



Formulation and Development of Polyherbal Hair Dye

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Abstract :

The increase of natural and health hazards in the manufacture of dyes. Its use throughout the world is a major concern. In this work was made possible while investigating the alternative to semi synthetic and synthetic dyes. The herbal dye composition of 100% herbal hair dye consist of 30% aqueous extract of Cymphomandra betacea containing 10% tannins, 35% flavanoid and 30% aqueous extract of Tagetes erecta containing 20% carotenoid and 40% Aloe vera gel, as natural mordant, containing 98.5% water and 0.3% polysaccharide. Hair dye compositions containing aqueous extract of Cymphomandra betacea and aqueous extract of Tagetes erecta blended with Aloe vera gel, a natural mordant the present study is also directed to synergistic. After this study is directed to method for coloring hair, by applying an effective with distilled water as an acceptable carrier amount of the herbal hair dye composition. The herbal hair dye without causing any hair loss or skin irritation or hair damage when compared to the semi synthetic and synthetic dyes are shows permanent dyeing to the applied regions of human hair. The active constituent also prevents the hair from damage caused by pollution and photoreaction. This formulation proves to be a vital alternative for the semi synthetic and synthetic dyes.

Key words: Tagetes erecta, Aloe vera, synthetic dye flavonoids and Cymphomandra betaceae

Keywords: Hair dye temporary, Semipermanent, Permanent, Action Mechanism, Tagetes erecta, Aloe vera.

INTRODUCTION :

It was a 5000 years bc among the Egyptians was the art of hair dyeing was known. Herbal hair color is used in various disorders such as dandruff, premature graying and head lice etc. In comparison to synthetic hair dyes, natural hair dyes are reported to cause skin and other skin related diseases. The manufacturing process is dangerous to health of the people involved in the process and its applications leads to environmental pollution. Causes potential side effects to the consumers of the product. The side effects from the synthetic dyes has limited use by health conscious customers throughout the world and has to overcome various regulatory barriers before it reaches its destination. A dye can generally be described as a colored substance that has an affinity to the fiber hair. The dye is generally applied as aqueous solution, it may require a mordant to

improve the fastness of the dye on the fiber hair. mordant dyes referred as a also natural dye . Different mordant will give hair color with the same dye. Since ancient times plants have been used for they play a key role in food, textile and cosmetic dyeing . Among them, walnut husk dyeing and henna leaf and were the most efficient natural hair dyes. Nowadays, hair dye is a important phase of development. since the Second World War,applications of new synthetic dyes has occurred great progress in discoveries . Brazil is a country that, because of its presents almost all the hair types , high miscegenation, . Further , the great importance of women give to their hair treatments, Brazil is now the world leader in hair dye products .The use of cosmetics in order to change hair color, occurs with high frequency such as hair dye products, mostly among the female population . However, the hair dyes their mechanisms action, it was cause serious damage to hair fiber structure . Throughout people history, many people have to change the appearance of their hair because it was way to differentiate the social status. Hair dye used since Ancient Egyptian times when Rameses II reinforced red hair color using henna. In Ancient Greece, hair was bleached with rinse of potassium solution and rubbed with a type of ointment made of pollen and yellow flower petals . Nowadays, hair dyes are important phase of development . since the Second World War, great progress in discoveries and applications of new synthetic dyes has occurred. Nevertheless, the dye market has focused on exports, mainly to South American countries.

1. STRUCTURE AND COMPOSITION OF HAIR:-

1.1 Hair scalp anatomy:-

The hair on our body grows from hair follicles, which are located at the junction of the deep layers of the subcutaneous layer and the dermis. These follicles, also known as hair bulbs, are responsible for producing the hair shaft. The hair shaft is supplied with blood flow through small blood vessels that run through the center of the hair, providing it with vital nutrients such as vitamins, amino acids and mineral salts that it needs to stay healthy.

The hair shaft is also surrounded by glands, with the sebaceous gland being the most important. This gland produces sebum that acts as a natural lubricant for the hair. Sweat glands on the scalp wick away sweat through pores on the surface. The hair shaft itself is made up of 95% keratin, a helical protein that is synthesized by keratinocytes. Keratin is insoluble in water and provides protection and impermeability to the hair

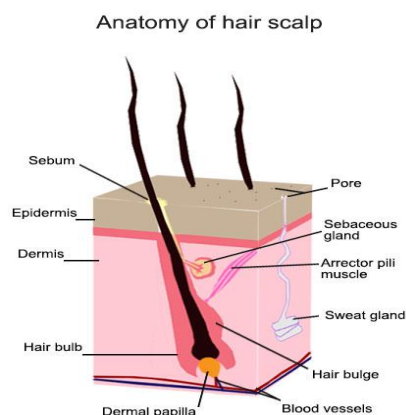


Fig1. Anatomy Of Hair Scalp

Hair also contains 18 different amino acids such as proline, leucine, threonine and arginine. Keratin is particularly rich in cysteine, a sulfur amino acid that forms disulfide bonds between molecules, giving hair rigidity and resistance to its entire structure. Hair fiber varies in diameter by race, with Caucasian hair typically fine and thin, African hair larger in diameter and slightly oval, and Mongolian hair being flat to wavy with a similar cross-section to Caucasian hair.

1.2 Composition and Morphology of Hair Fiber

The hair shaft is composed of dead skin cells that have undergone a process of keratinization, originating from hair follicles, which are invaginations that protrude into the subcutaneous tissue or dermis. In addition to keratin, hair also contains small amounts of water-soluble substances such as uric acid, penten, phenols, glycogen, glutamic acid, leucine and valine. The hair shaft itself is divided into four main structures: the cell membrane complex (cmc), the cuticle, the cortex, and the pith.

Medulla: the innermost layer of the hair shaft, composed of an amorphous, soft, oily substance.

The pith is the innermost region and its presence along the hair shaft is usually discontinuous or even absent and does not interfere with the hair structure. The pith can be empty or filled with fungal keratin, can serve as a reservoir of pigment and can contribute to the brightness of the hair. The concentration of lipids within the pith is greater than anywhere else in the hair.

Cuticle: a thin protective outer layer that contains the nourishing part necessary for hair growth. It is highly keratinized, composed of scale-shaped cells that are layered one over the other, measuring about 60 micrometers in length and about 6 micrometers in width.

Cuticles (which consist of amorphous and proteinaceous material) are the outermost part of the hair shaft and provide chemical resistance. These cuticles fulfill the function of regulating the amount of water in the structure of the hair, thus preserving its physical properties. It contains six to ten layers of overlapping cells in the longitudinal direction of the fiber. Cuticle damage can be caused by the weather or mechanical friction such as combing and brushing. Excessive use of shampoo and other inappropriate cosmetics can damage the hair. Each cuticle cell contains a thin outer membrane (5.0 to 10.0 nm) probably formed by a fatty acid layer attached to the protein layer via thioester linkages, which produces the cysteine residues responsible for the apparent hydrophobic character of the fiber.

The cuticle contains three important layers: the A-layer (120 nm) with a high cysteine content and highly cross-linked; exocuticle (B-layer), also rich in cysteine and occupying about half of the cell volume; and finally the endocuticle, a layer with low cysteine content and relatively high levels of basic (lysine, arginine) and diacidic (aspartic and glutamic acid) amino acids.

Cell Membrane Complex (CMC): The CMC is an important layer in the hair structure consisting of cell membranes and an adhesive material that "glues" or connects the cortical and cuticle cells. Chemically, CMC is composed of proteins, polysaccharides and ceramides. It is also responsible for the hair's natural moisture, making it shiny, transparent and hydrated. Its outer lipid layer forms the epicuticle and the inner lipid layer is found between the cuticle cells, which consist of a δ -layer formed by proteins with a low cystine content (<2%) and richer in polar amino acids (12% basic and 17% acidic). The CMC and endocuticle are usually referred to as non-keratinized regions because they have a low level of sulfur amino acids and studies have shown that they are important pathways for the diffusion of molecules into the inner regions of the hair fiber.

Cortex: the main component of the hair, containing long keratin chains that give the hair elasticity, flexibility and resistance. The cells of the cortex are connected by an intercellular cement rich in lipids and proteins. Each cell consists of bundles that lie in the direction of the length of the hair: these are macrofibrils, which are composed of microfibrils, which in turn contain protofibrils.

The cortex is the main component of the hair and consists of cylindrical cells about 1 to 6 μm thick and 100 μm long. It forms the matrix where other proteins and keratin are located, and forms the greater part of the fibrous mass of the human hair, which is made up of intracellular and intercellular material. The bark represents 90% of its total weight and consists of keratin-filled cells with an organization that provides the fibers with mechanical properties. Cortical cells adjacent to the cuticle are flatter and contain less sulfur than cells within the cortex, which are rich in cystine (two cysteines), amino acids, lysine and histidine in addition to melanin granules.

The matrix contains the main structure of the hair and contains a high concentration of disulphide bonds. In contact with water, it shows significant swelling and forms a slightly cross-linked gel structure. Although there are amorphous regions, the matrix represents small parts with structural organization. It shows keratin macrofibrils aligned in the direction of the hair shaft and melanin granules, which are responsible for the color of the hair and its photoprotection.

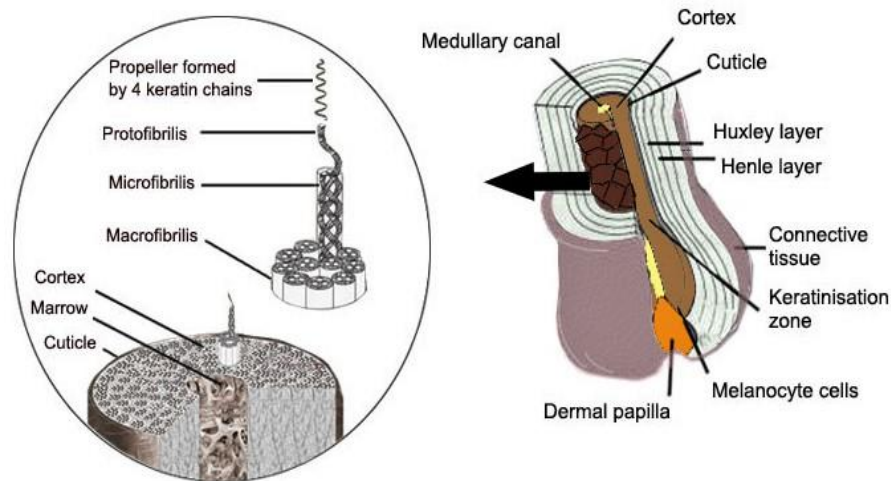


Fig. 2- Structure of hair and onion[9]

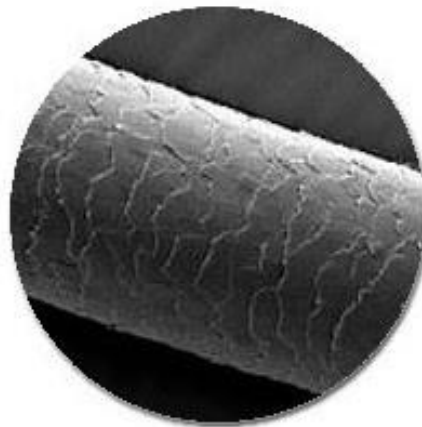


Fig. 3- Hair structure, scales[9]

1.3 Role of melanocytes and keratinocytes:-

The hair cortex also contains melanin. Melanin is produced by specialized cells called melanocytes and is the pigment responsible for hair color.

Melanocytes located near the hair bulb inject pigments into the keratinocytes of the new hair shaft.

The color lasts throughout the hair cycle, from the beginning to the end when the hair falls out.

1.4 Causes of hair bleaching:-

1. Vitamin Deficiency: Any deficiency in vitamin B-6, B-12, biotin, vitamin D, or vitamin E can contribute to premature graying. A 2015 report in the journal Development cited various studies of vitamin D-3, vitamin B-12, and copper deficiencies and their association with hair graying. He finds that nutritional deficiencies affect pigmentation, suggesting that color can return with vitamin supplementation.

2. Genetics: According to a 2013 report in the Indian Journal of Dermatology, Venereology and Leprology, premature graying of a person's hair is largely linked to genetics. Race and ethnicity also play a role. Premature graying in white people can start as early as age 20, according to the same 2013 study, while it can be as early as age 25 in Asians and as early as age 30 in African-American populations.

3. Oxidative Stress: While graying is mostly genetic, oxidative stress in the body can play a role when the process occurs prematurely. Oxidative stress causes an imbalance when antioxidants are insufficient to counter the damaging effects of free

radicals. Free radicals are unstable molecules that damage cells, contribute to aging and disease. Too much oxidative stress can promote the development of diseases, including the skin pigment vitiligo. Vitiligo can also turn hair white due to melanin cell death or loss of cell function.

4. Certain medical conditions Certain medical conditions, including autoimmune diseases, can increase the risk of premature graying. In fact, research published in 2008 showed a link between hair abnormalities and thyroid dysfunction. White hair is also common in alopecia areata, an autoimmune skin disease that causes hair loss on the scalp, face, and other parts of the body. When the hair grows back, it tends to be white due to the lack of melanin.

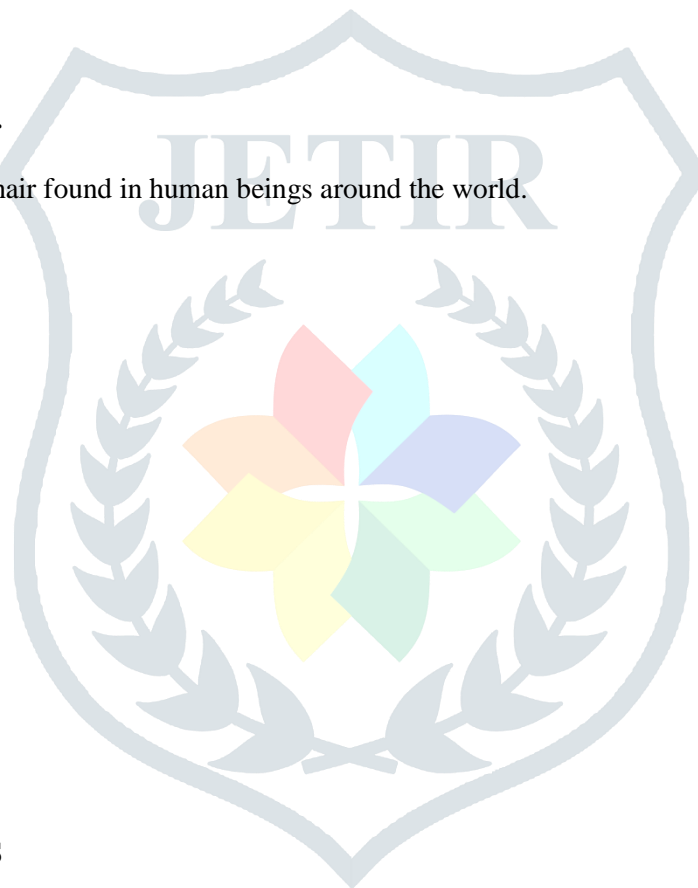
5. Smoking: A 2013 study published in the Italian Dermatology Online Journal shows that smokers are 2 1/2 times more likely to start going gray. Trusted source 30 years ago as non-smokers. A 2015 study in the Journal of the American Academy of Dermatology also found that smoking is linked to premature graying of hair in young people.

6. Chemical hair dyes and hair products: Chemical hair dyes and hair products, even shampoos, can contribute to premature graying of hair. Many of these products contain harmful ingredients that reduce melanin. Hydrogen peroxide, which is in many hair dyes, is one such harmful chemical. Excessive use of products that bleach the hair will also eventually cause it to turn white.

1.5 Levels of natural hair color

Below are the natural shades of hair found in human beings around the world.

1. black
2. darkest brown
3. dark brown
4. brown
5. light brown
6. dark blonde
7. blonde
8. light blonde
9. very light blonde
10. platinum



2. TYPES OF HAIR COLORS

There are four most common hair color classifications

(i) Temporary hair dyes

Temporary hair color is available in a variety of forms including rinses, shampoos, gels, sprays and mousses. Temporary hair colors are typically brighter and more vibrant than semi-permanent and permanent. The pigment molecules in temporary hair colors are large and cannot penetrate the cuticle layer. The remaining color particles are absorbed into the hair shaft and are easily removed with a single shampoo. It takes approximately a few hours to a day.

(ii) Semi-permanent hair dye

Semi-permanent hair color has a smaller molecular size than temporary dyes and is therefore able to partially penetrate the hair shaft. This is why hair color can last 4-6 shampoos or several weeks. Semi-permanents contain no or very low levels of developer, peroxide or ammonia. However, it may contain a toxic compound such as P-phenylenediamine or other agents.

(iii) Demi-permanent hair dyes

Demi-permanent hair dyes are permanent hair dyes that contain an alkaline agent other than ammonia (e.g. ethanolamine, sodium carbonate) and when always used with a developer, the concentration of hydrogen peroxide in this developer may be lower than in permanent hair dye.

(iv) Permanent hair color

All permanent hair dyes and lighteners contain a developer or oxidizing agent and an alkalizing agent (most commonly ammonia). When a dye containing an alkalizing agent is mixed with a developer, a chemical reaction occurs that swells the hair, allowing the dye to enter the cortex where the melanin resides. Ammonia swells the hair cuticle to allow color pigments to penetrate deep into the hair shaft. Permanent colors are truly permanent and do not wash out, although they may fade.

2.1 How chemical hair coloring works:

With temporary hair dyes, they simply adhere to the cuticle like a coating. So the color generally lasts 1 to 2 washes.

Semi-permanent hair dyes have molecular pigments that are small enough to slip between the scaly cells of the cuticle and adhere to the cortex. The color usually fades after 5 to 10 washes.

Permanent hair dyes cause permanent chemical changes to the hair and the color change lasts until the hair grows back or falls out. Permanent hair colors use a chemical such as ammonia or a milder substitute to open the scaly cells of the cuticle. Another chemical called a developer is then used to remove the natural hair color from the melanin and start chemical reactions that oxidize and deposit the new color in the hair cuticle. The chemical dye resists multiple washings and the color does not fade. While color retention is good, the cuticles are damaged and the moisture in the hair is reduced, resulting in dry and damaged hair.

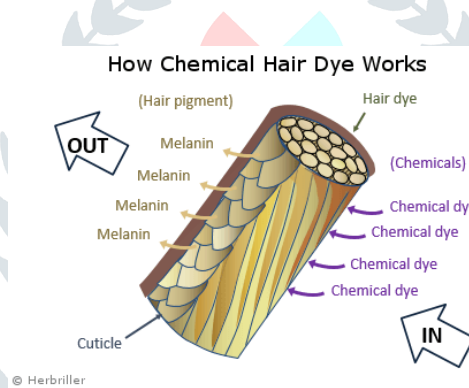


Fig. 4- Working with chemical hair dye

2.2 How natural hair dyeing with henna works :

Henna itself contains a natural red coloring component called lawson. When used to dye hair, the henna paste coats the hair shaft and the lawson gradually migrates from the henna to the hair shaft through the gaps in the cuticle, then combines with keratin and strengthens the cuticle. The result is naturally colored hair. With repeated use, the hair color settles and deepens.

The strength of the hair will increase and the ability of the hair to retain moisture will also be strengthened. In addition, the condition of the scalp improves, hair loss and dandruff are reduced. The henna coating on the surface protects the hair from UV radiation and pollution, resulting in healthy and overall shiny hair.

Herbriller covers white and gray hair using henna (and its coloring component lawson) as one of the 100% natural ingredients. For customers looking for something other than lawson orange, Herbriller has a range of colors that contain other natural dyes such as indigo to achieve different shades of brown for hair.

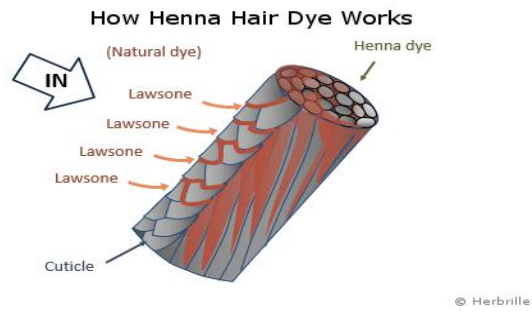


Fig.-5 Treatment of hair dye with henna

3. DIFFERENCES BETWEEN NATURAL Henna AND CHEMICAL HAIR DYES –

Effects	Henna Hair Dye	Chemical Hair Dye
	<ul style="list-style-type: none"> Naturally colors hair Increases the strength of hair Strengthens water retention capacity 	<ul style="list-style-type: none"> Good color development and long color retention Damages cuticles Reduces moisture
On Hair	<ul style="list-style-type: none"> Protects cuticles, with resulting improvements in luster, body and volume Coloring component bonds with hair, with resulting stability in color and coloration 	<ul style="list-style-type: none"> Damage and disintegration of cuticles due to effects of chemicals used to bleach and dye hair, resulting in split ends and dry hair
On Scalp	<p>Henna component</p> <ul style="list-style-type: none"> Moisturizes and protects scalp Maintains clean scalp Prevents inflammation Antioxidant that improves hair growth environment with effective hair and scalp treatment 	<p>Chemical stimulus induces</p> <ul style="list-style-type: none"> Dryness, inflammation, keratosis of scalp (bumpy, waxy-appearing skin growths) Loss in moisture balance of scalp, resulting in sebum secretion Damage to hair matrix cell, resulting in change to hair growth cycle and deterioration of hair growth environment by damaging hair and scalp
Overall	Prevents ageing of hair and scalp	Accelerates ageing of hair and scalp

Table No. 1- Differences between natural henna and chemical hair dyes

4. ADVANTAGES OF HERBAL HAIR DYE OVER SYNTHETIC HAIR DYE:-

The prepared herbal hair color contains all the goodness of natural ingredients. In addition to acting as a hair color, this formulation also acts as a hair growth stimulator, hair conditioner, conditioner and anti-dandruff agent thanks to the perfect blend of herbs. Henna acts as a basic powder, it acts as a universal hair dye, which is used all over the world for its coloring properties. It is also beneficial in removing excess oil from the scalp and nourishes the hair well. Reetha restores the health of dull, dry and damaged hair. Bhringraj helps improve blood circulation at the hair roots by providing more nutrients to promote hair growth. Jatamansi extract helps in hair growth. It is also beneficial for smooth, silky and healthy hair. Shikakai is loaded with vitamins A, C, D and K, which together form a powerful antioxidant. This antioxidant is probably all your hair needs to cleanse your scalp of sebum build-up, unclog pores, kill infection-causing bacteria, and stimulate hair growth. Regular use of hibiscus flower juice can easily reduce the control of hair fall, dandruff and gray hair even if you are 50 years old. This is an age-old remedy for all people who struggle for healthy hair without gray hair. It also contains essential fatty acids that strengthen hair follicles and provide shine and new life. Sufficient vitamin C in amla helps to stop premature greying. It is a great hair conditioner as well as a dandruff remover. Tea gives the hair a perfect color in combination with other herbs. It is good for hair growth and fights dandruff. Hair coffee strengthens the hair by improving its overall quality and structure. It is absorbed by the follicles, making them instantly softer and shinier. The results of the organoleptic evaluation revealed that the package is a smooth and pleasantly smelling powder. Physico-chemical parameters showed that the moisture content was only 1.9%. The pH has been found to be neutral to suit the needs of different scalp types. The ash value was found to be nominal, indicating the presence of inorganic radicals in appropriate amounts. It shows the presence of major phyto-components that act as true nourishment for the scalp and hair. The irritation test revealed negative results for irritation, redness and swelling as the herbs in their natural form without the use of artificial additives were compatible with hair proteins. Stability tests carried out at different temperatures over a regular period of one month revealed the inert nature of the pack in terms of colour, smell, appearance, texture and pH. From the above observations, since the formulation is made up of naturally occurring dried plant ingredients, there is almost minimal possibility of deterioration of the formulation as there is no moisture containing substance in raw or processed form. The formulation was stored for one month at room temperature to observe changes in its color, smell, texture and appearance. The pH was also recorded before and after one month. The formulation was found to be stable. It can be easily stored and used at any temperature and in any place. Since it is a natural herbal preparation, it does not contain the harmful effects of ammonia-based chemical dyes. However, its regular use provides voluminous, smooth and well-dyed hair. Its continuous use shows excellent effects later. Since the natural ingredients are known for their non-toxic, non-habit forming properties and the packaging contains no chemicals, preservatives, artificial colors or perfumes, the chances of it spoiling are almost minimal. This leads to increased shelf life with stable ingredients

5. NATURAL RESOURCES USED IN PREPARATION:

5.1 ALOE VERA :-

Contains:- Anthraquinones, resins, tannins and polysaccharides are the main chemical components in Aloe vera. The gel also contains vitamins A, B, C, E, B12, enzymes and amino acids. Aloe vera gel is effective on the scalp and can be used not only to treat hair loss but also to promote hair growth. Aloe vera contains aloe emodin, which promotes hair growth by stimulating the hair follicle.

Uses:- It is used as a natural stain. One of the most valuable cosmetic properties of aloe gel is its ability to stimulate blood circulation in the skin and remove dead skin cells, giving the skin a fresher and younger appearance. Recommended for sunburns, insect bites, etc.



Fig.6 -Aloe Vera Gel

5.2 HENNA :-

Contains:- The basic coloring compound of Henna is “Lawson”, a red-orange colored compound present in the dried leaves at a concentration of 1-1.5% w/w. cosmetic product. Other components in henna, such as flavonoids and gallic acid, contribute as organic mordants to the dyeing process. Carbohydrates give the henna paste the right consistency to hold the hair. Henna has an affinity for keratin in a slightly acidic environment (pH=5.5). Natural henna is usually hypoallergenic, but allergic reactions have occurred with mixed types including black henna. This was caused by chemical compounds consisting of para-phenylenediamine, 2-nitro-4-phenylenediamine, 4-aminophenol and 3-aminophenol.

Uses: - Henna also has antifungal activity against Malassezia species (causing dandruff). Henna balances the pH of the scalp and thus prevents premature hair loss and graying of hair. Henna leaf paste used to relieve jaundice, skin diseases, smallpox, etc. Henna leaf extract with ethanol (70%) showed significant hypoglycemic and hypolipidemic effects in diabetic mice.



Fig. 7 -Henna

5.3 COCONUT OIL:-

Contains:- Vitamins, Minerals, Amino Acids, They promote hair growth and moisturize the scalp.

Uses:- Coconut oil used as such or as a base ingredient for the preparation of hair oils and tonics. Coconut oil increases hair strength and also prevents hair from drying out.



Fig. 8- Coconut oil

5.4 AMLA :-

Contains:- This fruit contains vitamin C, tannins, minerals such as (Ca, P, Fe) and amino acids.

Uses:- The fruit extract is useful for hair growth and reduces hair fall. Amla has antibacterial and antioxidant properties that can help promote the growth of healthy and shiny hair.



Fig.9 -Amla[49]

5.5 BHRINGRAJ:-

Contains:- Treatment with 5% petroleum ether extract of bhringraj initiates more hair follicles. An oil extract from the leaves is traditionally used to improve hair growth and to add natural color to gray hair.

Uses:- Neelibhringaadi Tailam mentioned in Ayurveda is good for promoting hair growth and giving natural color to gray hair. Bhringraj is used in the preparation of various oils, shampoos, hair dyes, etc.



Fig.10-Bhringraj

5.6 BLACK TEA: -

Rich in polyphenols, selenium, copper, phytoestrogens, melatonin, the tea is also used in traditional Chinese medicine and has been used as a hair dye in Ayurvedic medicine since ancient times.



Fig. 11 -Black tea

5.7 COFFEE: -

6. In hair dyes, herbs can be used in the form of powder, aqueous extract or oil from their seeds to give shades of different colors from reddish brown to black brown. Herbal drugs such as coffee powder obtained from its seeds are used as hair dyes.



Fig. 12-Coffee

6. PRODUCTS ON THE MARKET :-

6.1 Henna-Dye Combo – herbal hair dye 100g + Henna 100g-

Combination of 100g pack of Siri Herbal Henna and 100g pack of Siri Herbal Hair Dye.

Siri Herbal Hair Dye - Natural Black is a chemical-free herbal hair dye. All ingredients used in it are grown in a safe, organic environment; they are handpicked, inspected and carefully combined to ensure consistent quality and the best results. It is easy to use and gives hair a natural shine.

- 100% natural
- Herbal hair dye
- No chemicals
- No side effects
- Natural black color
- Ease of use

Siri Herbal Henna – 100% natural henna powder. Cleaned, dried and powdered henna leaves. Gives the hair a reddish tint. It also cools the body and relieves excessive heat.



fig. 13 Henna

6.2 Sesa Natural Hair Color Set - 100% Organic Hair Color - 100% Ayurvedic Solution - Natural Black, 40ml + 200g

Features and details:

- FOR THE FIRST GRAY - DIY hair color kit ideal for those with less than 20% gray hair
- 100% NATURAL AND SAFE - NO Ammonia, NO Peroxide, NO PPD, NO Parabens, NO Silicones, NO Sulfates.
- 100% AYURVEDIC PRE-COLOR GEL with extracts of curry, turmeric, black pepper, ginger, garlic and cinnamon. It opens the cuticle and promotes better color absorption.
- 100% BIO HAIR COLOR - a mixture of indigo and henna enriched with extracts from Amla, Shikakai, Aritha, walnuts and coffee. Covers gray hair and adds a natural black color.
- 100% AYURVEDIC POST-COLOR SHAMPOO with kokam, aloe vera and hibiscus extracts. Seals the cuticle, helps lock in color and improves texture. 100% AYURVEDIC POST-COLOR SHAMPOO with extracts of cocoam, aloe vera and hibiscus. Seals the cuticle, helps lock in color and improves texture.



Fig. 14-Sesa Natural Hair Color Kit

7. CONCLUSION:-

The herbal hair pack colors the hair in the most gentle way. The advantage of herbal cosmetics is its non-toxic nature. Nourishes the scalp and hair. This hair formulation provides vital nourishment to the skin. It helps in the treatment of dandruff by removing excess sebum from the scalp. Frequent use of this pack results in manageable, frizz-free colored hair. Pollution, aging, stress and harsh climates adversely affect hair quality. In this research, we have found out the effective properties of herbal hair pack and more studies need to be done to explore more useful benefits of this herbal hair pack. Natural remedies are now widely accepted with open arms as they are safer with minimal side effects compared to chemical based products. Herbal preparations are in high demand to meet the needs of the growing world market. It is a striking attempt to put together a herbal hair pack containing the goodness of powders of various plants that are excellent for hair care.

8. FUTURE SCOPE:-

It is a labor-intensive industry that provides employment opportunities to all involved in the cultivation, extraction and application of these dyes to textiles. Natural dyes create sustainable employment and income for the weaker section of the population in rural and peri-urban areas both for dyeing and for growing non-food crops to produce plants for natural dyes. - The application of natural dyes has the potential to obtain a carbon credit by reducing the consumption of synthetic dyes based on fossil fuels (petroleum).

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