COMPARATIVE PHARMACEUTICO-ANALYTICAL STUDY OF RASASINDOORA AND RAKTA PARADA BHASMA

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ABSTRACT

Parada Bhasma (Incinerated Mercury) is a very potent medicine which is described to be used solely with different anupaan as also as a constituent of another kalpa to treat various disorders including the kashtasaadhya vyadhis. But the exact methodology of its preparation is unknown. Rasa Sindoor on the other hands is a popular kupipakwa rasayana. Both these kalpas have many similarities due to which people started using Rasa sindoor instead of Parad bhasma. But there are subtle differences between the method of preparation and also in the characteristics of the final product. The present study is an attempt to highlight those differences. Rasa sindoor and Rakta Parad Bhasma both were prepared using the kupipakwa method to make it easier to show the similarities as well as their differences. Both these samples were subjected to XRD and XRF analysis. The XRD analysis revealed Rasa Sindoor as HgS and the Rakta Parad Bhasma as HgO. The XRF analysis revealed the concentration of Mercury and Sulphur as 80% and 20% respectively in Rasa Sindoor and the concentration of Mercury and Oxygen as 93% and 7% respectively in Rakta Parad Bhasma. Hence, there is a vast difference between Rasa Sindoor and Rakta Parad Bhasma and the former cannot be used instead of Rakta Parad Bhasma as its alternative.

KEYWORDS: Rakta Parad Bhasma, Rasa Sindoor, Kupipakwa, XRD, XRF, Mercury.

INTRODUCTION

There are 4 types (Shwet, Peeta, Rakta, Krushna) of Parad Bhasma described in the ancient classical texts.¹ There are various methods described in various samhitas to prepare parad bhasma. The various methods of preparation include kupipakwaviddhi, agnipaaka and putapaka etc. Rasasindoor is a sindoor kalpa and is exclusively prepared by kupipakwaviddhi. Sindoor kalpa have a very specific colour to them i.e. sindoor like red.² One of the types of parad bhasma is Raktaparad bhasma. Rasasindoor is relatively easy to make and is more popularly made. Hence, people use rasasindoor in kalpas where parad bhasma is asked to be used. But the properties of Rakta Parad bhasma and Rasa sindoor are different. Their pharmacokinetics is different and hence to establish the difference between the two is a must. The aim of this study is to highlight and establish the difference between these two and to show that one cannot be used instead of the other.
MATERIALS AND METHODS
Materials for Rasasindoor- Shuddha Parad, Shuddha Gandhak, Nirgundi Swaras
Materials for Rakta Parad bhasma- Shuddha Parad, Shuddha Gandhak, Nimbu Swaras
Instruments required for both - Valuka Yantra, Kupi, Matkapad, Mudra.
Method of Preparation of Rasa-Sindoor
Shuddha Parad (100 gms) and Shuddha Gandhak (100 gms) were taken in same proportion in Khalva Yantra for preparation of kajjali (200 gms) which is samagunajarit. It was then triturated with same quantity of Nirgundi swaras. At the end of trituration Kajjali was dried and put in Kachkupi upto 3/4th of its capacity. Then Kachkupi was placed in Valuka Yantra and kramagni starts with mrudwagni for the first 8 hrs then madhyamagni for the next 8 hrs and tikshnagni forth next 8 hrs respectively. After the initial 8 hrs fumes of sulphur start coming out of the bottle. Fumes end when there is no free sulphur remaining in molten kajjali. Shalaka-sanchalan was done throughout to prevent the neck of bottle from clogging. Corking was done after complete stoppage of fumes which is approximately 16th hour after the procedure starts. Copper coin test should be done before corking for the confirmation of mercury fumes. After corking 8 hrs of tikashnagni was given for the formation of Rasasindoor (160gms) which is collected at the neck of Kachkupi during this time.
Method of Preparation of Rakta Parad bhasma
Shuddha Parad (100gms) and Shuddha Gandhak (100gms) were taken in same proportion in khalva yantra. It was then triturated with Nimbu swaras until the kajjali (200gms) is dry again. This kajjali was then filled in a kaachkupi upto 3/4th its capacity. This kaachkupi was then placed in the valuka yantra for paaka (by antardhooma method) using the kramagni starting with mrudwagni followed by tikshnagni. Mrudwagni was given for 8 hrs and then tikshnagni was given for 24 hrs. In this procedure however, corking was done at the start of the procedure hence making it impossible to examine the kajjali inside while the process is still going on. However, the idea of increasing the agni to tikshnagni is that mercury in the kajjali (molten by then) should turn to fumes and the sulphur is expected to burn inside the bottle using up the oxygen inside the bottle. This prevents the formation of sulphur dioxide gas thus preventing the bottle from breaking. After the end of tikshnagni, Rakta Parad Bhasma (100 gms) was collected at the bottom of the bottle which was collected once the bottle cools down by itself (Swanga-sheeta).

RESULT

![Fig-1 Rasasindhoor](image1)

![Fig-2 Rakta Parad bhasma](image2)
The XRF and XRD analysis of both the samples were done. The results have been tabulated below:

Table No. 1:

<table>
<thead>
<tr>
<th><strong>Rakta Parad Bhasma</strong></th>
<th><strong>Rasa Sindoor</strong></th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercuric Oxide (HgO)</td>
<td>Mercuric Sulphide (HgS)</td>
<td>XRD</td>
</tr>
<tr>
<td>Hg- 93%, O- 7%</td>
<td>Hg- 80%, S- 20%</td>
<td>XRF</td>
</tr>
</tbody>
</table>

Table No.2

Graphs of XRD Reports

1. Rasasindhur-XRD Reports.

<table>
<thead>
<tr>
<th>Chemical Formula</th>
<th>Compound Name</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hg1 S1</td>
<td>Metacinnabar</td>
<td>40</td>
</tr>
<tr>
<td>Au1 Te2</td>
<td>Calaverite beta</td>
<td>36</td>
</tr>
<tr>
<td>Ag3 Pb2 S8 Sb3</td>
<td>Diaphorite</td>
<td>26</td>
</tr>
<tr>
<td>Hg1 S1</td>
<td>Cinnabar</td>
<td>26</td>
</tr>
<tr>
<td>Hg1 S1</td>
<td>Metacinnabar</td>
<td>31</td>
</tr>
</tbody>
</table>
2. Rakta Parad bhasma-XRD Reports

![XRD Report Image]

<table>
<thead>
<tr>
<th>Chem. Formula</th>
<th>Compound Name</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hg1 O1</td>
<td>Montroydite</td>
<td>52</td>
</tr>
<tr>
<td>Hg3 O6 S1</td>
<td>Schuetteite</td>
<td>28</td>
</tr>
<tr>
<td>Cl1 Hg3 O1</td>
<td>Poyarkovite</td>
<td>18</td>
</tr>
<tr>
<td>Hg1 O1</td>
<td>Montroydite</td>
<td>52</td>
</tr>
<tr>
<td>Hg3 O6 S1</td>
<td>Schuetteite</td>
<td>26</td>
</tr>
</tbody>
</table>

**DISCUSSION**

From the above observations, it can be said that *Rasa Sindoor* (Mercuric Sulphide) is a compound of Mercury and Sulphur, whereas *Rakta Parad Bhasma* (Mercuric Oxide) is an oxide of Mercury. The percentage of mercury in both kalpas are different. In *Rasasindoora* 80% and *Rakta parad bhasma* 93% respectively. *Rasa Sindoor* is of sindoor like colour i.e. Orangish red whereas *Rakta Parad Bhasma* is more Ruby red in colour. *Rasa Sindoor* is a *Moorchana* of Parad while *Parad Bhasma* is *Mrita Parad*. The properties of both are different for eg. *Rasa Sindoor* cures diseases and relieves from pain whereas *Rakta Parad Bhasma* is said to cure chronic diseases and has *jaranaashan* (anti-ageing) properties. This implies that *Rakta Parad Bhasma* has the ability to treat disorders which are *chirakaleena kashta saadhya* (chronic and difficult to cure ailments). *Gandhak* undergoes *jaarna* along with Parad in *Rasa*
**Sindoor** whereas it reacts with mercury breaks its bonds and converts it into its *mrita* form i.e. *bhasma* form via molecular degradation.

**CONCLUSION**
Thus, from the above observations and discussion it is concluded that both these *Kalpas* are different from one another not only physically but also chemically. Their therapeutic properties differ from one another as well. *Rakta Parad Bhasma* is used for *Dehavaad* (makes the *nikrushta dhatu* to *saarrupa / Utkrushta dhatu*) while *Rasa Sindoor* is used to cure diseases. Hence, both of these cannot be used in the place of one another.

**REFERENCES**

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