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Research Article

A PHARMACEUTICAL STUDY ON VANGA JARANA WITH SPECIAL REFERENCE TO CHANGE IN PERCENTAGE OF TIN

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ABSTRACT

Jarana is an intermediate process in between *Shodhana* and *Marana* which is usually done before *Marana* of metals like *Vanga, Naga, Yashada etc.* as these have low melting points. Although the origination of term *Jarana* is only recent, in the ancient *Rasa granthas* the method of *Jarana* was termed as *Marana*, in this study after *Samanya* and *Vishista shodhana* of *Vanga jarana* of *Vanga* is done by using *Apamarga panchanga* as per reference of *Rasamrita. The Jarita vanga* was then *Prakshalita* to obtain *Kshara rahit jarita vanga bhasma.* The organoleptic character of the *Jarita Vanga Bhasma* was then studied, after which the elemental assay of the *Jarita vanga bhasma* was done and the changes in the elemental constituents were compared and studied with the elemental constituents of *Shuddha Vanga* & *Asuddha Vanga,* the loss in % of *Vanga* by weight & elemental percent was observed in order to understand the changes at elemental level in the *Vanga* after *Shodhana,* & *Jarana.*

INTRODUCTION

The concept of usage of *bhasma* in form of powder is evident from time of *Acharya Charak*. After rise of *Rasashastra* the concept of *Bhasmikarana* evolved, and it became clear that for different *Dhatus* (metals) different *Maraka Dravya*, *Puta*(temperature), & procedure i.e. *Bhanupaka, Sthalipaka, Putapaka, Kupipaka* etc, are needed. In this context another concept came in light, that metals like *Vanga, Naga* & *Yashada,* should undergo an intermediate procedure after *Shodhana* and before *Marana* known as *Jarana*. In *Jarana* the metal is triturated continuously with vegetables like *Apamarga Panchanga, Palash Pushpa*, *Pipala twak* etc, or with metals/ minerals like *Parada* and *Hartala* etc, with strong heating with temperature around 400-600^0 C till it attain the form of fine powder. Although the term *Jarana* is not used in ancient *Rasa granthas*, in ancient times the same procedure was termed as *Marana*.

The process of *Jarana* although completes in 6-7 hours, and the end product is a powder which is certainly different from the original metal both physically and chemically. The physical changes are evident through the naked eyes but chemical changes can only be known by modern sophisticated techniques like EDS, XRD etc. In this study the elemental composition of in *Jarita Vanga* are studied by EDS.

MATERIAL & METHOD

The raw *ashodhita Vanga* was collected from local market of Raipur, C.G. After *Samanya* and *Vishesha Shodhana* of *Vanga, Jarana* of *Vanga* is done by the help of *Apamarga Panchanga* (***Achyranthes aspera***) as per *Rasamritam 3/88-94*[1] in department of *Rasashastra & Bhaishajya Kalpana* , Raipur (C.G).

Vanga Shodhana

Both *Samanya* and *Vishesha Shodhana* of *Vanga* were carried out as per reference of AFI-1[2].

Samanya Shodhana

The *Samanya shodhana* of *Vanga* was done as per reference of *Sharandhar Samhita Madhyam Khanda 11/2* [3]by process of *Dhalana*. The *Ashuddha Vanga* was melted in a long handle iron ladle and was poured in *Tila taila*, *Takra*, *Gomutra, Arnaala*, *Kulthi Kwath* 3 times each in every liquid respectively**.**

Vishesha Shodhana

Vishesha shodhana was done as per the reference of *Rasa Tarangani 18/11*[4] by process of *Dhalana*. The *Samanya Shodhita Vanga* was melted in a long handle iron ladle and poured in the *Nirgundi kwath (Vitex negundo Linn.)*with

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*Haridra (Curcuma longa Linn.)*powder, the whole process was done total 3 times.

Vanga Jarana

Jarana of *Vanga* was done as per reference of AFI-1 *(Rasamritam 3/88-94)*[5]. The *Shodhita Vanga* put in the big iron pan and was kept over fire, after the *Vanga* melt dried & a handful of fractured *Apamarg Panchanga* was introduced to the iron pan after the temperature reached 510^{o}C (*Tivragni*)Over the fire the molten *Shuddha Vanga* and fractured dried *Apamarga* were continuously rubbed against the surface of hot iron pan until the whole *Vanga* was reduced to ash coloured powder. The powdered *Vanga* was then collected in the centre of iron ladle and was covered with the earthen saucer and further subjected to fire until it became red hot after which heating was stopped and it was allowed to cool down. After cooling down the white ash of *Vanga* was collected in a stainless steel vessel and was mixed with 4 times water in order to remove its alkaline property. The water was then removed carefully thereby preventing the loss of settled *Vanga bhasma*, and the whole procedure was repeated until the water became neutral. The *Jarita bhasma* was then dried well powdered in stone mortar & pastel and double packed in an airtight ziplock and stored in airtight containers.

EDS Analysis

After completion of process of *Jarana* EDAX/EDS of *Jarita Vanga bhasma* was carried out in Metallurgy Department of National Institute of Technology, Raipur(C.G), by Zeiss EVO-18 special edition machine in order to know the change in percentage of *Tin* and other elemental constituents before & after *Jarana*.

OBSERVATION & RESULT

1. The *Shodhit Vanga* which upon heating melted at very low temperature was gradually converted into powder form upon rubbing with *Apamarga panchanga.*
2. The *Apamarga Panchanga* was added little by little in the *Shodhit Vanga* for *Jarana*.
3. Although the *Jarita Vanga* was at first grey in colour, upon covering with mud pot and heating continuously for 1.5 hours at 600^{0}C it became red hot at most portions and upon cooling down it became fine white powder.
4. pH of the water was 12 at first when mixed with white *Jarita Vanga bhasma* and gradually became neutral in 5 washes

Prakshalana	pH
1st	12-10
2nd	10
3rd	8
4th	8
5th	7

Weight of shuddha Vanga	Weight of Apamarga panchanga used	Weight of jarita Vanga bhasma before prakshalana	Weight of jarita Vanga bhasma after prakshalana	Colour of Vanga bhasma	% of loss
660 gms	580gms	620gms	590gms	White fine bhasma	10.6%

The percentage of Tin was reduced after *Jarana* as per the findings of EDS too on elemental level by 3.93 % from *Shodhita Vanga*

S no.	Sample name	Sn%(weight %)	Sn%(Atomic%)
1.	Ashuddha Vanga	98%	95.82%
2.	Shuddha Vanga	99.72%	99.62%
3.	Jarita Vanga	95.79%	93.06%

The percentage of various other trace elements was also increased after *Jarana* in *Shodhita Vanga.* The changes in other trace metals as detected by the EDS are as follows.

Trace Element	Shodhit Vanga Weight %	Shodhit Vanga Atomic %	Jarita Vanga Weight %	Jarita Vanga Atomic %
Mg	-0.16%	-0.80%	0.26%	1.22%
Al	0.01	0.04	0.29%	1.25%
Si	0.39	1.64	0.63%	2.57%
P	0.12	0.44	-0.50%	-1.87%
Ca	-0.43	-1.27	0.52%	1.51%
Mn	-0.16	-0.34	-0.09%	-0.19%
Fe	-	-	0.47%	0.98%
Co	-0.07	-0.14	0.29%	0.57%
Ni	0.00	0.00	0.31%	0.61%
Zn	-0.27	-0.49	-0.13%	-0.23%
As	0.37	0.59	-0.42%	-0.64%
Cd	0.89	0.94	-0.60%	-0.62%
Sn	99.72	99.62	95.79%	93.06%
Au	-	-	3.15%	1.85%
Hg	-0.18	-0.10	-0.01%	0.00%
Pb	-0.24	-0.14	0.05%	0.03%

It was noticed that the percentage of Mg, Al, Si, Ca, Fe, Co, Ni, Pb were increased after *Jarana.*

Whereas, P, Zn, As, Cd were decreased after *Jarana*

The increase in Mg, Ca, Al, might be due to introduction of *Apamarga panchanga* which constitute the Mg etc in trace amount, The percentage of Iron might have increased as the whole process of *Jarana* was carried out by triturating the *Shuddha Vanga* with while the decrease in the Phosphorous etc might due to rigorous trituration of *Shuddha Vanga* by Iron ladle over a large iron ladle over fire, the increase in amount of Co, Ni, & Pb, on the other hand might be due to washing of the *Jarita Vanga* with water which might have carried Co etc from the water pipes through which it was passing and introduced it to the *Jarita Vanga.*

The decrease in amount of Phosphorous etc might be due to conversion of the Phosphorous etc into another compound form which was soluble in water and might have washed away with water during process of *Prakshalana.*

DISCUSSION

On the basis of above observations the whole process of *Vanga Jarana* can be divided into two major Parts/Stages

1st partssss

Initial 5 hour 30 minutes at temperature of 420-500^{0}C.

- *Apamarga Panchanga* was added periodically
- Continuous stirring was done in a temperature of 420-530^{0} C in open air.
- The process was done till all molten *Vanga* was converted into greyish powder.

2nd part

It was done for next 1 hour 30 minutes at an approximately Temperature of 600^{0}C.

- The greyish ash which was formed from above procedure was collected in centre of the iron ladle and was covered with an earthen saucer and was heated at temp of 600^0 C till it became red hot.
- After it became red hot the ladle was removed from fire and was allowed to cool down. Later white ash was obtained.

Thus from above process following procedure can be assumed

- In the above process when the *Vanga* was subjected to the temperature of 420-500^0C the molecular bonds of *Vanga* may have loosened.
- Rubbing with iron ladle with pressure along with the *Apamarga panchanga* while subjecting it to high temperature might have helped in further loosening of the metallic molecular bond along with entrance of the ash of *Apamarga panchanga*, after the *Panchanga* had entered the intermolecular spaces further heating and pressurised rubbing of the metal might have lead to final breakage of bond, thus formation of grey metallic ash of *Vanga*.
- Another point to be noted was the change in the colour of the metallic ash which occurred after it was heated in high temperature while covered with earthen saucer. The covering of earthen saucer might have given an ideal environment for controlled combustion of the grey *Vanga bhasma*, as the covering of earthen saucer cannot provide a complete anaerobic environment to the *Bhasma*, because of which it reacted with oxygen and formed tin oxide, which was white in colour.
- As the *Bhasma* so formed contained the *kshara* content of the *Apamarga panchanga* it was then *Prakshalita* (washed) till the universal pH paper showed neutrality when the filtered water was tested.
- The total amount of *Shuddha Vanga* taken for *Jarana* was 660gms and the amount of *Apamarga panchanga* used was 580 gms and the amount of *Jarita bhasma* so obtained after *Prakshalana* is 590gms.
- The *Jarita bhasma* so obtained was white in colour, and was fine enough to fill the furrows of finger, but it did not float on the surface of water.

CONCLUSION

Loss by weight of tin after Jarana was 10.6% & loss on elemental level was 3.93%. The probable reason for loss being

- While rubbing parts of *Vanga* in molten form as well as in ash form were tossed outside of iron pan when rubbed intensely.
- While changing the vessel and washing the *Vanga bhasma* with water.
- And on elemental level the loss may have been observed because of the heat to which it was subjected it may have formed a compound which was not detectable by the machine.
- In this context it can be correlated with the reference of *Yagyavalkya smriti*[5] according to which the loss of *Vanga* on fire was confirmed by 8 percent after *Marana*.

References

1. Acharya Yadavjitrikamji, Rasamritam, edited by C.B.Jha & D.S.Gautam, lohavigyaniyadhyay, verse 81-94, pp 46.
2. AFI -1 pp-242
3. AFI-1pp-242
4. Sharma.S, Shastri.K, Rasatarangani, Motilal lachmandas, chapter 18, verse 13-14,pp437.
5. Yagyavalkya smriti, verse 178.

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