



(RESEARCH ARTICLE)



## Development and estimation of herbal hair conditioner by *Annona squamosa*

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### Abstract

Hair conditioner is one of the cosmetics which is widely used in daily life. Hair is an imperative part of the human body which protects scalp. Hair conditioner is hair care product, which is applied to the hair and hair tips after shampoo in order to condition the hair and then it is rinsed out. Hair conditioner is used to improve the manageability and to enhance lustrous look of hair. Its main purpose is to reduce friction between the hair strands to allow easier brushing and combing. The main objective is to develop the most effective hair care product to meet people's compliance. The plants product used in herbal hair conditioner like Custard Apple, egg white, Aloe Vera, Hibiscus Flower, Lemon, Curry Leaves, rose oil having various properties like Stimulate hair growth, prevents breakage, prevent dandruff, reduces hair fall, improve manageability, helps in smoothing. Herbal hair conditioner was evaluated by different parameters like pH, dirt dispersion test, cleansing, and stability, moisturizing time determination, and viscosity, physical appearance (color, odor, and texture).

**Keywords:** Anatomy of Hair; Herbal drugs; Herbal drug extract; Herbal Hair conditioner; Evaluation; Effective hair care.

### 1. Introduction

Herbal hair conditioner that helps to prevent the hair from breakage and makes the hair strong and lustrous. Made with the key ingredients of custard apple, hibiscus flower, egg white, aloe Vera and hibiscus, this herbal conditioner for healthy hair is a solution for keeping the hair dirt-free and smooth. To put it simply, after shampoo cleans and removes oils, conditioner reintroduces moisture back into your hair and helps to smooth your strands for a shiny, soft, healthy finish. It is kind of like how you wash your face and then apply moisturizer. Deeply condition the hair and retain the scalp and hair moisture which helps to detangle the hair and support easy combing (use a wide tooth comb). Hair becomes smoother and stronger. It can't break out easily. All these prevent the hair from unwanted breakage. Target market nearly holds a 5.9% share in the overall beauty products industry. Increasing focus on healthy skin and hair and surging demand for natural remedies have positioned the herbal beauty products market to surpass US\$ 134.0 Billion I in 2033. Herbal drugs constitute a major share of all the officially recognized systems of health in India viz. Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy, except Allopathy. More than 70% of India's 1.1 billion population still use these non-allopathic systems of medicine.

#### 1.1. Hair [8]

Hair is a natural part of their look and an expression of their personality. Hair can also offer protection: For instance, it helps to keep the sun's rays from reaching our scalp. Eyelashes and eyebrows keep dust, dirt and sweat out of our eyes. Even the hairs in our nose and ears help to keep out germs and other foreign objects. Body hair helps to regulate our body temperature: The hairs stand up when it's cold, keeping the air that is warmed by the body close to the body – like a warming layer of air. Hair is a keratinous filament growing out of the epidermis. It is primarily made of dead, keratinized cells. Strands of hair originate in an epidermal penetration of the dermis called the hair follicle. At the

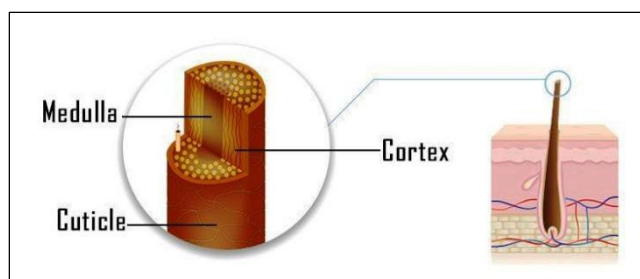
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hairline, the hair root spreads into a round bulb. There is a dermal papilla inside the hair bulb, which supplies blood to the hair root. New hair cells are constantly forming in the hair bulb near the papilla. The hair shaft of mammals is three main regions: Cuticle, Cortex, and Medulla.

a) Cuticle: The cuticle is your hair's protective layer, composed of overlapping cells like fish scales or roof tiles, but facing downwards. A healthy cuticle is smooth and flat. This gives your hair shine and protects the inner layers from damage.

b) Cortex: The cortex of the hair shaft is located between the hair cuticle and medulla and is the thickest hair layer. It contains most of the hair's pigment, giving the hair its color. The major pigment in the cortex is melanin, which is also found in skin.

c) Medulla: The medulla, also referred to as the pith or marrow of the hair, is the innermost layer. Composed of round cells, this layer is normally found in thick and/or coarse hair. Naturally blonde and fine hair generally does not have a medulla.



**Figure 1** Structure of Hair

## 1.2. Herbal hair conditioner

Herbal hair conditioners are more than just a conditioner. They are made with natural ingredients that help to nourish and condition your hair. Best hair growth conditioners can help to repair damaged hair add shine, make your hair more manageable and protect your hair from environmental damage.

### 1.3. Objectives of hair Conditioner:

- Protects hair from chemical and mechanical damage.
- Reduce split ends and to restore damaged hair.
- To Leaves hair soft and moisturized and keep it soft and flowing
- To Makes hair more manageable and easier to comb.
- To revitalizes and replenishes hair strands.

### 1.4. Properties of herbal hair conditioner

The inherent quality that must exist is the conditioner must provide maximum moisture. It should be super hydrating and restore natural oils removed from hair from daily styling and shampooing. Emollients and humectants will provide moisture and shine. In addition to moisture, a good conditioner will provide slip and thus have detangling ability. Slip is imperative to length retention and effective detangling. Consistency partial to rich, thick and creamy conditioners. The conditioner must be able to absorb and protect at a high level, which means it needs to penetrate the hair shaft. This can be achieved by using a water-based conditioner. If you are partial to all natural ingredients, reading the ingredients is essential. Leaves hair feeling soft. A conditioner that leaves your hair feeling like cotton has done its job. If you suddenly have hand in hair syndrome, you can add the conditioner to your hair care rotation.

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## 2. Material and methods [4, 5]

### 2.1. Collection of Material

Custard apple, Aloe Vera leaves, hibiscus flowers, curry leaves, Lemon are collected from home garden.

Egg, glycerin, Xanthan gum, rose water are collected from local market.

Instruments used: Soxhlet apparatus, Digital <sup>PH</sup> meter**Table 1** Herbal Drug and their uses

Sr No	Name Of Herbal Drug	Pictures	Chemical Constituents	Uses
1	Custard Apple		Squamosin, Annonacin and Annonastatin	Support To Growth of Hair
2	Curry Leaves		Koenigine, Koenidine,	Remove Dead Hair Follicles
3	Hibiscus Flower		Flavonoids And Tannins	Stimulate Hair Growth, Prevent Hair Fall
4	Aloe Vera		Glycoside, Alongside	Strengthens And Repairs Hair Strands
5	Egg		Proteins And Minerals, Such as Riboflavin, Niacin	Excess Sebum Regulation, Cleansing Scalp
6	Lemon		Citric Acid, Ascorbic Acid	Helps To Fight Dandruff
7	Glycerin		Shea Butter Or Coconut Oil	Moisturizer
8	Xanthan Gum		Glucose, Mannose, And Glucuronic Acid	Thickening Agent
9	Rose Water		2-phenylethanol, Linalool	Vehicle
10	Methyl Paraben		4-hydroxybenzoate Ester	Preservative

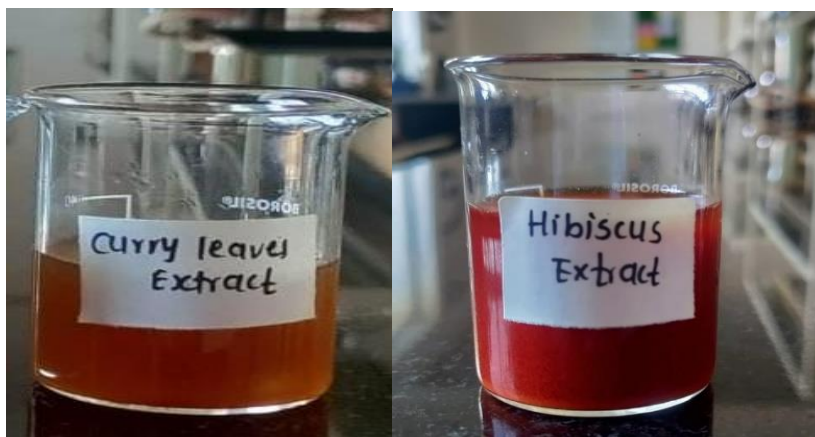
## 2.2. Extraction process [1, 2]

### 2.2.1. Curry leaves extract

Take curry leaves and dry it at room temperature. After proper drying of leaves they are was powdered with the help of blender. Then soxhlet apparatus is used for extraction, 50 gm of curry leaves powder placed it into thimble i.e. RBF containing the 500 ml Ethanol as a solvent for 3 hours. After curry leaves extraction, filter it and keep it on water bath for 1 hour, for the evaporation process.

### 2.2.2. Hibiscus flower extract

Take Hibiscus flower and dry it at room temperature. After proper drying of leaves they are was powdered with the help of blender. Then soxhlet apparatus is used for extraction, 50 gm of Hibiscus flower powder placed it into thimble i.e. RBF containing the 500 ml Ethanol as a solvent for 3 hours. After Hibiscus flower extraction, filter it and keep it on water bath for 1 hour, for the evaporation process.



**Figure 2** Curry Leaves Extract

**Figure 3** Hibiscus Flower Extract

### 2.2.3. Aloe Vera Gel

Take some fresh aloe Vera leaves & wash with D/W. Then dissect the outer part and edges of the leaves using a sterile knife. Then the remaining jelly part i.e. the aloe Vera gel is collected. Then blend the collected aloe Vera gel until a proper consistency is formed, with the help of a blender.

### 2.2.4. Egg white

Take egg and wash it with water. Break it and collect white part of it.



**Figure 4** Aloe Vera Gel

**Figure 5** Egg White

### 2.3. Formulation of hair herbal conditioner [9]

Add required quantity of Xanthan gum into Rose water and keep it overnight in a beaker (12 hrs.)

Then take 2<sup>nd</sup> beaker and add custard apple extract, Curry leaves Extract, Hibiscus flower Extract, Aloe-Vera Gel, Egg white, Glycerin, Lemon juice with continuous stirring mixture and mix well.

Then transfer 2<sup>nd</sup> beaker mixture into 1<sup>st</sup> beaker continuous stirring mixture and mix well.

Last add the Methyl paraben as a preservative to the above mixture it.

Finally herbal conditioner is prepared.

**Table 2** Formulation Table [9, 11]

Sr. No	Ingredients	F1 (100ml)	F2 (100ml)	F3 (100ml)	F4 (100ml)	F5 (100ml)
1	Custard apple extract	2 ml	3 ml	5 ml	7 ml	10 ml
2	Curry leaves extract	1 ml	2 ml	4 ml	2.5 ml	3 ml
3	Hibiscus flower extract	1 ml	2 ml	3 ml	4 ml	5 ml
4	Aloe Vera gel	5 ml	6 ml	15 ml	17 ml	20
5	Egg white	6 ml	7 ml	15 ml	20 ml	20 ml
6	Lemon juice	1 ml	1 ml	4 ml	4 ml	5 ml
7	Glycerin	1 ml	1 ml	4 ml	7 ml	10 ml
8	Xanthan gum	1.5	2	2.5	4	3
9	Rose oil	1 ml	1 ml	1 ml	1 ml	1 ml
10	Rose water	q.s.	q.s.	q.s.	q.s.	q.s.
11	Methyl paraben	1 ml	1 ml	1 ml	1 ml	1 ml



**Figure 6** Formulation of Herbal Hair Conditioner (F1, F2, F3, F4, F5)

### 2.4. Evaluation parameters [13, 14]

- Physical evaluation: Physical parameters, such as color, appearance and consistency, are examined for people with visual Impairment
- Wash-ability: The product will be painted by hand and was observed under running water.
- pH test: Using a digital pH meter calibrated at constant temperature, the pH of 1% of the hydro transpiration is calculated.

- Stability test: Place the product at -100C for 24 hours and place it at room Temperature (250C) for 24 hours. This completes one cycle. If the product passes three cycles, then you can have a good degree of confidence in the stability of the product. An even more rigorous test is a -100C to 450C five cycle test.
- Spread-ability: Spread-ability indicate the limit of the area in which the gel spreads easily on the skin or the affected part. The biological availability of the functionality to create a gel also depends on the value of the extension. By slides spread-ability two seconds, put the second slide to slide out of jail, it shows below a certain weight. Reduce the time needed to separate the two slides, a good spread-ability
- Grittiness: The product was checked for the presence of any gritty particles by applying it on the skin.

### 3. Results and discussion

Custard Apple, Aloe Vera, Egg white, Hibiscus Flower, Lemon, Curry Leaves, are well known for their medicinal value in Indian traditional system of medicine. The herbal substances is a gift of nature to the mankind and therefore there is high demand of herbal cosmetics worldwide. So that, I tried my level best and prepared Herbal hair conditioner containing the extract of Custard Apple, Hibiscus Flower, Curry Leaves, The custard apple containing conditioner was formulated and evaluated for color, odor, consistency, pH, spread ability, wash ability, grittiness, and obtained results are given into table no.2 . Color of formulation was creamy pink. It shows characteristic odor. Consistency of formulation is semi liquid so that it can be easily poured from the container. pH of formulation is neutral. Formulation shows easy spread ability. It is completely free from grittiness. Smoothing is also very good.

**Table 3** Evaluation Table

Test	F1	F2	F3	F4	F5
Color	Brown	Light brown	Light brown	Light brown	Light brown
Odor	Pleasant	Pleasant	Pleasant	Pleasant	Pleasant
Texture	smooth	smooth	smooth	smooth	smooth
Spread-ability	Easily spreadable	Easily spreadable	Easily spreadable	Easily spreadable	Easily spreadable
Wash-ability	Easily washable	Easily washable	Easily washable	Easily washable	Easily washable
pH	6	7	6.5	7	6.5
Grittiness	No grittiness	No grittiness	No grittiness	No grittiness	No grittiness
viscosity	233.10 P	233.69 P	232.4 P	232.18 P	231.14 P

### 4. Conclusion

By using Custard apple, Aloe Vera leaves, Egg white, hibiscus flowers, curry leaves, Glycerin, Lemon juice the hair conditioner shows very good effect and all these herbal ingredients showed significant different activities. Based on results and discussion, the formulation is stable at room temperature and can be safely used on the hair. It is used to smoothing, reduce hair fall, hair follicles, promoting hair growth.

### Compliance with ethical standards

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No conflict of interest to be disclosed.

### *Author's Contributions*

- Conception, design and writing of the work: Ms.Bhavna R.Waghmare
- Drafting the article: Ms. Bhavana D.Tambe
- Critical revision of the article: Ms.Bhavna Waghmare
- Final approval of the version to be submitted - All named authors should approve the paper prior to submission: Ms.Bhavna R. Waghmare, Ms. Bhavana D.Tambe

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