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“Formulation and Evaluation of Herbal Hair Dye”

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Abstract

The medicinal plants are considered to be effective and for most important for the human health. Some of the natural medicinal plants are so common that we use them in daily life without knowing their medicinal important. Custard apple (*Annona squamosa*) is a great natural source of copper and gives hair the dark melanin colour and that it lack. Therefore if you are dealing with too many greys consume custard apple to stop your hair from losing colour further. Hair color change by dye application is a common procedure among women. Hair dye cosmetic products are used for colouring hair. Hair dye classified according to color resistance, into classified, according to color, resistant, into temporary, semipermanent, and permanent. In oxidation system, there is an intense diffusion of the molecule into the cortex, what promotes a longer color resistance. Dye and color precursors present difference related to chromophore groups.

Keyword : hair dye, temporary, semipermanent, permanent, *Annona squamosa*, Antioxidant.

Introduction

Hair colouring or dying, practices of changing of the hair color. The main reason for this are cosmetic to recover white and grey hair, to change the regarded as more fashionable or desirable, or to restore the original color after it has been decoloured by hair dressing or sun bleaching. The prepared herbal dye contain all the goodness of natural ingredients. Apart from acting as a hair dye, this formulation, because of the perfect blend of herbal, also act as a hair growth promoter, hair nourisher.

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. Hair dye has been used Ancient Egyptian times when Rameses reinforced red hair color using henn. 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 polle. As compered 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 hai. The need of herbal based natural medicine is increasing fastly due to their natural goodness and lack of side effects.

Advantage

1. Natural appearance of use of real human hair fibre.
2. May be styled as a natural hair.
3. Able to color and perm.
4. Moves like natural hair.
5. Less susceptible to heat damage.

Disadvantages

1. More expensive.
2. Need more maintenance and care.
3. Requires styling.
4. May be heavier in weight than synthetic wigs, which may lead to itching.
5. More susceptible to sunlight fading and environmental damage.

Methods of hair dye preparation

1. Weighing :

Next a worker weighs out of the ingredient for the batch. For some ingredients, only a small amount of is necessary in the batch. But if a very large batch is being made, and several ingredients are needed in large amounts.

2. Mixing :

In a formula in which no pre mixing is required, after checking and weighing, the ingredients are simply mixed together. The ingredients are completely mixed with each other.

3. Filling :

The finished batch of hair dye products formed place in the filling area. Then the measured amount of hair dye on the weighing balance.

4. Packaging :

From the filling area, the plastic bag are taken to the packaging line. The packaging complete and the labelling of the product write the with full information. Then the product are them taken to the warehouse to await distribution

Role of ingredients used in the formulation :

Shilakai :

It contains Lupeal, Spinasterol, Lactone, Hexacosanol, Spinasteron, Calyctomine, Racimase - A Oleanolic acid, Lupenone, Betulin, Betulinic acid, Betulonin acid. 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. All of these ingredients come in two forms, one as a dried fruit and other in powdered form. Amala, Reetha and Shikakai suit all hair and help prevent split ends, hair fall, dandruff, greying of hair and other hair related problems, to make hair soft and shiny.



Coffee

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.



Hibiscus :

It is excellent for increase in hair growth activity. Hibiscus is naturally enriched with Calcium, Phosphorus, Iron, Vitamin B1, Vitamin C, Riboflavin and Niacin, which help to promote thicker hair growth and decrease premature graying of hair. This flower is used for controlling, dandruff. Hibiscus exhibits antioxidant properties by producing flavonoids such as anthocyanins and other phenolic compounds. It can be used to rejuvenate the hair by conditioning it.

**Custard apple pulp powder :**

It also helps to deal with premature greying of hair in both men and women. Custard apple is a great natural source of copper and gives hair the dark melanin colour and that it lack. To have thick, long, shiny and lustrous hair, one can apply the fruit paste on the hair loss when applied on the scalp. The considerable amount of iron in custard apple improves blood circulation, in the scalp stimulating the follicle to promote hair growth.



Types of hair dyes :

Temporary :

1. These type of hair colours used to colour the hair for temporarity.
2. The colorants which are used doesn't penetrate into the hair or surrounding.
3. Can be easily rinsed off water one shampooing.
4. Temporary hair coloring some time used to apply finely ground metals by means of a Puffer Spray.
5. Such metals, which include orasse, bronze and aluminum, both untreated and anodized in various colors, it provide metallic effect when applied to hair, mainly used for high lighting.
6. Powders, setting lotions, crayons are used for temporary color.
7. Temporary hair coloring may also achieved by using yhe leuco derivative of a basic dye like crystal violet.
8. The various type of products used for temporary coloring of hair include rinse, lotion, aerosols, crayons etc.
9. In rinse aqueous or hydro alcoholic solution of simple dye stuffs are used.

10. In lotions dye in solution with a transparent polymer, such as 3% polyvinyl pyrrolidone in water or aqueous alcohol.

11. Crayons are used either directly rubbed on to the wet hair or applied with the help of hair brush.

Semipermanent :

1. Most of them are basic dye stuffs, whose cationic character gives them a natural affinity for the hair.

2. Metalized dye stuffs in combination with nitro derivatives of aromatic diamines or aminophenols.

3. Performance of colorants can be enhanced by the inclusion of solvent.

4. Shampoo is the most commonly used base.

5. Semipermanent dye contains mainly either Nitrophenylene diamines either Nitroaminophenes or either Aminoanthraquinones.

Permanent :

1. Most popular hair dye products.

2. The dyes are formed during the dyeing process and are not present, as such in the solution before application.

3. Consists of two parts

. Dye intermediate

. Oxidizing agent

4. Dye intermediates are blends of primary intermediates and coupling agent or modifier, in a suitable base.

5. During dyeing of hair, the intermediate solutions are mixed and applied to the hair.

- 6.The primary intermediates are gradually oxidized and then undergo coupling reaction with modifiers.
- 7.Permanent dye systems are able to dye hair a lighter shade than the original.
- 8.These dye are capable of confusing the difference in color between individual hair.
- 9.Very effective on mixed colored white hair and black hair.
- 10.They cause some hair damage.

Formulation of herbal hair dye :

S. No.	Ingredients	Quantity
1.	Shikakai	2gm
2.	Coffee	3gm
3.	Hibiscus	2gm
4.	Custard apple pulp Powder	3gm



Evaluation of the herbal hair dye :

The prepared herbal hair dye was evaluated for its various parameters such as organoleptic, physio-chemical, phytoconstituents and the rheological aspect.

Organoleptic evaluation :

Organoleptic characteristics for various sensory characters like colour, odour, taste etc. were carefully noted down as illustrated in Table 1. The raw drugs and powders were separately studied by organoleptic and morphological characters like colour, odour, texture and appearance.

Organoleptic evaluation of herbal hair dye :

S.No.	Parameters	Results
1.	Colour	Greenish brown
2.	Odour	Characteristics
3.	Texture.	Fine
4.	Appearance	Powder

Physio - chemical evaluation :

The physical and chemical features of the herbal hair dye were evaluated to determine the pH, its moisture content and its ash value for the purpose of stability, compatibility and the amount of inorganic matter present in it. Table 2 reflects the above findings.

Physico- chemical evaluation of herbal dye:

S.No.	Parameter	Results
1.	pH	6.5
2.	L. O. D.	1.7%
3.	Ash value	0.17

Phytochemical evaluation

Prepared herbal hair dye was subjected to Phytochemical screening to reveal the presence or absence of various phytoconstituents as Carbohydrate, Lipids, alkaloids, Sugar etc. The formulation when dissolved individually in 5 ml of water and filtered were used to the presence of carbohydrates. The aqueous extract of formulated herbal face pack was evaluated for the presence or absence of different phytoconstituents as per standard procedure and norms. The result of Phytochemical screening are highlighted in Table 3.

Phytochemical evaluation of herbal hair dye :

S. No.	Parameter	Results
1.	Foam tes.	Present
2.	Molisch test	Present
3.	Fehling test	Absent
4.	Hager test	Present
5.	Volatile oil	Absent

Rehological evaluation :

Physical parameter like untapped or bulk density, tapped density, the angle of repose, Haursner ratio and carrs index were observed and calculated for the inhouse formulation. Bulk density symbolizes the adjustment of particle or granules collectively in the packed form. The formula for the determination of bulk density, (D) $D=M/V$ where M is the mass of the particle and V is the total volume accupied them. This is determined taking graduated cylinder. Weighing the formulation was added to the cylinder with the help of a funnle. The initial volume was noted and the sample was then tapped fully. The bulk density value was obtained from the initial volume and after

tapping the volume is noticed, from which tapped density was calculated. The angle of repose quantify the flow properties of powder as it's affects cohesion among the different particle. The fixed cone funnle method empolyes the calculation height (H) above the paper that is placed on a flat surface. The pack was carefully poured through the funnle till the formation of the peak. Here R denotes radius of the conical heap. $\tan a = H/R$ where a is angle of repose. Hauseners ratio is linked with the interparticle friction and influences the powder flow properties. The hasuners ratio is calculated as D/D where D isthe tapped density and D is the bulk density. Carrs index helpt to measure powder flow from the bulk density as shown namaste Table 4.

Rehological evaluation of herbal dye:

S.No.	Parameters	Results
1.	Bulk density	0.33
2.	Tapped density	0.461
3.	Angle of repose	1.03
4.	Carrs index	34.1
5.	Hauseners ratio	1.32

Patch test

This usually involve dabbing the small amount of aqueous solution of hair dye behind the ear on or inner elbow in an area 1sq.cm and leaving it to dry. The sign of irritation or feeling of non wellness is noted, if any. Measured and small quantities of the prepared hair pack was applied to the specific area for the fixed time. Irritancy. redness and swelling were checked and notice for regular interval up to 24 hours if any. The result of tests for the sign of irritation are displaced in Table 5.

Patch test:

S. No.	Parameters	Results
1.	Swelling	Negative
2.	Redness	Negative
3.	Irritation	Negative

Stability test

Stability testing for the prepared formulation was preformed by storing at different temperature condition for the time of period of one month. The packed glass vials of formulation were stored at different temperature condition for the physical parameters like colour, odur, pH, texture and smoothness as highlighted in Table 6

Stability testing :

S. No.	Parameters	Room Temperature	35°C
1.	Colour	No change	No change
2.	Odour	No change	No change
3.	pH	6.5	6.7
4.	Texture	Fine	Fine
5.	Smoothness	Smooth	Smooth

Application of custard apple**For Better Hair Growth :**

To have thick, long, shiny, and lustrous hair, one can apply the fruit paste on the hair and the scalp or consume the fruit. This helps with bringing down the occurrence of inflammation and reducing hair fall to a large extent. When the paste is massaged into the hair, then nutrients are better absorbed and the hair follicles are nourished as well. This is because of the high amounts of iron in the fruit, which helps circulate more oxygen to the scalp and stimulate hair growth and promotes the thickness of the hair too.

For A Luxurious, Moisturized Hair:

To have lovely shiny and beautiful hair is a must for us all and a desire too. This is why, we shall look at the oil of the custard apple seed for the same. It helps tame the mane with frizz and waves, and also softens out coarse hair too. What the oil does is to hydrate the scalp and moisturize it as well, and this makes the hair lustrous, shiny and full of volume too. There are also high levels of Vitamin A in the seed oil which helps hydrate and protect the hair from the harmful UV rays of the sun as well as. Remember this is a light weight hair oil which can be used even before going out, since it would not make the hair look limp and weighed down.

Good For Fetal Skin And hair :

The fruit when broken down for nutritional value shows us how abundantly blessed it is with Vitamins A and C. And it is these two vitamins that helps best with skin and eyes and hair of the fetus maintenance. This is why, it is safe as pronounced by doctors for expectant mothers to consume and have everyday.



Keeps scalp healthy :

Apart from benefiting your skin, custard apples also help keep skin infections at bay because they are full of vitamin C. Additionally, a rich source of antioxidant, it helps inhibit any sort of infection in the scalp and keeps in healthy and nourished. Since it also helps in regulating sebum production area the and eliminate dead skin cells to restrict the g of bacteria. This is also a great way to promote new hair growth.



Prevent premature greying :

Just like eating custard apples is a great way to keep premature ageing of the skin at bay, it also helps to deal with premature greying of the hair in both men and women. One of the main reasons for premature greying is a shortage of copper in the body. Custard apple is a great natural source of copper and gives hair the dark melanin colour and that it lacks. Therefore, if you are dealing with too many greys, consume custard apples to stop your hair from losing colour further.



For Better College levels :

For all the hair issues that we have, one must look deep into the matter to find a solution. A natural way to enhance the working of the collagen would be the consume custard apples. This is because of the abundance of vitamin C in the fruit, which helps with healthy development of collagen, and which leads to better hair growth and scalp maintenance too. Collagen is protein which is the main part of the hair and scalp, and hence needs to be cared for with almost grit. One can again topically consume the fruit or make a paste of the flesh and apply it as a hair mask once a week.

Helps To Gain Weight :

Call it the ideal snack to munch on when you are hungry, the humble fruit would be best to have for these who fall into the Skinny binny category.

It is highly calorie laden, and the sugars found in the fruit are responsible for pepping up the metabolism rate in the body too. This in turn makes the eater more hungry than before and the food intake at meals would be much better. Hence, if you or someone you know has an issue with eating, a custard apple a day can help them beat the eating disorder. Healthy weight would be gained too.

For A Better Immune System :

Medicinal science and experts always recommend a fruit, and in this case, a custard apple to are for your immunity.

Custard apples are an excellent source of vitamins and antioxidants and is also known to help beat inflammation in the body, and boost the immune system strong and healthy. The fruit helps the body to be strong against the pathogens and the free radicals around that scavenge over the human body. Having a custard apple per day, means to help the body stay strong and fit, it also helps keep the illnesses at bay.

Replenish Your Energy Level :

Most of us are perennially tired, and irrespective of the amount of sleep we have, the exercise we do and the light diets we follow something is always amiss. We still lethargic and tired. This is because our bodies lack the kind of energy once again comes from the custard apple. The fruit helps one eliminate weakness of the muscles and also fights exhaustion in the long run. Just a serving a day would help keep the exhaustion at bay.

Natural Anti - cancerous Properties:

While we seek the best treatments for cancer, medical sources now point out to the powers of the humble custard apple that helps defeat and kill cancer causing cells.

The bark of the custard apple tree has plenty of tannins and astringent properties in it, which is used in the manufacturing of herbal supplements. It is exactly these herbal supplements that can go ahead and stop metastasis from happening, and prevent the spread of tumors and cancer at large.

There are compound in the fruit such as acetogenin and plenty of alkaloids that help bring the risk of cancer down and renal failure too.

For A Strong Dental System :

Chomping and munching on the fruit brings in a lot of health benefits for sure, but the skin of the fruit should not be thrown out. This is because, the enzyme in the skin of a custard apple can help with stronger teeth and gums, overall dental health is always wished for and desired, no matter what. So before you throw the skin out the next time, wash it well and chew on it to reap the benefits of the same. It is antimicrobial and antiseptic at the same time, which helps promote the fight against bacteria and plaque formation.

Keep Anemia Away with Custard Apple :

For anyone from anemia, it is a saia that one would need to increase the iron content in their respective diets. There are various sources to gather than from, but for a healthier and a yummier bite to have iron in it, the humble custard apple can be the right source to choose and consume. This is because of the high level in the fruit which can help cure anemia, says medical science, The fruit also helps treat vomiting and nausea, gout and vitamin B6 deficiency too.

For A Better Vision :

We wonder why is custard apple better to have when you suffer from eye problems and visionary issues. The answer lies in the fact that custard apple has plenty of vitamin C and Riboflavin as well which helps combat the onslaught of free radical destruction to a very large extent. In turn, when you consume a custard apple a very large by medical source that the eyesight is kept in good health and steady.

Helps To Eliminate Lice :

The paste of the fruit has plenty of enzyme and antioxidant in it, but the skin is also strong enough to ward off pathogens, infections and lice too. Applying the paste of the flesh and the skin on lice infected hair can eliminate dandruff and lice in a week.

We now hope you understand how important it is to use and consume custard apples on a daily basis.

Thwarts off Diabetes :

For these that suffer from diabetes, we know how annoying it is to them because they feel that the sweetness of life has been robbed. This can be prevented to a large extent when you consume the sweet custard apple, which has a lot of fiber in it. The fruit is known to bring down the sugar absorption in the body, and also helps prevent the occurrence of type 2 diabetes too from happening.

For Better Cardiovascular Health :

Custard apples have a well - balanced ratio of potassium and sodium in it, which helps with the regulation and the controlling of blood pressure in the body. Even the level of magnesium in the fruit is high which helps in smoothing out the working of the muscles and does not allow jerking or cramping of the muscles to happen.

Thanks also to the fiber and the niacin content in the fruit, the LDL or the bad cholesterol levels in the body is brought down to a large extent, while the HDL or the good cholesterol levels in the body is upped.

Lower The Risk of Arthritis :

Thanks to the abundance of magnesium in the fruit, a custard apple has a lot of power to equalize the water balance distribution in the body. The fruit is also known to remove the acid from every joint in the body which helps in bringing down the inflammation and the pains associated with arthritis. The fruit also helps in bringing down the occurrence of rheumatism, which is why even doctors worldwide would ask you to consume a custard apple everyday so that you can fight the weakness of the muscle internally. And there is also a lot of calcium in a custard apple which helps with bone development and health too.

Conclusion :

Herbal based hair dye has been prepared. It offers a natural alternate, which can be used. A herbal hair pack colour the hair in a almost gentle manner. The advantage of herbal based cosmetics are their non toxic nature. It helps to treat dandruff by removal of excess oil from scalp. The herbal formulation hair pack containing the goodness of powder of different plants, which excellent for hair care. Natural remedies are widely accepted with open hands nowadays as they are safer with minimal side effects as compared to the chemical based products. In this research we found effective properties of the herbal hair pack and further studies are needed to be performed to explore more useful benefits of this herbal hair pack.

Result:

The prepared herbal hair dye contains all the goodness of natural ingredients. Shikakai is packed with vitamin A, C, D and K, which together form a powerful antioxidant. This antioxidant is probably the only thing your hair needs to clean the scalp of the sebum buildup, unclog pores, and hair growth. Coffee for hair strengthens hair by improving the overall quality and texture of it. Hibiscus is excellent for hair growth activity. Custard apple pulp powder helps with premature greying of hair. Custard apple is a great natural source of copper and gives hair the dark melanin colour. Organoleptic evaluation findings revealed that the pack is smooth and pleasant smelling powder. Phytoconstituents, which act as true nourishers for the scalp as well as hair. The protein of hair stability tests performed at different temperatures. The formulation was found to be stable.

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