

A REVIEW OF AN IMPORTANT MINERAL GANDHAKA**Prof. Dr. Inamdar Mahesh Prabhakar***

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ABSTRACT

Ayurvedic Pharmaceutics is a branch related with manufacturing of Ayurvedic drugs. The main sources of Ayurvedic medicines are Vanaspatija (originated from medicinal plants), Praniya (Animal originated) and Khanija (Minerals and Metals) dravyas. The study of preparations of medicines from minerals and metals comes under Rasashastra. The study of minerals is classified under Maharasa, Uparasa and Sadharanarasa. Gandhaka holds prime importance in Ayurveda due to its miraculous properties. The Gandhaka or Sulphur is an important mineral in Rasashastra which has a strong relation with Parada or Mercury while preparing Rasoushadhis. Gandhaka murchchana in Parada is very important as this murchchchana creates vyadhinashana property in Parada. Gandhaka comes under Uparasa category according to Rasa Ratna Samucchaya. The basic aim of this article is to explore, understand and review various concepts regarding

Gandhaka as this mineral is being in use since Samhita period. While conducting review of literature Samhita granthas, various Text books of Rasashastra, Rasa granthas, textbooks written by authors of 20th century along with these references from internet have been used as materials. The methodology used was initially all the references were collected from literature materials and the information was classified under various categories. Information has been collected from vedic period up to this modern period. Mythological origin, vernacular names, various synonyms, occurrence, types, various shodhan processes along with its properties and uses have been studied in detail and discussed in this article.

KEYWORDS: Rasashastra, Uparasa, Gandhaka, Sulphur, Shodhana.

INTRODUCTION

In Ayurvediya Oushadhikarana i.e. Ayurvedic pharmaceuticals the formulations prepared from herbal drugs comes under Bhaishajyakalpana and Rasashastra deals with the preparation of formulations from plants, metals and minerals. In Rasagranthas the minerals are classified as Maharasa, Uparasa, Sadharana Rasa. The minerals under Uparasa category are important for conducting various Samskaras on Parada and also important for incineration of metals. Various Rasacharyas have given various numbers of minerals under Uparasa category. Gandhaka is an important mineral given under Uparasa category by almost all Acharyas. Gandhaka stands next to Parada in Rasashastra. Parada and Gandhaka these are the two basic and important drugs in Rasashastra. Gandhaka is considered as an essential agent for various processes of Parada such as Murchhana, Jarana, etc. It is believed that Gandhaka imparts desirable properties to Parada and reduces its toxic effects. Parada preparations without Gandhaka are considered to be more toxic so mostly Parada is used internally with Gandhaka. Gandhaka is also useful for Paradabandhana. In text books of Rasashastra Parada is given as Shivaveerya while Gandhaka is described as Raja of Devi Parvati. During Samudramanthana Deva and Dānava started churning of ocean Gandhaka came out along with nectar. Due to its characteristic smell Deva gave the name Gandhaka to it.

AIM AND OBJECTIVES

- 1) To understand, re-evaluate, review various concepts regarding Gandhaka in various Rasagranthas and Textbooks
- 2) To review various Shodhana processes of Gandhaka and its properties and Uses.

MATERIAL AND METHODOLOGY

This article is based on a review of ancient Ayurvedic texts like Charaka Samhita, Sushruta Samhita, Ashtangsamgraha, Ashtanghrudaya and Rasagranthas. The main Ayurvediya Rasagrantha used in this study are Rasaratnasamucchaya written by RasaVagbhata, Acharya Sadanand Sharma virachit Rasatarangini, Rasendrasarasangraha, Rasayogasagara, Rasachandanshu, Ayurved prakash, Rasakamadhenu, Bhavaprakasha, RajNighantu, Dhanvantary Nighantu and available commentaries on these texts. Literary material related to the derivation, characteristics, purification processes, therapeutic activities of Gandhaka and all related information related to Gandhaka is collected. For taking literary review modern books also referred and various websites and Scientific Research journals have been searched for Research Articles to collect information on the relevant topic of Gandhaka.

HISTORY

Gandhaka is used in the treatment since Samhita period. Its detailed description is found in Rasashastra Classics; due to its wider use it holds an important place in Rasashastra.

Mythological Origin

According to Ayurved Prakash^[1], Devi Parvati get menstruated when She was playing near Kshirabdhhi. The Rajah was very fragrant and beautiful. The cloth which was wet with Rajah was then washed in Ocean that Rajah when mixed with water converted into Gandhaka. When Deva and Danava started churning of Ocean, Gandhaka came out along with Nector. This Gandhaka pleased Deva gave the name Gandhaka to it.

According to Prof. D. A. Kulkarni, the Commentator of Rasaratnasamucchaya^[2],

- Origin of Gandhaka is Shvetadvipa, this Shvetadvipa is most probably Sisily region which is in the Southern part of Italy.
- Gandhaka is artava of Devi Parvati i.e. Prakriti means Gandhaka is obtained from volcano present in the Earth
- The smell coming from the mines of Gandhaka is somewhat similar to Artava.

In modern Science Gandhaka or Sulphur is known to the World due to its highly inflammable quality.

SULPHUR = SUL - Salt + FUR – Fire^[3]
= FIRING SALT

The nature of Sulphur is given as –

Like the Planets up in the Heaven,
Metals also number seven,
Copper, Iron, Silver, Gold,
Tin and Lead to smelt and mould.
Cosmos gave us, listen further,
Fiary SULPHUR was there father,

And there mother Mercury

That my son, is known to Cosmas !
Brimstone may also refer to an alternative name for sulfur^[4]

VERNACULAR NAMES**Table No.1 Name of Gandhaka in different languages.**

Sr No	Language	Name
1	Sanskrit	Gandhaka
2	Hindi	Gandhaka
3	Marathi	Gandhaka
4	Gujarati	Gandhaka
5	Udia	Gandhaka
6	Punjabi	Kibrit ,Gogirda
7	Kannada	Gandhaka
8	Malyalam	Gandhagam
9	Telugu	Gandhagam
10	Tamil	Gandhagam
11	English	Sulphur , Brim Stone
12	Arabian	Kivarit
13	Paarasika	Gogirda

SYNONYMS**Table no. 2: Synonyms according to various Texts.**

TEXT	SYNONYMS
Charak Samhita	Sougandhika, Navanita, Lelitaka etc
Ashtang Hridaya	Gandhopala, Gandhapashana etc
Rajanighantu	Putigandha, Atigandha, Kitaghna etc
Dhanvantari Nighantu	Dhatuha, Nikruntaka etc
Rasakamdhenu	Bali, Balarasa, Balivasa, Devyaraja
Bhavprakasha	Shilbari, Pamarietc

Table no. 3: Synonyms according to Properties.

PROPERTY	SYNONYMS
Gandhavachaka	Gandhi, Putigandha, Gandhamodana, Sugandha, Sougandhika ^[5] , Atigandha, Kruragandha etc.
Swarupavachaka	Gandhapashana, Gandhopala, Navnita, Shukapiccha, Pitagandhaka, Gauripushpa etc.
Karmavachaka	Kitari, Kitaghna, Pamari, Kushthari, Balivasa
Dhatukarmopyukta	Shulbari, Shulbaripu, Rasagandha, Dhatuha etc

OCCURANCE

Gandhaka is found in both forms – Native as well as Ores

In Native Form: - In Italy – Sisily region, Spain, Texas, Newzeland, Japan etc.

Table no. 4: Name of the Ores of Gandhaka and the compounds related the Ores.

Sr.No.	Name of the Ores	Name of Compounds
1	Sulphides	i. Iron Pyrite (FeS ₂)
		ii. Copper Pyrite (Cu ₂ S, Fe ₂ S ₃)

		iii. Galena (PbS)
		iv. Zinc Blende (ZnS)
		v. Realgar (As ₂ S ₂)
		vi. Orpiment (As ₂ S ₃)
		vii. Cinnabar (HgS)
		viii. Hydrogen Sulphide (H ₂ S)
2	Sulphate	i. Gypsum or Calcium Sulphate (CaSO ₄ ·2H ₂ O)
		ii. Heavy Spar (BaSO ₄)
		iii. Selestone (SrSO ₄)
		iv. Kieserite (MgSO ₄ ·H ₂ O)
		v. Ferrous Sulphate (FeSO ₄ ·7H ₂ O)
		vi. Copper Sulphate (CuSO ₄ ·5H ₂ O)
3	Some of the vegetable groups	Rai Group
		Gajar Group
		Rasona Group
		Nimba Group

In combined form: - Japan, Burma, USA, Chilli, Philipines etc.^[6]

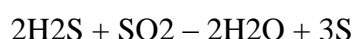
In India – Bihar State – Sinhabhoom District, Rohatas District, Rajasthan, Aasam.

Sulphur obtained from nature is of two types

- (a) Sulfatric type
- (b) Gypsum type

(a) Sulfatric type

It is produced by interaction between SO₂ and Sulphuretted Hydrogen in volcanic regions, both the Gases mentioned being present in the volcanic regions.



(b) Gypsum type

It is produced by decomposition of Gypsum by Bacteria & organic matter.



ALLOTROPIC FORMS OF SULPHUR

Several allotropic modifications of Sulphur are known, in which some are Crystalline & some are Amorphous.^[7]

(a) Crystalline modification

- i. Rhombic Sulphur
- ii. Monoclinic Sulphur

(b) Amorphous modification

- i. Plastic Sulphur
- ii. Colloidal Sulphur
- iii. Liquid Sulphur

CLASSIFICATION

According to all Texts Gandhaka is classified under Uparasa category.

VARITIES

According to Rasarnava^[8],

Three types**i. Shukachanchunibha**

Red coloured, Uttama

ii. Peetavarna

Yellow coloured, Madhyam

iii. Shvetavarna

White coloured, Adhama

Table no. 5: Various types of Gandhaka and their colour and Uses.^[9]

TYPE OF GANDHAKA	COLOUR	USE
Rakta – Shukatundakhya	Red	Dhatuvada
Peeta – Shukapichhanibha	Yellow	Rasayankarma
Shweta – Khatika	White	Lohamarana
Krishna – Duralabha	Black	Jara, Mrutyunashak

According to some Rasacharya,

Two types

- i. Amalasara – For internal use
- ii. Pinda - For external use

GRAHYA GANDHAKA

According to Ayurveda Prakasha^[10], Colour of the Grahya Gandhaka should be like tail of Parrot, its consistency like Butter, it should be soft. All these qualities are observed in Amalasara Gandhaka so that should be taken.

GANDHAKA SHODHANA

Necessity of Gandhaka Shodhana

According to Raja Nighantu, Gandhaka contains two types of impurities-

- i. Shilachurna [Stone powder or Clay]^[11]
- ii. Visha [Toxic substances]

Ayurveda Prakash has given that if the impurities are not removed and AshuddhaGandhaka is used then it produces various diseases like-

Kushtha, Tapa, Bhrama, Paittik disorders, Balahani, Varnahani, Sukhaand Viryahani etc. Besides this Unpurified Gandhaka increases body temperature, creates vertigo, creates blood born diseases & it hampers strength, luster and beauty of body.

PROCESS OF GANDHAKA SHODHANA

(1) Shodhana drugs:- Gokshira, Shringavera Swarasa, Bhringaraj Swarasa^[12], Nimbursa, Jambuvvari, Palandu Swarasa, Kanji, Ajadugdha, Unmattaniryasa, Karanja taila, Eranda taila, Mastypitta, Goghrita, Ushnodaka, etc.

(2) Process & Duration: - Various processes are given in various texts.

- i. Swedana – From 1 ghati to 1 day
- ii. Dravana (Melting), Galana (Filtering) Dravanikshepana (Pouring In to liquid) – 3 times.
- iii. Bhavana – 2 to 21 times
- iv. Varidravana or Jambuvvari prakshalana
- v. Pachana in Kurmaputapaka

(3) Agnimatra :- Badarngara tapana (Heating)

Mrudu Agni paka, 20 vanyopala heating

(4) Yantra:- Darvika, Lohapaatra, Kacchapa yantra^[13], Khalva yanta, Stove, etc.

Table no. 6: Properties of shuddha or purified Gandhaka.

Properties	Ra. Ta.	Ay.Pr.	R.R.S
Rasa	Katu	Katu , Tikta, Kashaya	Madhura
Guna	Sara	-	-
Virya	Ushna	-	-
Vipaka	-	Katu	Katu
Karma	-	Kushthaghna, Rasayana	-
Doshaprabhava	-		Pittavardhana

In nut shell,

Properties of Shuddha Gandhaka are,

- Rasa^[14] : Tikta, Katu, Kashaya, Madhura
- Guna : Ushna, Snigdha, Sara
- Virya : Ushna
- Vipaka : Katu, Madhura
- Doshaghata : Vatakaphanashaka^[15], Krimighna, Raktashodhana, etc
- Prabhava : Dadrunashaka, Kushthanashaka, Twakvikaranashaka
- Karma : Deepana, Amapachana, Kandughna.

USES

Gandhaka has the properties like Agnideepana, Amapachaka, Tikta Rasa, Kaphashoshaka, Jantughna, Raktadushtinashaka Sravanashaka. So Gandhaka is used in Kushtha, Shwasa, Kasa, Gandamala, various Gudavikara etc.

In Charak Samhita, Gandhaka is mentioned in Kushthadichurna^[16], which is used in Dadru, Kandu, Kitibha, Pama & Vicharchika for external application for dusting purpose.

In Sushrut Samhita, Mahavajraka taila is used for all types of Kushtha.

In Ashtanga Sangraha, Gandhaka is used in the Mustadi Churna^[17] for irradiation of Dadru, Pama, Kandu, Kitibha.

In Chakradatta^[18] & RasaRatnaSamucchaya and also other Rasashastra Texts various preparations are available for the management of various diseases.

Gandhaka is used for therapeutic purpose and for drug formulation in various forms, as a Sneha^[19], Kalka for lepa, pralepa, Druti, Pishti, Parpati, Pottali, Kharaliya Rasayanas, Kupipakva Rasayanas etc.

Table no. 7: Dose of Gandhak described by various Rasagranthas.

TEXT	DOSE
Vangasena, Vaidyakchintamani	1 Karsha
Rasakamdhenu, Ayurveda Prakasha	1 Pala
RasaTarangini	1-8 Ratti

Table no. 8: Uses of Gandhaka according to various Anupanas.

Diseases	Anupana
ENT diseases, Agnimandya	TriphalaKwatha
NutanaKshaya	Vasa Kwatha
Shwasa, Kasa	Kantakari
Skin diseases	PakwaKadaliphala
Weakness, Debility	Chitrakamula
Arsha, Gudavikara	Tila churna
Yakshma, Antrashosha, Gandamala	Jyotishmati oil + Vachachurna + Butter
Shukrajvikara	Sugar
Shukralpata	Shalmalimula
Galitkushtha	Madhu + Dhatriwarasa

Formulations of Gandhaka

Gandhaka is very important ingredient of most of the Rasoushadhis. The formulations which contain Gandhaka are called as Sagandha Yougika. Some of the examples are as follows:-

1. Kharaliya Rasayanas- Like Arogyavardhini vati, Chandraprabha vati,
2. Parpati Rasayanas- Like Rasaparpati, Tamraparpati, Lohaparpati, Panchamrut Parpati etc.
3. Kupipakwa Rasayanas- Like Rasasindur, MAkaradhwaja, Shilasindur, Swrnarajavangeswar, Sameerapannag, Talasindur, Hinguliya Manikyarasa etc.
4. Pottali Rasayanas- Like Rasagarbhapottali, Abhagarbhapottali, Hemagarbhapottali, Tamragarbhapottali etc.

One of the important kalpa of Gandhaka is Gandhaka Rasayana which is very popular amongst Vaidyas.

PATHYA KALPANA

The things to be followed while using Gandhaka Kalpa

Aahara: Godugdha (Cow milk), Goghrita, Jangala, Chhagamamsa, Wheat, Rice, Saindhav, Sugar.

Vihara: Warm water for bath, Coconut oil massage, Wandering and stay at cold Places etc.

DISCUSSION

Table no 1 gives the various names of Gandhaka described in various languages. In most of languages it is called as Gandhaka and also in some languages it is called as Kibrit, Gogirda. In English it called as Sulphur and brim stone. It is better to understand vernacular names so that we can get knowledge regarding the local name of Gandhaka in that particular area so that it will be easy to purchase and prepare medicines in that particular area.

Table no 2 gives various synonyms of Gandhaka depicted by Ancient Acharyas in their respective Samhitas. These Acharyas have given the nomenclature according to various characteristics or properties of Gandhaka. This indicates that the Ancient Acharyas were having deep knowledge about Gandhaka and they were utilizing this mineral.

Table no 3 gives an idea regarding various synonyms given in various texts according to characteristics of Gandhaka. As Gandhaka is having peculiar odour, some of the names are related with this smell. Some of the synonyms are according to some characteristics of Sulphur like its colour, consistency, softness etc. Some of the synonyms suggest that Gandhaka is very useful in treating various skin diseases, Kitaghna, Kitari gives idea about pharmacological property of it. Meaning of some of the synonyms depicts its usefulness during Dhatukarma or Dhatuvada. So by knowing synonyms or having good knowledge of synonyms of Gandhaka one can better understanding and utility of this mineral.

Table no 4 is showing name of the Ores of Gandhaka and the compounds related the Ores. Sulphur found in some vegetables so it is having plant origin also. Along with this Gandhaka is found in some mineral sources of origin like in Sulphide and Sulphate forms. In Rasashastra we study these Sulphide compounds of Gandhaka by different names like Makshika, Vimala, Rasaka, Haritala, Manashila, Hingula and some of the names of Sulphate forms of Gandhaka are Sasyaka, Kasisa, Godanti etc. All these Sulphur containing compounds or minerals plays important role while preparing various medicines from Mercury.

Table no 5 gives information regarding various types of Gandhaka. The various types are according to the colour. The pharmacological properties are also different and the uses given by Acharyas are also different according to the properties. The most useful variety for preparation of various Ayurvedic medicines is yellow.

Table no 6 gives properties of shuddha or purified Gandhaka like Rasa, Vipaka, Veerya etc. according to Rasatarangini, Ayurved Prakash and Rasaratnasamucchaya. The pharmacological properties are dependent on these properties.

Table no 7 The dose of purified Gandhaka described by Acharyas has variation. In this table dose given in the texts like Vangasen, Vaidyakchintamani, Rasakamdheni, Ayurveda

Prakasha and Rasa Tarangini are given. Most commonly Gandhaka is utilized in a compound formulation, guti, vati form or in the form of Rasoushadhi.

Table no 8 describes utilization of Gandhaka according to various Anupanas. This is the speciality of Ayurveda that the same medicine can be used while treating different disease by changing Anupana only. Gandhaka can be used for treating various diseases like Kshaya, Shwasa (Asthma), Kasa(Cough), skin diseases, Arsha(Haemorrhoids), weakness etc. with different Anupana.

CONCLUSION

Ayurveda has a basic prayojana as Swasthasya Swasthya rakshanam and Aaturasya vyadhiparimokshah. Various dravyas and medicines are useful for maintaining normalcy of a normal person and for treating various diseases. The study of Mineral, Herbomineral, Metallic, Herbometalic, Herbometalomineral Ayurvedic formulations comes under Rasashastra. In Rasashastra Gandhaka is an important mineral given under Uparasa category by almost all Acharyas. In ancient Samhitas like Charaka Samhita, Ashtang Hruday there are descriptions of different uses of Gandhaka. In Rasashastra it is given that Mercury is able to cure diseases only after Murchhana Samskara, thus the mineral Gandhaka is having importance in Ayurvedic drug manufacturing. We found detailed description of Gandhaka in various rasaganthas like Rasaratnasamucchaya, Rasendrasarasamgraha, Rasatarangini, Ayurved Prakash etc. In modern Science Gandhaka or Sulphur is known to the world due to its inflammable quality. Mythologically Acharyas has given that Gandhaka is originated from Devi Parvati. According to Prof. D. A. Kulkarni, the Commentator of Rasaratnasamucchaya, Origin of Gandhaka is Shvetadvipa and this Shvetadvipa is most probably Sicily region which is in the Southern part of Italy and this Gandhaka is obtained from volcano present in the Earth. We found the name Gandhaka in many languages. The synonyms given in various text books give the idea regarding physical characteristics, pharmacological properties and uses of Gandhaka. From synonyms like Pamari, Kushthari it is clear that Gandhaka is most useful to treat various skin diseases. Many dravyas given under Maharasa, Uparasa and Sadharana Rasa category are ores of Gandhaka. In these ores it is mainly in the form of Sulphide, Sulphate form and Gandhaka is also found in some of the plants as well like Nimba, Rasona etc. Several allotropic modifications of Sulphur are known, in which some are Crystalline & some are Amorphous. According to Ayurveda Shukapichhanibha variety having yellow colour is useful for Rasayana karma. All the grahya qualities are observed in

Amalasara Gandhaka. In textbooks of Rasashastra various methods of purification of Gandhaka are given which includes Swedana, Dravana (Melting), Galana (Filtering) Dravanikshepana, Bhavana, Pachana by the utilization of various yantras like Darvika, Lohapaatra, Kacchapa yantra, Khalva yanta, Stove, etc. The Gandhaka has properties like Katu rasa, Ushna veerya and krumighna, kandughna, raktashodhana etc and hence it is widely used for the treatment of various skin diseases. Acharya Charaka, Sushruta and Vagbhata also given the utility of Gandhaka as Kushthghna. Gandhaka is used for therapeutic purpose and for drug formulation in various forms. The formulations which contain Gandhaka are called as Sagandha Yougika.

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