



Review Article

ABHRAKA BHASMA A BOON OF AYURVEDA TO MANKIND: A REVIEW

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ABSTRACT

Abhraka bhasma is a popular *Rasashastra* medicine in Ayurveda stream. It is basically herbomineral preparation used by all *Ayurvedic Vaidyas* since long time. *Abhraka* is basically Mica (Biotite). *Bhasma* is nothing but incinerated ash. *Rasashastra* is an Indian metallurgy which deals with several minerals and herbomineral preparations specially *Bhasmas*. There are several popular *Bhasmas* in Ayurveda but there is great demand of this *Bhasma* in *Ayurvedic vaidyas*. Use of this *Bhasma* is in multiple disorders, so could be consider as a major Ayurvedic drug. Published details scientific literature on *Abhraka Bhasma* by various research scholars, internet and pharmacopeias were reviewed. The review was done to find physicochemical characteristics as well as standardization studies done on *Abhraka bhasma*. Also attempt is made to find scientific studies done on *Abhraka bhasma*. Need of hour to evaluate its efficacy value as potential Ayurvedic drug in various disorders. As well as importance of *Abhraka bhasma* as an evidence-based drug. Review of literatures and scientific studies of *Abhraka bhasma* clearly indicate that there are lot of studies is done on *Abhraka bhasmas* specially it's physicochemical characteristics, standardization as well as it's therapeutic uses. *Abhraka bhasma* is indicated in several ailments like Diabetes, Asthma, Paralysis, Neurological condition, Tuberculosis and Acid peptic diseases.

KEYWORDS: *Abhraka Bhasma*, Mica, Ayurveda, Standardization.

INTRODUCTION

The science of life is the basic meaning of the word Ayurveda, it is an Indian traditional system of medicine. Ayurveda addresses health issues of human being since ancient days. In Ayurveda *Bruhatrayi* i.e. *Charka Samhita*, *Sushruta Samhita* and *Vagbhata (Ashtanga hrudya)* primarily uses herbal plant material as a therapeutic agent. Indian alchemist *Nagarjuna* in 8th century AD recommended the usage of mineral and metals such as Mercury, Iron, Zinc and minerals such as Mica to use as an therapeutic agents as they are very adequate, rapid in action, lesser in dosage, and showing prolonged shelf life, which made the bases for minerals and metals to become the pillar for treating diseases of human being.^[1]

World Health Organization (WHO) stated that the people follow the traditional system of medicine in the economically progressing nation mankind believes that traditional systems of medicines are safe and having less side effects as compared to that of Allopathy.^[2] *Rasashastra* is a branch of Ayurveda follows various processes involved for the Ayurvedic formulations like detoxification; trituration and pulverization/ calcinations etc.

Rasashastra believes that the element which is in finished products does not cause toxicity. The adaptable methods for process of detoxification to remove toxicity of the heavy metals or minerals is well explained in *Rasashastra*. *Ashodhit Abhraka bhasma* which is obtained from refinery, may cause the adverse effect if used as a therapeutic agent. This presence of the impurities shall be removed by the process called *Shodhana*. The *Shodhana* is a process which helps in purification of the material by removing the unwanted toxins and other impurities.^[3]

In context of *Bhasma*, *Shodhana* make the product ready for next pharmaceutical process which is called as a *Marana*. In the process, *Shodhana* were collected Mica is allowed to heat at higher temperature until it becomes red hot and followed by fusion of herbal plant extracts along with the cow's excreta. Based on the metals present the procedure varies in the practice of *Shodhana*, for instance the purification of the liquefied mass of *Abhraka* carried out by spurting for twenty-one times with pure cow milk.^[4]

Rasashastra, termed various "*Dhatus*" and "*Updhatus*" plays important role in the maintenance

of the human biological system. The metabolic activity needed metals as a trace element in specific concentration is so essential to maintain the metabolic activity of the human system e.g. Hg, Au, Ag, Fe, Zn, Cu, Pb etc. Deficiency or excess amount of intake leads to imbalance in the biological system causes metabolic disturbances. The states of an equilibrium level of metals as a trace element maintains immunity.

Abhraka (Mica) in Rasashastra texts

Abhraka Synonyms

Gouriteja, Gagana, Bahupatrankam, Kha, Antariksha Ambara.^[5]

Ores: Biotite, Paragonite, Lepidolite, Muscovite, Phlegophite.^[5]

Type of the Abhraka

Based on Colour: *Krishna, Rakta, Peeta, Shweta.*

Based on Reaction to heat: *Pinaka, Naga, Manduka, Vajra.*^[6]

Grahyata

Considerable: *Snigdha*, thick and heavy layers, easily separable layers

Not considerable: *Chandrikaryukta, Kittayukta (Mala).*^[7]

Shodhana

Procedure is carried in following manner

Nirvapana technique is used in which, *Raw Abhraka* is heated till become red hot and it is immersed in liquid media like *Kanji* or *Gomutra* or *Triphala Kwatha* or *Godugda*. Repeat the same procedure for 7 times. Each time fresh liquid is to be used.^[8]

Dhany Abhraka

Procedure

Shodhit Abhraka and $\frac{1}{4}$ *Shalidhanya* are combined to prepare *Pottali* by *Kambala* cloth (jute bag in case non availability). *Pottali* is kept immersed in *Kanji* for 3 days. Afterwards *Pottali* is macerated well with force. *Abhraka* in the form of small particles will come out from *Kambala* which is devoid of *Valuka* and is collected and dried.^[9]

Marana Procedure

Dhanyabhraka and *Kasamarda swarasa* combined by *Bhavana* process and *Chakrika* is prepared. The dried *Chakrika* is kept in *Sharava* and



Figure 1: *Abhraka (Mica)*

Samputikarana process is used for drying up. *Gajaputa* is repeated for 10 times till *Bhasma siddhi lakshana* are obtained. To treat the disease *Sahasra puti* (1000) is done to obtain *Rasayana*.^[10]

Amrutikarana

Abhraka Bhasma is repeatedly subjected to *Putra* (incineration in a closed earthen vessel). Also process of *Amrutikarana* where *Abhraka Bhasma* is fried in *Goghrita* (cow ghee) and *Triphala kwatha*, have a role in its therapeutic efficacy which needs evaluation. As many as 100 incinerations are mentioned for the preparation of *Shataputi Abhraka Bhasma* which underlines the amount of *Agni Samskara* (heat processing) *Abhraka Bhasma* is subjected to before being used therapeutically.

As mention in *Ayurveda Prakash*, 2nd chapter and 138th *Sloka* the process of *Amrutikarana* is carried out with the help of *Triphala kwatha* 16 Tola, *Ghruta* 6 Tola, *Abhraka bhasma* 10 Tola.

Procedure

Abhraka Bhasma is mixed *Ghruta* and *Triphala kwatha* in iron vessel and *Bharjana* (fry it) is done until only *Abhraka bhasma* remains.^[11]

Lohitikarana

It develops desired red colour in case of *Abhraka bhasma* and this process of *Lohitikarana* where *Abhraka Bhasma* is triturated with some distinct herbs before incinerating. This process is carried out in following manner,

Abhraka bhasma by *Bhavana* process with *Raktavarga dravyas* and made into *Chakrikas*. These are kept in *Sharava Samputikarana* and *Gajaputa* is done. The process adopted to attribute red color to *Bhasma* which was lost due to a greater number of *Putra* (exposure to heat).^[12]

Bhasma siddhi lakshana

Finalized *Abhraka Bhasma* shows some specific characteristics, in many *Rasashastra* texts it called as *Siddhi lakshana*. *Rastarangini* includes some *Siddhi lakshana* such, *Nishchandratva* means properly prepared *Bhasma* will not be having any luster or shining, also will be red in colour, fine powder in nature along with soft in touch.^[13]



Figure 2: *Abhraka Bhasma*

Indications as per Rasashastra texts

Sr.No.	Name of Text	Indication	Anupana
1	<i>Rasa Ratna Samucchaya</i>	<i>Kshaya, Prameha, Pandu, Kustha, Jwara, Grahani, Shoola, Shwas, Kasa.</i> ^[14]	<i>Vidanga, Vyosha and Ghruta</i>
2	<i>Rasa Chikitsa</i>	<i>Prameha Rajyakshma Raktapitta Mutrakruccha Vidhradi-dusta vrana</i> ^[15]	<i>Haridra Swarna bhasma Haritaki, Guda, Sugar Ela, Gokshura, Ghruta Durvarasa</i>
3	<i>Rasa Tarangini</i>	<i>Ruchikara, Keshya, Rasayana, Klaibya, Ayuvruddhikara.</i> ^[16]	Honey
4	<i>Ayurveda Sara Sangraha</i>	<i>Prahema Kshaya Viryavruddhikar.</i> ^[17]	<i>Haridra and Pippal Swarna bhasma Raupya bhasma</i>

Dose: 1 to 2 Ratti (120 – 240 mg) ^[18]

Adverse reactions

If *Abhraka Bhasma* is not prepared in prescribed manner so, not having any *Siddhi Lakshana*, after consuming it, the body may show some toxic symptoms such as, *Moha, Mandagni, Visha, Pandu, Parshwapeeda, Kustha, Kshaya, Shotha.*^[19]

Treatment for Adverse drug reaction: Ayurved *Vaidyas* follows following method, treatment for the adverse effect cause by eating such *Abhraka bhasma* includes *Uma phala (Atasi beeja)* trituration in water and consume this preparation for 3 days.

Famous Commercial Ayurvedic Formulations of Abhraka Bhasma

Arogyavardhini vati, Panchamruta parpati, Yogndrarasa, Rasaraj Ras, Agnikumararasa, Vasant kusumkar Ras, Bruhat Kasturi bhairav Ras.

Studies on Abhraka Bhasma

1. Act as a nervine tonic which strength and rehabilitate the tissue precisely and commit to the healing of impaired nervous tissue. It is a well-known hematinic which has the tendency to increasing the red blood cells count which enhances the oxygen caring capacity.^[20]
2. Anti-helminthic effect of *Abhraka Bhasma* prepared with *Kumaraswarasaan* experimental study.^[21]

3. In the treatment of Malabsorption, Asthma, Bronchitis, UTI and Digestive impairment.^[22]
4. In vivo hypoglycemic activity of *Abhraka bhasma* by alloxan induced method.^[23]
5. On the neurobehavioral activity and oxidative stress in rats of *Basanta Kusumakara Rasa (BKR)* which contains *Abhraka bhasma.*^[24]
6. The effect of *Abhraka bhasma* on invivo CCL4 induced hepatotoxicity and nephrotoxicity.^[25]
7. Spermatogenic enhancing property on heat damaged organ in rats of *Abhraka bhasma.*^[26]
8. Used in the treatment of Cancer such as breast cancer and leukemia.^[27-28]
9. Effect of *Abhraka bhasma* (4mg in formulation) for oral treatment of Acne vulgaris.^[29]
10. Testicular oxidative stress protective effect and *Abhraka bhasma* showed has a defensive effect in heat-induced oxidative stress in rat testicular cells.^[30]
11. Effect of *Abhraka bhasma* in lipid profile in rats and found antihyperlipidemic.^[31]
12. *Abhraka bhasma* Induces the secretion of insulin from pancreas, hence used in the treatment of Type I Diabetes mellitus.^[32]

Toxicity Studies

Abhraka bhasma is the oxide form of the minerals are poorly soluble and hence doesn't show any hepatotoxicity and nephrotoxicity studied in male Albino rats.^[33]

Table 1: Modern Instruments used for testing of Abhraka bhasma

S.No.	Instruments used	Results obtained
1	FTIR	The FTIR analysis was carried out using FTIR Model, SHIMADZU 8400. The spectra were recorded between 4000 and 400 cm ⁻¹ ^[34]
2	EDXRF	EDXRF revealed the presence of Fe (22%) as a major element and Ca, K and Si in low concentrations, their concentration being 11%, 8% and 13%

		respectively. Mg (4%), Al (2%) and Ti (1%) were present as minor elements while Sodium, Chlorine, and Phosphorous were present in traces (<1%) [35]
3	FEG—SEM	FEG-SEM studies showed that the grains in <i>Abhraka Bhasma</i> were heterogeneous and in aggregates of particle size between 19nm and 88nm. The grains were found to be irregular in shape ranging from spherical to oblong [35]
4	EDS	EDS analysis show that major elements present in the sample) were O (41%), Si (16%), K (13%) and Fe (13%) and the minor elements were Al (6%), Mg (5%), Ca (4%) and Cl (1%). Sodium, Phosphorous and Titanium were found in traces (<1%) [35]
5	XRD and SEM	XRD study of <i>Abhraka bhasma</i> shows various peaks which shows presence of Mica, FeSO ₄ , Fe ₂ O ₃ [36] While SEM study shows the presence of nano particles in which particle size ranges from 1 to 200 micron[36]
6	Infra-Red (IR) Spectroscopy	The percent transmission of <i>Abhraka bhasma</i> was found to be recorded from 500-4000 wave number/cm[37]
7	UV spectrometric Analysis	<i>Abhraka bhasma</i> shows distinct peak at 330 nm and various peak at 220-280nm[37]

Ancient Rasashastra tests of *Abhraka bhasma*

Varitar: It's a floating test of *Bhasma*. If small quantity of *Bhasma* is sprinkled on water surface it should float on water.[38]

Rekhpurnatva: On rubbing a small quantity of *Abhraka bhasma* sample in between the fingers it should enters into the lines of the finger.[38]

Loss of metallic luster: when examined in sun light there should not any metallic luster should be observed.[38]

Apurnabhavtv: This test involves heating a very thin silver sheet along with *Bhasma* to red hot for 5 min.[26]

After cooling there should be absence of traces of sample on silver sheet. Thus, it confirms the mica totally converted into *Bhasma*.[38]

Physicochemical characteristics of *Abhraka Bhasma* [39]

Physical Properties

Nature: Platy (separable in thin layers), Colour: Greenish black, Streak: Greenish black, Cleavage: Perfect, Fracture: Uneven, Luster: Splendent Tenacity: Flexible 2, Transparency: Translucent, Hardness: 2.5 to 3, Sp. Gr.: 2.6 to 3

Optical properties

Anisotropic, Biaxial Negative, small 2V and strong birefringence. Refractive Index: η_{α} 1.565-1.625; η_{β} 1.605-1.696; η_{γ} 1.605-1.696 (Appendix-2).

Chemical Properties

Effect of Heat: Hold a piece of *Abhraka* by forceps and heat it over a burner flame in its outer zone (about 10000). It swells almost double in volume.

Colour changes from black to silver moon while, water is released.

Solubility: Take about 1g finely powdered (150 mesh) sample of *Abhraka* in 250ml beaker. Add 50ml sulphuric acid. Stir the solution. It decomposes leaving skeleton of silica (distinction from other micas which are not affected by sulphuric acid).

Assay: Should contain not less than 50% silica (SiO₂) when analyzed by gravimetric method (Appendix-3.1.3).

Heavy metals and Arsenic: Should not contain more than the stated limits for the following:- Lead= 45ppm, Arsenic= 3ppm, and Cadmium= 2ppm Appendix-3.2).

Other Elements: May contain the following within \pm 20% of the stated limits: - Iron= 6%, Aluminum= 5%, Magnesium= 9% and Potassium= 5% (Appendix-3.1 & 3.2).

CONCLUSION

There is great demand of Ayurvedic medicines is increasing day by day. The drug like *Abhraka bhasma* which is having wide range of therapeutic doses with minimal side effect as well as no toxicity is plays crucial role in defining its importance as a potent alternative drug in various disorders. The study focuses the studies done in multi dimensional aspect of *Abhraka bhasma* and highlights the future prospects of the studies of *Abhraka bhasma*. Future research needed to decide *Abhraka bhasma* as a drug in main therapy in various diseases like Diabetes, Asthma, etc.

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