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Gandhak Shodhan - Research Work with Special Emphasis on Fifth Method following Rasatarangini

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***Abstract:** Ayurveda is the most ancient therapy which was practiced by our Acharya long back ago. Among all the therapeutic measures used by Vaidya, Rasashatra is considered as the backbone of all the treatments. Most commonly practiced Dravya in Rasashastra are Parad (mercury), Gandhak (sulphur), Abhrak (Mica), Shilajatu (black bitumen) and so on. The main purpose of Rasashastra is said to be Dehvad which was later on carried forward to the level of Lohvada and Chikitsavad. To achieve this along with Parad, Gandhak was most popularly practiced by Rasacharya. Gandhak was very well known Dravya from Samhita time but after 8th century there was no any Dhatukarma which was formulated without Gandhak. In the text Rasatarangini six different Shodhan processes were mentioned out of which special emphasis will be given to fifth Shodhan method that is by Urdhvapatan using Damru Yantra. Gandhak obtained by this process is considered as the purest form. This article entitling " Gandhak Shodhan –Research work with special emphasis on Fifth method following Rasatarangini" will discuss each and every aspect of Shodhan Process which was carried out practically.*

***Keywords:** Ayurveda, Rasashastra, Dehvada, Lohvada, chikitsavada, Parad, Gandhak, Urdhvapatan, Damru Yantra*

I. INTRODUCTION

Gandhak is the most important *Dravya* mentioned in *Rasashastriya* texts after *Parad*. It is obtained in both free as well as compound form that is in sulphide and sulphate form.

1) It is of four types[1]

a)	*Rakta*	*Uttama*	*Shukchanchunibha*	*Dhatuvadarth*
b)	*Peeta*	*Madhyam*	*Shukpichchanibha*	*Ras-Rasayanarth*
c)	*Shukla*	*Adham*		*khatika Lepanarth*
d)	*krishna*	*Durlabh*		*Jaramrityuhara*

2) Other types described are:-[2]

a)	*Aamlasar*	Internal use
b)	*Pinda*	external use

A. Physical properties

1)	Specific Gravity	:	1.9 to 2.1
2)	Hardness	:	1.5 to 2.5
3)	Melting point	:	115°C
4)	Boiling Point	:	440°C
5)	Atomic Wight	:	32.064
6)	Atomic Number	:	16

Sulphur is a very reactive element. At 250°C, it ignites with air. As it bums, it combines with oxygen to form sulphur dioxide, a colourless gas. At temperature above 150°C, sulphur becomes thick & viscous. Above 250°C, it become more fluid again & its colour change from yellow to red. It is dark brown at its boiling point. It is insoluble in water, but dissolves in carbon disulphide, benzene & turpentine.

It is used for commercial, industrial, pharmaceutical purposes. In allopathic medicines sulpha drugs made revolutionary changes. It is used to eliminate *Parad Dosha.*

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B. Ashodhit Gandhaka Dosha[4]

अशोधितः सुगन्धिकस्तनौ तनोति तापकम् ।भृश«p चित्तविभ्रमaaa करोति रक्तtkन गदाu~ ॥5॥
प्रसन्नता सुरूपतां शरीरबन्धचारुताम् ।प्रभा बy«p नाशयत्यतो विशोधयेत्तु तम ॥6॥

Using *Ashodhit Gandhaka* in formulations or as a sole increases body temperature, produces blood disorders, diminishes *Saundarya*, *kanti* and *Bala*. That is why it is always advisable to use *Gandhaka* in purified form

C. Shodhan

Impure Sulphur causes lots of hazardous effects over body. So it is always advisable to use *Gandhaka* after *Shodhana* process. There are six procedures mentioned in Rasatarangini. Out of that fifth method mentioned is *Shodhana* by *Urdhvapatan* method using *Damru Yantra*. *Gandhaka* obtained by this process is said to be most purified as impurities cannot get evaporated upwards and it is freed from unctuous properties.

1) *Khalve Saugandhikam Kshiptva Dridham Sampeshayetatataha|*
2) *Shlaksha Choornam Tato Gyatva Chatushpalamitam Balim||*
3) *Yantre Damrusagnecha Pachedyamachatushtyam|*
4) *Urdhwalagnam Balim Peetam Yatnato Hyavataryet||*
5) *Evam samshodhito Gandhaha shuddhimayatyanuttamama|*
6) *Pashanadikadoshashch Sarvatha Vijahatyayam||*[3]

The author of the book told this method to use in the preparation of *Swarna Vanga* and *Antardhoom Makardhwaj*. *Madhyamagni* is advisable because low heat does not allow it to evaporate.

II. PROCEDURE

In a mortar, take *Gandhak* and make it into fine powder and fill it in an earthen pot. Do the *Kapadmitti* over the joint of two pots. Heat for four *Prahar* (12 hours) on *Madhyamagni*. After self-cooling collect above condensed *Gandhak* .

The procedure was followed in college pharmacy of M.M.M. Govt. Ayurved College, Udaipur, Rajasthan to obtain *Swarna Vanga*. It was repeated for seven times. At the end of seventh procedure we came to some conclusions about heat and time period. All the seven processes and conclusions are discussed below.

A. First Procedure

Gandhak was taken 250 gm. Coarse powder was made. It was kept in an earthen pot. Both the pots were covered with mud smeared cloth externally. Three *Kapadmitti* were done at the joint of pots. It was kept over *Chullah* and heating was started at 7.30 am. Heating was achieved with the help of woods. The upper pot was kept cool by continuous changing of cloth soaked in cold water. Maximum temperature achieved was 650°C for 12hours continuously. Fire was removed and whole apparatus was allowed to be self -cooled. Next day *Kapadmitti* was removed and we found no matter was collected.

B. Second Procedure

This time whole procedure upto *Kapadmitti* was same but to give constant heat, it was kept in iron pan filled with *Baluka*. Whole apparatus was kept on *Chullah*. Heat was given with gas cylinder. The upper pot was kept cool by continuous changing of cloth soaked in cold water. Same 12 hours pattern was followed. After that heat was removed and *Damru Yantra* left for self-cooling. Next day *Kapadmitti* was removed but this time no matter was evaporated. It was found as it is in lower pot with dark brown colour.

C. Third Procedure

Third time the apparatus was same and the same *Gandhaka* was used which was not evaporated last time. This time the set up with *Baluka Yantra* was removed. It was directly heated on *Chullah*. Heat was provided with gas cylinder. Total time provided was 10 hours. The upper pot was kept cool by continuous changing of cloth soaked in cold water. Fire was removed and allowed it to self -cool. It was opened up next day. Again no matter was evaporated.

D. Fourth Procedure

Whole practical was started with fresh material taken in 250gm and two new pots. No *Kapadmitti* was done externally. Previous procedure was followed. Heat was given for 10 hours with gas cylinder. Cooling was achieved through cloth soaked in water. Fire was removed and allowed it to self -cool. It took half an hour. Then apparatus was opened same day. First time matter was found adhered to upper pot but most of the matter was evaporated. Yield was too short. Initial amount was 400 gm. and final amount was 60gm only.

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E. Fifth Procedure

It was done to get *Gandhaka* for *Swarna Vanga* preparation. Whole procedure was repeated like it was done fourth time. Matter was not completely evaporated remnant was there in lower pot. Yield was too short. Starting amount was 800gm and final yield was 200gm.

F. Sixth Procedure

This time it was done just to check what happens exactly in lower pot when it subjects to fire. The pot which has remaining part in it was directly kept on *Chullah* provided with gas cylinder. Second pot was kept over it without *Kapadmitti* and boiling of *Gandhak* was observed directly. This took only one hour to evaporate all residual matter.

G. Seventh Procedure

This time it was the great achievement in terms of both matter and time also. *Gandhaka* was made into fine powder placed in lower pot whose borders was filed made smooth other pot was kept over it two *kapadmitti* were done. It was kept on *Chullah.* Heat was given through gas cylinder. It was provided for three hours without any cooling of upper pot. Apparatus was allowed to self-cool and opened in one hour same day. All the material was evaporated completely in less time and without cooling. Initial amount was 500 gm. and yield was 277 gm. which was more than half of matter.

The causes and logics made by us are discussed below

III. DISCUSSION

Gandhaka is a very mysterious *Dravya* found in *Rasashastra* practice after *Parad*. According to modern chemistry its behaviour is explained as when taken in a test tube and heated at 114°C it turns into yellow coloured liquid. After increasing temperature by 3°C its colour changes to darker. At 230°C it becomes so thick that it cannot spill out even after holding the test tube upside down. Beyond heating this point it becomes liquid and black. At 444°C it boils and orange coloured fumes appear.[5] By knowing this the processes performed above can be explained.

In first method there was excess of heat and time noticed. Second method lacked of heat due to barrier of *Baluka*. Third method also lacked of heat in spite of removal of *Baluka* may be due to hardning of *Gandhaka* which was the residue of second method. Fourth method went correctly but time taken was too much by which above collected *Gandhaka* escaped outside and yield was poor. Fifth method also went correctly but remnant was noticed due to low heat. Sixth method was just to experiment what was the exact process happening inside pot. There we noticed that *Gandhaka* evaporated in very short time and with medium flame. All the precautions were applied during seventh procedure. Heat was maintained at medium flame. No cooling was done. Time given was only three hours. Yield was more than half of initial amount. At the end good quality and good quantity of *Gandhaka* was obtained.

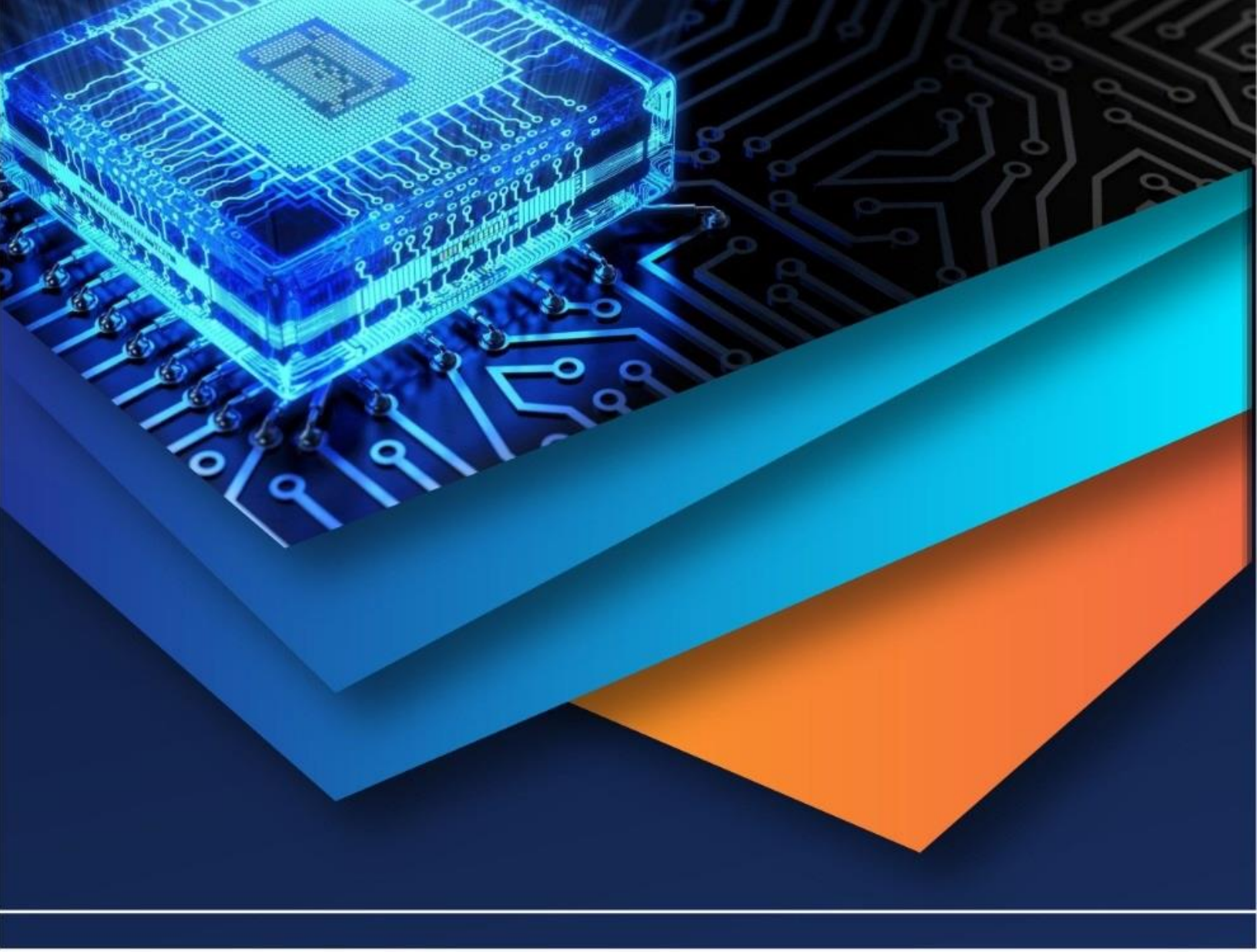
IV. CONCLUSION

A. Practically it is a less practiced method as it is time consuming and laborious work
B. Commercially it can be obtained easily within short time by following above discussed points
C. *Gandhaka* obtained by following one process seven times needs to be proven on analytical grounds
D. We observed no difference in external appearance like touch, colour, quality
E. Edges of earthen pots should be filed to make it smooth so that *Gandhaka* can easily condense at neck. So that pots should have big size.

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