

Formulation and Evaluation of *Embilica officinalis*

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Abstract: *As earlier studies has stated amla is having rich hair nourishing activity and is beneficial for treatment of dandruff problem. The present study is based on combining the capacity of amla with Hibiscus, Henna, Neem, Shikakai and other herbs to obtain enhanced property which can be used to treat the dandruff and problems of whitening of hairs at early age in youth due to exposure to pollutants, improper care and many other factors. The present research aims at formulating and evaluating polyherbal shampoo. The shampoo was tested with different parameters such as anti-dandruff activity, Dirt dispersion test, Foaming ability, Patch test and Stability studies were carried out for 3 months. And based on the all the evaluation test the formulation was found to be stable and can be considered good for applying to scalp and was found to be effective to treat dandruff and also nourish hairs and enhance its appearance.*

Keywords: Amla, Anti-dandruff, Henna, Hair tonic

I. INTRODUCTION

Shampoo is mainly used for cleaning of hair and scalp. The liquid preparation mainly used for cleansing of hair known as shampoo. They are basically water-based product containing Primary and Secondary surfactant. The main function of Primary surfactant is cleaning and secondary surfactant work as foaming action. The primary function of cleaning the hair of accumulated sebum, scalp, debris and residues of hair grooming preparations. The herbal shampoo is best in performance due to lesser side effects, it might be safer than synthetic ones.

Importance of this formulation:

- The selection of active ingredients of hair care shampoo is mainly based on the ability of ingredients to prevent damage to our hair, scalp, and prevent dryness to the hair skin. To improve quality of hair, smoothing and nourishing and protecting the skin. It does not have any side effect as compared to synthetic ones.
- It is easier to used.
- It cannot cause irritation to the scalp and eyes also.
- It has ability to produce foam to satisfy the psychological requirements. Main ingredients used in shampoo preparations:



Hibiscus Leaf: The leaves of hibiscus trees are also used as a shampoo as it leaves the hair soft and shiny. Ayurveda recognizes the hibiscus flower as an important source for hair growth.



Henna Leaf: The natural properties of henna promote hair growth. The powder can be used to create an essential oil that nourishes and encourages growth.



Neem Leaf: Prevents the problems like hair loss and premature graying. The powder is rich in fatty acids, minerals, vitamins, and possesses antifungal, and antibacterial properties.

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Amla for Dandruff:

Traditional medicines have long used amla shampoo for dandruff. It utilises the properties of amla to go after the root cause of dandruff, which is usually excessive oil on your scalp. scalp secretes oil or sebum to form a protective layer against germs and infections. It also hydrates your skin and prevents it from drying out. But when your oil production is disrupted, often due to hormonal fluctuations, there is a tendency for this oil to build-up on your scalp. This is when a naturally occurring fungus, known as *Malassezia Globosa*, goes into overdrive. This leads to a breakout of severe scalp itching, redness, and white-yellow flakes of dead skin cells. When you use amla shampoo for dandruff, you simultaneously attack the oil build-up and the dandruff causing germs. It tries to regulate the oil levels on your scalp and stop the growth of fungus, while calming down the itching and inflammation. The increased blood circulation also brings nutrients to the scalp, which can possibly reset the health of your head.

II. PLANT PROFILE

2.1 AMLA

Synonym: Indian gooseberry.

Family: Euphorbiaceae.

Source: Amla Fruit.

Role:

- The fruits are diuretic, acrid, cooling, refrigerant, and laxative.
- Dried fruit is useful in haemorrhage, diarrhoea, diabetes, and dysentery.

2.2. HIBISCUS

Synonym: Cotton rose.

Family: Mallows.

Source: Dried leaves.

Role:

- The leaves of hibiscus trees are also used as a shampoo as it leaves the hair soft and shiny.
- Ayurveda recognises the hibiscus flower as an important source for hair growth.

2.3. HENNA

Synonym: Amber.

Family: Lythraceae.

Source: Dried leaves. Role:

- The natural properties of henna promote hair growth.
- The powder can be used to create an essential oil that nourishes and encourages growth.

2.4. NEEM

Synonym: Margosa

Family: Meliaceae.

Source: Dried leaves. Role:

- Prevents the problems like hair loss and premature graying.
- The powder is rich in fatty acids, minerals, vitamins, and possesses antifungal, and antibacterial properties.

III. MATERIALS AND METHODS

Selection of Plant:

In the present study, I have selected the plant of *Embilica officinalis* as a fruit.

Collection of Plant Material:

The fruit of *Embilica officinalis* were collected from village of narayangaon.

Preparation of Herbarium:

After that we have prepared herbarium of *Embilica Officinalis* plant. For the herbarium the plant mainly fruit specimens are properly dried, pressed & mounted on sheets.

Preparation of Amla Powder:

The fruit were dried under shade for about four weeks and then made into powdered and then sieved.

3.1 Preformulation Study

A. Total Alkaloid

Add 2 ml extract along with 2 ml of conc. HCl and few drops of Mayer's reagent then formation of Green ppt is obtained, which shows it have presence of Alkaloids.

B. Total Glycoside

1 ml of Glacial acetic acid containing traces of $FeCl_3$. Add some amount of conc HCl from side of the test tube and add extract then formation of Reddish ppt obtained in the test tube. It indicates presence of glycoside in it.

C. Total Flavonoid

2 ml of extract along with 1 ml of 2N NaOH then, formation of yellow colour is obtained, which indicates presence of Flavonoids in the test.

D. Total Tannin

1 ml of extract along with 2 ml of 5% $FeCl_3$ gives formation of dark blue colour which indicates presence of Tannins.

3.2 Overall Phytochemical Test

Sr.no.	Test	Purpose of detection	Result
1.	Molisch's test	Presence of Carbohydrate	Positive
2.	Fehling's test	Presence of Carbohydrate	Positive
3.	Hager's test	Presence of Alkaloid	Positive
4.	Mayer's test	Presence of Alkaloid	Positive
5.	Volatile oil test	Presence of volatile oil	Negative
6.	Biuret test	Presence of proteins	Negative
7.	Foam test	Presence of saponin	Positive

3.3 Preparation Method of Herbal Shampoo

1. Weighed all the ingredients according to the formula.
Decoction of Hibiscus, Henna, Neem, Amla, Banyan root powders, Alovera gel, Soya milk was prepared in one part of water.
2. Filter it, by using muslin cloth. Collect filtrate. Decoction of Shikakai, and Ritha was prepared in another part of water. Filter it by using muslin cloth. Collect filtrate.
Mixed to each other of above filtrate with constant stirring.
3. Mixed gaur gum as a thickening agent for maintenance of consistency of herbal shampoo as like semisolid nature. Preservatives and perfume was added lastly.



3.4 Evaluation Parameter of Anti-Dandruff Shampoo

A. Organoleptic Evaluation

By utilizing sensory organs like eyes or nose, the examination of the formulation is performed under this evaluation, and it includes macroscopic characteristics of the drug or product, such as colour, odour, and taste. The texture and appearance are also included under macroscopic features.

Sr.no.	Evaluation tests	Observation
1.	Color	Dark Brown
2.	Odor	Characteristic
3.	Texture	Fine
4.	Appearance	Coarse formulation

B. Determination of pH

The pH of shampoo solution in distilled water was determined at room temperature by using pH of paper.

Sr. no.	Evaluation tests	Observation
1.	pH	5

C. Determination of % of Solid Contents

A clean, dry evaporating dish was weighted and added 4 grams of herbal shampoo to the evaporating dish. The extract weight of the shampoo was calculated only and put the evaporating dish with shampoo was placed on a hot plate until the liquid portion was evaporated. The weight of the shampoo only (solids) after drying was calculated, and the result is as below:

Sr.no.	Evaluation tests	Observation
1.	Determination of % of solid content.	3.8%

D. Dirt Dispersion Test

Two drops of the shampoo were added in large test tube contain 10 ml of distilled water. One drop of ink was added in the test tube, was stopped and shake for ten times. The amount of ink in the foam was estimated as none, moderate or heavy. Their evaluation test is as follows:

Sr.no.	Evaluation tests	Observation
1.	Dirt Dispersion test	Light

E. Foaming Ability and Foam Stability

Cylinder shake method was used for determining the foaming ability. 50 ml of 1% shampoo was put into a 250 ml graduated cylinder and covered the cylinder with the hand and shaken for 10 times were recorded. The total volumes of the foam contents after 1 min shaking. The foam volume was calculated only. Immediately after shaking the volume of foam at 1-minute intervals for 4 minutes recorded.

Sr.no.	Evaluation tests	Observation
1.	Foaming ability and foam Stability	50 ml

F. Patch Test

In this test, the tiny amount of moistened formulation is applied on the surface of the hand and the effects have been observed for irritancy, redness and Swelling caused by formulation.

Sr. no.	Evaluation tests	Observation
1.	Swelling	Nil
2.	Redness	Nil
3.	Irritation	Nil

IV. RESULT AND DISCUSSION

The synthesized anti-dandruff herbal hair formulation is loaded with the goodness of natural herbs along with the active phytoconstituents, like alkaloids, saponin, etc. It nourishes hair mildly by acting as an anti-dandruff agent. It effectively removes excess oil from the scalp, which is the major root cause behind the dandruff.

Amla supplies more nutrients and antioxidant content to nourish hair, also prevents free radical damage to hair follicle because of dandruff. Amla with Vit.C, anti-inflammatory and anti-bacterial properties can stop dandruff formation.

Hibiscus powder carries amino acids, vitamin A, C and alpha hydroxyl acids that are extremely nice for scalp and healthy scalp is a must for the removal of dandruff from hair. It has the astringent properties which help to reduce the oil gland secretions and excessive oil secretion of the scalp. This property of the flower helps to cool and soothe scalp providing relief from itchy scalp and dandruff.

Neem treats clogged pores and increases hair growth. The anti-fungal properties of neem do wonders in fighting dandruff. Reetha improves blood circulation and is capable of revitalizing the hair follicles and facilitating hair growth, to cope with the air loss caused by dandruff. Organoleptic evaluation signified that the pack is characteristics smelled, coarsely formulation. The phytochemical parameters revealed that the presence of alkaloid, glycoside, flavonoids and Tannins were found to be green, red, yellow and dark blue respectively. The colour of prepared formulation was found to be dark brown with characteristics smell. The pH of formulation was found to be 5 that is suitable to our scalp pH. Irritancy test was found to be negative for redness and swelling as the contents were used in their natural form, devoid of artificial additives. Determination of % solid content was found to be 3.8% along with 50 ml of foaming ability and foam stability.



V. CONCLUSION

The formulated shampoo was not only safer than the chemical conditioning agents, but also greatly reduce the hair loss during combining as well as strengthens the hair growth.

The pH of shampoo was adjusted to 5, to retain the acidic mantle scalp. The physicochemical approach used for preservation of the formulation to avoid the risk posed by chemical preservatives.

In the present scenario, it seems improbable that herbal shampoo, although better in performance and safer than the synthetic ones, will be popular with consumers. Formulators must play an active role in educating the consumers about the potential harmful effects of the synthetic detergent in the shampoo.

There is a strong need to change the consumer perceptions of a good shampoo. And used more herbal formulation for hair which can be helpful in anti-dandruff activity.

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