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 Rasadravyas which is specially mentioned in classical textbook of Rasashastra that is Rasataranginimainly 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
INTRODUCTION

_Rasashastra_ is the science of metals & minerals that forms basic _Ayurvedic_ Pharmaceutics. _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 & Ahiben_. 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 _NirmalikrutaKalmisoa, 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 a concentrated 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. Solution was filtered through cotton cloth and then allowed to dry at room temperature, to obtain bright blue coloured, crystalline Nirmalikruta Tutha4.

Ahifen Nirmalikaran was mentioned in Vishavidnyaniya Taranag5, but in present study only mineral drug nirnalikaran 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:

PHOTO

Fig1

Kalmisora Nirmalikaran Process (Fig. 1-4)
Tankan Nirmalikaran Process (Fig. 5-8)

Fig. 5  Fig. 6  Fig. 7  Fig. 8

Tutha Nirmalikaran Process (Fig. 9-12)

Fig. 9  Fig. 10  Fig. 11  Fig. 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 Kalmisora to 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**[^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 was then allowed to filter through a 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):

*Tuthanirmalikaran* 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 3 times. 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 no 1.

**Table 1** Observations and results of *Nirmalikrut* drug with respect to colour, appearance, structure & weight
**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 application. *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.
REFERENCES