



PREPARATION AND EVALUATION OF HERBAL SHAMPOO

DIWAKAR SHUKLA, ABHINAV KUMAR SINGH, ANKIT KUMAR, HIMANSHU PANDEY,
MOHAMMAD KAIF, PREETI GIRI, SEEMA BHARTI, SURAJ CHOUDHARI
PRADUMAN SINGH SIKSHAN PRASIKSHAN SANSTHAN PHARMACY COLLEGE, BASTI

Abstract

The study aimed to formulate a pure herbal shampoo and to evaluate and compare its physicochemical properties with the marketed synthetic and herbal shampoos. The herbal shampoo was formulated by adding the extracts of *Acacia concinna*, *Sapindus mukorossi*, *Phyllanthus emblica*, *Ziziphus spina-christi* and *Citrus aurantifolia* in different proportions to a 10% aqueous gelatin solution. Every single manufactured item like cleanser contains a destructive substance which is in charge of damage of hair. HS is the only product which used for hair washing and also used for hair remedy on hair problem. In recent study herbal HS (HS) has remarkable properties toward hairs. Greener preparation of HS made has two sections, In first section contain, herbal extract prepared by mixture of amla, reetha, shikakai, nagarmotha, bhringaraj, brahmi, aloe vera, lemon juice and some Ingredients. Herb extract (10%) take an amla, reetha, shikakai, nagarmotha, bhringaraj, brahmi all in dried form in a beaker in aqueous medium, warm up to till the beginning of boil by microwave method, sieve and put for cooling, obtained herb extract. For their transparency add some lemon squeeze in it, followed by mixing up to colourless. In second section beaker contains SLES, glycerin and CAPB everyone followed by stirring gradually, Herb extract with lemon juice in it stir gradually due to avoid foaming. Preservative methyl paraben and sodium benzoate, for pearlising impact with EGMS to it. Pour an Aloe vera in it, with small concentration of cocamono in it, mockup with water in it for small proportion, increasing a thickness with cocodi, obtained product HS. The formed HS is thick semi white transparent in colour, with great foam producing ability and fluidity. The pH of HS is between 6-7 at 25°C RT, formed HS is acidic in nature which is good quality. Percentage of solid contents of HS is 0.05g after dry. The cleansing action of the formed HS is All these are these characters demonstrates that the herbal HS is high quality for usable in daily life.

Keywords: Herb Extract, Greener preparation, Cocodi, Cocamono, Herbal HS (HS), Microwave method.

1-INTRODUCTION

Shampoos are most probably used as cosmetics. It is a hair care product that is used for cleaning scalp and hair in our daily life. Shampoos are most likely utilized as beautifying agents and are a viscous solution of detergents containing suitable additives preservatives and active ingredients. It is usually applied on wet hair, massaging into the hair, and cleansed by rinsing with water. The purpose of using shampoo is to remove dirt that is build up on the hair without stripping out much of the sebum. Many synthetic shampoos are present in the current market both medicated and nonmedicated; however, herbal shampoo popularized due to natural origin which is safer, increases consumer demand and free from side effects. In synthetic shampoos, surfactants (synthetic) are added mainly for their cleansing and foaming property, but the continuous use of these surfactants leads to serious effects such as eye irritation, scalp irritation, loss of hair, and dryness of hairs. Alternative to synthetic shampoo we can use shampoos containing natural herbals. However, formulating cosmetic products containing only natural substances are very difficult . There are a number of medicinal plants with potential effects on hair used traditionally over years around the world and are incorporated in shampoo formulation ^{1,2} .These medicinal plants may be used in extracts form, their powdered form, crude form, or their derivatives. To develop a shampoo containing an only one natural substance which would be safer with milder effect, then the synthetic shampoo is difficult and also it should possess good foaming, detergency, and solid content as such synthetic shampoo. Hence, we considered in detailing an unadulterated natural cleanser utilizing conventional technique using regularly utilized plant material for hair washing. A shampoo is basically a solution of a detergent containing suitable additives for other benefits such as hair conditioning enhancement, lubrication, medication etc. Now-a-days many synthetic, herbal, medicated and non medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these products being of natural origin are safe and free from side effects. Synthetic surfactants are added to shampoo primarily for the foaming and cleansing action but their regular use leads to dryness of hairs, hair loss, irritation to scalp and eyes .Herbal formulations are considered as alternative to synthetic shampoo but formulating cosmetics using completely natural raw material is a difficult task . There are large numbers of medicinal plants which are reported to have beneficial effects on hair and are commonly used in formulation of shampoo. These plant products may be used in their powdered form, crude form, purified extracts, or derivative form . It is extremely difficult to prepare a herbal shampoo using a single natural material that would be milder and safer than the synthetic ones, and at the same time would compete favorably with its foaming, detergency and solid content ^{3,2,4}



Fig.No- 01 Herbal Shampoo

1-1. BENIFITS OF HEARBAL SHAMPOO ⁵

1. More Shine
2. Less Hair Loss
3. Long Lasting Colour
4. Stronger and More Fortified Hairs
5. All Natural, No Chemicals
6. Won't Irritate Skin or Scalp
7. Keep Healthy Natural Oils

1.2. FUNCTION OF HEARBAL SHAMPOO

1. Lubrication
2. Conditioning
3. Hair Growth
4. Maintenance of Hair Color

5. Medication

1.3. DESIRED PROPERTIES OF HERBAL SHAMPOO ⁶

1. Ease of Application
2. Removal of More Debris
3. Easy Wet Combing
4. Fragrance
5. Low Level of irritation
6. Well Preserved
7. Good Stability

1.4. ADVANTAGES OF HERBAL SHAMPOO

1. Pure and Organic Ingredient
2. Free from Side Effects
3. No Surfactants eg:- SLS
4. No Synthetic Additives
5. No Animal Testing
6. Earth And Skin Friendly
7. No Petroleum based Ingredient



2. Function of ingredients

2.1.Amla

It nourishes hair and help for growth. It allowing the nature texture and nature oils of the hair retained for a healthy shine and appearance. It controls hair loss. It contain fatty acids that moisture the hair. Fatty acids penetrate through the scalp to remove dryness and dandruff. It contain antioxidant properties which strengthening the roots of the hairs. It acts as a conditioner that gives hair a nature shine and bounce ^{7,8,9}

2.1.1. Function of Amla

- i. Strengthen the Scalp and Hair.
- ii. Reduce premature pigment loss from hair, or greying.
- iii. Stimulate Hair Growth. iv. Reduce Hair Loss.
- iv. Prevent or treat dandruff and dry scalp.
- v. Prevent or treat Fungal and Bacterial



Fig No. 02 Amla

2.2. Reetha

It is a cleansing agent, keeps scalp gentle and removes any microorganism responsible for infection. It nourishes hair, keeps healthy and smooth also. It shines the hair and brings back nature texture. It is also helpful for dandruff. ^{8,9}



FigNo.03-Reetha

3.3. Shikakai

It retain nature oil of hair, It keeps hair lustrous and healthy. It condition and strength the hair. It reduce hair loss and adds volume to the hair'. It is a powerful antidandruff. It products scalp from infection.⁹

Fucntion of Sikakai

Cleanses Hair.

ii. Add more Shine to the Hairs,.

iii. Prevents Grays.

iv. Crubs Hair Loss and Prevents Lice, Psoriasis, Eczema & Scabies.

v. Provides Nourishment to the hair and promote healthy and rapid hair growth. vii. Prevents Split ends.



Fig No- 04 Shikakai

2.4.Nagarmotha

It stimulates hair roots. It works on subaceous gland to promote new hair growth.



Fig. No.05 Nagarmotha

2.5. Bhringaraj

It retain the original black colour of hair. It rejuvenating the scalp



Fig No- 06 Bhringaraj

2. 6. Brahmi

It nourishes hair. It relieves the tension, stress and relaxes the nerves. It also help for better circulation in scalp.



Fig. No- 07. Brahmi

2.7. Aloe vera

It helps for thickening hair. It also helps to nourish hair. 8. Lemon juice :-It maintains the pH of HS. It gives a fragrance to HS

Function

- i. Calms an itchy scalp.
- ii. Deep cleans oily hairs. I
- iii. Strengthens
- iv. Aloe vera contains proteolytic enzymes which repairs dead skin cells on scalp.
- v. Promote hair growth vi. Smooth natural curls vii. Reduce frizziness viii. Detangle Hairs. ¹⁰



Fig No 08 Aloe vera

2.8-Gelatin

- i. Gelatin Can improve hair thickness and growth.
- ii. Gelatin supplement or placebo for 50 weeks to 24 people with alopecia.
- iii. It gives thickness to hairs. iv. For strengthening of Hairs



Fig No- 09 Gelatin

9. Lemon Juice

- i. Add More shine.
- ii. Get rid of dandruff, Split ends
- iii-Reduces Hair fall
- iv- Gives Natural colour to hairs



Fig No-09- Lemon

2.10 Function of chemicals

- 1) Glycerine :-It helps to look the moisture in hair
- 2) Cocamidopropylbetane (CAPB):- It thickness the HS .It is used as a surfactant and a foam booster. It is emuleifying agent
- 3) Sodium lauryl ether sulphate (SLES) :-It is used as a surfactant.
- 4) Sodium benzoate :-Both are used as a preservative to preserve HS.

- 5) Ethylene glycol monosterate (EGMS) :-It is used for a pearlised effect.
- 6) Cocamono:-It is used as a surfactant.It increases the viscosity

3. FORMULATION OF HERBAL SHAMPOO

Weighed all the ingredients according to the formula Soak it for overnight next morning (all ingredients become puffy and filled with water after soaking overnight). boiled ingredients in the same water on medium flame the cool the mixture and filter it. 1ml of lemon juice was also added with constant stirring .then preservatives was added and developed shampoo was stored in a suitable container and used for the further evaluation.^{11,12,13}

Part - 1:- Preparation of Herbal Extract:

Take a herb Amla, Reetha ,Shikakai, Nagarmutha, Bhringaraj, Brahmi, Aloevera and soak it in distilled water.Placed in microwave irradiation of 800W it for a 5 minutes or till when it starts boil sieve it and take a 10ml from extract should give a small of lemon strongly.For their transparency add some lemon squeeze in it, followed by mixing up to colourless.(Near about juice of 2 lemons)

Part -2 :- Preparation of Herbal HS:

In beaker contains SLES (30%), glycerin (18%) and CAPB (6%) everyone followed by stirring gradually, Herb extract with lemon juice in it stir gradually due to avoid foaming. Preservative methyl paraben(0.5%) and sodium benzoate (1.5%), for pearlising impact with EGMS (4%) to it. Pour an Aloevera(12%) in it, with small concentration of cocamono(4%) in it, mockup with water in it for small proportion, increasing a thickness with cocodi, obtained product Herbal Shampoo.

4.EVALUATION OF PREPARED HERBAL LIQUID SHAMPOO

To evaluate the prepared formulations, quality control tests including visual assessment and physicochemical controls such as pH, density and viscosity were performed. Also, to assure the quality of products, specific tests for shampoo formulations including the determination of dry residue and moisture content, total surfactant activity, salt content, surface tension, thermal and mechanical stability and detergency tests were carried out.

1. *Physical appearance/visual inspection:* The formulations prepared were evaluated in terms of their clarity, foam producing ability and fluidity.
2. *Determination of pH:* mix 01gm of shampoo with 09ml of water and determine the pH using pH meter at 27°C.
3. *Determine Percent of Solids Contents:* A clean dry evaporating dish was weighed and added 4 grams of shampoo to the evaporating dish. The dish and shampoo was weighed. The exact weight of the shampoo was calculated only and put the evaporating dish with shampoo was placed on the hot plate

until the liquid portion was evaporated. The weight of the shampoo only (solids) after drying was calculated.

4. *Rheological or Viscosity Evaluations:* The viscosity of the shampoos was determined by using Brookfield viscometer. 10ml of shampoo is taken in a beaker and spindle is dipped in it for about 5min. and then reading is taken.
5. *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 Heavy.
6. *Cleaning Action:* 5 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of shampoo in a flask. Temperature of water was maintained at 35°C. The flask was shake for 4 minutes at the rate of 50 times a minute. The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated by using the following equation: $DP = 100(1 - T/C)$ In which, DP is the percentage of detergency power, C is the weight of sebum in the control sample and T is the weight of sebum in the test sample.
7. *Detergency Ability:* The Thompson method was used to evaluate the detergency ability of the samples. Briefly, a crumple of hair was washed with a 5% sodium lauryl sulfate (SLS) solution, then dried and divided into 3g weight groups. The samples were suspended in a hexane solution containing 10% artificial sebum and the mixture was shaken for 15 minutes at room temperature. Then samples were removed, the solvent was evaporated at room temperature and their sebum content determined. In the next step, each sample was divided into two equal parts, one washed with 0.1 ml of the 10% test shampoo and the other considered as the negative control. After drying, the residue sebum on samples was extracted with 20 ml n-hexane and re-weighed. Finally, the percentage of detergency power was calculated using the following equation: $DP = 100(1 - T/C)$ In which, DP is the percentage of detergency power, C is the weight of sebum in the control sample and T is the weight of sebum in the test sample 3, 4.
8. *Foaming Ability and Foam Stability:* Cylinder shake method was used for determining foaming ability. 50ml of the 1% shampoo solution was put into a 250 ml graduated cylinder and covered the cylinder with hand and shaken for 10 times. The total volumes of the foam contents after 1-minute shaking were recorded. The foam volume was calculated only. Immediately after shaking the volume of foam at 1 minute intervals for 4 minutes were recorded.
9. *Stability Studies:* The thermal stability of formulations was studied by placing in glass tubes and they were placed in a humidity chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected for a period of 3 months at interval of one month.

OBSERVATION TABLE

Sr. No	Evaluation Shampoo	Formulation Shampoo
1.	Colour	Dull Brown
2.	Transparency	Clear
3.	Odour	Good
4.	Wetting Time	125s

5- RESULT

The shampoo was formulated by admixing the equal amount of the aqueous extracts of all the ingredients with soapnut (Table 1). The above plant extract contains phytoconstituents like saponins which is a natural surfactant having detergent property and foaming property. An ideal shampoo must have adequate viscosity and many natural substances possess good viscosity. The gelatin solution (10%) behaves as a pseudoplastic forming clear solutions. Lemon juice (1 ml) added to the shampoo serves as anti-dandruff agent, natural antioxidant, and chelating agent and maintains the acidic pH in the formulation

6. CONCLUSION

The formulated shampoo was not only safer than the chemical conditioning agent but also greatly reduce the hair loss during combining as well as strengthens the hair growth the ph of the shampoo was adjusted to retain the acidic mental of scalp the physiochemical approach used for preservation of the formulation to avoid the risk posed by chemical preservatives herbal shampoo better in performance and safer than the synthetic one will be popular with consumers.

7. REFERENCES

1. Khaloud Al Badi, Shah A. Khan,"Formulation, evaluation and comparison of the herbal shampoo with commercial shampoo", BeniSuef University journal of Basic and applied science vol.3 pp.301-305, 2014.
2. Thitilertdecha N, Teerawutgulrag A, Kilburn J.D.,Rakariyatham N. Identification of major phenolic compounds from *Nepheliumlappaceum*L. andtheir and their antioxidant activities. *Molecules* Thitilertdecha N, Teerawutgulrag A, Kilburn 2010;15:1453–65
3. Hadkar U.B. and Ravindera R.P., *Indian Journal of Pharmaceutical Education Research* 2009; 43(2): 187-191.
- 4- Gaud R.S. and Gupta G.D., *Practical Physical Pharmacy*, 1st ed., C.B.S. Publisher and Distributer, New Delhi, 2001; 81-105

- 5- Umbach W., Cosmetics and Toiletries Development, Production and Use, 1991; 26. [8] Griffin J.J., Corcoran R.F, Akana K.K., Journal of Chemistry. 54th ed, 1977; 553-554.
- 6-Potluri A, Asma SS, Rallapally N, Durrivel S, Harish GA. Review on herbs used in anti-dandruff shampoo and its evaluation parameters. Indo Am J Pharm Res.
7. Shinde PR, Tatiya AU, Surana SJ. Formulation development and evaluation of herbal antidandruff shampoo. Int J Res Cosmet Sci . 8
8. Firthouse PU. Effects of *Ocimum sanctum* and *Azadiracta indica* on the formulation of antidandruff herbal shampoo powder. Der Pharm Lett . 6. Pooja A, Arun N, Maninder K. Shampoos based on synthetic ingredients vis-à-vis shampoos based on herbal ingredients: A review. Int J Pharm Sci Rev Res
9. Kapoor VP. Herbal cosmetics for skin and hair care. Nat Prod Radiance . 8. Khushboo PS, Jadhav VM, Kadam VJ, Sathe NS. *Psoralea corylifolia* Linn.-“Kushtanashini”. Pharmacogn Rev .
10. Roy RK, Thakur M, Dixit VK. Hair growth promoting activity of *Eclipta alba* in male albino rats. Arch Dermatol Res.
- 11 Pooja Arora, Arun Nanda, Maninder Karan. A review on shampoos based on synthetic ingredients vis-a-vis shampoos based on herbal ingredients: International Journal of Pharmacognosy and Phytochemistry Journal of Pharmaceutical Sciences Review and Research, 2011; 7(1): 07.
10. Sharma RM, Shah K, Jankipatel. Evaluation of prepared herbal shampoo formulations and to compare formulated shampoo with marketed shampoos. International journal of pharmacy and pharmaceutical sciences, 2011; 3(4): 402-405. 12.
11. Chanun Punyoyai, Sasithorn Sirilun, Panuwan Chantawannakul and Wantida Chaiyana. Development of Antidandruff Shampoo from the Fermented Product of *Ocimum sanctum* Linn, 2018,2,14.