

A CONCEPTUAL REVIEW OF HARATALA - AN ARSENIC-BASED AYURVEDIC COMPOUND

[Sharad Chandra](#)¹, Karbhal Kamleshwar Singh², Bhagat Alka³

P.G. Scholar¹, Reader², Lecturer³, Shri N.P.A. Government Ayurved College, Raipur (Pin No. – 492010), Chhattisgarh, India

Corresponding Author: sharadsarang98@gmail.com

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ABSTRACT

Objectives - *Ayurveda* is the science of life practised by ancient *Aryans* which is based on *Atharva-Veda*. The object of *Ayurveda* is to counteract the imbalance of three very essential elements, *Vata*, *Pitta*, and *Kapha*. *Rasa Shastra* is the branch of *Ayurveda* which deals with knowledge of alchemical & pharmaceutical processes. *Haratala* is an important mineral drug in *Rasa Shastra* for alchemical purposes and therapeutic uses. **Methods** – This review is focused on the concise discussion, collection and interpretation of *Haratala* related descriptions in different Ayurvedic and modern literature. **Results** - *Haratala* is being used in the field of treatment of various diseases, especially in *Rasa Shastra*. There is no controversial opinion regarding the identity of '*Haratala*' as it is equated with the 'Orpiment'(Arsenic Trisulphide) of modern mineralogy. **Conclusions** -*Haratala* is an Arsenic based *Ayurvedic* compound which is being used for several years in *Ayurveda* for treatment of various disease, especially in *Vata-Kaphatmaka Vyadhi*.

Keywords: *Ayurveda*, *Rasa Shastra*, *Haratala*, *Arsenic-Trisulphide*,

INTRODUCTION

Haratala is an important mineral drug in *Rasa Shastra* for alchemical purposes and therapeutic uses. It is the

5th drug under *Uparasa Varga*, and it is known as “Yellow Orpiment” in modern which contains 39%

sulphur and 61% Arsenic. Its internal and external uses are mentioned in Ayurvedic classics.

Haratala is being in use in the field of treatment since the beginning of the pre-historic period. There is no controversial opinion regarding the identity of 'Haratala' as it is equated with the 'Orpiment' of modern mineralogy.¹

Aim and Objectives -

1. Literature review of Haratala in Ayurvedic classics.
2. Literature review of Arsenic Trisulphide in modern books, articles and journals.

Nirukti – Peetvarna Dhatu Visheshah sa tu Hari-Veeryama. (Shabdakalpadruma)

Haratala is considered yellow coloured Dhatu as well as Hari Veerya.

History -

Mythological Origin -

1. **Rasendra Purana** - Haratala is derived for the first time when Lord Narsimha had destroyed the evil Hiranya-Kashyapa. When Hiranya-Kashyapa was dying, he had vomited, and this vomitus was converted into Haratala which remained in his armpit.
2. **Sabdartha Chintamani** - It is explained in Siddha Bhaisajya Manimala with the reference of Sabdartha Chintamani that Haratala is the semen of Lord Vishnu.

Table 1: History in Samhita and Rasashastriya Kala

Charaka Samhita	<ul style="list-style-type: none"> ❖ In Sutra-Sthana, it is described in Parthiva Dravyas, an external application in various skin disorders and the subject of Siro-Virechana as an ingredient of Dhumapana. ❖ In Chikitsa-Sthana also Haratala is indicated for skin diseases apart from Unmada (Insanity), Hikka (Hiccups), Shwasa (Dyspnea), Kasa (Cough) and in Visa Chikitsa (Toxicosis) in the form of oil and Sura etc. ❖ It is also used for Pradeha, Pralepa (the external applications) Dhumapana (Therapeutic smoking), Anjana (collyrium) etc.
Sushruta Samhita	<ul style="list-style-type: none"> ❖ Haratala is counted under Sthavara Vishas. ❖ In Sutra Sthana only two references are there which are in the subject of Vranas- hodhana Dravyas (Cleansing of wounds). ❖ In Chikitsa Sthana, they are mainly in the subject of Vrana Shodhana (Wound cleaning), Pandu Karma (Coloring the skin after scars of wounds) Arsha (Piles), Granthi (Nodules) Upadansha (Syphilis) Visarpa etc. ❖ In Kalpasthana two references are available in the counting of Dhatu-Vishas and Luta-dansa Chikitsa. ❖ In Uttara Tantra, it described in worm's disease, eye diseases, skin diseases and several pediatric disorders in the form of oil, powder, and Dhumapana.
Vagabhatta	Vagabhatta has also described Haratala on various Nasa Rogas, (Nasal, diseases), Shotha (Oedema), Vrishcika Dansha (scorpion sting poisoning) for Vidarana Karma.
Rasa therapy and NAGARJUNA	The description of Haratala regarding its properties, indications, contraindication, Shodhana, Marana and Satva- Patana etc. are more elaborately described. Nagarjuna utilized Haratala for various al-chemical processes.

In the 13th century, the author of Rasakamadhenu compiled the uses of Haratala according to diseases and systems. Rasatarangini, Rasachandanshu, Rasajalanidhi etc the description of Haratala is modified.

Table 2: Vernacular names²

Sanskrit - Haratala, Tala, Ala.	Marathi - Haratala.	Bengali - Haratala.
Hindi - Haratala.	Gujarati - Haratala.	English - Yellow orpiment
Arabia - Jarnikha asphara.	Telugu - Haratalamu	

Synonyms of Haratala³- Haritalam, Talam, Alam, Talakam, Mallagandham, Pinjaram, Peetanakham Shaileshu Bhooshanam, Vidalakam, Chitrangandham, Vamshapatram, Natabhushanam, Natamandanam.

Table 3: Types of Haratala

No.	Types	Names	Classical texts Reference
1.	2	1. Patra Haratala 2. Pinda Haratala	Rasa Ratna Samucchaya Rasa Tarangini Rasa Prakasha Sudhakar
2.	4	1. Pinda Haratala 2. Patra Haratala 3. Godanti Haratala 4. Vakdala Haratala	Rasa Jala Nidhi

1. PATRA HARATALA -

According to the classics of *Rasa Shastra* this is the best quality of *Haratala*. Following properties are there in *Patra Haratala* – (R.R.S. 3/71)

- Yellow in colour.
- Heavy.
- *Snigdha*.
- Small layers.
- *Rasayana-Guna*.
- Shiny appearance.

2. PINDA HARATALA -

This type of *Haratala* is not preferred for oral application. Generally, it is preferred for external applications like ointments etc. Following properties are there in *Pinda Haratala* -(R.R.S. 3/72)

- Without small layers.
- *Pinda-sadrishya*.
- *Alpasara*.
- Heavy.
- Lesser in quality.

3. GODANTI HARATALA -

According to *Rasa-Jala Nidhi*. Following properties are there in *Godanti Haratala* – (R.J.N. Part 2/Chapter 2)

- It is smooth in touch.

- The shape of teeth of a cow.

- It is yellowish with bluish streaks at the centre.

4. VAKADALA HARATALA –

It has been described in *Rasa Jala Nidhi*. Following properties are there in *Godanti Haratala* -(R.J.N. Part 2/Chapter 2)

- It is soft in touch and generally known as cold *Haratala*.

- It possesses layers and marks weight too.

- It can cure leukoderma.

❖ *Grahyalakshana*⁴ -Qualities of *Patra Hartala* is considered *Grahyalakshana*.

❖ *Agrahyalakshana*⁵ -Qualities of *Pindaa Hartala* is considered as *Agrahyalakshana*.

❖ *Haratala Shodhana* –Materials used for *Shodhana* of *Haratala* -

Kushmanda Swarasa, Kanjika, Tila Taila, Triphala Kwatha, Churnodaka, Nimbu Swarasa, Tila Kshara Jala, Shalmalimoola Kwatha, Palashamoola jala.

❖ **Purification Procedures⁶ -**

To purify *Haratala*, breaks it into small pieces and make a *Pottali* and boiled in a *Dolayantra* with the *Kushmanda Swarasa* (Liquid media) for 1 *Prahara* or in *Churnodaka/Tilaksharodaka* for 1 *Prahara* each.

Table 4: Pharmaco-Therapeutic properties of *Haratala*⁷

S. No.		
1	<i>Rasa</i>	<i>Katu</i> .
2	<i>Guna</i>	<i>Snigdha, Ushna</i> .
3	<i>Veerya</i>	<i>Ushna</i> .
4	<i>Vipaka</i>	<i>Katu</i> .

5	Doshagnata	Kapha- Vata Nashaka.
6	Karma	Deepana.
7	Rogagnata	Kushtha, streepushpa Nashaka, Kriminashaka, Bhootpreta Badhanashaka.
8	Matra	Not mentioned
9	Anupana	Anupana is not mentioned.

Haratala Yoga- Sameerapannaga Rasa, Tala Sindoor, Nityananda Rasa, Rasamanikya, Kasturibhairava Rasa, Vatagajankusha Rasa, Talakeshwara Rasa, Vidyadhara Rasa, Gulmakuthara Rasa.

HARATALA MODERN VIEW - ORPIMENT (AS₂S₃)

Arsenic Trisulphide is the inorganic compound with the formula As₂S₃. This bright yellow solid is a well-known mineral orpiment (*Latin - Aurpimentum*), has been used as a pigment, and has played a role in the analysis of arsenic compounds.⁸ Arsenic is a chemical element that has the symbol as (atomic no. 33 & atomic mass 74.92).

❖ Historical⁹-

The Egyptians used these substances as pigments for frescoes. The term orpiment is a corrupt form of Latin *Aurpimentum* meaning “Gold paint” in allusion to its colour.⁹ It was first documented by Albertus Magnus in 1250 A.D.

❖ Occurrence¹⁰-

Yellow orpiment is a bright yellow colour mineral and widely distributed in the combined form above the earth. It usually forms masses and crusts. It is available in the countries like Romania, Peru, Japan, U.S.A, Australia.

Table 5: Physical properties¹¹

1.	Crystal structure	Monoclinic
2.	Form and habit	Crystals rare, usually occurring in foliaceous or massive
3.	Hardness	1.5 – 2
4.	Specific gravity	3.4 -3.5
5.	Lustre	Pearly to brilliant on cleavage faces, elsewhere resinous or Dull
6.	Colour	Lemon yellow of several shades.
7.	Streak	Yellow
8.	Transparency	Sub transparent to sub translucent
9.	Tenacity	Sectile, lamina is flexible but not elastic.
10.	Melting point	310 ⁰ C
11.	Boiling point	707 ⁰ C
12.	Density	3460
13.	Kg ^{m-3} Molecular weight	246
14.	Class	Sulphide

Table 6: Allotropic forms - Arsenic exists in 3 allotropic forms¹²

1.	Yellow Arsenic (or α - Arsenic)	It is obtained by cooling Arsenic vapour in Carbon Disulphide. It is a wax-like solid of much lower density (3.98g/cm ³) than grey arsenic. It is soluble in carbon disulphide on warming, it reverts into grey Arsenic. It is Non-Metallic in Nature, has no metallic lustre, is a very good conductor of electricity and readily volatile. It is poisonous.
2.	Amorphous or Black Arsenic (or β- Arsenic)	Sometimes, during the conversion of yellow into grey arsenic by warming as mentioned above, black arsenic is formed as an intermediated product. It is also obtained as a deposit when Arsine, AsH ₃ , is passed through a heated tube. It has a density of 4.6g/cm ³ . It is a poor conductor of electricity.

	Grey Arsenic (or γ -Arsenic)	It is grey and is a common ordinary variety. It is a very stable metallic-looking brittle solid of density 5.73g/cm ³ . It is a feeble conductor of electricity and a good conductor of heat. It volatilizes at 100oc. it sublimes without melting at 613oc under atmospheric pressure giving yellow vapours. If heated under pressure melts at about 500°C.
3.	Amorphous or Black Arsenic (or β - arsenic by warming as mentioned Arsenic)	Sometimes, during the conversion of yellow into grey arsenic by warming as mentioned above, black arsenic is formed as an intermediated product. It is also obtained as a deposit when arsine, AsH ₃ , is passed through a heated tube. It has a density of 4.6gcm-3. It is a poor conductor of electricity.

Table 7: Acute & Chronic Arsenic poisoning symptoms¹³

System	Acute poisoning	Chronic poisoning
GIT	Sweetish-metallic taste, Nausea, Vomiting, Garlic odour breath, Defecation is frequent and involuntary, Odourless and watery resembling rice water.	Nausea, Vomiting, Loss of appetite, Diarrhea.
Renal	Oliguria, Uremia, Albuminuria, ARDS, Micturition	Chronic nephritis, renal tubular necrosis
CVS	Hypotension, Pulmonary oedema, Circulatory collapse	Hypotension, IHD, Cardiac failure
Hepatic	Fatty infiltration	Hepatomegaly, Cirrhosis of liver, Jaundice
MS	Pain in limbs, Weakness	-----
CNS	Headache Vertigo, Tremors, Convulsions, General paralysis	Peripheral neuropathy, Encephalopathy
Skin	Alopecia, Skin eruptions	Raindrop pigmentation, Aldrich-meas lines, Alopecia.

❖ General Line of Treatment in Arsenic poisoning¹⁴ -

- Emetics.
- Stomach wash.
- Freshly prepared hydrated ferric oxide in tablespoon full doses suspended in water, which will convert arsenious acid into ferric Arsenite, a harmless and insoluble salt.
- Intravenous injections of 450mg of sodium thiosulphate in 10% solution.
- BAL in the dose of 5mg/kg body wt. by IM injection.
- Water & Electrolyte balance should be maintained.
- Demulcents e.g.- ghee, albumin water, barley water and linseed tea.
- Castor oil or MgSO₄ may be given to diminish intestinal absorption.

RESULTS AND DISCUSSION

Haratala is an Arsenic based compound which is described in Ayurvedic classics since the pre-historic period. There are numerous Yogas of Haratala in Rasa Shastra for different therapeutic purposes specially

Shwasa-Kasa Rogas. It is Kapha-Vata Nashaka because it has Katu Rasa, Snigdha and Ushna Guna and Ushna Veerya. Its Yogas are also widely used as antibiotics in skin diseases because it also contains sulphur which has anti-fungal, anti-bacterial properties.

CONCLUSION

Haratala is an important mineral compound being used in Rasa Shastra because of its therapeutics importance in respiratory and skin diseases. It is mainly used as Sindoor Kalpana or combination in Rasa Kalpa as Bhasma form like - Tala Sindoor, Kasturibhairava Rasa etc.

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