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Formulation And Evaluation Of Herbal Shampoo

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ABSTRACT

This study's primary goal was to replace dangerous synthetic ingredients in anti-dandruff shampoo formulations with safe natural ones. Dandruff can only be adequately treated and controlled; it cannot be totally eradicated. A shampoo is a preparation that contains surfactant in a suitable liquid, solid, or powder form. When used as directed, it will remove skin debris, surface oil, and grime from the hair shaft and scalp without causing any negative effects to the user. Herbal-based substances such as Bringraj Extract, Hibicus Extract, Reetha Extract, Tulsi Extract, Amla Extract, Neem Extract, and other ingredients for base shampoo were used to make herbal anti-dandruff shampoos. Visual inspection, pH, viscosity, percentage of particles, skin irritation test, and other assessment parameters were applied to the shampoo formulations.

Keywords: Natural Herbs, Herbal Shampoo

1. SHAMPOO

A shampoo may be defined as a cosmetic preparation that is packaged in an easy-to-use manner and is intended for the purpose of shampooing the hair and scalp. Its main purpose is to rid the hair of accumulated sebum, debris from the scalp, and leftovers from hair grooming products. Shampoo's further uses include bulking, lubrication, conditioning, preventing static electricity, medicine, and more. Lastly, for long-term use, the entire shampoo composition needs to be medically safe.

A shampoo is a preparation of a surfactant (also known as a surface active material) in a suitable liquid, solid, or powder form that, when used as directed, removes surface oil, grime, and skin debris from the hair, shaft, and scalp without negatively affecting the user's health or the hair or scalp. In English, the word "shampoo" first appeared in 1762 and meant "to massage." The name comes from Anglo-Indian shampoo, which is taken from the Hindi word champoo, which means champna, which means to smear, knead, or

massage muscles. Both men's and women's shampoos are widely available nowadays. Regardless of the kind of water used or the sort of dirt or fat that has to be removed from hair, a good shampoo should almost instantly produce a lot of foam. Even if the washing function does not cause foam to develop, individuals mentally always like products with a lot of froth. It has been shown that certain high-quality shampoos have adverse consequences, such as drying out the hair. The hair becomes too dry to manage or comb as a result. Because certain shampoos cause eye discomfort and a permanent corneal haze, appropriate hair conditioning is also a crucial factor. You should stay away from these. It is anticipated that shampoo will serve a variety of purposes. The following qualities should be included in a decent shampoo

2. MATERIALS AND METHODS

2.1 Collection of plant material

The plants have been selected on the basis of its availability and Folk use of the plant. Ethnobotanical surveys were conducted in different localities of Madhya Pradesh. Drying of fresh plant parts were carried out in sun but under the shade. Dried leaves of *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica* were preserved in plastic bags and closed tightly and powdered as per the requirements.

2.2 Extraction of Plant Material

Leaves of *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica* were shade dried at room temperature. The shade dried plant material was coarsely powdered and subjected to extraction with petroleum ether by maceration. The extraction was continued till the defatting of the material had taken place. 50 gm of dried powdered leaves of all plants has been extracted with solvent using solvent in extracted by Soxhlet process for 6 hrs, Filtered and dried using vacuum evaporator at 40^0C. The percentage yield of each extract was calculated by using following formula:

$$\text{Percentage Yield} = \frac{\text{Weight of extract}}{\text{Weight of powder of drug taken}} \times 100$$

2.3 Phytochemical Screening

The *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica* extract acquire was subjected to the precursory phytochemical analysis following standard methods by Khandelwal and Kokate. The extract was screened to identify the presence of various active principles of alkaloids, glycosides, phenols, flavonoids, Terpenoids, Saponins, Steroids.

2.4 Preparation of Shampoo

Preparation of anti-dandruff shampoo: Shampoo was formulated using simple mixing process. Herbal anti-dandruff shampoo was formulated by adding the required amounts of herbal ingredients as given in the formulation.

Step of Preparation Process

1. All the plant materials were collected from rural area.
2. All the ingredients were accurately weighed and soaked in water overnight individually.
3. Then the ingredients are boiled in the same water.
4. Later the mixture were cooled, filtered and collected.
5. Then thickening agents were added and the solution were gently stirred.
6. Later preservatives, coloring agents & Perfuming agents are added to the mixture and gently stirred.
7. Finally, shampoo were prepared and stored in a container

Table 2.1: Formulation of Herbal Shampoo

S.N.	Ingredients	F1	F2	F3
1	Bringraj Extract	1.0	1.5	2.0
2	Hibicus Extract	1.0	1.5	2.0
3	Tulsi Extract	1.0	1.5	2.0
4	Retha Extract	1.0	1.5	2.0
5	Amla Extract	1.0	1.5	2.0
6	Neem Extract	1.0	1.5	2.0
8	Sodium Lauryl Sulfate(gms)	15	10	5
9	Glycerin (ml)	1	1	1
10	EDTA (gm.)	0.15	0.15	0.15
11	Sodium Hydroxide	To adjust pH	To adjust pH	To adjust pH
12	Water	q.s	q.s	q.s
13	Perfume	q.s	q.s	q.s

2.4 EVALUATION OF SHAMPOO

1. Physical appearance/visual inspection:

The formulation prepared was evaluated for the clarity, color, odor and foam producing ability and fluidity

2. Foam and foam stability:

200 ml of surfactant solution is dropped into a glass column containing 50ml of the same solution. The height of the foam generated is measured immediately and again after a specified time interval, and is considered proportional to the volume.

3. Cleaning action and Detergency:

5gm sample of soiled human hair is placed at 35°c in 200 cc of water containing of 1 gm of shampoo. The flask is shaken 50 times a minute for 4 minutes. Then washed once again with sufficient amount of water, then after filter the hair dried and weighed. The amount of soil is removed under this condition is calculated.

4. 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 complete.

5. Surface tension

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/cm. Surface tension reduction is one of the mechanisms implicated in detergency.

6. Determination of solid content percentage:

A clean dry evaporating dish was weighed and 4 grams of shampoo was added to the evaporating dish. The evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the solid contents present in the shampoo was calculated after drying.

7. Viscosity: Viscosity of the samples changes gradually with the increase in rpm, therefore the shampoo formulations were time dependent. Secondly as the data showed the viscosity decreases with increase in rpm, so the shampoo formulations were shear thinningor pseudo plastic in nature.

3. RESULTS AND DISCUSSION

Formulation and evaluation of herbal anti-dandruff shampoo of using plant *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica.* The dried plant portion were washed carefully under running tap water and was grinded using electronic grinder. The powder was successively extracted by Soxhlet process for 6 hrs, filtered and dried using vaccum evaporator at 40^0C.

3.1 Results of percentage yield

Table 3.1: Results of percentage yield of extracts

Plant Name	Percentage Yield (%)
Eclipta alba	5.2
Hibiscus rosa-sinensis	4.7
Ocimum sanctum	4.3
Sapindus mukorossi	5.1
Phyllanthus emblica	3.9
Azadirachta indica	5.8

3.2 Results of phytochemical screening of extracts

Preliminary phytochemical analysis generally helps identify and classify the plant extracts' bioactive constituents. For extracts of all samples, a small portion of the dried extracts of plant leaves underwent phytochemical screening using Kokate methods for chemical testing of alkaloids, glycosides, flavonoids, saponins, phenolics, proteins and amino acids, diterpenes and tannins separately.

Table 3.2: Result of Phytochemical Screening of extracts of *plant*

S. No.	Constituents	*Eclipta alba*	*Hibiscus sinensis*	*Ocimum sanctum*	*Sapindus mukorossi*	*Phyllanthus emblica*	*Azadirachta indica*
1.	Alkaloids	-	+	–	+	+	+
2.	Glycosides	-	-	–	–	–	+
3.	Flavonoids	-	+	+	+	+	+
4.	Saponins	+	+	+	+	+	+
5.	Phenolics	+	+	–	+	+	+
6.	Proteins and Amino Acids	–	–	+	+	–	–
7.	Carbohydrate	+	+	+	–	+	+
8.	Diterpene	+	+	–	–	+	–
9.	Tannin	+	+	+	+	+	+

3.3 Result of Evaluation of herbal Shampoo

3.3.1 Result of Physical Appearance

Physical Appearance results of visual inspection of series of formulations are listed in Table. As can be seen, all formulations had the good characteristics with respect to foaming.

Table No. 3.3 Result of Formulations for Physical Appearance

S. No.	Formulations	Appearance
1	F1	Pale yellow color, Good Foaming
2	F2	Pale yellow color, Good Foaming
3	F3	Pale yellow color, Good Foaming

3.3.2. Result of Foaming ability

Foaming ability 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. The foam retention ability of Three samples is given in table. All Three shampoos showed comparable foaming properties. The final formulation produced stable foams there was little bet change in foam volume.

Table No. 3.4 Result of Foam ability of Herbal Shampoo

Time in Mins	Foam Volume (ml)		
	F1	**F2**	**F3**
1 Min	172	155	162
2 Min	170	151	157
3 Min	167	148	153
4 Min	163	147	149
5 Min	161	142	145

3.3.3. Result of Cleaning action (%)

Dirt Dispersion Shampoo that cause 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

Table No.3.5 Result of Formulations for Cleaning action (%)

S.No.	Formulations	Cleaning action (%)
1	F1	25.43±0.06
2	F2	28.71±0.04
3	F3	23.68±0.03

3.3.4. Result 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 current trend to promote shampoos of lower 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. As seen from Table all Three shampoos were acid balanced and were ranged 6.69 to 6.95.

Table No. 3.6 Result of Formulations for pH

S.No.	Formulations	pH
1	F1	6.69±0.03
2	F2	6.95±0.05
3	F3	6.89±0.05

3.3.5. Result of Surface tension

The reduction in surface tension of water to 30.28±0.74 dynes/ cm by the herbal shampoos is an indication of their good detergent action.

Table No. 3.7 Result of Formulations for Surface tension

S.No.	Formulations	SurfaceTension (dy/cm)
1	F1	28.17±0.63
2	F2	30.28±0.74
3	F3	27.69±0.22

3.3.6. Result of Percent of Solids Contents

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 in table and found between 20.05±0.02% to 23.14±0.02. As a result, they were easy to wash out.

Table No. 3.8 Result of Formulations for Percent of Solids Contents

S.No.	Formulations	Solids (%)
1	F1	20.05±0.02
2	F2	22.81±0.02
3	F3	23.14±0.02

3.3.7. Result of Viscosity

These formulations showed pseudo plastic behavior which is a desirable attribute in shampoos formulation. At low rpm the herbal shampoos showed high viscosity and increase in the shear rate the viscosity of the shampoos drops, this is a favorable property which eases the spreading of the shampoos on hair. The results obtained from the rheological studies were fitted into different flow behaviors, using the linear or non-linear regression.

The rheological evaluation's findings demonstrated that the samples' viscosity changed gradually as the rpm increased, indicating that the shampoo formulas were time-dependent. Second, the shampoo formulations were shear thinning or pseudoplastic in nature since the findings indicated that viscosity decreased as rpm increased. The pseudoplastic behavior shown by these formulations is a desirable feature in shampoo composition.

Table No. 3.9 Result of Formulations for Viscosity

RPM	Viscosity (cp)		
	F1	F2	F3
0.3	-	81206.25	-
0.5	61772.00	69192.15	-
1.0	45814.69	47261.48	21794.33
1.5	32471.00	33911.00	15957.38
2.5	23612.25	25716.51	8591.42
5	12937.63	13819.66	6735.00
10	8859.00	9185.82	5685.15

CONCLUSION

At this time ,Hair fall is the major problem so in this case we try to add some type of herbal drugs in the formulation to prevents hair fall, make smooth, as well as give anti-dandruff action. This type of formulation we use *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica* herbal plant which contain anti-dandruff property. There are no any type of side effect, so they are useful for all of them. The formulation of Anti-dandruff hair shampoo provides a method for treating a scalp dandruff or seborrheic dermatitis. Herbal hair shampoo containing 2ml of herbs concentration of *Eclipta alba, Hibiscus rosa sinensis, Ocimum sanctum, Sapindus mukorossi, Phyllanthus emblic* and *Azadirachta indica* with sodium lauryl sulfate base could be used as an effective in treatment of Dandruff on scalp. Regardless of the existence and widespread use of numerous therapeutic substances, disease relapses are common. The prolonged chemical based treatments and the high rate of reccurrence suggest the opportunity of alternative treatment. As additives play an important role in defining the performance, stability and aesthetic appeal of any formulation, this point was kept in mind while selecting the additives for the shampoo formulation. Finally the shampoo was formulated and evaluated. As seen from the results, it is possible to formulate a herbal shampoo that is not only equivalent in its performance to the synthetic ones but also have better safety, efficacy and purity.

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