

Experimental Study on *Nirmalikaran* Process with special reference to *Rasatarangini*

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Abstract

Rasashastra is the science of applied pharmaceutical procedures which is based on experimental studies. *Nirmalikaran* is one of the important processes of external purification of *Rasadavyas* which is specially mentioned in classical textbook of *Rasashastra* that is *Rasatarangini* mainly for three *dravyas* *Kalmisora*, *Tankana*, & *Tutha*.

Nirmalikaran is based on the phenomenon of dissolution, filtration and evaporation with crystal formation. While doing this procedure of *nirmalikaran* as per text some problems were arises in solubility of *dravyadue* to proportion of water indicated. In Present study some modifications in the quantity of water to be added was done to attain complete solubility and filtration of drug which aimed to study the principles of *nirmalikaran* experimentally.

Keywords

Rasashastra, Purification, *Nirmalikaran*



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INTRODUCTION

Rasashastra is the science of metals & minerals that forms basic *Ayurvedic* Pharmaceuticals. *Rasa dravyas* are toxic in nature if are used or ingested directly. Before their use in medicines they should go through the different procedures of purification. Various methods of purification were mentioned in the classical texts of *Rasashastra*. *Rasatarangini* is an authoritative text of *Rasashastra* which introduces various new processes.

Nirmalikaran is the special procedure of purification mentioned in the reference of mainly four drugs *Kalmisora*, *Tankana*, *Tutha* & *Ahiphen*. Though *Nirmalikaran* is a process of purification but it is different than *shodhan* process.

Purification process is of two types one is physical or external purification & second is chemical or internal purification. *Nirmalikaran* is mentioned only for physical or external purification where as internal or chemical purification is done by *shodhan* process. *Nirmalikaran* is based on three principles dissolution, filtration and evaporation with crystal formation. Crystals are formed according to original colour and structure of compound.

There are two methods of *Nirmalikaran* mentioned in text as follows

- 1) Using cold or normal water
- 2) Using hot water

AIM

To study the basic principles of *Nirmalikaran*

OBJECTIVES

1. To review the literature available on *Nirmalikaran* in *Rasatarangini* text.
2. To perform the experimental study of *Nirmalikaran* of *Kalmisora*, *Tankan* and *Tutha* as per *Rasatarangini*.
3. To do the physical examination of the *Nirmalikruta Kalmisora*, *Tankan* and *Tutha*.

MATERIALS AND METHODS

In present study *nirmalikaran* of mineral drugs, mentioned in *Rasatarangini* namely *Kalamisora*, *Tankan* and *Tutha* were decided to perform.

LITERARY REVIEW

Rasatarangini mentioned *Nirmalikaran* of *Kalmisora*, *Tankan*, *Tutha* and *Ahifen*. In case of *Kalmisora* two types of references are mentioned; one using cold water and

second by hot water. In first method, 1pal(40gms)Kalmisora dissolved in 4pal(160ml) cold water, dissolved mixture was filtered through cotton cloth and then subject to heat, to get aconcentrated solution by evaporation. Concentrated mixture was then allowed to dry at room temperature to get shwetavarna, suchikakar, spatikabha nirmalikruta Kalmisora¹. In second method Kalmisora was dissolved in half quantity of hot water, and the rest of the procedure is same as previous².

In Tankan Nirmalikarn, Ashudha Tankan dissolved in Sankhyaguna (24 times) cold water. Solution was filtered through cotton cloth and then subjected to heat. Concentrated solution was allowed to dry at room temperature to get shwetavarna, nirmalikruta Tankan³.

In Tutha Nirmalikaran, 10 tola ashudha Tutha was dissolved in 5tola hot water.

PHOTO



Fig 1



Fig 2



Fig 3



Fig 4

Kalmisora Nirmalikaran Process (Fig. 1-4)

Solution was filtered through cotton cloth and then allowed to dry at room temperature, to obtain bright blue coloured, crystalline *Nirmalikruta Tutha*⁴.

Ahifen Nirmalikaran was mentioned in *Vishavidnyaniya Taranag*⁵, but in present study only mineral drug *nirmalikaran* was done experimentally.

EXPERIMENTAL STUDY

Theoretical knowledge is a base of every experimental study but while performing this experiment, problem of solubility i.e. dissolution arises in case of hot water method. Though quantity of water was mentioned in text, but practically it was not applicable, so some important modifications regarding water quantity were done.

1)Nirmalikaran of Kalmisora Fig 1-4:



Fig. 5



Fig. 6



Fig. 7



Fig.8

Tankan Nirmalikaran Process (Fig.5 -8)



Fig.9



Fig.10 Fig.11



Fig.12

Tutha Nirmalikaran Process(Fig. 9-12)

Nirmalikaran of Kalmisora was done by two methods

Cold water method:

Ingredients:

Impure *Kalmisora* - 20 grams

Cold water - 80 ml

Procedure:

1) Fine powder of *Kalmisora* was added in water to get complete dissolved solution.

2) The solution then allowed filtering through filter paper in a stainless steel vessel.

3) Filtered solution is then subjected to mild heat for evaporation till concentrated solution was obtained.

4) Then solution was allowed to cool at room temperature in a dish.

Hot water method:

Ingredients:

Impure *Kalmisora* - 20 grams

Hot water - 60 ml



Procedure:

- 1) Hot Water was added in fine powder of *Kalmisorato* get dissolved solution.
- 2) The solution then allowed filtering through filter paper in a stainless steel vessel.
- 3) Filtered solution was allowed to cool at room temperature in a dish.

2) *Nirmalikaran of Tankan*^{Fig 5-8:}

Tankan nirmalikaran was mentioned by cold water method

Ingredients:

Impure *Tankana* - 20 grams

Cold water - 480 ml

Procedure:

- 1) Fine powder of *Tankana* was added to 24 times of water to get a clear solution.
- 2) The solution is then allowed filtering through filter paper in a stainless steel vessel.
- 3) Filtered solution is then subjected to mild heat for evaporation till concentrated solution was obtained.
- 4) Then solution was allowed to cool at room temperature in a dish.

3) *Nirmalikaran of Tutha* (Fig 9-12):

Tutha nirmalikaran was mentioned in text by hot water method

Ingredients:

Impure *Tutha* - 20 grams

Hot water - 60 ml

Procedure:

- 1) Hot water was added as a fine powder of *Tutha* to get a solution.
- 2) The solution was then allowed to filter through a filter paper in a stainless steel vessel.
- 3) Filtered solution was then allowed to cool in a dish at room temperature..

Modification:

In case of *Kalmisora* and *Tutha* half quantity of hot water was mentioned in text which found insufficient for complete dissolution. Water was added till complete dissolution of these two drugs, which was approximately 3times. Because this process was mainly based on the principle of solubility, filtration can be done only after complete dissolution. Unwanted parts were removed during filtration. Pure form of the drug was obtained after evaporation of excess water. Hence dissolution of the drug is the most important phenomenon in *Nirmalikaran* process.

OBSERVATIONS AND RESULT

Every stage was observed during experiment and results of *Nirmalikrut* drug with respect



to colour, appearance, structure & weight were enclosed in table no1.

Table 1 Observations and results of *Nirmalikut* drug with respect to colour, appearance, structure & weight

Sr. no	Drug Name	Colour	Appearance	Structure	Weight in gms
1	Kalmisora (Cold Water method)	BrightWhite	Crystalline	Needle shape	17.5
2	Kalmisora (Hot Water method)	Bright White	Crystalline	Needle shape	17
3	Tankan	White	Amorphous	Spherical	18
4	Tutha	Bright Blue	Crystalline	Square	17.5

DISCUSSION

Nirmalikaran is a special procedure of external purification mentioned by *Rastarangini*, only for four drugs i.e. *Kalmisora*, *Tankan*, *Tutha* & *Ahiphen*. *Shodhan* was done for internal purification of drug and then the drug is being used for internal application⁶. *Nirmalikaran* and *Shodhan* are two different procedures. In every experimental study theoretical knowledge is useful but while doing this experimental study, problem of dissolution arises. For successful procedure of *Nirmalikaran*, modifications were done in case of *Kalmisora* and *Tutha*. The important observation was recorded that during the process of evaporation, suddenly in 3 to 5 minutes a typical crystalline structure appears at the bottom. This is very characteristic feature of *Nirmalikaran* process. In *Kalmisora*, bright white coloured, shiny, needle shaped crystals

appeared, in *Tankan* white colored rounded ball like crystals appeared and in *Tutha* a very beautiful, dark blue coloured, bright shining, square shaped crystals appeared. The structure and colour of crystal was appeared as per original nature of the compound. Weight of the drug was reduced after completion of process due to loss of impurities. Following precautions were taken while performing the experiment.

1. Before dissolution fine powder of the drug was done properly for complete dissolution.
2. Filter paper was used instead of cotton cloth for proper filtration.
3. Glassware beaker, Petri dish and stainless steel vessels were used .
4. After complete drying, the drug was stored in air tight jar.

CONCLUSION

After detailed discussion on observations and result achieved, present study concludes

that *Nirmalikaran* process is an important procedure for external purification. It is based on three principles Dissolution, filtration and evaporation with crystal formation.

At the end of the *Nirmalikaran*, typical crystalline structure of the drug appeared. It is important characteristic sign of this procedure. For internal application purpose only *Nirmalikaran* is not sufficient but *Shodhan* should be done properly. This is a honest effort to study the *Nirmalikaran* process experimentally as per *Rastarangini* text.

To know the effect of *Nirmalikaran* further research work on chemical analysis of *Nirmalikruta* drug should be done. Whether *Nirmalikaran* process is applicable for all other *kshariya dravyas* is again part of research, so one can do this further progressive study.

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