How to Cite:
Gupta, P., Tiwari, Y., & Mukopadayay, S. (2022). Formulation and evaluation of herbal hair dye: A review article. *International Journal of Health Sciences*, *6*(S6), 3591–3609. https://doi.org/10.53730/ijhs.v6nS6.10195

Formulation and evaluation of herbal hair dye: A review article

Pratik Gupta
Research Scholar, Dev Bhoomi Institute of Pharmacy andResearch, Dehradun (Uttarakhand), pin code-248007

Mr. Yogesh Tiwari
Assistant Professor, School of Pharmacy and Research, Dev BhoomiUttarakhand University, Dehradun (Uttarakhand), pin code-248007.
*Corresponding author email: sopr.yogesh@dbuu.ac.in

Dr. Sayantan Mukopadayay
Associate Dean, School of Pharmacy and Research, Dev Bhoomi Uttarakhand University, Dehradun (Uttarakhand), pin code-248007

***Abstract*---**A dye can typically be defined as a colored Substance that has an affinity to the fiber, fur or hair. Continuous utilization of such compounds containing dye on herbal hair reasons such a lot of aspect effects along with pores and skin inflammation, erythrema, loss or damage of hair and skin most cancers. In oxidation device, there's a severe diffusion of the molecule into the cortex, what promotes an extended shade resistance. Herbal preparations viz., herbal pills, herbal tonics, herbal paste, natural shampoo, natural contraceptives and herbal dyes has become popular most of the customer herbal drug treatments represent the quickest developing section to heal the various illnesses. Hair dyes encompass dyes modifiers, antioxidants, alkalizers, soaps, ammonia, wetting sellers, fragrance, and a ramification of different chemical substances used in small amounts that impart unique qualities to hair along with softening the texture or supply a desired movement to the dye. It is the ratio of kinds of melanin Eumelanin and Pheomelanin that determines your natural hair shade. Custard apple (Annona squamosa) is a first rate natural supply of copper and gives hair the dark melanin color and that it lack. Therefore in case you are handling too many greys devour custard apple to prevent your hair from losing coloration similarly. Hair color alternate by way of dye software is a common process among ladies. Hair dye beauty products are used for colouring hair. Hair dye classified according to coloration resistance, into classified, in accordance to coloration, resistant, into brief, semipermanent, and everlasting.

***Keywords*---**hair dye, temporary, semi-permanent, melanin, annona squamosa, antioxidants.

Introduction

Hair coloring, or hair dyeing, is the exercise of converting the hair colour. The primary reasons for this are cosmetic: to cover grey or white hair, to trade to a color regarded as extra elegant or ideal, or to repair the original hair colour after it's been discolored with the aid of hairdressing procedures or solar bleaching. Hair color works like a further coat to your tresses. This gives a look of thicker, voluminous hair. In this situation it's miles continually an awesome concept to head for semi-everlasting hair color, it provides strength in your hair and makes them look more healthy. Our tresses are uncovered to exclusive environmental factors each day which includes polluted air, dirt, dirt, immoderate heat and temperature modifications among others[1]. These can have a negative effect on our hair ultimately. While you get your hair coloured, you get a shielding layer which protects your natural hair from those environmental dangers. Within the past natural organic materials were blended with metals inclusive of copper and iron, to supply extra lasting or richer sunglasses. Non-stop utility of such compounds on natural hair reasons more than one side effect which includes skin infection, hypersensitive reaction, hair fall, dry scalp, Erythrema and additionally skin most cancers. It's been observed in the neighborhood market survey that the maximum of the marketed natural formulations in India, though claim to be herbal, safe and powerful may sincerely include the dangerous synthetic agent, Paraphenylenediamine (PPD), at 20-25% concentrations that is the main ingredient of business artificial dyes. Natural dyes are the colors derived from plant, animal or insect be counted with none chemical processing. In India, henna has been used traditionally for colouring fingers and hairs[2].

The number one purpose of premature graying is hereditary and it is stated that via the age of fifty, half of the arena's population will have fifty percent grey hair. Many one of a kind extracts from plant have been used for the motive of hair dyeing in Europe and Asia before the invention of modern-day dyes. Inside the present technology of eco- conservation, using herbal dyes has been revived and reviewed for the colour of textiles and meals substances[3]. Use of these chemicals can bring about unsightly side effects, together with pores and skin irritation, allergic reaction, hair breakage, skin discoloration, sudden hair shade and so on. Hence there is a big call for hair dyes inside the marketplace. The splendor of pores and skin and hair essentially relies upon on character's health, food regimen, conduct, activity ordinary, climatic conditions and renovation. The dyeing of the hair is an historic art that involves treatment of the hair with various chemical substances compound. Hair dye has been used historic Egyptian instances when Rameses reinforced red hair coloration using henna. In historical Greece, the hair turned into bleached with a rinse of potassium answer and rubbed with a sort of ointment made from yellow flower petals and pollens[5].

As compared to the chemical primarily based hair dye, which purpose pores and skin and different pores and skin associated ailment, natural dye are being these days. Herbal tablets with none adverse impact are used from healthful hair. The

need of natural based herbal hair dye is increasing fastly due to their herbal goodness and absence of side effects. Artificial hair dyes that are available within the marketplace, uses aggregate of peroxide and Ammonia which alters the shape of hair and harm it and also reasons allergies[6]. In view that ancient time, researchers have been exploring nature in search of new tablets. Beneficial products may be derived from any a part of the plant like bark, leaves, vegetation, seeds and so on. Plant products were part of phyto drug treatments considering that instances immemorial. For primary healthcare, round 80% of worldwide s population is based on conventional drug treatments, concerning plant extracts.

In traditional systems of Unani, Ayurveda, Homeopathy, and Siddha, nearly 90% of prescriptions were based totally on tablets obtained from flora. Pills from the plant resources are without difficulty available, are less expensive, secure, and green and infrequently have side effects. The ancients also used saffron, indigo, and alfalfa. However herbal dyes most effective coat the hair temporarily, and those wanted chemically altered tresses. Graying of hair is attributed to reasons like genetics, pressure, dietary deficiency and sickness. Plants life has been used traditionally for his or her hair coloring, increase promoting and anti-ageing houses. Drugs from the plant resources are easily to be have, are less expensive, safe, and efficient and infrequently have side consequences. French researchers have located that Egyptians, Greek and Roman had been the usage of to dye their hair several thousand years in the past. Many one of a kind extracts shape plant had been used for the motive of hair dyeing in Europe and Asia before the invention of cutting-edge dyes. There are 3 type of hair dye. This is temporary, semi-permanent, permanent hair color and so on[10].

Amla, Bhringraj, Henna, Nilika, Tulsi, Aloe vera, Mentha are nicely-acknowledged ayurvedic herbal capsules historically used as hair colorant and for hair boom. Indigo, referred to as initial material dye, may be blended with henna to make unique light brown to black shades of hair dye. It's miles part of Islamic and Hindu cultures as a hair coloring and dyeing agent for the cause of decorating the nails or for the formation of brief pores and skin tattoos. Paraphenylenediamine (PPD), a key element of many manmade hair dyes is thought to trigger allergic skin rashes in lots of human beings. there are such a lot of herbs like Kikar, Bihi, Bhringraj, Patnag, Akhrot, Narra, Jaborandi, Jatamansi, Amla, Kuth, Giloe, Behera which can be used as a first-rate parts in hair care preparations mainly intended for dyeing hair[9].

As international scenario is now converting closer to the use of safer, secure herbal product with traditional use, attempts have been made inside the present research to increase natural hair dye without any chemical, containing few traditionally used herbs and modifiers; and compare it with advertised only natural hair dye. It also reasons dermatitis around lips, reddening and swelling of scalp and face and so on. Tannins create affinity among dyes and hair and accordingly improve color and fastness of dye. Natural hair colorants which might be presently marketed particularly comprise henna together with plant additives that need to be used inside the paste shape. but, such arrangements have several hazards like prolonged coaching time, messy software, terrible rinsability, loss of a trendy coloring and limited color sun shades. Formulations promoted as herbal hair colorants additionally comprise artificial dyes and chemical substances.

artificial hair colorants contain the usage of chemical compounds like 1-3% phenylenediamine, ammonia, peroxide and coal tar dyes which might be able to getting rid of and changing or protecting the natural hair colour.

Inorganic salts like aluminum sulphate, copper sulphate, lead acetate and potassium dichromate act as mordants also are delivered to improve and guard the color produced by using the dye[8]. Use of those chemical substances can bring about unpleasant aspect effects, together with transient pores and skin infection and hypersensitivity, hair breakage, skin discoloration, surprising hair coloration and cancer. since the conventional techniques of hair coloring by using herbal or artificial colorants has obstacles, an attempt has been made in this study to formulate a gel for hair dye the usage of natural extracts and different components from plant supply having properly coloring assets that is secure and ready to use. The beauty of skin and hair basically depends on Individual's health, diet, habits, job routine, climatic Conditions and maintenance. Synthetic hair dyes which are available in the market, uses combination of peroxide and Ammonia which alters the structure of hair and damage it and also causes allergic reactions.

Paraphenylenediamine (PPD), a key ingredient of many synthetic hair dyes is known to trigger allergic skin rashes in many people. It also causes dermatitis around lips, reddening and swelling of scalp and face etc. Vegetable dyes e.g., Madayantika leaves, Bhringraj etc. are semi-permanent dyes, used traditionally and believed to be safe and nontoxic. Plants have been used traditionally for their hair coloring, growth promoting and anti-aging properties. It has been found in the local market survey that the most of the marketed herbal formulations in India, though claim to be natural, safe and effective may actually contain the harmful synthetic agent, paraphenylenediamine (PPD), at 20-25% concentrations which is the main ingredient of commercial synthetic dyes. As global scenario is now changing towards the use of Safer, nontoxic natural product with traditional use, Attempts have been made in the present investigation to Develop herbal hair dye devoid of any chemical, containing few traditionally used herbs and modifiers; and compare it with marketed purely herbal hair dye.

As compared to the chemical based hair dyes, which cause skin and other skin related diseases, natural herbal dyes are being preferred nowadays [1]. Today most of the human beings are very careful about their beauty and hairs play an important role in this. Herbal drugs without any adverse effects are used for healthy hair. Nearly 70% of human beings above 50 years struggle with the problem of balding and graying of hair. In few cases, these symptoms of ageing occur earlier. Graying starts on the skin of head at about 40 years, starting initially from the temples, followed by beard, moustache and finally up to the chest. The age at which graying starts is deeply influenced by heredity. But premature depigmentation in adults is mainly due to variety of other factors, as illness, some specific drugs, shock etc. [2, 3]. People have been using natural dyes since ancient times for the purpose of dyeing carpets, rugs and clothings by the use of roots, stems, barks, leaves, berries and flowers of various dye yielding plants [4].

The need of herbal based natural medicines is increasing fastly due to their natural goodness and lack of side effects. Amla, Bhringraj, Henna, Mandara, Jatamansi, Reetha, Sariva, Curry leaves and Methi seeds are well - known ayurvedic herbal drugs traditionally used as hair colorant and for hair growth [5]. Many different extracts from plant were used for the purpose of hair dyeing in Europe and Asia before the invention of modern dyes. Indigo, known as initial fabric dye, could be mixed with henna to make different light brown to black shades of hair dye [6]. Use of these chemicals can result in unpleasant side effects, such as skin irritation, allergy, hair breakage, skin discoloration, unexpected hair color etc. [7 - 9]. Continuous application of such compounds on natural hair causes multiple side effects such as skin irritation, allergy, hair fall, dry scalp, erythrema and also skin cancer [10, 11]. In India, henna has been used traditionally for colouring palms and hairs. Antioxidants protect the dye from oxidizing with air. Most commonly used is sodium sulfite.

Alkalizers are added to alter the pH of the dye formula, because the dye works best in a highly alkaline milieu. Ammonium hydroxide is a common alkalizer. Apart from these basic chemicals, many other chemicals are used to impart special qualities to a manufacturer's formulala. In order to color human hair by oxidative dye technology, the hair is generally treated with a mixture of oxidative hair coloring agents and an oxidizing agent. Hydrogen peroxide is the most commonly used oxidizing agent. However, in addition to oxidizing the oxidative coloring agents, hydrogen peroxide treatment of the hair can also solubilise and decolorize the colored melanin component in the hair, which can lead to undesirable hair qualities, such as brittleness and hair damage. Composition of herbal dyes and hair coloring mordant can be used to deliver a variety of hair colors to the hair. However, substantial improvement is needed in the areas of color saturation, color development, precise initial color consistency, improved wash fastness, improved hair conditioning without causing hair damage and skin irritation.

Because of the manufacturing hazards, environmental pollution, its side and toxic effects there is a vital need for an alternative to the existing black dye. These limitations of the chemically derived dye can only be overcome by replacing the constituents in the composition, by non toxic ingredients derived from herbal resources[2]. The black dye produced from herbal resources may be used in wide variety of context including hair color products. At this juncture, there is enormous need for a method to increase the yield of such dyes from herbal products. French researchers have found that Egyptians, Greek and Roman were using to dye their hair several thousand years ago. Many different extracts form plant were used for the purpose of hair dyeing in Europe and Asia before the invention of modern dyes. There are three type of hair dye. This is temporary, semipermanent, permanent hair color etc. The dyeing of the hair is an ancient art that involves treatment of the hair with various chemicals compound. In Ancient Greece, the hair was bleached with a rinse of potassium solution and rubbed with a type of ointment made of yellow flower petals and pollen. As compared to the chemical based hair dye, which cause skin and other skin related disease, natural herbal dye are being preferred nowadays. Herbal drugs without any adverse effect are used from healthy hair. The need of herbal based natural medicine is increasing fastly due to their natural goodness and lack of side effects.

Types of Hair Dye

Temporary

- These form of hair hues used to shade the hair for Temporality.
- The colorants which are used would not penetrate into the hair or surrounding.
- Maybe without difficulty rinsed off water one shampooing.
- Temporary hair colouring some time used to use finely floor metals via a Puffer Spray.
- In rinse aqueous or hydro alcoholic solution of simple dye stuffs are used.

Semi-Permanent

- Semi-permanent dye includes particularly either Nitrophenylene diamines or Nitroaminophenes or both Aminoantrhaquinoes.
- Shampoo is the maximum generally used base.
- Overall performance of colorants may be enhanced by the inclusion of solvent.
- Most of them are primary dye stuffs, whose cationic person offers them a natural affinity for the hair.

Permanent

- Maximum popular hair dye merchandise.
- The dyes are shaped throughout the dyeing technique and aren't present, as such in the solution before application.
- They motive some hair damage.
- Permanent dye systems are capable of dye hair a lighter colour than the original.
- includes elements ;
  - Dye intermediate
  - Oxidizing agent

Advantages

- Herbal appearance of use of real human hair fibre.
- Can be styled as a natural hair.
- Capable of coloration and perm.
- Movements like natural hair.
- Much less susceptible to warmth harm.

Disadvantages

- More steeply-priced.
- Want extra protection and care.
- Requires styling.
- Can be heavier in weight after applying, which may cause itching.

- Greater vulnerable to daylight fading and environmental harm.

Different hair dye products available in market

Sr. No	SYNTHETIC HAIR DYES	CHEMICAL INGREDIENTS
1	Godrej Expert Rich Crème	Hydrogen Peroxide
2	L'Oreal Paris Excellence Creme Hair Color	Para-phenylenediamine(PPD)
3	Revlon Top Speed Hair Color	Para-phenylenediamine(PPD)
4	Schwarzkopf Essensity Ammonia Free Permanent Color	Resorcinol
5	Bblunt Salon Secret Creme Hair Colour	Sodium Sulfite
6	Streax Ultralights Highlighting Kit	Potassium Persulphate

Problems associated with synthetic hair dye

Almost every synthetic hair dyes contain Ammonia, Para-Phenylenediamine (PPD), Hydrogen Peroxide, Resorcinol, Paraben etc. They play critical role in the development of hair dyes. Although the PPD is used for dark color shades, it should not be applied repetitively for long period of time. PPD is an important constituent of hair dye toxicity of which one could herald fatal complications such as rhabdomyolysis, renal failure and respiratory failure. As well as Ammonia, Paraben and Hydrogen Peroxide are harmful chemical contained in hair dyes which cause toxicity to human body. Ammonia containing hair dye is used to open the hair's cuticle so that the dye can come into the shaft. In spite of its useful activity it has various side effects such as damaged cortex, lung irritation, frizzy & brittle hair, etc. Along with PPD and Ammonia, Paraben, Hydrogen Peroxide and Resorcinol also have various toxic effects on human body such as hormonal imbalance, fertility complications, irritation on scalp, drying of hair, flakes and even hair loss. These chemicals cause eye and lung irritation, hair breakage, dandruff, chemical burns and sometimes cancers as properly.

Approval of natural hair dye in replacement of chemicals used in synthetic hair dye

The dyeing process for natural, chemical-free hair is somewhat distinct from synthetic, chemically prepared hair dyes. Natural hair dyes are widely being adopted worldwide due to its very rare toxic effects. Nowadays people prefer natural hair dye rather than synthetic hair dye due to its toxic effects. Natural hair dye contains extracts of different herbs and plants such as Henna, Amla, Aloevera, Nilika, Hibiscus, Peppermint, Kikar, Bihi, Bhringraj, Patnag, Akhrot, Narra, Jaborandi, Jatamansi, Kuth, Giloe, Behera, etc.

Role of ingredients used in formulation
Henna
Scientific Classification

Kingdom: Plantae

Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Myrtales
Family: Lythraceae
Subfamily: Lythroideae
Genus: Lawsonia L.
Species: L. inermis

The leaves of this plant posess a purple dye molecule referred to as lawsone (2-Hydroxy-1yl-naphthaquinone), which has the capability to bond with the protein.

Chemical Constituents

Lawsone is the active constituents of Henna leaves. The other chemical constituents of henna are gallic acid, white resin, sugars, tannins and xanthones.

Use: Henna balances the pH of the scalp preventing premature hair fall and graying of hair.

Amla
Scientific Classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Malpighiales
Family: Phyllanthaceae
Genus: Phyllanthus
Species: P.emblica (Phyllanthus emblica)

Complete fruit is used as an energetic ingredient of the hair care preparations. Amla is the maximum wealthy and concentrated form of diet C alongside tannins found a number of the plant life. The fruit extract is beneficial for hair growth and decrease hair loss. The diet C located in the fruit binds with tannins that guard it from being lost by using warmness or light.

Chemical constituents

Amla fruits contain high amounts of ascorbic acid (Vit C), and have a bitter taste that may derive from a high density of ellagitannins, such as emblicanin A, emblicanin B, punigluconin, and pedunculagin. It also contains punicafolin and phyllanemblinin A, phyllanemblin other polyphenols, such as flavonoids, kaempferol, ellagic acid, and gallic acid.

Use: Amla has antibacterial and antioxidant houses that could assist promote the increase of wholesome and lustrous hair. It maintains the hair color and stops untimely graying, strengthens the hair follicles.

Peppermint (Mentha)
Scientific Classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Asterids
Order: Lamiales
Family: Lamiaceae
Genus: Mentha
Species: Mentha x piperita

Use: Its perfume is quality and it could assist with dryness, itching or scalp problem.

Chemical Constituent

The mint primary chemical substances include limonene, cineole, menthone, menthofuran, isomenthone, menthyl acetate, isopulegol, menthol, pulegone and carvone. It also contains terpenoids and flavonoids such as eriocitrin, hesperidine, and kaempferol 7-O-rutinoside.

Aloe Vera
Scientific classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Monocots
Order: Asparagales
Family: Asphodeloideae
Genus: Aloe
Species: Aloe Vera

Use: Aloe Vera is effective for scalp and may be used no longer simplest to deal with hair loss, but to promote hair boom as properly. Aloe Vera consists of aloe emodin which promotes hair increase by stimulating hair follicles. It's also beneficial in treating the scalp from solar burn. It is used as a herbal mordant. It is also recognized for its emollient effect.

Nilika
Scientific Classification

Kingdom: Plantae
Clade: Tracheophytes

Clade: Angiospems
Clade: Eudicots
Clade: Rosids
Order: Fabales
Family: Fabaceae
Subfamily: Faboideae
Genus: Indigofera
Species: Indigofera tinctoria

Chemical Constituent

Indigo dye incorporates flavonoids, terpenoids, alkaloids, glycosides, indigotine, indirubin, rotenoids. From a complex approach of extraction and purification, Indirubin, a crimson colored pigment by-product of indigo.

Use: It imparts the blue dye. It acts as a splendid conditioner. It promotes hair boom and prevent itching on scalp and reduces dandruff.

Bhringraj
Scientific Classification

Kingdom: Plantae
Clade: Angiosperm
Clade: Eudicots
Clade: Asterids
Order: Asterales
Family: Asteraceae
Genus: Eclipta
Species: E. prostrate (Eclipta prostrata)

Chemical constituents

Eclipta prostrate contains phytochemicals such as coumestans, polypeptides, polyacetylenes, thiophene derivatives, steroids, sterols, triterpenes, and favonoids. The plant carries the alkaloid ecliptine. Other chemical substances identified are wedelolactone, wedelic acid, apigenin, luteolin, b-amyrin and so forth.

Use: It saves you from hair fall and untimely graying. It also stimulates hair growth.

Hibiscus
Scientific classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Malvales
Family: Malvaceae

Subfamily: Malvoideae
Tribe: Hibisceae
Genus: Hibiscus

It is high-quality for growth in hair growth activity. Hibiscus is obviously enriched with Calcium, Phosphorus, Iron, diet B1, vitamin C, Riboflavin and Niacin, which assist to promote thicker hair increase and decrease untimely graying of hair. This flower is used for controlling dandruff. Hibiscus is famous for antioxidant properties via generating flavonoids along with anthocyanins and different phenolic compounds. It can be used to rejuvenate the hair via conditioning it.

Chemical Constituents

The phytochemical analysis showed that hibiscus rosa-sinensis contained tannins, anthraquinones, quinines, phenols, flavanoides, alkaloids, terpenoids, saponins, cardiac glycosides, protein, free amino acids, carbohydrates, reducing sugars, mucilage, essential oils and steroids.

Reetha
Scientific classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Sapindales
Family: Sapindaceae
Genus: Sapindus
Species: S. mukorossi (Sapindus mukorossi)
Sapindus mukorossi, commonly known as Indian soapberry, washnut, or ritha. Reetha as soapnuts or washing nuts, play an important role as natural hair care products since older times.

Chemical Constituent

The major 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. In addition to proteins, sugars and fibres are also present. Its fruit is rich in vitamin A, D, E, K, saponin, sugars, fatty acids and mucilage.

Use: Reetha extract is useful for the promotion of hair growth and reduced dandruff. This plant is enriched with saponins, which makes the hair healthy, shiny, and lustrous when used on regular basis.

Shikakai
Scientific classification

Kingdom: Plantae

Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Rosids
Order: Fabales
Family: Fabaceae
Subfamily: Caesalpinioideae
Genus: Senegalia
Species: S. rugata

The extract obtained from its pods is used as a hair cleanser and for the control of dandruff. Shikakai or acacia concinna, has rich amount of vitamin C, which is beneficial for hair.

Chemical constituents

In commercial extracts, when the plant is hydrolyzed it yields spinasterol, acacic acid, lactone, and the natural sugars glucose, arabinose and rhamnose. It also contains hexacosanol, spinasterone, oxalic acid, tartaric acid, citric acid, succinic acid, ascorbic acid, and the alkaloids calyctomine and nicotine.

Use:

- The extract obtained from its pods is used as a hair cleanser and for the control of dandruff. Shikakai or acacia concinna, has rich amount of vitamin C, which is beneficial for hair.
- Shikakai naturally lowers the pH value and retain the natural oils of the hair and keeps them lustrous and healthy.
- It is also effective is strengthening and conditioning hair, Amala, reetha and Shikakai compliments each other, therefore, they are mixed together to have healthy and lustrous hair.

Coffee
Scientific classification

Kingdom: Plantae
Clade: Tracheophytes
Clade: Angiosperms
Clade: Eudicots
Clade: Asterids
Order: Gentianales
Family: Rubiceae
Tribe: Coffeeae
Genus: Coffea

In hair colorants, herbs can be used in the form of powder, aqueous extract or their seed oil to impact shades of different colour varying from reddish brown to blackish brown. The herbal drugs like coffee powder obtained from its seed are used as hair colorant.

Use:

- It helps in restoring hair growth
- Promotes softer and shinier hair
- Also helps in dyeing hair to give natural look

Fig: Henna

Fig: Amla

Fig: Peppermint

Fig: Aloe Vera

Fig: Nilika

Fig: Bhringraj

Fig: Hibiscus

Fig: Reetha

Fig: Shikakai

Fig: Coffee

Conclusion

Herbal based hair dye has been prepared. Frequent use of this pack leads to manageable, frizz free coloured hair. A herbal hair dye colours the hair in an utmost gentle manner. The advantages of herbal based cosmetics are their nontoxic nature. Herbal formulations are in great demand to fulfill the needs of the growing world market. It is a noticeable attempt to formulate the herbal hair pack containing the goodness of powders of different plants, which are excellent for hair care. Hair dye containing Aloe Vera, amla, etc. nutrifies the skin of the scalp and hair. Pollution, ageing, stress and harsh climates badly affect the quality of hair. Natural remedies are widely accepted with open hands nowadays as they are safer with minimal side effects as compared to the chemical based

products. This hair formulation provides vital nourishment to the skin. It helps to treat dandruff by removal of excess oil from scalp.

References

1. Kumar K. Sudheer, Begum Afreen, et al., Formulation and Evaluation of 100% Herbal Hair Dye, Dept. of pharmacology, International Journal of Advanced Research in Medical & Pharmaceutical Sciences (IJARMPS-ISSN:2455-6998), Volume 1, Issue 2, March 2016.
2. Ganpat Ashwini, A.R Aswar, L.D. Hingane, Formulation and Evaluation of Herbal Hair Dye, International Journal of Creative Research Thoughts (IJCRT), Volume 9, Issue 12 December 2021 | ISSN: 2320-2882.
3. Rashmi Saxena Pal*, Yogendra Pal, A.K Rai, Pranay Wal and Ankita Wal, Synthesis and Evaluation of Herbal Based Hair Dye, The Open Dermatology Journal (Bentham Open), DOI: 10.2174/1874372201812010090, 2018, 12, 90-98.
4. Madhav Amle, Review on: Formulation and Evaluation of Herbomineral Hair Dye, Journal of Research in Pharmaceutical Science Volume 7 ~ Issue 12 (2021) pp: 01-11 ISSN(Online) : 2347-2995.
5. Willamson EM. Major herbs of ayurveda 2002 :126-8.
6. Lachman L, Lieberman HA, Kanig JL-The Theory and practice of industrial pharmacy 3rd 1987.
7. Khandelwal KR. Practical pharmacognosy 12th Ed. 2004
8. Upadhyay VP. Mishra A. K. Workshop on selected medicinal plants. 1985. In:Ministry of Commerce, Chemexcil :Bombay 1985.
9. Fatima A, Alok S, Agrawal P, Singh P, Verma A,. Benefits of herbal extract in cosmetics :A review. Int J Pharm Sci Res 2013:4(10):3746-60.
10. Dahanukar S, Thatte U. Ayurveda Revisita 3rd Ed. 2000
11. Tuner DM. Natural product source material used in the pharmaceutical industry: The Galxo experience J.Ethanopharmacol1996:51(1-3):39-43.
12. Ambasta ST. useful of plant of India 1986.
13. Gopalan C, Sastri BV, Balasubraminam SC. Nutritive value of Indian foods 1991.
14. Bhakuni,D.S.Tewari, S. and Dhar, M. M. (1972). Aporphine alkaloids of Annona Squamosa. Phytochemistry. H (5):1819-1822.
15. Janick, J. and Paull, R. (2006).The Encyclopedia of Fruit and Nuts. Publisher. CABI.
16. Natural colorants and dye In : Pharmacognosy and pytochemistry 1st Ed. India :Career publication 2004 :1:PP 98-117.
17. Chandhary G, Lawsonia inermis Linnaus :A phytopharmacological review. Int J Pharm Pharm Sci. 2016 :(6) :630-48.
18. Kumar KS. Begum A, Shashidhar B, et al. Formulation and evaluation of 100% herbal hair dye. International Journal of Advanced Research In Medicinal and Pharmaceutical Science 2016:(2)
19. Kumar S, Akhila A, Naqvi AA, Farooqi AH, Singh AK, Uniyal GC, et al. Medicinal plants in skin care. Lucknow, India: CIMAP 1994; pp. 425-30.
20. https://www.earthdye.com/natural-hair-dye-vs-chemical-hair-dye-difference/
21. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3634302/
22. https://mspfitness.com/7-chemicals-found-in-most-hair-dyes-to-avoid/

23. Suryasa, W., Sudipa, I. N., Puspani, I. A. M., & Netra, I. (2019). Towards a Change of Emotion in Translation of Kṛṣṇa Text. *Journal of Advanced Research in Dynamical and Control Systems*, *11*(2), 1221-1231.
24. Rahmadeni, A. S. ., Hayat, N. ., Alba, A. D. ., Badri, I. A. ., & Fadhila, F. . (2020). The relationship of family social support with depression levels of elderly in 2019 . International Journal of Health & Medical Sciences, 3(1), 111-116. https://doi.org/10.31295/ijhms.v3n1.188