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Research Article

THE EVALUATION Of PHYSICOCHEMICAL ANALYSIS OF *PARAD SHODHAN*

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ABSTRACT

Rasa Shastra *Dravyas* includes minerals and metals which are mainly *Bhumij* in origin (obtained from earth), *Parad* (mercury) is also one among them. In Rasa Shastra, the extra ordinary importance of mercury is easily seen as the whole branch is named after *Parad*. In Rasa Shastra *Parad* cannot be adopted for therapeutic purposes without purification. Owing to their origin all the metallic and mineral drugs are likely to be associated with different varieties of impurities up to various degrees. Hence, they are advised to be processed with certain specific methods before their internal use. These methods are called *Shodhan* and they occupy a major portion of *Rasa Shastra* processing. These *Shodhan* procedures play a very important role in making metallic and mineral preparations free of toxicity and highly absorbable for quicker therapeutic effects even in minute doses. *Parad* is invariably a major constituent in most of the rasa preparations; it needs thorough purification and detoxification to render it fit for internal use. *Rason* is best among the *Shodhandravya* in Parad Samhita *Paradshodhan* with only *Rason* is mentioned..In this study *Parad* is triturated with *Rasonkalka* and then *Kshalan* is done. *Parad* loss in this study is very less amount. In ICP AES, Qualitative Analysis is done it reveals that following element in *Parad* before *Shodhan* Ag, Fe, Ga, Hg, Mg, Mn, Sr, Zn and after *Shodhan* Ag, B, Ca, Cr, Fe, Ga, Hg, Mg, Mn, Sr, Ti, Zn.

KEYWORDS: *Parad, Parad Shodhan, Rason Kalk, Kshalan, Parad Smahita.*

INTRODUCTION

Rasa Shastra (science of alchemy) deals with *Parada* (mercury) and it is considered to be the heart of Rasa Shastra. In fact, the whole science is under the influence of physical and chemical properties of *Parad*. Rasa Shastra, one of the Pharmaco-therapeutic branches of Ayurved, incorporates many of the Herbo-mineral-metallic pharmaceutical preparations prepared out of the *Parad* namely *Khalviya Rasayana* [medicine is prepared grinding the ingredients in a *Khalva Yantra* (comparable with mortar and pestle)], *Parpati Rasayana* (thin flake like medicines), *Pottali Rasayana* (medicines prepared in cloth) and *Kupipakwa Rasayana* (Medicines prepared in bottle) respectively. It is Necessary that *Parad* Should be used internally is *Shodhit* (Purified). *Shodhana* is an important concept in Rasashastra, it is said that every drug should be subjected to *Shodhana* before its internal use and Mercury is no exception. Owing to its origin or other causes, Mercury is likely to be associated with different types of impurities of various degrees.

Amongst various *Parad shodhana* methods *Shodhan* with *Rason* is mentioned by Parad Dharanidhar Samhita[1], *Rason* (garlic) is antidote for heavy metal poisoning, contains sulphur and hence an innate codrug for *Paradabandha*.

Aim & Objective of study

- To study the concept of *Shodhana* of *Parada*.
- To Evaluate physical property changes in *Parad* after *Shodhan* and *Kshalan*
- To Evaluate elemental analysis of *Parad* Before and After *Shodhan*

Materials and Methods

Pharmaceutical study was carried out in Dr.D.Y.Patil School of Ayurveda and Research Institute, Navi Mumbai in Rasa Shastra Department.

Qualitative Analysis of *Parad* is done in Sophisticated Analytical Instrument Facility (SAIF), Indian Institute of Technology Powai, Mumbai.

Apparatus

- Digital Weighing machine
- *Khalva Yantra*
- Knife
- Iron vessel

Procedure

- Dry and clean *Khalva yantra* was taken.
- *Ashuddha Parad* were taken in *Khalva yantra.*
- Made small pieces of *Rasonkalka* and add to it in *Khalva yantra,* it should be equal quantity of *Parad*.
- Triturated *Ashudhha Parad* and *Rasonkalka* .

- Trituration continuously till it become completely mixed and colour of *Kalka* become black colour
- Then *Kshalan* with hot water is done.
- During *Kshalan*, first hot water was added into *Khalva yantra* and then stirred and then water was siphoned.
- *Parad* settled at base of *Khalva yantra* and impurities of *Parad* with *Lasunakalka* appeared on top of surface of *Khalvayantra* then impurities removed.
- After whole water siphoned *Parad* filtered with cloth.
- This procedure done for 10 times and 84 hour.
- Every time fresh *Rasonkalka* was taken.

Observation

- *Lasuna Kalka* became greenish black colour after 2 hours in Ist, IInd, IIIrd *Kshalan*.
- After IVth to VIIth *Kshalan Lasuna Kalka* colour became more black
- In the Xth *Kshalan Lasuna Kalka* colour became Dark black colour
- Impurities of *Lasuna Kalka* increases after every *Kshalan*,
- In the Xth *Kshalan* Impurities were more than previous *Kshalan*.
- *Lasuna Kalka* stickiness increased after 8thKshalan.
- Lustre of *Parad* increased after every *Kshalan*.
- Blackish Colour layer was seen on Upper surface of *Parad* but after 5th *Kshalan* layer reduced.

Table 1: Physical Property of *Parad* before and After *Shodhan*

Property	Before *Shodhan*	After *Shodhan*
Colour	Blackish colour layer on *Parad*, It is Silverish white colour	Blackish colour layer abolished, It is Silverish white colour layer
Touch	Soft	Soft
Lustre	Present	It is increases after *Shodhan* completed, *Parad* become more shiny

Table 2: *Parad* weight loss after 10 *Kshalan*

Kshalan	*Parad* Loss
Ist *Kshalan*	3 gm
IInd *Kshalan*	2gm
IIIrd *Kshalan*	2gm
Ivth *Kshalan*	2 gm
Vth *Kshalan*	3 gm
VIth *Kshalan*	4 gm
VIIth *Kshalan*	2 gm
VIIIth *Kshalan*	6gm
IXth *Kshalan*	3 gm
Xth *Kshalan*	4 gm
	31 gm Total *Parad* loss

Total *Parad* loss after 10 *Kshalan* is 3.15 %

Table 3: Total Weight of *Parad* before and After *Shodhan*

Before *Shodhan*	After *Shodhan*
982gm	951 gm

ICP AES Analysis

Inductively coupled plasma atomic emission spectroscopy (ICP-AES), also referred to as inductively coupled plasma optical emission spectrometry (ICP-OES) and is an analytical technique used for the detection of trace metals.

PRINCIPLE

- This method describes multi-elemental determinations by ICP-AES using sequential or simultaneous optical systems and axial or radial viewing of the plasma.
- The instrument measures characteristic emission spectra by optical spectrometry. Samples are nebulised and the resulting aerosol is transported to the plasma torch.
- Element-specific emission spectra are produced by radio-frequency inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and the intensities of the emission lines are monitored by photosensitive devices. Background correction is required for trace element determination.
- Background correction is not required in cases of line broadening where a background correction measurement would actually degrade the analytical result. Additional interferences and matrix effects must be recognized and appropriate corrections made; tests for their presence are described.
- Alternatively, users may choose multivariate calibration methods. In this case, point selections for background correction are superfluous since whole spectral regions are processed.

Table 4: Qualitative Analysis of *Parad* Before and after *Shodhan*

Before *Shodhan*	After *Shodhan*
Ag	Ag
Fe	B
Ga	Ca
Hg	Cr
Mg	Fe
Mn	Ga
Sr	Hg
Zn	Mg
	Mn
	Sr
	Ti
	Zn

DISCUSSION

- *Rasona* has best bond with *Parad* than any other compounds.

- When *Rasona* is crushed and *Mardan* with *Parad*, *Rasona* contain allin, Allicin & volatile oils it converted into organic sulphur compound in nature .
- Allicin is unstable and converted into mono di, tri and polysulphide, Sulphuroxide compound such as ajoene which is secondary degradation product of allinit's most active compound responsible for multiple bonding with mercury[2].
- When *Rasona Mardan* with *Parad* formed complex bond and responsible for chemical detoxification and purification and enhancing therapeutics properties.
- After *Paradshodhan Parad* becomes *Bhubukshit* and it formed best covalent bond with Sulphur.
- Sulphur and Mercury has forming bond within *Rasona* and mercury as result the triturated products turned into Black colour, it is miniature concept of *Kajjali*.
- After *Parad shodhan* enhancing Property of *Parad*.
- After *Parad shodhan* less amount of *Parad* loss occur by this method after *Kshalan*, *Parad* become more lustrous and shiny.
- In ICP-AES, *Parad* and *Rason Kalk* triturated together in *Khalva yantra* chemical reaction takes place it forms new element in *Shodhit Parad* new elements like B, Ca, Cr, Ti are detected.

CONCLUSION

- Thus, from this study which can be concluded that after *Shodhan* of *Parad* with *Rasonkalka Parad* becomes more lustrous and become more agile with Significantly minimally loss by this process.
- Physicochemical analysis of *Shodhit Parad* shall help to understand chemical and structural changes occurred due to this process of *Paradshodhan.*

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