Pharmaceutical Development Of Modified Tankana Malahara- An Ointment Preparation

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ABSTRACT: Introduction: Ayurveda is a treasury of variety of dosage forms for internal and external usage, malahara kalpana (ointment preparations) being one of them. This study deals with the pharmaceutical development of a new formulation of malahara using coconut oil, bee wax and purified borax on the basis of classically explained other malahara formulations.

Methods and materials: The preparation of the modified tankana malahara was done as per the classical guidelines of other malahara kalpana with three different ratios of ingredients. General observations and organoleptic parameters of all three samples were noted.

Results and Discussion: Modified tankana malahara prepared with different ratio of ingredients were similar in physical attributes as well as organoleptic parameters.

Conclusion: As per the study all the samples of tankana malahara are pharmaceutically indistinguishable. Hence it can be concluded that, tankana malahara prepared with maximum quantity tankana is likely to have more therapeutic potency than other two ratios with less borax.

Key Words: Malahara, Tankana, Siktha, Narikela Taila
INTRODUCTION:

Ayurvedic pharmaceutics is a profound, yet perplexing branch of Indian medical science, which comprises of plenty of distinctive formulations with herbal and metalo-mineral drugs. Among various preparations, the dosage forms that are used exclusively for external applications are also explained in the classical texts of Ayurveda. ‘Malahara kalpana’ are one such preparation intended to apply on the skin and are almost same as ointments of contemporary dosage form with a oily base, giving a greasy, viscous semisolid consistency.\[1\]

Rasa tarangini, a 20\textsuperscript{th} century book on Rasashastra contributes maximum number of malahara (ointment) preparations with various drugs for different ailments of the skin. For most of the preparations tila taila (sesame oil) and siktha (bee wax) are used as base drugs, which also add on to the therapeutic property of the main ingredients in the formulation. Tankana (Borax) a proved drug with antifungal and antibacterial property\[2\] is mentioned to be a content of several preparations like tankanamrita malahara, \[3\] tankanamla malahara, \[4\] gandhakadya malahara\[5\] etc. With this background, a slight modification in classically explained malahara is done and attempt is made to prepare a new formulation with oil, bee wax and purified borax, where coconut oil is used instead of sesame oil owing to its antimicrobial property. \[6\]

OBJECTIVES:

To do pharmaceutical development of modified Tankana malahara.
MATERIALS AND METHODS:

Materials:

The raw drugs required for the study was procured from local market of Udupi and the practical was carried out in Rasa shastra and bhaishajya kalpana practical hall, Sri Dharmasthala Manjunatheshwara College of Ayurveda, Udupi.

Method of preparation:

Step 1:

_Tankana shodhana_ (Purification of Borax):

Method followed: _Bharjana_ (Frying)

Reference: _Rasa tarangini_ [7]

Ingredients:

_Ashuddha Tankana_ (Unpurified borax) - 100g

Procedure:

• 100 g of _ashuddha tankana_ was weighed and powdered finely.
• This was then heated in an earthen vessel with frequent stirring.
• The heating was continued until it is devoid of moisture and hissing sound.

• The obtained _tankana_ was weighed and used for further procedure.

Step 2:

_Siktha taila_ preparation:

Ref: The method of preparation of _siktha taila_ was followed as per _Rasa tarangini_ [8] with modification in the ingredient, where _narikela taila_ (coconut oil) is taken instead of _tila taila_ (Sesame oil).

Ingredients:

_Narikela taila_ (Coconut oil) – 90ml

_Siktha_ (Bee wax)-15g

Procedure:

• 90 ml of coconut oil was taken in a clean stainless steel vessel.
• It was heated on mild fire until oil becomes hot.
• 15 g of _siktha_ was added to it, mixed thoroughly and taken out of fire once the _siktha_ melts in coconut oil completely.
• The mixture was immediately filtered through a clean cloth into vessel.
• The solidified filtrate once it gets cooled down is _siktha taila_.


Step 3: *Tankana malahara* preparation

Ref: Based on the references of various *malahara* formulations explained in *Rasa Tarangini*, Modified *tankana malahara* was prepared in 3 different ratios.\(^{[3-5]}\) The samples were prepared in batches and were assessed for organoleptic characters.

Ingredients of *Tankana malahara*:

The ingredients required for preparation of modified *tankana malahara* along with ratio and quantities are enlisted in table 1. Three samples of *tankana malahara* prepared with three different are ratios are denoted as *tankana malahara* 1 (TM 1), *tankana malahara* 2 (TM 2) and *tankana malahara* 3 (TM 3).

<table>
<thead>
<tr>
<th>Name of the drug</th>
<th>English name</th>
<th><em>Tankana malahara</em> test sample</th>
<th>Ratio</th>
<th>Quantity taken</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shuddha Tankana</strong></td>
<td>Borax</td>
<td></td>
<td>TM 1</td>
<td>1 part</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TM 2</td>
<td>1 part</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TM 3</td>
<td>1 part</td>
</tr>
<tr>
<td><strong>Siktha taila</strong></td>
<td>Ointment base prepared with bee wax and coconut oil in the ratio 1:6</td>
<td></td>
<td>TM 1</td>
<td>6 parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TM 2</td>
<td>4 parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TM 3</td>
<td>2 parts</td>
</tr>
</tbody>
</table>

Method of preparation:

- Prepared *siktha taila* was melted in a clean stainless steel vessel and poured to a porcelain mortar.
- Immediately specified quantity of *Shuddha tankana* in finely powdered form was added little by little. Meanwhile the pestle was rotated in such a way that the powdered *tankana* mixes uniformly with *siktha taila* and was continued until the mixture thickens and attains a homogenous form.
- The obtained product is weighed and noted for organoleptic features.
OBSERVATIONS AND RESULTS:

Observations:

- Uniform mixing of powdered tankana in molten siktha taila was observed during as well as after preparation in all three samples of tankana malahara.

- The samples were smooth and devoid of solid particles in it.

- All the three samples were greasy and not washable with water alone.

- On application over skin all the three samples produced mild tingling sensation for around 30 seconds.

- All the prepared samples were physically stable, when stored in room temperature for 3 months.
RESULTS:

The prepared samples of modified *Tankana malahara* are checked for quantity of product obtained, percentage loss and organolpetic parameters which are enlisted in table no.2

Table no. 2: Results of pharmaceutical study of modified *tankana malahara* prepared in three different ratios

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TM1</th>
<th>TM2</th>
<th>TM3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight of product</td>
<td>32.4g</td>
<td>35.6g</td>
<td>41.7g</td>
</tr>
<tr>
<td>obtained</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage loss</td>
<td>7.4%</td>
<td>6.3%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Color</td>
<td>Light creamy yellow</td>
<td>Light creamy yellow</td>
<td>Light creamy yellow</td>
</tr>
<tr>
<td>Consistency</td>
<td>Waxy semi solid</td>
<td>Waxy semi solid</td>
<td>Waxy semi solid</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic odor of coconut oil</td>
<td>Characteristic odor of coconut oil</td>
<td>Characteristic odor of coconut oil</td>
</tr>
<tr>
<td>Taste</td>
<td>Not assessed</td>
<td>Not assessed</td>
<td>Not assessed</td>
</tr>
</tbody>
</table>

DISCUSSION:

The basic ideology behind formulating modified *tankana malahara* is to use it as an antifungal drug for external application. Hence the pharmaceutically standardized ointment must be suitable for clinical usage with maximum therapeutic efficacy. Thus the formulation is prepared with an aim to fulfill following criteria [9]:

- Physical and chemical stability when stored under normal conditions.
- Pleasant appearance and odor.
- Non toxic and nonirritating.
• Easy for application.
• Non greasy, but remains in the applied site for longer time. As the oil and bee wax are ingredients in the formulation, it’s difficult to obtain completely non greasy consistency, but it should not be to the extent that it causes inconvenience for users.
• Presence of main ingredient tankana in maximum possible quantity.

Discussion on Ratio of the ingredients:

Various malahara formulas quoted in Rasa tarangini are having different ratio of siktha taila and other drugs in them. Among them, Tankanamrita malahara\textsuperscript{31} has 1:2:12 ratio of other drugs, tankana and siktha taila respectively; Tankanamla malahara\textsuperscript{4} has 1:9 ratio of tankanamla (boric acid) and siktha taila respectively; Gandhakadya malahara\textsuperscript{5} has 7:1:36 ratio of other drugs, tankana and siktha taila respectively.

Based on these references 1:6, 1:4 and 1:2 ratio of tankana and siktha taila were taken for the present study in TM 1, TM 2 and TM 3 respectively.

Discussion on observation and results:

• The smoothness and homogenous mixture of malahara owe to the uniformity of contents in them.
• The greasiness in the ayurvedic malahara is unavoidable due to its nature and is also responsible in imparting the therapeutic property. Apart from this, greasiness also makes the drug adhered to the skin for longer time.
• The mild tingling sensation produced on application is due to the presence of tankana- an alkaline drug in it.
• The stability checked in the present study is just an observation and need to be confirmed with laboratory stability tests.
• The quantities of product obtained are almost proportionate to the raw drugs taken with 6-8 percent of loss due to adherence to the vessels used and can be considered negligible. Color and odor of all the three samples are similar and are related the ingredients added. Consistency of TM 1, TM 2 and TM 3 was expected to vary to due to the ratio
of ingredient, but are similar in all the three samples.

CONCLUSION:
The prepared modified tankana malahara yielded almost identical products in three different ratios. Their characters by organoleptic parameters and general appearance remain the same. These parameters further need to be ascertained by quality control analysis of ointments and decided for the suitable ratio.

But, the key ingredient in the formulation tankana was incorporated in larger quantity in TM 3. Hence it can be concluded that modified tankana malahara prepared with 1:2 ratio of tankana and siktha taila would be beneficial for therapeutic purpose which has to be confirmed by further analytical and clinical study.

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REFERENCES