Formulation And Evaluation of Herbal Sahmpoo Powder

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***Abstract*— Shampoos (Powder) are the most common products of hair treatment. Shampoo are cosmetic products helps to cleansing the hair and scalp. In the present storyline, it seems good benefits of herbal shampoo, although better in performance and safer than synthetic ones will be popular in consumers. The main object present study is to prepare and evaluate an herbal shampoo and determine physiological function that emphasizes on safety efficacy and quality of the product. Herbal shampoo is the natural haircare product which is used remove grease, dirt, dandruff, promote hair growth, strenthness, and darkness of the hair. Its also provide softness, smoothness and shiness for the hair. Many drugs are used for the preparation of cosmetics or herbal shampoo such a drugs shows various side effects such as hair loss, increased scaling, scratching, discomfort, nausea, and headache. The reason of hair problems are tension and scalp infection, harmone disturbance, lowers vitamin, food, minirals and large chemical shampoo are used. Therefore an efforts is made to formulate and evaluate herbal shampoo that is free from side effects. A more radicle approach in popularizing herbal shampoo would be change the consumer expectation from a shampoo with safety and efficacy. Several tests such as visual assesment, PH determination, surface tension measurment and stability study were performed to determine the physiological properties of formulated shampoo. The conditioning performance and dirt dispersion is evaluated. The result is early is indicates that the formulated is shampoo is having a satisfactory conditioning performance level. Formulation containing suitable ingredients such as Hibiscus, Amla, Shikakai, Soapnut, Reetha, Bhringraj, Methi, Neem, Kalonji, Cinnamon and Rose etc. To overcome all this problems it was the main of our projects, so we prepared multipurpose herbal shampoo for hair treatment.**

Keywords: Herbal Shampoo, Formulation and Evaluation, Conditional performance, Dirt dispersion, Marketed Shampoos.

INTRODUCTION

Shampoo is defined as a it is a hair care product and preparation of surfactant in suitable form of liquid, solid or semisolid used for removal of oil , dirt , skin particle, dandruff, environmental pollutants and other contaminated particle that gradually build in hair. The shampoo is mostly used as cosmetics product. The objective of preparation is to remove unwanted build up without stripping so much sebum as to make hair is unmanageable. The shampoo is most widely used as beautifying agent and are viscous solution of detergent containing suitable additives, preservative and active ingredients. It is usually applied on wet hairs, massaging in hair, and cleansing with water.

In synthetics shampoo, surfactants (synthetic) is added for cleaning and foaming property, but continuous use of this surfactants leads to serious side effects such as eye irritation, scalp irritation, loss of hair and dryness of hairs. Alternative to synthetic shampoo is natural shampoo but it is quite difficult to formulating natural shampoo with only natural substance. There is a number of medicinal plants which have good potential effects on hair used traditionally over the years around world and incorporated in shampoo formulation. The shampoo is a basically a solution of detergent containing suitable additives for other benefits such as hair conditioning enhancement, lubrication, medication etc. Now a days so many shampoo is available in markets they may be synthetics, herbal, medicated, and non medicated shampoo but the popularity of herbal shampoo is more and increasing day by day because of less side effects, chief and safe.

Evaluation of shampoo is done by various tests which are visual assessment, ph determination, density and viscosity. In cheap shampoo contain high amount of detergent and expensive shampoo contain less cheap detergent. Shampoo are the various types which are in powder form liquid shampoo, lotion shampoo, solid gel shampoo, medicated shampoo etc. Depending upon the nature of ingredients the herbal shampoo are have different action such as antiseptic shampoo, antidandruff shampoo and nutritional shampoo which contain vitamin and amino acids. The herbal shampoo is should be ideal when all the important criteria fulfilled, (1) it should be effectively and completely remove dust particle and excessive sebum from the scalp and hair (2) it should be easily remove by water (3) leave the hair dry and soft and manageable (4) impart a pleasant fragrance to the hair (5) couses no side effects or irritation to the skin or hair.

Shampoo:

Shampoo is the most probably used as cosmetics product. It is a hair care product that is used for cleaning scalp and hair in our routing life. Shampoo are mostly utilized as beautifying agent and is a viscous solution of detergents containing suitable additives preservatives and active ingredients. It is normally applied on wet hair, massaging into the hair,

and cleansed by water. The main purpose of using shampoo is to remove dirt that is build up on the hair without stripping out much of the sebum.

History:
Shampoo is part of everyday hygiene and health care. In the 19th century, the art of shampoo travelled from British India to the Empire‟s heart, Britain. It did so thanks, in part, to at least one Indian immigrant, Sake Dean Mahomed (also spelled as Mahomet or Mohamed). The English word „shampoo‟ has its roots within the Hindi term champoo (sometimes champi/champy or champna), which suggests „kneading‟ or „massaging‟. People have always washed their hair and bodies, but washing amid a therapeutic massage of the scalp and therefore the body was imported into Europe, largely through Britain, from India. The word „shampoo‟ didn't take its modern meaning, limited to hair-washing, until the late 1800s. Before the 1860s, shampooing mentioned therapeutic massaging – of not only the top but of the whole body – before bathing
The word shampoo dates back to 1762 and comes from hindi word meaning massage and penetrate. English and hair stylist boiled shaved soap in water and added herbs to give shine and fragrance . Kasey hebert was the first known maker of shampoo, and origin of shampoo is attributed to him. A 1914 ad for canthrox in American magazine. Hans Schwarzkoaf developed his powder powder shampoo in berlin 1903. In 1927 he introduced first liquid shampoo in market and opened the institute for hair hygiene, very first training for hair dressers .

How shampoo works:
Shampoo cleans by stripping sebum from the hair. Sebum is an oil secreted by hair follicles that's readily absorbed by the strands of hair, and forms a protective layer. Sebum protects the protein structure of hair from damage, but this protection comes at a price . It tends to gather dirt, styling products and scalp flakes. Surfactants strip the sebum from the hair shafts and thereby remove the dirt attached thereto .
While both soaps and shampoos contain surfactants, soap bonds to oils with such affinity that it removes an excessive amount of if used on hair. Shampoo uses a special class of surfactants balanced to avoid removing an excessive amount of oil from the hair. The chemical mechanisms that underlie hair cleansing are similar to that of traditional soap. Undamaged hair has a hydrophobic surface to which skin lipids such as sebum stick, but water is initially repelled. The lipids do not come off easily when the hair is rinsed with plain water. The anionic surfactants substantially reduce the interfacial surface tension and allow for the removal of the sebum from the hair shaft. The non-polar oily materials on the hair shaft are solubilised into the surfactant micelle structures of the shampoo and are removed during rinsing. There is also considerable removal through a surfactant and oil “roll up” effect.

Ideal characteristics of Shampoo:
Shampoo formulations seek to maximise the subsequent qualities:
1. Easy rinsing
2. Good finish after washing hair
3. Minimal skin/eye irritation
4. No damage to hair
5. Feels thick and/or creamy
6. Pleasant fragrance
7. Low toxicity
8. Good biodegradability of ingredients
9. Slightly acidic (pH less than 7), since a basic environment weakens the hair by breaking the disulfide bonds in hair keratin.

Types of Shampoo :
According to the nature of the products the shampoo products can be classified as follow.
1. Powder shampoos
2. Clear liquid shampoos
3. Liquid cream or lotion shampoos
4. Solid cream/gel shampoos
5. Oil shampoos
6. Miscellaneous including anti-dandruff medicated shampoo

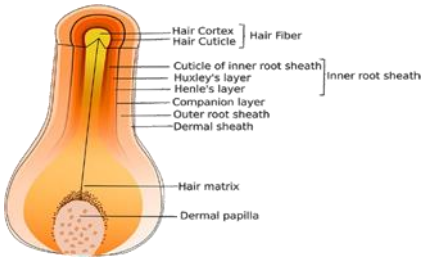
Benefits of Herbal Shampoo
1. More shine hair
2. Less hair loss
3. Long lasting color
4. Stronger and more fortified hairs
5. All natural, no or less chemicals added 6.Doesn‟t irritate skin or scalp.

Advantages of Herbal Shampoo over Chemical Shampoo:
To combat all such problems, it's best to replace to any chemical shampoo which can structure for the loss of nutrients and nullify the damage way. The advantages of this herbal formulation is ,
1. Free from the side-effects
2. No surfactants eg: SLS,
3. No synthetic additives,
4. Good stability.
5. They are less harmful as compared to commercial shampoos.
6. Exposure to harmful chemicals is kept to a minimum and as for the all natural one, there is no exposure to harmful chemicals at all.

Hair:

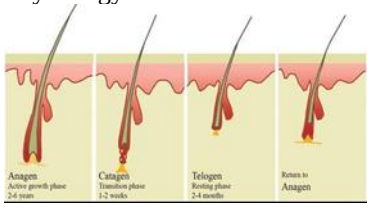
Hair is one of the characteristic features of mammals and it has various functions like protection against external factors; producing sebum , apocrine sweat and pheromones impact on social and sexual interactions , thermo regulation and being a resource for stem cells. Hair is a derivative of the epidermis and consists of two distinct parts the follicle and the hair shaft.
The follicle is the very essential unit for the generation of hair. The hair shaft consist of a cortex and cuticle cells , and a medulla for some types of hairs. Hair follicles has a continuous growth and rest sequence named hair cycle. The duration of growth and rest cycles is coordinated by many endocrine, vascular and neural stimulant depends not only on localization of the hair but also on various factors , like age and nutritional habits.

Anatomy of Hair Follicle :



The hair follicles are a complex and numerous epithelial structure and it enclosed by an outer root sheath (ORS) which help to support hair growth , and inner root sheath (IRS) , and followed the hair fiber up to the openings of the sebaceous gland. The ORS and IRS is separated by the companion layer. The IRS can be subdivided into three distinct layers which are Henle‟s layer, Huxley‟s layer and the cuticle of IRS. Besides these two layers, ORS and IRS, the hair follicles are composed of four other different epidermal layers which are hair matrix, medulla, cortex and cuticle, as well as two dermal tissues dermal papilla and dermal sheath . Among these layers, only medulla is not always present, given that some hairs have no medulla also and others have a medulla relatively large. Each layer itself can comprise numerous individualized cell layers characterized by particular programs of differentiation.

Physiology of Hair :



Hair growth cycle: Hair development may be a continuous cyclic process and every one mature follicles undergo a growth cycle consisting of growth (anagen), regression (catagen), rest (telogen) and shedding (exogen) phases . The duration of the phases changes supported the situation of the hair and also personal nutritional and hormonal status and age.
1. Anagen :
The anagen phase is presented by the onset of the mitotic activity within secondary epithelial germ placed between the club hair and dermal papilla at telogen hair follicle. The anagen is the active growth phase, the follicle enlarges and takes the original shape and the hair fiber is produced. Almost 84–90% of all scalp hairs are in anagen. Through the anagen I–V , hair stem cells proliferate , encloses the dermal papilla , grow lower to the skin and begin to proliferate hair shaft and IRS, respectively. Subsequently, hair matrix melanocytes started to develop pigment and the form of the hair shaft begins to arise in anagen VI, hair bulb and adjacent the dermal papilla formation is realize and the new hair shaft appeared on the skin.
2. Catagen :
At the highest of anagen, mitotic activity of the matrix cells is diminished and thus the follicle enters a highly controlled in volitionary phase mentioned as catagen. Catagen lasts approximately 2 weeks in humans, no matter the location and follicle type. During catagen the proximal of the hair shaft is keratinized and forms the club hair, whereas the distal a neighborhood of the follicle is involuted by apoptosis .
Catagen phase is consisted of eight different stages. The first sign of catagen is that the termination of melanogenesis within the hair bulb. Follicular epithelium, mesenchyme, neuroectodermal cell populations and also perifollicular vascular and neural systems demonstrates cyclic changes in differentiation and apoptosis. However, any apoptosis is occurred in dermal papilla thanks to the expression of suppressor bcl-2 .
Catagen is a process of bulbar involution. The perifollicular sheath collapses and vitreous membrane thickens, eventually, the lower follicles becomes reduce to an epithelial strand, bringing the dermal papilla into close proximity of the bulge. The epithelial strands begins to elongate and eventually reaches to only below the insertion of pilar muscle. After the keratinization of the presumptive club hair , the epithelial strands begin to involute and shorten progressively followed by the papilla which condenses , moves upward and locates to rest below the bulge. The column eventually reduced to a nipple and forms secondary hair germ below the club. The in presence of hairless gene mutation contributed to the failure of dermal papilla migrations towards the bulge area in catagen phase.
3. Telogen :
The telogen stage is defined because the duration between the completion of follicular regression and therefore the onset of subsequent anagen phase.

Telogen stage lasts for 2–3 months. Approximately 11–15 percent of all hair is in telogen stage. During the telogen stage , the hair shaft is transformed to club hair and eventually shed. The follicles remains in this stage unless the hair germ is responsive to anagen initiating signals from the dermal papilla , starts to show enhanced proliferative and transcriptional activity in late telogen, resulting in the initiation of anagen.

Telogen is one among the most of the targets of hair cycle which is influenced by several modulatory agents like androgens , prolactin , ACTH , retinoids and thyroid hormones . Germ cells of telogen follicle also express basonuclin and fribroblast growth factor (FGF-5). The bone morphogenic protein-4(BMP-4) as a growth factor plays an essential role in suppressing follicular growth and differentiation telogen stage .The macro-environment surrounding the hair follicle also takes part in regulating cycle transitions. Telogen with a hair germ that's aware of anagen-initiation signals and capable of entering a replacement anagen phase.

4. Exogen :

There is less interest for the mechanism of the hair shedding but from the patient‟s perspective it's probably the foremost important a part of the hair growth. It is commonplace for human telogen hairs to be retained from quite one follicular cycle and this means that anagen and exogen phases are independent. The shedding period is believed to be a lively process and independent of telogen and anagen thus this distinct shedding phase is known as exogen.

All body hairs undergo an identical life cycle, although its extent, the duration of its phases and therefore the length of individual shafts vary between different body areas and between individuals, counting on genetic programming, genre, age and health status.

There can be some ailments to the normal health of hair and can cause trouble ailments like dandruff, hair loss, etc.

Dandruff :

Formulation For Herbal Dry Powder Shampoo

Sr.No	Ingredient	Quantity (for 150gm)
1	Rose Petal	4 gm
2	Amla	3.3 gm
3	Shikakai	5 gm
4	Reetha	5 gm
5	Methi	7 gm
6	Kalonji	5 gm
7	Cinnamom	7 gm

Dandruff is one of the most common dermatological skin conditions and is a chronic , non- inflammatory condition of the scalp that is characterized by excessive scaling of scalp tissue. Dandruff affects 5-7% of the population and mostly occurs after puberty, between 18 and 30 years and dandruff affects males more than females. Dandruff may be a common scalp disorder, characterized by presence of corneocytes that form clusters thanks to their high cohesive power , within the sort of flaky white to yellowish scales, accompanied by itching .

Treatment:

Dandruff is controlled by fungistatic ingredients which present in Anti-dandruff shampoos. Herbal shampoos have growing demand in the world market. The natural remedies are more acceptable in market because its safe and fewer side effect antidandruff shampoo and nutritional shampoo containing vitamin, amino acids ,proteins hydrolysate . Synthetic and herbal shampoo both are having antidandruff action. But, synthetic shampoo contain cationic, anionic and non anionic surfacant mix in these surfactant having good foaming character but its toxic and caused irritation of eye. A herbal antidandruff shampoo can be formulated which is not only equal to the conventional shampoo in its consistency but also has better health, efficacy and purity.

Hair loss:

Although hair loss is not a serious problem for general health, it is a matter of concern because it can lower self-confidence and create feelings of inferiority. 75-100 hairs loss a day is very common however, dropping over 100 hairs a day lasting longer than a couple of week indicates a serious problem. In general, patients with alopecia have a higher incidence of psychiatric disorders such as depression, anxiety, and social phobia compared to the rest of the population.

Cause of Hair loss :

Androgenetic alopecia (AGA) is more prevalent in men, it is a widespread dermatological problem that also affects women. Up to 30%, 50%, and 80% of the men affected are over the ages of 30, 50, and 80 respectively. Androgens play an important role that appears to be independent from genetic pre disposition, which is considered the main etiologic factor in AGA .

Telogen effluvium (TE) is another frequent cause of diffuse hair loss, but the true incidence is not well known because of in sufficient data, especially due to subclinical cases . Although TE could also be one manifestation of varied chronic systemic illnesses, an association between stress and hair loss is well accepted among clinicians .

Other Cause of Hair Loss:

- Acute illness
- Autoimmune disorders
- Chemotherapeutic agents/ drugs.
- Diabetes
- Hair loss following childbirth
- Hair styling products
- Hair styling techniques
- High iron deficiency

• Nutritional deficiencies
• Other fungal infections
• Physical trauma to the scalp

Materials And Methods:
Herbal shampoo powders were accurately weighed, passed through sieve, prepared by mixing in their ascending order of quantities with continuous trituration, stored in air tight containers and used for further studies. Formulation is subjected to organoleptic studies, general powder characteristics, physicochemical evaluation, ash value, moisture content determination, pH determination, cleaning action, foaming index, dirt dispersion, wetting time ,etc.

Ingredients:
1. Amla:

▪ Synonyms: Indian gooseberry, Emblic myrobalan.
▪ Biological Source : Amla consists of the fresh or dried fruit of *Emblica officinalis* Gaerth (syn. *Phyllanthus emblica* Linn)
▪ Chemical constituents: Gallic acid, Ellagic acid and Vitamin C
▪ Family: Euphorbiaceae.
▪ Uses: used for hair growth, antidandruff, hair darkening ,reduce hair loss.

2. Cinnamon:

▪ Synonyms: Cortex cinnamoni, Ceylon cinnamon, Saigon cinnamon, Chinese cassia, Cinnamomum aromaticum, Cinnamomum laurus.
▪ Biological Source: Cinnamon is the dried inner shoot of the coppiced shoots of *Cinnamomum zeylanicum* Nees.
▪ Chemical Constituents Cinnamaldehyde, Cinnamic acid and Eugenol
▪ Family: Lauraceae
▪ Uses: lice treatment , hair growth

3. Kalonji :

▪ Synonyms: Small Fennel, Nigella Seed, Black Cumin, Fitch (Biblical)
▪ Biological Source: It consists of dried ripe seeds of Nigella Sativa
▪ Chemical Constituents: Thymoquinone, Thymohydroquinone, P-cymene, carvacrol,4 Terpineol, t-Anethol and Alfa-Pinene
▪ Family: Ranunculaceae.
▪ Uses: Improves scalp health, reduce dryness, improves blood circulation, promote hair growth , prevent premature graying, reduce hair fall.

4. Neem:

▪ Synonym: Neem, Margosa, Azadirachta Indica, Indian Lilac
▪ Biological Source: Neem consists of almost all parts of the plants which are used as drug. Some important morphological parts are the dried stem bark, root bark, leaves and fruits of *Azadirachta indica* also, known as *Melia azadirachta*.
▪ Chemical Constituents: Quercetin, Nimbosterol, Nimbin, Azadiractin.
▪ Family:Meliaceae
▪ Uses: Antiseptic,

5. Methi:

▪ Synonyms: Methi, Methika, Chandrika, Fenugreek, Greek hay.
▪ Biological Source: Methi consists of dried ripe seeds of *Trigonella foenum-graecum* Linn.
▪ Chemical constituents: Diosgenin, trigocoumarin, Trigoforin, Trigonelline, Flavonoids and Prolamine
▪ Family: Fabaceae.
▪ Uses: Cleaning, softening and shining of hairs.

7. Shikakai:

▪ Synonyms: Shikakai, sap-pod,
▪ Biological sources: It consists of dried fruit of *Acacia concinna* .
▪ Chemical Constituents: Lupeol, Spinasterol, Acacic acid, Lactones, Glucose, Arabinose, Rhamnose and Ascorbic acid
▪ Family: Mimosaceae.
▪ Uses: foaming, antidandruff, Antifungal, Antibacterial, Anthelmentic.

9. Reetha:

▪ Synonyms: Aritha, arishta, Soapnut, washnut , Three-leaf soapberry, Kumbhabeeja
▪ Biological sources: It consist of dried fruits of *Spindus mukorossi*.
▪ Chemical Constituents: Soponins, Hedera-genin, oleanelic acid, Sopindic acid
▪ Family: Sapindaceae
▪ Uses: Foaming and detergent , Mucolytic, Emetic, anti inflammatory, Antimicrobial and Epelepsy.

10. Rose:

▪ Synonyms: Shatpatri, Taruni, Charukeshra
▪ Biological source: It consists of dried petals of *Rosa centifolia*.
▪ Chemical Constituents: Phenyl ethanol, Geranyl acetate, Geraniol, Linalool, Benzyl Alcohol and Benzaldehyde.
▪ Family: Rosaceae.
• Uses: Promot hair growth, Fragrance

METHOD OF FORMULATION

Herbs have long been related to hair care and are often ingredients of conditioners, shampoos and rinses. The selection of active ingredients for hair care powder is usually supported the power of the ingredient to stop damage to the skin also on improve the quality of the skin by of cleansing , nourishing and protecting the skin.The Herbal shampoo powder was formulated using above natural ingredients, selected herbal drugs in dried form were purchased from the authenticated agencies. Herbs along side their part utilized in shampoo and quantity taken are tabulated in

Procedure for Formulation:
Formulation of Herbal shampoo powder
1. Drying: All the powder are in dry form and grinded .
2. Weighing: All the required herbal powders for shampoo formulation was weighed individually.
3. Size reduction: The crude ingredients were collected and these ingredients were size reduced using hand driven mixer individually.
4. Mixing: All these fine ingredients were mixed thoroughly by mixer to form a homogenous fine powder.
5. Sieving: Then this fine powder was passed through sieve no: 80, to get the sufficient quantity of fine powder.
6. Packing and labeling: Then it was packed and labeled suitably.
7. Preparation Quantity taken for 100g of Herbal Powder Shampoo.

EVALUATIONS:
Prepared formulation of shampoo were subjected to following evaluation parameters.
1. Organoleptic character
a. Odor
b. Color
c. Texture
d. Taste
2. Angle of repose
3. Bulk density
4. Tap density
5. Moisture content

1.Organoleptic character:

Organoleptic evaluation studies were performed by taking the samples randomly for the parameters like color, odor Taste and texture .

2. Moisture content:

Moisture content in the formulation is very important evaluation parameter as it contains herbs which are liable to be attacked by environment. Two gm of powder was taken and which kept in oven and dried up to two constant reading and percent moisture content was calculates as w/w.

3.Cleaning action:

5 Grams of wool was placed in grease , after that were placed in 200ml. of water containing 1 gram of herbal shampoo in a flask .Temperature of water were maintained at 35 c . The flask were shaken for 4 minute 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 the equation.

4.pH:

The pH of 10% shampoo solution in distilled water were determined at room temperature 25o C. the pH was measured by using digital pH meter.

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RESULTS AND DISCUSSION

Two formulations SN1 and SN2 of herbal powder were prepared using Harad, Bahera, Amla, Shikakai, Neem, Tulsi, Henna and Bramhi in different composition (Table-1) of crude drugs. These formulations were prepred using mixing in ascending order by weight and with continuous trituration. Bot preparation (SN1 and SN2) were evaluation organoleptically observing colour, odour, taste and texture. Results shows a slight change in colour only (Table – 2). General powder charecterestics of both formulations was found nearly same. The extractive values (% w/w) in organic solvents like petroleum ether, chloroform benzene, acetone and methanol was calculated shown in table-2. Moisture content was found to be 2.0% w/w respectively for SN1 and SN2 formulations.

CONCLUSION

The present study carried out with the aim of preparing the herbal shampoo that reduces not only hair loss during combing, but also safer than the chemical conditioning agents as well as to strengthen the hair growth. The world market is additionally moving towards herbal medicines for health care, health foods and for cosmetic purposes including hair preparations. India is rich heritage for cultivation and production of herbal medicines thanks to its diversified climate . Present study is to successful preparing herbal shampoo which containing herbal extract which is traditionally used for hair cleansing in India and cosmetic perpose. All the ingredients used for the preparation of herbal shampoo are safer than marketed commercial herbal shampoos. Formulated herbal shampoo include not only, cleaning but also includes basic scalp treatments eg. Kalonji: improves scalp blood circulation and promote hair growth, Cinnamon: help in prevention from lice and fungus, shikakai shows antidandruff property and neem: includes the antibacterial and antimicrobial effect.

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