JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

FORMULATION DEVELOPMENT AND EVALUATION OF POLYHERBAL ANTIDANDRUFF SHAMPOO.

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Abstract

The study's objectives included developing a pure herbal shampoo and assessing and contrasting its physicochemical qualities with those of commercially available synthetic and herbal shampoos. The extracts of Sapindus mukorossi, Hibiscus rosa-sinensis, Cyperus rotundus, Acacia concinna, and Indian gooseberry were added in varying amounts to 10% sodium Lauryl Sulphate, which serves as a foaming agent, and 5% sodium alginate, which serves as a thickening agent to create the herbal shampoo.

Keyword

Polyherbal shampoo, Nagarmotha, Antidandruff shampoo, Reetha, Fenugreek etc.

Introduction

The most popular hair care product is shampoo. It can be used to clean the hair and scalp of grime, leftover hair styling product residue, and environmental pollutants [1]. It comes in viscous liquid or powder form. Early shampoos were solely intended to clean the hair and scalp, but modern shampoos accomplish much more than that. In addition to cleaning, it makes the hair convenient to use, shiny, and easy to comb [2]. There is a huge variety of shampoos on the market today, including synthetic, herbal, medicated, and non-medicated shampoos with various purposes. The most well-known herbal shampoos are those that give off the idea of being purer, safer, and more effective. Similar to ordinary shampoo, herbal shampoos are made from natural ingredients and intended to clean the hair and scalp. These shampoos have good stability, are less hazardous than synthetic shampoo, and are free from side effects because there are no surfactants used [3].

Surfactants are found in synthetic shampoo. These surfactants have major side effects that can include eye irritation, split ends, scalp irritation, hair loss, dryness, and greying of the hair. Due to these factors, the public is becoming more interested in herbal cosmetics due to its little negative effects and affordable price. [4].

1.1 Types of herbal Shampoo

1. Powder Shampoo

2.Liquid Shampoo

3.lotion Shampoo

4. Cream Shampoo

5. Jelly Shampoo

6. Aerosol Shampoo

7.Speciallized Shampoo

I]Conditioning Shampoo

II] Antidandruff Shampoo

III] Baby Shampoo

1.2 Function of Herbal Shampoo

1. Cleansing

2. Conditioning

3. Hair Extensions

4. Hair color maintenance. [5]

1.3 Advantages of Herbal Shampoo

1. Organic and pure ingredients

2. Lacks Side Effects

3. No Artificial Substances

4. No Animal Research

5. Skin and Earth-friendly

6. No ingredients derived from petroleum. [6]

1.4 Desired Properties of Herbal Shampoo

1. Application Ease

2. More debris removal

3. Simple Wet Combing.

4. Fragrance

5. Minimal inflammation

6. Well Maintained

7. Stable Conditions. [7]

1.5 Importance of this formulation

• The choice of active ingredients for hair care shampoo is frequently made based on the ingredient's capacity to protect skin from harm and to enhance skin quality by washing, nourishing, and protecting skin.

• The choice of active ingredients for hair care shampoo is frequently made based on the ingredient's capacity to protect skin from harm and to enhance skin quality by washing, nourishing, and protecting skin.

• The hand hasn't become dry and chapped as a result.

• It doesn't have any negative side effects or irritate the eyes.

• It generates sufficient foam to meet the psychological needs.

2. Aim and Objective

2.1 Aim

Formulation Development and Evaluation of Polyherbal Antidandruff Shampoo.

2.2 Objectives

1) To formulate the herbal shampoo.

2) To evaluate the herbal shampoo.

3) The leaves, fruits, and roots are the components employed in formulation.

4) To lessen the effects of chemical formulation adverse effects.

5) To enhance the texture of hair.

6) To darken the color of the hair.

7) To provide hair a glossy finish and to keep their manageability and oiliness.

2.3 Need of study

Now days polyherbal formulation get override of synthetic with fewer side effects probably local side effects like itching, contact dermatitis and redness of skin. natural Formulation are having greater effectiveness as compared to Synthetic agent

A tremendous range of herbal cosmetics is available in the Indian market today. these herbal preparations help to enhance beauty of hair and skin without causing harm so they are increasingly gaining popularity world over.

3. Materials and methods

3.1 Materials

3.1.1 Collection of herbs : All herbs powder was collected from leaves, fruit, barks, seed, of tree. For the investigation, different plant sections that had hair-care properties were chosen. Fresh parts of Amla, , Fenugreek, Hibiscus, Shikakai and soapnut , Nagarmotha were obtained from leaves, fruit, barks, seed, of tree, cleaned, powdered and passed through sieve no:60 and stored.

Sr.No	Common name	Botanical name	Family	Part use	Use	Pictures
1	Nagarmotha	Cyperus rotundus	Cyperaceae.	Seed	It helps prevent dandruff and removes dirt or dry skin from the scalp	
2	Reetha	Sapindus mukorossi	Sapindaceae	Fruit	Detergent and antidandruff	
3	Shikakai	Acacia concinna	Leguminosae.	Fruit	Foam base and anti-dandruff.	
4	Amla	Indian gooseberry	Euphorbiaceae.	Fruit	Darkening of hairs and hair growth promoter.	
5	Hibiscus	Hibiscus rosa-sinensis	*Malvaceae*	Flower	Prevents hair loss and hair growth promoter.	
6	Fenugreek	Trigonella foenum-graecum	Fabaceae	Seed	It helps in hair growth, prevents hair loss, and dandruff.	

Fig. Collection of herbs

3.1.2 List of Equipment's

Sr No	Equipment's
1	Measuring cylinder
2	Beaker
3	Mortar pestle
4	Conical flask
5	Funnel
6	Water bath
7	Burner
8	Petri dish
9	pH meter
10	Incubator
11	Ostwald's viscometer
12	Pycnometer

Table No. 2 - List of Equipment

3.2 Methods

3.2.1 Extraction of polyherbs :

About 100 g of each powdered plant materials, namely Cyperus rotundus (nagarmotha), Fenugreek (methi), Hibiscus rosa-sinensis L. (Hibiscus), Phyllanthus emblica L. (Amla), Sapindus mukorossi Gaertn. (Ritha), Britton & Rose (Shikakai), were homogenized. The powdered material was extracted with distilled water by boiling for 4h. The extract of each plant material was separated and evaporate. Extract is stored at room temperature till formulation. [8,9,10]

fig - preparation of polyherbs extract.

3.2.2 Formulation of polyherbal shampoo :

Weighed all the ingredients according to the formula. Decoction of Cyperus rotundus (nagarmotha), Fenugreek (methi), Hibiscus rosa-sinensis L. (Hibiscus), Phyllanthus emblica L. (Amla), Sapindus mukorossi Gaertn. (Reetha), Britton & Rose (Shikakai) was prepared in one part of water. Filter it, by using muslin cloth. Collect filtrate. Ritha and Shikakai were produced as a decoction in a different section of water. Make use of muslin cloth to filter it. Gather filtrate. With constant stirring, the aforementioned filtrate was combined. Mixed sodium alginate as a thickening agent for maintenance of consistency of polyherbal shampoo as like semisolid nature. Preservatives and perfume were added lastly. [8,9,10]

Sr.No	Ingredients	Botanical Name	Roles	Formulation
1	Nagarmotha	cyperus rotundus	Antidandruff, Hair growth stimulant	5ml
2	Hibiscus	Hibiscus rosa-sinensis	Treat baldness, Prevent Dandruff	5 ml
3	Shikakai	Acacia concinna	Control Hair Fall	5ml
4	Reetha	Sapindus mukorossi	Foaming agent	5ml
5	Amla	Indian gooseberry	Preservative	5ml
6	Fenugreek	Trigonella foenum-graecum	Helps in hair growth, prevent hair loss	5ml
7.	Sodium lauryl sulphate	-	Foaming Agent	5%
8	Sodium alginate	-	Thickening agent	10%
9.	Perfumes	-	Fragrance	q. s
10.	Distilled Water	-	vehicle	Up to 30 ml

table - formulation of polyherbal shampoo.

4. Evaluation of Polyherbal Shampoo

To evaluate the prepared formulation, quality control test including visual assessment and physico-chemical controls such as pH, density, viscosity, surface tension, foam volume, foam stability and wetting time was performed using standard protocol.

4.1 Physical appearance/visual inspection: The prepared formulation's clarity, colour, aroma, ability to produce foam, and fluidity were all assessed.

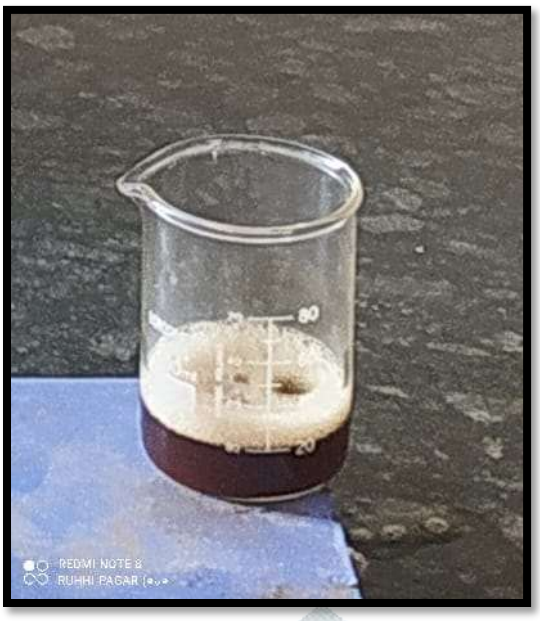

fig - physical appearance

4.2 Determination of pH: A 10% v/v shampoo solution was constituted in distilled water and the PH of the solution was measured by using a calibrated pH meter

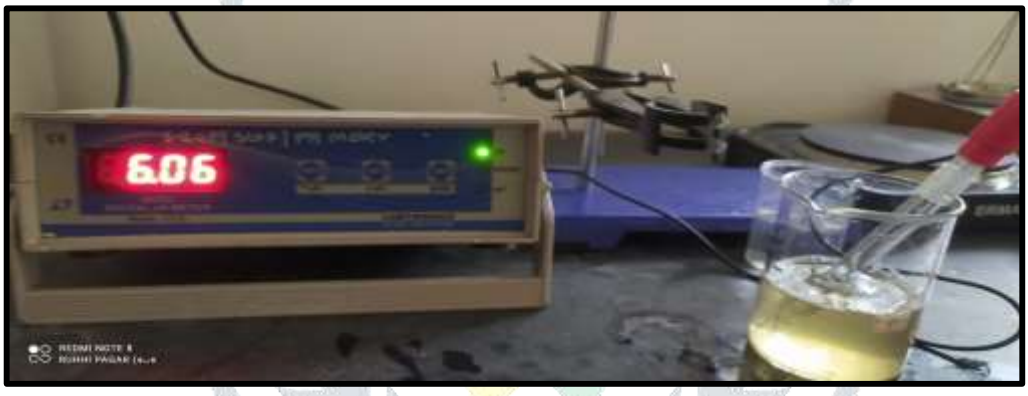

fig - determination of pH

4.3 Determination of solid content percentage: A clean dry evaporating disc was weighed and 4gm of shampoo was added to the evaporating disc. The shampoo-filled evaporating disc was placed on the heated plate and left there until the liquid portion evaporated. After drying, the weight of the solid component of the shampoo was estimated.

4.4 Cleansing action: Cleaning effect By using the shampoo on hair that had not been washed in seven days, the cleansing ability of the Polyherbal shampoo was assessed. Human subjects who had applied oil four to five hours prior to bathing were given shampoo to wash their hair with. The shampoo's effectiveness was measured by how well it cleaned the scalp's greasy filth.

4.5 Foaming ability and foam stability: Cylinder shake method was used for determining foaming ability. A 250ml graduated cylinder was filled with 50ml of the 1% Polyherbal shampoo solution, then the cylinder was covered with hands and vigorously shaken for 10 minutes. The total volume of the foam content after 1min shaking was recorded. Immediately after shaking the volume of the foam at 1min intervals for 10 minutes were recorded. The created Polyherbal shampoo exhibits increased foam property, which may be related to the presence of soapnut, and the foam volume stays the same over the course of around 5 minutes, demonstrating that the foam generated by the shampoo has good stability.

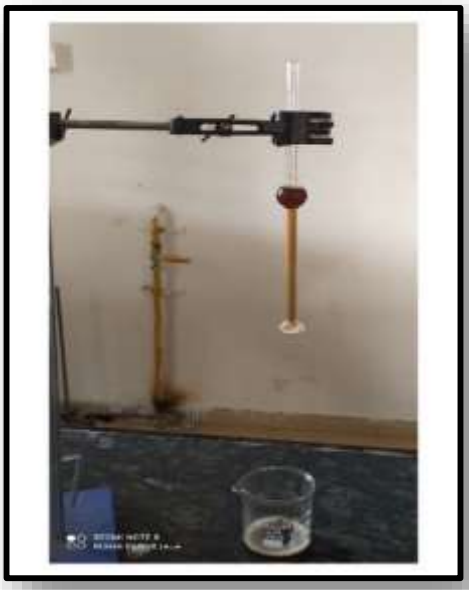

fig - foaming ability and foam stability

4.6 Stability study: The stability of the formulation was studied for a period of 4 weeks by keeping at temperature of 25-30°C.

4.7 Skin irritation: Prepared After using polyherbal shampoo for five minutes, the skin was rinsed and assessed for skin irritability and inflammation.

4.8 Viscosity: Viscosity of shampoo was determined by using Ostwald's viscometer. By counting drops of Polyherbal shampoo from top to bottom, the viscosity of the shampoo was determined.

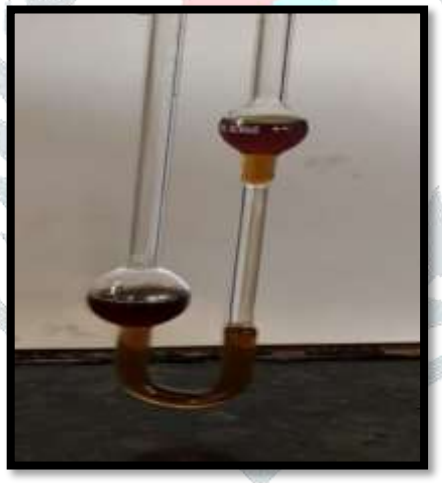

fig - viscosity

4.9 Surface Tension

A 10% shampoo dilution in distilled water was used for measurements, which were done at room temperature. Clean the stalagmometer completely with diluted acid and distilled water. Because grease and other lubricants have a significant impact on surface tension. The information calculated using the equation below is provided:

$$R3=(w3-w1)\ n1 \times R1/ (W2-W1)\ n2 \times R2$$

Where, W1 is weight of empty beaker.

W2 refers to weight of distilled water in a beaker.

W3 is the beaker's weight with the shampoo solution.

n1 is no. of drops of distilled water.

n2 is no. of drops of shampoo solution.

R1 is distilled water's surface tension at ambient temperature.

R2 is surface tension of shampoo solution.

fig - surface tension

4.10 Microbial examination: A sterile petri plate was filled with one milliliter of Polyherbal shampoo, which was then left to set in an aseptic environment. The plates were kept at 37°C for 24 hours while microbial growth was monitored. [11,12,13,14,15,16,17.]

4.11 Evaluation Table

Sr No	Characteristic	Result	Marketed Preparation	Range
1	Physical appearance / visual inspection	Brownish	White	Good
2	Determination of pH	6.6	5.9	neutral
3	Determination of solid content percentage	37%	24%	Pass
4	Cleansing action	Good	Good	Pass
5	Foaming ability and foam stability	50ml	60ml	Pass
6	Stability study	Stable	Stable	Pass
7	Skin irritation	Non-irritant	Non-irritant	Pass
8	Viscosity	Viscous	Viscous	Pass
9	Surface Tension	35.10	21.52	Pass

table - evaluation table

5. Results and Discussion

Physical appearance/visual inspection

A shampoo should seem attractive and appealing on the outside, just like any other cosmetic product. The formulated shampoos were evaluated for physical characteristics such as color, odor & transparency. The prepared shampoo was transparent, Brown and had good odor.

pH

To reduce damage to hair, most shampoos are either neutral or slightly alkaline in composition. The pH of shampoo also improves hair quality, keeps the ecological balance of the scalp, and lessens eye discomfort. The pH of formulated shampoo was found to be nearly neutral (6.56).

Percentage of solid contents

Good shampoos typically contain 20% to 30% solids since they are simple to apply and rinse from the hair. It will be too watery and wash away quickly if there isn't enough solid in it, and it will be difficult to massage into hair or to wash out if there is too much solid. The percent solid contents of the tested shampoo were found to be 37%.

Dirt dispersion

A crucial factor in determining how well shampoo cleans is how much dirt it disperses. Because ink or filth that remains in foam is difficult to rinse away and is redeposited on the hair, shampoos that cause the ink to concentrate in the foam are regarded as being of low quality. In order to get better washing action, the dirt should remain in the water component.

Surface tension

The phrase refers to the amount of surfactant in shampoo that is used to lower surface tension. The greater the surface tension, the greater the cleansing effectiveness of the shampoo. The surface tension of formulation was found to be 35.10 dyne/cm·

Foaming ability and foaming stability

Because foaming or lathering is vital to the consumer, it is considered a significant criterion in shampoo evaluation. The designed shampoo created a foam volume greater than 50 ml. The combination of Reetha and Shikakai may account for the enhanced foaming property of designed shampoo.

Stability study

The Polyherbal shampoo was stable at various temperature.

Skin irritation

The Polyherbal shampoo was non-irritant.

6. Conclusion

The current study was conducted with the goal of developing a Polyherbal shampoo that decreases dandruff and hair loss when combing, is safer than chemical conditioning agents, and strengthens hair development. Polyherbal shampoo was created using the aqueous extract of medicinal herbs that have historically been used to cleanse hair. The use of synthetic conditioning chemicals lowers protein or hair loss. The current study employs shikakai, amla, and other plant extracts instead of synthetic cationic conditioners to deliver effective conditioning benefits. The designed shampoos were not only safer than chemical conditioning agents, but they also significantly reduced dandruff and strengthened hair development.

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