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Conceptual review on *Shila Sindura*

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ABSTRACT

Background: The most well-known and advanced preparations for *Parada* that incorporate the *Jarana* process are called *Kupipakwa Rasayana*. In this procedure, *Gandhaka*, *Parada*, and other metals and minerals are heated gradually together to create a very close bondage that could help the product have better properties than other formulations made with the same ingredients. *Shila Sindura* is one of the most unique metalo-mineral preparation by *Kupipakwa* method. **Aim:** To compile and screen the all information regarding *Shila Sindura* (SS) preparation, *Bhavana Dravya*, duration of *Paka*, dose, indications and *Anupana* (vehicle). **Material & Methods:** References of SS compiled from different *Rasashastra* text and up to the 2024 all published literature on SS compile from different database like Pub-med, J-gate, google, Scopus. **Results & Conclusion:** Total 11 reference of SS were found in various *Rasa* text, most of the SS was used in *Kushtha* (Skin diseases), *Shwasa* (Asthma), *Jwara* (Fever), slight difference in ingredient, *Bhavana Dravya*, dose, *Anupana*.

Key words: *Shila Sindura*, *Kupipakwa*, *Manashila*, *Safety*, *Ayurveda*.

INTRODUCTION

Shila Sindura (SS) is one of the mineral preparations by the *Kupipakwa* method. It is a *Sagandha* (containing sulphur), *Sagni* (drug heated) and *Kantastha* (the final product accumulates at the neck of the bottle) *Kupipakwa Rasayana*. *Shodhita Parada* (processed mercury), *Shodhita Gandhaka* (processed sulphur), and *Shodhita Manashila* (processed realgar) are processed in the same proportion by weight as the ingredients to create *Shila Sindura* and also this ingredient mentioned in the Schedule E1 of D&C act 1945. Which are best and

fast acting arsenic medicine mainly used in ailments like *Kustha* (a group of skin disorders), *Shwasa* (respiratory problems including bronchial asthma), *Sannipataja Roga* (disease caused due to involvement of two of three bodily humors) and helps in rejuvenation.^[1] The preparation of *Sindura Kalpa* can be traced back to *Rasapraksha Sudhakara* in the 12th century A.D. under the name of *Udayabhaskara Rasa*, but the drug *Shila Sindura* was introduced in the early years of the 20th century.

Kupipakwa Rasayana is a unique pharmaceutical preparation where the drug is prepared in a glass bottle called *Kachakupi* and the processing is done in a traditional furnace with a pattern of gradual rise in temperature. *Kupipakwa Yogas* have mineral and metallic formulations, including both *Sagandha* (with the presence of sulphur) and *Nirgandha* (with the absence of sulphur) prepared with mercury as ingredients.^[2] Most of the texts followed reference of *Rasayanasastra*^[3] for preparation of *Shila Sindura*. Now a days SS available in market, many Ayurvedic pharmacies are producing SS by using different *Rasa* text reference book.

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MATERIALS AND METHODS

Total 11 reference of SS were found in different Rasashastra texts which are depicted in table no 1. Published researches on “safety study of *Shilasindura*” were reviewed from search engines, websites and research database like Google scholar, PubMed, Scopus, J-gate, by searching word “*Kupipakwa Kalpana*,” “Safety study on *Shilasindura*,” “Pharmaceutical study on *Shilasindura*.” Reviewed all the SS related published articles.

General Method of Preparation: The trituration of *Shuddha Parada* and *Shuddha Gandhaka* together,

they started to mix together and the mixture was converted into black color & *Nishchandravta* after 80hrs of trituration. Then *Shodhita Manashila* powder was added into *Kajjali* and trituration of the mixture was done along with *Ghritakumari Swarasa*. After that fill the above *Kajjali* into seven layered *Kachakupi* and placed them into the Electric muffle furnace (EMF) and gradually raised the temperature of EMF for the formation of SS.

Dose and Anupana: A human dose of *Shila Sindura* is 2 *Gunja* (250 mg) per day and the *Anupana* (vehicle) mentioned is *Madhu* (honey)

Table 1: References of ingredients and preparation methods of *Shila Sindura* according to various classical textbook.

Ref.	Name of the preparation	Ingredients	<i>Bhavana Dravya</i>	<i>Paka Kala</i>	Method of preparation
RA	<i>Shilasindura</i> ^[4]	<i>Su. Manashila</i> - 2 Pala <i>Su. Parada</i> - 2 Pala <i>Su. Gandhaka</i> - 2 Pala	<i>Ghritakumari Swarasa</i> (Alo Vera Juice)	2 days	<i>Kupipakwa</i>
KV	<i>Shilachandrodaya</i> ^[5]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Ardraka Swarasa</i> (<i>Zingiber officinale</i>)	4 days	<i>Kupipakwa</i>
	<i>Shilasindura</i> ^[6]	<i>Su. Manashila</i> - 1/2Part <i>Parada</i> - 1Part <i>Gandhaka</i> - 1Part	-	4 days	<i>Kupipakwa</i>
RYS	<i>Shilachandrodaya</i> ^[7]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Ardraka Swarasa</i> (<i>Zingiber officinale</i>)	4 days	<i>Kupipakwa</i>
	<i>Shilasindura</i> ^[8]	<i>Su. Manashila</i> - 1/2Part <i>Parada</i> - 1Part <i>Gandhaka</i> - 1Part	-	4 days	<i>Kupipakwa</i>
	<i>Shilachandrodaya</i> ^[9]	<i>Somala Taila</i> , <i>Haratala Taila</i> , <i>Jayapala Taila</i> (<i>Croton tinglium</i>), <i>Bhallataka Taila</i> (<i>Semi carpus anacardium</i>), (<i>Manashila Shodhana</i>) <i>Su. Manashila</i> - 1 Part <i>Su. Gandhaka</i> - 1 Part <i>Su. Parada</i> - 1 Part		12hr	<i>Kupipakwa</i>
	<i>Shilasindura</i> ^[10]	<i>Su. Parada</i> - 1 Part, <i>Su. Manashila</i> - 1 Part	<i>Dhatturapushpa</i> (<i>Datura stramonium</i> var.)	4days	<i>Kupipakwa</i>

	<i>Shilasindura</i> ^[11]	<i>Su. Manashila</i> - 1Part <i>Su. Parada</i> - 1Part <i>Su. Makshika</i> - 1Part <i>Su. Haratala</i> - 1Part <i>Su. Vatsa Nabha</i> - 1Part (<i>Aconitum ferox</i>)	<i>Vatankura Swarasa</i> , (<i>Ficus benghalensis</i> Linn) <i>Hansapadirasa</i> , (<i>Adiantum lunulatum</i>) Burm)	24hrs	<i>Kupipakwa</i>
RS	<i>Shilachandroday</i> ^[12]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Ardraka Swarasa</i> (<i>Zingiber officinale</i>)	4 days	<i>Kupipakwa</i>
	<i>Shilachandroday</i> ^[13]	<i>Su. Manashila</i> -1Part <i>Parada</i> -1Part <i>Gandhaka</i> - 1Part	-	4 days	<i>Kupipakwa</i>
RSS	<i>Shilasindura</i> ^[14]	<i>Su. Manashila</i> - ½ Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1Part	-	4 days	<i>Kupipakwa</i>
RSb	<i>Shilasindura</i> ^[15]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Vatankura Swarasa Arka</i> (<i>Calotropis Procera</i>) & <i>Snuhi Paya</i>	-	<i>Kupipakwa</i>
BRj	<i>Shilatalaka Rasa</i> ^[16]	<i>Su. Haratala</i> - 1Part (Orpiment) <i>Su. Manashila</i> - 1Part (Realgar)	<i>Trikantaka Swarasa</i> (<i>Euphorbia tricalli</i>) <i>Vasa Swarasa</i> (<i>Adhatoda vasica</i>)	-	<i>Kupipakwa</i>
PV	<i>Shilasindura</i> ^[17]	<i>Su. Manashila</i> - 5 Tola <i>Su. Parada</i> - 10 Tola <i>Su. Gandhaka</i> -10 Tola	<i>Ghritkumari Swarasa</i> (Aloe Vera juice)	2 days	<i>Kupipakwa</i>
SBM	<i>Shilasindura</i> ^[18]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Ghritkumari Swarasa</i> (Aloe Vera juice)	2 days	<i>Kupipakwa</i>
ASS	<i>Shilasindura</i> ^[19]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1 Part <i>Su. Gandhaka</i> - 1 Part	<i>Ghritkumari Swarasa</i> (Aloe Vera juice)	2 days	<i>Kupipakwa</i>
RSS	<i>Shilasindura</i> ^[20]	<i>Su. Manashila</i> - 1 Part <i>Su. Parada</i> - 1Part <i>Su. Gandhaka</i> - 1 Part	<i>Ghritkumari Swarasa</i> (Aloe Vera juice)	4 days	<i>Kupipakwa</i>

Table 2: Therapeutic indication, dose, Anupana of Shila Sindura

Reference	Indications	Anupana	Dose
RS ^[21]	<i>Kushtadiroga</i>	-	2 - Ratti
RS ^[22]	<i>Dadru, Shwitra, Rathtagadushthi, Charmakushtha</i>	<i>Navaneeta</i>	1 - Ratti
RYS ^[23]	<i>Yogavahi, Rasayana</i>	-	1 - Ratti
RYS ^[24]	<i>Sannipattaja Roga, Sarvajwarahara</i>	<i>Ardraka Swarasa,</i>	1 - Ratti

		<i>Panchkola Kwatha</i>	
SB ^[25]	<i>Kasa, Shwasa, Jwara, Kandu, Visha</i>	-	-
BRJ ^[26]	<i>Kaphaja Vikara</i>	<i>Vaijayanti Swarasa, Madhu</i>	
RA ^[27]	<i>Shwasa, Kapha-Vatagadahara</i>	<i>Madhu, Ghrita</i>	1-Ratti
PVI ^[28]	<i>Shwasa, Kapha-Vatagadahara</i>	<i>Madhu, Ghrita</i>	1-Ratti

RTS ^[29]	Shwasa, Kasa, Mada, Visarpa, Kanhtamala, Ratktadushti	-	2-Ratti
ASS ^[30]	Kapha and Vataja Kasa, Kandu, Kshaya, Aruchi, Medoghna.	Madhu	2-Ratti

Table 3: Published paper on Safety study of Shila Sindura; on different data base.

SN	Name Of Database	Keywords Used	Date	No of Articles Retrieved
1.	Ayush Research Portal	Shila Sindura	11/10/2022	1
2.	DHARA	Shila Sindura	11/10/2022	0
3.	Sodha Ganga	Shila Sindura	11/10/2022	0
4.	ADR	Shila Sindura	11/10/2022	0
5.	PubMed	Shila Sindura	11/10/2022	0
6.	J-Gate	Shila Sindura	11/10/2022	0
7.	Google Scholar	Shila Sindura	11/10/2022	4

Table 4: Market survey of Shila Sindura

SN	Ingredients	Dose (mg)	Anupana	Pharmacy	Ref.	Price (Rs)	Pack Size. (g)
1.	Su. Manashila - 1 Part Su. Parada - 1 Part Su. Gandhaka - 1 Part	125	Dugdha, Madhu	Baidyanath	RA ^[31]	190	2.5
2.	Su. Manashila - 5 Tola	250	Madhu	Patanjali	ASS ^[32]	45	1

	Su. Parada - 10 Tola Su. Gandhaka - 10 Tola						
3.	Su. Manashila - 1 Part Su. Parada - 1 Part Su. Gandhaka - 1 Part	-	-	Sanjeevika	-	175	2.5
4.	Su. Manashila - ½ Part Su. Parada - 1 Part Su. Gandhaka - 1 Part	-	-	Sadhana Ayurvedics	RYS ^[33]	65	1

Published paper on Safety study of Shila Sindura;

1. Dasari S. et al^[34]

The present drug (SS) was found to be an effective antimicrobial agent against gram-positive, gram-negative bacteria and fungus which are responsible for various infectious conditions like urinary tract infections, respiratory tract and skin infections. So, *Shila Sindura* may be used as an effective antibiotic in above mentioned conditions as instructed and used by Acharyas.

2. Dasari S, Sreelakshmi et al.^[35]

The study of albino rats did not show any significant physical changes to assess gross pathological changes. The evaluated values of blood and serum parameters were in normal limits in comparison with vehicle control group suggesting *Shila Sindura* did not pass the body filtering system and entered the blood stream. The critical evaluation of hepatic and renal functions demonstrated no evident changes in these tissues on microscopic examination, So drug *Shila Sindura* is safe for administration, at a treatment dose of 2 Ratti (250mg), as prescribed by Acharyas.

3. Barkha Tirpude et al.^[36]

Present study is planned for repeated dose toxicity study (sub chronic) of *Shilasindura* along with its antimicrobial activity. This a genuine attempt to fulfil

the gap of few scientific evidences available and if significant positive results obtained in this work, then it will be a valuable contribution and evidence that the drug *Shilasindura* is safe for consumption at treatment doses prescribed in classics for a longer duration.

4. Challa Srinivas Reddy et al.^[37]

In this study conclude that low single dose or even low repeated dose of mercury could be safe and may not lead to accumulation in the tissues especially in kidney - the target organ prone to damage. Medium dose administration needs stringent monitoring of the clinical/biochemical parameters for optimization of the dose. At this dose the administration of the drug or its continuation is at the discretion of the medical practitioner. High single dose and high repeated doses have showed very deleterious effects, further continuation may lead to severe nephrotoxicity, thus *Shila Sindura* at higher doses is not advisable for administration. Therefore, the process of purification and preparation of the product-*Shila Sindura* need to be improved.

6. Ajay Nagula et al.^[38]

The acute toxicity study in wistar strain of 12 female rats did not show any significant changes in their food behaviour, biochemical & histopathological values. In comparison with control group. It is suggested that up to 20 times higher dose than the therapeutic equivalent dose (TED) i.e., 125 mg/kg of *Shilasindura* will not cause toxicity.

DISCUSSION

Shila Sindura having total 11 classical book references. Most of the texts followed reference of *Rasayanasara*^[39] for preparation of *Shila Sindura*. In *Rasayogasagara*, *Rasayanasara* and *Kupipakwa Rasa Nirman Vigyan Shila Sindura* is mentioned as *Shila Chandrodaya Rasa*.

Shila Sindura described in *Rasayogasagara*, *Rasayanasara* and *Kupipakwa Rasa Nirmana Vigyana* are similar method. The preparation method of *Shila Sindura* is similar in *Rasamruta*, *Siddha Bhaishjyamanimala* and *Ayurveda Saarsangraha*. Maximum 8 ingredients for preparation of *Shila*

Sindura are mentioned in *Rasayogasagara* & *Rasayanasara*. *Manashila* is a main ingredient of all reference with different proportion i.e., ranging 1/2 part to same proportion of ingredients. Among 11 references, there is one method where *Parada* and *Gandhaka* is not mentioned as ingredient but instead of that *Manashila* and *Haratala* used in equal quantity.^[41] There is another reference where *Gandhaka* is not mentioned as ingredient only *Parada* and *Manashila* used in equal quantity^[41] ½ part (two formulation), 1 part (seven formulation), and 5 *Tola* (1 formulation) proportion of *Manashila* is mentioned in various classical texts during preparation of *Shila Sindura* (Table 1). In two classical methods of *Shila Sindura* has not mentioned *Bhavana* process i.e., *Rasayogasagara* and *Rasayanasara*. There are total 8 *Bhavana Dravya* are mentioned in various classical texts i.e., *Rasayogasagara*, *Rasayanasara*, *Ayurvedasara Sangraha*, *Rasendra Sambhava*, *Basavaraajeeyam*. *Rasayogasagara* and *Rasayanasara* mentioned *Ardraka Swarasa* as *Bhavana Dravya* for three times. In *Basavaraajeeyam*, *Trikantaka Swarasa* and *Vasa Swarasa* mentioned as *Bhavana Dravya* for one day. *Dhaturpushpa* mentioned in *Rasayogasagara* and *Rasayanasara* as *Bhavana Dravya*. In *Rasendra Sambhava Vatankura Swarasa*, *Snuhipaya*, *Arkapaya* mentioned as *Bhavana Dravya*. *Ghritakumari* mentioned in *Rasamruta*, *Ayurvedasara Sangraha*, *Rasatantrasara Siddhaprayogasangraha*, *Parada Vighyaniyama* as *Bhavana Dravya*. In all 11 references *Kupipakwa* method are mentioned for *Shila Sindura*. Maximum duration for *Kupipakwa* are 4 days and minimum 12hrs are mentioned in various classical text (Table 1). *Shila Sindura* mainly indicated in *Kushtha*, *Kapha-Vataja Kasa*, *Sannipattaja Jwara*, *Rasayana*, *Sarva Roga Nashaka* with *Anupana Bheda* (Table 2). The minimum dose of *Shila Sindura* is 1 *Ratti* & maximum dose is 2 *Ratti* mentioned in classical text (Table 2).

Researchers have proved the effect of garlic in heavy metal poisoning. Also, garlic contains sulphur which acts as a chelator for mercury poisoning hence the use of garlic in the process of purification of mercury helps to remove the toxic effect of mercury.^[42] *Ghrita* and

Dugdha both are having *Madhura Rasa* and *Jeevaniya Guna*, during *Shodhana* process, they may remove *Visha Dosha* in *Gandhaka* and also fat-soluble impurities.^[43] *Ardraka Swarasa* was required more in initial trituration and decreased in subsequent trituration's. It may be due to less absorption of *Swarasa* because more percentage of moisture may present in subsequence materials. Total 55 weight gain was observed after seven *Bhavana*, may be due to addition of total solid contents of *Ardraka Swarasa*. The *Shodhana* process turned the reddish orange powder of *Manahshila* into yellowish orange colour.

Phytochelatin: Ginger contains two important sulphur-based amino acids called cysteine and methionine which can act as phytochelatin and can render arsenic nontoxic in the *Manahshila*.^[44]

Methylation: Methylation is a process of detoxifying arsenic in the body through accelerated excretion. This process takes place in the liver by the addition of a methyl group to the arsenic and transforms it into a nontoxic form which is then excreted. Cysteine, which is a methyl donor peptide in ginger, helps in the process of methylation.

Preservation of Glutathione: Glutathione, a natural antioxidant recycling enzyme is an important detoxifying compound present in the blood, which combines with arsenic and excretes it via the bile. Arsenic poisoning reduces the level of glutathione in the blood. It has been shown that, following ingestion ginger reduces the fall in the amount of glutathione in the blood. Hence, it supports detoxification as well as combating its possible depletion due to arsenic.^[45]

Neutralization of alkalinity: Because of its acid-base reaction, the alkalinity of *Manahshila* is reduced and became safer to use.^[46]

CONCLUSION

In all 11 references *Kupipakwa* method are mentioned for *Shila Sindura*. Maximum duration for *Kupipaka* are 4 days and minimum 12hrs are mentioned in various classical text. (Table 1) *Shila Sindura* is mainly indicated in *Kushtha*, *Kapha-Vataja Kasa*, *Sannipataja Jwara*, *Rasayana*, *Sarva Roga Nashaka* with *Anupana Bheda* (Table 2). The minimum dose of *Shila Sindura* is 1 *Ratti* & maximum dose is 2 *Ratti* mentioned in classical text (Table 2). The safety of metallic and mineral ingredients of *Shila Sindura* have been reported. The present study is expected to be useful for researchers and Ayurvedic fraternity to get handy information on *Shila Sindura* and its various indications.

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