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## “Formulation and Evaluation Of Herbal Shampoo”

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### 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. Small amount of methyl paraben was added as a preservative and pH was adjusted with citric acid. Several tests such as visual inspection, pH, wetting time, % of solid contents, foam volume and stability, surface tension, detergency, Dirt dispersion etc, were performed to determine the physicochemical properties of both prepared and marketed shampoos. The formulated herbal shampoo was also evaluated for conditioning performance by administering a blind test to 20 student volunteers. The formulated herbal shampoo was clear and appealing. It showed good cleansing and detergency, low surface tension, small bubble size and good foam stability after 5 min. The prepared shampoo and commercial shampoos showed comparable results for % solid contents also. The score of the conditioning performance of the tress washed with herbal shampoo was found to be 3.0 out of 4, while the score of the marketed synthetic and herbal shampoo was 3.4 and 3.3 respectively. The results indicated the formulated shampoo is having excellent conditioning performance, at par with commercially available shampoo.

### 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. 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 .We, therefore, considered to formulate a pure herbal shampoo using traditionally and commonly used plant materials for hair washing in such India and gulf region especially in Oman<sup>(5)</sup>

Hair is one of the vital parts of the body derived from ectoderm of the skin and is protective appendages on the body and considered accessory structure of the integument along with sebaceous glands, sweat glands and nails. They are also known as epidermal derivatives as they originate from the epidermis during embryological development. Hair is an important part of the overall appeal of the human body .Hair is one of the external barometers of internal body conditions. Shampooing is the most common form of hair treatment. The primary function of shampoo is aimed at cleansing of the hair necessitated due to accumulated sebum, dust, scalp debris etc.. Various shampoo formulations are associated with hair quality, hair care habit and specific problems such as treatment of oily hairs, dandruff and for androgenic alopecia. Shampoos are liquid, creamy or gel like preparations. The consistency of the preparation depends on the inclusion of traditional soaps saturated with glycerides and natural or synthetic fatty alcohols or the thickening agents (e.g. gum, resin and PEG).<sup>20</sup> Indian women use herbals as shikkakai and reetha that are natural cleansing agents without harmful effects. Hair is one of the external barometers of internal body conditions. Shampooing is the most common form of hair treatment<sup>(6)</sup>.

#### **BENEFITS OF HERBAL SHAMPOO :**

- More Shine ○ Less Hair Loss ○ Long Lasting Colours ○ Stronger and More Fortified Hairs ○ All Natural, No Chemicals ○ Wont Irritate Skin or Scalp
- Keep Healthy Natural Oils

#### **IDEAL CHARACTERISTICS OF HERBAL SHAMPOO :**

- Shampoo should efficiently rid the hair and scalp of extra sebum and dust. ○ Shampoo needs to wash hair effectively.
- Rinsing with water should make shampoo removal simple. ○ Hair that has been shampooed should be shiny, manageable, and not dry. ○ Hair shampoo shouldn't cause rough hands.<sup>(10)</sup> ○ Shampoo ought not to cause any adverse reactions or irritate the skin or eyes. ○ Shampoo ought to be able to spread and disperse effortlessly across hairs. ○ Shampoo needs to create a thick, opulent foam. ○ It ought to work in modest doses. ○ combability of wet hair. ○ It shouldn't leave your hands chapped and rough.<sup>(11)</sup>

**COMPOSITION OF HERBAL SHAMPOO :**

- Principal Dispersant.
- Surfactant Secondary.
- An anti-dandruff product.
- Conditioning substance
- Pearl-like substance.
- Agent for thickening.
- Colors, Fragrances, and Antioxidants.
- Shampoo is mostly composed of surfactants. The majority of surfactants are anionic principal surfactants, which offer detergency and foam, are the main chemicals utilized in the production of shampoo.
- Shikai is a foam builder.
- Viscosity modifiers: electrolytes such as NaCl, NH, and Cl.
- Natural gums: Alginates, Tragacanth, and Karaya gum. ○ Tissue substitutes: methylcellulose, hydroxyethyl cellulose. ○ Plastics made of carboxyl vinyl: Carbopol 934.
- Other: esters of phosphate, PVP. ,Agents for sequestration: EDTA.

**TYPES OF SHAMPOO :**

- Conventional shampoo
- Medicinal shampoo
- Solid shampoo
- Powder shampoo
- Liquid shampoo
- Cream shampoo
- Jelly shampoo
- Aerosol shampoo

**IMPORTANCE OF THIS FORMULATION :**

- The selection of active ingredients for hair care shampoo is often based on the ability of the ingredient to prevent damage to skin as well as to improve the quality of the skin by way of cleansing, nourishing, and protecting the skin
- It have not make the hand rough and chapped.
- It's not give any side effects or causes irritation to the eye.
- It produces a good amount of foam to satisfy the psychological requirements.

**HERBS USED IN FORMULATION :****1) Shikakai :**

It's amazing how so many of our traditional Indian beauty regimes are making a come-back in this day and age. Take a look at shikakai or Acacia concinna, a climbing shrub that is native to Asia. Shikakai is commonly found in India and has been traditionally used as a hair cleanser in several parts of our country.



Fig 1 : Shikakai

- Biological Name : *Acacia Concinna*
- Family : Mimosaceae
- Uses : Foam base and antidandruff
- Chemical Constituents : Lupeol, spinasterol, acacic acid, lactone, and the natural sugars glucose, arabinose and rhamnose.

2) **Amla** : ○ Strengthen the Scalp and Hair. ○ Reduce premature pigment loss from hair, or greying. ○ Stimulate Hair Growth. ○ Reduce Hair Loss. ○ Prevent or treat dandruff and dry scalp. ○ Prevent or treat Fungal and Bacterial hair and Scalp infections.



Fig 2 : Amla

- Biological Name : *Phyllanthus emblica L.*
- Family : Euphorbiaceae
- Uses : Anti-diabetic, hypolipidemic, anti-microbial, anti-inflammatory, antioxidant, hepatoprotective and anti-emetic activities.

3) **Aloe vera** : ○ Aloe Vera is much more than just an ingredient offering calming coolness. There are several reasons experts recommend using Aloe Vera shampoo to overcome numerous hair issues.

- It contains proteolytic acid that repairs the damaged skin on your scalp while improving follicle health. Besides, it helps combat hair fall, fight dandruff, and nourish your hair. Here's a list of all the benefits that Aloe Vera offers for hair



Fig 3 : Aloe Vera gel

- Biological Name: *Aloe barbadensis miller.*
- Family: Liliaceae or Asphodelaceae
- Uses : wound healing, treat canker ,sores antioxidant and antibacterial properties.

## AIM AND OBJECTIVES :

### **AIM :**

Formulation And Evaluation Of Herbal Shampoo

**OBJECTIVES:**

- To understand how to make shampoo
- To perform quality control test for shampoo
- To understand the importance of herbs in health
- To enhance the knowledge about herbal drugs for human health

**LITERATURE SURVEY:****1) Dr. Akhil et.al :**

Today, lots of shampoos are available in market. But if we use it daily it will be harmful for our hair. By using Ayurvedic herbs, we can prepare Ayurvedic herbal shampoo. We can safely use this in alternate days without any side effects. All the ingredients used here have some medicinal values and it reduces hairfall, also give relaxation to head.

**2) Vineetha K. et.al :**

Shampoos are the cosmetics preparations meant for cleansing the hair by removal of the dirt grease from the hair shaft and scalp. There are wide range of synthetic shampoos available in the market with different functions. But these synthetic shampoo shows harmful effect on the hair and scalp like dryness of hair and keratin loss. Due to these reasons herbal shampoos has evolved as an alternative to synthetic shampoo because of the safe and traditionally used ingredients. Herbal shampoo is a cosmetic preparation which uses herbs and meant for cleansing the hair and scalp just like regular shampoo. Many of the herbs are reported to have beneficial affect on hair and are used in herbal shampoos.

**3) Suyog Sunil Bhagwat et.al :**

In the present study, herbal shampoo was formulated containing suitable ingredient such as *Hibiscus rosa-sinensis*, *Emblca Officinalis*, *Acacia concinna*, *Sapindus indica*, *Eclipta prostrata*, *Aloe barbadensis*, and *Cassia auriculata* in different proportions to formulate and evaluate its physicochemical properties.

**4) Dr. Hingane et.al :**

Shampoos are the cosmetics preparation meant for cleaning the hair by removal of the dirt grease from the hair shaft and scalp. The purpose of using shampoo is to remove dirt that is build up on the hair without out much of the sebum. In the present scenario, it seems improbable that herbal shampoo, although better in performance and safer than the synthetic ones, will be popular with the consumers. Synthetic shampoo shows harmful effect on the hair and scalp like dryness of hair and keratin loss. Due to these reasons herbal shampoos has evolved as an alternative to synthetic shampoo because of the safe and traditionally used ingredients the formulation of shampoo using the extracts of *Embelica officinalis*, *Acacia concinna*, *Sapindus mukorossi*, *Eclipta prostrate*, *Aloe barbudensis* in different proportions, evaluation of organoleptic, physiochemical, and performance tests in terms of visual assessment, wetting time test, pH, assurance of solid contents, detergency, dirt dispersion, conditioning performance, foam volume, and stability was performed.

**5) Priyanka Gaikwad et.al 2018. :**

The objective of this study is to formulate and evaluate poly-herbal shampoo for cosmetic purpose from herbal ingredients. Hibiscus powder, Neem powder, Henna powder, Amla powder, Shikakai powder, Ritha powder, Alo-vera gel was procured from local market in powdered form also gel form Banyan root powder and Soya milk is prepared by homemade method, then prepared decoction of these ingredients and mixing with each other and evaluated for its organoleptic and physico-chemical characteristics. Herbal shampoo is used to cleansing of the hair also conditioning, smoothing, of the hair surface, good health of hair, hair free of dandruff, dirt grease and lice above all, it's safety benefits are expected. The advantage of herbal cosmetics is their



nontoxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in present work, we found good properties for the herbal shampoo and further optimization study benefits of herbal shampoo on human use as cosmetic product.

#### 6) Mane Swati Mahadev et.al 2023 :

Shampoos are used not only for cleansing purpose but also for imparting gloss to hair and to maintain their manage ability and oiliness for hair. Shampoos are of various types, like powder shampoo, clear liquid shampoo liquid shampoo, lotion shampoo, solid gel shampoo, medicated shampoo, liquid herbal shampoo etc. As far as herbal shampoos are concerned in stability criteria. Depending upon the nature of the ingredients they may be simple or plain shampoo, antiseptic or antidandruff. In the present work the herbal shampoo powder has been developed, by using traditional drugs for hair care. The preparation were formulated using , Shikakai Heena, Reetha Tulsi, evaluated for organoleptic properties, powder characteristics, foam test and physical evaluation. The physicochemical evaluation of the formulated shampoo showed ideal results. However, to improve its quality, product performance, and safety, further development and study was required . Two preparations of herbal shampoo powder were formulated using some common traditional drugs used by folk and traditional people of Bundelkhand region (M.P) India, for hair care. The preparations were formulated using bahera, amla, neem tulsi, shikakai henna & brahmi evaluated for organoleptic, powder characteristic's, foam test and physical evaluation. As the selected drugs being used since long time as single drug or in combination, present investigations will further help to establish a standard formulation and evaluation parameters, which will certainly help in the standardization for quality and purity of such type of herbal powder shampoos. Herbal Shampoo is used to cleansing of the hair also conditioning, smoothing of the hair surface, good health of hair, hair free of dandruff dirt grease and live above all, it's safety benefits are expected . The advantage of herbal cosmetic is their non – toxic nature, reduce the allergic reaction. Time tested usefulness of many ingredients. Thus in present work, we found good properties for the herbal shampoo further optimization study benefits of herbal shampoo on human use as cosmetic product .

#### 7) Vijayalakshmi A. et.al 2018 :

**Aim and Objective:** The aim of this present study is to prepare and formulate an herbal shampoo and to assess its physiochemical function that emphasis on safety, efficacy, eliminating harmful synthetic ingredient, and substitute with safe natural ingredients. **Methods:** The formulation of shampoo using the extracts of *Embllica officinalis*, *Hibiscus rosa-sinensis*, *Acacia concinna*, *Sapindus indica*, *Eclipta prostrata*, *Aloe barbadensis*, and *Cassia auriculata* in different proportions. Evaluation of organoleptic, physicochemical, and performance tests in terms of visual assessment, wetting time test, pH, assurance of solid contents, surface tension, detergency, dirt dispersion, conditioning performance, foam volume, and stability was performed. **Results:** The created cleanser was clear and good appealing. It demonstrated good froth stability, detergency, good cleansing, small bubble size, low surface strain, and execution of good conditioning. **Conclusion:** The physicochemical evaluation of the formulated shampoo showed ideal results. However, to improve its quality, product performance, and safety, further development was required.

#### 8) Barde Gourav S. et.al : 2022 :

Herbal shampoo is used to cleansing of the hair also conditioning, smoothing, of the hair surface, good health of hair, hair free of dandruff, dirt grease and lice above all, it's safety benefits are expected. The advantage of herbal cosmetics is their non-toxic nature, reduce the allergic reactions and time tested usefulness of many ingredients. Thus in present work, we found good properties for the herbal shampoo and further optimization study benefits of herbal shampoo on human use as cosmetic product. Herbal shampoos are the cosmetic preparations that with the use of traditional ayurvedic herbs are meant for cleansing the hair and scalp just like the regular shampoo. • They are used for removal of oils, dandruff, dirt, environmental pollution.

**9) Prajwal R. Bhujbal et.al 2023 :**

Shampooing is the most common form of hair treatment. Shampoos are primarily been products aimed at cleansing the hair and scalp. In the present scenario, it seems improbable that herbal shampoo, although better in performance and safer than the synthetic ones, will be popular with the consumers. A more radical approach in popularizing Harbal shampoo would be to change the consumers' expectations from a shampoo, with emphasis on safety and efficacy. The present paper emphasizes on composition, types, methods of evaluation, also a brief review on herbal shampoo formulations Formulating a pure herbal shampoo and assessing and contrasting its physicochemical properties with commercially available synthetic and herbal shampoos were the goals of the study. From this review it conclude that the extracts of *Acacia concinna*, *Sapindus mukorossi*, *Phyllanthus emblica*, *Ziziphus spina-christi*, and *Citrus aurantifolia* will be added in varying amounts to a 10% aqueous gelatin solution to create the herbal shampoo. Also as a preservative, a small amount of methyl paraben will be added, and citric acid used to adjust the pH.

**10) Anushal Sharma et.al 2023 :**

The aim of the study is to formulate a pure herbal shampoo and to compare its physiological properties with marketed synthetic shampoos. The herbal shampoo was formulated by adding the extracts of *Sapindus mukorossi*, *Phyllanthus emblica* and *Acacia concinna* in different proportions to a solution. Shampoos are the cosmetics preparations that meant for cleansing the hairs by removal of the dirt grease from the hair shaft and scalp. There are different types of synthetic shampoos available in the market, but these shampoos shows many harmful effects on the hairs and scalp like dryness of hairs and hair fall. Due to these reasons herbal shampoos are formulated as an alternative to synthetic shampoos because of safe and traditionally used ingredients in them. Herbal shampoos are used for cleansing of the hairs, also smoothing of hair surface, good health of hairs, dandruff free hairs etc. therefore an attempt is made to formulate herbal shampoos that is safer in terms of health and is chemical free.

**METHOD/ PROCEDURE:****Material:**

Shikakai, dried amla, aloe vera gel.

**Apparatus:**

Breaker, glass rod, burner, cooker, pH meter, measuring cylinder, conical flask.

**EXPERIMENTAL DESIGN:****1) COLLECTION OF HERBS:**

The required herbs are collected from market and some of them are collected from the area of college. Washed and dried the leaves and then powdered.

**2) PROCEDURE:**

- Weighed Amla & Shikekai powder ingredients according to the formula.
- Decoction of Amla, Shikekai was prepared in one part of water.
- Filter it, by using muslin cloth. Collect filtrate.
- Decoction of Shikakai, and Ritha was prepared in another part of water.
- Filter it by using muslin cloth collect filtrate mark as 'a'
- Filtered aloe vera gel by using muslin cloth mark as 'b'
- Mixed the both solution 'a' and 'b' with constant stirring

- Mixed gelatin as a thickening agent for maintenance of consistency of herbal shampoo as like semisolid nature.
- Preservatives and perfume was added lastly

### FORMULATION TABLE:

| Ingredients    | Uses                | Quantity |
|----------------|---------------------|----------|
| Shikakai       | Anti-dandruff agent | 10gm     |
| Amla           | Detergent           | 10gm     |
| Aloevera gel   | Reduce Hair Fall    | 1gm      |
| Rose Water     | Perfume             | q.sml    |
| Methyl paraben | Preservative        | 1gm      |
| Gelatine       | Base                | 2gm      |
| SLS            | Foaming Agent       | 1gm      |
| Citric acid    | Adjust pH           | q.sml    |

### 3) EVALUATION OF SHAMPOO:

- **Physical Evaluation Parameters**
- **pH Determination Test**
- **Percentage of Solid Content Determination**
- **Foam Ability Test**
- **Foam Retention Time**
- **Dirt Dispersion Test**

#### 1) Organoleptic Evaluation/ Visual Assessment :

The prepared formulations are evaluated in terms of color, clarity, color etc

#### 2) pH Determination:

The pH of the shampoo is measured by using pH meter or by applying the pH paper on freshly formulated shampoo .

#### 3) Percentage Of Solid Content Determination:

4g of shampoo is taken in a previously weighed evaporating dish and evaporated by placing the evaporating dish on the hot plate. The final weight is noted down. Percentage of solid contents of shampoo left after complete evaporation is calculated.

#### 4) Foaming Ability And Foaming Stability :

The cylinder shake method is employed in the foaming ability and stability test. In this method 50ml of the 1% shampoo solution is taken in a 250ml graduated cylinder and covered the cylinder with hand. The cylinder is then shaken for 10 times. The volume of the foam appeared due to shaking is measured after every one minute consecutively for 5 minutes.

#### 5) Dirt Dispersion Test :

About 1% of shampoo solution taken in a Test tube and 1 drop of India ink is added. The test Tube is stoppered and shaken for about 10 mins The amount of ink present in the foam is indicated as None, light, moderate, or heavy.



**RESULT AND DISCUSSION :**

| Test                 | Observation | Result |
|----------------------|-------------|--------|
| Color                | Brown       | Good   |
| Odor                 | Pleasant    | Pass   |
| Consistency          | Thick       | Pass   |
| pH                   | 4 to 5      | Pass   |
| Solid Content (%)    | 50.5%       | Pass   |
| Foaming Ability      | 11cm        | Pass   |
| Foaming Stability    | 5-7min      | Pass   |
| Dirt Dispersion Test | Light       | Pass   |

**CONCLUSION:**

The aim of this study was to formulate a completely herbal shampoo which is at par with the synthetic shampoo available in the market. We formulated a herbal shampoo by using plant extracts which are commonly used traditionally and lauded for their hair cleansing actions across Asia. All the ingredients used to formulate shampoo are safer than silicones and polyquaterniums synthetic conditioning agents and vis a vis can greatly reduce the hair or protein loss during combing. Instead of using cationic conditioners we have used Shikakai,, Amla, Ziziphus and other plant extracts to provide the conditioning effects. Several tests were performed to evaluate and compare the physicochemical properties of both prepared and marketed shampoos. Our prepared shampoo showed comparable result with that of marketed shampoo for quality control tests but further research and development is required to improve it's over all quality.

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