

Formulation & Evaluation of Herbal Hair Serum From Leaves Extract *alternanthera Sessilis* Linn

¹Waghmare Rutuja

¹Final Year B-Pharm Student at Saraswati Institute of pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

²Wahule Manisha

²Final Year B-Pharm Student at Saraswati Institute of pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

³Yedatkar Shivshankar

³Final Year B-Pharm Student at Saraswati Institute of pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

⁴Ziparage Nikita

⁴Final Year B-Pharm Student at Saraswati Institute of pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

⁵Lomte Pratiksha

⁵Final Year B-Pharm Student at Saraswati Institute of pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

*Guide

Asst. prof. Ashish D. Sakhare

Asst. Prof in the Pharmacognosy department At Saraswati Institute of Pharmacy, Kurtadi, Tq. Kalamnuri, Dist. Hingoli (MH)-431701

ABSTRACT -

Alternanthera sessilis is a green (ASUI) and red (ASR) medicinal weed of the Amaranthaceae family, which is rich in a high phytochemical content. The hair is highly important in the healthy growth of the scalp and the hair is usually regarded as a crucial aspect of human physical appearance and beauty. Cosmetic preparations such as hair serums have also gained popularity over the past years as they have a large concentration of active ingredients and can nourish the scalp and hair follicles. Modern daily lifestyle, stress, fatigue, anxiety and poor dietary habits have contributed to the increase of the frequency of hair related complications such as loss of hair, thinning hair, baldness and alopecia particularly among young individuals.

Alternanthera sessilis contains several bioactive compounds that consist of flavonoids, alkaloids and saponins which have different pharmacological properties that comprise antioxidant, “anti-inflammatory and hair-growth-promoting properties. These phytochemicals are applicable in enriching the roots of hair, maintaining the well-being of the scalp, and, in addition, making hair follicles functional. The present paper is interested in the creation and trial of polyherbal hair serum comprising *Alternanthera sessilis* and others (natural products) to treat the usual hair problems. The aim of the study is to develop a safe and effective herbal cosmetic product that enhances growth of hair and reduction of hair fall.

Herbal preparations are normally preferred to synthetic products because it is believed to be safer, environmentally friendly and also because it is associated with fewer side effects. *Alternanthera sessilis* can make a useful natural cosmetic and health ingredient due to its therapeutic and nutritional value. One option that can be a good substitute to the hair problem in addition to improving the health of the scalp could be the development of the herbal hair serum which is made using plant products.

KEY WORDS - *Alternanthera sessilis*, cosmetic , polyherbal , herbal hair serum.

INTRODUCTION –

Alternanthera sessilis is a perennial and herbaceous plant of family Amaranthaceae, and is commonly considered to be a weed in most areas of the world. Traditionally, it is a food and a traditional medicine plant yet it is a weed and has been used centuries wide. *Alternanthera* is a genus that is composed of approximately 80200 species and occur in different parts of the world. Its place of introduction is unknown but through the works of various authors, it is believed that a species of this genus has a high distribution in warm regions like North America, South America, and tropical and sub-tropical climate.

The plant is usually small and herbaceous and will extend to a mean height of one meter. It is characterized by simple and opposite leaves with short petioles and leaves that may be of any length between linear and obovate. They are tiny bisexual and can be of different colours e.g. white or pink. Most of the species in the genus *Alternanthera* are perennial although under some circumstances they may perform the roles of annual plants. The plant species can be grown in warm climatic conditions with optimum temperature of 32 o C to 40 o C. It can also survive in the relatively dry habitats besides being capable of surviving in a large spectrum of habitats like in regions which are both moist and flooded. The plant exhibits moderate root growth and rather high water demand with its pH being between 4 and 7 that is typically present in soils.

Alternanthera sessilis has two different cultivars otherwise referred to as the red and the green. The plant is used widely as the leafy vegetable in many traditional dishes of South India particularly in Tamil Nadu. The nutritional value is also supplemented by several phytochemical compounds in the plant such as sterols; stigmasterol, campesterol, -sitosterol and spinasterol amongst other bioactive compounds. These phytochemicals contribute to the count of biological as well as therapeutic characteristics of the plant.

Cosmetic is a term that is formed out of a Greek word; kosmesticos, which translates to beautify or embellish. The rules that followed and the Drugs and Cosmetics Act of 1940 have characterized cosmetics as substances that are meant to be applied to the human body to cleanse, beautify or to add or take away attractiveness or has any effect on appearance. The past years have seen herbal cosmetics getting an increasing share and share alike due to the fact that the cosmetics is considered safe, effective and with a lower probability of resulting in side effects than synthetic formulations.

Human hair growth is a cyclic process that consists of 3 major stages, namely anagen (growth phase), catagen (transitional phase), and telogen (resting phase). The anagen period is the active growth of hair follicles and hair shafts are generated whereas telogen period is the rest period of these hair follicles and the shedding of hair may occur. One therefore needs to take care of the health of the scalp and hair follicles as a way of normal hair development and also prevent hair thinning, loss and alopecia. This may have a positive effect on scalp health as well as hair growth in the fingers using cosmetic preparations with bioactive materials obtained as plants thereby nourishing and stimulating follicles.

TAXONOMICAL CLASSIFICATION :

Domain: Eukaryota

Kingdom: Plantae

Phylum: Spermatophyta

Subphylum: Angiospermae

Class: Dicotyledonae

Order: Caryophyllales

Family: Amaranthaceae

Genus: Alternanthera

Species: Alternanthera

promote hair growth, improve elegance of hair and forestall hair fall(2) Numerous issues can be resolved with the correct Serum for your hair type, ranging from detangling, adding shine, and smoothing to mending damage and offering Pollution protection[6].

HIGHLIGHTS OF HAIR SERUM :

- Hair serum is the styling substance that is applied to the hair's surface.
- It is essentially a liquid hair care product with a thicker consistency than water. Ha
- Hair serum has uses beyond hair styling. They are also used to address a variety of hair issues, such as unruly, dull, And dry hair.
- Different hair objectives require different kinds of hair serums. A hair serum may straighten hair, add gloss, or Lessen frizz, depending on the product's recipe.
- This is style product is based on silicone and is intended to be applied to the hair's surface to help enhance shine, Smoothness, hydration, humidity, and pollution protection.
- Designed to be applied on damp hair[7].

MATERIAL AND METHODS –



1] Alternanthera sessilis :

Synonyms – Dwarf copper leaf

Biological source – Alternanthera sessilis.

Family – Amaranthaceae .

Use alternanthera sessilis Activating hair roots is essential for promoting hair growth and reducing hair loss[4].



2]Moringa :

Synonyms – drumstick tree

Biological source - It can consist of dried long , slender , triangular seed- pods of moringa oleifera

Family – Moringaceae.

Use moringa: Widely recognized as a Natural ingredient that promotes scalp and hair health.

Moringa leaf Extract is optimal for stimulating hair growth.. Flavonoids accelerate hair growth and prevent hair loss.[8]



3]Wheatgrass :

Synonyms – , spelt ,Durum, emmer

Biological source – The freshly sprouted , young tender leaves of the common wheat plant,Triticum aestivum Linn

Family – Gramineae

Use: Wheatgrass is one of the Richest sources of chlorophyll and it show the antioxidant activity resulting in the promotion of hair growth.[9]

4]Okra :

Synonyms – Lady’s finger, bhindi

Biological source – *Abelmoschus esculentus*.

Family – Malvaceae

Use : Okra, when boiled, releases a mucilage that can be used as a natural hair conditioner, offering benefits Like moisture retention, frizz reduction, and promoting softer, shinier hair[10].

5]Fenugreek :

Synonyms – methi

Biological source – consist of the dried ripe seed of *trigonella foenum – graecum* Linn

Family – Leguminosae

Uses: fenugreek It reduces dandruff on the hair’s scalp by acting as an antibacterial and antidandruff agent. .

Fenugreek is thought to improve blood flow to Hair follicles[7]

6]Rose water :

Synonyms – rose hydrosol

Biological source – fresh petal of rose plant

Family – Rosaceae

Use: rose water Balances and Calms the Scalp Anti-inflammatory Provides Softness and Shine A natural conditioner is rose water[7].

7] Flaxseed:

Synonyms: Linseed, Alsi, Jawas, Aksebija

Biological Source: The dried, ripe seeds of *Linum usitatissimum* Linn

Family: Linaceae

Use: flaxseed It strengthens hair, improves manageability and gloss, and lessens dandruff. After letting it sit for half an hour to an Hour, rinse it off with a gentle wash[7]

PHYTOCHEMICAL ANALYSIS:

Phytochemical screening is a mode of analysis that was used in identifying the key classes of bioactive compounds in the plant extracts. These are the ones that lead to the majority of medicinal plant therapeutic and pharmacological effects. Mature leaves of the selected plant were carefully collected in this experiment, washed and separation of the stems was performed. The leaves were then dried under shade at room temperature to take approximately three weeks to make sure that the leaves do not degrade heat-sensitive compounds. All the dry plant material was mixed using an electric blender to a fine-powder. To further phytochemical studies, a sample of the powdered material was stored in clean sealed test tubes.

Different qualitative tests were also performed as an indicator of the presence of different phytochemical constituents in the plant extract.

Test of Alkaloids (Wagner test)

The 1 milliliter of plant extract was put in a test tube and 3-5 of Wagners reagent (this was prepared by means of the usage of iodine and potassium iodide in distilled water) were added. The presence of alkaloids in the extract was indicated by the emergence of reddish-brown product or color.

Test for Flavonoids

2 ml of plant extract was mixed with 1 ml 2N sodium hydroxide solution. The formation of yellow color was a sign of flavonoids.

Cardiac Glycosids (Keller Killani Test) Test.

Plant extract (1ml) was put in 1 ml of glacial acetic acid and a few drops of 5 per cent ferric chloride solution. A 1 ml of concentrated sulphuric acid was applied lightly over this mixture. The formation of brown ring in the interface was a sign that there were deoxy sugars which was characteristic of cardiac glycosids. A violet ring (under the brown layer) and a greenish ring (in the acetic acid layer) also confirmed the presence of these compounds.

Test for Saponins (Foam Test)

The extract of the plant (a milliliter) was mixed with distilled water and stirred. The presence of saponins was observed as usual with the appearance of stable honeycomb-like foam and lasted 10 to 15 minutes.

Carbohydrates (Molisch) Test.

One milliliters of plant extract were introduced into 2 ml of Molisch reagent and some few drops of concentrated sulphuric acid were placed. The presence of carbohydrates could be determined by a violet or a purple ring at the interface.

Test for Tannins

Plant extract was put in 1 ml along with 2 ml of 5 per cent ferric chloride solution. Tannins were indicated by the appearance of bluish or dark green color.

Test to Terpenoids (Salkowski Test)

A 1 ml concentrate of hydrochloric acid was added to a 1 ml of the extract. The formation of a yellowish precipitate or color meant that there were terpenoids.

Test for Quinones

The 1 ml of plant extract was added to 5 ml of distilled water and the turbidity was noted. The formation of a turbidity value indicated that there was the presence of quinones.

Test for Coumarins

A 1.5 ml solution of 10 percent sodium hydroxide was added to the plant extract (1 ml). The yellow colour when observed meant that there are coumarins.

Phenols (Ferric Chloride Test) Test.

Plant extract was mixed with 2 ml of distilled water to which a few drops of 10% ferric chloride solution were added. The coloration that was observed was blue or green and this meant that there were phenolic compounds present.

Amino Acids and Proteins (Ninhydrin Test) Test.

Aqueous nine-hydrin solution (2 -5 milliliters) was placed as a spot on the plant extract. The mixture was warm in the water bath of boiled water 1-2 minutes. The change in colour of the purple or violet colour showed the availability of the amino acids and proteins in the extract.

METHOD OF HERBAL HAIR SERUM:

1. The oil phase (natural oil + emulsifier) is heated to 60-70°C.
2. The aqueous phase (distilled water + glycerin + herbal extract) is heated separately to the same temperature.
3. The aqueous phase is slowly added to the oil phase with continuous stirring until a uniform serum is formed.
4. The formulation is allowed to cool, preservative and fragrance are added, and pH is adjusted to 5.5-6.5[13]

EVALUATION PARAMETERS :

Physical appearance:

The Texture, color, and *scent* of the created cosmetic serum were assessed in order to gauge its physical appearance.

PH:

A digital pH meter will be used to determine the test's pH. A digital pH dipper will be inserted deeply into the serum Formulation sample, and the pH value will be noted. Since the skin has an acidic pH of around, the formulation's pH Should also be acidic[7]

Homogeneity Test: A clean and dry object glass was smeared with the hair serum, and a cover glass was Sealed. The appearance under the light of some coarse particle/homogeneity was investigated. Herbal hair Serum was tested by visual examination for homogeneity and tested for some lumps, flocculates, or aggregates<[5]

Skin Irritation Test:

It is carried out by applying the serum on skin and tested for any redness or itching after 2 hours. [4]

Sensitivity Test:

It is carried out by applying the serum on the skin and is exposed to sunlight and tested for Any rashes or itching after 10 minutes[4]

Stability:

The herbal hair serum was kept for three months at two separate temperatures of 4 ± 2 °C and 30 ± 2 °C, with 65 RH. Compared with the original pH and density, the pH and density of the herbal hair serum were Determined after three months[4].

Conclusion:

The use of natural cosmetics is gaining preference to most commercially produced beauty products due to its relative safety and compatibility to the human body. These herbal preparations are ready with plant substances

that have different bioactive molecules, which can enhance the condition of the hair and scalp. Relative to the synthetic cosmetic products, natural formulations are typically related with limited side effects, and long-term advantages of hair care.

The existing literature review shows that herbal hair serums are important in maintaining healthy hair and conditions of the scalp. The ingredients in such formulations which are of plant origin include nutrients, antioxidants, and other phytochemicals that facilitate the nourishment of hair follicles and hydration of the scalp. These natural substances can be useful in making hair roots stronger, enhancing hair texture and making the hair grow in general". Herbal serums are capable of treating a number of usual hair issues, such as hair fall, dryness, dandruff, and dull hair, when that is done correctly.

Research has also indicated that peri-hair products are the ones that help in enhancing the quality and quantity of hair in general by supplying the scalp with the necessary food. Frequent exploitation of herbal serums can assist in keeping the hair strands strong, less prone to breakage, as well as making the hair appear shinier and healthier. Also, some of the natural ingredients contained in the herbs are said to help slow down the process of greying and retain the natural hair colour.

Thus, herbal hair serums may be used as a good ingredient in everyday hair maintenance. Through the merging of various plant-based ingredients with positive qualities, these formulations offer an integrated method of hair care and can potentially be used as a substitute of synthetic cosmetic products and help maintain healthier and shinier hair.

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