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Pharmaceutical Review of *Gandhak Shodhan* and Comparative Physico-chemical analyses of *Ashodhit* and *Shodhit Gandhak*

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Abstract

Rasashastra is most important and popular branch of *Ayurveda* related to Herbo-mineral (*Rasaushadhis)* preparation techniques with their therapeutic uses. *Gandhak* (Sulphur) is most important drug in *Rasashastra* , used largely to prepare *kajjali*, many *bhasma*, *Kupipakwa, Pottalli, Parpati kalpa* which are most selling drugs and effective within smallest dose of 125-250 mg. *Ashodhit Gandhak* contains impurities and causes disorders in body, *Gandhak* should be used in *Shodhit* form. It indicates that requirement of *Shodhit Gandhak* is of large quantity, so if we can lower the production cost of *Shodhit Gandhak* then above preparations will be affordable to large populations. Among the *Rasashastra* classical texts, *Ayurved Prakash and Rasayansar* have mentioned different quantities of *Goghrita* for *Gandhak* Shodhan *using* same *Dhalan* method. Change in materials quantity during *Shodhan process* may affect whole process and structural changes in drug. In the present study, *Gandhak* Shodhan *has* been done according to *Ayurved Prakash and* organoleptic and physico-chemical properties of *Ashodhit* and *Shodhit Gandhak* have been compared.

Keywords

Gandhak, Shodhan, Dhalan, Ayurved Prakash, Goghrita

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INTRODUCTION

The science and art of pharmacy of *Ayurveda* is perhaps the oldest in the world and its development has been parallel to that of science and art of medicine in India. The progress of Iatrochemistry (*Rasa Shastra*) or art of preparing metals and metallic compounds as well as of salts (inorganic or organic) for medicinal use was rather slow in early days of *Hindu* medicine but subsequently it flourished. *Chakrapani* was first to mention processing of minerals with extracts of herbs as well as animal origin products *uparasa* [1] (classification according to *Ayurvedic* texts). It has been never used in its natural but in purified form as in natural (impure) form it causes disorders like *kushta* (skin diseases), hyperthermia, dizziness, weakness, vitiation of *pitta dosha* and loss of lustre of skin[2]. Many procedures for purification of sulphur are available in *Ayurvedic* texts but there is need of procedure to identify sulphur. After purification some modifications in the properties of any element must take place which can cause change in its physico-chemical properties.

Gandhak comes under *uparasa* group3 and every *Rasavaidya* should know theoretical, practical and therapeutic knowledge of *Gandhak. Gandhak* is most important drug in *Rasashastra* and used to prepare *kajjali*, different *bhasma*, and with the help of these used for preparation of *Kupipakwa, pottalli, parpati, khalwirasa*. These preparations are most demanding and used by large population in India, so requirement of *Gandhak* is on large quantity. But *Gandhak* should be used after *Shodhan i.e. Shodhit form* as impure or raw *Gandhak* contains impurities like *shila churna* and *vishatatva*[4]. Many processes are mentioned in *Shodhan process* as *mardan* (trituration), *swedana, bhavana, dhavana* (washing), *avapa, nir-vapana, Dhalan* etc. *Shodhan process* has half weightage to whole process of medicine preparation. *Dhalan* process is widely used process for *Gandhak* Shodhan *using Goghrita* and *godugdha. Ayurved* Prakash *5* and *Rasayansar* [6] have mentioned equal and one fourth quantity of *Goghrita* for *Gandhak* Shodhan *by* using same *Dhalan* method. In the present study, *Gandhak* Shodhan *has* been done according to *Ayurved* Prakash and organoleptic and physico-chemical properties of *Ashodhit* and *Shodhit Gandhak* have been compared.

MATERIALS AND METHODS

Materials

1. *Ashodhit Gandhak* (Raw *Gandhak*)
2. *Goghrita* (Cow *Ghee*)
3. *Godugdha* (Cow Milk)

Total Quantity of *Gandhak* taken – 400 gm

Ashodhit Gandhak for physic-chemical analysis – 100gm

Gandhak for *Shodhan process* used –300 gm

Place of study – Pharmacy of *Gaur Brahmin Ayurvedic* College, *Rohtak, Haryana.*

Methods

Gandhak Shodhan *was* done by *Ayurved* Prakash method using same quantity of *Goghrita* and *Gandhak.* As per *Ayurved* Prakash *m*ethod, *Dhalan* was done 3 times.

Table 1 Materials taken for *Gandhak Shodhan*

S.No.	Materials	1st *Dhalan*	2nd *Dhalan*	3rd *Dhalan*
1	Raw *Gandhak*	300gm	270gm	260gm
2	*Goghrita*	300gm	270gm	260gm
3	*Godugdha*	900ml	900ml	900ml

Before process total 400 gm of *Ashodhit Gandhak* was taken and 100 gm was separated to be used for physico-chemical analysis and 300 gm was used for *Dhalan* process. *Godugdha* was taken in a cylindrical pot i.e., ketley covered with dry clean cotton cloth tied at to avoid blockage of cloth pores due to cooling of *Gandhak.* Temperature was maintained between 1100C- 1200C during each *Dhalan* process (Table 2). Required *Goghrita* was taken in a steel pot, heated on slow fire and when *Goghrita* completely melted then powdered *Gandhak* was added to it. Melted *Gandhak* and *Goghrita* were poured through cloth in ketley containing *godugdha.* Stones and clay like structures remained on cloth and *Gandhak* filtered in *godugdha.* Mixture was continuous stirred and *Dhalit Gandhak* was taken out from *godugdha.* It appeared as fresh yellow *bundi* like structure. *Shodhit Gandhak* was washed out with hot water of 80^0C temperature till it gets free from *Goghrita* and *godugdha.* This process was repeated for twice i.e., three *Dhalan* was completed for each method. For one *Dhalan* 15 minutes of time was required. For each *Dhalan* new and fresh *Goghrita* and *godugdha* were used.

OBSERVATIONS

Table 2: Observations for each *Dhalan* process

S.No.	Temperature Range	Findings
1	900-1000 °C	*Gandhak* hardened with small yellowish stony structures.
2	1000 – 1050 °C	Yellowish stones with reddish tint found
3	1050-1100°C	Melting of *Gandhak* started
4	1150-1200°C	*Gandhak* Melting completed

PRECAUTIONS

1) Raw *Gandhak* (Figure 1) and *Dhalit Gandhak* (Figure 2) should be used in powder form.

2) Cotton cloth should be clean and dry. As cloth remains wet *Gandhak* is accumulated on the wet portion and causes blockage of cloth pores results in difficulty in filtering *Gandhak* through cloth. Hence *Shodhan* should not be carried properly as *Gandhak* does not get poured in *godugdha.*

3) *Gandhak* should be melted in *Goghrita* properly.

4) Temperature should be noted during each *Dhalan* process.

5) During *Dhalan* process, pouring of melted *Gandhak* should be done quickly with continuous stirrer till *Gandhak* was get poured through cloth.

6) *Shodhit Gandhak* should be washed carefully to remove *Goghrita* and *godugdha* completely (Figures 3 & 4).

Figure 1 *Ashodhit Gandhak*

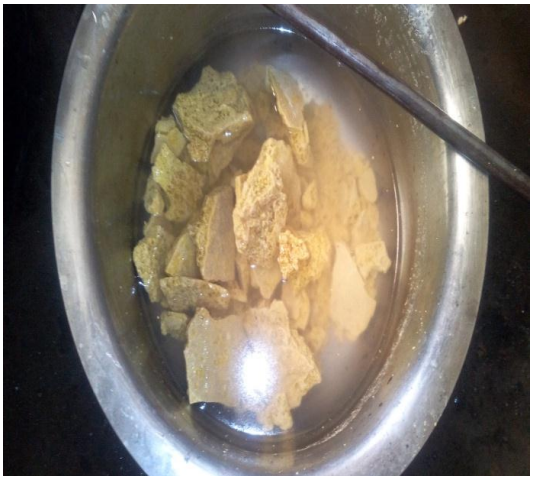

Figure 2 *Dhalit Gandhak*

Figure 3 *Shodhit Gandhak*

Figure 4 Dried *Shodhit Gandhak*

Table 3 Organoleptic properties of *Gandhak*

S. No.	Parameters	*Ashodhit Gandhak*	*Shodhit Gandhak* of *Ayurved Prakash*
1	Colour	Yellow	Yellowish red
2	Odour	Original	*Goghrita*
3	Taste	Bitter	Tasteless
4	Touch	Khar	Snigdha

Table 4 Physicochemical properties of *Ashodhit* and *Shodhit Gandhak*

S.No.	Physico-chemical tests	*Ashodhit Gandhak*	*Shodhit Gandhak* of *Ayurved Prakash*
1	Flame test	Blue	Blue and violet
2	Melting point	115 °C	118°C
3	Solubility in CS4	96.7%	74.5%
4	Ash value	Nil	Nil
5	Consistency	Brittle	Hard
6	Loss on drying at 110°C	9.45%	9.54%

DISCUSSION

The study was carried out in the local Pharmacy of *Gaur Brahmin Ayurvedic* College to follow the correct method of *Gandhak* Shodhan *using Ayurved* Prakash and also assesses the comparison of physico-chemical properties of *Ashodhit* and *Shodhit Gandhak. Gandhak* Shodhan *brings* about changes in the physic-chemical and organoleptic characteristics and thus removes the impurities associated with the *Ashodhit Gandhak. Gandhak* has many therapeutic indications mostly for skin disorders as it has best antimicrobial action especially against fungal infections. It is largely used drug for preparation of many formulations in *Rasashastra.* Many methods and materials are mentioned in classical texts of *Rasashastra* in which widely

accepted method is *Dhalan* using *Goghrita* and *godugdha.* Preferably *Goghrita* and *godugdha* are used due to their *pittashamak, oaksatmya, vishaghna, shita-virya, laghu guna*. *Gandhak* is having impurities like *shila churna* and *vishatatva*, so *godugdha* and *Goghrita* are commonly used to do *Shodhan of Gandhak.* As per modern aspects *Gandhak* is soluble in fat and very essential for metabolism in human physiology and it may contain arsenic as a toxic substance which detoxify with hydrocarbons of *Goghrita* and *godugdha.* The same explanation has been given by classical texts of *Rasashastra* that by *Dhalan* process *shila churna* remains filtered on cloth and detoxification of *visha* occurs in *Goghrita* and *godugdha.* During this study powdered *Gandhak* was added to melted *Goghrita* then melted firstly and showed hard stone like structures and then melts completely after some time. Required complete time for *Dhalan* was 15 minutes with similar structural changes for *Gandhak.* *Gandhak* was melted at 1150°C-1200°C temperature for each *Dhalan*. Organoleptic properties of *Shodhit Gandhak* of above methods were yellowish red coloured, tasteless, *Goghrita* odour and *snigdha* touch (as mentioned in Table 3). Similarly, physico-chemical properties were also changed (as mentioned in Table 4). The photographs showing the *Gandhak* Shodhan *process* are presented at the end in the article.

CONCLUSION

Gandhak has most important role for preparing *Rasaushadhi* in *Rasashastra. Shodhit Gandhak* should be used to prepare medicines and for that *Dhalan* process is widely accepted method with *Goghrita* and *godugdha.* Change in materials quantity during *Shodhan process* may affect whole process and structural changes in drug. The present study has clearly indicated that *Gandhak* Shodhan *is* an important process of purification of *Gandhak* and can be used for preparation of *Gandhak* Rasayana, *Kajjali* and other important medicines.

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Conflict of Interest: None declared

Source of Support: Nil

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