown in Tables- 3. Result of particle size analysis for all the four samples is shown in Tables- 4.

Table 1: Observations during *Shodhana* of *Kant Lauh Bhasm.*

Media for Shodhan	Sample1 S-1		Sample 2 S-2		Sample3 S-3		Sample4 S-4	
	Wt. Before Shodhan	Wt. After Shodhan	Wt.Before Shodhan	Wt.After Shodhan	Wt. Before Shodhan	Wt. After Shodhan	Wt Before Shodhan	Wt After Shodhan
Til Taila	600ml	583ml	400ml	390ml	350ml	345ml	340ml	335ml
Takara	583ml	576ml	390ml	385ml	345ml	340ml	330ml	326ml
Go-mutra	576ml	566ml	385ml	380ml	340ml	333ml	328ml	320ml
Kanji	566ml	560ml	380ml	375ml	333ml	325ml	320ml	316ml
Kulath Kwath	560ml	555ml	375ml	360ml	325ml	321ml	315ml	310ml

Table 2: Observations during Marana of *Kant Lauha.*

Name of the processs	Sample1		Sample2		Sample3		Sample4	
Marana	Wt before Marana	Wt. After Marana	Wt. Before Marana	Wt. After Marana	Wt. before Marana	Wt. After Marana	Wt. before Marana	Wt. After Marana
	498gm	491gm	475gm	472gm	460gm	455gm	428gm	425gm

Table 3: Maximum temperature given to *Kant Lauha Bhasma* during *Puta.*

No.Of puta	Maximum temperature given to Kant Lauha Bhasma during Puta			
	Sample1 S1	Sample-2 S2	Sample-3 S3	Sample-4 S4
1st	950c	950c	950c	950c
2nd	950c	950c	950c	950c
3rd	950c	950c	950c	950c
4th	950c	900c	900c	900c
5th	950c	900c	900c	900c
6th		900c	900c	900c
7th		900c	900c	900c
8th		900c	900c	900c
9th		900c	900c	900c
10th		900c	900c	900c
11th			850c	850c
12th			850c	850c
13th			850	850
14th			850c	850c
15th			800c	800c
16th			800c	800c
17th			800c	800c
18th			750c	750c
19th			750c	750c
20th			750c	750c
21th				700c
22th				700c
23th				700c
24th				700c
25th				650c
26th				650c
27th				650c
28th				650c
29th				600c
30th				600c
31th				600c
32th				600c

Table 4: Particle Size of *Kant Lauha Bhasma.*

Parameter	Particle Size			
	Sample1	Sample 2	Sample3	Sample3
X_{10}	1.97µm	1.89µm	1.91 µm	`1.42µm
X_{16}	2.85µm	2.72µm	2.76µm	1.97µm
X_{50}	9.91µm	9.59µm	9.36µm	5.29µm
X_{84}	45.67µm	48.34µm	35.77µm	15.88µm
X_{90}	61.34µm	67.11µm	43.46µm	28.60µm
X_{99}	173.25µm	134.75µm	71.55µm	67.70µm
SMD	6.09µm	5.93µm	5.86µm	4.26µm
VMD	23.86µm	23.41µm	16.83µm	10.36µm

DISCUSSION

The purified Kant lauha obtained after the Shodhan process was subjected to Bhavana (Levigation) and Marana Process with Triphala kwath prepared with *gomutra* for about 8 hours. *Triphala* contains useful compounds like polymannans, Chebulinic acid and tanins. are well-known metalchelators capable of coordinating with nickel, cobalt, tin etc. The tirturation of *purified kant lauha in triphala Kwath* results in the reduction in its particle size, accompanied by an increase in surface area. Since most of the solid-fluid interactions take place at the external surface of the solid, these interactions are promoted through increase in surface area by the presence of particles of smaller sizes. Increased number of *Puta* also leads to increase in the

property and potency of *Bhasma*. It reaches to higher molecular level and shows quicker action on the body.

CONCLUSION

The temperature pattern observed over different '*Puta*' cycles indicate a consistent pattern, of certain degree of heating and cooling, essential for the formation of particles of well-defined morphology and crystallinity, which were confirmed through EDAX. Significant increase in surface area as a result of *Puta* confirmed the essentiality of *Puta* step for administering metallic supplements in biocompatible form. The particle size of *kant lauha Bhasma* was found to be decreasing while increasing the number of *Puta*. It denotes that more the number of *Puta* results in finer *Bhasma.* Thus, 32 *Puta* is more convenient to form superior *Bhasma* of *kant lauha* in.

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