

Review Article

Therapeutic utilities of *Sorakamliya Rajatadrava* – A drug review

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ABSTRACT:

In the 16<sup>th</sup> *Tarang*, of *Rasatarangini* textbook namely '*Rajata Vidhyaniyam*', the author described exceptional formulations named as *Sorakamliya Rajata* (Silver nitrate –AgNO<sub>3</sub>), and its *Drava kalpna*, in its various dilutions. A unique preparation *Drava Kalpna*, is used internally and externally in various diseased conditions as –. *Drava kalpna* internally used for to treat *Agnimandya* (loss of appetite), *Shool – Astha vidha* (Pain), *Grahani* (Bowel disease), etc. Externally *Drava kalpna* used for wound cleansing, for *Uttarbasti*, for to treat various *Netraroga* (Eye diseases), and for local application. This review article includes the discussion about the three different preparative methods and their therapeutic properties of the drug *Sorakamliya Rajatadravas*.

**KEY WORDS:** *Rasatarangini*, *Sorakamliya Rajata*, *Drava*, *Dravak kalpna*, *Sorakamliya Rajatadrava* etc.

INTRODUCTION:

From pre-*vaedic* period metals and minerals are known to human beings, as previously they were used for only domestic purposes, after recognizing therapeutic properties of metals, they began to use extensively for the treatment. The branch of ancient Indian medicine which mainly deals with preparation of various formulations (*Rasaushadhies*) from metal and mineral is named as *Rasashastra* (Indian Alchemy). Abundant literature is available regarding *Rasashastra*. Amongst the most recent works (20<sup>th</sup> century) is '*Rasatarangini*', this holds an important place amongst academicians, researchers and students of *Rasashastra*<sup>[1]</sup>. This classical text gives different ideas of ancient alchemy along with modern chemistry without losing its depth and therapeutic values. In this text author *Pranacharya Sadananda Sharma*, elaborates various ancient procedures and also unique modern formulations, like the preparation of various *Drava* (Amla/Acids) eg. – *Gandhakadrava*, *Navasadara-bashpadrava*, etc. Here, he has *Sanskritized* these chemicals of modern chemistry and detail discussed their preparations with their uses, in *Ayurvedic* parlance, which are not mentioned yet by any other author. Likewise, in the 16<sup>th</sup> *Tarang*, – '*Rajata Vidhyaniyam*', the author described exceptional formulations named as *Sorakamliya Rajata* (Silver nitrate –AgNO<sub>3</sub>), and its *Drava kalpna* <sup>[2]</sup>.

The substance, one that causes to liquefy or melt is known as *Drava* or *Dravak* <sup>[3]</sup>. *Drava kalpna*, is a

special formulation, which is mentioned in *Rasashastra* texts, not in *Samhita grantas* <sup>[4]</sup>. It is a liquid form of *Lavan* (Salts) and *Kshara* (Alkalis), prepared with or without mixing of fluids <sup>[5]</sup>. A unique preparation *Drava Kalpna*, is used internally and externally in various diseased conditions as –. *Drava kalpna* internally used for to treat *Agnimandya* (loss of appetite), *Shool – Astha vidha* (Pain), *Grahani* (Bowel disease), etc. Externally *Drava kalpna* used for wound cleansing, for *Uttarbasti*, for to treat various *Netraroga* (Eye diseases), and for local application <sup>[6]</sup>.

The first reference of *Drava* was found in *Rudramalaya tantra*, where *Agni drava* prepared from *Amla rasa drava* <sup>[7]</sup>. There are more than 40 *Drava kalpna* found explained in various classical texts as- *Rasatarangini*, *Rasa Yoga Sagar*, *Rasatantra Sara*, *Siddhprayoga Sangraha*, *Bharat Bhaishajya Ratnakar* <sup>[8]</sup>. Among these three different methods of preparation of *Sorakamliya Rajatadrava* were mentioned by *Pranacharya Sadananda Sharma* in *Rasatarangini*, which are not critically reviewed till date<sup>[9]</sup>. To enlighten the therapeutic utility of *Sorakamliya Rajatadrava*, this review was carried out.

Three different preparative methods and their therapeutic properties of the drug *Sorakamliya Rajatadrava* are discussed in this review article.

**AIMS AND OBJECTIVES –**

1. To prepare *Sorakamliya Rajatdrava* by three different methods.
2. To study therapeutic properties and utility of *Sorakamliya Rajatdrava*

**MATERIALS AND METHODS:**

In *Rasatarangini*, Author *Pranacharya Sadananda Sharma* explained three different types of preparative methods (*Nirman vidhi*) of *Sorakamliya Rajatdrava*, along with its therapeutic utilities. Present review was conducted by –

1. Learning different preparative methods of *Sorakamliya Rajatdrava* mentioned in *Rasatarangini, Shodasha Tarang* (16<sup>th</sup> chapter) Name – *Rajat Vidhnaniam*.
2. Studying qualities and properties of *Sorakamliya Rajatdrava*
3. Studying therapeutic uses of *Sorakamliya Rajatdrava*

**(1) Preparative methods of *Sorakamliya Rajatdrava* (*Nirmana vidhi*)** - following three methods of preparation of *Sorakamliya Rajatdrava* are

mentioned in *Rasatarangini granta*.

**Method I (*Pratham Sorakamliya Rajatdrava*)**<sup>[10]</sup> - 2 ½ Pala (approximately 125 ml.) of distilled water is taken in glass bottle then add 8 *Gunja/Ratti* (1 g.) of solid *Sorakamliya Rajata* into it, mix well and stored in clean blue colored glass bottle for further use. This liquid is named as *Sorakamliya Rajatdrava*.

**Method II (*Dvitiya Sorakamliya Rajatdrava*)**<sup>[11]</sup> - *Sorakamliya Rajata* of weight 32 *Gunja/Ratti* (4 g.) placed in a clean glass bottle and 2 ½ *Tole* (approximately 25 ml) distilled water added into it. This mixture mixed well and then stored in blue colored glass bottle.

**Method III (*Trutiya Sorakamliya Rajatdrava*)**<sup>[12]</sup> - 5 *Tole* (approximately 50 ml) distilled water mixed well with 1 *Gunja/Ratti* (125 mg.) or ½ *Gunja/Ratti* (approximately 65 mg.) weighted *Sorakamliya Rajata* and stored in blue colored bottle for further therapeutic use.

**(2) Qualities and properties (*Rasadi Guna and Karma*) of *Sorakamliya Rajatdrava*** - Qualities of *Sorakamliya Rajatdrava* is described as [Table No. 2]-

**Table No. 1: Comparative description of preparation methods of *Sorakamliya Rajatdrava*** <sup>[13]</sup>

Sr. No.	Ingredients		Preparation Methods	Storage
	<i>Sorakamliya Rajata</i> (Silver nitrate)	<i>Sudha Jala</i> (Distilled water)		
Method I	1 g.	*125 ml	Mixing together	In blue colored glass bottle
Method II	4 g.	*25 ml	Mixing together	
Method III (a)	125 mg	*50 ml	Mixing together	
Method III (b)	*65 mg	*50 ml		

\* - approximately

**Table No. 2: *Rasadi Guna and Karma* of *Sorakamliya Rajatdrava***

<b><i>Rasadi Guna</i> (Qualities)</b>	<b><i>Rasa</i></b> (Taste)	<i>Amla rasa</i>
	<b><i>Gandha</i></b> (Odor)	<i>Alpa ugra</i> (Suffocating)
	<b><i>Roopa</i></b> (Colour)	Colorless like water
	<b><i>Veerya</i></b>	<i>Ushna</i> (Hot)
<b><i>Karma</i> (Properties)</b>	<i>Netrarogahara, Shothahara, Visarpanashaka, Vishphotanashaka, Shwetapradara, Vranamehanashaka</i> <sup>[14]</sup> This <i>Drava</i> is especially effective in controlling the various types of infective secretion ( <i>Srava</i> )	

**Therapeutic Uses (*Prayoga vidhi*) of *Sorakamliya Rajatdrava***<sup>[15], [19]</sup> - This unique formulation i.e. *Sorakamliya Rajatdrava* is topical used in following cases as in the form of solution with various percentages (0.1% solution, 0.2% solution, 0.8% solution, 80% solution, etc. - *Drava-shakti bheda*) It is used in various types of *Netraroga* (Eye diseases) as *Abhishyanda* (Conjunctivitis), *Pothaki* (Trachoma), etc., *Visarpa* (Erysipelas), *Visphota* (Inflammatory blisters), *Vrana-meha* (Diabetic wound), *Kshataja vrana* (Mechanical wound), *Shwetapradara* (Leucorrhoea), etc. *Sorakamliya Rajata* is of corrosive and pursuer (*Grahi*) in nature <sup>[15]</sup>.

When it applied locally, it reduces the secretions (*Strava*) and it also acts as antimicrobial (*Jevanuhara*). By internal application it acts like *Rajata bhasma*, gives strengths (*Balya*) to Nervous system (*Vatanadi*). (1) Mixture of 1 Ounce (28.3 g. approximately 30 g.) <sup>[16]</sup> distilled water (*Shudha jala*) and 30 grains (approximately 2 g.)<sup>[17]</sup> or 60 grains (approximately 4 g.) of *Sorakamliya Rajata* if applied externally on old keratinized (*Puran, Kathor Vrana*) wound then it destroys the keratinized hard tissues (*Kathor Vrana Ankur*), very old wounds (*Jirna Vrana*), dead tissues in old wounds, etc. (2) If aqueous mixture of 1 ounce (28.3 g. approximately 30 g.)<sup>[16]</sup> distilled water (*Shudha jala*) and 1 dram (approx. 1.7 g. or 2 g.)<sup>[18]</sup>

of *Sorakamliya Rajata* applied locally on edema developed by Blisters (*Pidika*) or Erysipelas (*Visarpa*), it reduces edema as well as it controls the further development of Blisters or spreading of Erysipelas. (3) Mixture of 1 Ounce (28.3 g. approximately 30 g.)<sup>[16]</sup> distilled water (*Shudha jala*) and 4 grains (approximately 0.26 g.)<sup>[17]</sup> or 10 grains (approximately 0.65 g.)<sup>[17]</sup> of *Sorakamliya Rajata* applied externally on *Pama Shotha* where as mixture of 1 Ounce (28.3 g. approximately 30 g.)<sup>[16]</sup> distilled water (*Shudha jala*) and 10 grains (approximately 0.65 g.)<sup>[17]</sup> to 20 grains (approximately 1.3 g.)<sup>[17]</sup> of *Sorakamliya Rajata* applied on mouth ulcer or Stomatitis, it reduces edema (*Shotha*). (4) In cases of Colitis (*Guda shotha*), *Pravahika*, mixture of 1 Ounce (28.3 g. approximately 30 g.)<sup>[16]</sup> distilled water (*Shudha jala*) and ½ grains (approximately 32 mg.)<sup>[17]</sup> of *Sorakamliya Rajata* near about 2 to 4 ounce (60 to 120 g.) dose is used for enema (*Guda basti*). (5) Mixture of 1 Ounce (28.3 g. approximately 30 g.)<sup>[16]</sup> distilled water (*Shudha jala*) and 2 grains

(approximately 130 mg.)<sup>[17]</sup> of *Sorakamliya Rajata* near about 1 to 2 ounce (30 to 60 g.)<sup>[16]</sup> dose is used for *Uttarbasti* in cases of Cystitis (*Mootra marga shotha* - Bladder inflammation) developed due to *Vrana meha*<sup>[19]</sup>.

**Method I (*Pratham Sorakamliya Rajatdrava*) Uses** <sup>[20]</sup> - the *Sorakamliya Rajatadrava* prepared by this method is used in case of eye disease (*Netra rog*) like Conjunctivitis (*Abhishyanda*), Trachoma (*Pothaki*), etc. The dropper (*Bindu Kshepaka Yantra*) is used for the application of such liquid (*Drava*) into diseased eyes.

**Method II (*Dvitiya Sorakamliya Rajatdrava*) Uses** <sup>[21]</sup> - *Drava* prepared by this method is used for local application in Edema (*Shotha*) which is developed due to Erysipelas (*Visarpa*), Blisters (*Visphota*), etc.

**Method III (*Trutiya Sorakamliya Rajatdrava*) Uses** <sup>[22]</sup> - This type of *Drava* is used specially as an ingredient of *Uttarabasti* in case of *Vranameha* and *Shweta-pradara*.

**Table No. 3: Therapeutic Uses (*Prayoga vidhi*) of *Sorakamliya Rajata* <sup>[23]</sup>**

Sr. No.	Solution in percentages	Therapeutic Uses ( <i>Prayoga vidhi</i> ) of <i>Sorakamliya Rajatadrava</i>	Dose	Application
Method I	*0.8 %	Eye diseases like - Conjunctivitis, Trachoma	1 drop into Eyes	Eye drop
Method II	*80 %	Edema - developed in cases of Erysipelas, Blisters,	---	Externally on Skin
Method III (a)	*0.25 %	<i>Vranameha</i> (Diabetic wound),	---	<i>Uttarbasti</i>
Method III (b)	*0.1 %	Leucorrhoea ( <i>Shweta-pradara</i> )	---	

\* - approximately

## OBSERVATIONS AND RESULTS:

The author *Shree Sadananda Sharma* explains a unique form of *Sorakamliya Rajatadrava*. Here, he described such compounds of modern chemistry on the platform *Ayurveda*. He also discussed the therapeutic properties of such formulation. *Sorakamliya Rajatadrava* is very much effective in case of infectious wound of a topical application. Unlike the modern chemistry author here use *Rajata patra* which are purified / *Shodhita* by a process of *Samanya* as well as *Vishesha Shodhana* according to *Ayurvedic* textual reference. Due to this *Sorakamliya Rajata* prepared as per classical reference must have a better therapeutic effect than that off prepare as per modern chemistry.

This unique formulation i.e. *Sorakamliya Rajatadrava* is topical used in following cases as - Various types of *Netraroga*, *Visarpa*, *Visphota*, *Vranameha*, *Shwetapradar*, *Kshataja vrana*, etc. in the form of solution with various percentages (*Dravashaktibheda*). The *Sorakamliya Rajata* prepared by this method is solid (crystal) in nature and very corrosive in action, which are not used in the respective form. So *Dravanirmiti* (liquefaction) and *Sajalikarana* (dilution) is necessary. Author here mention three methods of *Dravanirmiti* means preparation of *Drava* of *Sorakamliya Rajata* with their respective therapeutic

properties. It significantly reduces the infectious secretion in the wounds, so it proves beneficial in diabetic foot (*Vrana-meha*).

## DISCUSSION:

*Pranacharya Sadananda Sharma*, the Author of *Rasatarangini* has described *Sorakamliya Rajat* (Silver nitrate -  $AgNO_3$ ), related to modern chemistry in *Sanskritized* pattern on *Ayurvedic* parlance, is very first and last time. Silver salt especially Silver nitrate ( $AgNO_3$ ) has powerful germicidal activity. It has been used topically to prevent *Optithalmia neonatrum*. Also, it has antiseptic activity and can potentially used as a Cauterizing or Antisclerotic agent. In 1981 introduced the use of diluted solution of Silver nitrate in the eyes of newborn babies at birth to prevent contraction of gonorrhoea from the mother, which further could cause blindness. Much research work has been carried out in evaluation the ability of the Silver ion at inactivating *Escherichia coli*, a micro-organism the commonly indicator of fecal contamination. Silver antimicrobial activity saw many applications prior to the discovery of modern antibiotics.

As per *Rasatarangini*, preparation of *Sorakamliya Rajata*, the main ingredient of these *Drava kalpna*,

includes *Samanya Shodhana* and *Vishesh Shodhana* of *Rajata patra* and *Yashada*. As per modern chemistry, it is prepared in only one step method, by chemical action of Silver toil/bullion with nitric acid. *Shodhana* procedures which were carried out in different stage of *Sorakamliya Rajata* preparation did not perform during the preparation of Silver nitrate. This makes the difference in pharmacokinetic and pharmaco-dynamic action of the *Sorakamliya Rajata* compound as compare to Silver nitrate. Due to its corrosive nature, *Sorakamliya Rajata* can't applied directly on skin or ingest internally, but, its diluted forms are used for therapeutic purposes named as *Sorakamliya Rajatadrava*. Here Author mentioned various diluted forms of *Sorakamliya Rajatadrava* with its clinical utilities.

### CONCLUSION:

Unique preparations, *Drava Kalpna* are explained only in few text book of *Rasashastra*. Among these in *Rasatarangini*, Author *Pranacharya Sadananda Sharma* explained three different types of *Sorakamliya Rajatadrava*, in the form of various percentages as 0.1% solution, 0.2% solution, 0.8% solution and 80% solution, etc. On the basis of reviewed classical data, we can conclude that these three types of *Dravas* are more effective in various infective conditions. Due to its potent antimicrobial activity, it reduces secretion on local application. Also, on internal application it acts like *Rajata Bhasma* and gives strength (*Balya*) to Nervous system. This *Sorakamliya Rajata Drava* is useful in various types of Eye diseases (*Netra roga*), Skin diseases (like *Visarpa*, *Visphota*, etc.) Keratinized hard old wound (*Puran*, *Kathor Vrana*), Diabetic wound (*Vranameha*), Mouth ulcer (*Mukha vrana*), Stomatitis (*Mukha paka*), Mechanical wound (*Kshataja vrana*), Leucorrhea (*Shwetapradara*), Colitis (*Guda shotha*, *Pravahika*), Cystitis (*Mootra marga shotha*), etc. These *Drava* may be used in the form of Eye drops, like ointment on skin or oral cavity, enema (*Uttar basti*, *Guda basti*). But, because of its acidic nature and lack of clear classical guidelines, these *Sorakamliya Rajata Drava* preparations rarely used. Also more precautions required during use of these formulations. Due to these reasons the utility of these unique preparation are left behind. Without significant statistical data we can't claim its safety as well as efficacy. So, there is need of time, to do the further pre-clinical experiment and clinical research to prove its safety and explore the therapeutic utility of these *Sorakamliya Rajata Drava*.

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