Review Article

Available online through
www.ijrap.net

IJRAP
ISSN 2229-3566

SIGNIFICANCE OF MICA IN AYURVEDIC PRODUCTS: AN OVERVIEW

Mishra Amrita[1,2]*, Mishra Arun K[2], Ghosh Ashoke K[2], Jha Shivesh[1]
[1]Dept. of Pharmaceutical Sciences, Birla Institute of Technology, Mesra, Ranchi, India
[2]Pharmacognosy (P.G.) Research Laboratory, Pharmacy College, IFTM University, Moradabad, India

Received on: 20/01/2011 Revised on: 17/02/2011 Accepted on: 01/03/2011

ABSTRACT
Mica after repeated burning is turned into Abhrak Bhasma which is an Ayurvedic medicine commonly used against many diseases, including hepatitis, respiratory tract infections and anemia. This Bhasma is prepared from mica and other herbs by purification, burning and pulverizing. It is a cellular regenerator and nerve tonic. Also it plays significant role to treat gastritis and renal diseases.
KEYWORDS: Mica; Abhrak bhasma; Ayurveda

***Address of Correspondence**
Amrita Mishra, Ph.D Scholar, Pharmacognosy (P.G.) Research Laboratory, Pharmacy College, IFTM University, Moradabad 244001 Email: Amrita_azam@rediffmail.com

INTRODUCTION

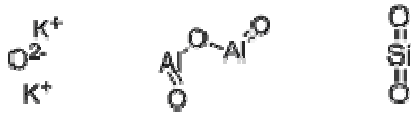
Ayurvedic products are usually prepared of herbs and herbo-mineral combinations[1]. These Ayurvedic products are very useful for treating disorders. As Ayurvedic medicines are prepared from natural origin substances, it is considered that they do not have side effects[2]. Ayurvedic medicine comprise of remedies with medicinal herbs, organic or animal derived products and natural mineral substances. However the most important aspect of Ayurvedic formulation is their balance, integrity and synergy in relation to human body and to triple humors - Vata, Pitta and Kapha[3]. Among several mineral elements used in Ayurvedic products, mica in form of Abhrak bhasma, zinc in form of zinc oxide or zinc carbonate in kharpara or pittala (brass), iron in form of iron oxide in Lauh bhasma are used since a long time[4].

When focusing on Mica (Abhrak), it plays a very significant role in traditional system of medicine because it has been used as constituent of traditional Ayurvedic products since several years back. Ayurvedic practitioners in current era and traditionally vaidyas have practiced oral utility of mica in form of Abhrak bhasma[5]. In sanskrit mica is known as Abhrak and also known as powdered Talc, Biotite or Calx[6]. The process required to manufacture includes treating mica with juices and extracts of a number of plants that makes it a very powerful cellular regenerator. Abhrak is also nervine tonic and is also widely used in respiratory tract infections and anemia[7]. It contains iron, magnesium, potassium, calcium and aluminum in traces. Abhrak is known to produce effect on all the three doshas in the body. It provides the body necessary energy to cope up the need of daily work. Abhrak is known for its calming effect on the body. Abhrak bhasma is a commonly used ayurvedic drug against many diseases including hepatitis[8]. Preparations which contain minerals as main ingredients are called rasa-yoga in Ayurveda. Abhrak yoga, Makshik (copper pyrites), Swarna (gold), Rajat(silver), Tamra (copper) etc. are common example of such class. The Abhrak bhasma is prepared from mica and other herbal extracts. It is an excellent cellular regenerator and nerve tonic. It is indicated in various chronic diseases as tuberculosis, COPD and many types of cardiac diseases[9].

Chemical composition and Physical properties of mica

Mica represents the classic phyllosilicate mineral belonging to the subclass of the silicates class. Mica, a generic term, refers to any of a group of approximately 30 silicate minerals occurring as non-fibrous plates. The mica group of plates includes several closely related materials having highly perfect basal cleavage. It is combination of rock generating minerals being found in all three rock types: igneous, metamorphic and sedimentary. It is also said that micas are thus composed of sheets of silicate tetrahedrons. The silicate sheets are composed of interconnected six member rings. These rings are responsible for the micas typical six sided pseudo-hexagonal symmetrical structure. Each

tetrahedron in the rings shares three of their oxygens with three other tetrahedrons and all the tetrahedrons in a given sheet point their unshared oxygen in the same direction[10]. Muscovite (hydrated aluminum potassium silicate[$KAl_2(AlSi_3O_{10})(F, OH)_2$]) and phlogopite (potassium magnesium aluminum silicate hydroxide) are the two major micas of commerce. Micas are commonly found in ordinary rocks. Inhalation of mica dust presents an occupational hazard.



Common chemical structure of Mica

Its density is 2.77g/cm^3 and refractive index value lies in range of 1.55-1.66[11].

Types of abhrak (Mica)

In India, mica is obtained in white, brown and black color especially in Bihar and Bengal. As per Ayurvedic classification, Abhrak is of four types naming Panak Abhrak, Dadur Abhrak, Naag Abhrak and Vajra Abhrak. Panak Abhrak has peculiarity that upon burning, its layers are opened. Daur Abhrak creates sound like frog (tarr-tarr) upon burning and Naag Abhrak creates sound like snake upon burning. The Vajra Abhrak neither creates any type of sound nor changes its property upon burning. The Vajra Abhrak colour is shiny carbon black and is unchanged on heating[12]. Vajra Abhrak is very beneficial and commonly used Abhrak in Ayurvedic preparations. (**Figure 1**)

Beneficial aspects of Mica

Mica is having several beneficial attributes on various organ system of body (**Table 1**)

Abhrak bhasma (burned Mica) and it's utility in Ayurvedic drugs

Experts of Ayurveda believes that burning and pulverizing the minerals in repeated way produces "potency" or peculiar molecular change in these and enhances the therapeutic rationality as well as applicability of the product[13]. Reduced mica is described in Ayurveda as a general tonic and potent medicine. In general, it is said to stimulate metabolic reactions of tissue cells. It is also used as an aphrodisiac. Reduced mica removes the derangement of the tridoshas and establishes their equipoise. Apart from mica itself, it is used along with several other herbal ingredients to formulate Ayurvedic polyherbo-mineral products to cure various acute and chronic ailments (**Table 2**)

Abhrak bhasma is an important constituent of Chyawanprash which helps in removing body weakness and enhances energy, immunity & stamina[14]. Recent studies have proved the hepatoprotective and anticonvulsant potential of abhrak itself and inform of bhasma[8]. Significant role in treatment of spleen associated diseases as spleen enlargement are claimed in traditional books and literature. Abhrak bhasma along with other crude herbal drugs are used to treat several ailments and is being used by tribal persons till date[15]. A list of such combinations is presented in **table 3**.

Other uses of Mica

Mica sheet in natural way is used by electric and electronic industries in block form which is named as Micanite. Chiefly it is employed to manufacturer capacitor or gauge glass of steam boiler or some optical instruments. The ground mica is used in paint, as joint cement, as a dusting agent, in well-drilling muds and in plastics, roofing, rubber and welding rods[16]. In the paint industry, ground mica is used as a pigment extender that also facilitates suspension due to its light weight and platy morphology. Mica is also used as segment plates between copper commutator sections to insulate copper from the steel. The ground mica also reduces checking and chalking, prevents shrinkage and shearing of the paint film, provides increased resistance to water penetration and weathering, and brightens the tone of colored pigments. The rubber industry uses ground mica as inert filler and as a mold lubricant in the manufacture of molded rubber products, including tires[17].

CONCLUSION

Since ancient time, mica is used in form of Abhrak bhasma in Ayurvedic system of medicine to cure various ailments as treating anemia, hepatic dysfunction jaundice, chronic dysentery, stroke, paralysis, asthma, TB -Tuberculosis, bone marrow depletion, leukemia, sex debility, autoimmune diseases (disallows the formation of antibodies), breast cancer, sexual debility, azoospermia, pernicious and sickle cell anemia, gonorrhea, syphillis, cervical dysplasia, problems of erythrogenesis, eczema, dermatitis, cardiac diseases, miocardia, ischemia, respiratory diseases, pneumonia, pneumonitis, lupus bronchitis, demyelination of nervous sys (MS), low immunity, HIV, hepatitis and rheumatism. Among all these ailments, few have been proved on scientific background and others are to be proved. Keeping in view the tremendous applicability of mica itself and in form of bhasma which is constituent of several Ayurvedic products, cellular and molecular level studies are also to be focused in near future.

REFERENCES

1.Balendu Prakash, Purvish M Parikh, Sanjoy K Pal. Herbo-mineral ayurvedic treatment in a high risk acute promyelocytic leukemia patient with second relapse: 12 years follow up. Journal of Ayurveda and Integrative Medicine. 2010; 1(3): 215-218.

2. Bhushan Patwardhan, Raghunath Anant Mashelkar. Traditional medicine-inspired approaches to drug discovery: can Ayurveda show the way forward? Drug Discovery Today. 2009; 14: 804-811

3. Charaka, Charak samhita, vidyotini commentary siddisthana 3/24, Chaukhambha orientalia, Varanasi, p 35
4. Rajib Kumar Rai, CB Jha, JPN Chaurasia, KR Kohli. Comparative assessment of antihyperlipidaemic action of *Tamra bhasma*. Indian J Traditional Knowledge. 2008; 7(2): 335-340.
5. Vardhini NV, Sathya TN, Balakrishna Murthy B. Assessment of genotoxic potential of herbomineral preparations – Bhasmas. Current Science, 2010; 99(8): 1096-1100
6. Chopra R.N, Ghosh S, Dutt AT. Some inorganic preparations of Indian indigenous medicines.- Abhrak bhasma. Indian J. Med. Res. 1934; 22: 285–288.
7. Narayana Rao UB. Indigenous Medicinal Specialities, 3rd Edi, Chawla Offset Printers, New Delhi, 2005, p 162
8. Buwa S, Patil S, Kulkarni PH, Kanase A. Hepatoprotective action of abhrak bhasma, an ayurvedic drug in albino rats against hepatitis induced by CCl4. Indian J Exp Biol. 2001;39(10):1022-7.
9. Chandramouli Thirunarayanan T, Mukeshbabu K, Sriram R. Designing Toxicological Evaluation of Ayurveda and Siddha products to cater to global compliance – current practical and regulatory perspectives. J. Pharm. Sci. & Res. 2010; 2 (12): 867-877
10. Vrltnn W. Correlation between infrared spectrum and chemical composition of Mica. The American Mineralogist. 1964; 19: 736-767
11. Srntnrrnr H. Crystal structure of a trioctahedral mica: Phlogopite. American Minerol. 1962; 47: 896-899.
12. Mishra S. Ayurvedeeya Rasashastara. 15th Edi. Chaukhambha orientalia, Varanasi 2007 p 356.
13.Devanathan. R, Rajalakshmi. P, Brindha P. Chemical standardization studies on varatika Bhasma. International J Current Pharmaceutical Research. 2010; 2(4): 12-16
14. Milind P, Bansal N. Traditional medicinal formulation Chyawanprash :A review. Indian J Traditional Knowledge. 2006; 5(4): 484-488
15. Fraweley D, Ranade S.Ayurveda Nature's Medicine. 3rd Ed. Motilal Pblishers, Varanasi 2004 p 162.
16. Clark G. *Mica*. A Review of world developments. Indust. Min. 1983; 3: 27-50.
17. Kumar M. Problems and prospects in mineral Industry in India 1st Edi. .Mittal Publishers, New Delhi 1993 p. 5-8
18. Pathak Ramraksh Vaidya. Ayurveda Sarsangarh. 19th Edi., Sri Baidyanath, Allahabad 2011, p 85-92
19. Nandkarni KM. Indian Materia Medica. 3rd Edi. Popular Prakasan, Mumbai. 2007 p 29
20. Sastri Haridutta. Rasatarangini. 11th Edi. Motilal Banarasidas Publishers, Varanasi, 1979 p 225-228
21. TrikamJi Vaidya Yadavaji Aacharya. Siddhayog Sangarha. 1st Edi., Sri Baidyanath, Allahabad 1954, p 175
22. Sharma Triyambaknath. Rasamirta. 3rd Edi., Pt. Ranmnath Sharma Publishers, Varanasi. 1965 p 29-33

Table 1: Beneficial effect of Calcinated Mica on various body organ system[18,19]

Body System	Effect
Nervous system	Nervine tonic and increases tone of tissue. It acts to protect myelin sheath
Reproductive system	Benefits in azoospermia, Helpful in various types of sexual disorders as impotency, erectile dysfunction. Increases sperm count.
Blood circulation system	Brings about improvement in circulation, Also having a great potential to treat pernicious and sickle cell anemia. Increasing red blood cells count (haematinic). Also increases their oxygen carrying capacity.
Hepatic system	Treats hepatitis and serves and as hepatoprotective agent
Respiratory system	Provides relief in asthma, pneumonia, pneumonitis, and Lupus bronchitis
Cardiac system	It works as carioprotective. Also improves myocardial ischemia
Immunity system	Also it is known to benefit in low immunity and various types of veneral diseases as HIV

Table 2: List of Ayurvedic product in which Abhrak in form of Bhasma is used[20,21]

Name of Ayurvedic Product	Use
Prabhakr Vati	Cardiotonic
Ratnaprabha vati	Feminine tonic, to treat diseases releated with uterus
Kshudavati gutika	Used in hyperacidity, acts as gastroprotective agent
Kshar vati	Works as digestive aid, cures stomach ache.
Mahabhra vati	Uterine tonic
Madanmanjari vati	Aphrodisiac, increases sperm count
Brahmi vati	Used in mental weakness, acts as memory enhancer

Table 3: Abhrak Bhasma in combination and their uses to cure diseases[22]

Combinations	**Diseases in which it is used**
Abhrak bhasma + Pippali+ Turmeric in honey	Diabeties
Abhrak bhasma+ Sitopaladi churna in Cow ghee	Tuberculosis
Abhrak bhasma+ Chandi bhasma+ Elaichi in honey	Oligozoospermia
Abhrak bhasma+ Cinnamon +Elaichi +Nagkeasar	Acte and Chronic Piles
Abhrak bhasma + root of pippali churna in honey	Vitiligo and high fever
Abhrak bhasma + vidarikand churna	Muscular weakness
Abhrak bhasma+dried ginger+ Ashwagandha+ Puskar root in honey	CNS associated disorders
Abhrak bhasma+Mukta bhasma	Cough and Pyrexia

Figure 1: Vajra Abhrak