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Review

Therapeutic Legacy of *Shalmali* (*Bombax ceiba* L.) and *Mocharasa* in Classical Rasashastra Literature: A Review

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ABSTRACT:

Background- Plant-based medicinal formulations are an integral part of classical Ayurveda therapeutics. Although *Rasashastra* is predominantly focused on metals and minerals, many processes such as *Shodhana* and *Marana* are incomplete without the herbal-origin drugs. Therefore, plants and herbs are the conjoining part of these two specialty domains. *Shalmali* (*Bombax ceiba* L.), mentioned in *Rasashastra* literature, is revered for its multipotent therapeutic utility. **Objectives-** This document aims to compile and study references of *Shalmali* and *Mocharasa* in classical *Rasashastra* literature. Further, they were analyzed to gain insights into the rationale present in the pharmacodynamics of the therapeutics of both drugs. **Methods-** Thirty-two classical *Rasashastra* texts available in the Central Library of ITRA, Jamnagar, were screened for references of *Shalmali* and *Mocharasa* about therapeutics. The collected information of formulations was evaluated and arranged in tabular format for ease of understanding and ready reference. **Results-** *Shalmali* along with *Mocharasa* was found in twenty-nine classical *Rasashastra* texts, which are used in more than 42 therapeutic indications with 15 parts of the plant. These include *Moola, Moola Tvak, Kanda, Kanda Tvak, Veshta, Satva, Pushpa, Beeja, Panchanga, Phala, Patra, Patra Vrinta, Pushpa Vrinta, Kantak,* and *Toola*. *Balashalmali* and *Kutashalmali* are also mentioned at very few instances. This indicates their broad-spectrum therapeutic potential in *Rasashastra*. In the *Rasashastra* domain, *Shalmali* has been used in various processes of *Parada*, *Abhraka*, *Haratala,* and *Loha*. **Conclusion:** This review can be utilized as a ready handbook regarding the references of *Shalmali* and *Mocharasa* in *Rasashastra* literature. The information revealed here is beneficial for AYUSH stakeholders like Ayurvedic researchers, practitioners, and pharmacists in understanding the action mechanism of *Shalmali* and *Mocharasa*.

KEYWORDS: AYUSH, *Bala Shalmali*, *Bombax ceiba*, *Laghu Shalmali, Mocharasa*, Pharmacodynamics, *Rasashastra*.

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1. INTRODUCTION

Rasashastra, traditionally described as the "science of mercury," emerged as a specialized branch of Ayurveda between the 8th and 13th centuries, revolutionizing therapeutics through the application of metals, minerals, and gemstones. [1] Central to this discipline is the transformation of *Rasadravyas* like *Maharasa*, *Uparasa*, *Sadharana Rasa,* (major, secondary and commonly classified minerals) and various *Loha* (metals) including *Parada* (mercury) into potent, biocompatible medicines. This is achieved through rigorous pharmaceutical procedures such as *Shodhana* (purification), *Marana* (Calcined medicinal ash), *Amrutikarana* (potentiating/stabilizing), and *Satvapatana* (extraction of metallic essence). [2] The *Rasashastra* domain is largely dependent on specific herbal adjuncts to facilitate these inorganic transformations. Medicinal plants serve as the essential bridge in the *Rasashastra* (Indian alchemical pharmaceutical science), acting as catalysts, purifying agents, or media for purification, *Bhavana* (trituration), and *Bhasmikarana* (incineration). [3] Among these plants, *Shalmali* and its natural gum-resin, *Mocharasa* stands out as highly efficacious drugs, traditionally utilized for its varied therapeutic indications and included in different pharmaceutical processes of *Rasashastra*. [4] *Shalmali* (*Bombax ceiba* L.), commonly known as the 'Silk cotton tree or Red Silk cotton tree', is a large deciduous tree belonging to the family *Malvaceae* (earlier *Bombacaceae*). It is widely distributed throughout the Indian subcontinent and other tropical and subtropical regions of Asia. [5-7] Different parts of the plant, including the bark, roots, flowers, leaves, fruits, seeds and its characteristic gum-resin, have been traditionally utilized for medicinal and other purposes. The bark produces *Semul gum*, noted for its astringent qualities and medicinal applications. [8] These parts of the plant, including the bark, roots, flowers, leaves, seeds, and the characteristic gum-resin, have been extensively utilized in the traditional systems of medicine for centuries because of their diverse therapeutic applications. [9, 10]

In Ayurveda, *Shalmali* is characterized by *Madhura* and *Kashaya Rasa* (sweet and astringent tastes), *Guru* and *Snigdha Guna* (heavy and unctuous attributes), *Sheeta Veerya* (cold potency) and *Madhura Vipaka* (sweet post-digestive effect). It is traditionally indicated in conditions such as *Raktapitta* (bleeding disorders), *Pravahika* (dysentery) and *Atisara* (diarrhoea), and is also attributed properties such as *Balya* (strength-promoting), *Vrishya* (aphrodisiac) and *Shukravardhana* (promoting reproductive tissue). *Mocharasa* is also described as having similar properties like *Grahi* (absorptive), aphrodisiac properties, being useful in *Grahani* (malabsorption disorder), *Daha* (burning sensation)- like pathologies. [11, 12] Apart from these, different parts of the *Shalmali* have also been employed in numerous classical pharmaceutical procedures of *Rasashastra*, reflecting its importance beyond conventional herbal therapy. However, increasing industrial demand, habitat degradation and indiscriminate harvesting of medicinal- plant resources have raised concerns regarding the sustainable utilization and conservation of several medicinal species, including *Shalmali*. [13] Promoting the evidence-based use of *B. ceiba* L. supports its therapeutic application and sustainable conservation. Research indicates its considerable therapeutic potential due primarily phenolics and flavonoid-rich fractions. These exhibit various pharmacological effects, including anti-inflammatory, antimicrobial, hepatoprotective, anti-ulcer, antidiabetic, and lipid-peroxidation-inhibitory activities. Key bioactive compounds such as quercetin, kaempferol, gallic acid, catechin, β-sitosterol, and mangiferin are significant contributors to these biological effects. [14]

Many *Rasashastra* texts detail *Shalmali* and *Mocharasa*, focusing on their therapeutic uses, formulations, and pharmaceutical applications. However, the specific pharmaceutical role of *Shalmali* within *Rasashastra* has not been thoroughly reviewed. Existing studies mostly cover its botanical and pharmacological aspects, neglecting its importance in classical herbo-mineral formulations and pharmaceutical techniques. This review aims to fill this gap

by analyzing *Shalmali* from the perspective of *Rasashastra* literature, providing insights for practitioners and researchers in the AYUSH healthcare system.

2. MATERIALS AND METHODS

In the present attempt, available classical *Rasashastra* texts (32 in number) from central library of ITRA (formerly IPGT & RA), Jamnagar, Gujarat, (India) were searched word by word manually for the references using keywords for basonyms of '*Shalmali*' and '*Mocharasa*'. Also, to include synonyms and broaden the search, keywords including synonyms of *Shalmali* such as '*Mocha', 'Piccha', 'Picchila', 'Tulini', 'Tulaphala',* and '*Kukkuti*', were also used ensuring inclusivity of every reference. Special references of *Shalmali* i.e., '*Balashalmali*' (tender/young *Shalmali*) and '*Kutashalmali*' (*Ceiba pentandra* L. Gaertn.) were also included. Texts which did not meet the inclusion criteria were excluded from the study (inclusion- exclusion criteria for texts mentioned below), as this can lead to obscurity in locating the exact reference of drug/ formulation. Collected information was screened, analyzed, categorized and interpreted according to their type and represented in tabular form for ease of understanding. The references were categorized according to therapeutic indications, internal and external application along with details of part of the drug used, its role in formulation and dosage form. The formulations with the same nomenclature and the same ingredients described by different compendia were considered as a single entry and all the respective references were compiled together in last the right-side column. Texts with incomplete, unverifiable, or unauthenticated information were excluded. Numerical analysis of the found references was done to evaluate the majority in therapeutic indications, parts used and dosage form. Graphical tools were also used to depict the same. Outcome of the review is briefly discussed for the elaboration of rationale which can give new insights into understanding of mode of action (Pharmacodynamics) of *Shalmali* and *Mocharasa*.

***Rasashastra* texts used for the review with abbreviations:** Ayurveda Prakasha (APK), [15] Arka Prakasha (AKP), [16] Bharata Bhaishajya Ratnakara (BBR), [17] Anandakanda (AKD), [18] Brihatrasarajasundara (BRS), [19] Rasachintamani (RC), [20] Rasajalanidhi (RJN), [21] Rasakamadhenu (RK), [22] Rasamanjari (RMi), [23] Rasamritam (RA), [24] Rasapaddhati (RP), [25] Rasaprakasha Sudhakara (RPS), [26] Rasarajamahodadhi (RRM), [27] Rasaratnasamuchaya (RRS), [28] Rasarnava (RNV), [29] Rasasanketakalika (RSK), [30] Rasatarangini (RT), [31] Rasayanasara (RNS), [32] Rasayogasagara (RYS), [33] Rasendrachudamani (RCD), [34] Rasendrachintamani (RNC), [35] Rasendramangala (RSM), [36] Rasendrasambhava (RSb), [37] Rasendrasarasangraha (RSS), [38] Rasapradipika (RPD), [39] Rasendrabhaskara (RB), [40] Rasendrapurana (RPU), [41] Rasachandanshu (RCA), [42] Rasapradeep (RPd), [43] Rasakaumudi (RKM), [44] Rasahridayatantra (RHT), [45] Rasadhyaya (RAD). [46]

Criteria for reference collection

Inclusion criteria

- Classical *Rasashastra* texts (32 in number) containing therapeutic references of *Shalmali* (*B. ceiba* L.) and/or *Mocharasa* in the form of formulations and *Amayika Prayoga* (disease therapeutics), classifications of drugs, pharmaceutical procedures, including *Shodhana*, *Marana*, *Jarana*, *Bhavana*, *Satvapatana*, *Amritikarana*, *Sindurikarana,* and *Puta* were included. Texts which are well known, exclusive to *Rasashastra* specialty, routinely referred, in good physical condition and having complete details regarding their publisher, edition, editor were included.
- References mentioning the described synonyms of *Shalmali*, namely *Mocha*, *Piccha*, *Picchila*, *Tulini*, *Tulaphala,* and *Kukkuti*, were considered during manual screening to ensure comprehensive retrieval.
- References related to *Balashalmali* and *Kutashalmali* (*C. pentandra* L. Gaertn.) were also included wherever explicitly mentioned.

- Both internal and external therapeutic formulations containing *Shalmali* or *Mocharasa* were included.
- References describing the plant part used, dosage form, therapeutic indications, role of the drug in the formulation/ pharmaceutical process, and method of administration were included for data extraction.
- Identical formulations appearing in multiple classical texts were retained as a single formulation, while all corresponding textual references were documented collectively.

Exclusion criteria

- References describing *Shalmali* only in the context of botanical description, morphology, *Rasapanchaka*, or without therapeutic application were excluded.
- Duplicate formulations with identical composition and indication reported in different compendia were not counted repeatedly.
- References in which the identity of *Shalmali* or *Mocharasa* could not be confirmed from the original text were excluded from analysis.
- Texts which do not contain any reference of *Shalmali* and *Mocharasa* were excluded from study.
- As the study is concerned with the exclusive classical *Rasashastra* texts, textbooks of *Rasashastra* were excluded.

Methodology utilised for selection of reference, Duplicate entries and their removal-

- Formulations by same name and same '*Chikitsa Adhikarana*' i.e. the authoritative indication of *Vyadhi-chikitsa* in which they are described, having same ingredients are considered as Duplicate.
- Formulations by same name and same the authoritative indication but with difference in ingredients were counted as separate entries.
- In a formulation, if there is presence of *Shalmali* in more than one form (ingredient as well as *Bhavana, Anupana or Prakshepa*) the entries are counted as separate so as to represent data of *Shalmali* in detailed structure.

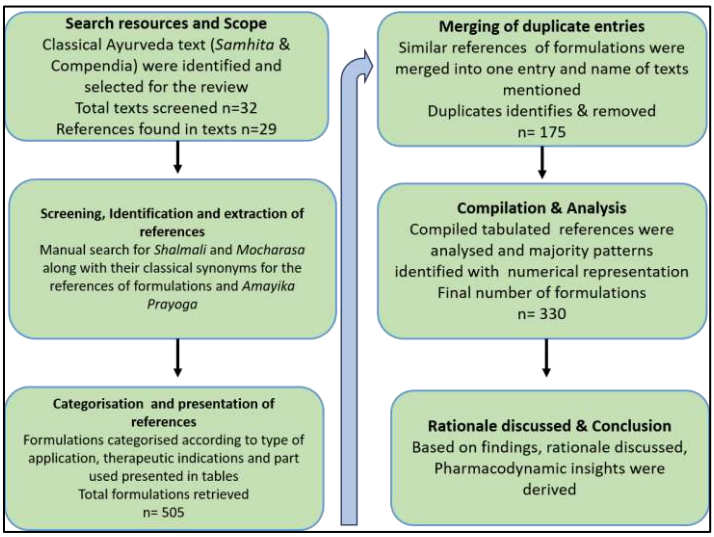


Figure 1: Schematic flow chart representing the methodology followed for the review

3. OBSERVATIONS AND RESULTS

Table 1: Use of *Shalmali* in processing of *Parada* and other minerals

Sr. no.	Indication	Form or Part used	References
Rasa/ Parada			
1.	*Parada Bhasmakarana*	*Chandali*	RJN/1/122
2.	*Rasa Jarana, Rasa Drutikarana*	*Kukkuti Kanda* (tuber)	RNV/284
3.	*Parada Chanchalya Doshnashaka Aushadhi*	*Balamochaka*	RNV/56
4.	*Rasa Bandhanakara Aushadhi*	*Ksheerakukkuti*	RNV/58
Maharasa			
5.	*Abhraka Marana*	*Shalmali*	RJN/2/21, BRS/131, BBR/1/106
6.	*Abhraka Bhasmikarana 15th*	*Svarasa* (freshly expressed juice)	RPU/168
Sadharana Rasa			
7.	*Haratala Shodhana, Marana*	*Svarasa* (*Toya*)	RP/112, RJN-2/116,120, BRS/145, AKD/647,

			RRS/75, RT/248, RSS/46
Naga adi Loga			
8.	*Loha Sindurikarana*	*Shalmali Tvak*	RPD/3/90

Table 2: Classification of *Shalmali- Mocharasa* in various *Gana* (class/group) of classical *Rasashastra* texts

Sr. No.	Formulation/Gana	Part mentioned	Used for/ Indication	Reference
1.	*Dhoopagana*	*Mocharasa*	*Dhoopana*	AKP/155
2.	*Kinshukadi Gana*	*Shalmali/ Mocharasa*	*Tridoshaja Vikara*	RJN/3/47
3.	*Kiratadi Gana*	*Shalmali*	*Pittaja Vikara*	RJN/3/46, RSb/43, RSS/85
4.	*Priyangvadi Gana*	*Manadruma, Mocharasa*	NA	RSb/18
5.	*Purisha Sangrahaniya Gana*	*Mocharasa*	*Purisha Sangrahana*	RSb/32
6.	*Purisha Virajaniya Gana*	*Shalmali*	*Purisha Virajana*	RSb/32
7.	*Rodhradi Gana*	*Mocha (Semal)*	*Meda-Kapha- Yonidoshahara, Stambhi, Varnya, Vishaghna*	RSb/16
8.	*Sandhaniya Gana*	*Mocharasa*	*Sandhana Karma*	RSb/23
9.	*Shonitsthapana Gana*	*Mocharasa*	*Shonitsthapana Karma*	RSb/33
10.	*Vedanasthapana Gana*	*Mocharasa*	*Vedanasthapana Karma*	RSb/16
11.	*Vrukshagana*	*Shalmali*	NA	AKP/153
12.	*Vruksha Kashara*	*Kshara* (caustic substance)	*Kshara* preparation	RNV/5/60
13.	*Vyaghrikadi Gana (Rasanirjivakaraka)*	*Hilamochaka (Balamochaka)*	*Parada Bhasma/ Marana*	RCD/95

Table 3: Number of formulations containing *Shalmali- Mocharasa* as an ingredient according to type of application

Sr. No.	Indications	Internal	External	I+E
1.	*Vajikarana and Rasayana* (Including *Dhatukshaya, Karshya, Shosha*)	108	10	---
2.	*Atisara/ Pravahika/Grahani* (including *Raktatisara, Vishaja Atisara, Sarvatisara, Gudadaurbalya*)	72	---	1
3.	*Prameha and Kushtha (*including *Somaroga)*	36	1	1
4.	Miscellaneous disease conditions (including *Dantaroga, Visha, Upadamsha, Medoroga, Vatavyadhi, Shotha, Vriddhi, Shvasa, Mutrakrucchra, Panchkarma vyapad* indications*)*	16	1	---
5.	*Jwara/ Jwaratisara*	13	---	---
6.	*Rajayakshma/Pushti*	12	---	---
7.	*Yoniroga Chikitsa (*including *Yonivyapad, Pradara, Striroga, Sutika Vyadhi, Garbhapata*	11	---	---
8.	*Raktaja Vyadhi (*Including *Raktapitta, Raktaja Mukharoga, Shiroroga)*	9	---	---
9.	*Kamala/Pandu*	9	---	---
10.	*Arsha*	8	---	---
11.	*Annavaha Srotasa/Mahasrotasa/Koshtha (*including *Gulma, Shula, Agnimandya, Ajeerna, Vibandha, Amlapitta)*	8	---	---
12.	*Yakruta/Pleeha/Udara*	6	---	---
13.	*Kshudraroga (*including *Vyanga, Mukhadushika, Padaroga)*	2	1	
14.	*Balaroga (*including *Balatisara)*	2	---	---
15.	*Vrana Chikitsa*	---	2	1
	Total	**312**	**15**	**3**

Table 4: *Shalmali* as an ingredient of various formulations indicated in *Atisara, Pravahika, Grahani, Arsha, Annavaha Strotasa*

Sr. No.	Formulations with indication	Part used	Dosage forms	References
Internal applications in *Atisara/ Pravahika/ Grahani*				
1.	*Rasa Bhasma* (G)	*Mocharasa (Ap)*	*Bhasma*	RJN/1/166, RC/5
2.	*Amritarnava Rasa* (A)	*Mocharasa (Ap)*	*Rasaushadhi*	RCA/184
3.	*Atisarahara Yoga* 2nd (A)	*Mocharasa*	*Churna*	RPS/155, RRM-5/212
4.	*Bruhat Lai Churna (Sangrahani)*	*Mocharasa*	*Churna*	BRS/332
5.	*Bruhat Lavangadi Churna, 2nd* (G)	*Mocharasa*	*Churna*	RYS/2/283, BBR/4/517, 519
6.	*Laghu Gangadhara Churna (Pravahika,* A*)*	*Mocharasa*	*Churna*	RNS/2/355, RRM/2/231
7.	*Lai Churna, 4th* (G)	*Mocharasa*	*Churna*	RYS/2/294, BBR/4/521,
8.	*Madhya Lai Churna (Sangrahani)*	*Mocharasa*	*Churna*	BRS/332, BBR/4/522
9.	*Markandeya Churna* (G)	*Mocharasa*	*Churna*	RYS/2/168, BBR/4/233,
10.	*Mocha Niryasa* (G)	*Mocharasa*	*Churna*	RJN/3/324
11.	*Mustadi Churna* (G)	*Mocharasa*	*Churna*	RRS/370, BBR/4/237,
12.	*Pathadi Churna/ Yoga* (A)	*Mocharasa*	*Churna*	BBR/3/296
13.	*Pretasanjivana Rasa* (A)	*Mocharasa* (*Ap*)	*Churna*	RJN/4/198
14.	*Shunthyadi Churna* (A)	*Mocharasa* (*Ap*)	*Churna*	RNC/193, RRM/2/56, BBR/5/30
15.	*Talisadi Churna* (A, *Kasa*)	*Mocharasa*	*Churna*	RRM/2/217
16.	*Vriddha Gangadhara Churna (Sarvatisara)*	*Mocharasa*	*Churna*	RRM/2/230
17.	*Gangadhara Churna* (A)	*Mocharasa*	*Churna*	RRM/2/209, RRM/5/211, RYS/1/252,
18.	*Atisarahara Guti* (A)	*Mocharasa*	*Guti-Vati*	RRM/5/212
19.	*Jatiphaladi Vati* (G)	*Veshta* (exhudate)	*Guti-Vati*	RYS/1/476, BRS/347, BBR/2/284
20.	*Jirakadi Modaka* (G)	*Mocharasa*	*Guti-Vati*	RYS/1/477,
21.	*Lilavati Vati* (A)	*Mocharasa*	*Guti-Vati*	RRM/4/30
22.	*Varinigada Gutika* (A)	*Mocharasa*	*Guti-Vati*	RK/1/282, RYS/2/365
23.	*Yogaraja Guti* (A)	*Shalmali*	*Guti-Vati*	RK/1/280, BBR/4/293
24.	*Madhu Pakva Haritaki* (G)	*Mocharasa*	*Kalka*	RYS/2/153, BBR/4/173,
25.	*Bilvadi Siddha Kshira* (A, G)	*Mocharasa*	*Kshirapaka*	BBR-3/558
26.	*Atisara Rodhaka Kvatha* (A)	*Mocharasa*	*Kvatha*	RNS/1/148
27.	*Kutajashtaka kvatha* (A)	*Mocharasa (Ap, Pk)*	*Kvatha*	RRM/5/184,
28.	*Semara Paka* (A)	*Moola Tvak* (Root bark)	*Paka*	RRM/2/70
29.	*Amritarnava Rasa* (A)	*Mocharasa (Ap)*	*Rasaushadhi*	RYS/1/94
30.	*Gangadhara Rasa* (A)	*Mocharasa*	*Rasaushadhi*	BRS/330, RYS/1/252, RNS/2/356, BR/2/87, RCA/192
31.	*Grahanigajakesari Rasa,* 2nd (G)	*Mocharasa*	*Rasaushadhi*	BBR/2/122, RRS/367, RJN/4/235, RYS/1/399, BBR/2/123, RCA/206
32.	*Grahanikamadavaranasimha Rasa* (G)	*Mocharasa*	*Rasaushadhi*	BRS/352, BBR/2/115
33.	*Grahanikamadavaranasimha Rasa* (G)	*Piccha* (mucilaginous substance)	*Rasaushadhi*	BRS/352, RYS/1/400
34.	*Grahanikapata Rasa* (G)	*Mocharasa*	*Rasaushadhi*	BBR/2/117, RJN/4/222, RK/1/243, RRS/364, RYS/1/391, BRS/334, RPd/9
35.	*Grahanikapata Rasa* (G)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/1/394, BBR/2/120

36.	*Grahanikapata Rasa* (G)	*Svarasa*	*Rasaushadhi*	BBR/2/117
37.	*Grahanikapata Rasa* (G)	*Moola* (Root) *(Bh)*	*Rasaushadhi*	BRS/335
38.	*Grahanisetu Rasa* (G)	*Mocharasa*	*Rasaushadhi*	RYS/1/403
39.	*Grahanivajrakapata Rasa* (G)	*Mocharasa (Bh, Pk)*	*Rasaushadhi*	RNC/201, BBR/2/125,
40.	*Grahanivajrakapata Rasa* (G)	*Svarasa* (*Bh*)	*Rasaushadhi*	RSS/207, RJN/4/227, BBR/2/125
41.	*Hinguleshvara Rasa*, 2nd (A, G)	*Satva* (extract/ essence) *(Bh)*	*Rasaushadhi*	BRS/355, RYS/2/575, BBR/5/491
42.	*Jatiphaladi Rasa* (G)	*Veshta*	*Rasaushadhi*	RJN/4/243
43.	*Kanakasundara Rasa* (A)	*Mocharasa (Ap)*	*Rasaushadhi*	RYS/1/205
44.	*Karpura Rasa* (G)	*Mocharasa (Ap)*	*Rasaushadhi*	RYS/1/236
45.	*Karunasagara Rasa* (A)	*Mocharasa*	*Rasaushadhi*	BRS/332
46.	*Lokanatha Rasa,* 8th (G)	*Mocharasa (Ap)*	*Rasaushadhi*	RYS/2/302, BBR/4/535
47.	*Mahagrahanikapata Rasa* (G)	*Svarasa* (*Bh*)	*Rasaushadhi*	RSS/206
48.	*Mritasanjivani Rasa* (4th) (A)	*Mocharasa (Ap)*	*Rasaushadhi*	RSS/182, RK/1/277, RNC/192, RYS/2/196, BBR/4/250
49.	*Mustadi Yoga* (G)	*Mocharasa*	*Rasaushadhi*	RJN/4/257
50.	*Nagaraja Bhasma/ Rasa* (G, *Kushtha*)	*Satva (Ap)*	*Rasaushadhi*	RC/64, RK/2/184, BBR/3/233
51.	*Pashupata Rasa* (A)	*Mocharasa* (*Ap*)	*Rasaushadhi*	RJN/4/281, RC/266, RYS/2/44, RB/141
52.	*Purnachandra* (*Rasendra*) *Rasa* (G)	*Shalmali (Ap)*	*Rasaushadhi*	RK/1/255, BBR/3/502
53.	*Sangrahanihara Rasa* (G)	*Mocharasa*	*Rasaushadhi*	RJN/4/225
54.	*Sheeghraprabhava Rasa* (G)	*Mocharasa*	*Rasaushadhi*	BRS/346, RRS/368, RJN-4/236, RYS/2/441, BBR/5/133
55.	*Siddha Gandhara Rasa* (A)	*Mocharasa*	*Rasaushadhi*	RSb/273
56.	*Sudhasara Rasa* (A)	*Mochasara*	*Rasaushadhi*	BRS/327, RRS/359, RYS/2/524, BBR/5/364
57.	*Vajrakapata Rasa* (G)	*Mocharasa*	*Rasaushadhi*	RJN/4/217, BRS/334, RMi/97, RSb/275, RSS/192, BBR/4/714, RCA/197
58.	*Lakshmivilasa Rasa* (*Vataja Grahani, Prameha*)	*Mocharasa*	*Rasaushadhi*	RRM/3/50,
59.	*Lakshmivilasa Rasa* (*Vataja Grahani, Prameha, R,* 5th)	*Moola Tvak (Bh)*	*Rasaushadhi*	RRM/3/50, RYS/2/290
60.	*Ativishadi Churna* (A)	*Mocharasa*	*Churna*	RRM/2/217
61.	*Lodhradi Guti* (A)	*Mocharasa*	*Guti-Vati*	RRM/2/56
62.	*Atisarahara Rasa* (A)	*Mocharasa*	*Rasaushadhi*	BBR/1/101
63.	*Mritasanjivani Vati* 4th (A)	*Mocharasa*	*Guti-Vati*	RYS/2/200
64.	*Rajavallabha Rasa* (*Shankhodara*) (4th) (G)	*Mocharasa (Ap)*	*Rasaushadhi*	RYS/2/270
65.	*Sindurabhushana Rasa* 3rd (A)	*Mochasara*	*Rasaushadhi*	RYS/2/518
66.	*Sutadi Vati* (*Chandraprabha* 2nd) (A)	*Mochasara*	*Guti-Vati*	RYS/2/544
67.	*Sutadi Vati* (*Chandraprabha* 2nd) (A)	*Moola Drava (Bh)*	*Guti-Vati*	RYS/2/544
68.	*Hema Loham* (A)	*Mocharasa*	*Loha*	RYS/2/590
69.	*Hansa Pottali* 1st (G)	*Shalmali (Bh)*	*Pottali*	RYS/2/593
70.	*Anandabhairava Rasa 2nd* (A)	*Mocharasa*	*Rasaushadhi*	RYS/2/604
71.	*Karpuradi Vati* (G)	*Shalmali*	*Guti-Vati*	RYS/2/630

72.	*Visha* (*Vatsanabha*) *Anupana* (G)	*Mocharasa (Ap)*	*Churna*	BRS/219, RB/108, RPU/466
Number of dosage forms - *Churna*-17, *Rasaushadhi*-36, *Guti-Vati*-11, *Kvatha*-2, *Kshirapaka*-1, *Kalka*-1, *Bhasma*-1, *Paka*-1, *Loha*-1, *Pottali*-1				
Part used- *Mocharasa*-55, *Shalmali*-5, *Veshta*-2, *Moola*-1, *Svarasa*-3, *Piccha- Shleshma*-1, *Satva*-2, *Moola-Rasa/Drava*- 1, *Moola Tvak*-2				
Internal applications in *Arsha*				
1.	*Bolabaddha Rasa (Raktarsha)*	*Mocharasa (Bh)*	*Rasaushadhi*	BBR/3/607
2.	*Samangadi Dugdha (Raktarsha)*	*Mocharasa*	*Kshirapaka*	BBR/5/191
3.	*Abhayarishta* (*Arsha, Agnimandya, Ajeerna*)	*Mocharasa*	*Arishta*	RNS/1/50,
4.	*Ashtanga Rasa (Arsha)*	*Shalmali (Bh)*	*Rasaushadhi*	RJN/4/334
5.	*Ashtanga Rasa (Arsha)*	*Shalmali Svarasa (Bh)*	*Rasaushadhi*	RCA/216
6.	*Bolabaddha Rasa* 1st *(Raktasrsha)*	*Svarasa (Bh)*	*Rasaushadhi*	RYS/2/112
7.	*Bolabaddha Rasa* 4th *(Arsha)*	*Svarasa (Bh)*	*Rasaushadhi*	RYS/2/112
8.	*Boladi Vati* (*Pittaja Arsha*)	*Svarasa (Bh)*	*Guti-Vati*	RYS/2/113
Number of dosage forms - *Kshirapaka*-1, *Rasaushadhi*-5, *Arishta-1, Guti-Vati*-1				
Part used- *Mocharasa*-3, *Shalmali*-1, *Svarasa*-4				
Internal applications in *Annavaha Strotasa*				
1.	*Kshudhavati Vati (Shula)*	*Shalmali-(Kalamarisha)*	*Guti-Vati*	BRS/523
2.	*Pashupata Rasa (Ajeerna)*	*Mocharasa (Ap)*	*Rasaushadhi*	RSS/232
3.	*Purnachandra Rasa (Gulma)*	*Pushpa Churna* (powder of flowers)	*Rasaushadhi*	RJN/5/268, RRS/423
4.	*Sharbata Harraka (Udarashula)*	*Mocharasa*	*Svarasa*	RRM/2/32
5.	*Sharbata Sounfa (Vibandha)*	*Mocharasa*	*Svarasa*	RRM/2/30
6.	*Tamra Kalpa (Amlapitta)*	*Mocharasa (Bh)*	*Rasaushadhi*	BRS/502
7.	*Amakuthara Rasa* (*Amashula*)	*Mocharasa*	*Rasaushadhi*	RYS/1/137
8.	*Hanumana Rasa* (*Ama*)	*Mocharasa*	*Rasaushadhi*	RSb/271
Number of dosage forms- *Rasaushadhi*-5, *Svarasa*-2, *Guti-Vati*-1,				
Part used- *Mocharasa*-6, *Pushpa*-1, *Shalmali*-1				
Internal+ External applications in *Atisara/ Pravahika/ Grahani*				
1.	*Grahanimihira Taila (Grahani)*	*Mocharasa*	*Taila*	BBR/2/64
Number of dosage forms - *Taila*-1; Part used- *Mocharasa*-1				

Table 5: *Shalmali* as an ingredient of various formulations indicated under *Vajikarana, Rasayana* and *Rajayakshma- Pushti*

Sr. No.	Formulations with indication	Part used	Dosage form/ Method	References
External applications of *Vajikarana* and *Rasayana*				
1.	*Jalauka Bandh* (V)	*Beeja* (Seeds), *Tvak*	*Kalka/ Bhavana*	RRS/271
2.	*Jalauka Bandh* 2nd (V- *Stridrvana*)	*Vrunta* (Petiole) (*Patra*)	*Kalka/ Bhavana*	APK/218, RRS/281, RPU/128
3.	*Jalauka Yoga* (V)	*Panchanga* (whole plant)	*Kalka*	RYS/1/473
4.	*Jalauka Yoga* 2nd (V)	*Tvak*	*Kalka*	RYS/1/474
5.	*Jaluka Bandha* (V)	*Mocharasa*	*Kalka*	RSM/154, RPU/127
6.	*Jaluka Yoga* (V)	*Shalmali Vari* (*Svarasa*)	*Kalka*	RSM/155
7.	*Kamakalakhya Rasa* (V)	*Svarasa* (*Pk*)	*Rasa/ Udvartana*	RRS/615, BBR/1/297

8.	*Kamakalakhya Rasa* (V)	*Moola*	*Rasa/ Utsadana*	RRS/615
9.	*Karaviradi Lepa* (V)	*Tvak*	*Kalka*	RRM/1/117
10.	*Shashanka Rasa* (V)	*Svarasa*	*Rasa/ Mardana*	BBR/5/119
Number of dosage forms - *Kalka*- 5, *Kalka* for *Bhavana/ Mardana*-3, *Rasaushadhi* for *Utsadana*- 2				
Part used- *Tvak*-3, *Svarasa*-2, *Beeja*-1, *Moola*-1, *Panchanga*-1, *Vrunta* (*Patra*)-1, *Mocharasa*-1 (There are 2 parts mentioned in *Jalauka Bandh* at Sr. no 1)				
Internal applications of *Vajikarana* and *Rasayana*				
1.	*Abhra Sindura* (R)	*Satva (Shalmali) (Bh)*	*Bhasma*	RYS/1/74
2.	*Dehasiddhikara Tamra* (R)	*Neera/ Svarasa* (*Ap*)	*Bhasma*	RYS/1/653
3.	*Tamra Bhakshana* (R)	*Shalmali Rasa* (*Ap*)	*Bhasma*	BRS/27, RJN/2/211, 287, RPU/269
4.	*Kamadipana Rasa* (V)	*Moola*	*Churna*	RRS/632
5.	*Kumkumadi Churna* (V)	*Mocharasa*	*Churna*	RC/198
6.	*Panchasayaka Churna* (V)	*Moola (Bh)*	*Churna*	RYS/2/10,
7.	*Shalmali Gandhaka Yoga* (V)	*Moola Tvak,* (*Bh*)	*Churna*	RT/187
8.	*Shunaka Shalmali Kalpa* (R)	*Moola*	*Churna*	AKD/266
9.	*Vijayavardhana Krama (Viryavardhana)*	*Piccha*	*Churna- Panaka*	AKD/293
10.	*Amrita Rasayana* (R)	*Shalmali (Bh)*	*Guti-Vati*	RYS/1/83
11.	*Kamasundara Modaka* (V)	*Mocharasa*	*Guti-Vati*	RYS/1/269
12.	*Kameshwara Modaka* (V)	*Tvak (Valkala Rasa)* (bark)	*Guti-Vati*	RYS/1/275
13.	*Kameshwara Modaka* 2nd (V)	*Mocharasa*	*Guti-Vati*	RYS/1/273
14.	*Kameshwara Modaka* (V)	*Beeja*	*Guti-Vati*	RYS/1/275, 276, RC/196
15.	*Kameshwara Modaka* (V)	*Mocharasa*	*Guti-Vati*	RC/196, RNC/153, RRS/630, RYS/273,275 RNC/153,
16.	*Kameshwara Modaka* (V)	*Moola*	*Guti-Vati*	RRS/630, RYS/1/273, RNC/153,
17.	*Kameshwara Modaka* (V)	*Moola rasa*	*Guti-Vati*	RYS/1/274
18.	*Mahakameshwara Kalpa* (V)	*Moola*	*Guti-Vati*	AKD/326
19.	*Trutiya Paka* (V)	*Mocharasa*	*Guti-Vati*	RRM/4/124
20.	*Shreephala Khanda* (V)	*Shalmali Rasa* (*Bh*)	*Khanda*	RC/201
21.	*Shunaka Shalmali Kalpa* (R)	*Phala* (Fruit)	*Kshirapaka*	AKD/267
22.	*Shunaka Shalmali Kalpa* (R)	*Pushpa*	*Kshirapaka*	AKD/267
23.	*Kamadhenu Rasa* (V)	*Moola (Bh)*	*Kvatha*	RRS/621
24.	*Pushpadhanva Rasa* (3rd) (V)	*Svarasa* (*Bh*)	*Kvatha*	RRS/626, RYS/2/58, BBR/3/499,
25.	*Eranda Paka* (1st) (R, *Antravriddhi*)	*Mocharasa*	*Paka*	RYS/1/193, RK/1/389
26.	*Keshara Paka* (V)	*Mocharasa*	*Paka*	RYS/1/334, RK/2/274,
27.	*Pushtai ka Paka* (V)	*Tvak*	*Paka*	RRM/1/125
28.	*Ratibvallabhakhya Pugapaka* (V)	*Beeja*	*Paka*	RYS/2/61, RK/2/276, BBR/4/384
29.	*Kamadeva Rasa* (V)	*Moola (Bh)*	*Rasaushadhi*	RRS/616, RYS/1/262, 263
30.	*Kamaduta Rasa* (V)	*Shalmali (Ap)*	*Rasaushadhi*	BBR/1/295
31.	*Kamaduta Rasa* (V)	*Svarasa* (*Bh*)	*Rasaushadhi*	BBR/1/295
32.	*Kamakala Rasa* (V)	*Mocharasa* (*Pk*)	*Rasaushadhi*	RYS/1/258, BBR/1/297
33.	*Kamakalakhya Rasa* (V)	*Shalmali (Pk)*	*Rasaushadhi*	RRS/615, BBR/1/297
34.	*Kamanayaka Rasa* (V)	*Svaras (Anga)* (*Bh*)	*Rasaushadhi*	RYS/1/268, BBR/5/766

35.	*Kamanganayaka Rasa* (V)	*Moola Churna*	*Rasaushadhi*	RYS/1/271
36.	*Kameshavatsara Rasa (*V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/1/273
37.	*Kameshwara rasa* (V)	*Mocharasa*	*Rasaushadhi*	RMi/125, BBR/5/769
38.	*Kameshwara Rasa* (V)	*Moola*	*Rasaushadhi*	RMi/125
39.	*Kaminidarpaghna Rasa* (V)	*Tvak Churna (Bh)*	*Rasaushadhi*	BRS/547, BBR/1/298
40.	*Kaminidarpaghna Rasa* (V)	*Svarasa (Bh)*	*Rasaushadhi*	BRS/547, BBR/1/298
41.	*Kandarpajivana Rasa* (R)	*Shalmali rasa (Bh)*	*Rasaushadhi*	RYS/1/212
42.	*Kumkumadya Rasa* (V)	*Mocharasa*	*Rasaushadhi*	BBR/5/776
43.	*Kumudeshwara Rasa* (V)	*Shalmali drava*	*Rasaushadhi*	RYS/1/311
44.	*Kusumayudha Rasa* (V)	*Mocharasa (Pk)*	*Rasaushadhi*	BBR/5/782
45.	*Laghupushpadhanva Rasa* (V)	*Shalmali (Bh)*	*Rasaushadhi*	RK/2/284
46.	*Madanasandipana Rasa* (V)	*Svarasa*	*Rasaushadhi*	BBR/4/166
47.	*Madanasundara Rasa* (V)	*Moola Svarasa (Bh)*	*Rasaushadhi*	RRS/618
48.	*Madanamunmad Rasa* (V)	*Svarasa (Bh)*	*Rasaushadhi*	BBR/4/166
49.	*Mahalakshmivilasa Rasa* (R, *Vrushya*)	*Shalmali (Bh)*	*Rasaushadhi*	RP/182
50.	*Makaradhvaja Rasa* (V)	*Moola*	*Rasaushadhi*	BBR/4/156
51.	*Panchashara Rasa* (V)	*Shalmali (Bh)*	*Rasaushadhi*	BRS/546, RYS/2/10, BBR/3/411
52.	*Pramadebhankusha Rasa* (V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/79
53.	*Purnachandra Rasa* (R)	*Mocharasa (Ap)*	*Rasaushadhi*	BBR/3/502
54.	*Purnachandra Rasa* (V)	*Shalmali (Ap)*	*Rasaushadhi*	BBR/3/502, RCA/325
55.	*Purnendu Rasa* (1st) (R)	*Svarasa* (*Bh*)	*Rasaushadhi*	BBR/3/504, RYS/2/65, RK/2/286
56.	*Purnendu Rasa* (4th) (R, V)	*Moola (Bh)*	*Rasaushadhi*	RMi/122, RYS/2/67, BBR/3/504
57.	*Pushpadhanva Rasa* (1st) (V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/58
58.	*Rasa Sindura* (V)	*Moola*	*Rasaushadhi*	RT/146
59.	*Shalmali Satva Prayoga* (R)	*Moola Satva*	*Rasaushadhi*	RC/190
60.	*Shashanka Rasa* (V)	*Moola (Pk)*	*Rasaushadhi*	BBR/5/119
61.	*Shrungarabhra Rasa* (V)	*Svarasa*	*Rasaushadhi*	BBR/5/152
62.	*Tamra Kalpa* (R)	*Mocharasa*	*Rasaushadhi*	RNC/330, BRS/72, RYS/1/527, BBR/2/406
63.	*Vangeshvara Rasa* (V)	*Mocharasa*	*Rasaushadhi*	RK/2/289, BBR/4/610
64.	*Vangeshvara Rasa* (V)	*Tvak*	*Rasaushadhi*	BBR/4/705
65.	*Vasanta Kusumakara Rasa* (R)	*Shalmali Kanda Drava* (*Bh*)	*Rasaushadhi*	RP/177
66.	*Guduchi Kalpa* (R)	*Svarasa (Bh, Ap)*	*Rasayana kalpa*	RC/224, BBR/2/80
67.	*Mritasanjivani Sura* (R)	*Mocharasa*	*Sura*	BRS/395
68.	*Bruhat Musali Paka* (V)	*Mocharasa*	*Paka*	RYS/2/174
69.	*Amrita Bhallataka Paka* (V, R)	*Mocharasa (Pk)*	*Avaleha*	RYS/1/80, RK/2/272
70.	*Chandalini Yoga* (V)	*Mocharasa*	*Churna*	BRS/547
71.	*Chandalini Yoga* (V)	*Moola Svarasa (Bh)*	*Churna*	BRS/547
72.	*Amritasanjivana Rasayana* (V)	*Shalmali*	*Avaleha*	RYS/1/88
73.	*Ashwagandhabhraka* (V)	*Shalmali*	*Churna*	RYS/1/122
74.	*Dwitiya Paka* (V)	*Tvak churna*	*Paka*	RRM/4/124
75.	*Brahmhadandyadi Churna* (V)	*Mocharasa*	*Churna*	RRM/3/142

76.	*Majoon RM* (V)	*Tvak*	*Avaleha*	RRM/2/52
77.	*Shatavaryadi Leha* (V)	*Moola*	*Avaleha*	RPS/271
78.	*Harashashanka Rasa* (V)	*Toya* (*Svarasa*) *(Bh)*	*Rasaushadhi*	BBR/5/481
79.	*Vajikara Leha* (V)	*Moola Svarasa*	*Avaleha*	BBR/4/622
80.	*Vangeshwara Rasa* (V)	*Mocharasa*	*Rasaushadhi*	BBR/4/710
81.	*Vangeshwara Rasa* (V)	*Tvak*	*Rasaushadhi*	BBR/4/710
82.	*Panchabana Rasa* (V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/6
83.	*Pushpadhanva Rasa* (4th) (*Vriddha*) (V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/59, RK/2/284
84.	*Pushpadhanva Rasa* (5th) (V)	*Mocharasa*	*Rasaushadhi*	RYS/2/59
85.	*Pushpadhanva Rasa* (6th) (V)	*Mocharasa*	*Rasaushadhi*	RYS/2/60
86.	*Pugapaka* (*Brihat*) 2nd (V)	*Shalmali*	*Rasaushadhi*	RYS/2/62
87.	*Brahmhapanjara Rasa* (R	*Tvak rasa (Bh)*	*Rasaushadhi*	RYS/2/113
88.	*Makaradhvaja Rasa* 3rd (R)	*Shalmali drava* (expressed juice) *(Bh)*	*Rasaushadhi*	RYS/2/137
89.	*Makaradhvaja Rasa* 4th (V)	*Mocharasa*	*Rasaushadhi*	RYS/2/138
90.	*Madanakamadeva Rasa* (V)	*Svarasa* (*drava*) *(Bh)*	*Rasaushadhi*	RYS/2/144
91.	*Madanagolaka* (V)	*Svarasa* (*Vari*) *(Bh)*	*Rasaushadhi*	RYS/2/148
92.	*Madanajanaka Rasa* (V)	*Svarasa* (*Neera*) *(Bh)*	*Rasaushadhi*	RYS/2/148
93.	*Madanamodaka* 2nd (V)	*Shalmali*	*Guti-Vati*	RYS/2/149
94.	*Madanasandipana Churna* (V)	*Shalmali*	*Churna*	RYS/2/150
95.	*Madanodaya Rasa* 2nd (V)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/150
96.	*Manmatha Rasa* (V)	*Svarasa (Ap)*	*Rasaushadhi*	RYS/2/156
97.	*Manmatha Rasa* (V)	*Shalmali*	*Rasaushadhi*	RYS/2/156
98.	*Mrityunjaya Rasa* 16th (R)	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/2/206
99.	*Yuvatilila Rasa* (V)	*Beeja*	*Rasaushadhi*	RYS/2/217
100.	*Yuvatilila Rasa* (V)	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/2/217
101.	*Ratikantasundara Rasa* (*Madanasundara*) (V)	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/2/226
102.	*Lakshmivilasa Rasa* 10th (R, *Kasa*	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/2/292
103.	*Vangeshwaradi Vati* (V)	*Tvak*	*Guti-Vati*	RYS/2/325
104.	*Vangeshwaradi Vati* (V)	*Mocharasa*	*Guti-Vati*	RYS/2/325
105.	*Vajrasundari rasa* (R)	*Chandali Moola*	*Guti-Vati*	RYS/2/334
106.	*Vaikranta Rasayana* (R)	*Shalmali (Bh)*	*Guti-Vati*	RYS/2/402
107.	*Siddhashalmali Kalpa* (V)	*Shweta Shalmali Toya (Bh)*	*Churna*	RYS/2/643
108.	*Vidaryadi Vrishya Yoga* (V)	*Shalmali*	*Churna*	RK/2/403

Number of dosage forms - *Rasaushadhi*- 59, *Guti-Vati*-15, *Churna*-13, *Khanda/Paka-7*, *Avaleha*-5, *Bhasma*-3, *Kshirapaka*-2, *Kvatha*-2, *Rasayana Kalpa*-1, *Sura*-1

Part used- *Mocharasa*- 28, *Moola*-17, *Svarasa*-26, *Shalmali*-21, *Tvak*-9, *Beeja*-3, *Pushpa*-1, *Satva (Shalmali)-1*, *Piccha*-1, *Phala*-1,

Internal applications of *Rajayakshma, Pushti*

1.	*Asagandhadi Churna (Pushti*)	*Moola*	*Churna*	RRM/2/221
2.	*Mahamriganka Rasa (Kshaya)*	*Shalmali Rasa* (*Bh*)	*Rasaushadhi*	RP/171
3.	*Mrityunjaya Rasa (Dhatukshaya)*	*Shalmali Kvatha (Bh)*	*Rasaushadhi*	RSK/84, RC/150

4.	*Mrityunjaya Rasa* (*Mahan*, 18th) (*Pushti, Pittaja Vyadhi*)	*Shalmali Drava* (*Ap*)	*Rasaushadhi*	RC/150, RYS/2/207
5.	*Purnachandra Rasa (Shosha)*	*Shalmali Dvaya (Ap)*	*Rasaushadhi*	BBR/3/501
6.	*Purnachandra Rasa (Karshya)*	*Pushpa Churna (Ap)*	*Rasaushadhi*	RJN/5/268, RRS/423, RYS/2/64, BBR/3/503, RCA/518
7.	*Rajamriganka Rasa (Rajayakshma)*	*Shalmali (Bh)*	*Rasaushadhi*	BBR/4/441
8.	*Rasa Sindura* (*Rasa Bhasma*) *(Pushti)*	*Pushpa Vrunta* (Pedicel) *(Ap)*	*Rasaushadhi*	BRS/27, APK/197, RB/20, RPU/90
9.	*Shalam Paka (Kshaya)*	*Moola Tvak*	*Paka*	RRM/2/76
10.	*Mriganka Rasa* 17th (*Mahadadya*) (*Kshaya*)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/183
11.	*Mriganka Rasa 36th (Rajadya*) (*Rajayakshma*)	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/2/191
12.	*Rasakandarpa Rasa* (*Kshaya*)	*Shalmali Drava (Bh)*	*Rasaushadhi*	RYS/2/233
Number of dosage forms- *Rasaushadhi*-10, *Churna*-1, *Paka*-1				
Part used- *Tvak*-1, *Shalmali*-3, *Pushpa*-2, *Svarasa/ Drava*-3, *Kvatha*-1, *Moola*-1, *Mocharasa*-1				

Table 6: *Shalmali* as an ingredient of various formulations indicated in *Kshudra Roga, Raktaja Vyadhi, Kushtha, Prameha, Yakrut- Pleeha-Udara Roga*

Sr. No.	Formulations with indication	Part used	Dosage form	References
External applications in *Kshudraroga*				
1.	*Mukhakantikara Lepa (Kshudraroga)*	*Kantaka* (thorns)	*Lepa*	BBR/4/142
Number of dosage forms - *Lepa*-1				
Part used- *Kantaka*-1				
External applications in *Prameha* and *Kushtha*				
1.	*Nirgundyadi Lepa (Kushtha)*	*Moola Tvak*	*Lepa*	RRS/481
Number of dosage forms - *Lepa*-1, Part used- *Moola*-1				
Internal applications in *Kshudra Roga*				
1.	*Parvati Rasa (Mukharoga)*	*Shalmali*	*Rasaushadhi*	BRS/526, RSb/437, RSS/472, RNC/384, RYS/2/43
2.	*Shalmalyadi Leha (Vali-Palita)*	*Panchanga*	*Avaleha*	AKD/303
Number of dosage forms - *Rasaushadhi* -1, *Avaleha*-1				
Part used- *Shalmali*-1, *Panchanga*-1				
Internal applications in *Raktaja Vyadhi*				
1.	*Ghodacholi (Raktapitta)*	*Mocharasa*	*Rasaushadhi*	RRM/1/168
2.	*Raktapittakulakuthara Rasa (Raktapitta)*	*Moola (Bh)*	*Rasaushadhi*	BRS/391, RSb/298, RYS/2/223
3.	*Raktapittakulakandana Rasa (Raktapitta)*	*Shalmali (Bh)*	*Rasaushadhi*	BRS/395, RK/1/197
4.	*Raktapittakulakandana Rasa (Raktapitta)*	*Shalmali Moola*	*Rasaushadhi*	RCA/282
5.	*Panch phulo ka Sharabata (Raktapitta)*	*Pushpa*	*Sharkara/ Panaka*	RNS/1/121
6.	*Raktamaheshwara Rasa* (*Raktapitta*)	*Moola*	*Rasaushadhi*	RYS/2/225
7.	*Vasantamalati Rasa* (*Mahamalinivasanta Rasa*) (*Raktapitta, P*)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/531

8.	*Hemambuda Loham 1st* (*Raktapitta*)	*Mocharasa*	*Loha*	RYS/2/592
9.	*Samangadi Churna* (*Raktasrava*)	*Mocharasa*	*Churna*	RSb/588
Number of dosage forms - *Churna*-1, *Rasaushadhi*-6, *Sharkara/Panaka*-1, *Loha*-1				
Part used- *Mocharasa*-3, *Pushpa*-1, *Moola*-3, *Shalmali*-2				
Internal applications in *Kushtha-Prameha*				
1.	*Asagandha Paka* (P)	*Mocharasa*	*Paka*	RRM/2/76
2.	*Bahumutrantaka Rasa (Madhumeha Somaroga)*	*Moola Churna*	*Rasaushadhi*	RYS/2/642
3.	*Chandanadi Churna* (P)	*Mocharasa*	*Churna*	BBR/2/142
4.	*Chandanadi Churna* (P)	*Pushpa*	*Churna*	RYS/2/632,
5.	*Chandrakala Guti* (P)	*Tvak, Kvatha (Ap)*	*Guti-Vati (Kvatha as Anupana)*	RSK/103, RA/187, RYS/1/421
6.	*Chandrakala Guti* (P)	*Shalmali, Shalmali Kashaya (Bh)*	*Guti-Vati*	RK/2/22, RYS/1/421, BBR/2/208
7.	*Chandrakala Vati* (P)	*Mocharasa*	*Guti-Vati*	RYS/1/421, RSK/103
8.	*Chandrakala Vati* (P)	*Shalmali Kvatha* (*Ap*)	*Guti Vati – Kvatha as Anupana*	RPD/18, BBR/2/208
9.	*Chandrakala Vati* (P)	*Moola*	*Guti-Vati*	RPD/18
10.	*Chandrakala Vati* (P)	*Shalmali*	*Rasaushadhi*	RPd/18
11.	*Chuni Dava* (P)	*Tvak*	*Churna*	RRM/3/129
12.	*Gandhaka Anupana* (K)	*Mocharasa* (Ap)	*Rasaushadhi*	RB/27
13.	*Indra Vati* (P)	*Moola drava* (*Bh*)	*Guti-Vati*	BRS/483, RNC/294, RYS/1/151, RMi/108, RK/2/16, BBR/1/159
14.	*Lakshmivilasa Rasa* (P)	*Shalmali* (*Bh*)	*Rasaushadhi*	RP/181
15.	*Mirchadi Churna* (P)	*Mocharasa*	*Churna*	RRM/2/219
16.	*Pramehakuthara Rasa* (P)	*Tvak*	*Rasaushadhi*	BRS/485, RSb/387
17.	*Pramehari* (*Mehadhvantavivasvana*) *Rasa* (P)	*Moola kvatha (Ap)*	*Rasaushadhi*	RRS/388
18.	*Rajavartavaleha* (P)	*Neera (Svarasa)*	*Avaleha*	BRS/485, BBR/4/447
19.	*Rasa Parpati* (K)	*Shalmali* (*Ap*)	*Parpati*	RPS/60, BBR/4/404
20.	*Rasaraja Rasa* (P)	*Tvak rasa* (*Ap*)	*Rasaushadhi*	RYS/2/244, BBR/4/414,
21.	*Shalmali Leha* (P)	*Semal Kanda*	*Avaleha*	RNS/1/176
22.	*Shalmali Tvak Kvatha* (P)	*Tvak*	*Kvatha*	RRS/384
23.	*Svarna Parpati, 3rd* (P)	*Shalmali (Svarasa) (Bh)*	*Parpati*	RP/169, RYS/2/528
24.	*Vanga Bhasma* (*Vanga Yoga* 2nd) (P)	*Tvak Rasa* (*Ap*)	*Bhasma*	RYS/2/318, BBR/4/697
25.	*Vangashilajatu Yoga* (P)	*Semal Kanda*	*Rasaushadhi*	RNS/1/165
26.	*Vasanta Kusumakara Rasa* (P)	*Shalmali Kanda Drava (Svarasa) (Bh)*	*Rasaushadhi*	RP/177
27.	*Vedavidya Vati* (P, *Madhumeha*)	*Svarasa (Bh)*	*Guti-Vati*	RK/2/16, BBR/4/805
28.	*Veeravanga Rasa* (P, *Vajikara*)	*Semal Kanda* (*Bh*)	*Rasaushadhi*	RNS/2/157
29.	*Pramehakunjarakesari Rasa* 1st (P)	*Shalamali Drava (Bh)*	*Rasaushadhi*	RYS/2/80
30.	*Pramehakunjarakesari Rasa* 3rd	*Shalamali Drava (Bh)*	*Rasaushadhi*	RYS/2/80

	(*Mehakunjarakesari*) (P)			
31.	*Pramehagajankusha Rasa* (P)	*Moola Rasa (Bh)*	*Rasaushadhi*	RYS/2/82
32.	*Pramehahara Rasa 1st* (P)	*Moola/ Pushpa Rasa (Ap)*	*Rasaushadhi*	RYS/2/86
33.	*Vangeshwara Rasa 18th* (P)	*Mocharasa*	*Rasaushadhi*	RYS/2/324
34.	*Haragouri Rasa* (*Panchabana*) (P)	*Svarasa (Bh)*	*Rasaushadhi*	RYS/2/570
35.	*Vangasindura Rasa* (P)	*Moola Tvak*	*Rasaushadhi*	RYS/2/619
36.	*Adbhuta Churna* (P)	*Mocharasa*	*Churna*	RRM/4/173
Number of dosage forms - *Rasaushadhi*-17, *Churna*-5, *Guti-Vati*-7, *Kvatha*-1, *Avaleha*-2, *Paka*-1, *Parpati*-2, *Bhasma*-1,				
Part used- *Moola/Kanda*-7, *Shalmali*-3, *Tvak*-5, *Mocharasa*-7, *Nira/Drava/Svarasa/Moola Drava*-10, *Pushpa*-2, *Moola Kvatha*-1, *Tvak Kvatha*-1 (1 *Kvatha* is used as *Anupana*)				
Internal applications in *Yakrita-Pleeha- Udara Roga*				
1.	*Gangadhara Churna (Uadara Roga*	*Mocharasa*	*Churna*	RRM/2/209
2.	*Majoona 1st (Yakruta, Udara)*	*Mocharasa*	*Avaleha*	RRM/2/162
3.	*Purnachandra Rasa (Pleeha)*	*Pushpa Churna (Ap)*	*Rasaushadhi*	RRS/423
4.	*Safufa 3rd (Yakruta- Udara Roga)*	*Moola Tvak*	*Churna*	RRM/2/164
5.	*Tamra Kalpa (Pleeha roga)*	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/1/527, RSS/422
6.	*Tamra Kalpa (Udara Roga)*	*Mocharasa* (*Bh*)	*Rasaushadhi*	RNC/330
Number of dosage forms- *Rasaushadhi*-3, *Churna*-2, *Avaleha*-1				
Part used- *Mocharasa*-4, *Pushpa* -1, *Moola Tvak*-1,				
Internal+ External applications in *Kushtha*				
1.	*Gandha Taila* (K) (I+E)	*Shalmali rasa*	*Taila*	RK/2/205
Number of dosage forms- *Taila*-1				
Part used- *Shalmali Svarasa*-1				

Table 7: *Shalmali* as an ingredient of various formulations indicated in *Yoniroga, Yonivyapada, Striroga, Pradara, Sutikaroga* and *Balaroga*

Sr. No.	Formulations with indication	Part used	Dosage form	References
Internal applications in *Striroga- Yonivyapada*				
1.	*Bolabaddha Rasa* (S)	*Shalmali Toya* (*Svarasa*) (*Bh*)	*Rasaushadhi*	RCA/601
2.	*Bhadrotkatadya Avaleha* (S)	*Tvak (Veshta)*	*Avaleha*	BBR/3/635
3.	*Chandanadi Churna* (Pr)	*Mocharasa*	*Churna*	BBR/2/142
4.	*Pancha phulo ka Sharabata* (Pr)	*Pushpa*	*Sharkara/ Panaka*	RNS/1/121
5.	*Pradarari Lauha* (Pr)	*Mocharasa*	*Loha*	RSb/567, RYS/2/77,
6.	*Purnachandra Rasa* (S)	*Svarasa* (*Ap*)	*Rasaushadhi*	BBR/3/502, RYS/2/64
7.	*Pushyanuga Churna* (Yv, Pr, S)	*Mocharasa*	*Churna*	RRS/597
8.	*Salya Paka* (S, *Vataroga*, *Shirorioga*)	*Tvak*	*Paka*	RRM/1/129
9.	*Sutikavallabha Rasa* (*Sutika*)	*Moola (Bh)*	*Rasaushadhi*	RSb/456, RYS/2/546
10.	*Pradarantaka Loha* (Pr)	*Mocharasa*	*Loha*	RYS/2/76
11.	*Pradarari Rasa* 3rd (Pr)	*Mocharasa*	*Rasaushadhi*	RYS/2/77
Number of dosage forms- *Avaleha*-1, *Churna*-2, *Loha*-2, *Paka*-1, *Rasaushadhi*-4, *Sharkara/Panaka*-1				
Part used- *Pushpa*-1, *Mocharasa*-5, *Moola*-1, , *Svarasa*-2, *Tvak*-2				
Internal applications in *Balaroga*				

1.	*Janma Ghunti* (B)	*Mocharasa*	*Churna*	RNS-1/105
2.	*Nimbadi Ghrita Kshira (Balagraha)*	*Patra* (leaves)	*Ghrita*	RRS/539
Number of dosage forms- *Ghrita*-1, *Churna*-1, Part used- *Mocharasa*-1, *Patra*-1				

Table 8: *Shalmali* as an ingredient of various formulations indicated in *Jwara, Jwaratisara, Kamala, Pandu*

Sr. No.	Formulations with Indication	Part used	Dosage form/ Method	References
Internal applications in *Jwara-Jwaratisara*				
1.	*Chandraprabha Vati* (JA)	*Mocharasa (Bh)*	*Guti-Vati*	BRS/330, RK/1/280, BBR/2/210
2.	*Chandraprabha Vati* (JA) (*Tridoshaja Atisara*)	*Mulottha Drava* (expressed juice of root) *(Bh)*	*Guti-Vati*	BRS/330, RK/1/280, RMi/94, BBR/2/210, RCA/193
3.	*Jwaratisarahara Rasa* (J, A)	*Mocharasa (Bh)*	*Rasaushadhi*	RYS/1/510
4.	*Mritasanjivani Sura (Sannipata Jwara)*	*Mocharasa*	*Sura*	BRS/395, BBR/4/130
5.	*Nagaradi Churna* (JA)	*Mocharasa*	*Churna*	BBR/3/166
6.	*Parvati Rasa (Pittaja Jwara)*	*Shalmali*	*Rasaushadhi*	BBR/3/486
7.	Shringarabhra Rasa (*Jvara*)	*Mocharasa* (*Mocham*)	*Rasaushadhi*	RCA/348
8.	*Sudha Pippali Yoga (Jirna Jwara)*	*Tvak Svarasa* (expressed juice of tvak) (*Bh*)	*Churna*	RP/168
9.	*Sutadi Vati* (J)	*Mocharasa*	*Guti-Vati*	BRS/328
10.	*Sutadi Vati* (JA)	*Moola drava* (*Bh*)	*Guti-Vati*	BRS/328
11.	*Talisadi Churna* (J)	*Mocharasa*	*Churna*	RRM/2/217
12.	*Trailokyasundara Rasa*(JA)	*Mocharasa*	*Rasaushadhi*	RSb/296
13.	*Sarvasiddhiprada Rasa* (J)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/2/497
Number of dosage forms- *Rasaushadhi*-5, *Guti-Vati*-4, *Churna*-3, *Sura*-1				
Part used- *Mocharasa*-8, *Shalmali*-2, *Tvak*- 1, *Moola*-2,				
Internal applications in *Kamala-Pandu*				
1.	*Amritasrava Rasa* (Pd)	*Shalmali* (*Bh*)	*Rasaushadhi*	RPS/156, RCA/272
2.	*Lohasundara Rasa* (*Lohasindura*) (Pd)	*Shalmali drava (Bh)*	*Rasaushadhi*	RK/1/179, RNC/230, RYS/2/315, BBR/4/554
3.	*Pandunigraha Rasa* (Pd)	*Shalmali Svarasa* (*Bh*)	*Rasaushadhi*	RK/1/171, RNC/229, BRS/383
4.	*Pandusudana Rasa* (Pd)	*Tvak rasa* (*Bh*)	*Rasaushadhi*	RPS/158, RYS/2/32, BBR/3/440 RCA/262
5.	*Trailokyasundara Rasa* (Pd)	*Mocharasa*	*Rasaushadhi*	BBR/2/503
6.	*Trailokyanatha Rasa* (Pd)	*Mocharasa*	*Rasaushadhi*	BRS/389, RYS/1/630, RK/1/173, BBR/2/501
7.	*Trailokyanatha Rasa (Pandu, Shvasa, Kasa)*	*Moola*	*Rasaushadhi*	RCA/264
8.	*Pandukuthara Rasa* (Pd)	*Tvak (Bh)*	*Rasaushadhi*	BBR/3/437
9.	*Purnachandra Rasa* 4th (Pd)	*Shalmali Ambu* (expressed juice) *(Ap)*	*Rasaushadhi*	RYS/2/65 RCA/325
Number of dosage forms- *Rasaushadhi*-9				
Part used- *Mocharasa*-2, *Svarasa/ Drava/Rasa/Ambu*-3, *Shalmali/Mocha*-1, *Tvak*-2, *Moola*-1				

Table 9: *Shalmali* as an ingredient of various formulations indicated in *Vrana* and other miscellaneous diseases

Sr. No.	Formulations with indication	Part used	Dosage form/ Method	References
External applications in *Vrana*				
1.	*Shalmali Toola Yoga* (*Agantu Vrana*)	*Shalmali Toola* (silk-cotton fluff)	*Lepa*	RK/2/358
2.	*Gorochanadi Lepa* (*Vrana*)	*Kantaka*	*Lepa*	RK/2/343
Number of dosage forms- *Lepa*-2				
Part used- *Toola*-1, *Kantaka*-1				
External applications in Miscellaneous disease conditions				
1.	*Palashadi Taila (Pakshaghata)*	*Tvak*	*Taila*	RRM/5/86
Number of dosage forms- *Taila*-1				
Part used- *Tvak*-1				
Internal applications in Miscellaneous disease conditions				
1.	*Kumkumadi Churna (Vata Roga)*	*Mocharasa*	*Churna*	RRM/3/51
2.	*Lokanatha Rasa (Sarvaroga)*	*Mocha (Ap)*	*Rasaushadhi*	RC/207
3.	*Mahamrityunjaya Rasa (Pitta Roga)*	*Shalmali Drava* (*Ap*)	*Rasaushadhi*	BRS/243
4.	*Pipari Paka (Vata Roga)*	*Tvak*	*Guti-Vati*	RRM/5/110
5.	*Piyusha Vati (Shotha)*	*Shalmali Kshara*	*Rasaushadhi*	RJN/4/258
6.	*Trailokyasundara Rasa (Shotha, Pd)*	*Mocharasa*	*Rasaushadhi*	RSS/255, RYS/1/633
7.	*Trinetra Rasa (Mutrakrucchra)*	*Shalmali Tvak Toya (Ap)*	*Rasaushadhi*	BRS/480, RNC/290, BBR/2/483
8.	*Trinetra Rasa* 5th (*Mutrakrucchra*)	*Shalmali (Bh)*	*Rasaushadhi*	RYS/1/600
9.	*Trinetrakhya Rasa (Mutrakrucchra)*	*Kvatha* (*Tvak*) *(Ap)*	*Rasaushadhi*	RSS/382, RNC/290
10.	*Trinetrakhya Rasa (Mutrakrucchra)*	*Moolarasa (Ap)*	*Rasaushadhi*	RSb/381, RSS/381
11.	*Trinetrakhya Rasa (Mutrakrucchra)*	*Pushpa*	*Rasaushadhi*	BBR/2/483
12.	*Vaiduryaka Rasayana (Vishajanya Sannipata)*	*Mochasara* (*Bh*)	*Avaleha*	RCD/168
13.	*Ashtottari Kuraiyadi Avaleha* (*Aruchi, Shotha, Pravahika*)	*Mocharasa*	*Avaleha*	RRM/5/135
14.	*Prachandabhairava Rasa* (*Apasmara)*	*Moola*	*Rasaushadhi*	RYS/2/67, BBR/3/505
15.	*Paneeyavatika* (*Sannipata*)	*Shalmali (Bh)*	*Guti-Vati*	RYS/2/35
16.	*Vatari Paka* (*Madhusnehi*) (*Vatavyadhi*)	*Mocharasa*	*Paka*	RYS/2/363
Number of dosage forms- *Rasaushadhi*-10, *Churna*-1, *Avaleha*-2, *Guti-Vati*-2, *Paka*-1				
Part used- *Mocharasa*-5, *Mocha/ Shalmali*-3, *Moola*-1, *Kvatha/ Drava/ Toya*-4, *Pushpa*-1, *Kshara*-1, *Tvak*-1				
Internal+ External applications in *Vrana*				
1.	*Kumbhikadi Taila (Nadi Vrana)*	*Mocharasa*	*Taila*	BBR/5/729
Number of dosage forms- *Taila*-1				
Part used- *Mocharasa*-1				

Table 10: Distribution of Internal and External Applications of *Shalmali* and *Mocharasa*

Sr. No	Type of Application	*Shalmali* and its parts	*Mocharasa*
1.	Internal application	184	128
2.	External Application	14	1
3.	Internal as well as External Application	1	2

Table 11: Comparative analysis of references pertaining to *Shalmali* and *Mocharasa* found in referred *Rasashastra* texts (texts arranged as per their time period)

Sr. No	Name of classical *Rasashastra* text	Time period	References of formulations pertaining to *Shalmali*	References of formulations pertaining to *Mocharasa*	Total
1.	Rasendramangala (RSM)	10th–11th century CE or earlier	1	1	2
2.	Rasahridayatantra (RHT)	10th–11th century CE	---	---	---
3.	Rasarnava (RNV)	12th century CE	4	---	4 (PP)
4.	Rasendrachudamani (RCD)	12th century CE	1	1	2
5.	Rasaprakasha Sudhakara (RPS)	13th century CE	4	1	5
6.	Anandakanda (AKD)	13th century CE	5	1	6
7.	Rasaratnasamuchaya (RRS)	Late 13th–early 14th century CE	19	7	26
8.	Rasadhyaya (RAD)	14th century CE	---	---	---
9.	Arka Prakasha (AKP)	14th–16th century CE	1	1	2 (PP)
10.	Rasendrasarasangraha (RSS)	14th–15th century CE	6	5	11
11.	Rasendrachintamani (RNC)	14th–15th century CE	7	7	14
12.	Rasachintamani (RC)	14th–15th century CE	8	4	12
13.	Rasamanjari (RMi)	15th century CE	4	2	6
14.	Rasapaddhati (RP)	15th century CE	7	0	7
15.	Rasasanketakalika (RSK)	Late 15th century CE	2	1	3
16.	Rasapradipa (RPd)	15th–16th century CE	1	1	2
17.	Rasakaumudi (RKM)	16th century CE	---	---	---
18.	Rasapradipika (RPD)	16th century CE	1	1	2
19.	Rasakamadhenu (RK)	16th–17th century CE	18	9	27
20.	Ayurved Prakasha (APK)	16th–17th century CE;	2	0	2
21.	Rasarajamahodadhi (RRM)	19th century CE	16	23	39
22.	Rasachandanshu (RCA)	19th–early 20th century CE	10	5	15
23.	Brihatrasarajasundara (BRS)	Late 19th–early 20th century CE	21	19	40
24.	Rasendrabhaskara (RB)	Early 20th century CE	1	3	4
25.	Rasatarangini (RT)	20th century CE; 1924	2	0	2
26.	Rasayogasagara (RYS)	20th century CE; 1927–1930	85	55	140
27.	Rasayanasara (RNS)	20th century CE	5	5	10
28.	Rasajalanidhi (RJN)	20th century CE	9	11	20
29.	Bharata Bhaishajya Ratnakara (BBR)	20th century CE	54	41	95
30.	Rasamritam (RA)	20th century CE; 1951	1	0	1
31.	Rasendrasambhava (RSb)	20th century CE	4	7	11
32.	Rasendrapurana (RPU)	20th century CE	3	1	4

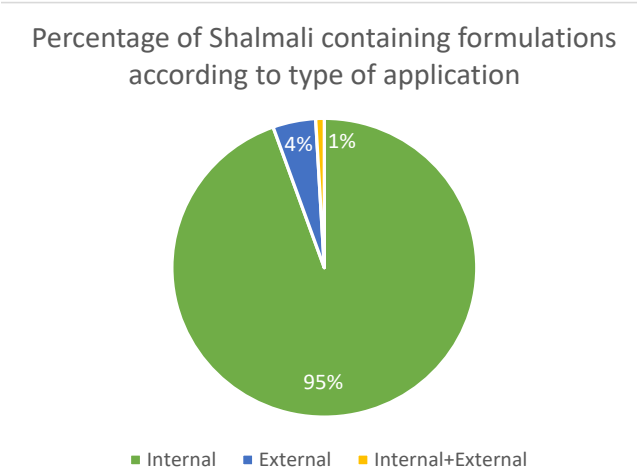


Figure 2: Distribution of *Shalmali- Mocharasa* containing formulations according to route of application

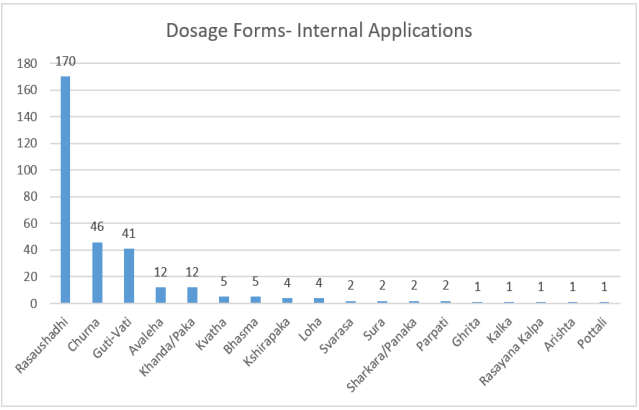


Fig. 3 A) Bar chart for dosage forms of *Shalmali* formulations of internal applications

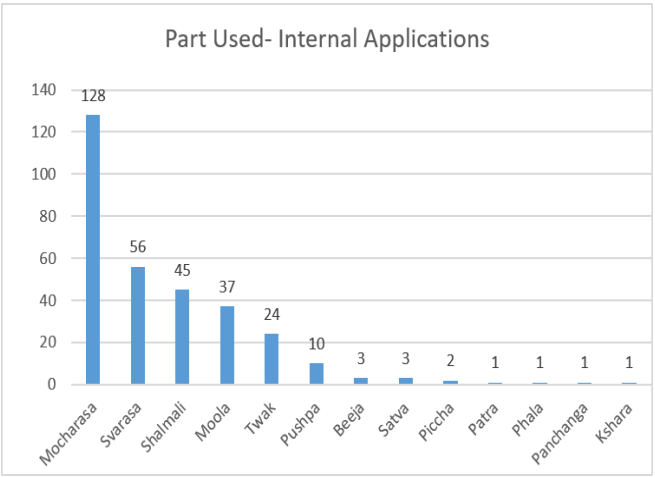


Fig. 3 B) Bar chart for number of parts used of *Shalmali* in internal applications formulations

Figure 3- Number of Dosage forms and Parts used of *Shalmali* in internal applications

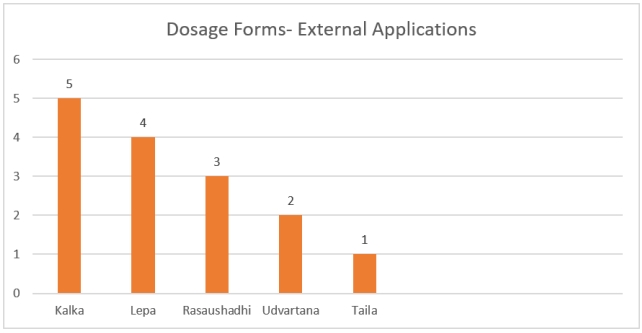


Fig. 4 A) Bar chart for dosage forms of *Shalmali* formulations of external applications

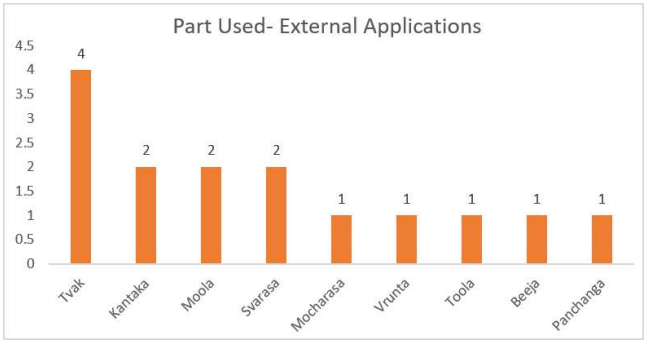


Fig. 4 B) Bar chart for number of parts used of *Shalmali* in external applications formulations

Figure 4- Number of dosage forms and parts used of *Shalmali* in external applications

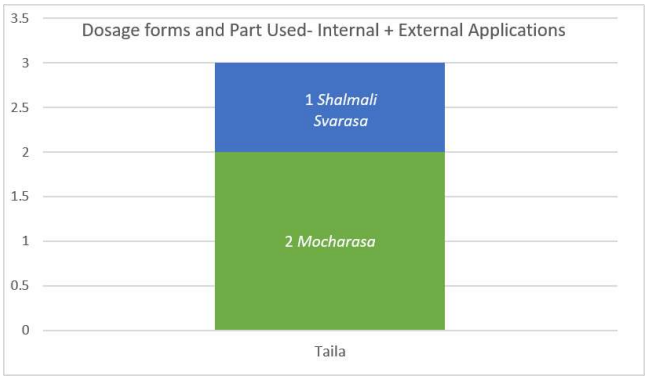


Figure 5- Number of dosage forms and parts used of *Shalmali* in internal as well as external applications

4. DISCUSSION

The present review highlights the multifaceted importance and working principle of *Shalmali* (*B. ceiba* Linn.) in classical Indian alchemy literature. Although classical *Dravyagunavigyan* (the science of Ayurvedic pharmacology and medicinal herbs) texts primarily describe *Shalmali* based on its botanical identity, pharmacodynamics and therapeutic indications, *Rasashastra* literature presents a much broader perspective by employing different parts of

the plant in pharmaceutical processing as well as a wide range of therapeutic formulations. The review of twenty-nine classical *Rasashastra* texts (no references found in three texts) revealed that *Shalmali* is incorporated in numerous formulations intended for both internal and external administration. Among these texts *Rasahridayatantra, Rasadhyaya* and *Rasakaumudi* does not contain references related to *Shalmali* and *Mocharasa*. (Fig.1 & Table 11) It is also used as a pharmaceutical adjuvant during the preparation of herbo-mineral medicines. It is evident by the screened literature that *Shalmali* has been utilised in Mercury-related pharmaceutical procedures more often than other minerals and metals like *Abhraka* (Mica), *Haratala* (Orpiment) & *Loha* (Iron). This might be because of characteristic affinity of *Shalmali* for Mercury and its procedures. As evident in the extracted information regarding pharmaceutical processes, *Shalmali* is found to be used in the processes like *Bhasmikarana* (incineration), *Jarana* (assimilation), purification and *Sindurikarana* (colourisation) of Mercury, Orpiment, Iron and Mica (Table 1). Specificity of the part used of *Shalmali* in these processes might play important role along with the pharmacodynamics of *Shalmali*. Also, general principle of *Rasashastra* conveys the concept of utilising a drug with some specific properties which can potentiate the favorable attributes or reduce/ neutralize harmful or unwanted noxious qualities in target metal/ mineral. [47] *Shalmali* has sweet- astringent taste*,* sweet post digestive effect and cold potency. [48] Cold potency of *Shalmali* can balance the noxious *Ushna* (hot), *Tikshna* (sharp/ pungent) and *Ruksha* (dry) properties of *Hartala*.[49] Likewise, the *Madhura Rasa* along with *Snigdha-Sheeta-Picchila* (slimy/mucilaginous) attributes can potentiate the *Vata-Pitta* pacifying, *Snigdha*, *Deepana* (appetizing), *Sheeta*, strength promoting, aphrodisiac properties of *Abhraka*.[50] *Shalmali* and *Mocharasa* being potent slimy in nature, can counteract *Ruksha* (excessive dryness) and aid in *Lepana Karma* (Anointing) during the process. This transposition of properties from *Shalmali* to metal and mineral is evident in their therapeutic applications. (Table 1) Formulations of *Rasaushadhi* (herbo-mineral formulations) are prepared by many important manufacturing principles including trituration, assimilation, incineration into *Bhasma* and *Puta* (controlled heating). [51] These formulations undergo extensive trituration, levigation and some forms like *Bhasma*, *Kupipakva Rasayana* (a pharmaceutical preparation obtained by controlled heating of the formulation in a sealed glass bottle) are exposed to controlled high amount of heat during the pharmaceutical preparation of drugs. The process of trituration by *Kvatha*/ *Svarasa* of herbal drug (trituration, levigation) may cause the transfer of properties of herbs to the metals or minerals in the mixture of formulation. [52] Also, all these processes make the drug capable of penetrating the minute channels of body (*Sukshma Srotasa*) and effective in very small dose. [53]

The primary analysis also showed that internal administration constituted the major proportion of formulations containing *Shalmali* and *Mocharasa*, whereas comparatively fewer formulations were intended solely for external use (Table 3 & 10). This predominance of internal formulations suggests that the *Rasavaidya* (Ayurvedic iatrochemist) recognized *Shalmali* chiefly as a systemic therapeutic agent. An interesting observation from the compiled data is the predominance of *Mocharasa*, the gum-resin exudate of *Shalmali*, among all the plant parts used (Table 10). Classical Ayurvedic texts describe *Mocharasa* as possessing astringent taste*, Sheeta* potency and *Madhura* post digestive effect attributes that impart absorptive*, Stambhana* (restraining), *Ropan*a (healing) and *Pitta-Shamaka* (alleviating *Pitta*) actions. [54] Such properties can make it particularly suitable for conditions associated with excessive fluid loss, bleeding, inflammation and tissue damage (Table 3). Additionally, easy accessibility of *Mocharasa* as a dried gum can be a contributing factor since it eliminates the strenuous efforts to procure roots of *Shalmali* thereby reducing the degradation of plant material. The highest number of formulations containing

Shalmali or *Mocharasa* were found indicated in *Vajikarana* (aphrodisiac)- *Rasayana* (rejuvenative) followed by *Atisara* (diarrhea)- *Pravahika* (dysentery)- *Grahani* (IBS), *Prameha* (diabetes)- *Kushtha* (skin disease), *Jvara* (fever)-*Jvaratisara* (diarrhea with fever), *Rajayakshma* (wasting)- *Pushti* (nourishment), *Striroga- Yoniroga* (Gynecological disorders), *Raktaja Vyadhi* (hemorrhagic disorders), *Kamala* (jaundice)- *Pandu* (anemia) and so on (Table 3). This therapeutic versatility of *Shalmali* can be better understood through its pharmacodynamics. (Table 4-9) *Shalmali* is classified as *Stambhana* due to its astringent taste and *Sheeta* potency properties, as defined in *Sharangadhara Samhita*. Similarly, *Mocharasa* is predominantly described as absorptive in various *Nighantus*. Both substances are utilized in the treatment of diarrhea, dysentery, IBS, and piles. *Bhavaprakasha* has explicitly quoted *Shalmali* as *'Raktapittajita'* (cures haemorrhagic disorder). Based on these characteristics it is useful in controlling diarrhea, dysentery, haemorrhage and menorrhagia. [55] (Table 4) Astringent taste of *Shalmali* and *Mocharasa* can be useful for its attributes like *Sandhanakara* (joining), *Shoshana* (absorptive), and the ability to reduce excessive *Kleda* (moisture), which might help alleviate these conditions. (Table 4) Classical texts attribute sweet- astringent taste, heavy and unctuous, cold potency, and *Madhura* post-digestive effect to *Shalmali*. [56] The sweet- astringent taste, *Madhura* post-digestive effect, and *Sheeta* potency of *Shalmali* can nourish *Saptadhatus* (seven body tissues) through *Santarpana* (nourishing), supporting its role in rejuvenative- aphrodisiac. While not a direct *Rasayana*, by possessing optimal appetizing property, it can enhance *Saumya Dhatus* (mild tissues) like *Rasa* (nutritive fluid) and *Mamsa* (muscle tissue). Its pharmacodynamical properties may enrich muscle tissue and *Shukra Dhatu* (reproductive tissue), aiding in aphrodisiacs through the strengthening of *Shithila Dhatu* (lose body tissues). Nighantus have described *Shalmali* as *Brumhani* (nourishing), aphrodisiac, and rejuvenative. [57] These descriptions highlight the potential of *Shalmali* to be useful in conditions like *Rajayakshma* for nourishment where body tissues are depleted. [58] (Table 5) Their selection in *Doshaja* types of *Prameha* and *Kushtha* is completely dependent on the skill of the physician. It is prominently featured in the treatment of *Pittaja* and *Vataja* fever. *Shalmali* can help nourish depleted body tissues from procedures like *Langhana* (fasting) and *Kashaya*, while its cold and unctuous qualities can balance the pungent characteristics of other drugs. (Table 6) The astringent taste of *Mocharasa* may contribute to reducing diarrhea by controlling excess movement of metabolic toxins. It is extensively evident in multisystem disorders of the gastrointestinal tract, female reproductive system, urinary tract, bleeding disorders and chronic debilitating diseases. This might support its broad therapeutic applicability and capacity of influencing multiple physiological systems. (Table 6,7) For the tissue healing activity, *Shlakshna* property (smoothness) and for the strength, unctuous, cold, *Sthira* (steady), *Sthula* (bulky) properties are useful which can lead to tissue stability and promote healing of damaged mucosa and wounds. (Table 9)

The diversity of dosage forms also reflects the pharmaceutical adaptability of *Shalmali*. It is incorporated into approximately 18 dosage forms such as herbo-mineral formulations, *Churna* (powder), *Svarasa* (expressed juice), *Guti-Vati* (tablet), *Avaleha* (Linctus), *Kvatha* (decoction), *Kalka* (paste), *Taila* (oil), *Ghrita* (ghee), *Ksheerapaka* (Milk decoction), *Khanda-Paka* (Sugar-based confection), *Sura* (fermented liquor), *Sharkara-Panaka* (Sugar syrup), *Arishta* (Fermented decoction), *Lepa* (Paste), *Lauha* (Iron preparation), *Bhasma* (Calcined ash), *Parpati* (Flake preparation), *Pottali* (Bolus preparation). Among these, herbo-mineral formulations constituted the largest proportion, indicating that *Shalmali* has been employed as a herbal ingredient but also served as a *Bhavana Dravya* (substance used for trituration), *Anupana* (vehicle) or *Sahapana* (adjuvant) during the preparation of medicines. *Bhavana* (pressurized trituration) with *Shalmali* juice or *Mocharasa* may facilitate mixing of herbal

phytoconstituents with mineral particles, enhance particle size reduction, improve stability and possibly augment therapeutic efficacy.[59] The repeated use of *Shalmali* during purification, incineration into *Bhasma* and trituration procedures may suggest that it is capable of modifying both the pharmaceutical characteristics and biological activity of metallic preparations. (Fig. 3,4,5)

Phytochemical profile and part-wise relevance: Modern phytochemical investigations are useful in interpreting the classical observations. Different parts of *B. ceiba* L. have been reported to contain tannins, phenolic acids (gallic acid), flavonoids, the xanthone C-glycoside mangiferin, the flavonol glycoside shamimicin and shamiminol, triterpenoids such as lupeol, phytosterols such as β-sitosterol, sesquiterpenoid naphthoquinones (hemigossypol derivatives), and polysaccharides and mucilage. [60] The distribution of these constituents varies by plant part. Bark, root, flower, fruit and exudate show a different phytochemical emphasis, which is evident in the part-specific selection described in the classical texts. *Mocharasa* is chiefly a polysaccharide-rich gum with associated tannins, and so differs from the bark and root in both composition and expected pharmacological properties. [61]

Correlation of principal *Rasapanchaka* with pharmacological activity: *Kashaya rasa* and *Grahi/Stambhana* action: Tannins and polyphenols precipitate proteins on mucosal surfaces, reduce secretions and strengthen tissue. This astringent mechanism is a plausible basis for the *Grahi* and *Stambhana* properties, and for the probable use of *Shalmali* and *Mocharasa* in *Atisara*, *Pravahika*, *Raktatisara*, *Raktapradara*. [61] Antidiarrhoeal and antimicrobial activities of *B. ceiba* L. extracts have been reported in experimental models. [62]

Mucilage and gum polysaccharides (*Mocharasa*): The demulcent and film-forming properties of gum polysaccharides may protect inflamed mucosa and soothe irritated tissue. This can resemble the *Snigdha*, *Picchila* and *Sheeta* qualities attributed to *Mocharasa*, and may partly explain its use in gastrointestinal, genitourinary and burning conditions. [63]

Ropana and *Vrana-ropaka* action: Flavonoids, phenolics, lupeol and β-sitosterol have shown antioxidant, anti-inflammatory and wound-healing effects in experimental studies, including enhanced wound contraction, collagen deposition and reduced oxidative stress. [64,65] These effects are consistent with the mentioned classical use of *Shalmali* in chronic wounds and inflammatory conditions.

Sheeta Virya and *Pitta-Rakta Shamana* action: The anti-inflammatory and antioxidant constituents may account for the *Rakta-Prasadana* effects. Hemostatic and anti-inflammatory actions are also supported by the astringent tannin fraction. [66]

Prameha (diabetes): Antihyperglycaemic and antihyperlipidaemic effects of *B. ceiba* L. extracts have been reported in rodent models. Mangiferin and related polyphenols have been associated with improved glucose handling, α-glucosidase inhibition and antioxidant protection of pancreatic tissue. [67]

Vrishya and *Balya* action (reproductive tonic, rejuvenation): Root and other extracts have shown aphrodisiac and androgenic-type effects in animal studies, such as improved sexual behavior parameters. Antioxidant and anabolic-supportive effects of phytosterols may further contribute to the *Rasayana* and *Brimhana* properties. [68]

Reported immunomodulatory and hepatoprotective effects may relate to the polyphenol and triterpenoid fractions, and could underlie the use of *Shalmali* in chronic, debilitating conditions. [69,70]

Because classical formulations most often use *Mocharasa* in *Rasaushadhi* dosage forms, the pharmaceutical context matters as much as the phytochemistry. The gum polysaccharides and tannins in *Mocharasa* may act as binders, stabilizers and bioavailability modifiers. In *Kupipakva* and *Parpati* type preparations, they may also help with trituration and with the dispersion or palatability of the mineral and metallic constituents. Whether the heat, trituration or *Bhavana* steps alter the tannin and

polysaccharide profile has not been systematically studied. This is an important aspect, because most modern studies use crude bark, root or flower extracts rather than the exudate or the processed classical form.

Novel inputs of this review in Ayurveda research domain: Previously published reviews on *B. ceiba* L. that predominantly focuses on its botanical identity, phytochemistry, pharmacological activities, and general Ayurvedic therapeutic applications. But the present review provides a specialized and structured analysis of *Shalmali* and *Mocharasa* in classical *Rasashastra* literature. Its distinctive contribution lies in the systematic screening of 32 classical *Rasashastra* texts (references found in 29 texts) and the consolidation of references pertaining to their applications in *Parada* and other mineral–metal processing procedures, including *Shodhana*, *Marana*, *Jarana*, *Bhavana*, and *Sindurikarana*, alongside their use in diverse therapeutic formulations. This review further categorizes the documented applications according to therapeutic indications, plant parts or derivatives employed, pharmaceutical roles, and dosage forms. By integrating these textual findings with an interpretation of their Ayurvedic pharmacodynamic rationale, this work provides a specialized reference for understanding the multifaceted pharmaceutical and therapeutic significance of *Shalmali* and *Mocharasa*.

Limitations of the review- Although efforts were made to include all relevant references to *Shalmali* available in the texts consulted, the possibility of inevitable omissions cannot be entirely excluded. The interpretation of classical textual references may be subject to uncertainty owing to variations in terminology, contextual usage, and differences in interpretation. Furthermore, variations in verses, numbering, and pagination across published editions may arise from differences in the manuscripts and opinions of editors. In addition, some formulations may be repeated or derived from common textual sources. The review is limited to the texts consulted, and relevant information may also be present in rare, unpublished, or unexamined *Rasashastra* texts and manuscripts. Finally, the findings are based on textual and literature-based evidence; the reported uses and therapeutic properties of *Shalmali* have not been independently validated through clinical studies as part of this review.

5. CONCLUSION

Evaluation of screened references from *Rasashastra* texts reveals *Shalmali* along with *Mocharasa*, are used in approximately 42 therapeutic indications with 15 parts of plant. Parts used include *Moola* (root), *Moola Tvak* (root bark), *Kanda* (tuber), *Kanda Tvak* (stem bark), *Veshta* (exudate), *Satva* (essence/ exudate), *Pushpa* (flowers), *Beeja* (Seeds), *Panchanga* (whole plant), *Phala* (fruit), *Patra* (leaves), *Patra Vrinta* (petiole), *Pushpa Vrinta* (pedicel), *Kantaka* (thorn), *Toola* (silk cotton fluff), and *Mocharasa*. By this, *Shalmali* and *Mocharasa* indicate their potential broad-spectrum therapeutic utility in *Rasashastra*. This attempt will help Ayurveda researchers and practitioners to understand the mode of action of *Shalmali* and *Mocharasa* to some extent with possible rationale behind the formulations, therapeutic administrations thereby nourishing the young minds of Ayurveda stakeholders. This document can be used as ready manual Ayurveda and pharmacy experts who are interested in specific information about the *Shalmali* in *Rasashastra* domain regarding textual validation, pharmaceutical standardization, and experimental investigation. Information compiled here can be used as guidelines for drafting research projects for subject of same interest.

Abbreviations:

A – Atisara

Ap – Anupana

B – Balaroga

Bh – Bhavana

E – External

G – Grahani

I – Internal

I+E – Internal + External

J – Jwara

JA – Jwaratisara

K – Kushtha

NA – Not Available

P – Prameha

Pd – Pandu

Pk – Prakshepa

PP – Pharmaceutical Process

Pr – Pradara

R – Rasayana

S – Striroga

V – Vajikarana

Y – Yoniroga

Yv – Yonivyapada

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