**Shodhana of Gandhaka (Sulphur) with Bhringaraj (Eclipta Alba) and Goghruta (Cow’s Ghee)**

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**Abstract**

According to the Indian alchemy (Rasashastra) literature, *Gandhaka* has been included in *Uparasa* category. It is the next drug after Mercury in terms of importance. In Indian medicine it has been used both externally and internally. Even today it is being used for its antimicrobial activity. In Ayurveda *Gandhaka* is used after the *Shodhan* (Purification) process. In the present study chemical analysis of *Gandhaka* was done after its purification in *Bhringaraj Swaras*. Ayurvedic texts suggest that after the purification process, physical appearance of *Gandhaka* changes. The purification process mentioned in *Rasashastra* not only removes the impurity of *Gandhaka* but also increases its therapeutic activity for internal and external uses without producing any harmful effects.

**Keywords**

*Gandhaka, Sulphur, Godugdha (Cow’s Milk), Goghruta (Cow’s Ghee), Bhringaraj, Maka, Shodhan, Purification*
INTRODUCTION

In Rasashastra, Gandhaka has been mentioned first among eight Uparasa\(^1\) group and Gandhaka\(^2\) Stands next to Mercury in importance. It is also considered as essential agent for various processes of Mercury such as Murechhana, Jarana, Bandhana etc. When used along with Mercury, potency of Mercury can be increased and toxic effects are reduced which are included in impure Mercury\(^3\). This is the reason why Mercury is used internally along with Gandhaka. The best accepted form of Gandhaka is greenish yellow in colour, lustrous as butter, smooth and oily in touch. When purified Gandhaka is consumed it prevents death, old age, increases appetite, potency, can cure diseases like Kushtha (Skin diseases) etc; but impure Gandhaka when consumed causes increased body temperature, mental confusion, blood related diseases\(^4\). It also destroys brightness and beauty of the human body, strength as well as comfort, produces pitta disorder, causes pain and loss of Oja (Immunity) \(^4\). Hence purification is important for medicinal use.

MATERIALS AND METHODS

Gandhaka 500 gms, Goghruta QS, Bhringaraj Swaras QS.

Genuine raw material was produced from local market of Kolhapur, Maharashtra, India.

The purification of Gandhaka was done by Dhalana (Pouring into Liquid) of Gandhaka in Bhringaraj Swarasa. The process is to be repeated seven times.

**Equipments:**

**Procedure:**

Previously weighed Gandhaka was powdered fine with the help of mortar and pestle. The powdered Gandhaka was taken in an Iron vessel, smeared with Goghruta and subjected to Mandagni (Controlled Heat). When Gandhaka melted, it was poured in Bhrungaraj Swarasa in a vessel. The vessel was covered with a cotton cloth before pouring melted Gandhaka in it. The Gandhaka from the vessel was then collected and washed with hot water and dried in shade. The process was repeated 7 times\(^5\) (Fig 1-3).

**Precaution**

- Equipments should be clean and dry.
- Mandagni should be maintained throughout the procedure.
- Gandhaka should be poured as soon as it is melted.
• The Bhringaraj swaras should be changed after each process.

**Steps of purification of Gandhaka**

Fig. 1 “Raw Gandhaka”

Fig. 2 “During Pouring”

3. “Purified Gandhaka”

**OBSERVATIONS**

• Time required for liquefaction of Gandhaka was 6-7 minutes, on an average.

• Gandhaka liquefied completely at 116 C in the first procedure. It liquefied at 110 C in the second procedure and afterwards it liquefied at 105 C in each process.

• Color changed from Dark yellow to orange yellow during liquefaction of Gandhaka.

• After each process Gandhaka became more brittle.

• Any physical impurities present in the Gandhaka were removed because of its filtration through the cotton cloth.

• Strong smell of Gandhaka reduced considerably in subsequent procedures.

• At the end of the procedure color of Bhringraja swarasa turned to yellowish green with oily appearance.

• Gandhaka found in Bhringaraja swarasa was greenish yellow granular solid mass.

• The quantity of Goghruta required in the first procedure was much more, compared to that required in the subsequent procedures.

• Weight of Gandhaka - 500 gms

• Weight loss - 17gms

(Table 1)
Table 1 “Observations during Gandhaka Shodhana”

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Weight of Gandhaka (gm)</th>
<th>pH of Bhringaraja Swaras</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td>Before</td>
</tr>
<tr>
<td>1</td>
<td>500</td>
<td>498</td>
<td>6.03</td>
</tr>
<tr>
<td>2</td>
<td>498</td>
<td>495</td>
<td>6.05</td>
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<td>3</td>
<td>495</td>
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<tr>
<td>7</td>
<td>485</td>
<td>483</td>
<td>6.2</td>
</tr>
</tbody>
</table>

RESULTS
1. Shiny, lustrous, sticky Gandhaka obtained.
2. Strong smell of Gandhaka subsided.
3. The pH of Bhrigaraj Swaras increased from 6.03 to 6.32.

DISCUSSION
Gandhaka was used from very long period for therapeutic purpose. In many of the Rasashastra texts, the mythological origin of Gandhaka was stated and related with Goddess Parvati. The adverse effects of impure Gandhaka are supposed to be avoided by following the process of Shodhana.

In Rasashastra, Shodhana is considered as an important step towards quality drug production. Shodhan includes various types of procedures by which the undesired part is eliminated from the drug and the desired part is elevated. After Shodhana, the dose of the drug is also found to be decreased. Its advantages are as follows:
1. It decreases the harmful part of the drug.
2. It increases the potency of the drug.
3. Marana process is easy after the shodhan procedure.
4. Because of the Shodhan, the drugs alter their native form which may be unstable.
5. Physical impurities like stone, dust are separated.
6. After the proper Shodhan procedure the shelf life of that particular drug is increased.
7. By using different *dravyas* for the *Shodhan*, the targeted action of that drug also changes.

There are different *dravyas* mentioned for the *Shodhan* of *Gandhaka*:

1. *Bhringraj Swarasa*
2. *Kanji*
3. *Karanja Taila*
4. *Godugdha*
5. *Nimbu Rasa*

Different methods are chosen as per the desired medicinal effects.

**CONCLUSION**

1. pH of *Gandhaka* decreased at the end of seventh cycle of purification and that of *Bhrungaraj swaras* increased considerably.
2. It is concluded that the total amount of ‘*Sulphur*’ in the raw material increased after purification.
3. The purification method stated in the *Rasashastra* text is to remove the impurities and to improve the quality of *Gandhaka*.
4. Such *Gandhaka* does not produce harmful effects by external or internal administration.
REFERENCES