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UTILITY OF ARSENIC COMPOUNDS IN AYURVEDA: A REVIEW

[1*]Sreedevi A. P., [2]Seema M. B., [3]Surekha S. Medikeri and [4]Anand Katti

[1]P. G Scholar, Dept. of P. G Studies in Rasashastra and Bhaishajya Kalpana, Government Ayurveda Medical College Bengaluru, Karnataka, India.

[2]Professor, Dept. of P. G Studies in Rasashastra and Bhaishajya Kalpana, Government Ayurveda Medical College Bengaluru, Karnataka, India.

[3]Professor and HOD, Dept. of P. G Studies in Rasashastra and Bhaishajya Kalpana, Government Ayurveda Medical College Bengaluru, Karnataka, India.

[4]Associate Professor, Dept. Samhita Siddhantha, Government Ayurveda Medical College Bengaluru, Karnataka, India.

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***Corresponding Author**
Sreedevi A. P.
P. G Scholar, Dept. of P. G Studies in Rasashastra and Bhaishajya Kalpana, Government Ayurveda Medical College Bengaluru, Karnataka, India.

ABSTRACT

Ayurvedic formulations are grossly classified as herbal, herbo-mineral and mineral based preparations. Mineral based formulations have been accused to cause toxicity by heavy metal poisoning. However, *Acharya charaka* opines even the best medicine (*amruta*) caused toxicity if used injudiciously. Conversely judicious use of otherwise toxic substance also yields cure. Metals and minerals used in ayurveda are subjected to *shodhana* and *marana* before prescribing. Arsenic is toxic substance. *Rasagrantha* of *Ayurveda* refer to medicinal uses of three substances viz. *Haratala, Manashila and Gouripashana* and all these are arsenic compounds. Even though arsenic is toxic, modern medical science also has noted the usefulness of arsenic in many diseases. The present article analyses *haratala, manashila and gouripashana* in the light of arsenic.

KEYWORDS: Arsenic, *Haratala, manashila, gouripashana*.

INTRODUCTION

Arsenic is a chemical element with the symbol as (atomic number 33). Arsenic occurs in many minerals, usually in combination with sulphur and metals, but also as pure elemental crystal. Arsenic is a metalloid. Arsenic can exist in 3 different valance states. Elemental

arsenic (Zero oxidation state), trivalent or pentavalent arsenic. *Haratala* (Orpiment), *Manashila* (Realgar), and *Gouripashana* (white arsenic) are the three commonly used arsenic compounds in *Ayurveda* used in wide range of diseases. *Haratala* (Orpiment) and *Manashila* (Realgar) comes under *Uparasa* and *Gouripashana* (white arsenic) comes under *Sadharana rasa* as per *Ayurveda Rasashastra*.

REVIEW OF LITERATURE

HARATALA

'Haratala' as it is equated with the 'Orpiment' of modern mineralogy.[1] Haratala is yellow Orpiment or Sulphate of Arsenic.[2] *Haratala* is green in colour or variegated or even the colour of Parrot. *Haratala* (As $_2S_3$) is the arsenical compound used in *Ayurveda* since thousands of years for various indications. In *BhaishajyaRatnavali* alone, 91 formulations of haratala, 61 formulations both *Haratala* and *Manashila* and one formulation of *Haratala* and *Gauripashana* in combination are mentioned. Out of them maximum formulation was used for the treatment of Jwara. In *Ayurveda Prakasha* and *Rasatarangini, Haratala* is mentioned as *Rasayana*. It is indicated in *Phiranga, Vatarakta, Visarpa, Vipadika, Vicharchika*, Different types of *Kushta, Vishamajwara, Phirangajanya Roga, Apasmara, Bagandhara, Vrana, Nadivrana, Visphota.*[3] Though *Haratala* is toxic drug, it is used in the treatment after *shodana* process with number of acidic and alkaline media of organic origin. As its *Doshaprabhava* is *Rakthadoshahara*, *shudhaharatala* administered along *Amragandhaharidra* for *Sarvarakthavikara* and also with *haridraswarasa* indicated in *Pandu*. Along with guduchisatwa indicated in *Vataraktha*. As its *karma* is *deepana* it indicated in *Vahnimadya,* ie administered along with *pippali* and *madhu*. *Shudhaharatala* along with *panchatikta kashaya* can be given in *kushta*. Due to its *Kaphavatahara* property we can use it along with *Vasa* or *Kantakariswarasa* in *Swasa.*[4]

MANASHILA

Manashila is called as red arsenic (Realgar), chemically it is arsenic disulphide. Description regarding *Manashila* is found in the *Samhita kala*. First description is found in *Charaka Samhita*. He describes a few instances of minerals and metallic preparations of which *Manashila* is one; in combination with herbal drugs, he has prescribed it in *kushta, kasa* and *shwasa.AcharyaSushruta* has also explained it in *netrarogachikitsa* and wider explanation is found in *Ashtanga Sangraha* as *rasayana*. It cures disease like *Kasa, Shwasa, Bhutopadrava, Agnimandya, Kshaya, Anaha, Kandu*. If consumed for more days it acts as *Rasayana*, cures

Jwara, Varnya, Vishanashaka.[5] It is administered along with herbal drugs or is an important ingredient in popular formulations like *ShwasakutharaRasa, Trailokhyachintamani rasa* and *Rasa raja rasa*.As its karma's are *Lekhana* and *Kaphahara Shudhamanasila* along with *trikatu* and *Vasa swarasa* indicated in *Kasa* and *Shwasa*. *Shudhamanashila* with *pippalichoorna* triturates with water and applied as *Anjana* in *vishamajwara.*[6] As it is *varnakara, Shudhamanashila, Haridra, Manjishtachurna* and *Yavakshara* triturated with ghee and honey is used as an external application in *Twakrogas.*[7]

GOURIPASHANA

Gouripashana is identified as white arsenic. Chemically it is Arsenic trioxide. *Gouripashana is* the second mineral drug of *sadharana rasa* group. *Gouripashana* is also known as Malla chemically it is Arsenic trioxide. It is more toxic when compared to other two arsenic compounds of *Rasashatra*. Use of *Gouripashana* in *sandhigatavata, Phirangaroga*, all types of *kushta, Vishmajwara*, severe *swasaroga, Amavata, Athisara.*[8]*Gouripashana* gunas mentioned as *Rasabhandakara, Snigdha and Rasaviryakrit.*[9] It is administered along with herbal drugs or is an important ingredient in popular formulations like *Malla sindura, Suchikabharana Rasa* and *Samirapannaga Rasa*. Due to its *kaphavatahara* property *Shudha gouripashana* along with *Vasa satva* or *Vyagri choorna* can be given in *Swasa*. As it is having *kushtaghna* property along with *panchatikthasatwa* or *choorna* is indicated in various types of *kushta*. *Shudha gouripashana* along with *shuntichorna* and *punarnava choorna* given for 3 days for *Amavata* and *jwara* associated with it.[10]

DISCUSSION

MEDICAL USES OF ARSENIC AND ITS COMPOUND

Arsenical's compound has been used to control the blood counts of the patient with haematological malignancies. There is some observation of the treatment of various solid tumours by contemporary Ayurveda practioners such as Nasal polyps, Haemorrhoid and Elephantiasis.[11] The mechanism of Arsenic- induced cell death is well understood in the application of AS_2O_3, which is a potent cytotoxic and antitumor activities in vitro and vivo. An important initial cellular event that occurs during the treatment of target cells with AS_2O_3 involves the elevation of Reactive oxygen species. Such generation of ROS appears to be regulated, at least in part, by activation of NADPH oxidase and NO synthase isozymes. Also arsenic-containing compounds are potent modulators of the thioredoxin system that includes thioredoxin, thioredoxin reductase and NADPH. The thioredoxin system controls, to a large

extent, intracellular redox reactions, regulates apoptosis, and protects cell from stress damage, and the ability of arsenic-containing compounds to target and block thioredoxin reductase may be important in the induction of its pro-apoptotic effect. Over production of ROS is linked to the induction of apoptosis by AS_2O_3.Accumulation of hydrogen peroxide leads to decreases in the mitochondrial membrane potential, resulting in cytochrome c release and activation of the caspase cascade. This appears to be a common mechanism of induction of cell death in adverse cellular backgrounds.[12] Arsenic compounds frequently target elements oncogenes selectively expressed in certain malignancies.

CONCLUSION

Haratala (Orpiment), *Manashila* (Realgar), and *Gouripashana* white arsenic) are the three commonly used arsenic compounds in *Ayurveda* used in wide range of diseases. The pharmacological properties of drug in Ayurveda is based on *Rasa, Guna*, *Veerya and Vipaka* as the main causative factor for the disease are *Sheetha*(Cold), *Snigdha*(Unctous), *Ushna*(Hot) and *Roukshya*(Non unctuous). Many toxic metals are used in Ayurveda after Shodana and *Marana*. *Shodana* (Purification) is a method of triturating herbs and animal's products and heating of metals and metamorphosed into herbo- mineral. It is a process to convert inorganic materials to organic compound for better absorption, assimilation, reduce toxicity and to enhance medicinal properties.

REFERENCES

1. Monier Williams, Sanskrit-English Dictionary, Varanasi, Indica Books, 1996; 1290.
2. Raja Radha kantha Dev, Sabda kalpa druma, Delhi,Naga publishers, 2002; (reprint). P 498.
3. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 52-54th sloka, 252 pp.
4. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 60-63th sloka, 254 pp.
5. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 115-116th sloka, 263pp.
6. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 118-119th sloka, 263 pp.
7. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 123 rd sloka, 264pp.

8. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 139-142th sloka, 267 pp.
9. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 138th sloka, 267 pp.
10. Sadananda Sharma, Rasa Tarangini, Kashinath Shatry ed, New Delhi, Motilal Banarasidas publication, 2000; 11th chapter, 153-155th sloka, 270 pp.
11. Jennie Treleaven, Simonmellar, peter Farmer, Farmer, Derek Birchall, John Goldman, Goldman, Gordon Piller, Arsenic and Ayurveda; Leukemia & Lymphoma, 1993; 10(4-5): 343-345.
12. Leonidas C Platanias, Biological response to Arsenic Compounds,J Biol Chem, 2009; 284(28): 18583-7.