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FORMULATION AND EVALUATION OF HERBAL HAIR CONDITIONER

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ABSTRACT:

Hair is an important part of the human body that protects the scalp. Hair conditioners are skin care product that are applied to the ends of the hair and later used for cleansing, conditioning the hair, and rinsing. It is used to make the hair shiny and smooth. Increases the luster of hair. Mainly prevents hair breakage, reduces split ends and improves manageability. Its main purpose is to reduce friction between hairs, making brushing and combing easier. Fenugreek, hibiscus flowers and curry leaves are used as the main ingredients in herbal conditioners. It was evaluated and analyzed based on physicochemical parameters such as efficiency, stability studies. A more radical approach to popularizing herbal conditioners would change consumer expectations and emphasize safety and efficacy. The purpose is to manufacture herbal hair conditioners. All herbal conditioners exhibited pH within the specified range, comparable solids %, stable lather and high viscosity properties along with good wetting properties compared to synthetic conditioners.

Keywords: herbal conditioner, fenugreek, hair care.

INTRODUCTION:

Herbal products have grown in popularity over the past decade. Currently used by 20-30% of the population. Herbal products are made from natural sources such as flowers, stems, bark, seeds, leaves and medicinal plants. Hair conditioners are hair care products that condition the hair after shampooing¹. Restores hair to its natural state, leaving it soft, shiny and manageable. This product is suitable for all hair types. It restores moisture and smoothes the hair follicle cuticle. Hair conditioners with powerful antioxidants can reduce UV damage to your hair, including hair color changes and protein damage. Plant-based conditioners contain chemicals and sulfates. Today's conditioner formulations go beyond pure hair cleansing. In addition to cleansing power, conditioners have many properties such as Conditioning and hair shine. It is expected not to irritate the skin or mucous membrane.⁴

Various ingredients are required to make a good herbal conditioner. Each of these ingredients plays a specific role in the conditioner formula. Hair products are highly valued these days. Hair lotions and conditioners are included in many cosmetics. May contain herbal extracts such as fenugreek extract. Fenugreek extract plays an important role in reducing hair loss and its conditioning mode. Therefore, this study was designed to formulate a conditioner containing herbal products and their physicochemical properties. conditioning, straightening, providing good hair health and, most importantly, expected safety benefits. Herbal conditioners are designed to stop hair problems. Because it does not contain substances. Herbal conditioners were evaluated for physicochemical properties such as pH, solids content, rheological measurements, soil dispersibility, foaming capacity and stability, wetting time, and surface tension. Therefore, people should be more aware of how natural products can positively impact our lives and help us choose safer and healthier options.

Current research focuses on all-natural conditioner formulations and their evaluation against commercial products. Herbal products are complex mixtures of organic chemicals derived from the raw, processed parts of plants, such as leaves, flowers, stems, bark, and seeds. Herbal supplements contain plant parts or other active ingredients. It is a finished herbal product.

HOW TO USE CONDITIONER:

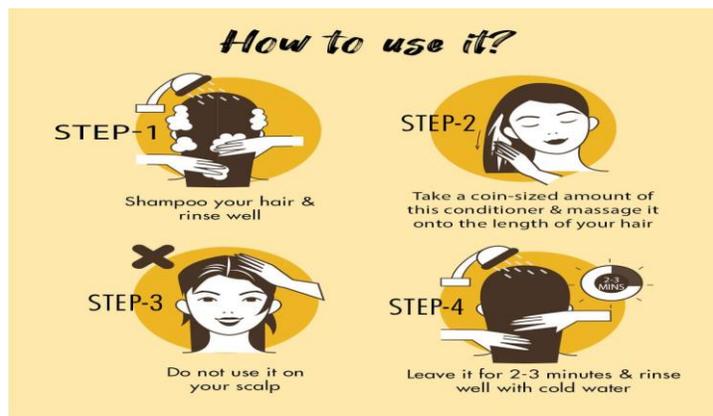


fig no: 1 how to use conditioner

Hair Anatomy:

Hair is an integrated system with specific chemical and physical behavior. It is a complex structure composed of multiple morphological components that work as a unit. All hair has a shaft and a root. The shaft is the visible part of the hair that attach to the skin. Hair roots are located within the skin and reach the deeper layers of the skin. It is surrounded by hair follicles (coverings of skin and connective tissue) that are also connected to sebaceous glands. Each hair follicle is connected to a small muscle (pillor muscle) that can straighten the hair. Many nerves also end in hair follicles. These nerves sense hair movement and are sensitive to even the slightest breeze. At the hairline, the hair root spreads into a round bulb. There is a dermal papilla inside the hair bulb, which supplies blood to the hair root. New hair cells are constantly forming in the hair bulb near the papilla. The hair shaft of mammals is divided into three main regions:

- a) Cuticle
- b) cortex
- c) medulla.

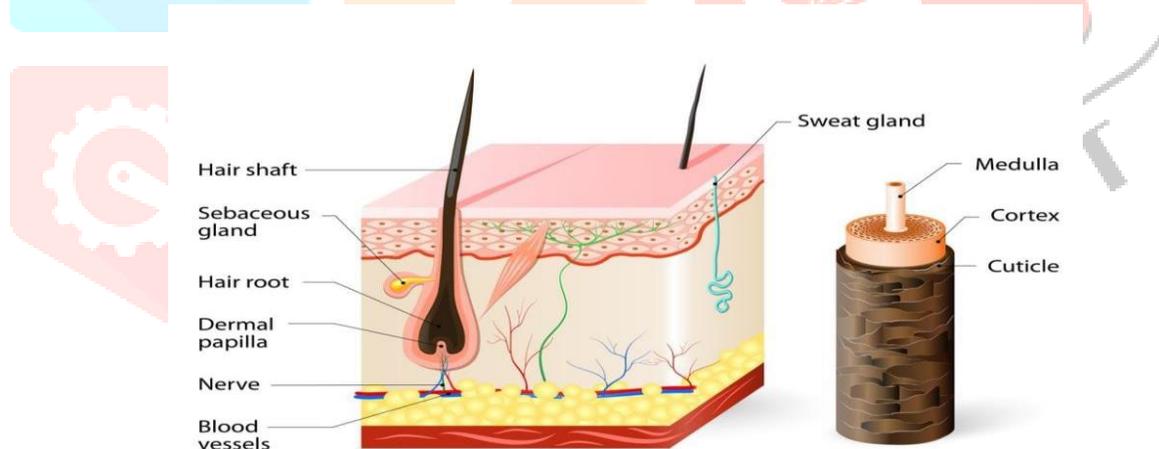


fig no: 2 hair anatomy

- a) Cuticle:** The cuticle of the hair is naturally coated with an oily substance called sebum, which protects the hair from drying out. So, when the cortex of the hair penetrates, it removes the protective sebum. The cuticle is open and natural. must be closed to return to a healthy state. The cuticle, made up of overlapping cells like fish scales or roof tiles, is the protective layer of the hair that faces downwards. A healthy cuticle is smooth and flat. It adds luster to the hair and protects the inner layers from damage. It also minimizes the movement of moisture in and out of the underlying cortex, maintaining the hair's moisture balance and flexibility. However, chemical treatments and exposure to the elements can lift the cuticle and upset this balance, making hair dry and brittle.
- b) Cortex:** Cortex makes up the bulk and pigment (color) of the hair. It consists of long strands of keratin held together by disulfide and hydrogen bonds. Cortical health is highly dependent on the integrity of the cuticle that protects the cortex. The cortex is the largest part of the hair, accounting for approximately 75% of its weight. The cortex, located in the center of each hair fiber, is composed of long, tightly packed keratin spindles stabilized by disulfide bonds. These keratin spindles are arranged hierarchically starting from the smallest structure, the keratin protein itself, to the largest and final structure, the cortex itself. The cortex gives strength to the hair and also houses melanin granules. These are the pigment packets responsible for the color of the hair. Cortex is also responsible for giving the hair its shape and texture, resulting in it being either straight, wavy, curled or frizzy.

- c) **Medulla:** The medulla is the inner layer of the hair shaft. This almost invisible layer is the softest, most fragile, and serves as the marrow or core of the hair. Some mammals do not have a medulla in their hair. The presence or absence of this layer and the characteristics of the medulla help taxonomists to identify which taxon a hair comes from. Features include whether the medulla contains air pockets and histology of the medulla.

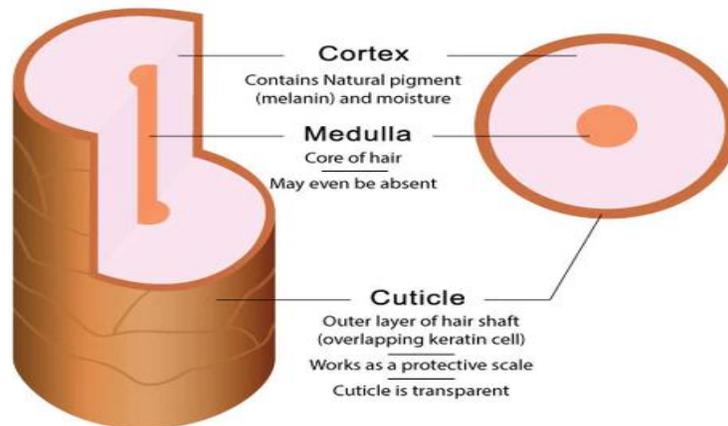


fig no:3 hair shaft

Aim and objective:

Aim: To Prepare and evaluate herbal conditioner by using fenugreek seeds, hibiscus flower and Curry leaves.

Objective:

1. To Designed to add shine to your hair.
2. To Keep it soft and flowing.
3. To Increase hair growth.
4. To Makes hair more manageable and easier to comb.
5. To Leaves hair soft and moisturized.
6. To Restore damaged hair.
7. To straightening curly hair.
8. To revitalizes and replenishes hair strands.
9. To Prevents styling from UV rays and heat.

Advantages of herbal conditioner:

- 1) Gives hair shine and softness.
- 2) Reduce split ends.
- 3) Improve manageability.
- 4) Prevent hair breakage.
- 5) Protects hair from chemical and mechanical damage.

Disadvantages of other conditioner available in market:

- 1) Harmful to hair and generally toxic.
- 2) Causes eye irritation.
- 3) Other conditioners mainly contain Sodium Lauryl Sulfate and Ammonium Lauryl Sulfate.
- 4) They dry out the hair shaft and cause split ends and frizz.

Material and Profile:

table no:1 ingredient and their role

Sr.no	Ingredient	Role of ingredient
1	Fenugreek seeds	Nourishes the hair.
2	Hibiscus flower	Natural conditioner
3	Curry leaves	Promote hair growth
4	Mint oil	Antimicrobial agent
5	Aloe Vera	Conditioning Agent
6	Glycerine	Moisturizer
7	Rose water	Perfume
8	Almond oil	Smoothing Agent
9	Citric acid	pH adjuster
10	Propyl paraben	Preservative

1.Fenugreek: It helps to repair hair shafts damaged by dehydration. A rich source of iron and protein, two nutrients essential for hair growth. Fenugreek contains lecithin, which acts as a natural emollient that nourishes and moisturizes the scalp and hair. Fenugreek contains mucus fibers that absorb moisture tremendously. This will improve the shine and soft texture of your hair. Fenugreek seeds contain significant amounts of fiber, phospholipids, glycolipids, oleic acid, linolenic acid, choline, vitamins A, B1, B2, C, nicotinic acid, niacin, and many other functional elements.²⁰



fig no: 4 fenugreek seeds

2. Hibiscus Flower: In herbal, hibiscus is one of the most famous herbs for promoting hair growth. Hibiscus flowers and leaves contain large amounts of mucus that acts as a natural conditioner. Crushed hibiscus flowers and leaves feel slimy thanks to this natural conditioner. Hibiscus has been used as a natural dye to cover gray hair. The antioxidants and vitamins in hibiscus help produce melanin, the natural pigment that gives hair its natural color.²¹



fig no:5 hibiscus flower

3. Curry Leaves: Curry leaves contain vitamin C, vitamin B, protein and antioxidants, all of which contribute to cell regeneration and promote healthy blood flow to the blood vessels of the scalp. The properties help promote hair growth and skin regeneration and improve the overall health of the scalp. Applying the ingredient topically rejuvenates hair follicles and promotes hair growth.⁵



fig no:6 curry leaves

4. Mint oil: One of the best sources of carotenes and antioxidants, it provides natural antibacterial and antifungal properties that help eliminate dandruff and other scalp problems. Peppermint oil is rich in pulegone and Mentone. It is contained in and strengthens the hair roots to prevent hair loss. It penetrates into the hair follicles, stimulates blood flow and promotes further growth. It helps soothe itchy and dry scalp.²



fig no:7 mint oil

5. Aloe Vera Gel: It contains many active ingredients and minerals that help strengthen your hair. It protects against ultraviolet [UV] radiation that comes from the sun. Aloe Vera contains many active ingredients and minerals that help strengthen hair. It contains fatty acids and amino acids and is rich in vitamins A, B12, C and E. These play a role in healthy hair follicles. Aloe Vera cleanses the hair shaft very effectively. Aloe Vera contains proteolytic enzymes that repair dead skin cells on the scalp.⁵



fig no: 8 aloe vera gel

6. Glycerine: Glycerin is a humectant. This means that it can actually absorb moisture from the air, keeping your hair moisturized and healthy. It is a popular ingredient in skin and hair care products because of its effectiveness. Glycerin's antibacterial properties help treat itchiness caused by dryness and dandruff. Glycerin is used to nourish and condition hair, leaving it soft and frizz-free.²



fig no: 9 glycerine

7. Propyl Paraben: Promotes hair growth and prevents the growth of harmful bacteria and mold. They are effective preservatives in many types of formulations. These compounds and their salts are primarily used for their antifungal and antibacterial properties. They are found in shaving gels, shampoos, and conditioners as preservatives.²

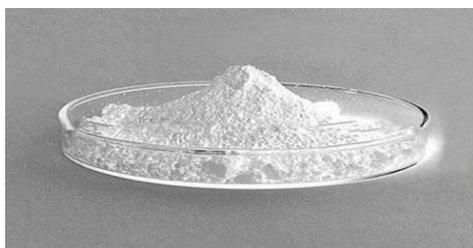


fig no:10 propyl paraben

8. Rose Water: Rosewater softens hair in many ways. Rosewater is a mild astringent and can help reduce oiliness and dandruff. Rosewater acts as an astringent on the scalp, tightening the skin and preventing excess sebum production. By reducing oil production, rose water prevents the formation of dandruff on the scalp.²²



fig no:11 rose water

9. Almond Oil: Moisturizes the scalp and hair for healthy, straight hair. Being rich in B-7 and biotin, almond oil helps keep hair healthy and strong. Oiling is considered the most beneficial for promoting hair growth. Massaging it improves blood flow to the roots, promotes hair growth, and makes hair stronger²¹.



fig no: 12 almond oil

10. Citric acid: Citric acid is known to balance the pH of the scalp as hair care products make the scalp more alkaline. Citric Acid is used as a natural alternative in hair conditioners. Rinsing your hair with diluted citric acid has a conditioning effect on your hair, leaving it silky and shiny²



fig no: 13 citric acid

Evaluation Parameter: Formulation of herbal hair conditioner were made and evaluated by the following organoleptic properties and physicochemical parameters.

1)pH test: Soak the pH strips in the herbal conditioner solution and wait for the color to change. Determine the pH by comparing the color of the pH strip to the color chart.¹

- pH of hair strands: 3.6 to 5.5
- pH of hair conditioner: 3 to 7

2)Dirt dispersion test: Two drops of conditioner were added to a large test tube containing 10 ml of distilled water, one drop of Indian ink was added, the test tube was capped and shaken 10 times. The amount of ink present in the foam was rated as none, light, medium, or heavy.²

3) Cleansing action: 5g of wool yarn was put into the grease and then into 200ml of water with 1g of conditioner in the flask. The water temperature is kept at 350°C. The flask was shaken at 50 times per minute for 4 minutes. The solution was removed, the sample removed, dried and weighed. The amount of fat removed was weighed.³

4) Stability testing: Store the herbal hair conditioner at 37°C for 6 weeks and observe changes in color and viscosity.²

5) Moisturizing time determination: Appropriately sized 1 g, 20 cm³ size were placed on the surface of 60 ml of various diluted conditioners and the complete sinking time of ball in the conditioner was measured.³

6) Viscosity: A Brookfield rotating spindle viscometer was used for viscosity testing. To measure viscosity, the measuring body (spindle) is immersed in oil and rotated at a given speed.¹

7) Wetting time: The wettability of surfactants depends on their concentration in the formulation and is commonly tested to assess surfactant effectiveness. Wet time was determined by measuring the time it took for the disc to sink into the conditioner.¹

8) Physical appearance: To check organoleptic properties of the conditioner.

- i. Color:
- ii. Odor:
- iii. Texture:

Conclusion: From the above studies, it can be concluded that hair conditioner exhibits excellent conditioning properties. Conditioners are applied to hair after washing and are intended to smooth hair, improve shine and shine, and repair damaged, mechanically damaged, and weathered hair. Herbal Hair Conditioner are free of chemical ingredients and are therefore safe to use on all scalp types. Hair conditioner contains ingredients that strengthen, smoothen and protect and promote shiny, healthy hair. pH value of hair rinse, dirt dispersion test, determination of wetting time, Cleaning efficacy and stability have been tested and has been found to be safe and effective to use.

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