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“A PHARMACEUTICAL STUDY OF AN AYURVEDIC FORMULATION- TANKANADI CHURNA”

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ABSTRACT:

Tankanadi Churna is a Herbo-mineral Formulation mentioned in the classical text called *Siddha Bhesajya manimala*. It is a *Dadruhara Lepa* which contains *Tankana*, *Gandhaka*, *Navasadara* and *Mishri* as ingredients. *Tankanadi Churna* is in *Churna* form (powder) which should be mixed with *Nimbu swarasa* (lemon juice) and applied on the affected area. Preparation of the *Churna* and *Lepa* are explained in the *Sharangadhara samhitha*. In the present study, *Shuddha Tankana* (Borax), *Shuddha Gandhaka* (Sulphur), *Shuddha Navasadara* (Ammonium Chloride) and *Churna of Mishri* (Rock sugar) were taken in a *Khalwa yantra* and properly mixed to prepare *Tankanadi Churna*. Step by step pharmaceutical procedures were carried out according to classical reference and SOP. Loss during the process, total yield is noted. Pharmacological action of the *Tankanadi Churna* is discussed in brief.

Keywords: *Tankanadi Churna*, *Dadru Kushta*, *Churna nirmana*, Pharmaceutical study,

INTRODUCTION:

Rasa shastra is a branch of *Ayurveda* that deals with pharmaceutical processing and therapeutic application of metals and minerals and its sole aim is to provide effective, safe and non-toxic medicines. *Bhaishajya Kalpana* is a branch of *Ayurveda* that deals with the Basic principles of Pharmaceutics. Ayurvedic classics are the treasure of internal and external medicaments. There are different medications for internal and external use. *Lepa Kalpana* are used for the treatment of various skin disorders like *Kushta*, *Visarpa*, *Kshudra rogas* etc.

Tankanadi Churna is a *Dadruhara Lepa* used for the treatment of *Dadru* i.e *Tinea*. Ingredients of this *Churna* are *Tankana* (Borax), *Gandhaka* (Sulphur), *Navasadara* (Ammonium- Chloride) and *Mishri* (Rock Sugar).^[1]

In the present study, *Tankanadi Churna* was prepared following the classical reference, pharmaceutical guidelines and SOP. *Shodhana* of *Tankana*, *Gandhaka*, *Navasadara* was done and *Churna* of *Mishri* was prepared following standard operating procedure and the process involved from the purchase of drug to packing was documented in a step by step procedure.

MATERIALS AND METHODS

Literature Review

All the data was collected from classical texts and pharmaceutical procedures involved in the preparation of *Tankanadi Churna* were carried out in PG Department of *Rasa Shastra* and *Bhaishajya Kapana*, S.V Ayurvedic College, T.T.D, Tirupati.

Total Pharmaceutical Study was carried out in Three stages

Stage I

Gandhaka shodhana
Tankana Shodhana



Stage II

Navasadara Shodhana

Preparation of *Mishri Churna*

Stage III

Preparation of Homogenous mixture of *Tankanadi Churna*.

1. *Gandhaka Shodhana*^[2]

Reference: *Rasatarangini*

Materials: *Ashuddha Gandhaka*-500g, Cow Milk-4 lit, *Goghrita*-20g, Water-As required

Principle: *Dhalana*

Apparatus: Earthen pot, Stainless steel vessel, Gas stove, Iron pan, Cotton cloth, *Khalwa Yantra*.

Procedure: Milk was taken in a glass vessel. A cloth was tied to its mouth. *Ashuddha Gandhaka* was taken in a *Khalwa Yantra* and made into fine powder. *Go-Ghrita* was taken in a *Lohadarvi* and was heated on *Mandagni*. Fine powder of *Ashuddha Gandhaka* was added to *Lohadarvi* and heated till it get's completely melted. Melted *Ashuddha Gandhaka* was poured into cow milk through the cloth. *Gandhaka* was taken out from milk and washed with hot water. Above process is repeated for 2 more times. Fresh cow milk was taken

each time. After completion of process, *Shuddha Gandhaka* was taken out, washed with hot water, dried, pounded in a *khalwa yantra* and made into fine powder, weighed and stored in a glass container.

Observations:

- On pouring molten *Gandhaka* through cloth, impurities like small stones, mud, etc were filtered over the cloth.
- Melted *Gandhaka* looked like ghee.
- After *Shodhana*, *Gandhaka* colour was changed from dull yellow to thick, bright yellow colour with increased luster.
- *Go-Dugdha* and *Go-Ghrita gandha* was observed in *Shuddha Gandhaka*.
- Cow milk was hot after *Dhalana*.

Precautions:

- *Mandagni* was maintained throughout the process.
- During melting, *Gandhaka* was constantly stirred.
- Care was taken while pouring *Gandhaka* to avoid spilling.

Results:

Table No.1: Showing the result of *Gandhaka Shodhana*

Initial weight	Final weight	Loss in weight	Loss percentage
200g	180g	20g	4%

Probable reason for loss in weight:

Impurities were removed. *Gandhaka* was stuck to the cloth.

2. *Tankana Shodhana*^[3]

Reference : *Rasa Tarangini* 13/77-78

Materials : *Ashuddha Tankana*-200g

Principle : *Nirjalikarana*

Apparatus : *Khalwa yantra*, Earthen Plate, Gas stove, Spatula

Procedure:

- *Ashuddha Tankana* was taken in a clean and dry *Khalwa yantra* and pounded into powder.
- It was taken in an earthen plate and heated on *Mandagni*.

- Heat was continued until the water content in the *Tankana* was completely evaporated.
- Then it is powdered and stored in an air tight glass container.

Observation:

- *Tankana* changed to pale white colour after *Shodhana*.
- Crackling sounds were observed during the process.
- *Tankana*, after *Shodhana* bloomed and turned in to white opaque substance.

Precautions:

- Moderate heat should be given.

Result:**Table No 2: Showing the result of *Tankana Shodhana* :**

Initial weight	Final weight	Loss in weight	Loss percentage
200g	120g	80g	40%

Reason for loss in weight:

The weight of *Tankana* was reduced after *Shodhana* due to evaporation of water content.

3. Navasagara Shodhana^[4]

Reference: *Rasa Tarangini* 14/3-4

Material : *Ashuddha Navasagara* - 200g

Principle: Pounding, Filtering and Evaporation.

Apparatus: Earthen plate, Stove, cloth

Procedure:

- One part of *Ashuddha Navasagara* and three parts of water were taken in a vessel.
- After complete dissolving of *Navasagara* in water, it was filtered through a cloth.
- The filtrate was kept on fire and heated till water is evaporated.
- Crystalline form of Pure *Navasagara* is obtained.

Observations:

- After *Shodhana*, *Navasagara* becomes white in colour due to removal of physical impurities.

Precautions:

- Filtration should be done properly.

Result:**Table No 4: Showing the result of Navasadara Shodhana :**

Initial weight	Final weight	Loss in weight	Loss percentage
200g	190g	10g	5%

4. Mishri Churna Nirmana^[5]**Reference :** Sharangadhara Samhitha.M.K.6/1**Materials :** Mishri**Apparatus :** Khalwa yantra, Stainless steel vessel, Cloth.**Procedure**

- Mishri was checked for any external impurities and cleaned.
- It was taken in Khalwa yantra and pounded.
- Pounded material was sieved through cloth to obtain very fine powder.
- Then it was stored in air tight container.

Observations

- Very fine powder of Mishri was obtained.

Precautions

- Care should be taken to avoid spillage of drug.

Result**Table No.4: Showing the result of preparation of Mishri Churna**

Initial weight	Final weight	Loss in weight	Loss Percentage
200g	180g	20g	10%

Probable reasons for weight loss

- The reason for weight loss is due to spillage during pounding.

5. Preparation of Homogenous Mixture of Tankanadi Churna**Reference :** Siddha Bheshaja Manimala**Materials :** Shuddha Gandhaka - 150g

Shuddha Tankana - 150g

Shuddha Navasadara - 150g

Mishri Churna - 150g

Apparatus: *Khalwa yantra*, Weighing machine, Spoon.

Procedure:

- Fine powders of *Shuddha Gandhaka*, *Shuddha Tankana*, *Shuddha Navasadara* and *Mishri* were taken in *Khalwa yantra* and mixed to form a homogenous mixture.

Observations:

- Pale yellow coloured *Tankanadi churna* was obtained.

Precautions:

- Care should be taken during mixing to avoid spilling of the drug.

Result

Table No.6: Showing the result of preparation of *Tankanadi Churna*

Initial weight	Final weight	Loss in weight	Loss Percentage
600g	590g	10g	2%

Probable reasons for weight loss

The reason for weight loss is due to spillage during pounding.

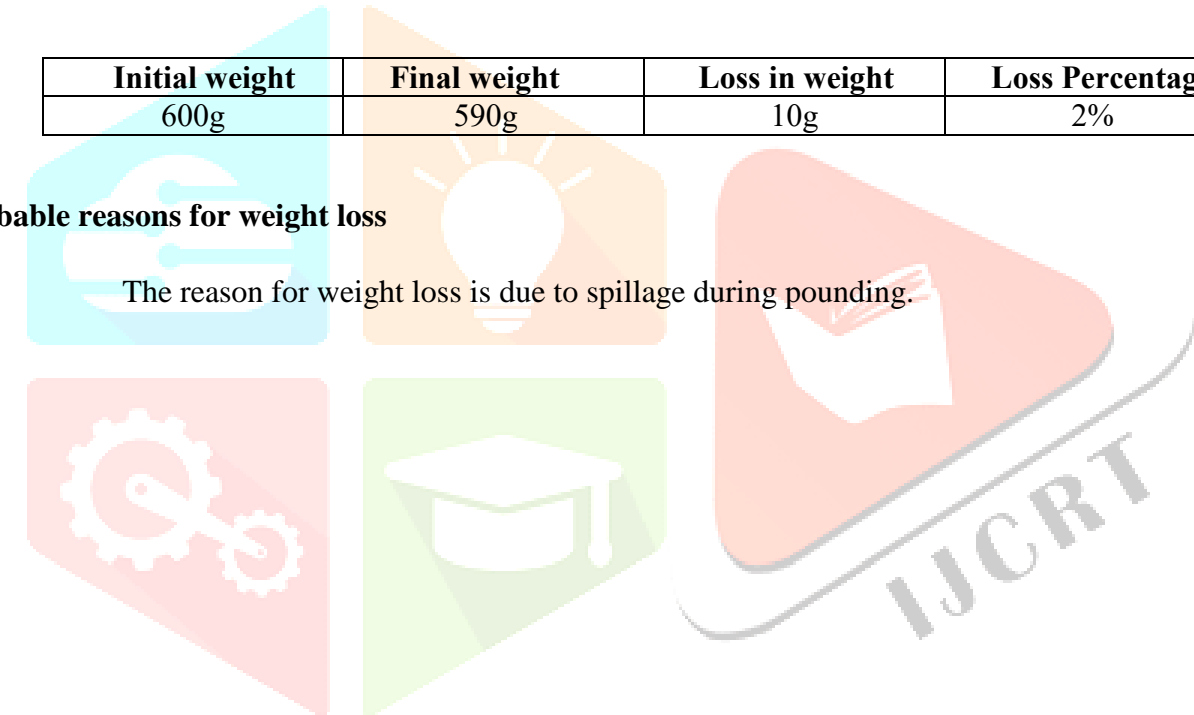




Figure 1 Ashuddha Gandhaka



Figure 2 Melting of Gandhaka



Figure 3 Pouring molten Gandhaka into milk



Figure 4 Shuddha Gandhaka Churna



Figure 5 Ashuddha Tankana



Figure 6 Heating of Ashuddha Tankana churna on mild flame



Figure 7 Nirjalikarana of Tankana



Figure 8 Shuddha Tankana Churna



Figure 9 Ashuddha Navasagara



Figure 10 Ashuddha Navasagara Churna

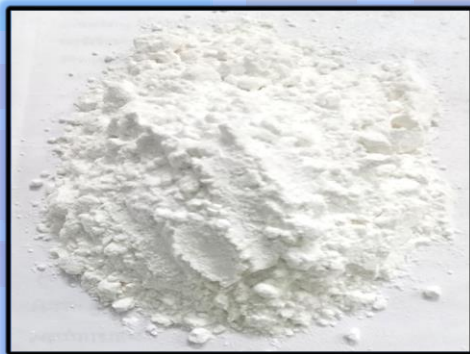


Figure 11 Shuddha Navasagara Churna



Figure 12 Mishri



Figure 13 Mishri Churna



Figure 14 Mixing of All powders

DISCUSSION:

- Pharmaceutical study was carried out in several stages to obtain the contents in desired form for the preparation of *Tankanadi Churna*.
- *Tankanadi Churna* contains *Shuddha Gandhaka*(Sulphur), *Shuddha Tankana*(Borax), *Shuddha Navasadara*(Ammonium Chloride) and *Mishri*(Rock sugar) as ingredients.
- The pharmaceutical procedures adopted in this study are *Shodhana*^[6], *Nirjalikarana*, *Dhalana*^[7], *Churna nirmana* and preparation of *Tankanadi Churna*.
- *Shodhana* procedure plays an important role in *Rasashastra*. *Shodhana* is defined as the process which is done to remove the impurities present in a drug by adopting procedured like trituration, boiling in liquids etc using the drugs advocated by the texts.^[8]

Preparation of *Tankanadi Churna*:

Tankanadi Churna is a preparation mentioned in *Siddha Bhesaja Manimala*, *Kushta Roga chikitsa*. *Gandhaka Shodhana* was done by subjecting *Gandhaka* to *Dhalana* in Cow milk for 3 times. *Navasadara and Tankana Shodhana* was done by *Nirmalikaarana*^[13] and *Nirjalikarana* method. *Churna Nirmana* was done by adding fine powders of *Shuddha Gandhaka*, *Shuddha Tankana*, *Shuddha Navasadara* and *Mishri*.

All these fine powders are taken in a *Khalwa yantra* and mixed well to form a homogenous mixture of *Tankanadi Churna*. The *churna* obtained was packed and stored in air tight containers. While applying, the *churna* is mixed with *nimbu swarasa* to form a *Lepa* which can be applied on the affected area.

Mishri having *Madhura rasa*, *Snigdha*, *Sheeta* and *Sara gunas* is a Natural coolant and Anti-inflammatory in action. It has *Sheeta virya* and *Madhura Vipaka*.

Shuddha Gandhaka has *Madhura*, *Katu*, *Tikta rasa*, *Katu Vipaka*, *Ushna Virya* and *Kaphavatahara Guna*. It has *Amapachana*, *Deepana*, *Kushtaghna*, *Kandughna*, *Krimighna*, *Jantughna*, *Vishahara* and *Rasayana* properties. It is indicated in *Kushta*, *Dadru*, *Visarpa*, *Pama*, *Pliha*, *Kshaya*, *Adhmana*, *Jwara*, *Netra roga* etc.

By the virtue of *Dadrughna*, *Krimighna* and *Kandughna* properities, *Shuddha Gandhaka* is useful in curing *Dadru Kushta*.^[9]

Shuddha Tankana has *Katu rasa*, *Tikshna guna*, *Ushna virya* and *Katu vipaka*. It has *Deepana*, *Balya* and *Shoolaghna* properities. It is indicated in *Shula*, *Gulma*, *Kasa*, *Adhmana*, *Jwara* and *Swasa*.^[10]

Shuddha Navasadara has *Deepana*, *Kaphanissaraka*, *Kushtanashaka* and *Tridosahara* properties. It has Anti-bacterial, Anti- Asthmatic, Muco-expectorant and Anti-inflammatory properities.^[11]

Nimbu swarasa^[12] has *Madhura-amla rasa*, *Teekshna*, *laghu guna*, *Sheeta virya* and *Madhura Vipaka* in Nature.

So *Tankanadi Churna* has *Kushtaghna*, *Krimighna*, *Kandughna*, *Dadrughna*, *Lekhana*, *Vranashodhana* and *Vranaropana* properties. So it can be used effectively in *Dadru Kushta*.

Conclusion:

Pharmaceutical standardization is an important requisite for the establishment of an efficient drug. *Lepa Kalpana* are meant for external application. The pharmaceutical procedures involved in this study are *Shodhana, Dhalana and Churna nirmana*. *Shodhana* is done in order to make the drug free from internal and external impurities and make it fit for therapeutic purpose. *Churna nirmana* procedure helps in size reduction thereby making the drug more bio- available. The ingredients of *Tankanadi Churna* are having *Lekhana, kushtaghna, dadrughna, krimighna, vrana shodhaka and vrana ropaka* properties which are beneficial for the management of *Dadru Kushta*.

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