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FORMULATION AND EVALUATION OF HERBAL SHAMPOO AND TO COMPARE FORMULATED SHAMPOO WITH MARKETED SHAMPOO

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ABSTRACT

To formulate an herbal shampoo powder containing natural ingredients with an emphasis on safety and efficacy, which will avoid the risk posed by chemical ingredients. It clears sebum, dirt, dandruff, promotes hair growth, strengthens, and darkens the hair. Moreover, it also acts as a conditioning agent and performs all these actions without affecting or damaging hair. The herbs amla, bhringaraj, hibiscus, shikakai, Fennugreek Seed, Reetha , Brahmi and Lemon Extract have been selected to formulate the herbal shampoo powder on the basis of the traditional system and scientific justification with modern uses. The physicochemical characteristics of both produced and commercially available shampoos were compared and evaluated by several experiments.

KEYWORD: Herbal Shampoo, Fenugreek Seed, Hibiscus, Brahmi.

1. INTRODUCTION

Hairs are the integral part of human beauty. People are using herbs for cleaning, beautifying and managing hair since the ancient era. As the time has passed synthetic agents have taken a large share but today people are getting aware of there harmful effects on hairs, skin and eyes. These regions attracted to community towards the herbal products, which are less

expensive and have negligible side effects. Hair cleansers or shampoos are used not only for cleansing purpose but also for imparting gloss to hair and to maintain their manageability and oiliness for hairs1.Shampoos are of various types, like powder shampoo, clear liquid shampoo liquid shampoo, lotion shampoo, solid gel shampoo, medicated shampoo, liquid herbal shampoo etc.

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.

Indian women use herbals such as shikkakai and reetha that are natural cleansing agents without harmful effects. A shampoo is a preparation of a surfactant in a suitable form- liquid, solid or powder- which when used under the specific conditions will remove surface grease, dirt and skin debris from the hair shaft without adversely affecting the user.[1,2]

1.1 Anatomy Of Hair

The hair is made up of 95% keratin protein. Each hair has a hair shaft and hair rmat Hair is a protein filament that grows from follicles found in dermis. The hair shaft consists of a cortex and cuticle cells, and a medulla for some types of hair.

The hair structure consists of 3 different parts

Medulla: It is the innermost layer of the hair shaft, made up of an amorphous, soft, oily Substance.

Cuticle: Thin protective outer layer that contains nutrients beneficial for hair growth. It is highly keratinized with cell shaped like scales that are layered one over the other, measuring about 60 micrometers long and about 6 micrometers wide.

Cortex: It is the main constituents of the hair, containing containing long keratin chains which gives. elasticity, suppleness and resistance to the hair. The cells of the cortex are joined together by an intercellular cement rich in lipids and proteins.[3]

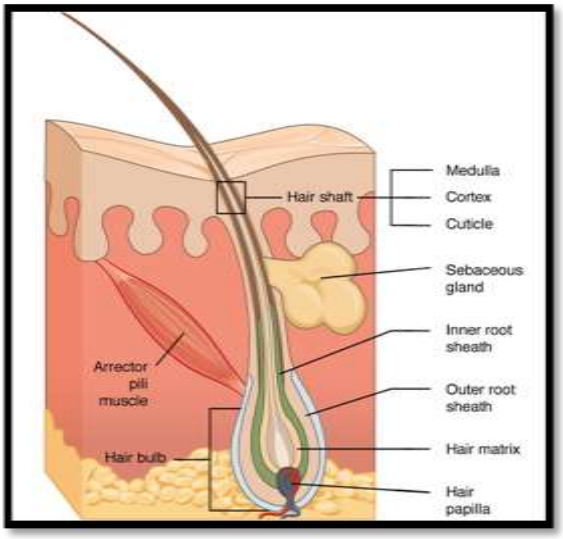

Fig. No.1: Anatomy of hair.

1.2 Benefits of Hearbal Shampoo

- More Shine
- Less Hair Loss
- Long Lasting Cokour
- Stronger and More Fortified Hairs
- All Natural, No Chemicals Wont Irritate Skin or Scalp
- Keep Healthy Natural Oils[4]

1.3 Function of Hearbal Shampoo

- Lubrication
- Conditioning
- Hair Growth
- Maintenance of Hair Colour
- Medication

1.4 Properties of Hearbal Shampoo

- Ease of Application
- Removal of More Debris
- Easy Wet Combing
- Fragrance
- Low Level of irritation
- Well Preserved

1.5 Adavantages of Herbal Shampoo

- Pure and Organic Ingredient
- Free from Side Effects
- No Surfactants
- No Synthetic Additives.
- Earth And Skin Friendly
- No Petroleum based Ingredients

2. OBJECTIVE

- To formulate the herbal shampoo using an extract of amla, ritha, shikakai and understand the uses or application of the ingredients in day to day life.
- To evaluate the herbal shampoo prepared from the extract of amla, ritha, shikakai to understand the stability and applicability of the shampoo.
- To understand the advantages of herbal shampoo over chemical based shampoo and reduce side effect.
- To compare the prepared formulation with marketed formulation & evaluation of herbal shampoo.[4]

3. DRUG AND EXCIPIENTS PROFILE

3.1 Reetha

Synonym- Sapindus mukorossi, Haithaguti, Ritha, Aritha, Dodan

Biological source- Dried fruits of Sapindus Tree

Family- Sapindaceae

Chemical constituents- Present in Reetha are saponins,sugars and mucilage. The seed kernels of Reetha are a rich source of proteins and show a balanced amino acid composition as per the World Health Organization.

Uses- Detergent and antidandruff.[1,6]

Fig. No.2: Reetha.

3.2 Amla

Synonym- Indian gooseberry, emblic myrobalans

Family- Euphorbiaceae

Biological Source- Dried ripe fruits of Embelica Officinalis

Chemical constituent- Ellagic Acid, emblicanine A, emblacani, Gallic acid, Phyllatine.

Uses- Hair growth promoter.[8]

Fig. No.3: Amla.

3.3 Shikakai

Synonym- Acacia Concinna

Biological Source- Dried pods of acacia concinna

Family- Mimosaceae

Uses- Foam base and Anti-dandruff.[9]

Fig. No.4: Shikakai.

3.4 Hibiscus

Synonym- Jaswand, Chaina rose

Biological source- It consist of dried Flowers and leaves of Hibiscus rosa sinessis.

Family- Malvaceae

Chemical constituents - The leaves contain protein, Carbohydrate, minerals, iron, Thiamine,

carotene, riboflavin and Ascorbic acid.

Uses

- It used as hair growth promoter.
- It used as Hair conditioner
- It used to Shine hair and gives smoothness.[1,8]

Fig. No.5: Hibiscus.

3.5 Bhringraj

Synonym- Keshranjana, Keshraja, Markova, Bhunga

Family- Asteraceae

Biological source- It is obtained from entire herb Ecilipta- albaCoumes

Chemical Constituents- Wedoloacetone, demethylwedoloacetone

Uses- Increasing haemoglobin level reducing.[1,8]

Fig. No.6: Bhringraj.

3.6 Fenugreek Seed

Synonyms – Methi, Methika, Chandrika

Family - Leguminosae

Biological source - The plant grows wild In Northern India and is cultivated as a crop throughout India. It is also cultivated in Southern and Eastern Europe, Pakistan, France, Morocco and Egypt.

Chemical Constituents- Saponin glycosides, Coumarin derivatives, Alkaloids, Choline, Proteins, Flavonoids, Prolamine.

Uses

- Used as a tonic, demulcent, aphrodisiac
- Aromatic
- Carminative
- Hypoglycaemic properties
- Powder, if taken internally, to control blood cholesterol level
- Used as a condiment and for flavouring food preparation
- Used in ointments, plasters and poultices[10]

Fig. No.7: Fenugreek seed.

3.7 Brahmi

Synonym- Bacopa monnieri, Water hyssop and herb of grace

Family- Plantaginaceae

Biological Source- Plant Bacopa monnieri

Chemical Constituents- Alkaloid, Bacosides, flavonoids, saponins.

Uses- Make hair stronger, Provides nourishment, Hair look thicker and shinier, Better hair growth.[1]

Fig. No.8: Brahmi.

3.8 Lemon Extract

Synonyms- Citron, Sour fruit, Tart fruit

Biological Source- Lemon trees

Family- Rutaceae

Uses- Add More shine get rid of dandruff, Split ends, Reduces Hair fall.[5]

Fig. No.9: Lemon Extract.

4. MATERIALS AND METHODS

4.1 Materials

Amla, reetha, shikakai, fenugreek seeds, hibiscus, bhingraj, brahmi and lemon extract.

4.2 Experimntal Work

Table 1: Formulation Table.

Material	Quantity	Role
Reetha	5 g	Foaming agent
Amla	5 g	Nourishment to hair
Shikakai	30 g	Anti dandruff agent
Fenugreek seed	5 g	Carminative
Hibiscus	5 g	Stimulates hair growth
Bhringraj	5 g	Increasing haemoglobin level
Brahmi	5 g	Make hair stronger
Lemon Extract	5 g	pH stabilizer

Procedure

- **Drying**

All the powder are in dry form and grinded.

- **Size reduction**

The crude ingredients were collected and these ingredients were size reduced using driven mixer individually.

- **Sieving**

Then this fine powder was passed through sieve no.:80,to get the sufficient quantity of fine powder.

- **Weighing**

All the required herbal powders for shampoo preparation were individually.

- **Mixing**

All these fine ingredients were mixed throughly by mixer to form a homogeneous fine powder.

- **Packing and Labeling**

Then it was packed and labeled suitably.

5. EVALUATION OF HERBAL SHAMPOO POWDER

5.1 Organoleptic evaluation

Organoleptic evaluation on the parameters like colour, odour taste and texture was carried out. Colour and texture was evaluated by vision and touch sensation respectively. For taste and odour evaluation a team of five taste and odour sensitive persons was formed and random sampling was performed.

5.2 General powder characteristics

General powder characteristics includes evaluation of those parameters which are going to affect the external properties (like flow properties, appearance, packaging criteria etc.) of the preparation, Characteristics evaluated under this section are powder form, particle size angle of repose and bulk density. Sample for all these evaluation were taken at three different level i.e. from top, middle and lower level.

5.3 Particle Size

Particle size is a parameter, which affect various properties like spreadability, grittiness etc., particle size was determined by sieving method by using LP. Standard sieves by mechanical shaking for 10 min.

5.4 Angle of repose

It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow.

- **Funnel method**

Required quality of dried powder is taken in a funnel placed at a height of 6 cm from a horizontal base. The powder was allowed to flow to form a heap over the paper on the horizontal plane. The height and radius of the powder was noted and recorded the angle of repose (6) can be calculated by using the formula.

- **Open-ended cylinder method**

Required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface.

Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above two methods, the angle of repose (8) can be calculated by using the formula.

$$0 = \tan\text{-}1(h/r)$$

Where, 0-Angle of repose, h-Height of the heap, r- Radius of the base

5.5 Bulk density

Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed.

5.6 Tapped density

The tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass

readings are taken until little further volume or mass change was observed. It was expressed in grams per cubic centimeter (g/cm^3).[11,12]

5.7 Physicochemical evaluation

- **pH:** pH affect the pharmaceutical consideration as well as it affect the effect of shampoo on hairs. 1gm of powder shampoo was taken and 9ml of distilled water was added to it. pH of the resulting solution was calculated using pH meter at 37°c.
- **Washability:** Formulations were applied on the skin and then ease and extent of washing with water were checked manually.
- **Skin irritation test:** The skin irritation tests revealed that the herbal shampoo powder shows no harmful effect on skin. This is due to the absence of synthetic surfactants. Most of the synthetic surfactants produce inflammation of the eyelid and corneal irritation. But in this formulation of herbal shampoo powder, the uses of all ingredients are obtained naturally. So it does not produce any harmful effect on skin.
- **Foaming Test:** Foaming capacity of the test herbal powder shampoos were calculated using foam stability test with 2 grams of powder with 50 ml water in a graduated cylinder for different time interval.
- **Stability study:** Stability and acceptability of organoleptic properties (odour and colour) of formulations during the storage period indicated that they are chemically and physically stable.[11,13]

6. RESULT AND DISCUSSION

Table 2: Organoleptic Evaluation.

Organoleptic evaluation	Sample	Marketed Formulation
Colour	Light Yellow	Yellowish
Odour	Slight pleasant	Slight pleasant
Texture	Fine smooth	Smooth

Table 3: General powder characteristics.

Powder characteristics	Sample	Marketed Formulation
Particle size	25-30 micrometre	23-29 micrometer
Angle of repose	34°9	34^o
Bulk density	0.354	0.350

Table 4: Physicochemical evaluation.

Test	Sample	Marketed Formulation
pH	5	5
Wash ability	Easily washable	Easily washable

Skin irritation test	No harmful effect on skin	No harmful
Stability study	Stable	Stable

Table 5: Foaming test.

Sr. No	Time	Sample 1			Marketed Sample		
		Liquid	Foam	% Foaming Capacity	Liquid	Foam	% Foaming Capacity
1.	0 Min	23.5 ml	29 ml	123.4	22.5 ml	30 ml	133
2.	5 Min	24 ml	28 ml	116.6	22 ml	29 ml	131.8
3.	10 Min	24.5 ml	27 ml	110	21 ml	28 ml	130
4.	20 Min	25 ml	26 ml	104	21 ml	27 ml	128.5
5.	Average % foaming capacity	113.5			Average % foaming capacity		130.8

7. CONCLUSION

The purpose of this project was to create an herbal shampoo that could compete with commercially available synthetic shampoo. We have used Shikakai, Amla, and other plant extracts to provide anti-dandruff and conditioning properties in place of cationic conditioners. The physicochemical characteristics of both produced and commercially available shampoos were compared and evaluated by several experiments. For quality control tests, our formulated shampoo produced results that were comparable to those of commercial shampoo. The evaluation study revealed strong wetting, good rinsing, stability, foam foaming, and good dirt dispersion activity; however, more research and development are needed to raise the product's overall quality.

8. FUTURE PROSPECTIVE

1. Clinical Trials

Conducting clinical trials to evaluate the efficacy and safety of the formulated herbal shampoo powder.

2. Consumer Acceptance Studies

Herbal powder shampoo would typically evaluate factors such as effectiveness, fragrance, texture, ease of application, and overall satisfaction among users. These studies can involve surveys, interviews, or even product testing trials to gather feedback and insights from consumers. Conducting such studies helps companies understand consumer preferences and improve their products accordingly.

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