



Standard Operating Procedure of *Rasakarpura Drava* & *Rasakarpura Gel*

Research article

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Abstract

In the wake of the present surge of increased global, curiosity regarding safety and efficacy of various metallic and mineral preparations in *Rasashastra*, there is an imminent need to pay attention to the establishment of standard operating procedure (SOP). For the purpose of SOP of manufacturing process for these Ayurvedic formulations and their pharmacopoeial standard, each step of the process for each unit operation was considered as an independent procedure and minimum of three readings of each step were taken as parameters for fixing the standards. Here, *Rasakarpura Drava* was prepared by adopting *Rasa Tarangini* reference, while *Rasakarpura Gel* was prepared by *Anubhuta* (by self experience) method and result was found 99.50% and 99.36% respectively.

Key Words:

Rasakarpura, Rasakarpura Drava, Rasakarpura Gel, ICP, Nirgandha, Murchchna

Introduction:

The *Rasaausadhis* are the backbone of the Ayurvedic therapeutics. It is chiefly based on metals and minerals, small doses, *tastelessness*, quick action, effectiveness(1), *Rasayana* property make *Rasaausadhis* more popular and superior over the other medicines and this attract the attention of patients as well as pharmaceutical manufacturers. Among the *Rasausadhis* *Kupipakva Rasayana* are more unique due to their specific method

of preparation and long shelf life, less toxic thus there are medicinally more valuable for physicians and patients.

Rasakarpura is considered as *Nirgandha* type of *Murchhana*. It is firstly mentioned in *Rasa Prakash Sudhakar* by the name 'Ghananasara Rasa' (2) under the heading of *Shweta Rasa Bhasma* in 12th century AD. Thereafter about 57 references (3) are found in various *Rasa* classics. *Rasakarpura* is also included in schedule E1 of Drug and Cosmetic Act 1940 and rule 1945. (4)

The *Rasakarpura* and *Rasapushpa* are most controversial regarding their self-existence. Most of *Acharyas* opined that both are same but *Acharya* Sadanand Sharma firstly mentioned the difference

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between them. He mentions separate method of preparation of *Rasakarpura* and *Rasapushpa* in *Rasa Tarangini*. (5)

Rasakarpura is a *Kupipakva Rasayana* product with *Parada*, *Gandhakamla* and *Saindhava* in the ratio 1 : 1½ and approx. 1½ part. *Rasakarpura* is used as internal medicine in diseases like *Phiranga* (syphilis), *Atisara* (diarrhea), *Twak Vikara* (skin diseases) etc.(6) It is also used externally in 1 : 1000 or 1: 2000 or 1 : 5000 dilution in water or *Nimbukamla* for local application in the form of *Rasakarpura Drava* (7) in various skin diseases and considered as one of the best remedy.

As above says for the preparation of *Rasakarpura*, *Parada* is needed. Here *Parada* was extracted as per the standard operating procedure of *Hingulottha Parada*. (8) *Rasakarpura* is used as an ingredient in *Rasakarpura Drava* and *Rasakarpura Gel*. *Rasakarpura* is also prepared by adopting standard procedure of *Rasakarpura*. (9)

Generally *Rasakarpura Drava* dries within few minutes on local application, which leads to its therapeutic action. Increased contact period of the drug, possibly enhance the efficacy of the drug too. Thus here an attempt was made to change the formulation *Rasakarpura Drava* into *Rasakarpura Gel* form to get more therapeutic efficacy. It is also safe in dispensing and transportation.

Aims and Objectives:

- To develop Standard Operating Procedure for *Rasakarpura Drava* and *Rasakarpura Gel*.
- To analyze *Rasakarpura Drava* and *Rasakarpura Gel* by employing

various possible organoleptic and physicochemical parameters.

Material and Methods:

To develop the Standard Operating Procedure of *Rasakarpura Drava* and *Rasakarpura Gel*, *Rasakarpura* was procured from department of Rasashastra and Bhaishajya Kalpana, I.P.G.T. & R.A., G.A.U., Jamnagar, which was prepared as per the *Rasa Tarangini* method (10). 1 part *Hingulottha Parada* was heated with 1.5 parts of 98.08% concentrated sulphuric acid to make *Parada Churna* (mercuric sulphate). This *Parada Churna* was mixed with equal quantity of *Saindhava Lavana* (Rock Salt). This mixture was filled in *Kach Kupi* and sublimed in *Valuka Yantra*. After self cooling of bottle *Rasakarpura* was collected from the neck of the *Kupi*.

2 g of *Rasakarpura* was dissolved in 1998g of distilled water and filtered in flask through filter paper to prepare *Rasakarpura Drava*.

For the Preparation *Rasakarpura Gel*, 2 g *Rasakarpura* was diluted in 1 kg distilled water and added 20 g of Triethanolamine in it. In another vessel remaining 958 g of water and 20 g of Carbopol was mixed by using hand blender. Both mixtures mixed well till it become semisolid ointment.

Observation and Results:

Preparation of Rasakarpura Drava: The ratio of *Rasakarpura* to the water is 1998: 2 parts. *Rasakarpura* is readily soluble in distilled water. Hence 1998 g of *Rasakarpura* was mixed with 2g of *Rasakarpura* and stirring with glass rod well in each batch up to subsequent 16 batches. Average 1990 g of *Rasakarpura Drava* has been prepared. (Table 1) (11)

**Table 1: Result of Rasakarpura Drava**

Batch Code	Rasakarpura (g)	Distilled water (g)	Obtained Rasakarpura Drava (g)
D ₁	2	1998	1991
D ₂	2	1998	1990
D ₃	2	1998	1992
D ₄	2	1998	1993
D ₅	2	1998	1992
D ₆	2	1998	1990
D ₇	2	1998	1986
D ₈	2	1998	1990
D ₉	2	1998	1990
D ₁₀	2	1998	1992
D ₁₁	2	1998	1986
D ₁₂	2	1998	1990
D ₁₃	2	1998	1988
D ₁₄	2	1998	1992
D ₁₅	2	1998	1990
D ₁₆	2	1998	1988
Average	2	1998	1990

Organoleptic and physicochemical parameters of Rasakarpura Drava: pH of distilled water was 7 whereas it turned to 6 with Drava respectively. Organoleptic characters like colour, consistency, smell and form were found transparent, watery, non specific and liquid respectively for Rasakarpura Drava (Table 2) (12). ICP test report reveals that there is 0.0508 wt% of mercury element in Rasakarpura Drava.

Table 2: Organoleptic properties of Rasakarpura Drava

Parameters	Colour	Consistency	Smell	Form
Rasakarpura Drava	Transparent	Watery	Non specific	Liquid

Preparation of Rasakarpura Gel: Initially 2 grams of Rasakarpura was dissolved in 1000 parts of water. Then 20 parts of Triethanol amine was added into this liquid. After that in another glass beaker 958 parts of water and 20 parts of Carbopol was mixed and obtain viscous liquid finally. The both mixture became semisolid immediately when they mixed. The process has been repeated for 16 batches in each batch the ratio of distilled water, Rasakarpura, Triethanol amine and Carbocol is 1958:2:20:20. (Table 3) (13)

Table 3: Result obtained during preparation of Rasakarpura Gel

Batch Code	Rasakarpura (g)	Triethanol amine (g)	Carbopol (g)	Distilled water (g)	Obtained Rasakarpura Gel (g)
G ₁	2	20	20	1958	1980.0
G ₂	2	20	20	1958	1990.0
G ₃	2	20	20	1958	1988.0
G ₄	2	20	20	1958	1986.0
G ₅	2	20	20	1958	1990.0
G ₆	2	20	20	1958	1992.0
G ₇	2	20	20	1958	1984.0



G ₈	2	20	20	1958	1985.0
G ₉	2	20	20	1958	1988.0
G ₁₀	2	20	20	1958	1988.0
G ₁₁	2	20	20	1958	1986.0
G ₁₂	2	20	20	1958	1988.0
G ₁₃	2	20	20	1958	1990.0
G ₁₄	2	20	20	1958	1984.0
G ₁₅	2	20	20	1958	1990.0
G ₁₆	2	20	20	1958	1988.0
Average	2	20	20	1958	1987.3

Organoleptic and physicochemical parameters of *Rasakarpura* Gel: The pH of distilled water before adding and after adding of *Rasakarpura* was 7 and 6 respectively. After adding Triethanolamine pH of solution was 10, while after adding of Carbopol in distilled water it was found 3. The pH of the final product *Rasakarpura* Gel was 7. Organoleptic character like colour, consistency, smell and form were found white translucent, soft and smooth, non specific and semisolid respectively in *Rasakarpura* Gel (Table 4) (14). ICP test report of *Rasakarpura* Gel reveals that there is 0.0539 wt% of mercury element in *Rasakarpura* Gel.

Table 4: Organoleptic properties of *Rasakarpura* Gel

Parameters	Colour	Consistency	Smell	Form
<i>Rasakarpura</i> Gel	White translucent	Soft, Smooth	Non specific	Semisolid

Discussion:

Rasashastra is the science dealing with *Rasa* (mercury) and its processing. This is one of the important branches in the field of Ayurveda for the purpose to achieve *Dehavada* and *Lauhavada* by using different type of *Parada Murchhana* and one of them is *Rasakarpura*.

Here, prepared *Rasakarpura* was taken, which was prepared by adopting *Rasa Tarangini* method, as mainly mercuric chloride is found in final product along with some trace elements (15), because mercuric chloride is water soluble.

Rasakarpura was 98% water soluble. So it was dissolved in distilled water and then filtered through simple filter paper. It was prepared in glass apparatus, because *Rasakarpura* reacts with iron and steel and make amalgam.

In classical literature reveals that *Rasakarpura Drava* is abundantly used

dosage form for topical proposes to treat the various types of skin diseases due to its antimicrobial properties (16). Present study 0.1% concentration of *Rasakarpura* was prepared. So, here 2 g of *Rasakarpura* was dissolved in 999 g of distilled water. The pH of distilled water was 7.0 and pH of *Rasakarpura Drava* was 6.0. It is suggests that this solution is acidic in nature.

Majority of gels in the market are aqueous or occasionally, aqueous/alcoholic (17). Carboxyvinyl polymers are the most important and while their prime function is to create the clear gel base, they also have some fixative powers and contribute to the overall hold of the formulation (18). Basic requirement for the preparation of gel are water solubility, clarity in solution and compatibility with the carbomers resins (19). Carbomer 940 gives the clearest gels. Polymers used should be diluted with



water before addition and slowly neutralizer should be added to the carbomer (20). Gel prepared from carbomers is influenced by the choice of neutralizing agent. Sodium hydroxide gives a very stiff gel while amines give a softer gel (21). The hydroxy amines, specially, Triethanolamine (TEA) are the most widely used (22).

Rasakarpura has very good water solubility (98%) (23) And it gives clear solution with water. Carbomer 940 gives the clearest gels and Triethanolamine gives softer gels, so they are selected to prepare gel for this study. Percentage of *Rasakarpura* in gel is taken as 0.1% in final product, which is same as *Rasakarpura Drava*.

The percentage of Triethanolamine is decided by trial and error method i.e. 1%, which is in permissible limit for the preparation of Gel. Here for 2 kg preparation of gel it is taken 20 g. 0.3-1.0% of Carbomer 940 is necessary to prepare gel. For *Rasakarpura* Gel, here it was taken 1% by trial and error method. Here for 2 kg preparation of gel it is taken 20 g. For maintain the ratio of percentage water was added 1958 g for the preparation of 2 kg *Rasakarpura* Gel.

ICP study of *Rasakarpura Drava* and *Rasakarpura* Gel was done at SICART, Vidyanagar, Gujarat for the finding mercury percentage. 0.0508 wt% and 0.0539 wt% of mercury was observed in *Rasakarpura Drava* and *Rasakarpura* Gel respectively. On the basis of data it can be said that both the samples contain almost same percentage of mercury.

Conclusion:

* To prepare 0.1% solution of *Rasakarpura Drava*, 1% *Rasakarpura*

should be dissolved in 99% distilled water, which having appearance like water in colour and consistency along with pH 6.0.

* 1% Carbopol, 1% Triethanolamine, 0.1% *Rasakarpura* and 97.9% distilled water is needed to prepare 0.1% of *Rasakarpura* Gel; which is in whitish semisolid form, soft and smooth along with 7.0 pH.

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Equipment Specifications:

- Simple filter paper
- 2 Glass beaker capacity- 2 litre
- Digital balance range - 0 to 200 g
- Digital balance range - 0 to 2000 g
- Hand blander
- Glass rod
