Formulation and Evaluation of Polyherbal Anti-Acne Facewash

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ABSTRACT
Acne is a chronic inflammatory disorder of pilocelebaceous unit, which involves increased Sebum production by sebaceous gland and abnormal desquamation of hair follicles occur in response to increasing androgen level with the onset of puberty. Obstruction of Follicles causes follicular distension which is often accompanied by the proliferation of the bacteria Propionibacterium acnes and activation of an inflammatory response. The Main aim of this study was to formulate and evaluate polyherbal anti-acne facewash containing extract of \textit{Moringa oleifera}, \textit{Aloe barberdandis} (Aloevera). The plants have been reported in the literature having good anti-microbial, anti-fungal, anti-inflammatory activity. Other than some of the chemicals like sodium lauryl sulfate, methyl paraben, Xanthan gum and marketed product like rose oil and turmeric are used. Prepared Formulation was evaluated for various parameters like colour, appearance, consistency, pH, viscosity, stability, washability and foamability. The efficacy when tested with a standard was almost same to that of poly herbal facewash. Concluded that from this study, extract was proved to be stable and considered as an effective herbal formulation for acne treatment.

KEYWORDS: Propionibacterium Acne, Anti-Inflammatory, Anti-Microbial, Anti-Fungal.

INTRODUCTION
Our skin is a largest organ on our body made up of different component including water, protein, lipid, and minerals. Throughout our life, our skin will change constantly, for better or worse. Our skin regenerates itself approximately every 27 days. So proper skin care is essential to maintain healthy skin.

There are four layer of skin:
1. Stratum corneum
2. Epidermis
3. Dermis
4. Subcutaneous
Face wash is the products which are used to cleanse face without drying it out. Face wash is also commonly known as “cleanser”. Face wash product found to be equally good for all skin type. Face wash is very helpful in removing dirt, oil and provide moisture to the dry skin. Both face washes & cleansers are used to rid your face of dirt, oil, pollution etc. A cleanser dissolves away excess oil makeup and grime from your face. These are oil soluble impurities. They can be removed by a face wash too, but that might be not 100% effective.

**FORMS OF FACE WASH:**
1. Cream based face wash
2. Gel based face wash
3. Liquid based face wash

**Anti-acne facewash:**
Skin, being the most exposed part of our body to the pathogens, requires protection from skin diseases, especially acne causing bacteria. Acnes are found to be the most common skin problem that 85% of the teenagers face today. They may continue to even adulthood and mostly affect the areas with largest oil glands like face and neck. Acnes are generally characterized by the presence of seborrhea, inflammatory
lesions, comedone, excessive sebum production and host to bacteria such as Propionibacterium acnes, Staphylococcus epidermidis, and Malassezia furfur in the follicles. So these microorganisms can be targeted for the potential acne treatment. The usage of the long-term antibiotics for the treatment makes the organisms develop resistance to the drugs. This adaptation is multi-factorial and depends upon the organism susceptibility to the treatment and host factors like hormones, stress conditions etc. To overcome this problem, the herbal alternatives for the treatment have been studied. As the herbal extracts cannot be directly used for the treatment, they were modulated and were formulated as poly herbal anti-acne faces wash.

In this study, the facewash were formulated using sodium lauryl sulfate and methyl paraben with varying concentrations of the herbal extracts and were tested for their anti-acne efficacy and were examined for the antimicrobial activity against the acne causing microorganisms.

They can have different mechanism, for examples
- Control of sebum production.
- Anti-inflammatory effect, which can prevent deterioration of the condition caused by inflammation and redness.
- Anti-fungal agent that inhibits prionibacterium and staphylococcus epidermis, the main bacteria responsible for acne.

**Types of acne:**
Acne vulgaris is a common skin condition characterized by formation of seborrhea, comedone, nodules, papules, pustules and cysts. It occurs in the area of the skin with high hair growth such as legs, face, back and upper chest. Blackheads and whiteheads are most common type of acne.
MATERIALS AND METHOD

Following plant materials and excipients are used to formulate this facewash:

Table: 1 List of ingredients

<table>
<thead>
<tr>
<th>SR.NO</th>
<th>INGREDIENTS</th>
<th>QUANTITY</th>
<th>PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>F1</td>
<td>F2</td>
</tr>
<tr>
<td>1</td>
<td>Moringa leaves</td>
<td>15 ml</td>
<td>18 ml</td>
</tr>
<tr>
<td>2</td>
<td>Turmeric</td>
<td>0.2 gm</td>
<td>0.3 gm</td>
</tr>
<tr>
<td>3</td>
<td>Aloe vera</td>
<td>2 gm</td>
<td>3.5 gm</td>
</tr>
<tr>
<td>4</td>
<td>Rose oil</td>
<td>qs</td>
<td>qs</td>
</tr>
<tr>
<td>5</td>
<td>SLS</td>
<td>1 gm</td>
<td>1.3 gm</td>
</tr>
<tr>
<td>6</td>
<td>Xanthan gum</td>
<td>0.5 gm</td>
<td>1 gm</td>
</tr>
<tr>
<td>7</td>
<td>Methyl paraben</td>
<td>1 ml</td>
<td>1 ml</td>
</tr>
</tbody>
</table>

METHODS

1. Collection
Leaves of Moringa oleifera were collected from botanical garden of Jay jalaram ayurvedic medical college, Shivpuri. Other herb like Aelovera is also collected from there.

2. Extraction
Leaves of Moringa oleifera are soaked overnight in purified water. After 24 hours, boil this leaves for 30 minutes.

3. Filtration
Cool down the extract of leaves and then filter it and collect the filterate in another beaker.

4. Development of formulation
Total 3 beakers are taken and prepared 3 formulations.
1. Take one beaker and add leaves extract and turmeric as required quantity. Mixed well.
2. In another beaker Aelo Vera gel, water and xanthan gum are mixed well and formulate gel type formulation.
3. Sodium lauryl sulphate is dissolved in water.
All 3 formulations are well mixed together till liquid base face wash is formed. And then methyl paraben is added as preservative. Prepared formulation were filled in suitable container and labeled it.

EVALUATION OF FORMULATION

1. Physical evaluation:
The organoleptic evaluation includes:
Color- Pale yellow
Odour- Pleasant
Texture- Smooth
2. **Washability**: Formulation was applied on the skin and then ease and extent of washing with water were checked manually.

3. **pH**: pH of 1% aqueous solution of the formulation was measured by using pH meter at constant temperature.

4. **Viscosity**: Viscosity of facewash was done by using Brooke field viscometer at a 60 RPM.

5. **Foamability test**: Foamability: Small amount of gel was taken in a beaker containing water. Initial volume was noted, beaker was shaken for 10 times and the final volume was noted.

6. **Stability test**: The purpose of stability testing is to provide evidence on how the quality of drug substance or drug product varies with time under the influence of variety of environmental factors such as temperature, humidity and light and enables to recommend storage condition and to predict. The shelf life. Stability study for cream was performed at accelerated condition i.e.25°C.

7. **Skin irritation test**: Mark the area (1 cm²) on left hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 hrs and reported.

RESULT AND DISCUSSION

The result of evaluation of this formulation is shown in table 2. Colour of the product is lemon yellow whereas marketed product is green in colour. Total 3 formulations were prepared for checking consistency and stability of formulation. All the formulation was easily washable, homogeneous and gives alkaline pH which is compatible with normal body skin physiology.

<table>
<thead>
<tr>
<th>SR.NO</th>
<th>EVALUATION TEST</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Colour</td>
<td>Pale yellow</td>
</tr>
<tr>
<td>2</td>
<td>Odour</td>
<td>Pleasant</td>
</tr>
<tr>
<td>3</td>
<td>Texture</td>
<td>Smooth</td>
</tr>
<tr>
<td>4</td>
<td>Washability</td>
<td>Easily washable</td>
</tr>
<tr>
<td>5</td>
<td>pH</td>
<td>5.7</td>
</tr>
<tr>
<td>6</td>
<td>Viscosity</td>
<td>580 mPas</td>
</tr>
<tr>
<td>7</td>
<td>Foamability test</td>
<td>1.5 ml at 10minutes</td>
</tr>
<tr>
<td>8</td>
<td>Stability test</td>
<td>Stable at room temperature</td>
</tr>
<tr>
<td>9</td>
<td>Skin irritation test</td>
<td>No irritant</td>
</tr>
</tbody>
</table>

CONCLUSION

Poly herbal anti acne face wash was developed and characterized under stability study. A formulated poly-herbal facewash containing extract of moringa leaf, turmeric powder, Aloevera, xanthan gum, methyl paraben, orange oil and rose water. This formulation are more acceptable in belief that it is safer than synthetic others. Because of no more chemical are used in it except SLS and methyl paraben. Evaluation parameter like physicochemical properties, spreadability, viscosity, foamability, skin irritation was performed and achieved appropriate results. The entire evaluation test is passed and gives accurate results related to this formulation but in formulation 2 consistency of product is achieved accurate and this formulation is very stable in compared with another.
ACKNOWLEDGEMENTS
In the present world of competition, there is race of existence in which those are having the will to come forward to success. The project is like a bridge between theoretical and practical work. With this willingness we joined this project work. We would like to thank Almighty firstly for giving us this opportunity, determination and strength for doing this research.

With due reverence, we express to my esteemed supervisor Ms.Vaishali Pardhe Department of Pharmaceutics, B Pharmacy College, Rampura for her kindness and encouragement on keeping us organized and focused. She continues grace and mercy was with us throughout our life and even more during the tenure of our research.

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REFERENCES
8. https://pharmasprings.com
9. https://pharmacy.dypvp.edu.in