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Traditional techniques in *Rajata Shodhana*: A comprehensive review of classical methods

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ABSTRACT

Introduction: The traditional *Ayurvedic* process of *Rajata Shodhana* (silver processing) is essential in preparing silver for therapeutic applications, transforming it from a raw metal into a safe, bio available from known as *Bhasma*. This review comprehensively examines classical methods of *Rajata Shodhana*, focusing on techniques that involve various herbal, mineral, and heating processes to detoxify and enhance the metal's medicinal properties. By analyzing these traditional practices, the review aims to highlight their scientific underpinnings and relevance. **Material and Methods:** A detailed analysis of the following 14 classical *Ayurvedic* texts on were undertaken for this study: *Anandakanda, Rasendra Chudamani, Rasarnava, Rasa Paddhati, Sharangdhara Samhita, Rasaprakash Sudhakara, Rasa Ratna Samucchaya, Rasendra Chintamani, Rasendra Sara Sangraha, Rasa Manjiri, Ayurveda Prakash, Rasa Jala Nidhi, Rasa Tarangini,* and *Rasamrita.* **Results & Discussion:** The primary techniques employed in the *Shodhana* of *Rajata* include *Nirvapa*, *Dravana*, *Dhalana*, *Dhamapana*, and *Swedana*, with *Nirvapa* being the most frequently used. The quenching process ranges from a minimum of 3 to a maximum of 21 repetitions. Various *Shodhana* media are detailed in Rasashastra classics, with *Naga* (lead) being the most commonly used, appearing 14 times in the reviewed texts. The processes of *Dhmapana* or *Dravana* often incorporate *Naga*, along with *Kharpara* and *Tankana*, as purifying media. **Conclusion:** These varied media illustrate a comprehensive approach to metal processing, combining chemical reactions, traditional practices, and therapeutic properties to achieve the desired processing of *Rajata*. The choice of media depends on the specific requirements of the processing of the traditional knowledge embedded in the practice.

Key words: *Rajata, Silver, Shodhana, Purification, Nirvapa*

INTRODUCTION

Rasashastra is a branch of Ayurveda dedicated to the purification and processing of metals, minerals, and gemstones (*Rasadi Dravya*) for medicinal use. These substances, categorized as *Parthiva Varga*, possess potent therapeutic properties surpassing those of herbs. However, their raw form can be harmful, necessitating rigorous processing (*Shodhana* and *Marana*) before formulating into safe and effective medicines. *Shodhana* involves various techniques classified as *Samanya* (general) and *Vishesha* (specific), as well as *Saagni* (involving fire) and *Niragni* (without fire). Processed substances (*Shodhita Rasoushadhis*) may undergo further treatments like *Marana*, *Satvapatana*, *Amrutikarana*, or *Lohitikarana* to enhance their medicinal attributes. These processes are meticulously detailed in ancient texts, specifying durations, ingredients and procedures. Modern scientific analysis corroborates the efficacy of these traditional purification methods by demonstrating significant alterations in the raw materials composition. This underscores the critical role of *Shodhana* in realizing the full therapeutic potential of *Rasaadi* drugs while ensuring patient safety.

Shodhana: Beyond Purification

While literally translated as purification, *Shodhana* in *Ayurvedic* alchemy signifies a far more complex

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process. It's not merely about removing impurities but transforming a substance into a therapeutic agent. This fundamental distinction sets *Shodhana* apart from conventional purification methods.

Objectives of *Shodhana*:[1]

- Eliminate physical and chemical contaminants.
- Neutralize toxic properties.
- Enhance therapeutic qualities.
- Impart organic properties to inorganic substances.
- Prepare metals and minerals for medicinal use.
- Facilitate subsequent processes like *Marana*, *Satvapatana*, and *Lohitikarana*.

Materials and Methods

A detailed analysis of the following classical *Ayurvedic* texts was undertaken for this study: *Anandakanda, Rasendra Chudamani, Rasarnava, Rasa Paddhati, Sharangdara Samhita, Rasaprakash Sudhakara, Rasaratna Samucchaya, Rasendra Chintamani, Rasendrasara Sangraha, Rasa Manjiri, Ayurveda Prakash, Rasa Jala Nidhi, Rasatarangini*, and *Rasamrita*. These texts, representing a broad spectrum of *Ayurvedic* thought on the subject of mineral-based medicines, were meticulously examined to extract relevant information regarding *Shodhana* of *Rajata*.

Observations and Results

To make the complex details of these ancient texts more accessible, the key findings were structured into tables, allowing for easier interpretation and comparison.

Table 1: Methods of *Rajata Shodhana*.

SN	Text	Reference	Principle	Media	Number of processing
1.	*Anandakanda* (*Kriyakarana Vishranti*)	(03/11)[2]	*Dravana*	*Naga & Tankana*	-
		(03/11)[3]	*Nirvapa*	*Jyotishmati Taila*	03
		(03/12)[4]	*Nirvapa*	*Jatamansi Taila*	03
		(03/13)[5]	*Dravana & Dhalana*	*Naga*	07
2.	*Rasendra Chudamani*	(14/32-33)[6]	*Dhmapana*	*Naga* (equal) + *Kharpara Churna*	*Naga Kshaya*
3.	*Rasarnava*	(7/103-104)[7]	*Dravana & Nirvapa*	*Naga* (equal) + *Tankana & Jatamansi Taila*	03
4.	*Rasa Paddhati*	(1/49)[8]	*Nirvapa*	*Takra, Kanji, Gomutra, Tila Taila, Kulattha Kwatha*	21
5.	*Sharangdhara Samhita*	(11/2-3)[9]	*Nirvapa*	*Tila Taila, Takra, Kanji, Gomutra, Kulattha Kwatha*	03
6.	*Rasa Prakash Sudhakara*	(4/24-26)[10]	*Dhmapana*	*Naga* (6times)	*Naga Kshaya*
7.	*Rasa Ratna Samucchaya*	(5/31)[11]	*Dravana & Nirvapa*	*Naga* (equal) + *Tankana & Jatamansi Taila*	03
		(5/32-33)[12]	*Dhmapana*	*Naga* (equal) + *Kharpara Churna*	*Naga Kshaya*
8.	*Rasendra Chintamani*	(6/9) [13]	*Dravana*	*Naga & Tankana*	-
		(6/9)[14]	*Swedana*	*Kshara & Amla Rasa*	-

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9.	*Rasendra Sara Sangraha*	(1/261)[15]	*Dravana*	*Naga & Tankana*	-
		(1/261)[16]	*Swedana*	*Kshara & Amla Rasa*	-
10.	*Rasa Manjiri*	(5/17)[17]	*Dravana*	*Tankana*	
11.	*Ayurveda Prakash*	(3/93)[18]	*Nirvapa*	*Agastya Patra Swarasa*	03
		(3/94)[19]	*Nirvapa*	*Jyotishmati Taila*	03
		(3/95-96)[20]	*Dhmapana*	*Naga (equal)+ Tankana*	*Naga Kshaya*
12.	*Rasa Jala Nidhi*	(Vol. II, Ch. IV)[21]	*Nirvapa*	*Taila, Takra, Gomutra, Arnala, Kulattha Kwatha*	*07*
		(Vol. II, Ch. IV)[22]	*Dravana & Nirvapa*	*Naga* (equal) *+ Tankana & Jatamansi Taila*	*03*
		(Vol. II, Ch. IV)[23]	*Dhmapana*	*Naga (equal)+ Tankana*	*Naga Kshaya*
		(Vol. II, Ch. IV)[24]	*Nirvapa*	*Agastya Patra Swarasa*	03
		(Vol. II, Ch. IV)[25]	*Dravana & Nirvapa*	*Naga & Chincha* or *Draksha Swarasa*	-
13.	*Rasa Tarangini*	(16/6)[26]	*Nirvapa*	*Agastya Patra Swarasa*	03
		(16/7-9)[27]	*Dhmapana*	*Naga (equal)+ Tankana*	*Naga Kshaya*
		(16/10-11)[28]	*Nirvapa*	*Nimbu Swarasa*	*Mardavata*
14.	*Rasamrita*	(03/27)[29]	*Nirvapa*	*Taila, Takra, Gomutra, Arnala, Kulattha Kwatha*	-
		(03/27)[30]	*Nirvapa*	*Agastya Patra Swarasa*	03
		(03/28)[31]	*Nirvapa*	*Jyotishmati Taila*	03

Results and Discussion

Rajata Shodhana's methods were reviewed from the 14 texts, *Anandakanda, Rasendra Chudamani, Rasarnava, Rasa Paddhati, Sharangdara Samhita, Rasaprakash Sudhakara, Rasaratna Samucchaya, Rasendra Chintamani, Rasendrasara Sangraha, Rasa Manjiri, Ayurveda Prakash, Rasa Jala Nidhi, Rasatarangini,* and *Rasamrita*. The common techniques used in the *Shodhana* of *Rajata* are *Nirvapa*, *Dravana*, *Dhalana*, *Dhmapana* and *Swedana* with commonest being *Nirvapa*. The number of quenching differs from minimum of 03 to maximum of 21 quenching. There are various *Shodhana* media explained in the *Rasashastra* classics where *Naga* (Lead) has been used the most which accounts for 14 times in the texts reviewed. The process of *Dhmapana* or *Dravana* has been associated where *Naga* along with *Kharpara* and *Tankana* has been used as a media, this is generally followed by quenching in a liquid media. This phenomenon has been explained in the following paragraph;

The processing of metals like silver has industrial analogues that help justify the systematic methods of *Rajata Shodhana* in *Ayurveda*. In the metallurgical process, for instance, lead concentrates are roasted and smelted to produce lead bullion, which is then purified by removing impurities like antimony, arsenic, tin, and silver. Silver is specifically separated using the Parkes process, where zinc is added to molten lead,

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allowing zinc to bond with silver and gold, forming compounds that are easily skimmed off. Subsequent cupellation - heating the residue under high temperatures and oxidizing conditions - allows noble metals like silver and gold to remain elemental, while lead oxidizes and is removed. The final refined silver is achieved after additional processes, including the Moebius and Wohlwill methods.[32] This multi-step approach mirrors *Rajata Shodhana*, where traditional techniques like sequential heating in various herbal decoctions and mineral baths systematically remove impurities, detoxify, and transform the metal for safe medicinal use. Both methods emphasize high temperatures to enable purification and targeted impurity removal. However, *Rajata Shodhana* diverges with its emphasis on bioavailability, safety, and therapeutic efficacy, as the Ayurvedic process is designed to produce a non-toxic, consumable form of silver, such as *Bhasma*, that is believed to confer medicinal benefits. Unlike industrial purification, which focuses solely on physical purity, *Shodhana* also aims for energetic and qualitative transformations, reflecting *Ayurveda's* holistic approach to metal purification.[32]

The choice of these media is based on traditional practices and their perceived effectiveness in processing the metal. The use of these substances is rooted in their chemical and physical properties, which assist in removing unwanted materials from the silver and preparing it for further use.

Conclusion

These diverse media exemplify a holistic approach to metal processing, integrating chemical reactions, traditional methods, and therapeutic objectives to achieve the desired purification of *Rajata*. The selection of media is guided by the specific needs of the process and the traditional knowledge embedded within the practice.

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