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REVIEW ARTICLE

Review on Yashad Bhasma – A Herbometallic Preparation of Indian System of Medicine

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ABSTRACT

Rasa Shastra an ancient science of pharmaceutics that primarily utilize metals and minerals in the form of Bhasma for therapeutic purpose. Yashad Bhasma – a zinc-based herbometallic preparation is a well-known bhasma (based on single metal) for its wide range of utilization in the treatment of eye diseases, anemia, diabetes, asthma, skin diseases, etc. Rasaka Satva is found mentioned in Rasarnava for the first time. Zinc is first described in Madanpal Nighantu under the name Yashad but not described things related to Yashad Bhasma. In Rasa Grantha, Ayurveda Prakasha was the first to describe Yashad as a Dhatu among Seven Dhatus (metals) and also described other things related to Yashad Bhasma. The present work aimed to collected and analyzed various references of Yashad Bhasma from available classical text. Various published articles were also searched and included to review updated knowledge regarding the Yashad Bhasma.

Keywords: Metals, Rasa Shastra, Rasaka Satva, Yashad Bhasma

INTRODUCTION

Bhasmas are unique Ayurvedic herbometallic preparations useful in various ailments with quicker action in smaller doses and longer stability period.[1,2] Yashad Bhasma is a unique particulate preparation of zinc which has been made with single metal – Yashad Dhatu.

A category of Dhatu in Rasa Shastra is the one of Puti-Loha. Puti means low quality, giving some undesirable smell, not up to the mark, reflecting lesser qualities or low qualities than their category of substances not having their constitution as per their ideal category. The puti-Lohas, which have now been accepted, are the Naga (Lead), Vanga (Tin), and Yashad (Zinc). Throughout various texts, Yashad is classified under – Dhatu, Puti-Loha, Trivanga, and Triloha.

Before Madanpal Nighantu, Yashad is found as Rasaka Satva or Kharpara Satva in Rasa texts. In Charak Samhita, Riti (alloy of Yashad) has been described as a substance of vessels and instruments.[3] Yashad was 1st time described as a metal in Madanpal Nighantu (14th AD) with its synonyms and pharmacological actions.[4] In Rasa Grantha, Ayurveda Prakash was the first to describe Yashad as a Dhatu among seven Dhatus.[5]

Ancient Acharya of Rasa Shastra has discovered several methods of processing metals before transforming them into bhasma, these process includes Shodhana, Jarana, and Puta. The term marana means to kill. After marana process, the metallic nature of metal is killed and it is converted into such form in which these are absorbed and assimilated into body fluid. In general, four types of medicine are used to prepare the metallic bhasma that includes Rasa (Mercury bhasma or kajjali), herbs, gandhaka, and arilauha.

Various references of Yashad Bhasma are mentioned in classics of Rasa Shastra. Yashad Bhasma is one of the potent medicines prepared through subjecting zinc metal to special procedure such as Shodhana, Jarana, and Marana. Studying such literary work enables

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one to acquire detailed knowledge of the Yashad Bhasma including pharmaceutical process, Bhasma properties, dose, and various therapeutic uses.
Various researches conducted on Yashad Bhasma were reviewed for better understanding and upgradation of concepts regarding Yashad Bhasma.

MATERIALS AND METHODS

Classics starting from 12th AD to 20th AD were reviewed for relevant references of Yashad Bhasma preparation, Rasak Satva shodhan, marana, Bhasma properties, various therapeutic uses, and other related things.
Few recent researches on Yashad Bhasma have also been reviewed to provide updates on the preparation.

12th century AD

1. Rasarnava, a text of 12th AD, mentioned Rasaka Satva,[6] but not mentioned Satva shodhana, marana and Satva bhasma's properties, etc.
2. Another text of the same period, Rasendra Chudamani has mentioned Rasaka Satva and described Rasaka Satva marana[7] and therapeutic use of Rasaka Satva Bhasma.[8]

13th century AD

1. Rasa Prakash Sudhakara mentioned marana of Rasaka Satva[9] and also mentioned uses and properties of Kharpara Satva Bhasma[9]
2. Rasaratna Samuchchaya mentioned Bhasmikaran of Kharpara Satva[10] and therapeutic uses of Kharpara Satva Bhasma[10]
3. Riddhi Khanda of Rasa Ratnakar from the same period mentioned only method of Rasaka Satvapatan[11] and not described Rasaka Satva shodhana, marana.

14th century AD

1. It is first described in Madanpal nighantu under the name Yashad. The author described name, properties, and therapeutic uses of Yashad Dhatu.[4] Madanpal Nighantu is not a Rasa Shastra text so the author has not described Yashad Bhasma preparation method and other things related to Yashad Bhasma.

15th century AD

1. Rasa Chintamani explained only method of Rasak Satvapatan and said that it is similar to Naga (lead).[12]

16th century AD

1. Bhavaprakasha described Yashad in seven Dhatus.[13] According to Bhavprakash Yashad is similar to Ranga (vanga/tin) and one synonym is Ritihetu.[14] Riti is upadhatu (alloy) of Tamra and Yashad (copper and zinc).[15] Properties and pharmacological action of Yashad have been described in Bhavaprakasha[14,16] and the author said its purification and process of calcinations are similar to that of tin.[16]

17th century AD

1. In Rasa Grantha, Ayurveda Prakasha was the first to describe Yashad as a Dhatu among seven Dhatus.[5] Synonyms, properties, and therapeutic uses of Yashad[17,18] are described in Ayurveda Prakash and said thart its shodhana and marana are similar to Vanga.[19] The author of Ayurveda Prakash has mentioned complications caused by the consumption of impure and improper Yashad Bhasma and he has also explained their remedies.[18]

19th century AD

1. Brihad Rasarajsundar described shodhana, marana of Jasad[20] and also described dose, properties, anupana of Jasad Bhasma.[21] The author of Brihad Rasarajsundar has also explained complexity due to improper Jasad Bhasma and also clarified their medication.[22]

20th century AD

1. Name,[23] Grahya (acceptable) – Agrahya (unacceptable) form,[24] four types of shodhana

process and four types of marana process of Yashad[25] are described in Rasa Tarangni. The author of Rasa Tarangni also described physiological properties,[26] therapeutic use,[27] dose,[28] and diseases due to improper Yashad Bhasma[29]

2. The author described physical form of Yashad Bhasma used in formulations.[30] The author also described marana process of Kharpara Satva[31] and therapeutic uses of Kharpara Satva Bhasma.[32] The author said that Kharpara Satva Bhasma doses are similar to Yashad Bhasma doses[33]
3. Another text of same period Rasajalanidhi has mentioned properties, two shodhana process and three marana process of Jasad.[34-36] He has also mentioned accompaniments, therapeutic use, doses of Yashad Bhasma,[34,37] and evil effect of not properly purified and incinerated Yashad and its remedy[38]
4. The author also described Rasaka Satva Marana and therapeutic uses of Rasaka Satva Bhasma[39]
5. Rasamrita described synonyms, pharmacotherapeutic properties, shodhan and marana process of Yashad[40]
6. Rasa Chandasu described Yashad shodhana – marana process,[41] pharmacotherapeutic properties of Yashad[41] and also described effect of improper Yashad Bhasma and its remedy like Brihad Rasarajsundar.[42]

Related references have been reviewed and observed that there are so many process of Yashad/ Rasaka Satva shodhana [Table 1], marana [Table 2], properties of Bhasma [Table 3], therapeutic use [Table 4], Anupana [Table 5], Yashad Bhasma matra [Table 6], and effect of improper Yashad Bhasma and its remedy [Table 7].

In today's regime

In recent past, 12 works have been reported from the institutes of Jamnagar, BHU, Haridwar, and Bengaluru taken up by the scholars of Rasa Shastra and others till 2020.[43] Pharmaceutical

Table 1: Collected references of Yashad Shodhana process

S. No.	References	Shodhan categorization and media	Activity
1.	Bhavprakash {7 (3)/3-4, 74}	**Samanya for Dhatus**: Taila – Takra – Kanji – Gomutra – Kulattha Kwatha **Yashad Vishesha Shodhana**: Like Vanga Vishesha Shodhana: Arka Dugda	**Quenching/Nirvapa** 3 times each 3 times
2.	Ayurveda Prakash (3/48, 54, 52-53)	**Samanya for Dhatus**: 1. Takra – Kanji – Gomutra – Tila Taila – Kulattha Kwatha 2. Kadli mula swarasa **Yashad Vishesha Shodhana**: Like Vanga Vishesha Shodhana: Kanji adi Drava – Arka Dugda	**Quenching/Nirvapa** 3 or 7 times each 7 times 7 times each
3.	Brihad Rasarajasundra (pg-78)	**Yashad Vishesha Shodhana**: Milk	**Quenching/Nirvapa** 21 times
4.	Rasa Tarangini (15/4-6, 7), (19/98-103)	**Samanya for Dhatus**: 1. Kanji – Takra – Kulattha Kwatha – Gomutra – Tila Taila 2. Kadlikanda swarasa **Yashad Vishesha Shodhana**: 1.Churnodaka or 2.Nirgundi mula swarasa or 3.Godugdha or 4.Sudha Dugdha	**Quenching/Nirvapa** 3 times each 7 times 7 times 7 times 21 times 7 times
5.	Rasa Jala Nidhi (2nd part, chapt. 4th, pg-242-243), (Vol. 3rd, chapt. 2nd, pg-97)	**Samanya for Dhatus**: Kadli mula swarasa **Yashad Vishesha Shodhana**: Godugdha	**Quenching/Nirvapa** 7 times 21 times
6.	Rasamrit (2/117)	**Yashad Vishesha Shodhana**: Godugdha	**Quenching/Nirvapa** 21 times
7.	Rasa Chandashu (Purvakhand, slok-490, pg-78), (Purvakhand, slok-645, pg-102)	**Samanya for Dhatus**: Taila – Takra – Gomutra – Kulattha Kwatha – Kanji **Yashad Vishesha Shodhana**: Godugdha	**Quenching/Nirvapa** 7 times each 21 times

Table 2: Collected references of Rasaka Satva/Yashad Marana Process

S. No.	Type	Media	No.	Color	References
1	Jaran	Apamarg	-	Angar like	AP3/157-159 (Vanga like), RT19/112-115
2	Jaran	Shudh Haratala (Rasaka Satav Marana)	-	-	R.Chu. 10/124, RPS5/117, RRS2/168, RT21/209-211, RJN 2nd part, chapt. 1st, pg-128
3	Jaran	-	-	Sweta like Chandani Pushpa or like moon	RT19/116-119
4	Jaran	Nimb Patra	-	Sweta like Dhana Kheel	BRRSpg 78-79, RJN Vol. 3rd, chapt. 2nd, pg-97-98
5	Dipping following by Jarana	D-Ahiphen Jala or Hingu Jala	-	-	R.Chan. Purvakhand, slok-648-649, pg-102
6	Puta Paka	Manhashila, Gandhaka, Araka dugdha (Samanaya marana for Dhatus)	12	-	AP3/56, R.Chi. 6/20, RT15/8
7	Puta Paka (gajputa)	Haridra, Yavani, Sorak Shilajit, Apamarg, Chincha	-	-	AP3/160 (Vanga like)
8	Puta Paka (gajputa)	Alasi pinyak, Yavani	-	-	AP3/161 (Vanga like)
9	Puta Paka	Haratala, Arak Dugdha, (kept durg in Ashvath Valkal)	7	-	AP3/170 (Vanga like)
10	Puta Paka	Kalmi Sora, Haridra	-	Kundendu Dhaval	AP3/171-173 (Vanga like)
11	Puta Paka	Chicha, Tila	-	Sweta	AP3/174-176
12	Puta Paka	Parad, nimbu, Gandhak	-	-	RT19/104-107
13	Puta Paka	Parad, Gandhak, Kumari swarasa	-	-	RJN Part 2nd, Chapt. 4th, Pg-247-248
14	Puta Paka	Kajjali (Samanaya Marana of Dhatus)	-	-	R.Chan. Purvakhand, slok 491-492, pg-78
15	Jaran Followed by Puta method	J-Chincha, Ashwath P-Haratala, Nimbu swarasa	P-10	-	AP3/177-180 (like Vanga), BP7 (3)/75-77 (like Vanga)
16	Jaran Followed by Puta method	P-Haratal	-	-	RT19/108-111
17	Jaran Followed by Puta method (Gajputa)	J-Bhanga, Posta P-Kumari swarasa	P-7	-	RM 2/118-119
18	Lepan following by Puta method (Gajputa)	L-Parad, Gandhak, Kumari swarasa, Nimbu swarasa	P-1	-	BRRS pg-79, RJN Vol. 3rd, chapt. 2nd, pg-98-99, R. Chan. Purvakhand, slok 646-647, pg-102

R.Chu: Rasendra Chudamani, RPS: Rasapraksh Sudhakar, RRS: Rasaratan Samuchchaya, R.Chi: Rasendra Chintamani, AP: Ayurveda Prakash, BRRS: Brihad Rasa Raj Sundar, RT: Rasatarngni, RJN: Rasa-Jala-Nidhi, BP: Bhava Prakash, RM: Rasamrit, R.Chan.: Rasa Chandasu, D: Dipping, J: Jarana, P: Putapaka, L: Lepan

Table 3: Rasaka Satva Bhasma/Yashad Bhasam Guna – Karma

S. No.	Guna – Karma		References
1	Rasa	Kasaya (Astringent) Tikta (Bitter)	MN4/12, BP6 (8)/33, AP3/183 , RT19/120, RM2/116, RJN Vol. 3rd, chapt. 2nd, pg-96, BRRS pg-79, R. Chan. Purvakhand, slok 651, pg-102
		Katu (Spicy)	RT19/120
2	Guna	Sara	BP7 (3)/81
		Sitala	MN4/12, BP6 (8)/33, BP7 (3)/81, A3/183P, RT19/120, RM2/116, RJN Vol. 3rd, chapt. 2nd, pg-96, BRRS pg-79, R. Chan. Purvakhand, slok 651, pg-102
3	Doshaghnata	Pecifies Kapha and Pitta	MN4/12, BP6 (8)/33, BP7 (3)/81, A3/183P, RT19/120, RM2/116, RJN Vol. 3rd, chapt. 2nd, pg-96, BRRS pg-79, R. Chan. Purvakhand, slok 651, pg-102
		Pecifies Vata	RT19/124
4	Karma	Chaksusya	MN4/12, BP6 (8)/33, BP7 (3)/81, A3/183P, RT19/120, RM2/116, RJN Vol. 3rd, chapt. 2nd, pg-96, BRRS pg-79, R. Chan. Purvakhand, slok 651, pg-102
		Bala, Veerya, and Buddhi Vardhak	RT19/120
		Slaismik Kala Sankochak Vranasrav Rodhak	RT19/122
		Masiksrav niyamak Relieves tiredness due to over work	RT19/123

MN: Madanpal Nighantu

Table 4: Therapeutic uses of Rasaka Satva Bhasma/Yashad Bhasam

Diseases	References
Prameha (increase frequency and turbidity of urine)/Madhumeha (diabetes mellitus), Pandu (anemia), Swasa (asthma)	MN4/12, BP6 (8)/33, BP7 (3)/81 AP3/183, RT19/121, RT21/212-213, RM2/116, RJN Vol. 3rd, chapt. 2nd, pg-96, BRRS pg-79, R. Chan. Purvakhand, slok 651, pg-102
Kasa (cough)	RT19/121, RT21/212-213
Night sweat due to tuberculosis and chronic fever	RT19/121
Kampavata (parkinsonism)	RT19/123
Kshya (pthisis), Hikka (hiccup), Shotha (inflammation), Gulma (abdominal lump), Visham jwar (intermittent fever), Rajha Shool (pain during menstruation), Sweta Pradar (leukorrhea) Raktagulma (hematoma)	RT21/212-213

Table 5: Anuran/Sahapana of Rasaka Satva Bhasma/Yashad Bhasam

Anupana/Sahpana	Disease	References
Tambula Swarasa	Prameha	RJN Vol. 3rd, chapt. 2nd, pg-99-100, BRRS pg-79
Hima of Kharjura and Tanduliya roots	Raktatisara (diarrhea with blood), Fever an Excess of pittam	
Yavanini and lavanga	Fever accompanied with a sensation of coldness	
Sugar and Jeera	Atisara (diarrhea) and Vami (vomiting)	
Abhrak Bhasma+Honey	Kasa, Swasa	RT19/126-145
Adrak swarasa+Honey	Swasa	
Suhaga+Abrak Bhasma+Vanshlochan Churna	Swasa	
Loha Bhasma, Abhrak Bhasma, Pippali churna, and Honey	Pratmak Swasa (bronchial asthma)	
Praval Bhasama	Night Sweats due to Kshya	
Go-ghrta	Slaismik kala Daurbalya of Nasika due to repeated Pratisyay (coryza) (by nasay), Vicharchika (eczema) (by lepan)	
Kwath of Konch root, Rasana, Bala and Erand root	Pakshaghata (hemiplegia)	
Swarna vanga	Swapna Prameha due to mental weakness	
Ashok twak Kwath	Ati vedna yukta and Praval Masik srava after 3–4 months discontinuation	
Loha Bhasma and Rala churna	Sweta Pradara due to discontinuation of masik srava	
Rasa Sidura and Bhimsaini Karpura	Sannipatic Jwara (high fever due to vitiation of all dosas)	
Rasa Sindura and Honey	Mastisk Daurbalya with uneasiness and tiredness	
Swarna Bhasma	Yoshapsmar	
Rajat Bhasma+Swarnamashik Bhasma+Chitrak Mool twak	Ardhavbhedak (migraine) and Suryaverta	
Puran Ghrat	Drasti Daurbalya	RT19/126-145, RJN Vol. 3rd, chapt. 2nd, pg-99-100, BRRS pg-79
Arni mool twak churna	Jatharagni Daurbalya (digestive impairment)	
Elaychi beej Churna, Dalchini Churna, Tejpatra Churna	Tridosha	
Kanta loha Bhasma+Triphala Kwath+Tila Churna/taila	Kshya, Yoniroga (diseases of female genital tract), Jwara (fever), Visham Jwara and all diseases of Stri (female), Hikka, Raktagulma, Pradara (excessive vaginal discharge), Somaroga (polyuria in females), Shool due to Krichartva, Pitta roga diseases due to pitta dosha), Shotha, Gulma	R. Chu. 10/125-128, RRS2/169-172, RJN part 2nd, Chapt. 1st, pg-128-129
	Kshya, Yoniroga, Jwara, Visham Jwara and all diseases of Stri, Vatavikar (diseases due to vata dosha)	RPS5/118-120

standardization,[44] analytical profiles,[44,45] evaluating safety and bioactivity,[46] clinical efficacies in myopia,[47] childhood anemia,[48] hypoglycemia,[49] pharmacological evaluation in wound healing,[50] and diabetes[51] were attempted in research articles. Availability of essential elements in Bhasma[52] and cosmetic use of Bhasma[53] were also set out in studies.

Table 6: Yashad Bhasma Matra

Matra	½–1 Ratti (62–125 mg) according to Bala-Kala, etc.	2 Ratti (250 mg) a day if incinerated with orpiment 6 Ratti (750 mg) a day if incinerated without orpiment	2 Ratti (250 mg)
No. of references	28	36	21

Table 7: Evil effects of improper incinerated Yashad Bhasma and their remedy

Evil effects	Prameha, Ajeerna, Vata Vyadhi, Vaman, Bhram	Gulma, Prameha, Kshaya, Kustha
Remedy	Bala+Abhaya+Sita Churna for 3 days	
No. of references	18, 22, 37, 42	28

Analytical facts of Yashad Bhasma

Dynamic light scattering studies reveal that Yashad Bhasma prepared by electric muffle furnace heating has 70% nanoparticles in the range of 250–750 nm, while that the sample prepared by using traditional method of heating has shown 30% particles in the range of 200–700 nm.[44] In XRD analysis, Yashad sample was crystalline in nature and highest peak was correspond to element zinc and in its bhasma crystalline structure was destroyed and highest peak correspond to zinc oxide.[45] XRF analysis, Yashad sample has 98.20% zinc metal along with other trace elements such as Pb – 0.63%, Sn – 0.11%, Fe – 0.56%, Ca – 0.07%, Al – 0.09%, and Cr – 0.06%, and in Yashad Bhasma, 98.20% zinc oxide was present along with trace element such as Fe_2O_3 – 2.6%, K_2O – 0.8%, Al_2O_3 – 0.32%, and PbO – 0.2%.[45]

The XRD results accompanied with Rietveld analysis indicate that the final bhasma is mainly oxide of zinc, whereas the intermediate is mainly sulfide of zinc.[46] The animal studies show that the bhasma as well as its intermediate do not lead to any bioaccumulation of zinc in major organs, when administered with and without anupan.[46] Both, bhasma and intermediate, do not cause any deleterious effects on kidney and liver as indicated by blood biochemistry and SPECT studies.[46] However, the intermediate perturbs antioxidant status more and affects the platelet turnover, in comparison with bhasma.[46] On 28-day treatment, the bhasma treated animals show prominence of T_H1 mediate immune response, whereas intermediate treated animals show prominence of T_H2-mediated immune response.[46]

Two samples of Yashad Bhasma from Baidyanath and Deshrakshak Aushdhalaya contained 60.0 and 13.4% Zn, respectively.[52] Although Yashad Bhasma sample from Baidyanath contained significant amount of Al (0.30%), Fe (2.28%), and P (0.22%) and no Ca, whereas Yashad Bhasma sample from Deshrakshak Aushdhalaya showed Mg (6.7%), Ca (19.3%), K (0.22%), and Mn (0.03%).[52]

The traditional Ayurvedic proprietary Jasad Bhasma is a promising novel candidate as a wound healer.[50] Iron along with Yashad Bhasma is more beneficial than iron in anemia.[48] Both Yashad Bhasma and Shilajatu possess hypoglycemic activity.[49] However, such activity is relatively more pronounced in Yashad Bhasma treated rates than the Shilajatu treated ones.[49] Jasad Bhasma showed a significant antihyperglycemic effect against streptozotocin-induced diabetes in rat.[51] Bhasmas in which Yashad bhasma is also include can prove to be the most effective, organic, and health supportive ingredients in topical face treatments.[53]

DISCUSSION

Rasaka (Kharpara) is of three types includes – (1) Mratika rupa, (2) Guna rupa, and (3) Pashana rupa,[54] which are compared with zinc oxide, zinc sulfide, and zinc silicate or carbonate in sequence.[55] Satvapatana which described in Rasa Shastra is a metallurgy in modern era. The satva obtained by it, is mainly the same element, whose mineral/ore we deal with Satvapatana, therefore, the substance obtained from Rasaka Satvapatana is Yashad or its mixture.

Bhasmas are unique Ayurvedic metallic preparations used in the Indian subcontinent since the 7th century BC and widely recommended for the treatment of a variety of chronic ailments. The Bhasmas are in fact products of classical alchemy inorganic compounds of certain metals and gems

in a very fine powdered form, mostly oxides, made in elaborate calcinations process known as Marana which is also known as Bhasmikarana. It is believed that bhasmikarana process converts the metal into its specially desired chemical compound which eliminates the toxicity of the metal and has the necessary medicinal benefits. The methods of Bhasma preparation vary so much for each metal such that Bhasma with different colors are produced. The resultants are considered to be same medicinal substances with the different indications even though these may differ in the chemical composition between them. However, it is a well-known fact that if two compounds have different chemical composition, then their pharmacodynamic and pharmacokinetic action will be different.[56]

Yashad Bhasma is utilized in many Ayurvedic formulations. Rasaka Satva is found elaborated in Rasarnava for the first time but Bhasma of the same is not mentioned here. Rasendra Chudamani mentioned Rasaka Satva and described its marana[7] and therapeutic uses of its Bhasma.[8] It is first described in Madanpal Nighantu under the name Yashad[4] but not described things related to Yashad Bhasma preparation.

In Rasa Grantha, Ayurveda Prakasha was the first to describe Yashad as a Dhatu among seven Dhatus[5] and also described other things related to Yashad Bhasma.

Samanaya shodhana for Dhatus and vishesh Shodhana for Yashad are described in classics and also mentioned many marana process like – Jaran, Dipping followed by Jaran, Puta Paka, Jaran followed by Puta, and Lepan followed by Puta method. Yashad Bhasma Guna – Karma, many therapeutic uses and Anupana, Matra, evil effects of improper Bhasma, and their remedy described in classics.

CONCLUSION

The critical review revels that primitively Rasaka Satva was used during the 12th century AD and later Yashad was described in Madanpal Nighantu and in Rasa Grantha, Ayurveda Prakash was the first to describe Yashad as Dhatu. In Ayurvedic Formulary of India, Yashad Bhasma is used in place of Rasaka described in classical formulations.[57]

According to published research articles on Yashad Bhasma – it is observed that Yashad Bhasma prepared by electric muffle furnace heating has 70% nanoparticles in the range of 250–750 nm, while that the sample prepared by using traditional method of heating has shown 30% particles in the range of 200–700 nm.[41] In XRD analysis of zinc bhasma, crystalline structure was destroyed and highest peak correspond to zinc oxide. XRF analysis in Yashad Bhasma 98.20% zinc oxide was present along with trace elements such as Fe_2O_3, K_2O, Al_2O_3, and PbO. Yashad bhasma shows many therapeutic activities such as wound healing, hypoglycemic, and activity to cure anemia. Yashad Bhasma is also used in many skincare formulations.

REFERENCES

1. Vagbhat AS, Samucchayah R. Siddhiprada Hindi Commentary by Prof. Siddhi Nandan Mishra. 1st ed. Varanasi: Chaukhambha Orientalia; 2011. p. 28.
2. Sharangadhar A, Samhita S. Jiwanprada Hindi Commentary by Dr. Smt. Shailaja Srivastava. Vol. 1. Varanasi: Chaukhambha Orientalia; 2017. p. 12.
3. Agnivesa A, Samhita C. Vidyotini Hindi Commentary by Pt. Kasinatha Sastri and Dr. Gorakha Natha Chaturvedi, Part 2nd. Varanasi: Chaukhambha Bharati Academy; 2018. p. 989.
4. Madanpal SN, Nighantu M. Hindi Commentary by Prof. (Dr.) Gyanendra Pandey. 1st ed., Vol. 4. Varanasi: Chaukhambha Orientalia; 2012. p. 347.
5. Madhava AS. Ayurveda-Prakasa, Arthavidyotini and Arthaprakasini Sanskrit and Hindi Commentaries by Shri Gulrajsharma Mishra. Vol. 3. Varanasi: Chaukhambha Bharti Academy; 2016. p. 342.
6. Rasarnavam R. Rasachandrika Hindi Commentary by Dr. Indradeo Tripathi, Chowkhamba Sanskrit Series. 6th ed., Vol. 7. Varanasi: Vikram Era; 2018. p. 92.
7. Somdeva A, Chudamani R. Siddhiprada Hindi Commentary by Dr. Siddhinandan Mishra. Vol. 10. Varanasi: Chaukhambha Orientalia; 2009. p. 163.
8. Somdeva A, Cudamani R. Siddhiprada Hindi Commentary by Dr. Siddhinandan Mishra. Vol. 10. Varanasi: Chaukhambha Orientalia; 2009. p. 163.
9. Yashodhar A, Sudhakar R. Siddhiprada Hindi Commentary by Dr. Sddhinandan Mishra. Vol. 5. Varanasi: Chaukhambha Orientalia; 2009. p. 110.
10. Rasaratnasamucchaya V. Vijnanabodhini Hindi Trans. and commentary by Prof. Dattatreya Anant Kulkarni. Vol. 1. New Delhi: Meharchand Lachhmandas Publications; 2017. p. 42.
11. Siddha N, Rasaratnakar R. Vadi Khand Riddhi Khand, Shasiprabha Hindi Commentary by Swaminath Mishra.

2nd ed. Varanasi: Chaukhambha Publishers; 2003. p. 201-2.
12. Soori AA. Rasachintamani, Siddhiprada Hindi Commentary by Prof. Siddhinandan Mishra. 2nd ed., Vol. 5. Varanasi: Chaukhambha Publishers; 2003. p. 111-2.
13. Bhavaprakasa B. English Commentary by Dr. Bulusu Sitaraman, Foreword by Prof. K.C. Chunekar. 1st ed., Vol. 6. Varanasi: Chaukhambha Orientalia; 2006. p. 399.
14. Bhavaprakasa B. English Commentary by Dr. Bulusu Sitaraman, Foreword by Prof. K.C. Chunekar. 1st ed., Vol. 6. Varanasi: Chaukhambha Orientalia; 2006. p. 401.
15. Bhavaprakasa B. English Commentary by Dr. Bulusu Sitaraman, Foreword by Prof. K.C. Chunekar. 1st ed., Vol. 6. Varanasi: Chaukhambha Orientalia; 2006. p. 406.
16. Bhavaprakasa B. English Commentary by Dr. Bulusu Sitaraman, Foreword by Prof. K.C. Chunekar. 1st ed., Vol. 7. Varanasi: Chaukhambha Orientalia; 2006. p. 588.
17. Madhava AS. Ayurveda-Prakasa, Arthavidyotini and Arthaprakasini Sanskrit and Hindi Commentaries by Shri Gulrajsharma Mishra. Varanasi: Chaukhambha Bharti Academy; 2016. p. 380.
18. Madhava AS. Ayurveda-Prakasa, Arthavidyotini and Arthaprakasini Sanskrit and Hindi Commentaries by Shri Gulrajsharma Mishra. Vol. 3. Varanasi: Chaukhambha Bharti Academy; 2016. p. 381.
19. Madhava AS. Ayurveda-Prakasa, Arthavidyotini and Arthaprakasini Sanskrit and Hindi Commentaries by Shri Gulrajsharma Mishra. Vol. 3. Varanasi: Chaukhambha Bharti Academy; 2016. p. 380.
20. Chauve D. Brihad Rasarajsundr. 3rd ed. Varanasi: Chaukhambha Orientalia; 2000. p. 78-79.
21. Chauve D. Brihad Rasarajsundr. 3rd ed. Varanasi: Chaukhambha Orientalia; 2000 p. 79.
22. Chauve D. Brihad Rasarajsundr. 3rd ed. Varanasi: Chaukhambha Orientalia; 2000. p. 79-80.
23. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 473.
24. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 474.
25. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 475-8.
26. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 479.
27. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 479, 480-3.
28. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 480.
29. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 475.
30. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 19. New Delhi: Motilal Banarasidas Publication; 1979. p. 483-4.
31. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 21. New Delhi: Motilal Banarasidas Publication; 1979. p. 559.
32. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 21. New Delhi: Motilal Banarasidas Publication; 1979. p. 559-60.
33. Sharma SS. Rasatarangini, Rasavigyana Hindi Commentary by Pandit Kashinath Shastri. 11th ed., Vol. 21. New Delhi: Motilal Banarasidas Publication; 1979. p. 560.
34. Mookerji B, Nidhi RJ. English Commentary. 2nd ed. Ahmedabad: Avni Prakashan; 1984. p. 96-9.
35. Mookerji B, Nidhi RJ. English Commentary. 4th ed. Varanasi: Chaukhambha Publishers; 2004. p. 242-3.
36. Mookerji B, Nidhi RJ. English Commentary. 4th ed. Varanasi: Chaukhambha Publishers; 2004. p. 247-8.
37. Mookerji B, Nidhi RJ. English Commentary. 2nd ed. Ahmedabad: Avni Prakashan; 1984. p. 99-100.
38. Mookerji B, Nidhi RJ. English Commentary. 2nd ed. Ahmedabad: Avni Prakashan; 1984. p. 99-101.
39. Mookerji B, Nidhi RJ. English Commentary. 4th ed. Varanasi: Chaukhambha Publishers; 2004. p. 128-9.
40. Acharya VJ, Rasamritam R. English Translation by Dr. Damodar Joshi and Dr. G. Prabhakara Rao. 2nd ed., Vol. 2. Varanasi: Chaukhambha Sanskrit Bhawan; 2003. p. 82-83.
41. Rasachandashu R. Hindi Translation by Prof. S.S. Savarikara. New Delhi: Central Council for Research in Ayurvedic Sciences; 2011. p. 102.
42. Rasachandashu R. Hindi Translation by Prof. S.S. Savarikara. New Delhi: Central Council for Research in Ayurvedic Sciences; 2011. p. 101-103.
43. Renuka J. Standardization of Yashad Bhasma, RSBK Deptt. IPGT&R. Jamnagar, Gujrat: Gujarat Ayurved University; 2004.
44. Babita K, Nilima R, Bhasma Y. Synthesis and characterization. Pharm Innov J 2018;7:119-2.
45. Narayan GL, Neeraj K, Deo YK. XRD and XRF screening of Yashad Bhasma. Int J Pharm Biol Arch 2014;5:74-78.
46. Aparna C, Praneeth C, Sandipto G, Priyanka P, Meena P, Suresh D, *et al*. Safety and bioactivity studies of Jasad Bhasma and its in-process intermediate in Swiss mice. J Ethnopharmacol 2017;197:73-86.
47. Puri RN, Thakur V, Nema HV, Role of Zinc (Yashad Bhasma) in arrest of myopia. Indian J Ophthalmol

1983;31:816-22.
48. Atul B, Niraj S, Singh BM. Appraisal of preventive and curative aspect of Yasad Bhasma in childhood anemia. UGC Care J 2020;40:3157-66.
49. Bharati B, Singh RH, Chansouria JP. Hypoglycaemic property of shilajeet and Yashada Bhasma. Ancient Sci Life 1996;16:118-21.
50. Praful SD, Sadhana S, Aruna K. Pharmacological evaluation of wound healing potential of Jasad Bhasma Using Wistar rats: A mechanistic approach. Pharmacologyonline 2009;2:1269-77.
51. Sanjeevkumar M, Rajesh S, Vipul S, Sachin J, Hemanth B. Investigation of anti-diabetic potential of Jasad bhasma against streptozotocin induced diabetes in rat. J Pharmacogn Phytochem 2018;7:1526-31.
52. Kumar A., Nair AG, Reddy AV, Garg AN. Availability of essential elements in bhasmas: Analysis of ayurvedic metallic preparations by INAA. J Radioanal Nuclear Chem 2006;270:173-80.
53. Parth MA. Cosmetic use of Bhasmas. Int J Res Med Sci Technol 2019;8:307-10.
54. Rasachandrika R. Hindi Commentary by Dr. Indradeo Tripathi. 6th ed., Vol. 7. Varanasi: Chowkhamba Sanskrit Series; 2018. p. 91.
55. Rasaratnasamucchaya V. Vijnanabodhini Hindi trans. and Commentary by Prof. Dattatreya Anant Kulkarni. Vol. 2. New Delhi: Meharchand Lachhmandas Publications; 2017. p. 40.
56. Dhirajsingh R, Pravin M, Patgiri BJ. Critical review on pharmaceutical prospects of Naga bhasma (Incinerated Lead). Int J Pharm Biol Arch 2014;5:46-53.
57. The Ayurvedic Formulary of India. Part 1, Formulations. New Delhi: Department of India System of Medicine and Homeopathy, Ministry of Health and Family Welfare Government of India, Second Revised English Edition; 2003.