

A Review on Hartala (Orpiment) in Classical Ancient Text of Rasa Shastra

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Abstract

Bhasma's are one of the exceptional preparations therapeutically used in Ayurveda and have been used as effective drugs for centuries without any noticeable hazardous effects. Minerals, metals and poisonous herbs are used in Ayurvedic medicine after several processing. Hartala (orpiment) Bhasma (incinerated powder of Arsenic) is one such preparation containing Arsenic as a main ingredient. In present study, critical review of Ayurvedic literature regarding Hartala is described in detail. Several classical texts of Rasa Shastra are reviewed in an attempt to provide the detailed description about Hartala like its Praptisthan (Occurrence), Prayaya (Synonyms), Vargikaran (Classification), Karma (Pharmacological properties), Ashuddha Hartala Dosha, its prativisha (antidote), Shodhana (Purification), Marana (Incineration), Matra (Therapeutic dose), Chikitsiya Prayog (Therapeutic indications), Satvapatana (Extraction), artificial methods of Hartala preparation. It is used only in purified and detoxified condition for the therapeutic purposes as internal as well as external medicine.

Keywords: Hartala, Sodhan, Marana, Stvapatana, Rasashastra.**Copyright © 2022 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

The arsenical compounds have a prolonged & remarkable history of pharmacological utilities and traditional practices. Haratala, Manashila and Somala are important arsenic compounds which are used in Ayurveda. Haratala is most popular among them. In majority of the Classical texts, it has been grouped under Uprasa Varga. It is one of the Arsenical raw materials emphasized since *Samhita* period. Hartala (AS₂S₃) is called as yellow orpiment with two molecules of Arsenic and three molecules of Sulphur. It is important in Rasa shastra for alchemical purposes and therapeutic uses. It is commonly used in treating the diseases like Kushtha, Firang, Visham Jwara, Bhagandar, Vata-rakta etc. It is used as ingredient in many Ayurvedic formulations i.e., Vtagajankush Rasa, Kasturibhairava Rasa etc. Acharya Sushrut has categorised it under Dhatuja Visha.

Improper Shodhana of Hartala causes Mandagni, Malabaddata, Ashmari and Mutra Krichra. Hence Shodhana of Hartala is essential. Shodhana is the

process of removal of physical, chemical impurities and potentiating of the drugs. There are various Shodhana and Marana procedures explained for Hartala in classical text like Rasa Ratna Samucchaya, Ayurveda Prakasha and Rasa Tarangini etc. It is found in natural form as well as prepared artificially.

Origin of Haritala in mythology: In Rasendra Purana, it is stated that Lord Narsimha had killed the evil Hiranyakashyapu, When Hiranyakashyapu was dying, he vomited and this vomitus was converted into flakes. This is considered as Hartala [1]. Moreover, it is described in Siddha Bhaisajya Manimala with the reference of Sabdartha Chintamani that orpiment is semen of Lord Vishnu. It resembles one of the synonyms of Haritala viz. Harerbijam [2].

Different references of Hartala in Samhitas

1. In Charaka Samhita:

In Sutra Sthana- Acharya Charaka classified Hartala under Parthiva Dravyas [3], used as an external application in various skin disorders [4].

As a chief ingredient of Kushthadi Churna and Manhashiladi Pradeha and also an ingredient of Shwetadi Shirovairachanik Dhuma [5].

In Chikitsa Sthana- Reference of Haritala is found in Kushtha (Skin Diseases) Chikitsaadyaya [6], Unmada (insanity) Chikitsaadyaya [7], Arsa (Haemorrhoids) Chikitsadyaya [8], Hikka-Shwas (Hiccups-Dyspnoea) Chikitsaadyaya [9], Kasa (Cough) Chikitsaadyaya [10], Visha (Toxicosis) Chikitsaadyaya [11] and in Trimarmiya Chikitsaadyaya as an ingredient of Peetak churna [12].

2. In Susruta Samhita:

In Sutra Sthana which are used in the subject of Vranas Shodhana Dravyas i.e, Sanshodhani varti & Sanshodhani Kalka [13].

In Chikitsa Sthana- Reference of Haritala is found in Dwivarniya adhyay [14], used in Pandu Karma (Skin fairness enhancer after scars of wounds) [14], Lomshatan (hair remover) Lepas [14], in the treatment of Arsha (piles) [15], Kustha [16], Shvitra (vitiligo) [16], Updansa (Syphilis) [17], Arunshika (Dandruff), Ahiputana (Diaper rashes) [18].

In Kalpasthana Hartala is described in Sthavar visha under the sub group of Dhaturvisha (earthen-origin poison) [19], and in the treatment of Lutadansa (Spider bites) [20],

3. In Ashtanga Hridaya:

Sutrasthana- Vagbhata mentioned Haritala as an ingredient of Tikshna Dhooma (Strong fumigation) [21],

Chikitsa Sthana- It is used in the treatment of Vata Kaphaja Kasa as an ingredient of Dhoom-pana (Nasal inhalation of medicated smoke) [22], ingredient of Kasisadi Taila in the treatment of Arsha (Pile) [23], in Dadrunashaka churna [24] and Marichyadi Taila [24].

Uttar sthana- It is mentioned in Nasa Roga Chikitsa (Treatment of Nose diseases) [25], Twacha Shudha Karaka Lepa [26], use in the treatment of Apachi [27], Updansa (Syphilis) [28], as an ingredient of Chandrodaya Agada [29] and Mandar Agada [30], in Vrishchika Dansha Chikitsa [30].

Synonyms in various Classical texts

- Haritalam, Talam, Alam, Talakam [31], Lomahrt, Vansapatrakam, Vangari, Kharjuram, Vanshpatriakam, Aal, Virala, Godantam, Vangari, Natmandanam, Pinjar [32], Citragandham, Natmandnak, Shailbhushanam, Vanshpatriam, Vidalakam, Peetnak, Malgandhajam [33], Atigandham, Girijalalit [34], Siddha, Karbura, Haribeej Dhatu Manogya, Chhatrang, Kanchanrasa, Vaidal, Varnaka [35], Gaurilalit, Chitrang, Pinga, Pingasara, Kanakrasa, Kanchanak, Gaur [36], Romharana, Maal, Pinjaka [37], Naramandanam, Chitragandham [38], Natbhushan, Roma-nashana [39].

Table 1: Classification of Hartala in Rasa Shastra classics

Name of the Text	Category
Charaka [3]	Parthiva dravya
Sushruta [19]	Dhatuvisha
Rasarnava [46], Rasa Ratna Samucchaya [41], Rasendra Sara Sangraha [37], Ayurveda Prakasha [31], Bhava Prakasha [44], Rasa Hridaya Tantra, Rasa Prakasha Sudhakara [42], Rasendra Chudamani[40], Rasa Manjari [50], Ananda Kanda [34].	Uparasa
Sharangadhara, Yogaratnakara [48]	Upadhatu

Table 2: Hartala Bheda (Types of Hartala)

Type	Variety	Text
2 types	Patratata, Pinda tala	Rasendra Chudamani [40], Rasaratna Samucchaya [41], Ayurveda Prakasha [31] Rasendra Sarasamgraha[37], Shaligram Nighantu [35], Rasaprakasha Sudhakara [42], Rasa Paddhati [43], RasaKamdheni [32], and Rasatarangini [33], Bhav Prakash Nighantu [44], Brihat Rasa Raja Sundar [45]
2 types	Patal tala, Pinda tala	Rasarnava [46]
4 types	Patratata, Pindatala Godandi, Bakadadi	Rasajalanidhi [39], Rasendra sambhava [47]
8 types		Shaligram Nighantu [35]

Types of orpiment have been classified on the basis of complexion,

1. Patra Haritala [31, 41]:

It is usually preferred and practiced for the therapeutic purposes. According to the classics of Rasa Sastra these are the quality of Patra Hartala-

- Contains lamellae like Mica
- Snigdha & Guru

- Tanu Patram (Thin layered)
- Lustrous
- Having rasayana properties
- Best quality for medicinal preparation

2. Pinda Haritala [31, 41]:

Pinda Haritala is not preferred for Systematic application. Generally, it is preferred for the external applications like ointments etc. following characteristics is mentioned texts:

- I. Not good in appearance
- II. Guru (heavy) [41] Laghu [31]
- III. Svalpasatva (Has a very little essence.)
- IV. Pinda sadrisha (lump like resemblance)
- V. Without layers
- VI. Stripuspa haranam (can stop the Menstruation)

3. Godanti Haritala [39]

It is not actually orpiment, so, it has not been counted in the types of Haritala by Rasacaryas.

- I. Dirgha khanda (Found in large chunks)
- II. Appearance of resemblance with a cow's teeth
- III. Yellow with blue streaks at the center
- IV. Very soft
- V. Heavy

4. Bagdadi or Tabaki [39]

- I. It is very soft
- II. Having layers
- III. Can cure leukoderma and leprosy
- IV. Himaprakhyam (generally known as "Cold Hartala")
- V. Heavy.

Table 3: Rasa-panchak of Hartala (Ayurvedic Pharmacological properties)

Rasa	Guna	Virya	Vipaka	Refrence
Katu, Kasaya	Snigdha	Usna	Katu	Ayurveda Prakash [31], Bhav Prakash Nighantu [44], Brihat Rasa Raja Sundar [45], Rasendra sambhava [47], Shaligram Nighantu [35], Yoga Ratnakara [48], Madanpala Nighantu [49]
Katu	Snigdha	Usna	Katu	Dhanvantari Nighantu [38], Raja Nighantu [36], Rasajalanidhi [39], Rasa Ratna Samuchaya [41], Rasa Prakash Sudhaka [42], Rasendra Chudamani [40]
Katu, Kasaya, Tikta	Snigdha Guru	Usna	Katu	Rasakaamdheni [32],
Katu, Kshaya	Snigdha		Katu	Rasendra Sara Sangraha [37]

Table 4: Asodhita Haritala Dosha

Dosha	Name of text Text
Kapha, Vata, Meha-kara	Rasendra Sara Sangraha [37], Brihat Rasa Raja Sundar [45], Ayurveda Prakash [31], Shaligram Nighantu [35], Rasamanjari [50], Rasa Ratna Samuchaya [41], Rasakaamdheni [32], Yoga Ratnakara [48], Rasajalanidhi [39],
Aayunashak	Shaligram Nighantu [35], Rasendra Sara Sangraha [37], Brihat Rasa Raja Sundar [45], Ayurveda Prakash [31], Rasamanjari [50], Rasa Ratna Samuchaya [41], Yoga Ratnakara [48], Rasajalanidhi [39]
Sphota, Angasankoch-kara	Rasa Ratna Samuchaya [41], Shaligram Nighantu [35], Brihat Rasa Raja Sundar [45], Ayurveda Prakash [31], Rasamanjari [50], Yoga Ratnakar [48], Rasajalanidhi [39],
Tapa	Rasa Ratna Samuchaya [41], Bhav Prakash Nighantu [44] Shaligram Nighantu [35], Brihat Rasa Raja Sundar [45], Ayurveda Prakash [31], Rasamanjari [50], Rasakaamdheni [32], Yoga Ratnakar [48] Rasajalanidhi [39],
Vaman	Rasamanjari [50]
Peeda (Toda)	Ayurveda Prakash [31], Rasataringini [33], Shaligram Nighantu [35]
Kushtha	Ayurveda Prakash [31], Rasendra sambhava [47], Rasataringini [33], Shaligram Nighantu [35]
Daha, Kshobh, Kampakara, Malinikaroti Angam	Rasataringini [33],
Kaph-Vata kara	Rasataringini [33],
Pangu	Rasendra Sambhava [47]
Vatapita karak	Rasendra Sambhava [47], Shaligram Nighantu [35]
Anga Diptihara, Arucikara, Balahanikara, Asmakara	Rasakaamdheni [32],

Hartala Shodhana (Method of purification)

In Rasa Shastra Shodhana is done to make the drug free from physical impurities, Vishadi Doshas, and to make the drug suitable for therapeutic use. As Sushruta considered Hartala as Dhatuvisha and Most of

Rasa Shastra texts described evil effect of Ashuddha Hartala like Ayughana, Kapha Vata Vraddhikara, Meha, Tapa, Sphota etc. To avoid these complications Different methods have been adopted for Shodhan of Hartala by Acharyas-

Table 5: Different summarized textual methods of Hartala Shodhana

Principle Followed	Drugs used	Duration / Process repetition	Reference
Swedan (Dola Yantra Dwara)	Churnodaka (Lime water)/ Kusmanda swarasa (juice of <i>Benincasa Hispida</i>)/ Tila Kshara Jala	3 hrs	Rasa Ratna Samuchaya [41], Rasendra Chudamani [40] Rasajalanidhi [39],
Swedan	Churnodaka, Kusmanda swarasa, Tila tail (<i>Sesamum indicum</i> oil)	1 prahar (3 hr)	Rasendra Sara Sangraha [37], Rasamanjari [50]
Swedan	Small pieces of Hartala +1/10 Part Tankan (Borax) → wash it 7 times with Nimbu (<i>Citrus Limon</i>) rasa and 7 times with Kanji (Sour gruel) → Swedan with chuna mixed kanji/Kushmand Jala (<i>Benincasa Hispida</i>) /Salmali kwatha (<i>Salmalia malabarica</i>)	1 day	Rasendra Sara Sangraha [37]
Swedan	Chuna mixed kanji → Kushmand Rasa, Tila Tail and Triphala Kwatha	1-1 Yaam (3hr) Respectively	Rasendra Sara Sangraha [37], Rasendra sambhava [47], Rasendra Chintamani [51] Rasamitra [52], Rasajalanidhi [39], Rasa Pradeep [53]
Swedan	Kushmand Swaras/Ksharodak (alkaline water)/ Palashmula Swaras (<i>Butea monosperma</i>)/ Shalmali Swaras (<i>Salmalia malabarica</i>)	1 yaam /2 yaam	Rasa Paddhati [43]
Swedan and Nimajjan (dipping)	Swedan in Kushmand Swaras for 6hr → dipped in Nimbu swaras (<i>Citrus Limon</i>) (Change Nimbu swaras daily for –7 days)	7 days	Sidha yog sangrah [54],
Swedan	Kanji (Sour gruel) → Kushmand rasa, Dugdha (Milk) and Vata dugdha (<i>Ficus benghalensis</i> milk)	3 days	Rasendra sambhava [47]
Swedan	Kushmand swaras/ Ksharodak/ Churnodak (Lime water)	3 hrs	Rasa Prakash Sudhakara [42]
Swedan	Take Hartala and put it in Kushmand, repeat this process 3 times	3 times	Rasayan sara [55]
Swedan	Grahadhujala/ Nimbu swaras	1 yaam(3hr)	Rasatarangini [33],
Swedan	Kushmand swaras	1 yaam	Rasatarangini [33],
Swedan	Churnodak/ Triphala kwath	2 yaam	Rasatarangini [33],
Swedan	Tilaksharjala	1 yaam	Rasatarangini [33],
Swedan	Salmalimula kwatha(<i>Salmalia malabarica</i>)	1 yaam	Rasatarangini [33],
Bhavana	Salmalimula kwatha(<i>Salmalia malabarica</i>)	7 times	Rasatarangini [33],
Bhavana	Churnodaka	7 times	Rasatarangini [33], Rasajalanidhi [39],
Swedan	Kushmand swaras (<i>Benincasa Hispida</i>)	100 times	Rasarnava [46]
Swedan	1/10 Part Tankan (Borax), Jambiri Swaras (<i>Citrus Limon</i>), Kanji	1 day	Rasajalanidhi [39],
Swedan	Kusmand swaras/Shalmanli kwatha	1 day	Rasajalanidhi [39],
Swedan	Jambiri swaras	6 hrs	Rasajalanidhi [39],
Swedan	Mahish Mutra (Buffalo urine), Kumari swaras (<i>Aloe vera</i>), Churnodak (Lime water), Sarapunkha Swaras (<i>Tephrosia purpurea</i>), Ikshu rasa (<i>Saccharum officinarum</i>)		Rasajalanidhi [39],
Swedan	Kanji (Sour gruel)	1 Yama	Yoga Ratnakara [48]
Swedan	Tila tail (<i>Sesamum indicum</i> oil), Takra (Butter milk), Gaumutra (Cow urine), Kanji (Sour gruel), Kulatha (<i>Macrotyloma uniflorum</i>)	1 Yama	Rasayan Sara [55]
Swedan	Small pieces of Hartala + ¼ part tankan → wash it with Nimbu rasa and kanji → swedan in Chuna mixed kanji	2 days	Rasa Ratnakar [56]
Bhavana	Kushmand swaras (<i>Benincasa Hispida</i>)	100 times	Rasa Ratnakar [56]

Godanti Hartala Shodhan: Swedan in Jayanti swaras (*Sesbania sesban*) or Nimbu swaras or Dronpushpi swaras (*Leucas cephalotes*) for 1 yama [47].

Godanti Hartala dosh Shanti: Antidote of Godanti Hartala is Yavaas rasa or Kushmand swaras (*Benincasa*

Hispidia) or Rajhans swarasa (*Adiantum capillus-veneris*) [47].

Hartala Marana (method of incineration): Various methods of Hartala Marana are summarized in below table no-6.

Table 6: Different summarized textual methods of Hartala Marana

Principle method	Lavigation	Reference
Bhasma yantra	Punarnava swaras (<i>Boerhavia diffusa</i>)	Rasataringini [33], Ayurveda Prakash [31] Brihat Rasa Raja Sundar [45]
Bhasma yantra	Pippali twak kwatha (<i>Piper longum</i>) (21 bhavana)	Rasataringini [33],
Bhasma yantra (4 yaam)	Arka ksheer (<i>Calotropis gingantea</i>) (10 times)	Rasataringini [33], Rasendra sambhava [47]
Laghuputa	Equal amount of Shudha hartala+ Shukti bhasma levigate with Kumari swaras (<i>Aloe vera</i>)	Rasataringini [33],
Kapotputa(12 puta)	Palashmula kwatha (<i>Butea monosperma</i>) (3 times), Mahish mutra (Buffalo milk) (3 times)	Rasataringini [33], Rasendra sambhava [47]
Mahaputa	Kumariswaras	Rasataringini [33],
Putra (10 cow dung)	Palashmula kwatha(3 times), Mahish mutra	Rasa Ratna Samuchaya [41],
Boiling in <i>Benincasa hispidia</i> Juice	Churnodaka, Apamarg mula rasa (<i>Achyranthes aspera</i>), Ksharodak (Alkaline water)	Rasendra Sara Sangraha [37]
Baluka Yantra	Changeri swaras (<i>Oxalis corniculata</i>), Nimbu swaras, churnodaka (2 yaam)	Rasendra Sara Sangraha [37]
Putra (12 yama)	Kumari swaras	Rasamanjari [50], Rasendra sambhava [47] Rasajalanidhi [39], Brihat Rasa Raja Sundar [45]
Putra (4 yama)	Churnodah, Apamarg Rasa (<i>Achyranthes aspera</i>), Ksharodak,	Rasajalanidhi [39],
Pithar Yantra (5 Days)	Punarnava Rasa	Rasajalanidhi [39],
Baluka Yanta (12 prahar)	Changeri swaras, Nimbu swaras, Churnodak	Rasajalanidhi [39],
Baluka Yanta / Handika Yantra	Sahdevi (<i>Vernonia cinerea</i>), Dugdika (<i>Euphorbia hirta</i>) & Bala Swaras (<i>Sida Cordifolia</i>)	Rasajalanidhi [39], Brihat Rasa Raja Sundar [45]

Tala Bhasma Pariksha (Test of incinerated Hartala [31, 39])

Properly incinerated Hartala does not produce smoke when put upon fire.

Pratyashadha (Antidote) for Haratala janya vikara

If any toxic effect was seen in the body of the person by consumption of improperly purified Hartala or any of its compound formulation, then they can be neutralized by administration of Rasa Jal Nidhi [39].

- Jira (*Cuminum cyminum*) mixed with Sugar for three days.
- Javasa swaras (*Alhagi camelorum*) /Kushamanda swaras (*Benincasa Hispidia*)/Rajahansa swaras (*Adiantum capillus- veneris*).

Rasataringini [33] -

Kushmanda Swarasa with sugar and Jiraka Churna thrice daily.

Ayurveda Prakash [31]

- Equal quantity of Jiraka powder and Mishri (Candy sugar) along with Madhu (Honey) (3 Masha) for thrice a day
- Kushamanda Swarasa with Mishri in 3 Thola (48 gm) for thrice a day.

Rasendra Sambhav [47]

Jeera mixed Mishri for 3 days.

Rasayan Sara [55]

Rasa Sindoor 2 Rati (250 mg) with Madhu (Honey) and Sitopladi churna for 7 days.

Table 7: Satvapatana (Extraction) of Hartala

Text	Methodology & Drug used
Rasatarangini [33]	1) i. Triturate 2 pala Hartala & 2 pala Tankan (Borax) in Mesh dugdha (Sheep milk), Kushmand swaras, Kumari swaras, Nimbu swaras, Arka dugdha (<i>Calotropis procera</i>), Eranda Taila (<i>Ricinus Communis oil</i>), Madhu (Honey) & Ghrita. ii. Make the mixture in tablet form iii. Put these tablets in Baluka yantra (a special type of equipment in which indirect heat is provided through sand) inside the bottle & subjected to heat for 4 days. <ul style="list-style-type: none"> • Resemblance of Satva- Kuleesh prabham
Rasa Ratna Samuchaya [41], Rasendra Chudamani [40]	1) i. Grind Shudha Hartala in Arka dugdha. ii. Mix Tila Tail in it. Put the mixture in Baluka yantra inside the bottle & subjected to heat for 7 yama. <ul style="list-style-type: none"> • Colour of Satva- white
Rasa Ratna Samuchaya [41]	2) i. Grind equal amount of Hartala & Got meet / Gandhak & Dravak gana aushadh ii. Put the mixture in Baluka yantra inside the bottle & subjected to heat
Rasa Prakash Sudhakar [42]	1) i. Triturate Shudha Hartala with Kulath kwatha, Tankan, Mahish ghrita (Buffalo Ghee), Madhu, Erand beej-majja (<i>Ricinus communis seed</i>) for a day. ii. Make the tablet of the mixture & put it in Baluka yanta for 12 hrs. Colour of Satva- white
Rasajalanidhi [39]	1) i. Shudha Hartala is incinerated by means of Triyak Patana Yanta. ii. A essence having white-coloured is obtained
Rasajalanidhi [39], Rasendra Chintamani [51] Ayurveda Prakash [31]	1) i. Hartala, mixed with ½ its quantity of Laksha (<i>Laccifer Lacca</i>), Raji, Tila, Shigru (<i>Moringa Olerifera</i>), Tankan, Lavana (Salt) and Guda (Jaggery). ii. Put it in ChidraMusa (Sieve like-crucible) iii. Subjected to thermal treatment in the Patana Yantra.
Rasajalanidhi [39], Ayurveda Prakash [31]	1) i. Hartala triturated with <i>Eranda Beeja (Ricinus Communis Seed)</i> & Jayapala (<i>Croton tiglium</i>). ii. Heated in a mud-smearred muslin cloth covered glass bottle, by means of the Baluka Yantra.
Rasendra Mangal [57]	1) i. Hartala is mixed with Tila, Sarshapa (<i>Brassica juncea</i>), Shigru, Laksha, Guda & Tankan is kept in crucible and heated in Bhudhara Yantra for melting for extraction of Satva.

Hartala Druti (Liquefaction)

The belly of a big fish is to cut out very carefully, remove the internal organs and debris material, and use it as a bag which is to be stuffed with purified Hartala. The borders of the bag being stitched carefully by means of thread. The whole things are then to be kept into an earthen vessel, covered in such a way as to let some air enter into it. The vessel is to be kept securely at the top of a big tree growing in locality far away from human habitation, so that the stench coming out of the fish in a state of putrefaction may not prove a nuisance to anyone. Innumerable insects grow upon the

putrefied fish. The stronger among these insects devour the weaker ones until a few very big ones survive. These big ones are very beautiful and have the colour of gold. These are to be taken out and kept suspended, by means of a thread, inside a glass bottle, closed by a light cork. This bottle is to be sunk up to its neck into rice, boiled with milk and still very hot, until the insects melt and collect into a gold-coloured liquid. This liquid may be used in all sorts of disease, and serves as a very important factor in the secret process of transformation of base metals into gold [39].

Table 8: Hartala Vedhan Kriya (Transmutation of lower metals into gold by Hartala) [39]

Base Metal	Levigation	Smearred Drugs used	Final Product
Copper leaf	Rudanti Rasa (<i>Capparis moonii</i>)	Hartala	Gold
16-part silver+ 12 Part copper leaf	Kakmachi Swaras (<i>Solanum nigrum</i>)	Hartala, Manahshila(Realgar), Hingula(Cinnabar), Parad(Mercury)	Gold

Hartala Sevan Pathya-Apathya (Dietary regulation during medicated Hartala intake):**Pathya-** Madhur Rasa (Sweet in taste).**Apathya-** Katu Rasa (Bitter), Lavan (Salt), Exposure of heat of fire & Sun. If Lavan is to be used, then it is advised to use Saindhava lavana (Rock salt) instead of any other salt.**Artificial preparation of orpiment [33]:**

Artificial preparation of Hartala is given in classical text of Rasatarangini in which 49 parts of purified arsenic oxide (Somala) & 24 parts of purified sulphur (Gandhaka) are to be mixed well in a mortar. Then this mixture is kept in Damru Yantram & subjected to mild heat. When it becomes self-cooled, then, this Yantra should be put off carefully and Haratala collected at the upper part of the Damaru Yantra is separated. This prepared orpiment does not need to be purified.

Table 9: Hartala Amayika prayog [33]

Anupana	Roga
Vasaswaras/Kantakari swaras	Shwas rog
Amragandhi haridra	Rakta vicar
Vacha+Jeerak	Apasmara
Panchtikta Kashaya	Kushtha
Devdaali swaras	Vatarakta janya upadrav
Bandhyakarkotaki swaras	Visarp
Kumari swaras	Twak rog
Haritaki churna	Arsh
Haridra swaras	Pandu
Giloy satva	Vatrakta
Tulsi swaras	Prameh
Aja mutra	Jalodar
Pippali churna+ Madhu	Agnimandhya
Tambula swaras	Kshaya
Manjishthadi Kashaya	Kushtha
Triphala+ sharkara	Pandu
Shunthi churna	Aamvata
Swaran Bhasma	Raktapitta
Tanduliya swaras	8 Jwara
Shudha Vatsanaabh + jeera	Hysteria
Samudra phalam	Jalodar
Devdaali swars	Bhagandara

Dose- ¼- ½ Rati [33]**Some Yogas (Formulations) of Hratala:**

Kasturibhairav Rasa Krimikastanal Rasa Chandkeshwar Rasa Talak Bhasma Talkeshwar Rasa Talsindur Talakoday Malhar Nityananda Rasa Bhutankusa Rasa` Manthana Bhairav Rasa Raktapittantak Rasa.

DISCUSSION

At the time of Vedic period Hartala was not being used for medicinal purpose but since Samhita Kala, it has been used therapeutically in several disorders like Unamada, Hikka, Shwasa, Kasa, Pandu Karma, Varna Shodhana, Arsha and Visha Chikitsa. Hartala is chemically Arsenic Trisulphide i.e., two molecules of Arsenic and three molecules of Sulphur (AS₂S₃), also called Orpiment or Arsenical gold ore or yellow arsenic. In Samhita only therapeutical application of Hartala are given but in classical texts of rasa shastra detailed description of hartala starting from synonym, mythological origin, indication, contra

indication, adverse effect, Shodhan, Marana, Satvapataana and various formulations have been explained. It is categorized under Uprasa Varga in Rasashastra text by different Acharyas. When properties of Hartala are assessed, all the textbooks have opined Katu, Kashaya, Snigdha, Usna property but in Rasa Kamdhenu it has Tikta & Guru property also in addition to previous four. Classics have described the varieties of Hartala on the basis of complexion. Most of the authors had accepted two types of Hartala viz, Patra Haritala and Pinda Haritala in which Patra tala is said to be best quality and Pinda Tala is lesser quality. Rasajalanidhi mentioned four types of Hartala & Shaligram Nighantu mentioned 8 types of Hartala. Therefore, in Rasa classics various synonyms are given like Chitragandham, Aalam, Natabhushan, Pinjaram, Godantam, Lomahritam, Romnashnam etc.

It is clear that Haritala is a poisonous drug containing arsenic. Many methods have been given almost in all the classics for Shodhan(purification),

Marana (incineration) and Satvapata (Extraction) of Hartala. Ashodhita (impure) Hartala is harmful to the body. Shodhana and Marana makes Hartala free from the doshas (morbid factors), If the Shodhan is not carried out properly, it may lead to many complications like Ayunashaka, Vamana, Kushtha, Prameha, Kapha-Vataroga etc.

REFERENCES

- Sharma, K., Inchulkar, S. R., & Kaushik, Y. (2020). An Ayurvedic review on Hartala (yellow orpiment): A Dhātuja Visha. *Journal of Ayurveda and Integrated Medical Sciences*, 5(04), 248-257.
- Srimannarayana, K. A. Pharmaceutico- Pharmacological study of Rasamanikya w.s.r. to Ekakustha (Psoriasis), RSBK-2006 IPGT&RA, GAU, JAMNAGAR.
- Shastri, K. N. (2004). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2004, Sutra Sthana, Dirghanjivitiya adhyaya; verse no 71, page no. 31.
- Shastri, K. N. (2004). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2004, Sutra Sthana, Aragvadhya adhyaya; verse no 5 & 12, page no. 49-50.
- Shastri, K. N. (2004). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2004, Sutra Sthana, Matrashtitiya adhyaya; verse no 26, page no.80.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana, Kushthachikitsa adhyaya; verse no 114, page no.216.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana Unmadachikitsa adhyaya; verse no 66-67, page no. 265.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana Arshaachikitsa adhyaya; verse no 56, page no.354
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana Hikka-Shwasachikitsa adhyaya; verse no 77-145, page no. 443, 452.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana kasachikitsa adhyaya; verse no 69-75, page no. 463.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana Vishachikitsa adhyaya; verse no 54-78, page no. 559-562.
- Shastri, K. N. (2006). Vidyotini Hindi commentary on Charak Samhita, Maharishi Agnivesa, Chaukhamba Sanskrit Sansthan, Edition 2006, Chikitsa Sthana Timirachikitsa adhyaya; verse no 196-67, page no. 668.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Sutra Sthana, Mishraka Adhyaya, verse no. 14-15, page no.407.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Chikitsa Sthana, Dwivarniya chikitsa Adhyaya, verse no. 60-108, page no.181,189.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Chikitsa Sthana, Arsha chikitsa Adhyaya, verse no. 12, page no.268.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Chikitsa Sthana, Kushtha chikitsa Adhyaya, verse no. 10, 27 page no.298,302.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Chikitsa Sthana, Vridhi-Updansha-Shlipada chikitsa Adhyaya, verse no. 40, 46, page no.389.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Chikitsa Sthana, Kshudra Roga chikitsa Adhyaya, verse no. 28,59 page no.396-400.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Kalpa Sthana, Sthavara Visha Vigyaniya Adhyaya, verse no. 5, page no.643.
- Thakral, K. K. (2014). Nibandha sangrah by Dalhana Acharya and Nyaya Chandrika by Sri Gyadas on Sushtuta Samhita, Chaukhamba orientalia, Edition 2014, Kalpa Sthana, Keeta Kalpa Adhyaya, verse no. 112, page no.722
- Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Sutra Sthana, Dumapanavidha Adhyaya, Verse no. 18, page no. 178.
- Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015,

- Chikitsa Sthana, Kasa chikitsa adhyaya, Verse no. 68-69, page no. 421.
23. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Chikitsa Sthana, Arsha chikitsa adhyaya, Verse no. 14(1-3), page no. 466.
 24. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Chikitsa Sthana, Kushtha chikitsa adhyaya, Verse no. 67, 70, page no. 558,559.
 25. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Nasa pratishedhiya adhyaya, Verse no. 24, page no. 706.
 26. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Vrana Vigyana pratishedhiya adhyaya, Verse no. 60, page no.740.
 27. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Granthiarbudashlipadaapchinaadi pratishedhiya adhyaya, Verse no. 24, page no. 762.
 28. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Guhyaroga pratishedhiya adhyaya, Verse no. 5, page no. 779.
 29. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Visha pratishedhiya adhyaya, Verse no. 24, page no. 786.
 30. Gupt, A. (2015). Vidyotini hindi commentary on Ashtang Hridaya, written by Vagabhatta, Chaukhambha Publication, Varanasi; edition 2015, Uttara Sthana, Kitalutadivisha pratishedhiya adhyaya, Verse no. 35-73, page no. 803-807.
 31. Mishra, G. S. (2014). Aethavidyotini & Arthaprakashini Sanskrit & Hindi commentaries on Ayurveda Prakash of Acharya shri Madhava, Choukhamba Bhartiya academy Varanasi; edition 2014, 2nd Chapter, verse no.173-212page no. 304-312.
 32. Acharya, Y. T. (1988). Rasakamdhenu compiled by vaidhyavara sri chudamani, choukhambha Orientalia, Varanasi; edition 1988, Dvitiya Dhatusangrapaad chaturtha adhikara, verse no.64-78, page no.283, 285.
 33. Sharma, S. (2009). Rasatarangini. Motilal Banarasidas New Delhi: edition 2009, 11th Chapter, verse no 1-103 page no 146-245.
 34. Mishra, S. N. (2018). "Siddhiprada" Hindi Translation on Anandakanda, Chaukhambha Orientalia, Varanasi, edition 2018, verse no 48, page no. 647.
 35. Daas, K. K. (1981). Shaligram Nighantu, shri vaikateshwar steam press- Mumbai, edition 1981, Dhatu-updhatu varga, page no.560-562.
 36. Tripathi, I. (2010). Dravyagunaprakashika hindi commentary on Rajanighantu of Pandit Narhari, Chowkhamba Krishnadas Academy, Varanasi; edition 2010, suvarnadi varga, verse no.65, page no.441.
 37. Tripathi, I. (2003). Savimarsa 'Rasavidyotini' Hindi commentary on Rasendrasarasangraha, Chaukhambha Orientalia, Varanasi, edition 2003, Pratham Adhyaya, verse no. 176-177, page no.45.
 38. Sharma, P. V. Tripathi, I. (2005). Dhanvantari Nighantu, Mahendra Bhougika translated by Sharma, G. P., Chaukhambha Orientalia, Varanasi, edition 2005, Mishrakadi Varga, verse no.107, page no.279.
 39. Mookerjee, B. (1984). Rasa-Jala-Nidhi, Srigokul Mudranalaya, Varanasi, edition 1984, Vol-II, 2nd chapter, page no.155.
 40. Mishra, S. (2017). Rasendra- Chudamani by Acharya Somdeva, Chaukhambha Orientalia Varanasi-1, edtion 2017, Ekadasha adhyaya, verse no.33, page no.176.
 41. Shastri, K. S. A. (2015). The Suratnojjvala Hindi Commentary on Rasaratna Samuchchaya of Sri Vagbhatacharya, Chaukhamba Amarabharati Prakashan, edition 2015, 3rd Chapter, verse no70, page no.76.
 42. Mishra, S. (2013). 'Siddhiprada' hindi commentary on Rasaprakasha Sudhakar of acharya Yashodhar, Chaukhambha Orientalia Varanasi, edition 2013, 6th chapter, verse no.2, page no.114.
 43. Mishra, S. (2005). 'Siddhiprada' hindi commentary on Rasapaddhati by Acharya Bindu, Chaukhambha Orientalia Varanasi, edition 2005, Uparasa prakarana, verse no.86, page no.112.
 44. Chuneekar, K. C. Mishra, S. (2020). Svimarsha Hindi commentary on Bhavprakasha Nighantu of Bhavamishra, Chaukhamba Bharatia academy, Vranasi, edition 2020, Dhatvadi varga, verse no.130, page no. 606.
 45. Chaubey, D. (1998). Brihatrasarajasundar, Motilal Banarasidas publisher's Pvt ltd Delhi, edition 1998, Uprasa, page no.144.
 46. Panta, T. (1978). Rasachandrika Hindi Commentary on Rasarnavam by Indradeo Tripathi, Chowkhamba Sanskrit Series Office, Varanasi, edition 1978, Saptam Patala, verse no 74, page no.46.
 47. Vaidhya, V. D. (1997). Rasendra Sambhava, Krishna dasa academy Varanasi, edition 1997, Dwitiya prakaran verse no.154, page no. 116.
 48. Shastri, L. P. (2005). Vidhyotitini hindi commentary on Yogaratnakara, Chaukhambha Prakashan, Varanasi, edition 2005, verse no.1. page no.147.
 49. Madanpaal, N. Acharya Madanvinod e-Nighantu Designed and Development by National Institute of

- Indian Medical Heritage, Suvarnadi varga, verse no27.
50. Mishra, S. N. (2003). 'Siddhiprada' hindi Translation on Ras Manjari by Acharya Shalinath, Chaukhambha Orientalia, Varanasi, edition 2003, 3rd Chapter, verse no 69, page no.37.
51. Mishra, S. N. (2006). 'Siddhiprada' hindi Translation on Rasendra Chintamani by acharya Dundhuk Nath, Chaukhambha Orientalia, Varanasi-1, edition 2006, 7th Chapter, verse no 75-76, page no.99.
52. Joshi, D. (2003). English translation of Rasamritam of Vaidhya Jadavji Trikamji Acharya, Chaukhambha Sanskrit Sansthan, Varanasi, edition 2003, verse no.4-6, page no.114.
53. Mishra, S. N. (2013). Rasa Pradeep, Chaukhambha Orientalia, Varanasi, edition 2013, verse no.252-253, page no 57.
54. Acharya Y. K. Siddha yoga Sangraha, Shri Vaidhanath Ayurveda Bhavan Ltd, Allhabada, Page no.162.
55. Vaidhya, S. (2005). Rasayansara Vol-1, Chowkhamba Krishnadas Academy Varanasi, edition, verse no 379, page no.116.
56. Mishra, S. (2003). Incorporating 'Shasiprabha' Hindi Annotation of Rasaratnakar-Riddhi Khand by Nityanath Siddha, Chaukhambha publicaers, Varanasi, edition, vers no 83-86, pno. 34-35.
57. Sharma, H. S. (2003). Rasendra Mangalam, Chaukhambha Orientalia, Varanasi, edition, 2nd Chapter, verse no 34, 39.