FORMULATION AND EVALUATION OF THE HERBAL SHAMPOO

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Abstract:
Shampoos are the beauty care products arrangements implied for purging the hair by evacuation of the soil oil from the hair shaft and scalp. There are extensive varieties of synthetic shampoos accessible in the market with various capabilities. But these synthetic shampoos show unsafe impact on the hair and scalp like dryness of hair and keratin misfortune. Because of these reasons herbal shampoos has developed as an option in contrast to synthetic shampoo on account of the safe and generally utilized fixings. It is a corrective planning which utilizes spices and implied for purging the hair and scalp very much like standard cleanser. Large numbers of the spices are accounted for to have gainful effect on hair and are utilized in herbal shampoos.

Keywords: Synthetic shampoo, herbal shampoo, beauty care products.

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Introduction:

Shampoos are generally presumably utilized as beauty care products. It is a hair care item that is utilized for cleaning scalp and hair in our everyday life. Shampoos are undoubtedly used as improving specialists and are a gooey arrangement of cleansers containing reasonable added substances additives and dynamic fixings1. It is typically applied on wet hair, kneading into the hair, and purged by washing with water. The reason for utilizing cleanser is to eliminate soil that is developing on the hair without stripping out a significant part of the sebum. Numerous manufactured shampoos are available in the ongoing business sector both cured and non medicated, notwithstanding, home grown cleanser promoted because of regular beginning which is more secure, increments buyer interest and liberated from incidental effect[2].

Herbal Shampoos are corrective arrangements that include the utilization of conventional ayurvedic spices to clean the scalp and the hair. The ayurvedic herbal shampoos are extremely successful for individuals who face a ton of hair issues in their day to day routines, for example, hair fall, dandruff, silver hair, dry hair, and so on because of ecological contamination[3,4].

A cleanser is fundamentally an answer of a cleanser containing reasonable added substances for different advantages, for example, hair molding improvement, oil, prescription and so on. Presently a-days numerous engineered, home grown, cured and non sedated shampoos are accessible in the market however notoriety of home grown cleanser among buyers is on ascent due to their conviction that these items being of normal beginning are protected and liberated from aftereffects[5]. Manufactured surfactants are added to cleanser essentially for the frothing and purging activity yet, their normal use prompts dryness of hairs, going bald, aggravation to scalp and eyes .Home grown details are thought of as option to manufactured cleanser yet planning beauty care products utilizing totally regular natural substance is a troublesome errand . There are huge quantities of therapeutic plants which are accounted for to usefully affect hair and are generally utilized in detailing of cleanser[26,27]. These plant items might be utilized in their powdered structure, unrefined structure, filtered concentrates, or subsidiary structure. It is incredibly challenging to set up a home grown cleanser utilizing a solitary normal material that would be milder and more secure than the engineered ones, and simultaneously would contend well with its frothing, detergency and strong substance .We, in this way, considered to form an unadulterated natural cleanser utilizing generally and regularly involved plant materials for hair washing in India and bay district particularly in Oman[6].

Historically, people in the Indian continent had started using ayurvedic extracts of various varieties from very early times. In the early days, people would extract dried gooseberries, amla, soapberries to clean the scalp and provide effective solutions[12]. Shikakai and Reetha are a couple of these fixings in cleanser that are as yet referred to us as one of the most mind-blowing home grown shampoos for getting fit as a fiddle hair with diminished possibilities of hair fall, dandruff, and going bald. Fun Reality - Beginning of 'Cleanser' lies in India. The actual word is gotten from the Hindi word - 'Champo'. [7]

Benefits of herbal shampoo[7,8]:

- Herbal shampoos are made from unadulterated and natural fixings and there are no manufactured added substances or surfactants and are liberated from any after effects.
- These shampoos are not tried on creatures, dissimilar to manufactured cleanser brands.
- Are Bio-degradable and earth-accommodating.
- Skin-accommodating - never makes disturbance the eyes.
- Cost cordial - not much costly.
- More Sparkle
- Less Balding
- Enduring Variety
- More grounded and More Sustained Hairs
- All Regular, No Synthetic compounds
- Wont Disturb Skin or Scalp
- Keep Sound Regular Oils

Herbs used in formulation:

Amla:

Synonyms

Emblica, Indian goose berry, amla.

Biological Source

This consists of dried, as well as fresh fruits of the plant *Emblica officinalis* Gaerth (*Phyllanthus emblica* Linn.), belonging to family Euphorbiaceae.

It is a proven tonic for hair. It has plenty of essential fatty acids which penetrate deep into the follicles and slow down greying, prevents dandruff, and strengthens hair follicles. It has high iron and carotene content, thus boosting hair growth[8].

Reetha:

Synonyms
Indian soapberry, washnut, or ritha,
Biological Source
This consists of dried, as well as fresh fruits of the plant *Sapindus mukorossi*, *family Sapindaceae*

Reetha is widely used in preparations like shampoo. The dried fruit powder is used as a foaming agent in shampoos. It cleans the oily secretions in the skin and can be used as a cleanser for hair and a hair tonic as it forms a natural lather. It is also used for removing lice from hair[9]. The soapnut contains the compound of saponin.

Aloe vera:

Synonyms
It is commonly known as 'Gwar Patha or Ghrit Kumari'
Biological Source
Aloe vera is **Aloe barbadensis miller**. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, perennial, xerophytic, succulent, pea- green color plant leaves.

Aloe vera has many active ingredients and minerals that can help strengthen your hair. It has fatty acids and amino acids and is rich in vitamins A, B12, C, and E. These play a part in healthy hair follicles[10].

Shikakai:

Synonyms
Acacia abstergens, Acacia concinna, Chevakka kai
Biological Source:
It consists the fruits of the plant Acacia concinna Linn. (Leguminosae), It is a medicinal plant that grows in tropical rainforests of southern Asia.

It is an herb especially used for washing hair controlling hair fall and dandruff. Shikakai can be used alone or in combination with reetha and amla as a shampoo to help manage hair fall and prevent dandruff due to its cleansing and antifungal properties. It provides shine to the hair as well as prevents its greying.

Bhringraj:

Synonyms
false daisy,Gunta,kalagaraku/Gunta,galagaraku,
Biological Source
This plant has cylindrical, grayish roots. Solid, circular, purplish stems with white fine hairs, Leaves arranged in opposite pairs, hairy in two-sided, lanceolate, family Asteraceae.

Bhringraj is rich in nutrients such as Iron, Vitamin E, magnesium, polypeptides, steroids calcium, vitamin D. it is also rich in proteins that make it even more beneficial for hair. it can penetrate deep into the scalp and treat dryness. Bhringraj can be warmed and applied to hair to treat dandruff. It also provides relief from the itchiness and greasiness caused by dandruff[11].

Fenugreek seed:

Synonyms
- fenugreek seed. Trigonella

Biological Source
Fenugreek (*Trigonella foenum graecum*) is an annual plant belongs to the family Leguminosae.

Fenugreek powder is a rich source of vitamins A, K & C, folic acid, potassium, calcium, iron, and protein, which are essential nutrients for hair growth, says Friese. Additionally, fenugreek powder promotes a healthy scalp environment which contributes to hair growth

Nagarmota:

Synonyms
Nut grass, Nut sedge, Java grass, Coco grass, and Purple nut sedge

Biological Source
Nagarmotha (Cyperus rotundus) commonly known as it is found throughout India. Nagarmotha roots has multiple health benefits. It belongs to the family Cyperacea.

Nagarmotha controls hair fall associated with dandruff. Dandruff generally occur due to an imbalance of Pitta or Kapha dosha. Nagarmotha has Pitta-Kapha balancing properties which controls dandruff and removes excessive dryness.

Lemon:

Synonyms
lemon, citrus, citrus fruit, citrous fruit.

Biological Source
The lemon (Citrus limon) is a species of small evergreen trees in the flowering plant family Rutaceae,

The high content of vitamin C in lemons boost collagen production, which in turn stimulates hair growth. Rich in vital nutrients, regularly using lemon juice strengthens hair follicles and encourages hair growth. Acidic in nature, lemon clears the build-up from the scalp[12].

Hibiscus:

Synonyms
roselle, omutete, or sorrel.

Biological Source
Hibiscus flowers (genus Hibiscus), genus of numerous species of herbs, shrubs, and trees in the mallow family (Malvaceae).

It help to stop hair loss and prevent baldness. Loaded with vitamin C, flavonoids, amino acids, mucilage fiber, and antioxidants, the extract of hibiscus leaves and flowers nourishes your hair, promotes hair growth, and provides a soft & silky texture[13,14].

Materials and Methods:

Collection of plants materials

The selected plant material was collected from local area of Satna (M.P.). These Plant materials were shade dried and made into coarse particles and this powder material was used for extraction.

Preparation of Herbal Extract:

Take 10 gram powdered of each plant that is Hibiscus, Henna, Neem, Amla, Banyan root powders, Alovera gel, Soya milk were homogenized. The powdered material was extracted with 250 m.l. distilled water by boiling for 4 hours.. Filter it, by using muslin cloth. Collect filtrate. Decoction of Shikakai, and Ritha was extracted with 100 m.l.ethanol. Filter it by using muslin cloth[22]. Collect filtrate and mixed to each other of above filtrate with constant stirring. The extract of plant material was separated and evaporated[15,16].

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 seieve 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[18,19].(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[20,21].

Formulation of herbal shampoo:

S.no.	Ingredients	Concentration%
1.	Plant extract	25
2.	SLES	15
3.	Glycerine	05
4.	Aloevera	10
5.	CAPB	10
6.	CDEA	05
7.	Water	25
8.	Lemon juice	5
9.	preservative (Methyl paraben)	q.s.

In beaker contains SLES 15 ml, glycerin 5ml,CAPB 10ml.every one followed by stirring gradually, plant extracts were added 25ml. with lemon juice in it stir gradually for 20 min due to avoid foaming. Add preservative Methyl paraben (q.s.) to it. Pour an aloe vera 10ml in it with small concentration of yellow in it. make up volume with water in it for small proportion increasing thickness with CDEA obtained the final volume was made to 100 mL herbal shampoo product[22,23].

Evaluation of herbal Shampoo[24,25]**:**

To evaluate the quality of prepared formulations several quality-controlled tests including visual

assessment physicochemical controls condition in performance tests were performed.

1. Physical appearance/visual inspections: The formulation prepared was evaluated for the clearness, variety, smell and foam producing ability.

2**. Determination of pH:** Determining the pH of a herbal shampoo involves a simple procedure using pH testing strips or a pH meter at room temperature. Neutral pH=7, Acidic pH 7.

3. Determination of % of solid contents: Determining the solid content of a herbal shampoo involves separating the solids from the liquid portion of the shampoo and then measuring the weight of the solids.

Initial weight of the evaporating dish and shampoo= 4 grams

Weight of the evaporating dish= x grams (to be subtracted from the final weight)

Weight of the solid residues after drying= W grams

The weight of the solid content in the shampoo can be calculated by subtracting the weight of the evaporating dish from the final weight:

Weight of solid content = Weight of evaporating dish and shampoo - Weight of evaporating dish

Weight of solid content = 4 grams - x grams

Since we'll be weighing the dish with the solid residues, the weight of the dish (x grams) will cancel out when subtracted.

After complete drying, let's say the weight of the evaporating dish and solid residues is 5 grams

Then, the weight of the solid content (W) would be

W = 5 grams - x grams

Now, to find the percentage of solid content in the shampoo

Percentage of solid content=4 grams/W×100

Percentage of solid content=4 grams/(5 grams−x g rams)×100

4.Foaming ability and foaming stability Foaming is very important parameter in evaluation of shampoo. Take a small amount of the herbal shampoo in measuring cylinder. Add a small amount of water. Agitate the mixture by shaking the container or rubbing your hands together vigorously. Observe the formation of foam. A good shampoo should produce a rich lather with small bubbles Note the volume and quality of the foam generated A shampoo with high foaming ability will produce a significant amount of foam quickly.

After generating the foam, observe how long it takes for the foam to collapse. Time the duration for which the foam remains stable. Measure the volume of the foam at regular intervals to see if it decreases over time. A shampoo with good foaming stability will maintain its foam for a longer period without collapsing or dissipating quickly.

5.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.

6) Dirt dispersion: A few drop of synthetic dirt or a mixture of oil and dirt (simulated dirt), and dilute the herbal shampoo with distilled water according to the recommended ratio on the product in the test tube was stoppered and shakes it ten times. ensure that the water temperature is suitable for shampooing. the amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.

7) Cleaning action: Observe how effectively the shampoo removes dirt, oil, and product buildup from the hair and scalp. A good herbal shampoo should leave the hair feeling clean, soft, and refreshed without stripping away natural oils. 5 grams of wool yarn were put in oil, after that it was set in 200 ml. of water containing 1 gram of herbal shampoo in a conical flask. Temperature of water was kept up with at 35^0C. The conical flask was shake for 4 minutes at the rate of 50 times for one minute. The solution was removed and sample was taken out, dried and weighed. How much oil eliminated was determined by utilizing the accompanying condition: 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.

8) Testing of wetting: Wetting time was calculated by noting the time required by the canvas paper to sink completely. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch.

9)Surface tension measurement – The prepared shampoo in distilled water (10% w/v) was evaluated for surface tension using stalagmometer in room temperature.

Result and Discussions

The herbal shampoo was formed by admixing the equivalent measure of the water concentrates of the relative multitude of fixings with soap nut. The above plant extract contains phytocons tituents like saponins which is a characteristic surfactant having cleanser property and foaming property. An ideal shampoo should have satisfactory thickness and numerous normal substances have great consistency.

Sr. no.	Characterization	Result
1.	Physical appearance/visual inspections	Color –Brown Transparency- Clear Odor-like amla smell
2.	Determination of pH	6.8
3.	Determination of % solid contents:	21.75%
4.	Foaming ability and foaming stability	Foam volume above 80ml and the shampoo had 76ml foam volume for about 4 minutes showing that the foam has good stability.
5.	Rheological or Viscosity evaluations	0.94
6.	Dirt dispersion	The estimated amount of ink in the foam is moderate.
7.	Cleaning action	16%
8.	Wetting time	2 minutes
9.	Surface tension (dynes/cm)	34.26

Conclusion:

The present study was carried out with the aim of preparing herbal shampoo, offers a nourishing and cleansing properties. We have created a formula that not only cleanses the hair effectively but also promotes overall scalp health. Additionally, the use of herbal ingredients reduces the exposure to harsh chemicals, making it suitable for individuals with sensitive skin or those seeking a more eco-friendly option. The evaluation of herbal shampoo has revealed promising results regarding natural and gentle alternative to commercial products by combining various herbs known for their efficacy and potential benefits. The use of natural ingredients has shown to be gentle on the hair and skin, reducing the risk of irritation and allergic reactions commonly associated with synthetic chemicals found in commercial shampoos.

References:

1.Reddy VS, Prasanthi S, Gopinath C, Rao KM. Shampoos: An Overview. International Journal of Advances in Pharmaceutical Research. 2015;6(11):384-387.
2. Mithal B. M. and Saha R. N., Handbook of cosmetics, first edition, Vallabh Prakashan 2003: 1-10,110-121.
3. Haritha PN, Supraja P, Samreen S, Hrudayanjali, Qureshi M, Sandya P, Swetha T., A Review on Polyherbal Shampoo Powder. Int. J Pharm Res. 2021; 21(2): 346-63.
4. Ankule A, Wani S D, Murkute P M, Pundkar A S. Multipurpose herbal powder shampoo. World j. pharm. life sci. 2020; 6(5): 166- 182.
5. The World of Hair, A Scientific Companion by Dr. John Gray, Macmillan Press Limited, 1977, pp. 23–24
6.Jaya Preethi P, Padmini K, Srikanth J, Lohitha M, Swetha K, Vengal Rao P.A Review on herbal shampoo and its evaluation. Asian journal of pharmaceutical analysis. 2013; 3(4): 153- 56.
7. Teltscher, Kate (2000). "The Shampooing Surgeon and the Persian Prince: Two Indians in Early Nineteenth-century Britain". Interventions: International Journal of Postcolonial Studies. 2 (3): 409–23
8. Srivasuki KP. Nutritional and health care benefits of amla. J pharm 2012; 3; 147-51
9. Kothari S, Patidar K, Solanki R. Polyherbal Anti-Dandruff Shampoo: Basic Concept, Benefits, and Challenges. Asian J. Pharm. 2018; 12(3): S849- 58.
10.Jacob Rhea, Sakthivel KM, Kannan N, Guruvayoorappan C. Formulation of cost effective herbal shampoo powder: a comparative study with market shampoos. Int. J. Curr. Res. 2015;7(2):12645-49.
11.Rupesh Rathore et al., 2019, Preparation and Evaluation of Powdered Herbal Shampoo Using Bhirngraj, IJPLS ,6275-6279
12. Gubitosa J, Rizzi V, Fini P, Cosma P. Hair Care Cosmetics: From Traditional Shampoo to

Solid Clay and Herbal Shampoo, A Review. Cosmetics. 2019; 6(13): 1-16.
13. Snehal W, Nitin K, Vaibhav B. Preparation & evaluation of antidandruff poly herbal powder shampoo. Pharmacophore. 2014; 5(1): 77-84.
14. Patil SS, Mane YJ, Mohite SK. Formulation and evaluation of herbal shampoo powder. Int. J. Adv.Res.2015;3(3):939-46.
15. Pundkar A S, Ingale S P. Formulation and evaluation of herbal liquid shampoo. World J. Pharm. Res. 2020;9(5):901-11.
16. Mainkar A. R. and Jolly C. I., Formulation of natural shampoo, International Journal of cosmetics science, 2001, 23: 59-62.
17. Ali HS, Kadhim RB. Formulation and evaluation of herbal shampoo from Ziziphus spina leaves extract. Int J Res Appl Pharm 2011;2:1802-6.
18. Badi KA, Khan SA. Formulation, evaluation and comparison of the herbal shampoo with the commercial shampoo. Beni-Suef Univ J Basic Appl Sci 2014;3:301-5.
19. Method for shampooing a pet using a foam-dispensed pet shampoo composition", issued 1997-04-23
20. Boonme P, Pakpayat N, Yotmanee K, Kunlawijitrungsee S, Maneenuan D. Evaluation of shampoos containing silicone quaternary microemulsion. J App Pharm Sci 2011;1:59-63.
21. Utane R., Deo S .and Itankar P. 2017, preparation of herbal shampoo (hs) by green method and their characterization, IJRSSIS, Vol. V, : 254- 258
22. Newton A, Ihoeghiana A, Akwaraa E. Formulation, Evaluation and Comparison of Herbal Shampoo with Marketed Synthetic Shampoo. Journal of Science and Technology Research, 2021;3(4):342-348.
23. Klein K. Evaluation of shampoo foam. Cosmet Toilet Mag 2004;119:32-5.
24. Kancharla.Kameswararao et al. Formulation and Evaluation of Poly herbal Shampoo, Ijppr.Human, 2018; Vol. 13 (1): 251- 268.
25. Gharat, MV, Dalavi RV, Dound AA, Chikane AR, Walunj A, Kajal AA. Research Article on Formulation and Evaluation of Herbal Shampoo. International Journal of Advanced Research in Science, Communication and Technology. 2022;2(5):217-222.
26. Maurya P, Maury S, Yadav P, Yadav M, Maurya S, Jaysawal S. A review article on: Herbal shampoo. Journal of Emerging Technologies and Innovative Research. 2021;8(5):g366-g375.
27. Chavan VM, Tiwari KJ, Suryavanshi KA, Bhor AS. Formulation and Evaluation of Herbal Shampoo. American Journal of Pharm Tech Research. 2019;9(05):88-96.