



FORMULATION AND EVALUATION OF ANTI-DANDRUFF HAIR SHAMPOO

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ABSTRACT

Dandruff is the biggest problem for many in the world today. Many anti-dandruff shampoos, whether synthetic or herbal, and lotions are sold to combat dandruff problems. Dandruff is a common condition caused by *Pitosporum* yeast that affects the condition of the scalp. Dandruff cannot be completely removed and only is effectively treated and regulated. Shampoo is a formulation that contains the appropriate surfactant. Various antifungal agents are used to treat dandruff in hair care products. shampoo is one of the cosmetics that uses surfactant as the main ingredient, and when used under the specified conditions, the grease on the surface of the hair, stains, on the skin without affecting the user. Remove the residue. Currently, shampoo is used not only to clean hair and scalp, but also to prevent hair growth and hair loss. The shampoo containing was subjected to evaluation parameters such as visual inspection, pH, viscosity, percentage of solids, soil distribution, surface tension, foamability foaming stability. The main purpose of this study was to eliminate the harmful synthetic ingredient from the anti-dandruff shampoo formulation and replace it with a safe natural ingredient.

Keywords: anti-dandruff, evaluation, formulation, shampoo, scalp, natural.

INTRODUCTION

Dandruff is the number one cosmetic problem and a major public concern in both developed and developing countries Dandruff is a chronic condition of the scalp that causes xfoliation, itching, and redness of the scalp due to the loss of epidermal cells. The

scalp sheds dead cells in an almost invisible way, but sometimes the also sheds as visible flakes called scales. Tea tree oil, essential oil, vitamin E oil, pearl powder, glycerin with shampoo. Some of them have anti-dandruff properties. Anti-dandruff is designed to reduce dandruff. Although the cause of dandruff is not fully understood, treatment involves the use of several "active ingredients" that act as either antibacterial agents or mitotic inhibitors. Shampoo is probably the most commonly used hair care product today. Since it is based on synthetic detergent, it is relatively insensitive to the hardness of water. A good shampoo should produce enough foam almost immediately, regardless of the type of water used or the type of dirt or grease removed from the hair. Foaming is not inherited by the detergency, but psychologically people always prefer highly irritating products. Dandruff is clearly caused by a fungus called *Malassezia stricta* and *M. globose*. Formerly known as, *Malassezia*, *Pittosporum*, is a yeast that causes skin and scalp infections. Dandruff is a common condition caused by *Pittosporum* Yeast, which affects the condition of the scalp. Dandruff cannot be completely removed and can only be effectively treated and regulated. Dandruff affects 5% of the population, which occurs primarily after puberty in 2030 And dandruff affects men more than women. dandruff is a common scalp condition that affects almost half of the post pubertal population, regardless of gender or race.

Herbal cosmetics (hereinafter referred to as products) are formulated with a variety of acceptable cosmetic ingredients, using one or more botanical ingredients to provide a base that provides only defined cosmetics. Form The proportion of harmful chemicals in health cosmetics has led consumers to prefer herbal-based cosmetics to synthetic cosmetics.

History-

Indian subcontinent

In the Indian subcontinent, a variety of herbs and their extracts have been used as shampoos since ancient times. A very effective early shampoo was made by boiling Sapindas with dried Indian gooseberry (amla) and a selection of other herbs, using the strained extract. Sapindas, also known as soapberries or soapsuds, a tropical tree widespread in India, is called kunai ancient Indian texts and its fruit pulp contains saponins which are a natural surfactant. The extract of soapberries creates a lather which Indian texts called phenakite. It leaves the hair soft, shiny and manageable. Other products used for hair cleansing were Shukokai (*Acacia cincinnal*), hibiscus flowers, rather (*Sapindas mokoros'*) and acapu (*Albizzia Amara*). Guru Nanak, the founder and the first Guru of Sikhism, made references to soapberry tree and soap in the 16th century Cleansing with hair and body massage (champ) during one's daily bath was an indulgence of early colonial traders in India. When they returned to Europe, they introduced the newly learned habits, including the hair treatment they called shampoo.

Classification of Dandruff:

Depending upon the symptoms the dandruff is classified into two main types

A. Dry dandruff.

It is also called as pityriasis simplex characterize by excessive formation of minute scales which accumulate on the scalp area.

In this type of dandruff there is no excessive hair loss.

The inflammation on the skin is not observed.

The scales are first found in middle of the scalp and then spread to frontal, parietal and occupational areas.

B) Oily dandruff:

It is also called as pityriasis steatitis.

It arrives on the scalp with sebum production.

It is mostly found in young men following puberty.

Inflammation of varied intensity developed on the scalp along with oily scales of dirty yellow color.

Hair fall is most commonly found in this condition.

The most common site affected by this type of dandruff is scalp, behind the ears, over breast bone, armpits.

Advantage:

1. Anti-dandruff shampoos often contain an activating moisturizer. These effective moisturizers work regularly to combat dryness while keeping the scalp healthy and hair beautiful.
2. Anti-dandruff shampoo contains a zinc-based activator that can slightly relieve itching. They make your scalp brighter and give you complete comfort.
3. Anti-dandruff shampoo has a sedative formula that gently relieves irritation while providing healthy hair without dandruff.
4. In addition to relieving irritation, anti-dandruff shampoo reduces redness. It makes a person's scalp feel great and their appearance is awesome.
5. Anti-dandruff shampoo is very suitable for controlling the oiliness of the scalp.

Ideal Properties of shampoo

1. Make your hair smooth and shiny.
2. Produces a large amount of foam.
- 3 Do not irritate the scalp, skin or eyes.
4. Dirt needs to be removed completely and effectively.
5. Gives hair a pleasant scent.

Shampoo Features

1. Dirt and dirt need to be removed effectively and completely.
2. You need to wash your hair effectively.
3. It should not have any side effects or causes irritation to the skin and eye.

MATERIALS AND METHOD:

Sodium Lauryl Sulfate + demineralized water

Add all the ingredients slowly one by one

Tween 80 slightly warm at 50 degree celcius and mix with oils in separate beaker

Tween 80 and oils mixture are added with all ingredients

Need to add the SLS solution all ingradiet mixture with jelly to form a shampoo

Check the pH average 6.5

If the pH is low add Sodium Hydroxide to increase the pH

5gram of carbapol powder added slowly in 70 ml of demineralized water

Until the carbapol powder gets converted in jelly

Sr no	F1	F2	F3	F4	F5
Sodium Lauryl Sulfate (gram)	7	5	4	3	4
Aloe Vera (gram)	3	4	5	5	5
Glycerin (ml)	2	3	5	6	5
Tea tree oil (ml)	0.5	0.5	0.5	0.5	0.5

Vitamin E oil (ml)	0.5	0.5	1	1	1
Essential oil (ml)	1	1	1	1	1
Triethanolamine (ml)	1.5	2	q. s.	q. s.	q. s.
Demineralized water (ml)	q. s.				
Retha Powder (gram)	2	1	1	1	1
Sodium Hydroxide (ml)	To adjust pH				
Perfume	q. s.				
Tween 80(ml)	3	2.5	2.5	2	2.5
Carbopol 340 (gram)	5	5	5	5	5
Total (ml)	50	50	50	50	50

Evaluation parameter of shampoo

1. Physical Appearance / Visual Inspection

Formulation was evaluated in term of their clarity, color, odor and texture

2. Determination of pH

The pH of 10% shampoo solution in distilled water was determined at room temperature 25-degree Celsius dip one strip of pH paper in the solution and compare the color of strip to key.

pH meter can also use after calibration.

most shampoos are natural or slightly acidic, acidic solution cause the cuticle (outer layer) of the hair to shrink lay flatter on the shaft of the hair, basic solution cause the cuticle to swell and open

3.Dirt dispersion

- Two drops of shampoo were added in a large test tube contain 10 ml of distilled water
- 1 drop of India ink was added the test tube was stoppered and shakes it ten times
- The amount of ink in the foam was estimated as none, light, moderate or high
- Shampoo that causes the ink to concentrate in the foam are considered poor quality

- The dirt should be stay in the water portion dirt that stay in the foam will be difficult to rinse away it will redeposit on the hair

4. Determination of percentages solid content

- A clean dry evaporating dish was weighed and added 4 grams of shampoo to the evaporating dish. The dish and shampoo were weighed together.
- The exact weight of the shampoo was calculated only and put the evaporating dish with shampoo was placed on the hot plate until be liquid portion was evaporated
- The weight of the shampoo only (solid) is drying was calculated
- If a shampoo ha too many solids it will be hard to work into the hair or too hard to wash out
- If it does not have enough, it will be too watery and wash away quickly. A good shampoo will be between 20% to 30% solids

5. Surface tension measurement

- Measurement were carried out with a 10 % of shampoo dilution in distilled water at room temperature
- Thoroughly clean the stalagmometer using chronic acid and purified water because surface tension is highly affected with grease or other lubricants

The data calculated by following equation given below

$$R2 = (W3 - W1) N1R2 / (W2 - W1) N2$$

Where w1 is the weight of empty beaker

W2 is the weight of beaker with distilled water

W3 is the weight of beaker with shampoo solution

N1 is the number of drops of distilled water

N2 is the number of drops of shampoo solution

R1 is the surface tension of distilled water at room temperature

R2 is the surface tension of shampoo solution

6. Foaming ability and Foaming stability

Cylinder shake method was widely used for determination of foaming ability

25 ml of 1% shampoo solution was put into 250 ml graduated cylinder and covered the cylinder with hand and shake for 10 min

The total volume of the foam contents after one min shaking were recorded

The foam volume was calculated immediately after shaking the volume of foam at 1 min intervals for 4 min were recorded

7. Wetting time

The canvas was cut into one inch diameter disk having an average weight of 0.44 gm

The disk was floated on the surface of shampoo solution of 1% w/v and the stopwatch started

The time required for the disk to begin to sink was measured acutely and noted as the wetting time

Result and Discussion

Evaluation of Herbal Liquid Shampoo

1) Physical appearance/visual inspection:

The results of visual inspection of series of formulations are listed in table no.

Table No. 6: Evaluation of Formulation for physical appearance

SR NO	Formulation	Formulation
1	A1	Yellowish, amla like smell
2	A2	Yellowish, amla like smell
3	A3	Yellowish, amla like smell

2) Determination of pH

The pH of shampoos has been shown to be important for improving and enhancing the qualities of hair, minimizing irritation to the eyes and stabilizing the ecological balance of the scalp. The current trend to promote shampoos follower. pH is one of the ways to minimize damage to the hair. Mild acidity prevents swelling and promotes tightening of the scales, there by inducing shine. all the shampoos were acid balanced and were ranged 5.5 to 5.6, which is near to the skin pH

Table No 7: Determination of pH

Sr no	Formulation	pH
1	A1	5.6
2	A2	5.4
3	A3	5.5

3) Dirt dispersion

Shampoo that causes the ink to concentrate in the foam is considered poor quality, the dirt should stay in water. Dirt that stays in the foam will be difficult to rinse away. It will redeposit on the hair. All three shampoos showed similar results. These results indicate that no dirt would stays in the foam; so prepared formulations are satisfactory

4) Determine percent of solids contents

If the shampoo has too many solids it will be hard to work into the hair or too hard to wash out. The result of percent of solids contents is tabulated and was found between 22-29%. As a result, they were easy to wash out.

Table No 8.: Determine percent of solids contents.

Sr no	formulation	Solid Contents
1	A1	21.12
2	A2	22.16
3	A3	22.59

5) Surface tension:

measurement It has been mentioned that a proper shampoo should be able to decrease the surface tension of pure water to about 40 dynes/cm². Surface tension reduction is one of the mechanisms implicated in detergency. The reduction in surface tension of water from 72.8 dynes/cm to 34.70 dynes/cm by the herbal shampoos is an indication of their good detergent action.

$$R2 = (W3 - W1) N1R2 / (W2 - W1) N2$$

Where w1 is the weight of empty beaker

W2 is the weight of beaker with distilled water

W3 is the weight of beaker with shampoo solution

N1 is the number of drops of distilled water

N2 is the number of drops of shampoo solution

R1 is the surface tension of distilled water at room temperature

R2 is the surface tension of shampoo solution

Table No 9.: Surface tension(dynes/cm) of herbal shampoo

Sr no	formulation	Surface tension
1	A1	31.9
2	A2	32.3
3	A3	31.2

6) Foaming ability and foam stability:

Although foam generation has little to do with the cleansing ability of shampoos, it is of paramount importance to the consumer and is therefore an important. Criterion in evaluating shampoos. All the three shampoos showed similar foaming characteristics in distilled water. All three shampoos showed comparable foaming properties. A point to be noted here is that there does not seem to be indirect correlation between

detergency and foaming, which only confirms the fact that a shampoo that foams well need not clean well.

The final formulation produced stable foams there was little bet change in foam volume.

Table No 10: Foam stability of herbal shampoo.

Sr no	Formulation	Foam volume (ml)
1	A1	165
2	A2	168
3	A3	164



Fig no 5

Summary and Conclusion

The formulation of Anti-dandruff hair shampoo provides a method for treating a scalp dandruff or seborrheic dermatitis. Herbal anti-dandruff hair shampoo containing rather, tea tree oil, aloe vera gel with sodium lauryl sulfate base could be used as an effective in treatment of Dandruff on scalp. The formulated shampoos we're not only safer than the chemical dandruff agents, but may also greatly reduce the hair loss during combing as well as strengthen the hair growth. The pH of the shampoos was adjusted to 5.5, to retain the acidic mantle of scalp. However, the aesthetic attributes, such as lather and clarity, of the laboratory shampoo are not comparable with the marketed shampoos.

The main purpose of this study was to eliminate the harmful synthetic ingredient from the anti-dandruff shampoo formulation and replace it with a safe natural ingredient

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