POLYHERBAL HAIR CONDITIONERS: A COMPREHENSIVE REVIEW OF INGREDIENTS, BENEFITS, AND APPLICATIONS

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ABSTRACT:
As natural substitutes for traditional hair care products, polyherbal hair conditioners—which blend several plant-based extracts—are gaining popularity. Known for their numerous advantages in supporting healthy hair, these formulas frequently contain components like henna, shikakai, amla, brahmi, henna, and aloe vera. These products are free of artificial chemicals and provide benefits like promoting hair development, lowering dandruff, enhancing moisture retention, and shielding hair from harm. This review discusses the main components, prospective benefits, drawbacks, and future of herbal hair care in order to assess the efficacy of polyherbal conditioners.

INTRODUCTION:
Hair is one of the vital parts of the body derived from ectoderm of the skin, is protective appendages on the body and considered accessory structure of the integument along with sebaceous glands, sweat glands and nails. Hairs are protective appendages on the body and structures of integument with sebaceous glands, sweat glands and nails are considered an important part of the body, derived from the skin ectoderm. As described by Naizet [16], is mainly constituted by three parts: the bulb, the root and the stem, and it is implanted in the pilosebaceous follicle in the dermis. The bulb is the deepest end of the hair and is also the portion that makes it grow. It is connected to the richly innervated and vascularized dermal papillae, which allow the contribution of nutrients necessary for hair growth [16]. The root is firmly fixed in the hair follicle, the part of the hair located between the bulb and the surface of the epidermis where hair takes the form of the stem. The root and stem are made of the same three concentric layers: the medulla, the cortex and the cuticle on the outside. The medulla is the central core. The next stratum, the cortex, represents the largest and thickest part of the hair determining many of their mechanical properties [9,16,17]. The cortex is made of packed spindle-shaped cortical cells, filled with keratin filaments parallelly oriented to the longitudinal axis of the hair shaft, and of an amorphous matrix of high sulfur proteins) [10]. In particular, cysteine residues in adjacent keratin filaments tend to form covalent disulfide bonds with a strong crosslink between adjacent keratin chains [9]; thus, it contributes to providing the shape,the stability, and the texture of the hair [9]. The cuticle is a very resistant layer of overlapping dead cells that form a protective barrier against the outside environment and external aggressions. It consists of endocuticle and

exocuticle [10]. Normal cuticles have a smooth appearance, allowing light reflection and limiting friction between the hair shafts. Indeed, it is responsible for the hair luster and texture .The cuticle comprises three parts: b-layer, a-layer, and epicuticle [17]. Specifically, described by Hordinsky et al. as well [17], the epicuticle is a hydrophobic lipid layer, made of 18-methyleicosanoic acid on the surface of the fiber, or the f-layer, overlapping cuticle cells surrounding the elongated polyhedral cortical cells. The combination of the outer hydrophobic layer with the cortex gives the physical properties of shine and volume (body), essential for the appearance of ‘‘healthy hair’’. Indeed, if hair is damaged by frictional or chemicals forces with the subsequent removal of the flayer, the first hydrophobic defence, the hair fiber becomes much more fragile [17]. It is useful to remember that hair fibers contain sulfur-rich proteins, lipids, water, melanin, and trace elements [17].

Keratin is the main component of the hair. It is a fibrous and resistant protein, whose aminoacidic chains are organized in an α helix and contains mainly tyrosine, glycine and cysteine. It is usually present as acidic, neutral and basic keratin [10,17,18]

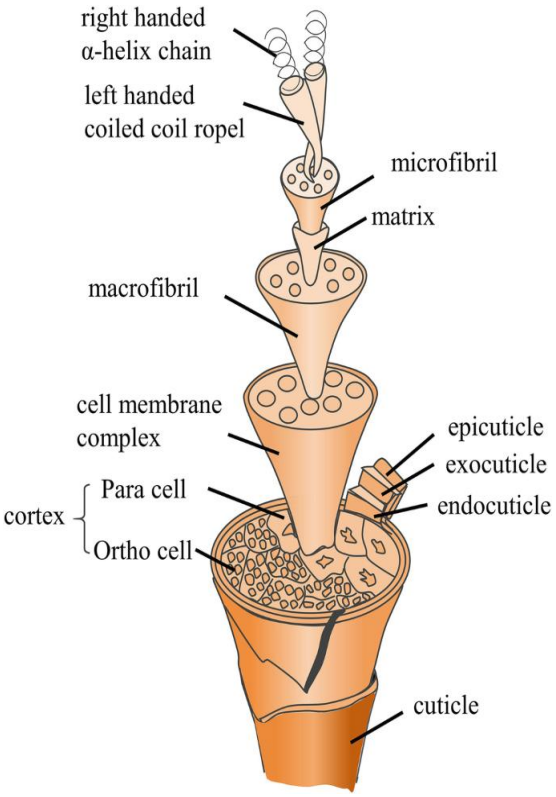

Fig :Anatomy of human hair

Hair Care

If, on one hand, hair texture and shine are usually related to hair surface properties, on the other hand, the integrity of hair is due to the hair cortex [19]. For this purpose, hair products that improve the structural integrity of hair fibers and increase tensile strength are available, along with products that increase hair volume, reduce frizz, improve hair manageability, and stimulate new hair growth [19]. Interestingly, modern cosmetic products are formulated to clean hair from detritus, and to restore and improve hair physiology. For example, intensive conditioning agents can temporarily ‘‘replace’’ the f-layer, improving the moisture retention in the cortex and rebuilding some of the reduced physical properties of hair. Therefore, the boost in hair shine is a key benefit of modern product[19].

Common hair problems

1) Dandruff

Dandruff, scaly particles that cling to the root of the hair, can be caused by a poor diet, an infection, or even a sluggish metabolism.

How to fix it: Once you have ruled out a medical issue with your doctor, use a good-quality anti-dandruff shampoo and conditioner. Remember that beauty professionals can recommend the best products.

2) Hair Loss

Although historically discussed as a problem among men, hair loss/thinning hair is also common among women. For most men, it may be male pattern balding. Female hair loss is often caused by stress, medication, changing hormones, and even menopause. Additionally, many hair styling products (chemicals/excessive heat) can contribute to hair loss.

How to fix it: Try a hair loss shampoo to add nutrition and to clean dirt, oil and the build-up of product residue that can cause hair loss. Also, limit the use of heat products to a bare minimum.

3) Dry Hair

Shampooing too often causes dry hair. Although squeaky-clean hair is a good thing, many overdo it by washing once, sometimes twice, per day. That will strip away all of the hair's natural oils.How to fix it: A gentle shampoo will stimulate the oil glands. You're safe washing your hair about every three days using an acidic shampoo with a pH between 5 and 6. Also, try an overnight moisturizing conditioner and a hot oil treatment to battle dry hair.

4) Spit Ends

Over-brushing hair, excessive perming, too much heat, and lack of a good conditioner cause split ends.

How to fix it: Treat your hair with care; and, if you have split ends, be sure to get a professional trim.

5) Oily/Greasy Hair

Oily hair is caused when the scalp produces too much of a natural oil called sebum. Sebum is produced by sebaceous glands, which can sometimes "work overtime", resulting in excessive amounts of oil.

How to fix it: Try a shampoo that is specially formulated to control sebum.

6) Frizzy Hair

Frizzy hair occurs when the hair's moisture level falls below normal levels, and it can also be hereditary.

How to fix it: Use a shampoo and conditioner specifically designed for frizzy hair. Talk to a professional for specific product suggestions. You may also want to consider a mild relaxer to keep the frizzies at bay.

7) Dull Hair

There are many causes of dull-looking hair — chemical or heat-styling damage, and environmental soils.

How to fix it: After using a moisturizing shampoo, try a cool rinse. The cold water causes the hair shaft to contract, which leaves hair looking smoother and shinier.

8) Heat Damaged Hair

Use your curling iron or flat iron too much and your hair will become damaged.

How to fix it: You will need to lay off the hot irons as much as possible. Next, start getting your ends trimmed every 3 weeks. Finally, start using a deep conditioner with keratin (to soften your hair) and cetyl alcohol (which will help retain moisture).

9) Color Damaged Hair

When you color your hair, chemicals are used to open your hair shaft, leaving your hair extremely porous and prone to brittleness and breakage.

How to fix it: Work with a professional, use a dye with special moisturizers, and get a precolor trim (because your ends are prone to soak up excess color).

10) Gray Hair

To many, gray hair is a badge of honor. But others would prefer to get rid of it because gray hair can be brittle and more unruly than other strands.

How to fix it: To cover gray hair, go semi- or demi-permanent. It will fade faster, but it is less harsh than a permanent dye. Leave this process to the pros because done incorrectly, a major color change can cause major harm.

Herbal hair conditioner

Hair conditioner is a hair care product used to improve the feel, appearance and manageability of hair. Its main purpose is to reduce friction between strands of hair to allow smoother brushing or combing, which might otherwise cause damage to the scalp.[1] Various other benefits are often advertised, such as hair repair, strengthening, or a reduction in split ends.

Conditioners are used to decrease friction, detangle the hair, minimize frizz and improve combability. Conditioners act by neutralizing the electrical negative charge of the hair fiber by adding positive charges and by lubricating the cuticle that reduces fiber hydrophilicity. They contain anti-static and lubricating substances that are divided into 5 main groups: Polymers, oils, waxes, hydrolyzedaminoacids and cationic molecules.[21] The most active and used conditioner agent is a silicone.[25,26,27] There are different types of silicones with different deposition, adherence and wash out capacity which will lead to different performances of the conditioner.[25,26,27] The ideal conditioner is capable of restore the hydrophobicity of the fiber and neutralize the static electricity. Depending on the capacity of entering the fiber, the conditioner may reach the cuticle surface or the inner part of the cortex. Smaller molecules can reach the cortex. Larger ones act on the cuticle. Low molecular weight polypeptides (<10.000 Da) can diffuse into hair. Bigger molecules (500.000 Da) can diffuse into the cuticle, especially on bleached hair. The preferred route is intercellular diffusion or diffusion through the nonkeratin regions, although intracellular diffusion may also occur. Higher molecule weight polymers (<600.000 Da) may sorption on the surface of the hair shaft.[5] Cationic ingredients such as cationic polymers are very popular in hair products. They can be so substantive to the hair that they can be difficult to remove. They are highly substantive to hair because of the hair's low isoelectric point (pH - 3.67). Any cosmetic with higher pH bears a net negative charge on the hair surface, and therefore cationic charges (positive) are attracted to it.[20,21,22,23,24] Also, Van der Waals forces and entropy are necessary to bind the molecule to the fiber, and they must be resistant to rinsing with water.[21,26] Examples of such polymers are: Benzyl dimethyl ammonium chloride and distearyldimonium chloride. The good correlation between silicone oil droplets stability, deposition on hair and resultant friction of hair support that droplet size and

uniformity are important factors for controlling the stability and deposition property of emulsion based products such as shampoo and conditioner.[24]

It is common to use cationic ingredients in many shampoos' formulations with anionic surfactants in order to result in charge neutralization forming a cationic-anionic complex, a neutral hydrophobic ingredient. Therefore, we can understand that the interaction between the ingredients is more important than the ingredient alone, as we are led to believe by the media. It is very common to think that a new release product that contains a certain ingredient has the magic ability to transform dull hair into shiny and smooth hair. Most of the time, the major ingredients do not change, and sometimes the capacity of the ingredients to interact inside the shampoo's or conditioner's chassis or system is what makes the product acts better. Bleached and chemical treated hair have a higher affinity to conditioning ingredients because they have a low isoelectric point (higher concentration of negative sites) and are more porous than virgin hair.[21,24]

Functions of the conditioners are:

- Improve combability
- Mimetize the hair natural lipid outer layer: 18-MEA
- Restore hydrophobicity
- Seal the cuticle
- Avoid or minimize frizz, friction: Neutralize the negative charged net
- Enhance shine, smoothness and manageability.

Types of hair conditioner :-

1. Pack conditioners are heavy and thick, with a high content of cationic surfactants that are able to bind to the hair structure and "glue" the hair surface scales together. These are usually applied to the hair for a longer time. The surfactants are based on long, straight aliphatic fatty acid chains similar to saturated fatty acids. Their molecules have a tendency to crystallize easily to form a lamellar structure, giving the conditioner higher viscosity, and they tend to form thicker layers on the hair surface.
2. Leave-in conditioners are thinner and have different surfactants, which add only a little material to the hair to avoid weighing down the hair or causing greasiness. They are based on unsaturated fatty acid chains, which are bent, not straight. This shape makes them less prone to crystallizing, making a lighter, less viscous mixture and providing a significantly thinner layer on the hair. The difference between pack and leave-in conditioners is similar to the difference between fats and oils, the latter being less viscous. Leave-in conditioner is designed to be used in a similar way to hair oil, preventing the tangling of hair and keeping it smooth. Its use is particularly prevalent by those with naturally curly or kinky hair.
3. Ordinary conditioners combine some aspects of pack and leave-in conditioners. Ordinary conditioners are generally applied directly after using shampoo, and manufacturers usually produce a conditioner

counterpart for different types of shampoo for this purpose.

4. Hold conditioners, based on cationic polyelectrolyte polymers, hold the hair in a desired shape. These have a function and composition similar to diluted hair gels.
5. Cleansing conditioners are a newer category, typically based on a combination of amphoteric and cationic surfactants that can be used in place of a shampoo either as a pre-treatment before shampooing for hair that is damaged or very curly.
6. Thickening conditioner are sometimes called "volumizing conditioner", uses ingredients like protein and collagen to make hair look as full and healthy as possible. This type of conditioner works for all hair types, but obviously is best for guys whose hair is thin or thinning. Biotin, caffeine, green tea, and saw palmetto are all good ingredients to look out for in a thickening conditioner.
7. Deep conditioner has a thicker consistency than regular conditioner. It's best suited for curly, oily, or colour-treated hair because these hair types tend to be dry or damaged.
8. Moisturizing conditioner contains more oils to soften and smooth the hair. It should be used for moderately dry, curly, or thick hair as these hair types need extra moisture. Avoid moisturizing conditioner if you have oily hair.
9. Protein conditioner contains keratin, the protein that makes up your hair and prevents breakage. It helps thicken fine, straight hair and provides necessary nourishment to dry, wavy, or curly hair.
10. Cream rinse conditioner has a thinner consistency than regular conditioner. It's used as a quick detangler for fine to medium hair that is straight or wavy.
11. Instant conditioner (also known as rinse-out conditioner) usually comes as a cream or spray to be used post-shower. It leaves trace amounts of key ingredients on the hair shaft. It's best suited for dry, curly, or coily hair because these hair types are prone to frizz and split ends.

PURPOSE:

By analyzing the functions of specific herbs frequently found in these formulations, this review seeks to assess the advantages and drawbacks of polyherbal hair conditioners. This review aims to provide consumers and researchers with an awareness of the possible benefits of polyherbal hair conditioners by integrating the existing data and elucidating their overall efficacy in comparison to conventional hair conditioners, highlighting the potential advantages of using natural ingredients over synthetic alternatives in terms of safety, effectiveness, and long-term hair health.

AIM AND OBJECTIVES:

The aim of review article is to formulate and evaluate a polyherbal hair conditioner using natural ingredients, specifically rosemary (Rosmarinus officinalis) and coffee (Coffea arabica), to assess their potential benefits for hair care. To formulate a polyherbal hair conditioner using rosemary and coffee

extracts, focusing on stability and effectiveness. To evaluate the conditioner's physicochemical properties, including pH, texture, and viscosity. To assess its effects on hair health, including moisture retention, strength, and smoothness. To test the antioxidant activity andsafety profile, ensuring the product's safety and efficacy

1. **Assessment of Hair Benefits**:

To assess the effects of the conditioner on hair texture, strength, moisture retention, and smoothness. To evaluate the potential antioxidant and anti-inflammatory properties of the conditioner, which could protect the scalp and hair from damage.

2. **Toxicity and Safety Testing**:

To ensure the safety of the formulation through skin irritation tests or cytotoxicity studies if necessary.

3.**Market Feasibility and Comparison**:

To compare the polyherbal conditioner with commercially available hair conditioners, assessing its effectiveness and potential advantages in terms of natural ingredients, cost, and environmental impact

SELECTION OF HERBAL INGREDIENTS

- **Rosemary**: Known for its ability to stimulate hair growth, improve circulation to the scalp, and strengthen hair follicles. It also helps reduce dandruff and promotes a healthy scalp.
- **Caffeine**: Stimulates hair follicles by increasing blood circulation, promoting hair growth, and preventing hair loss. It also helps to strengthen the hair and improve its overall texture
- **Aloe Vera**: Aloe vera is widely known for its ability to soothe and hydrate the scalp. Its natural enzymes help remove dead skin cells, reducing dandruff and promoting healthier scalp conditions. Aloe vera also moisturizes the hair, preventing dryness and flakiness. Its soothing properties reduce irritation, making it an ideal choice for sensitive scalps. Additionally, it strengthens hair follicles, encouraging healthy hair growth by maintaining scalp health and balance.
- **Bhringraj**: Bhringraj is an ancient herb celebrated for its potent hair growth benefits. It is known to improve blood circulation to the scalp, thereby stimulating hair follicles for faster hair growth. Bhringraj also helps to reduce hair fall by strengthening the roots and preventing premature graying. The herb's rejuvenating properties support the overall health of the scalp, maintaining a balanced environment for healthy hair growth. Regular use of bhringraj in hair products can enhance hair volume and shine.
- **Neem**: Neem is an herbal powerhouse with strong antifungal, antibacterial, and antiseptic properties. It helps to cleanse the scalp by removing impurities, excess oils, and preventing scalp infections like dandruff or fungal growth. Neem also alleviates itching and irritation, making it ideal for sensitive or inflamed scalps. It works as a natural purifier, improving the overall

condition of the hair and preventing hair fall caused by scalp imbalances. Its antioxidants contribute to strengthening the hair, making it look healthier and shinier

- **Henna**: Henna is a natural conditioner that strengthens hair fibres and enhances their texture. It nourishes the scalp, providing essential nutrients that promote a healthy environment for hair growth. Henna also improves the appearance of the hair by adding a natural shine and making it look fuller. It is rich in proteins and antioxidants, which help reduce hair breakage and protect from environmental damage. Additionally, henna has natural coloring properties that can enhance the depth and richness of hair colour, providing a subtle reddish tint when used regularly.
- **Amla**: Amla, or Indian gooseberry, is a potent source of Vitamin C and antioxidants, which help to protect hair from oxidative stress and damage. It strengthens hair strands, reduces hair fall, and prevents premature graying by nourishing the hair from the root. Amla improves the overall texture and shine of hair, making it look healthier and more vibrant. It also enhances scalp health by improving circulation and promoting hair growth. Regular use of amla in hair care products helps maintain a balanced scalp, resulting in smoother, more manageable hair.

How do polyherbal hair conditioners compare to conventional products in terms of efficacy and safety?

What are the key benefits of the herbal ingredients commonly used in these formulations?

Fig: 3 SHIKAKAI

Fig: 1 HENNA

Fig: 2 NEEM

Fig: 4 AMLA

Fig: 5 ALOE VERA

Method of preparation:

Formulation of polyherbal HAIR CONDITIONER from ROSEMERRY AND CAFFEINE(COFFEE):

1. Preparation of Water Phase:

- Heat **distilled water** to **70°C**.
- Dissolve **glycerine** (3-5%) and **panthenol (Vitamin B5)** (1-2%) into the heated water phase, ensuring both ingredients are fully dissolved and mixed.

2. Preparation of Oil Phase:

- In a separate beaker, heat **cete aryl alcohol** (3-5%), **rosemary extract/oil** (2-3%), and **coffee extract/oil** (2-3%) to **70°C**.
- Stir the ingredients gently until they are fully dissolved and properly blended.
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3. Emulsification:

- Slowly add the **oil phase** to the **water phase** while stirring continuously. Use a **hand blender** or **magnetic stirrer** for effective emulsification, ensuring the ingredients combine thoroughly to form a stable emulsion.

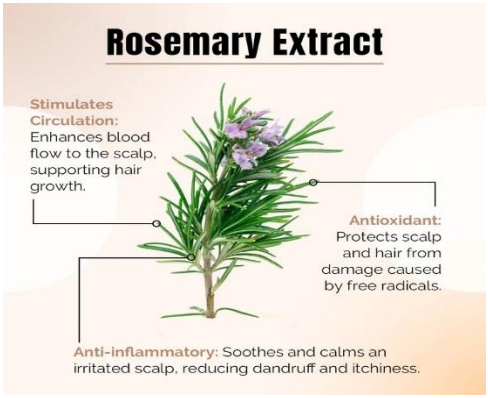
4. Cooling Phase:

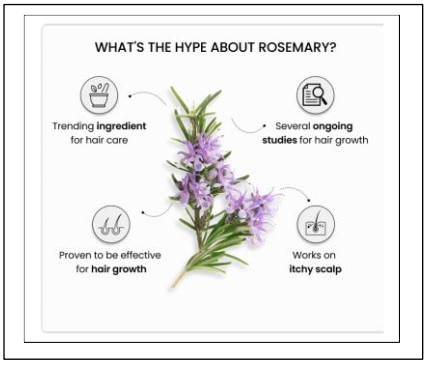
- Allow the mixture to cool to **40°C**.
- Once cooled, add **behentrimonium chloride** (1-2%), **dimethicone**, preservatives, and any **essential oils** (optional) to the cooled mixture. Stir gently to incorporate these ingredients.

5. Adjust pH:

- Measure the **pH** of the conditioner. If necessary, adjust the pH to **4.5-5.5** using **citric acid** to ensure the product is gentle on the scalp and hair.

This step-by-step process ensures the formulation of a high-quality, stable hair conditioner with the desired properties.





FORMULA: ROSEMARY AND COFFEE HAIR CONDITIONER:

Ingredient	% (w/w)	Role/Function
Distilled Water	60-65%	Solvent (water phase)
Glycerin	3-5%	Humectant (moisture retention)
Rosemary Extract/Oil	2-3%	Active ingredient (hair growth)
Coffee Extract/Oil or Caffeine	2-3%	Active ingredient (stimulate follicles)
Cetearyl Alcohol	3-5%	Emulsifier and thickener
Behentrimonium Chloride	1-2%	Conditioning agent (detangling)
Panthenol	1-2%	Moisture and strength enhancer
Dimethicone	0.5-1%	Silicone for smoothness and shine
Preservative (Phenoxyethanol)	0.5-1%	Preservative (shelf-life)
Citric Acid	q.s.	pH adjuster
Essential Oils (Lavender, etc.)	0.5%	Fragrance and scalp benefits

Quality control and Testing:

Before finalizing the product for distribution, it's essential to test its quality and safety:

• **Viscosity and Texture**: Ensure the conditioner has a smooth, creamy consistency that spreads easily on the hair. • **Stability Testing**: Test the product under varying temperature conditions (e.g., 4°C, 25°C,and 40°C) to ensure it maintains its stability and does not separate over time. •**Microbial Testing**: Perform tests to confirm that the preservative system is effective and the product is free from harmful bacteria and fungi. • **Patch Testing**: Conduct a patch test on volunteers to ensure the conditioner is safe for all skin types and does not cause irritation or allergic reactions.

EVALUATION:

1. Dirt dispersion:

Two drops of shampoo were added in a large test tube contain 10 ml of distilled water. 1 drop of India ink was added; the test tube was stoppered and shakes it ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.

2. Cleaning action: 5 grams of wool yarn were placed in grease, after that it was placed in 200 ml. of water containing 1 gram of shampoo in a flask. Temperature of water was maintained at 350.The flask was Shaked for 4 minutes at the rate of 50 times a minute. The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated by using the following equation [4].

Eye irritation test:

Animals (albino rats) were collected from animal house. About 1% conditioner solutions was dripped into the eyes of six albino rabbits with their eyes held open with clips at the lid. The progressive damage to the rabbit's eyes was recorded at specific intervals over an average period of 4 seconds. Reactions to the irritants can include swelling of the eyelid, inflammation of the iris, ulceration, haemorrhaging (bleeding) and blindness. Conditioning products are well served by objective methods to establish their various properties.4 The measurement was performed intriplicate and mean values are taken. The experiment was performed at room temperature some of the evaluation test are as following [8] .

Moisturising time determination:

One gram of hair ball with approximate of 20 cm3 size was placed on the surface of 60ml of different dilution of conditioner and the complete sinking time of the ball hair in the conditioner was measured.5-15 minutes were required to sink for silky, Naturally, human hair and sebum have a pH level between 4.5

to 5.5. This slightly acidity actually helps prevent the growth of fungi and bacteria on hair and scalp, keeping the cuticle sealed and healthy. Standard pH of conditioner is to be 7 to 8.

Stability studies:

The thermal stability of formulations was studied by placing in glass tubes and they were placed in a humidity chamber at 45°C and 75% relative humidity. Their appearance and physical stability were inspected for a period of 3 months at interval of one month. pH of prepared conditioner 7.6. Rheology experiment: Rotational spindle Brookfield viscometer (Model DV-I plus, LV, USA) instrument was used for rheology experiment. Conditioning effect experiment: In order to test the conditioning effect of the conditioner, we had to see how it is easy to comb the hairs, and to do so, we had to use a comb connected to a spring and a scaled page. The scaled page was able to display the rate of hair resistance against combing. In this method, the incoming force on ergometer caused by moving of the comb between hairs before and after using of conditioner was measured.

Tables and Figures

(Include visual aids such as tables comparing the benefits of each herbal ingredient and graphs illustrating their effectiveness in clinical studies.)

Ingredient	Key Benefits for Hair Care	Active Compounds	Mechanism of Action
Rosemary	- Improves circulation to the scalp - Enhances hair growth - Strengthens hair - Reduces dandruff and itchiness	- Carnosic acid - Rosmarinic acid	- Stimulates hair follicles - Has anti-inflammatory properties
Caffeine	- Stimulates hair growth - Increases hair follicle activity - Prevents hair loss - Improves hair thickness	Caffeine	- Increases blood flow to the scalp - Reduces DHT (Dihydrotestosterone)
Aloe Vera	- Moistu	- Polysacc	- Soothes and hydrates

	rizes hair and scalp - Reduces dandruff - Adds shine	harides - Vitamins (A, C, E)	- Helps balance scalp pH
Shikakai	Cleanses and strengthens hair - Promotes hair growth - Reduces dandruff - Makes hair soft and shiny	- Saponins	- Gently cleanses the scalp - Rich in antioxidants
Amla	- Rich in vitamin C - Prevents premature	- Vitamin C - Polyphenols	Promotes collagen production - Improves scalp health and strengthens hair
	graying - Strengthens hair follicles		
Neem	- Antifungal and antibacterial - Reduces dandruff - Treats scalp infections	- Azadirachtin - Nimbidin	Helps maintain scalp health - Strengthens hair and reduces hair thinning
Henna	Natural conditioner - Promotes healthy scalp - Adds shine	- Lawsone	Strengthens hair shaft - Protects from UV damage and oxidation
Brahmi	- Strengthens hair - Preven	- Bacosides	- Improves circulation

	ts hair fall		

CONCLUSION AND DISCUSSION:

The preparation of a rosemary and coffee hair conditioner follows a straightforward procedure involving the creation of water and oil phases, emulsification, and the incorporation of key active ingredients. The inclusion of rosemary extract and coffee extract or caffeine offers potential benefits for hair growth and scalp health, while the other conditioning agents and preservatives ensure the product's efficacy and shelf life. This formulation procedure can be scaled up for commercial production, but it requires thorough quality control testing to ensure safety and consistency. Recent study shows that hair shine can have profound physiological effects and affect people confidence. The present review showed that use of herbal hair conditioner reduces hair loss promote growth and strength of hair. Use of conditioning agents (synthetic) reduces the protein or hair loss. To provide the effective conditioning effects, the present study involves the use of Bhringraj, Shikakai Guava leaves, Hibiscus flowers, Neem leaves, Curry leaves, Amla fruit, Fenugreek seeds Aloe vera other plant extracts instead of synthetic . The use of herbal ingredients in formulation help to reduce hair loss, increase hair growth, smooth and shiny hair and lack of static electricity in hair etc. Based on this, it appeared that the use of herbal conditioner is safer and healthier for smooth and shiny hair.

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