**FORMULATION AND EVALUATION OF HERBAL OINTMENT USING Vateria indica RESIN**

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**ABSTRACT**

The *Vateria indica* resin is known in Indian traditional medicine system for their therapeutical value. In Ayurveda it is known as sarja rasa and in siddha as Vellai kungiliyam. In recent years, the interest in herbal medicines and utilization also increasing rapidly. Plant derivative substances and the herbal medicines have the richest source of bioactive compounds which is used in the modern and traditional medicines. The present work is to formulate and evaluate the ointment of *Vateria indica* resin. The ointment base was prepared and formulation was done by incorporating the extract by two method- levigation method and fusion method. Physicochemical parameters like colour, odour, pH, spreadability and extrudability has been evaluated after completion of formulation. The antibacterial activity *Vateria indica* resin was also investigated against Escherichia coli. Thus it could become a media to use the medicinal property of *V.indica* resin effectively and easily as a simple dosage form.

**KEYWORDS:** Ointment, Levigation, Fusion, Physicochemical.

**INTRODUCTION**

*Vateria indica* Linn is an evergreen medicinal tree that grows in evergreen forests of Western Ghats from North Karnataka to Kerala. The resin oozed by the tree is known as Pinny resin, white Dammar or Dhupa[1]. The use of plants and their exudates in therapy has been among the oldest and widely studied topics. The resin from *V.indica* is therapeutically known in Indian traditional systems of medicine (Ayurveda and Siddha). It is known as sarja rasa in Ayurveda and Vellai kungiliyam in Siddha.[2]

It is obtained by cutting and tapping the *V.indica* Linn. The resin finds its use in traditional Indian systems of medicine like Ayurveda and Siddha for health and healing diseases[3]. Studies have shown that the resin possesses resveratrol having anti-tumor properties. Kungiliya parpam (KP) is a Siddha preparation made from this resin that is effective in the management of urinary tract disorders.[4]

The resin is also used in the treatment of respiratory disorders like chronic bronchitis, throat infection, tubercular gland, boils, piles, diarrhea and rheumatism and so on.[5]

**MATERIALS AND METHOD**

**Collection of Plant material**

Resins of plant *V.indica* was brought from the market and dried at room temperature.

**Preparation of the extract**

150 gm of *V.indica* resin was powdered. The resin was mixed with 250 m of tender coconut water. Boiled the mixed resin started to appear on the surface of the boiling liquid in a molten state. Separate the resin by filtration and cool it. The melting procedure and recovery was repeated for several times. The final product was dried, ground and then sieved. The final powder was creamy white in colour.[6]

**Formulation of Ointment**

Table I shows the required base and quantity for making the ointment.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Ingredient</th>
<th>Quantity to be taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Wool fat</td>
<td>5gms</td>
</tr>
<tr>
<td>2</td>
<td>Cetostearyl alcohol</td>
<td>5gms</td>
</tr>
<tr>
<td>3</td>
<td>Hard paraffin</td>
<td>5gms</td>
</tr>
<tr>
<td>4</td>
<td>White soft paraffin</td>
<td>5gms</td>
</tr>
</tbody>
</table>

**Formulation of Herbal ointment**

Herbal ointment was prepared by mixing accurately weighed *V.indica* resin powder to the ointment base by two methods (Fusion method and Levigation method).
**Procedure for base preparation**
Initially ointment base was prepared by weighing accurately grated hard paraffin which was placed in evaporating dish on water bath. After melting of hard paraffin, remaining ingredients were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment base.

**Procedure for herbal ointment preparation**

**Fusion method**
Melt 9g ointment base and 1g resin in a china dish. At a highest melting point mix the base and the resin. Mix until it distributed uniformly. Finally, transfer it in to a suitable container.

**Levigation method**
The resin is first mix with a small quantity of the base to form a concentrated ointment base. The concentrated ointment base contains a finely divided powder uniformly distributed in it. It is then gradually diluted with remaining quantity of the base by rubbing with a stainless steel spatula. Gradually incorporate more bases until to form homogeneous ointment finally transferred in a suitable container.

**EVALUATION**

**Colour and Odour**
Physical parameters like colour and odour were examined by visual examination.

**Determination of the pH**
pH of prepared herbal ointment was measured by using digital pH meter. The solution of ointment was prepared by using 100ml of distilled water and set aside for 2hrs. pH was determined in triplicate for the solution and average value was calculated.

**Homogeneity**
Homogeneity of various formulations was tested by visual observation and was ranked as follows:

+++ = Excellent, ++ = Very Good, + = Good, - = Poor.

**Consistency**
The cone attached to holding rod was dropped from the fix distance of 10 cm such that it should be fall on the center of measuring cylinder filled with ointment. The distance travelled by cone was noted down after 10 sec.

**Washability**
Formulation was applied on the skin and then ease extend of washing with water was checked.

**Non irritancy Test**
Herbal ointment prepared was applied to the skin of human being and observed for the effect.

**Solubility**
Soluble in boiling water, miscible with alcohol, ether, chloroform.

**RHEOLOGICAL PROPERTIES**

**Viscosity measurements**
A Brookfield synchro electric viscometer, Brookfield, was used to measure the viscosity (in cps) of ointments. The spindle was rotated at 2.5rpm. Samples of the ointments were allowed to settle over 30 min at the temperature of 25°C before the measurements were taken.

**The Spreadability determination**
The herbal ointment was placed between the two glass slides, 100gm weight was placed on the upper glass slide for 5 min to compress for uniform thickness. The time required to separate the two slides, i.e. the time in which the upper glass slides moved over the lower plate was taken as measure of spreadability.

Formulation placed between two glass slides and $S = \frac{m}{l/t}$

Where,  
$m$ = weight tide to upper slide  
$l$ = length moved on the glass slide  
$t$ = time taken.

Spreadability test also was performed by applying the ointment on the skin and noticing whether spreading was good or not.

**Antibacterial activity**
In vitro antibacterial efficacy of formulated ointment using V.indica resin was done by Formulation 1 (fusion method ointment), and Formulation 2 (levigation method ointment). The cup-plate method was used to assess the relative antibacterial efficacy of the formulated herbal ointments prepared with V.indica resin.

A molten Mueller Hinton agar stabilized at 45°C, seeded with 0.1 ml of a 24 hour broth culture containing approximately $10^9$ cfu/ ml was used. Wells of 6mm diameter were created with a sterile cork borer and filled to about three-quarters full with the V.indica resin ointment at concentrations 0.2g, 0.4g, 0.6g. The plates were pre-incubated for 1 hour at room temperature to ensure adequate diffusion and finally incubated at 37°C for 24 hour.

**RESULT AND DISCUSSION**
The present study was done to prepare and evaluate the V.indica resin ointment. The two methods: levigation method and fusion method (figure: 1) was used to prepare ointment so that uniform mixing of the herbal extract with the ointment base was occurred which was stable during the storage.
Figure 1: Levigation method ointment and Fusion method ointment.

Table II: Physicochemical evaluation of formulated ointment.

<table>
<thead>
<tr>
<th>Physicochemical parameters</th>
<th>Fusion method</th>
<th>Levigation method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>White</td>
<td>White</td>
</tr>
<tr>
<td>Odour</td>
<td>Characteristic</td>
<td>Characteristic</td>
</tr>
<tr>
<td>pH</td>
<td>5.4</td>
<td>5.4</td>
</tr>
<tr>
<td>Homogeneity</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Consistency</td>
<td>5mm</td>
<td>5mm</td>
</tr>
<tr>
<td>Washability</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Non irritancy Test</td>
<td>Non irritant</td>
<td>Non irritant</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in boiling water, miscible with alcohol, ether, chloroform</td>
<td>Soluble in boiling water, miscible with alcohol, ether, chloroform</td>
</tr>
<tr>
<td>Viscosity measurements</td>
<td>10×10⁵</td>
<td>10×10⁵</td>
</tr>
<tr>
<td>Spreadability(seconds)</td>
<td>37 sec</td>
<td>36 sec</td>
</tr>
</tbody>
</table>

Antibacterial activity
The in vitro antibacterial activity of the V.indica resin based herbal ointments shows excellent activity against Escherichia coli (E.coli). Zone of inhibition (cm) developed in V.indica resin used herbal ointment against E. coli. The results from Table III show that herbal ointment effectively inhibited the growth of E.coli. The antibacterial activity was enhanced with increase of the ointment concentration. It was found that the maximum antibacterial activity in 0.6 g of the ointment was 4mm in fusion method and 3mm in levigation method for E.coli.

Table III: Antibacterial activity for formulated ointment.

<table>
<thead>
<tr>
<th>Sample method</th>
<th>Concentration of extract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>Fusion method</td>
<td>3mm</td>
</tr>
<tr>
<td>Levigation method</td>
<td>2mm</td>
</tr>
</tbody>
</table>

CONCLUSION
From the ancient time Vateria indica resin is used for their various medicinal properties like antibacterial, antifungal, anti-inflammatory etc. Thus this ointment could a great potential as an effective and safe way to administer. Ointments prepared from the Vateria indica resin shows good result in all physical evaluation parameters in both levigation and fusion method and it shows significant wound healing activity.

REFERENCES