

# PHARMACEUTICAL STUDY OF KHAGESHWARA RASA

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## ABSTRACT

Rasa formulations are very important in Ayurvedic treatment system. Due to its lesser dose, palatability and faster therapeutic effect, Rasaushadhis play a key role in pacifying both local and systemic diseases. Formulations of Rasa Dravyas include Khalwiya Kalpas, Parpati Kalpas, Kupipakwa Kalpas, Pottali Kalpas. Kupipakwa Kalpas are formulations prepared by administering progressive heat is administered for a definite period of time. The final product is a generally a condensed compact formulation which is adhered to the neck (Galastha) or Base (Talastha) of the Kupa or on both (Ubhayastha). Among various integumentary diseases described in Ayurveda, 'Switra', where skin becomes hypo pigmented. It may be correlated to 'Vitiligo' in modern science. This is one of the most prevalent disease affecting the public domain. 'Khageshwara Rasa' is a Kupipakwa Rasayana described in Rasaratnasamuchaya, which is expressed as an effective remedy for managing Switra Roga. The present work is a documentation on the preparation of Khageshwara Rasa conducted in Government Ayurveda College Thiruvananthapuram, India. The work is presumed to be a general guideline for the preparation of this formulation. A mixture of drugs containing 80 gm each of Sudha Parada, Sudha Gandhaka and Sudha Kasisa was done Paaka in Valuka Yantra. The end product obtained was 64.5 gm by weight. Proper assistance, observation and special precautions were required for the successful completion of this product. The chief features in this process was melting of Kajjali, elimination of Sulphur and Water molecules, boiling of Kajjali, liberation of Mercury as vapours, condensation of product and formation of final product which might be predominantly Ferro –Mercuric– Sulphide complex. Modern analytical parameters are required for the structural and compositional identity of the formulation. A hypothetical approach has been carried out, based on the expected action of the drug. Parada with the Yogavahi Karma and Gandhaka with Rasayana Karma may act as a carrier molecule to transport Kasisa. Kasisa is referred to as 'Switragna' in action, which may be due to Ranjana (pigmentation) property and, thereby pigmenting the hypopigmented integumentary zones. Analytical and Clinical studies of the present formulation is yet to be carried out.

**Keyword:** - Kupipakwa Kalpas, Swithra, Khageshwara Rasa, Parada, Gandhaka, Kasisa, Yogavahi, Rasayana, Switraghna.

## 1. INTRODUCTION

Diseases affecting integumentary system (*Twak roga*) are prevalent in this era. The main causes include irregular and unwholesome diet, exposure to harmful environmental conditions, genetic incidences etc. The expression of integumentary diseases may be either dry or exudative, terminal or central, partial or whole body affected, hyper pigmented or hypo pigmented. *Switra Roga* is a hypopigmented integumentary disease [1] which may be correlated to *Vitiligo* in modern science. It is one of the most prevalent disease affecting the public domain. This disease affects social as well as emotional well-being of an individual due to its characteristic features. There are various treatment methodologies and formulations introduced to treat this disease in due course of time. Among different Ayurvedic treatment methodologies Rasa formulations stays unique due to its lesser dose, palatability and faster therapeutic effect whereby it plays a significant role in pacifying both local and systemic diseases. Rasa formulations are generally classified as *Khalwiya Kalpas*, *Parpati Kalpas*, *Kupi Pakwa Kalpas*, *Pottali Kalpas*. *Khageshwara Rasa* [2] is a formulation introduced by *Rasashastra* system of Ayurvedic medicine which is indicated for *Switra Roga*. It is a *Kupipakwa Rasayana* where the formulation is prepared in a glass bottle wrapped with mud smeared cloth providing progressive heat for a prescribed period of time. The reference of *Khageshwara Rasa* is available in the treatise *Rasaratna samuchaya* written by Vagbhata

in 13<sup>th</sup> century AD in the context of *Visarpa – Kushta- Krimi Chikitsa*. The formulation is specially indicated for *Swetha Kushta (Switra)*. [3]

## 2. MATERIALS AND METHODS

The present work is a document on the preparation of *Khageshwara Rasa* implemented in Government Ayurveda College, Thiruvananthapuram by the department of *Rasasastra* and *Bhaishajya Kalpana*. The documentation includes time to time happenings observed and activities performed. The work is supposed to be a general guideline for preparing this particular formulation.

**Table-1** Ingredients of *Khageshwara Rasa* and quantity taken for the procedure

Ingredient	Ratio	Quantity
<i>Suddha Parada</i>	1part	80 gm
<i>Suddha Gandhaka</i>	1part	80 gm
<i>Suddha Kasisa</i>	1part	80 gm
<i>Arjuna twak Kwatha</i>	Q.S	QS

### 2.1. Poorvakarma (Pre-procedure)

- Parada was done *Sodhana* by grinding in *Kumari Swarasa*, *Chitrakamoola Kashaya* and *Kakamachi Swarasa* for a period of 12 each [4]. *Gandhaka* was done *Sodhana* in milk, by the method of *Koorma Puta* [5]. *Parada* and *Gandhaka* was grinded for a period of 60 hrs. The *Kajjali* thus obtained had all the qualities like *Slakshnanatwa* [6], *Masrinatwa* [7], *Nischandratwa* [8], *Varitaratwa*. To the above *Kajjali*, 80 gm finely powdered *Kasisa* was added grinded, till it was homogenously mixed. The mixture was then undergone *Bhavana* with *Arjuna Twak Kashaya* for a period of 1 *Yama* (3 hrs) [9]. *Bhavitha Dravya* after complete drying was finely repowdering it by *Mardana*. Filling the *Aushada dravya* in 7 layer wrapped *Kacha Kupi* (glass bottle) [10]

### 2.2 Pradhana Karma (Main Procedure)

- Installing the bottle in a *Valuka Yantra* and administering progressive heat.
- Swanga Seetha* (Self cooling) by leaving it for 1 day.

### 2.3. Paschat Karma (Post Procedure)

- Breaking the bottle by applying fire after tying a jute thread dipped in kerosene.
- Obtaining the sublimated *Rasa Dravya* by tapping the bottle and careful scrapping.
- Storing the final product in a clean dry glass container.

**Table No: 2** Time to time events in the preparation of *Khageshwara Rasa*

Time	Temperature	Observation
9.05am	38 degree Celsius	
9.45am	204 degree Celsius	
10.15 am	220 degree Celsius	
10.45 am	250 degree Celsius	Very mild Sulphur fumes were visible
11.00 am	258 degree Celsius	Sulphur fumes were more clearly visible
11.15 am	255 degree Celsius	
11.30 am	264 degree Celsius	
11.45 am	285 degree Celsius	
12.00 pm	291 degree Celsius	
12.10 pm	301 degree Celsius	Insertion of <i>Ushna shalaka</i> (Hot iron bar) started .The process was performed one in every 5 minutes.
12.15 pm	309 degree Celsius	
12.30 pm	323 degree Celsius	Yellow fumes were visible with cloudy appearance
12.45 pm	347 degree Celsius	
1.00 pm	386 degree Celsius	
1.15 pm	411 degree Celsius	
1.20 pm	416 degree Celsius	Slight bluish fumes while inserting hot <i>shalaka</i>
1.30 pm	458 degree Celsius	
1.45 pm	531 degree Celsius	
2.00 pm	600 degree Celsius	
2.07 pm	601 degree Celsius	On insertion blue flame appeared on the tip of hot <i>Shalaka</i>

2.13 pm	594 degree Celsius	Dense choking fumes came out on inserting hot <i>Salaka</i>
2.15 pm	614 degree Celsius	
2.20 pm	649 degree Celsius	A view of yellowish orange tinge on sides of <i>Kupi</i>
2.30 pm	652 degree Celsius	On insertion of <i>Ushna shalaka</i> (Hot iron bar), yellow flame at the mouth of <i>Kupi</i>
2.45 pm	631 degree Celsius	Movement of particles inside the <i>Kupi</i> observed on lighting a flash light
3.00 pm	596 degree Celsius	Reddish blue flame at the mouth of the <i>Kupi</i>
3.20 pm	509 degree Celsius	Inserted <i>Seetha Shalaka</i> (Cold iron rod) , partially melted <i>Kajjali</i> stuck on to the tip
3.30 pm	481 degree Celsius	
3.45 pm	452 degree Celsius	
4.20 pm	490 degree Celsius	Unmelted <i>Kajjali</i> was found adhered to the tip of <i>Ushna Shalaka</i>
4.35 pm	485 degree Celsius	Thick yellow flames was visible
4.45 pm	494 degree Celsius	Blackish shade in copper coil indicating the presence of Sulphur
4.50 pm	512 degree Celsius	Yellowish fumes disappeared on insertion of <i>Ushna Shalaka</i> . Red shade visible at the bottom of the <i>Kupi</i>
4.57 pm		Copper foil test - Ash shade on copper foil. But <i>Kajjali</i> not fully melted.
5.00 pm	512 degree Celsius	Blower was activated to raise the intensity of heat.
5.10 pm		Copper foil test positive indicating the presence of mercury on copper foil. Corking was done.
5.45 pm	527 degree Celsius	
6.15 pm	558 degree Celsius	
6.45 pm	618 degree Celsius	
7.45 pm	625 degree Celsius	
8.30 pm	632 degree Celsius	
9.00 pm	655 degree Celsius	
9.25 pm	704 degree Celsius	Fire was put off. The burning coal was kept in the furnace to retain heat



Fig-1 *Valuka Yantra* with *Abhraka* flakes at the centre. *Abhraka* is heat resistant and works as a mediator to transmit controlled heat to the sand, filled in the *Valuka Yantra*.



Fig-2 Filling of Aushada dravya in *Kachakupi*, using a funnel. 240 gm aushada dravya was filled in the *Kupa*.



Fig-3 Sand was filled in the *Yantra*, and the *Yantra* was placed carefully in the *Bhatti* (Furnace). The gaps between the *Bhatti* and the *Yantra* was filled with clay smeared cloth.



Fig-4 Slight yellow fumes, evolving out, hinting the '**melting of Gandhaka**' in the *Aushadi Dravya*.



Fig-5 Yellow fumes inside the bottle, indicating melting of *Gandhaka*.



Fig-6 Thick yellow fumes escaping out of Kupa, indicating vigorous melting of *gandhaka*.



Fig-7 Inserting *Ushma Shalaka* to clear the mouth of Kupa, or else the mouth will be blocked by sublimed *Gandhaka*, which can cause breakage of Kupa



Fig-8 Removing the hot sand around the neck of the *Kupi*, which favours sublimation of *Khageshwara Rasa* around the inner side of bottle neck.



Fig-9 *Khageshwara Rasa* around the inner side of bottle neck. (After breaking the *Kupi*)



Fig-10 The final product *Khageshwara Rasa*

#### 2.4. Method of administration and Indication

The dose of *Khageshwara Rasa* is 1 *Valla* (app 375 mg) [11]. It is chiefly indicated *Switra Roga* (Vitiligo), *Swasa - Kasa Roga* ((Respiratory ailments) with *Kutaja* as *Anupana*, *Paittika Kushta* (Inflammatory skin diseases) with *Gritha* as *Anupana* and *Meha Roga* (Diabetic ailments) with *Madhu* as *Anupana* [12].

### 3. RESULT AND DISCUSSION

*Kupi Pakwa Yogas* are prepared by the administering thermal energy in a progressive manner. Here a process of sublimation is carried out, where *Parada* (Mercury) is heated to a temperature above its boiling point. By this intense temperature majority of sulphur is eliminated in the form of fumes. The bonded sulphur might

be retained. Presence of sulphur and its binding with mercury to form a mercury sulphide complex can be assumed by different previous analytical studies [13]. Similarly the water molecules and majority of the sulphate ions in *Kasisa*, which is chemically  $FeSO_4 \cdot 7H_2O$ , [14] are likely to be eliminated by the intense heat. The elemental components, Mercury, bonded Sulphur and Iron should form a stable complex which will be condensed and solidified in the neck of the bottle. The product adhered in the neck of *Kupi (Galastha)* was considered as the final product which was reddish grey in appearance and red on grinding. The quantity of final product was 64.5 gm. The heat administered for *Koopipakwa Rasayana* preparation is classified as *Mridu Agni* (Mild fire), *Madhyamaagni* (Moderate fire) and *Chandaagni Agni* (Intense fire) with respect to the source of heat which is *Kashtaagni* [15]. Unlike the standardized quantum of heat in muffle furnace indicated for preparing *Koopipakwa Rasayanas* like *Rasasindhoora*, an upper level heat was decided. Similarly the duration of heat was not equally distributed for the three stages of heat. Depending on the *lakshanas* observed the intensity of heat was adjusted. The strategy was to provide slow progression of heat. *Mridu Agni* was administered for about 1 *Yama* (App 3 hrs) which enabled deliberate elimination of sulphur as fumes leaving only the bounded sulphur molecules. *Madhyama Agni* was administered for about half *Yama* (1½ hrs) after observing positive copper foil test, indicating escaping of mercury from the *Koopi*, corking was done, followed by administering *Tivra Agni*. The duration of *Tivra Agni* was about 2 ½ *Yama*. The maximum temperature perceived was 704 degree celsius. *Kasisa* belongs to *Uparasa* group of *Rasadravya* [16]. It is an efficient drug to treat '*Switra*' (*Switraghna*) [17]. By the property of *Ranjana*, *Kasisa* offers pigmentation on hypopigmented skin zones. *Parada* own the property of *Yogavahitwa* [18] while *Gandhaka* has an extensive *Rasayana* property [19]. By way of *Paaka* they gets converted into the subtle *bhasma* similar to *Rasa Sindhoora*. The so formed *Sindhoora* which is more likely to possess the inherent property of *Yogavahitwa* and *Rasayanatwa*, attains the ability to carry the *subtle Kaseesa bhasma* to act on the pathological areas, thereby generating pigmentation. The drug forms a complex where *Rasasindhoora* might act as a carrier encapsulating the *Kaseesa bhasma*. In the biological system, *Rasasindhoora* exhibits its own action and as well transports the *Kasisa bhasma* to the targeted area exhibiting its clinical effect. The bioavailability of *Kasisa Bhasma* may be enhanced by this *Rasa Sindhoora- Kasisa Bhasma* complex.

#### 4. CONCLUSION

*Koopipakwa Rasayana* remains as an important category of *Rasaushadhis* due to its unique method of preparation. *Khageshwara Rasa*, which is a *Sagandha Koopipakwa Yoga* indicated in diseases like *Switra* must be an effective formulation in generating pigmentation in the hypopigmented areas. The method of preparation is similar to general *Koopipakwa Rasayanas*, where progressive heat should be administered for a definite period of time. The various stages includes melting of *Kajjali*, elimination of *Gandhaka*, which might be unbonded, elimination of water molecules, dispersion of mercury, condensation of mercury, sulphur and iron compounds. The final product which is supposed to be *ferro-mercuric sulphide* is assumed to be an elemental complex, where *Parada- Gandhaka Bhasma* may act as a carrier and rejuvenator. *Kasisa*, which holds the property of pigmentation must be transported, metabolized and assimilated to exhibit its therapeutic effect.

#### 5. REFERENCE

1. Agnivesha, Charaka Samhitha, Chakrapani Datta, Ayurveda Deepika Vyakhyana, Chikitsasthana, Chaukhambha Surbharati Prakashan, 2009, Chapter 8, Pg 458, Sloka 174.
2. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 20, Pg 465, sloka 103.
3. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 20, Pg 465, sloka 104 ½.
4. Sri Gopalakrishna Bhatta, Vaidhya Ghanananda Panta, Rasendrasara Sangraha, Chaukhambha Sanskrit Series Office, Varanasi, 2005, Chapter 1, pg-25, sloka 34.
5. Acharya Sri Madhava, Ayurveda Prakasa, Sri Gulraj Sharma Mishra, Arthavidyotini- Artha prakasini commentaries, Chaukhambha Bharati Academy, Rp-2016, Chapter 2, Pg 262, sloka 26-29
6. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 8, Pg 209, sloka 5.
7. Sri Sadanantha, Sarma, Sri Haridatta, Sastri, Pandit, Sastri. Rasatarangini. (11 ed.). New Delhi: Motilal Banarasi das; 2014. chapter 6 Pg 124, sloka 107.
8. Vaidhya Yadavji Trikamji Acharya, Rasamritam, Motilal Banarasi Das, Banaras, 1951 Chapter 1 pg-6, sloka 18
9. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 20, Pg 465, sloka 101 ½.
10. Acharya Sri Madhava, Ayurveda Prakasa, Sri Gulraj Sharma Mishra, Arthavidyotini- Artha prakasini commentaries, Chaukhambha Bharati Academy, Rp-2016, Chapter 1, Pg 164, sloka 398 ½

11. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 20, Pg 465, sloka 103 ½ .
12. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 20, Pg 465, sloka 104 .
13. Mukhi P, Mohapatra SS, Bhattacharjee M, et al. Mercury based drug in ancient India: The red sulfide of mercury in nanoscale. *J Ayurveda Integr Med.* 2017; 8(2):93-98. doi:10.1016/j.jaim.2017.01.009
14. Ayurveda Pharmacopeia of India, The Controller of Publications Civil Lines, Delhi, 1st ed, 2008, Pg-19.
15. Sri Bhairava, Anandakandha , Prof Siddhinandan Misra , Siddhiprada Hindi translation, 'Amrutheekarana visrantha', Part 1 ,chapter 26 , sloka 236 .
16. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 3, Pg 60, sloka 1.
17. Sri Sadanantha, Sarma, Sri Haridatta , Sastri, Pandit, Sastri. Rasatarangini. (11 ed.). New Delhi: Motilal Banarasi das; 2014.chapter 21 Pg 564, sloka 231.
18. Niranjana Prasad Gupta, Parada Samhita, Sree Venkaeswara publications, 1973, Pg 419, Chapter 39, Sloka 10.
19. Acharya Vagbhata, Rasaratnasamuchaya, Prof Sidhinandan Misra, Sidhipradha Vyakhyana, Chaukhambha orientalia, Rp 2017, Chapter 3, Pg 64, sloka 17.

