INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)

e-ISSN : 2583-1062

Impact Factor : 5.725

www.ijprems.com
editor@ijprems.com

Vol. 04, Issue 01, January 2024, pp : 519-526

REVIEW ON HAIR CARE COSMETIC - FORMULATION AND EVALUATION OF SHAMPOO BAR [SOLID SHAMOO]

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ABSTRACT

The popularity of shampoo bars has grown in recent years as a result of their sustainability and environmental friendliness. A conventional hair cleaner in a solid form is called a shampoo bar. One of the most popular hair-cleansing beauty items is shampoo. The basic cleansing of hair is only one function of modern shampoo compositions. Shampoo bars don't just eliminate the need for a plastic container. Many are also free of the harsh sulfates typically found in liquid shampoos (sulfates can strip hair of protective oils, causing it to become more dry and brittle). Hair plays a significant role in how attractive the body appears and serves as a health indicator. One of the most popular hair-cleansing beauty items is shampoo. Additional advantages are anticipated, such as conditioning, smoothening of the hair's surface, and hair in good health, meaning free of dandruff, grime, grease, and lice. The biggest difference is that liquid shampoos often contain detergents, which can sometimes strip your hair of its natural oils, while shampoos often do not. In such situations, the use of very destructive chemical products can be avoided by taking advantage of the anti-dandruff properties of plants and various herbs. Development of solid herbal shampoo (bar) formulation using herbs. A dandruff test was conducted on an anti-dandruff formulation developed by modifying the formulation by using raw leaf powder instead of the extract. A type of Malassezia fungus that causes dandruff

Keywords - shampoo, guava leaf, anti-dandruff, salicylic acid, Malassezia species.

1. INTRODUCTION

This is the most common type of hair care. Shampoo is a product that cleans the hair and scalp. Nowadays, there are many brands of shampoos available from various sources, both local and imported from other countries. However, because these shampoos contain harmful chemicals, the purpose of this study was to evaluate whether the shampoos could be replaced with SLS-free products or homemade organic shampoos bar.

Shampoo Bar

a. Hair : Feather is one of the most important features of animals as it plays a role in many functions such as thermoregulation, body protection, distribution of sweat and sebum, sensory and tactile functions, social interaction, and protects the body from heat and cold. , sunlight, pollution, damage and degradatio

b. Hair types : Human hair can be divided into three types: human hair, vellus hair and medium hair. The first type is macroscopically long (> 2 cm), thick (> 0.03 mm), pigmented and found on the scalp, eyebrows, eyelashes, beard and inguinal area. In contrast, vellus hairs are unpigmented, less than 30 microns thick, filamentous, no longer than 2 cm in length, and widely distributed throughout the body, for example on the face and in the bald, hairless area. Medium hairs have a medium length and wide body and are usually found on the arms and legs of adults. The only parts of the human body that do not grow hair are the mucous membranes, palms, feet and lips.

c. Hair Follicle :

Hair follicles are located in the epidermis, extending downwards through the dermis and protruding into the subcutaneous fat layer, forming hair, a flexible tube composed of all keratinized epithelial cells. At the root, the hair

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Vol. 04, Issue 01, January 2024, pp : 519-526

follicle grows into the hair follicle around the dermal papilla. The hair follicle consists of several layers (root sheath, inner root sheath, vitreous membrane, and connective tissue sheath) that support and frame the hair. Focus on the root, which surrounds the hair follicle from the hair follicle to the sebaceous gland level and has three layers of cells: the outer Henry layer, the Huxley layer, and the inner cuticle.

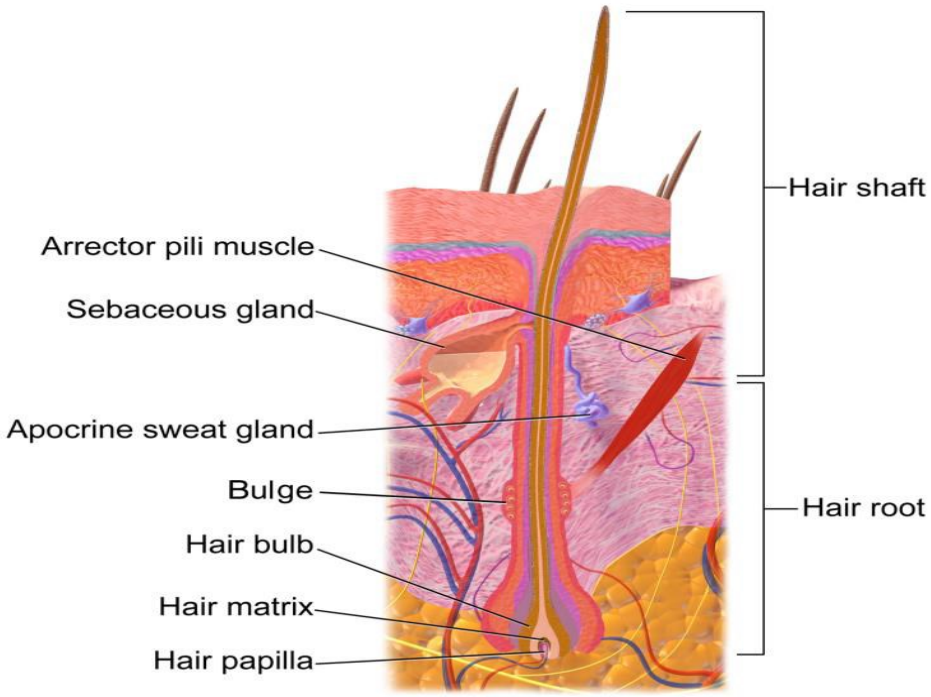

Diagram of a human hair follicle

The chemical composition of hair: Hair fiber contains 65-95% protein by weight and up to 32% water by weight. Additional ingredients are lipid pigments, etc. In addition, glycine, threonine, aspartic acid and glutamic acid, lysine, cysteine and tyrosine are amino acids that make hair important. So, chemically speaking, the properties of human hair are **a** determined by α-keratin.

2. FORMULATING OF SHAMPOO BAR HAIR

1. Formulate a mixture able to clean the scalp and hair and at the same time moisturize it without causing dryness is a complex task. In addition, most of the examples shown above are from surfactants used in conventional shampoos, which in the case of an organic shampoo are not used due to their aggressiveness towards the hair. Therefore, the aim is to formulate a mixture of mild surfactants (solid and liquid) to clean the hair, butters and oils to nourish it, hardeners and powders to give the desired texture and toughness and finally the aroma. The formulation includes several classes of ingredients with specific quantities necessary to create a shampoo.
2. **Surfactant.** A mixture of surfactants must be devised that provides the desired properties of detergency and foaming, cleaning the dirt and the debris imprisoned on the scalp. The most commonly used are fatty alcohol sulphates, but in the context of organic shampoo, the surfactants to be used are mild and accepted in organic cosmetics. Therefore, the base of the formulation is often constituted by an anionic surfactant to offer a lot of foam and detergency, as told before. Surfactants form micelles when added in suitable concentrations, as was previously said. However, in some cases some surfactants can stay apart of the micelles as monomers and interact with the proteins of the scalp, causing irritation. To increase the mildness and reduce the potential irritation caused by anionic surfactants (though mild) a mixture of amphoteric and non ionic is usually added forming larger and stable micelles, reducing the number of monomers and lowering the CMC of the system and consequently the irritation.
3. **Bar Hardeners :** Hardeners are especially needed Therefore, the base of the formulation is often constituted by an anionic surfactant to offer a lot of foam and detergency, as told before. Surfactants form micelles when added in suitable concentrations, as was previously said. However, in some cases some surfactants can stay apart of the micelles as monomers and interact with the proteins of the scalp, causing irritation. To increase the mildness and reduce the potential irritation caused by anionic surfactants (though mild) a mixture of amphoteric and non ionic is usually added forming l A mixture of surfactants must be formulated that will provide the necessary properties and cleanse the scalp of dirt and debris. The most commonly used are fatty alcohol sulfates, but creating a mixture that washes hair and hair while moisturizing it without causing dryness is a complex task. Additionally, most of the

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e-ISSN : 2583-1062

Impact Factor : 5.725

examples shown above are surfactants used in shampoos and are not used in shampoos due to their weight on the hair. Therefore, the aim is to create a mixture of small surfactants (solid and liquid) to cleanse the hair, butters to achieve the strength and desired consistency of solid shampoos. Therefore, to strengthen the bar you need to use fatty acids and fatty alcohols. Plant-derived waxes can also be used as hardeners because they are complex mixtures of alcohols, fatty acids and esters and are highly resistant to moisture, oxidation and microbial degradation. It also improves the viscosity and consistency of the mixture, providing stability.

3. CONDITIONING AGENTS

The conditioning agents are used to provide a greater softness and gloss to the hair and to improve disentangling, essential for dry and damaged hair. In this case of organic solid shampoo these are essentially oils and butters. These can help balance the effect of surfactants of removing oiliness from the hair, preventing hair from drying out. However, they have to be added in certain amounts to ensure hair nutrition but, at the same time, guarantying the hardness of the shampoo bar.

ACTIVE INGREDIENTS : Corresponding to the specific requirements of the shampoo. these can vary depending on whether the shampoo is for oily hair, dry hair, dandruff hair, sensitive hair or Depending on the kind of shampoo, different types of ingredients are added normal hair. humectants, emollients, proteins, clays or other ingredients can be used for this purpose.

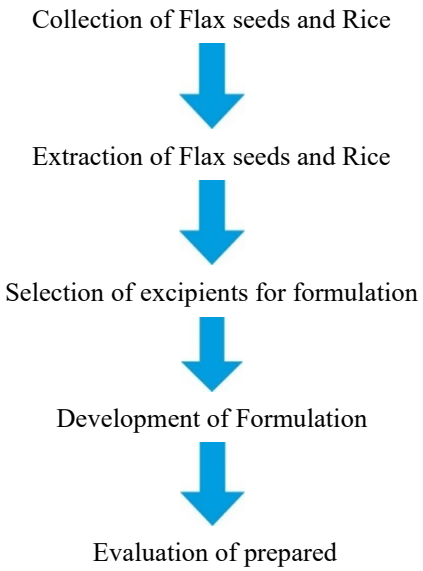
PRESERVATIVES : In the case of solid shampoo, there may be a need to add preservative or not, depending on the amount of water used in the formulation and on the conditions under which it is made. To prevent microbiological contamination, the use of preservative might be necessary.

Aroma- When it comes to fragrance, essential oils give the shampoo the desired scent. Aromatic plants and their natural oils are used for a variety of purposes, including relieving tension and fatigue, creating a sense of relaxation, relieving anxiety and anti-inflammatory effects. They also have 13 antibacterial, hepatoprotective, antiviral and anticancer Properties. Essential oils provide a long-lasting refreshing feeling and add a pleasant scent, shine and conditioning effect.

4. APPLICATION

1. Gentle on hair and scalp: Herbal shampoos are usually free from harsh chemicals such as sulfates and parabens, which can strip the hair and scalp of natural oils and cause damage. Instead, they contain natural ingredients that are gentle and soothing on the hair and scalp.
2. Nourishing and moisturizing: Herbal shampoos often contain natural ingredients such as aloe vera, coconut oil, and shea butter that are known to nourish and moisturize the hair, leaving it soft and shiny.
3. Promotes hair growth: Certain herbal ingredients like amla, bhringraj, and neem are known to promote hair growth and prevent hair fall. Herbal shampoos containing these ingredients may help improve hair thickness and volume.
4. Environmentally friendly: Herbal shampoos are often made using natural, biodegradable ingredients and packaged in eco-friendly materials, making them a more sustainable and environmentally friendly option compared to traditional shampoos.

5. PLAN OF WORK



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6. MATERIALS AND METHOD

1. Flaxseed :

Origin: Flaxseed is a flaxseed belonging to the Linaceae family.

Chemical composition: Palmitic acid, stearic acid, oleic acid, linoleic acid and linolenic acid, sterols, tocopherol, squalene mucus, fixed oil composition

Usage: Flaxseed gel helps hair grow faster and longer by providing nutrients to the hair.

flax seeds

2. Rice :

Origin: rice is a rice grain belonging to the Poaceae family.

Chemical composition: contains starch, water, protein, amino acids, amylose and amylopectin.
Usage: Rice water can help strengthen hair, improve hair shine and appearance, strengthen hair follicles, repair cuticle damage, prevent dandruff and prevent diseases.

Rice

3. Base :

Sulfate-free shampoo base.

Key Ingredients: Water, Propylene Glycol, Sodium Cocoyl Isothionate, Cocoamidopropyl Betaine, Glycol Stearate, Ceteryl Alcohol, Hydrogenated Vegetable Oil, Glycerin, Cococaprylate/Coconut Caprate, Sodium Isothionate, EDTA.

Base

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4. Lavender oil :

Origin: Lavender oil is obtained from the lavender flower belonging to the Lamiaceae family.

Chemical composition: Contains linalool, linalyl acetate, 1,8-cineole, ocimene and terpinen-4-ol.

Usage: Lavender oil helps hair grow faster.

Lavender Oil

5. Reetha

Origin: Reetha is the seed of the soap fruit (Sapindus mukorossi) belonging to the Sapindaceae family.

Chemical composition: contains saponins, sugar mucus and protein.

Usage: Reetha cleans the oily secretions on the skin and can be used as a hair cleanser as it creates a natural foam.

Reetha

7. INGREDIENT

1. Flaxseed
2. Rice
3. Lavender oil
4. Colouring agents
5. Shampoo bar base
   - Aqua
   - Propylene Glycol
   - Sodium Cocyl Isotheonate
   - Cocum Idopropyl Butaine
   - Glycol Stearate
   - Ceteryl Alcohol
   - Vegetable Oil
   - Glycerin
   - Coco Caprate
   - Sodium Isotheonate
   - EDTA

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8. FORMULATION

Sr.No	Ingredients	F1	F2
01	Flax Seed	10 gm	8 gm
02	Rice	10 gm	8 gm
03	Shampoo bar Base	40 gm	40 gm
04	Lavender Oil	2-3 drops	2-3 drops
05	Reetha	1 pinch	1 pinch

9. REQUIREMENT

1. White Plane Muslin Cloth
2. Water Bath
3. Beaker
4. Glass Stirrer
5. Tripod Stand
6. Wire Guaze
7. Pair of Tongs
8. Porcelain Dish

10. PROCEDURE

1. Take a required quantity of flax seed's, soak flax seed's in water for 8-10 hours.
2. Take required quantity of rise and soak in water for 2-3 hours.
3. Boil flaxseed until we get soft mucilage or gel.
4. Stir continuously and check frequently to know if gel is formed or not..
5. After formation of gel pore it in the beaker, with the help of White muslin cloth and filter the flaxseed gel.
6. Boil the rice after it is completely soaked in water.
7. With the help of White plane muslin cloth extract the rice water.
8. Completely Melt the base in Porcelain dish.
9. Add rice water, flaxseed gel and melt base and mix them completely.
10. Add Lavender oil 2-3 drops.
11. Add colouring agent.
12. Pour the formulation in soap mould.
13. Keep in dry place for a day (24hours).

11. EVALUATION TEST

1. FOAM STABILITY: 50ml of the 1% shampoo bar solution was placed right into a 250ml graduated cylinder and secured the cylinder with hand and shaken for 10 times. The overall volumes of the foam contents after 1 minute shaking were recorded. The foam volume turned into calculated handiest straight away after shaking the extent of foam at 1-minute periods for four minutes were recorded.

2. DIRT DISPERSION: Add two drops of 1% of each shampoo to a large tube containing 10 ml of distilled water. Add 1 drop of Indian ink. Close the tube and shake for 10 minutes. The amount of ink in the bubble is measured as none, light, medium or thick**.**

3. DETERMINATION OF SOLID CONTENT: The percentage waste content was determined by weighing approximately 4 grams of the shampoo during evaporation. Determine the weight of the plate and the shampoo bar. Evaporate the liquid part of the shampoo by placing it in the heater. Finally, calculate the weight of the solids present in the shampoo after it dries.

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4. SURFACE TENSION:

Drop Count Method :

Procedure- A mark A, pour the liquid onto a clean stone and then let it fall due to gravity. NO. Count the drops as the liquid flows from point A to point B. Repeat this process 3 times to get an average value [18,20,21**].**

5. pH TEST: The pH of 10% shampoo solution in distilled water was determined at room temperature 250 C with the help of pH meter.

12. RESULT AND DISCUSSION

Shampoo Bar (Solid Shampoo) using Flax seeds and Rice water was formulated and evaluat**ed.**

1. Foam Stability :

The results of foam height determination showed that the Shampoo Ba**r** which is capable to produce high foaming property .

F1	F2
4.5 cm	4.7 cm

2. Dirt Dispersion: The determination of dirt dispersion indicated that the amount of ink in the foam was light in all two formulations, and no dirt would stays in the foam. Dirt that stays in the foam will be difficult to rinse away and it will redeposit on the hair.

F1	F2
Light	Light

3. Determination of Solid Content :

Percentage solid content of all the formulations was ranges from 22.1% to 24.5%, which was in the acceptable range and hence they were easy to wash out from hair.

F1	F2
22.8%	24.5

4. Surface Tension: This term refers to the amount of surfactants present in a shampoo to reduce surface tension. The lower the surface tension, the stronger the shampoo's cleaning power. Shampoos are considered of good quality if they reduce the surface tension of pure water from 72.28 dynes/cm to approximately 40 dynes/cm (Ilton et al., 2007). All tested shampoos showed similar reductions in surface tension ranging from 31.68 to 38.72 dynes/cm. A decrease in surface tension is an indicator of good cleaning effect. The developed shampoo reduced surface tension to 38.72 dynes/cm, which is similar to Herbal Essences® (38.36 dynes/cm). The lowest surface tension provides the best cleaning power.

F1	F2
38.72dyne/cm	34.55dyne/cm

5. pH Test

All the shampoos were acid balanced and were ranged from 5.5 to 5.8, which is near to skin pH.

F1	F2
4.26	4.83

13. CONCLUSION

The shampoo bar formulation F1 and F2 were formulated on the basis of evaluation parameters.

The F1 formulation was showing superior results than that of F1 formulation.On the basis of F1 formulation we can conclude that it is having good hair cleansing activity.

14. REFERENCE

[1] Schneider, M. R.-U. (2009). The hair follicle as a dynamic mini organ. Current Biology 19.3, pp. R132- R142.

[2] Toll, R. (2004). Penetration profile of micro spheres in follicular targeting of terminal hair follicles. Journal of Investigative Dermatology 123.1, 168-176.

[3] Paus, R., & Cotsarelis, G. (1999). The biology of hair follicles. New England journal of Medicine 341.7, 491-497.

[4] Khidhir, K. G. (2010). Regulation of hair growth: Prostaglandins and prostamides. Studies confirming the growth stimulating effects of prostanoids and prostamides on human hair follicles in organ culture and locating their receptors using lipidomics, mole. Doctoral Dissertation, University of Bradford.

[5] Yu, Y., & Yang, W. (2017). Structure and mechanical behavior of human hair. Materials Science and Engineering, 152-163.

[6] Wagner, R. C., & Kunihiko, P. (2007). Electron microscopic observations of human hair medulla. Journal of Microscopy 226.1, 54-63.

[7] Sinclair, R. D. (2007). Healthy hair: what is it? Journal of Investigative Dermatology Symposium Proceedings, 12.2.

[8] Syed, A. N. (2018). The Science of Hair Care. March 3rd 2018.

[9] Alonso, L., & Fuchs, E. (2006). The hair cycle. Journal of Cell Science, 391-393.

[10] M.Lavker, R., Sun, T.-T., & Oshima, H. (2003). Hair follicle stem cells. Journal of Investigative Dermatology Symposium Proceedings, 8.

[11] Organic Cosmetic Science School. August 11th 2018. Fórmula Botânica.

[12] Secchi, G. (2008). Role of protein in cosmetics. Clinics in Dermatology 26.4, 321-325.

[13] Szumnya, A., & Figiel, A. (2010). Composition of Lavender essential oil (Lavender) as affected by drying method. Journal of Food Engineering 97.2, 253260.

[14] Ghosh, S., & Blankschtein, D. (2008). Why is sodium cocoyl isethionate (SCI) mild to the skin barrier? –An in vitro investigation based on the relative sizes of the SCI micelles and the skin aqueous pores. International Journal of Cosmetic Science 30.4, 310.

[15] Rigon, R. B. Development and sensory analysis of shampoo for curly hair. International Journal of Pharmacy and Pharmaceutical Sciences, (2013).270- 273.

[16] Vinod D. Rangari, pharmacy and phytochemistry, volume - I, Career Publication. 335 - 336

[17] K.R. Khandelwal, Practical pharmacognosy, Nirali Publication, 12th edition, 76-78

[18] Kumar A, Rakesh RM. Evaluation of Prepared Shampoo Formulations and To Compare Formulated Shampoo with Marketed Shampoos. International Journal of Pharmaceutical Sciences Review and Research.2010; 3 (1): 120-126.

[19] Harrison JL, Davis KD. Cold-evoked pain varies with skin type and cooling rate: a psycho physical study in humans Pain., 1999; 83: 123–135.

[20] Sorkin M. Shapiro B. and Kass G.S. The practical evaluation of shampoos. J.Soc. Cosmet Chem. 7; 1996: 539-551.

[21] Kumar A and Mali RR, Evaluation of prepared shampoo formulations and to compare Formulated shampoo with marketed shampoos, International Journal of Pharmaceutical Sciences Review and Research. 3 (1); 2010, Article 025: 120-126 .