PREPARATION AND EVALUATION OF HERBAL EMULSION FOR
TREATMENT OF DANDRUFF
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KEYWORDS:
Emulsion, wrightia tinctoria, dandruff.

ABSTRACT
Dandruff is a common skin condition associated with flaking skin and itchy scalp. Affect the scalp or any area on the body that grows hair or with small hair follicles. Seen commonly in people with Dry skin, Psoriasis, Eczema people who are Sensitive to hair products and due to improper cleaning. Causes of Dandruff May Be Having Too Much Oil On Scalp, Hormonal Changes, Illness, Stress, Improper Cleaning Of Hair. Emulsion Using Wrightia Tinctoria Can Be Useful to the Persons Suffering From dandruff.
INTRODUCTION:
An emulsion may be defined as a biphasic system consisting of two immiscible liquids, one of which (the dispersed phase) is finely and uniformly dispersed as globules throughout the second phase (the continuous phase). Since emulsions are a thermodynamically unstable system, a third agent, the emulsifier is added to stabilize the system. Emulsifier stabilizes the system by forming a thin film around the globules of dispersed phase. Either the dispersed phase or the continuous phase may vary in consistency from that of a mobile liquid to semisolid. Thus, pharmaceutical emulsions range from lotions (low viscosity) to creams (high viscosity). The particle size of the dispersed phase commonly ranges from 0.1 to 100 μm.\textsuperscript{i, ii}

Oil in water emulsion
Pharmaceutical emulsions usually consist of mixtures of aqueous phase with various oils and waxes. If the oil droplets are dispersed throughout the aqueous phase, the emulsion is termed oil-in-water (O/W). Fats or oils for oral administration, either as medicaments in their own right, or as vehicles for oil soluble drugs, are always formulated as oil in water (O/W) emulsions. They are non greasy and are easily removable from the skin surface and they are used externally to provide cooling effect and internally to also mask the bitter taste of oil. Water soluble drugs are more quickly released from O/W emulsion. O/W emulsion give a positive conductivity test as water, the external phase is a good conductor of electricity.\textsuperscript{iii, iv}

MATERIALS AND METHODS:
*Wrightia tinctoria* R.Br. (Wt) belonging to the family Apocynaceae is a small deciduous tree distributed in central and peninsular India. Traditionally, the plant is used to treat headache, dandruff, diarrhea and skin disorders like psoriasis, eczema etc. The phytochemical studies have shown the presence of alkaloids, triterpenoids, steroids, flavonoids, lipids and carbohydrates. The antidandruff efficacy of the oil prepared from the bark of *Wrightia tinctoria* (Indrajau) in *cocos* nucifera oil. The study findings showed that oil is the best drug of choice for the management of dandruff. In the present study, marketed product of *Wrightia tinctoria* is used in the formulation of emulsion. Excipients used include liquid paraffin, span 20, span 80, tween 20, tween 80, propyl paraben and distilled water.

PREPARATION OF EMULSION
The composition of emulsion is as shown in figure 1. Oil phase consists of *Wrightia tinctoria* oil, liquid paraffin and Span whereas aqueous phase includes propyl paraben, tween and distilled water. Oil phase is prepared by mixing Liquid paraffin and span together and *wrightia tinctoria* oil is added to it, mixed well and set apart. Aqueous phase is prepared by
dissolving propyl paraben in minimum amount of water and adding the mixture of tween and distilled water to it. Both the aqueous and oil phases were triturated separately and aqueous phase is added to oil phase and emulsification is completed to get oil in water emulsion.

Table 1

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>E4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrightia tinctoria oil (ml)</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Liquid paraffin (ml)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Propyl paraben</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Span 20 (ml)</td>
<td>-</td>
<td>7.0</td>
<td>-</td>
<td>3.0</td>
</tr>
<tr>
<td>Tween 20 (ml)</td>
<td>-</td>
<td>1.0</td>
<td>-</td>
<td>5.0</td>
</tr>
<tr>
<td>Span 80 (ml)</td>
<td>5.0</td>
<td>-</td>
<td>2.0</td>
<td>-</td>
</tr>
<tr>
<td>Tween 80 (ml)</td>
<td>3.0</td>
<td>-</td>
<td>6.0</td>
<td>-</td>
</tr>
<tr>
<td>Distilled water (ml)</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>HLB</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
</tr>
</tbody>
</table>
TESTS FOR IDENTIFYING EMULSION TYPES
Several tests are used for identifying the emulsion type. Although, such tests may be applied rapidly, the results must be interpreted with caution.

Dilution test/miscibility test
Miscibility test involves the addition of continuous phase, e.g. in case of O/W emulsion; the emulsion remains stable upon unlimited addition of water but will become unstable upon unlimited addition of oil, that is, the oil will separate. Vice versa is the case with W/O emulsion.

Electrical conductivity test
Water is a good conductor of electricity; hence, an emulsion with water continuous phase will readily conduct electricity while that with oil continuous phase will not.

Staining test/dye-solubility test
In this test, a small amount of water soluble dye, such as methylene blue is added to the emulsion, now if water is the continuous phase (O/W emulsion), dye will dissolve uniformly throughout the system. If oil is the continuous phase (W/O emulsion), dye will remain as cluster on the surface of the system.

STABILITY STUDIES
Pharmaceutical emulsion stability is characterized by the absence of coalescence of dispersed phase, absence of creaming and retaining its physical characters like elegance, odor, color and appearance. The instability of emulsion may be classified into three phenomena: Flocculation, creaming and coalescence.

Flocculation
It is the association of small emulsion particles to form large aggregate which is redispersable upon shaking. It is a reversible process in which the droplets remain intact. Flocculation is considered as the precursor of Coalescence.

Creaming
Creaming is the phenomenon in which the dispersed phase separates out, forming a layer on the top of the continuous phase. It is notable that in creaming, the dispersed phase remains in globules state so that it can be redispersed on shaking.

Coalescence (synonyms: breaking or cracking)
A more subtle type of emulsion instability, coalescence occurs when the mechanical or electrical barrier is insufficient to prevent the formation of progressively larger droplets.
RESULTS AND DISCUSSION

Identification Tests
From identification test results, it can be concluded that the prepared emulsion is an oil in water emulsion.

Stability studies
All the formulations except E4 failed in the stability analysis. Creaming occurred in formulations E2 and E3. Phase inversion occurred in E1.

CONCLUSION
Emulsion prepared with *Wrightia tinctoria* oil can be an effective agent for the treatment of dandruff. Since the formulation contains ayurvedic preparations it will be devoid of any side effects and will be readily able to cure the symptoms and further occurrence of dandruff.

REFERENCES:

i. Agarwal SP, Rajesh K (2007). Physical Pharmacy. CBS Publisher, Delhi, India, pp. 177-186.


