ABSTRACT

Herbal extract of guava leaves, neem leaves, curry leaves, amla fruit, fenugreek seeds, hibiscus flower and aloevera are used. The extraction is carried out by using maceration method by using ethanol as solvent. Herbal preparations are finished plant products that contain plant parts or other plant material as an active ingredient. Main The purpose is to reduce the friction between the strands of hair to allow for easier brushing or combing. physical evaluation, washability, irritation test, pH determination, conditioning effect, viscosity, moisture time determination checking testing, stability at room temperature, etc. The conclusion obtained was this the composition made of the polyherbal extracts used in requirements of the hair conditioner.

KEYWORDS: Guava leaves, fenugreek seeds, hibiscus flower, neem leaves, amla fruit, vitamin E oil, herbal conditioner.

INTRODUCTION

Since ancient times, people have used natural extracts and resources for health care and cosmetic purposes. Accordingly, today's consumer demand for natural ingredients and ingredients, especially in cosmetic products, as a substitute for synthetic compounds, with possible downsides health and environmental effects are increasing enormously. Therefore, in order to comply these requirements together with the urgent need to limit the use of microplastics on the market trends are developing towards cosmetics based on natural ingredients, generally associated with healthy lifestyle, both in the food industry and in cosmetics (i.e. hair care).
The hair has a protective role against adverse effects of the environment, for example towards the temperature and ultraviolet (UV) light (Harahap, 2000). The most significant role of the hair is for aesthetic purpose and thus, if the hair encounters any abnormalities, the confidence level of that person will be disturbed. The most common abnormalities are depigmentation (grey hair), dandruff and hair loss. Hair loss is the reduction of hair volume which causes hair thinning and even baldness. Herbal products have gained increasing popularity in the last decade, now it is used by 20-30% of the population herbal products are complex mixtures of organic chemicals that may come from any raw processed part of the plant, including leaves, flowers, stems, bark and seeds, etc. Herbal preparations are finished herbal products that contain parts of the plants or other plant material as active ingredient.

Amla is rich in vitamin C, tannins and minerals such as phosphorus, iron and calcium it provides nourishment to hair and also causes hair darkening. Hibiscus is composed of calcium, phosphorus, iron, vitamin B1, riboflavin, niacin and vitamin C, which are used to stimulate the growth of thicker hair and prevent premature graying of hair. Brahmi contains alkaloids that strengthen protein kinase activity. Methi contains a high protein feed that supplies the required protein hair nutrition. In this scenario, it seems unlikely that herbal hair conditioner, although better performance and safer than synthetics, they will be popular with consumers. Next A radical approach in popularizing herbal shampoo would be to change consumers expectations from a conditioner with an emphasis on safety and effectiveness.

Formulators must play an active role in educating consumers about the potential harmful effects of synthetic substances detergents and other chemical ingredients present in shampoos. There is a strong need for change consumer perception of a good conditioner and the onus is on the formulators Conditioners that are applied to the hair after shampooing are meant to promote properties as

- Smooth and easy detangling in wet and dry hair.
- Reduction of static electricity caused by combing and brushing dry hair, which result flying hair.
- Increases shine or as hair shine.
Fig. 1:

Hair is made up of a hard protein called keratin.[7] Hair is an important part of the overall attractiveness of the human body. There are many hair problems like thinning hair, lack of hair volume, premature graying, conditioning, hair loss, etc.[9] The hair bulb forms the base of the hair follicle. In the hair bulb, living cells divide and grow to form the hair shaft. That covers it entire surface of the body. Most of the world's population experiences the problem of dullness or unruly hair and using head coverings such as scarves or helmets can cause dryness and dull hair. Hair conditioners are used to solve these problems. Hair conditioner is a hair care product it is used to improve the feel, look and manageability of the hair as well as reduce friction between strands of hair, allowing for smoother brushing or combing.[7]

Collection of plants

Hibiscus flower, neem leaves, curry leaves, amla fruit, fenugreek seed, aloe vera were collected from the local market.

1] Hibiscus flower (rosa-sinensis)

Family- Malvaceae

Part used-flower

Hibiscus rosa-sinensis is an evergreen shrub or small tree that is traditionally claimed as a hair tonic in traditional and folk medicine. It is contained in chemical components such as Compestrol, Cholesterol, flavonoid, stigmasterol, etc. These include flavonoids is responsible for property maintenance, After a thorough rinse they facilitate detangling, no frizz, softness, reduce hair static changes, improves shine and protects hair from future damage. The purpose of the research is to obtain the composition of the hair conditioner hibiscus.[7] This flower is
used to control dandruff. Hibiscus antioxidant properties due to the production of flavonoids anthocyanins and other phenolic compounds and are immunomodulating, reducing the harmful effects of UV radiation radiation. It can be used to rejuvenate hair by air conditioning.\textsuperscript{[12]}

![Hibiscus flower](image1.png)

**Fig. 2: Hibiscus flower**

![Hibiscus flower powder](image2.png)

2) **Neem** (Azadirachta indica)

**Family**- Meliaceae

**Part used**- Leaves

Also known as "INDIAN LILAC". It is a plant of the Indian subcontinent. Neem leaves contain flavonoids, steroids, terpenoids, sterols, imbibing and Salinan. An aqueous extract of Neem is used. The high quality neem extract or pressed neem oil is used in product formulations to help control ticks, fleas and lice. It has anti-inflammatory, antioxidant, antiseptic and healing properties Properties. It also provides the best results for dandruff and hair loss. We can get it in the form of hair oil, hair tonic, and conditioners. It is also most easily used by boiling neem leaves in oil and then massaging them scalp.\textsuperscript{[10]}

![Neem](image3.png)

**Fig. 3: Neem**

![Neem powder](image4.png)

**Neem powder**
3] Curry (Murraya koenigii)

**Family:** Rutaceae

**Part used:** Leaves

It is rich in vitamin B, vitamin C, protein, folic acid and minerals such as iron and has antioxidant properties. It has a unique quality of regrowth of new hair. It is known as a miracle herb for thick and bulky. Helps reduce scalp infections. Vitamin B helps to strengthen hair roots; prevents hair breakage. It is used daily by boiling curry leaves in oil and massaging it into the scalp.\(^{[10]}\)

![Curry leaves](image1)

![Curry leaves powder](image2)

4] Amla (Emblica Officinalis)

**Family:** Phyllanthaceae

**Part used:** Fruit

Also known as "INDIAN GOOSE". Phyllanthus is derived from the Greek word that means leaf flower.\(^{[10]}\) Amla is a given name to the fruit of a small leafy tree (Emblica Officinalis), which grows in India and bears an edible fruit. This fruit is highly valued both for its high value vitamin C content and for the precious oil that is extracted from its seeds and pulp and used as a treatment of hair and scalp problems. It is used in eye syndromes, hair loss and childhood ailments etc.\(^{[13]}\) Contains 5 to 6% tannins, e.g such as Gallic Acid Ellagic Acid and Phyllembelin. Aqueous extract of Amla is used in the formulation. Amla contains a rich source of vitamin C, iron and calcium. It has properties such as astringent, cooling, laxative and diuretic. It is used in combination with any other hair oil. It is mostly available in the form of hair oil. It has been used since ages and can be easily made at home by boiling Amla fruit in oil and massaging it into the scalp.\(^{[10]}\)
5) **Fenugreek seed** (foenum-graecum)

**Family:** Fabaceae

**Part used:** seed

Fenugreek is popularly known as Greek hay. It is mainly grown around the world in semi-arid region. Currently, India is the world leader in fenugreek productions. Its seeds are cuboidal in shape from yellow to amber in color, the seeds are mainly used in pickled pastes and curry preparation in addition to the seeds being used as a conditioner and a traditional remedy for hair loss when mixed with yogurt.[^4] It is used as a hair conditioner. Fenugreek hay contain a significant amount of protein content that can promote hair growth and are rich in flavanoids, which have antioxidant activity by preventing radicals and prevents hair loss. Seed extract is too it is used as a hair cleanser.[^12]

6) **Guava Leaves** (*Psidium guajava*)

**Family:** Myrtaceae

**Part used:** leaves
Psidium guajava (common name-guava) is a well-known tropical tree that is widely distributed grown for fruit. Guava fruits contain vitamins A, C, iron, phosphorus and calcium. It has more vitamin C than an orange. The gauva fruit contains saponin, oleanolic acid, lyxopyranoside, arabopyranoside, guaijavarin, quercetin and flavonoids. Ascorbic and citric acid are the main components of guava that play a key role. The essential oils in the leaves contain α-pinene, limonene, β-pinene, isopropyl alcohol, menthol, terpenyl acetate, caryophyllene, longicyclene and β-bisabolene. Oleanolic acid is also found in pearl barley leaves. Guava leaves have antibacterial activity in extracts that can inhibit the growth of S. aureus. Guava contains high levels of antioxidants and anti-inflammatory nutrients. The methanolic extract of the leaves and bark of the P. guajava plant has high antibacterial activity that are not only essential for health, but also help regulate free radical activity.\textsuperscript{[14]}

\begin{figure}[h]
\centering
\includegraphics[width=0.4\textwidth]{guava_leaves.jpg}
\caption{Guava leaves.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=0.4\textwidth]{guava_powder.jpg}
\caption{Guava leaves powder.}
\end{figure}

**Formulation of conditioner** - Formulation of the herbal conditioner, mixing the two phases are prepared water phase (A) and oil phase (B)

**Polyherbal drug as follow**

<table>
<thead>
<tr>
<th>Sr.no</th>
<th>Plants</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hibiscus flower</td>
<td>5gm</td>
</tr>
<tr>
<td>2</td>
<td>Neem</td>
<td>10gm</td>
</tr>
<tr>
<td>3</td>
<td>curry</td>
<td>10gm</td>
</tr>
<tr>
<td>4</td>
<td>Amla</td>
<td>12gm</td>
</tr>
<tr>
<td>5</td>
<td>Fenugreek seed</td>
<td>18gm</td>
</tr>
<tr>
<td>6</td>
<td>Guava Leaves</td>
<td>15gm</td>
</tr>
</tbody>
</table>
Table: - 1.

<table>
<thead>
<tr>
<th>Sr.no</th>
<th>Ingredient</th>
<th>Quantity</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plant Extract</td>
<td>4ml</td>
<td>Medicinal Agent</td>
</tr>
<tr>
<td>2</td>
<td>Aloe Vera Gel</td>
<td>1gm</td>
<td>Conditioning Agent</td>
</tr>
<tr>
<td>3</td>
<td>Glycerine</td>
<td>3ml</td>
<td>Humectant</td>
</tr>
<tr>
<td>4</td>
<td>Citric Acid</td>
<td>0.6gm</td>
<td>pH Maintainance</td>
</tr>
<tr>
<td>5</td>
<td>Tragacanth Gum</td>
<td>0.4gm</td>
<td>Stabilizer</td>
</tr>
<tr>
<td>6</td>
<td>Methyl Paraben</td>
<td>Q.S</td>
<td>Preservative</td>
</tr>
<tr>
<td>7</td>
<td>Rose Water</td>
<td>Q.S</td>
<td>Perfume</td>
</tr>
</tbody>
</table>

Part A (aqueous phase)

Table 2:

<table>
<thead>
<tr>
<th>Sr.no</th>
<th>Ingredient</th>
<th>Quantity</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tween 40</td>
<td>3gm</td>
<td>Emulsifier &amp; Surfactant</td>
</tr>
<tr>
<td>2</td>
<td>Coconut oil</td>
<td>3ml</td>
<td>Softening agent</td>
</tr>
<tr>
<td>3</td>
<td>Almond oil</td>
<td>3ml</td>
<td>Strengthening agent</td>
</tr>
<tr>
<td>4</td>
<td>Castor oil</td>
<td>3ml</td>
<td>Enrichment of scalp</td>
</tr>
<tr>
<td>5</td>
<td>Vitamin E oil</td>
<td>1ml</td>
<td>Antioxidant &amp; moisturizer</td>
</tr>
</tbody>
</table>

Part B (oil phase)

Table: - 3

Extraction process

Plant extraction was performed by maceration method. First all plants was weighted and it was extracted using ethanol within 7 days after that this extract are filtered by using whatmann filter paper. After that this extract was evaporated in water bath. Then extract is collected.

(1)  
(2)
The water phase and the oil phase were mixed together with constant stirring using a mechanical stirrer, both phases were thoroughly mixed and poured into suitable labeled container.

**Evaluation of formulation**

**Physical evaluation**

Physical evaluation such as colour, odour was detected.

**Dirt dispersion**

Two drops of shampoo were added to a large test tube containing 10 ml Distilled water. 1 drop of India ink was added; test tube it was stoppered and shaken ten times. The amount of ink in foam was rated as none, light, moderate, or heavy.

**pH**

The pH of the prepared herbal hair conditioner was measured using a digital pH meter. pH meter was calibrated using a standard buffer solution.

<table>
<thead>
<tr>
<th>Sr no</th>
<th>Formulation</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic conditioner</td>
<td>6 to 8</td>
</tr>
<tr>
<td>2</td>
<td>Conditioner Containing herbal extract</td>
<td>7.1</td>
</tr>
</tbody>
</table>

**Conditioning effect**

A sufficient amount of the product was applied to the hair after shampooing and then washed of water and observed a difference after drying the hair.
Irritancy effect
In this test 1-2 ml of the formulation was applied to the dorsal side of the left hand and observed for 2 hours any signs of redness, irritation and inflammation.

Viscosity
Viscosity is measured by pouring the formulation from one beaker to another and its fluidity and pouribility were measured.

Moisturising time determination
One gram of hair ball with a volume of approx. 20 cm3 size was placed on the surface 20ml of different dilutions of conditioner and set the sinking time of the hair in the conditioner was 5–15 minutes were required to sink for silk, smooth hair.

Washability
Formulations have been applied to the hair and then it is easy and prolonged washing with water check manually.

RESULT AND DISCUSSION
The polyherbal hair conditioner by using the various plants extract was prepared and evaluated. the formulated product passed the physical evaluation, dirt dispersion, conditioning effect, irritancy test, viscosity, washability, moisturising time determination test was performed.

CONCLUSION
Hair conditioner containing hibiscus flower, neem leaves, curry leaves, amla fruits, fenugreek seeds, guava leaves. extracts was formulated and evaluated with the desired effect of conditioning and nourishing properties has also been found to be easy washable, liquid, does not cause skin irritation and stable. Guava leaves are an effective herb for hair reduction loss. Hibiscus are very nutritious and as a result they are effective in reducing hair loss, baldness and thinning hair. Fenugreek seeds contain progressive hormones that increase hair growth. There are natural emulsions for hair hydration which contain a high concentration of protein and are similar fenugreek seeds, have the ability to eliminate hair loss and hair damage. the use of herbal conditioner are safer and healthier for smooth and shiny hair.
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