Formulation and Evaluation of Ointment and Liniment Using Moringa Oleifera Seed Extract

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Abstract: Traditional medicine is an important source of potentially useful new compounds for the development of chemotherapeutic agents. Moringa oleifera is the most widely cultivated species of a monogenetic family, it is now widely cultivated and has become naturalized in many locations in the tropics. It is a perennial softwood tree with timber of low quality, but which for centuries has been advocated for traditional medicinal and industrial uses as well as used in treatment of Anti-inflammatory, Antioxidant, Coagulant. The Natural remedies are more acceptable in the belief that they are safer with fewer side effects than synthetic ones herbal formulation have growing demand in the world market. It is very good attempt to establish the herbal ointment and liniment containing ethanolic extract of moringa oleifera seed powder.

Keywords: Solubility, Anti inflammatory, Antioxidant, Coagulant, Extract

1. Introduction

Medicinal plants are believed to have therapeutically important as they are rich in various phytochemical constituents which treat many diseases [1]. Topically applied plant preparations in the form of cream or liniment are made available [2]. Moringa oleifera is the most widely cultivated species of a monogenetic family, the Moringaceae, that is native to the sub-himalayan tracts Indian, Pakistan, Bangladesh and Afghanistan this rapidly growing tree (also known as the horseradish tree, drumstick tree benzolive tree, kelor, marango, mlonge, moonga, mulangay, nebeday saijhan or Ben il tree) was utilized by the ancient Romans, Greeks and Egyptians; it is now widely cultivated and has become naturalized in many locations in the tropics. It is a perennial softwood tree with timber of low quality, but which for centuries has been advocated for traditional medicinal and industrial uses. It is already an important crop in India, Ethiopia, the Philippines and the Sudan, and is being grown in West, East and South Africa, tropical Asian, Latin America, the Caribbean, Florida and the Pacific Islands. All parts of the Moringa tree are edible and have long been consumed by humans. The World Health Organization (WHO) has appreciated the importance of medicinal plants for public health care in developing nations and has evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicine and to study their potential usefulness including evaluation, safety, and efficacy [3].

According to the many uses for moringa include alley cropping (biomass production) animal forage (leaves and treated seed-cake) biogas (form leaves) domestic cleaning agent (crushed leaves) blue dye (wood) felling (living trees) fertilizer (seed-cake) foliar nutrient (juice expressed from the leaves) green manure (from leaves) gum (from tree trunks) honey and sugar cane juice clarified (powdered seeds) honey (flower nectar) medicine (all plant parts) ornamental plantings biopesticide (soil incorporation of leaves to prevent seedling damping off) pulp (wood) rope (bark) tannin for tanning hides (bark and gum) water purification (powdered seeds). Moringa seed oil (yield 30-40% by weight) also known as ben oil is a sweet non-sticking non-drying oil that resists rancidity. It has been used in salads for fine machine lubrication and in the manufacture of perfume and hair care product (158) In the West one of the best known uses for Moringa is the use of powdered seeds Make Comments 3 to flocculate contaminants and purity drinking water (11,50,113) but the seeds are also eaten green, roasted, powdered and steeped for tea or used in curries (50) This tress has in recent times been advocated as an outstanding indigenous source of highly digestible protein Ca, Fe, Vitamin C and carotenoids suitable for utilization in many of the so-called “developing regions of the world where undernourishment is a major concern. Drugs presently in use for the management of inflammation are associated with well-known side and toxic effects [4].

1.1 Uses

The seed powder of Moringa oleifera powder
1) It is used as anti inflammatory (analgesic)
2) It is used as antioxidant
3) It is also used as coagulant

Image no. 1: Moringa oleifera

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1.2 Scientific Classification

Image no. 2: Moringa oleifera

1.3 Synonyms

Guilidian moringa l, Hyperanthera moringa Vah, Moringa pterygosperma Gaertn . nom.illeg.

Moringa oleifera-

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Plantae</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Unranked)</td>
<td>Angiosperms</td>
</tr>
<tr>
<td>(Unranked)</td>
<td>Eudicots</td>
</tr>
<tr>
<td>(Unranked)</td>
<td>Rosids</td>
</tr>
<tr>
<td>Order</td>
<td>Brassicales</td>
</tr>
<tr>
<td>Family</td>
<td>Moringaceae</td>
</tr>
<tr>
<td>Genus</td>
<td>Moringa</td>
</tr>
<tr>
<td>Species</td>
<td>M.oleifera</td>
</tr>
<tr>
<td>Binomial name</td>
<td>Moringa oleifera</td>
</tr>
</tbody>
</table>

2. Materials and Methods

Fresh leaves of Moringa oleifera was collected from local
Area Yelur, Tal- Walwa, Dist- Sangali, Maharashtra, India
and Extraction process performing Chemistry Lab in Shree.
Santkrupa College of Pharmacy, Ghugaon

2.1 Ointment Formulation from Seed of Moringa Oleifera

Ointment – ointment are the semisolid preparation meant for
application to the skin or mucous membrane.

1) Formula of ointment

<table>
<thead>
<tr>
<th>Ingredient (Water extract) F1</th>
<th>Quantity</th>
<th>Ingredient (Ethanol extract) F2</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>3gm</td>
<td>Propylene glycol</td>
<td>3gm</td>
</tr>
<tr>
<td>White bees wax</td>
<td>0.5gm</td>
<td>White bees wax</td>
<td>0.5gm</td>
</tr>
<tr>
<td>Hydrous wool fat</td>
<td>0.5gm</td>
<td>Hydrous wool fat</td>
<td>0.5</td>
</tr>
<tr>
<td>Methyl paraben</td>
<td>0.1gm</td>
<td>Methyl paraben</td>
<td>0.1</td>
</tr>
<tr>
<td>Propyl paraben</td>
<td>0.5gm</td>
<td>Propyl paraben</td>
<td>0.5</td>
</tr>
<tr>
<td>Triethanolamine</td>
<td>0.5gm</td>
<td>Triethanolamine</td>
<td>0.5gm</td>
</tr>
<tr>
<td>Moringa oleifera seed water extract</td>
<td>0.5gm</td>
<td>Moringa oleifera seed water extract</td>
<td>0.5gm</td>
</tr>
</tbody>
</table>

Procedure

1) The ethanol extract and the water extract separately were
incorporated in to the molten simple ointment base.
2) Add Moringa oleifera seed powder extract and stir till it
solidifies
3) Transfer to a suitable container, cork it, attach prepared
label and submit.

Evaluation

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

Consistency
Smooth and no greediness is observed

pH
pH of prepared 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. The pH measurements were done by using a
digital type pH meter by dipping the glass electrode into the
ointment formulation

Spread ability
The spread ability was determined by placing excess of
sample in between two slides which was compressed to
uniform thickness by placing a definite time. The time
required to separate the two slides was measured as spread
ability .Lesser the time taken for separation of two slide
result better spread ability was calculated for separation of
two slide result better spread ability was calculated by
following formula

\[ XS = \frac{M}{l/T} \]

Where,
S = spreadability
M = Weight tide to the upper
L = length of glass slide
T=Time taken to separate

Extrudability
The formulation was filled in collapsible tube container. The
extrudability was determined in terms of ointment required
to extrude 0.5cm of ointment in 10 seconds

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extrudability of prepared Moringa oleifera ointment
formulations was calculated by using following formula

\[ Ext = \frac{Amount\ of\ ointment\ extruded\ from\ the\ tube \times 100}{Total\ amount\ of\ ointment\ filled\ in\ the\ tube} \]

Diffusion Study
In Franz diffusion cell, 2gm of ointment was kept in donor
compartment. The entire surface of cellophane membrane
was in contact with the receptor compartment containing
25ml of phosphate buffer pH 7.4 The receptor compartment
was continuously stirred (100rpm) using the magnetic stirrer.
The temperature was maintained 37c .The study was carried
out for 2 hrs and the sample was withdrawn at 15 minute
time interval and same volume was replaced with free
phosphate buffer. The content of seed extract withdrawn and
sample was measured after suitable dilution.
LOD
LOD was determined by placing the formulation in petri-dish on water bath and dried for temperature 105°C.

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

Washability
Formulation was applied on the skin and then ease extend of washing with water was checked. Moringa oleifera ointment formulations were applied on the skin and then ease extend of washing with water was checked. Washability was checked by keeping applied skin area under the tap water for about 10 min [7].

Non Irritancy Test
Herbal ointment prepared was applied on the skin of human being and observed for effect.

Stability Study
Moringa oleifera ointment formulations were evaluated for their stability at an ambient condition of pressure and temperature for two weeks. Formulations were observed for phase separation and particle agglomeration [8].

3. Result and Conclusion

Table 2: Observation and Result

<table>
<thead>
<tr>
<th>S.No</th>
<th>Test</th>
<th>Observation</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Color</td>
<td>F1 (Water Extraction)</td>
<td>F2(Ethanol Extraction)</td>
</tr>
<tr>
<td>2</td>
<td>Appearance</td>
<td>Semi Solid</td>
<td>Semi Solid</td>
</tr>
<tr>
<td>3</td>
<td>Consistency</td>
<td>Semi Solid</td>
<td>Semi Solid</td>
</tr>
<tr>
<td>4</td>
<td>Wash ability</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>5</td>
<td>Spradility</td>
<td>15.75</td>
<td>26</td>
</tr>
<tr>
<td>6</td>
<td>pH</td>
<td>5.5</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Graph 1: Percentage drug release

Table 3: Water Extract

<table>
<thead>
<tr>
<th>Time</th>
<th>Absorbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>15min</td>
<td>0.114</td>
</tr>
<tr>
<td>30min</td>
<td>0.183</td>
</tr>
<tr>
<td>45min</td>
<td>0.214</td>
</tr>
<tr>
<td>60min</td>
<td>0.302</td>
</tr>
<tr>
<td>75min</td>
<td>0.41</td>
</tr>
<tr>
<td>90min</td>
<td>0.522</td>
</tr>
<tr>
<td>105min</td>
<td>0.602</td>
</tr>
<tr>
<td>120min</td>
<td>0.64</td>
</tr>
<tr>
<td>135min</td>
<td>0.712</td>
</tr>
</tbody>
</table>

Table 4: Ethanol Extract

<table>
<thead>
<tr>
<th>Time</th>
<th>Absorbance</th>
</tr>
</thead>
<tbody>
<tr>
<td>15min</td>
<td>0.232</td>
</tr>
<tr>
<td>30min</td>
<td>0.262</td>
</tr>
<tr>
<td>45min</td>
<td>0.284</td>
</tr>
<tr>
<td>60min</td>
<td>0.362</td>
</tr>
<tr>
<td>75min</td>
<td>0.488</td>
</tr>
<tr>
<td>90min</td>
<td>0.52</td>
</tr>
<tr>
<td>105min</td>
<td>0.612</td>
</tr>
<tr>
<td>120min</td>
<td>0.632</td>
</tr>
<tr>
<td>135min</td>
<td>0.732</td>
</tr>
</tbody>
</table>

Percentage Drug Release of Water Extract and Ethanolic Extract of Seed Moringa Oleifera

4. Conclusion

Natural remedies are more exceptable in the belief that they are safer with fewer side effects than synthetic ones herbal formulation have growing demand in the world market. it is very good attempt to establish the herbal ointment and liniment containing ethanolic extract of moringa oleifera seed powder. This study revolves that the developed single herble formulation table 4 was comparatively better than table 3.

References