



Review on Polyherbal Hair spray using *Centella Asiatica* and *Moringa Oliefera Lam*

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❖ Abstract:-

Hair spray is one of the most widely used cosmetic products in the hair care industry. Primarily formulated to provide hold, manageability, and style retention. Over the years, its formulation has evolved from traditional alcohol and propellant-based systems to modern eco-friendly and water-based alternatives enriched with natural polymers and herbal extracts. This review highlights the formulation aspects, mechanism of action, advantages, and limitations of hair sprays. While hair sprays offer benefits such as long-lasting hold, frizz control, volume enhancement, and added shine, they also pose challenges including hair dryness, scalp irritation, product build-up, and environmental concerns due to aerosol propellants. Recent research trends focus on developing safer, multifunctional, and sustainable formulations that combine styling efficiency with hair care benefits. Overall, hair spray continues to play a significant role in personal grooming, with innovations aiming to balance performance, safety, and environmental sustainability.

Key Words: Polyherbal formulation, Herbal hairspray, *Centella asiatica*, Hair growth promotion, Natural hair care.

❖ Introduction:

Hair – it's that we style, dye, straighten, curl, and occasionally cry over. But beyond being the crown we never take off, hair actually has some serious science going on.

❖ Hair Anatomy :

Hair has two separate structures:

- i. Shaft (the part we see above the skin)
- ii. follicle (the part that is below the skin)

The hair shaft, which is the visible part of the hair, is classified into three layers:

- i. The cuticle (outermost protective layer),
- ii. The cortex (middle layer responsible for strength and colour),
- iii. Medulla (Centre part).

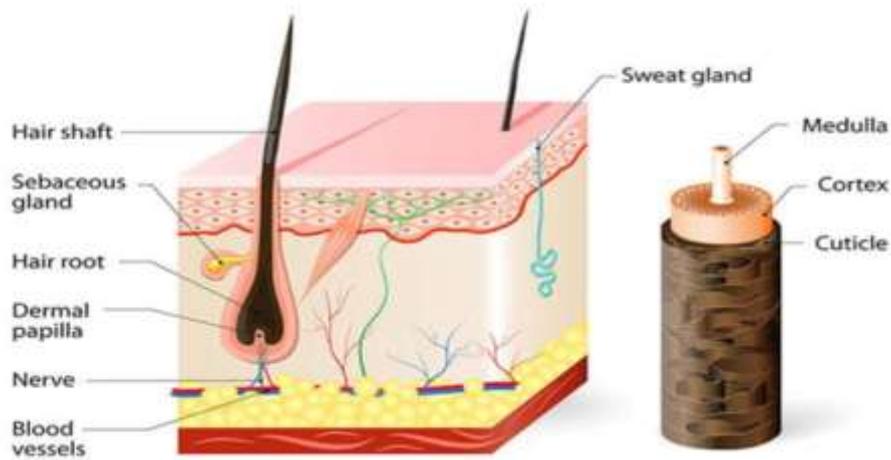


Fig. 1. Structure of the hair

Each strand of hair is made of keratin –a super strong protein that’s tougher than a lot of building materials. Hair grows from little pits in our scalp called follicles. Each hair follicle goes through 10-20 cycles in a lifetime.

➤ It follows a cycle:

- Anagen(Active growth)
- Catagen(Transitional phase)
- Telogen(Resting phase)
- Exogen(Shedding phase)



Fig. 2. Hair Growth Phases

Disruptions in this cycle can lead to hair loss (alopecia), thinning, or breakage, often influenced by factors such as genetics, hormonal imbalances, nutritional deficiencies, stress, environmental pollution, use of harsh chemical treatments, heat styling, or your shampoo that smells great but behaves badly. Hair isn't just for looks. It protects our scalp from sunburns, keeps our head warm in winter, and helps us sense things (like when a mosquito dares to land on it). Blame it on pollution, stress, junk food, heat styling, or your shampoo that smells great but behaves badly.

➤ Types of hair :

- 1) Primordial Hair :- Appear as early as the beginning of the third month of gestation; grows on the upper lip, eyebrows, palms and soles of the foetus.
- 2) Lanugo Hair :- Found in fetal life, are shed after the sixth month of gestation, and are often found on aborted fetuses.
- 3) Vellus Hair :- Are spread uniformly over the body's surface, except the soles of the feet.
- 4) Terminal Hair :- Replace the vellus hairs at specific sites and points of life; are found mainly on the scalp, on the face, chest, back, arms, and legs, and are sex-limited.



Fig. 3. Hair Types

Common Hair Causes:-

1. Hair Loss (Alopecia)

❖ Causes:

- i. Genetics (Androgenic alopecia)
- ii. Hormonal changes (pregnancy, menopause, thyroid issues)
- iii. Nutritional deficiencies (iron, protein, zinc)
- iv. Stress
- v. Medications (chemotherapy, blood pressure drugs)



2. Dandruff (Seborrheic Dermatitis)

❖ Causes:

- i. Fungal infection (Malassezia)
- ii. Dry scalp or excess oil
- iii. Poor hygiene or harsh shampoos
- iv. Excessive heat and styling
- v. Lack of trimming



3. Dry and Frizzy Hair

❖ Causes:

- i. Overuse of heat styling tools
- ii. Lack of moisture
- iii. Harsh shampoos or chemical treatments



4. Premature Greying

❖ Causes:

- i. Genetics
- ii. Stress
- iii. Vitamin B12 deficiency
- iv. Oxidative stress



5. Scalp Infections

❖ Causes:

- i. Fungal or bacterial infections
- ii. Poor scalp hygiene



6. Split Ends

❖ Causes:

- i. Excessive Heat or styling
- ii. Brittle hair
- iii. Lack of trimming



❖ Introduction of Hair Spray :-

Hair spray is one of the most widely used cosmetic formulations in the hair care industry, designed to provide hold, manageability, and style retention. It works by forming a thin polymeric film on the hair surface, which enhances shape control and maintains the desired hairstyle against environmental factors such as humidity, wind, and static electricity. Traditionally, hair sprays were based on alcohol and propellant systems that ensured quick drying and firm hold. However, with the growing demand for safer, eco-friendly, and multifunctional products, modern formulations now incorporate water-based systems, herbal extracts, and natural polymers to reduce side effects and improve hair health.

Hair sprays are not only used for styling purposes but also serve functional roles such as adding shine, reducing frizz, protecting hair from UV radiation, and delivering active ingredients like conditioners or herbal actives. Their market relevance continues to expand due to increasing consumer awareness about personal grooming, the influence of fashion trends, and the demand for sustainable cosmetic products.

➤ Advantages of Hair Spray :-

1. Long-lasting hold – Maintains hairstyle for extended periods.
2. Easy styling – Helps in shaping, setting, and managing hair conveniently.
3. Frizz control – Reduces fly aways and static electricity, especially in humid conditions.
4. Adds volume and texture – Provides fullness and body to thin or flat hair.
5. Shine enhancement – Some formulations give a glossy, healthy appearance.

➤ Disadvantages of Hair Spray :-

1. Hair damage – Frequent use may cause dryness, roughness, or breakage due to alcohol and chemical content.
2. Scalp irritation – Prolonged exposure to propellants, fragrances, or preservatives can lead to itching, redness, or dandruff.

3. Build-up and residue – Excessive application leaves flakes, stickiness, or a stiff texture on hair.
4. Difficulty in removal – Strong-hold sprays often require thorough washing, which can strip natural oils.

❖ Literature Survey:

1) Singh, R., et al. (2023)

Evaluation of film-forming polymers in cosmetic hair sprays. *Journal of Cosmetic Dermatology*, 22(5), 987–993. Compares different polymers like PVP, HPMC, and PEG.

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Developed a Gotu Kola-based hair spray, showing potential in hair strength enhancement and user safety.

3) Patel, D., & Chauhan, K. (2022)

Development of alcohol-free hair spray with conditioning effect. *Research Journal of Topical and Cosmetic Sciences*, 13(1), 25–30. Focuses on non-alcoholic, skin-friendly formulations.

4) Bhatia, S., & Sharma, A. (2021)

Formulation and evaluation of herbal hair spray using natural polymers. *International Journal of Pharmaceutical Sciences Review and Research*, 68(2), 45–49. Discusses natural alternatives in hair spray formulations.

5) Yadav, H., & Soni, A. (2020)

Herbal hair formulations: A review. *Asian Journal of Pharmaceutical and Clinical Research*, 13(6), 88–91. Includes herbal ingredients beneficial for hair sprays.

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D.A. Casamatta, Potential uses of *Moringa oleifera* and an examination of antibiotic efficacy conferred by *M. oleifera* seed and leaf extracts using crude extraction techniques available to under-served indigenous populations, *Int. J. Phytotherapy Res.* 3 61-71.

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❖ Plant Profile :

□ Gotu Kola:-

➤ Botanical Name :- *Centella Asiatica*.

➤ Biological Source:- It is obtained from dried or fresh whole plant of *Centella asiatica*.

➤ Chemical Constituents :- Flavonoids, Phytosterols, Asiaticoside, Minerals, Palmitic acid, etc.

➤ Family :- It belongs to the family 'Apiaceae'.

➤ Uses :-

1) It is used as anti- anxiety

2) It is used to improve blood circulation in the scalp

3) Promotes hair growth and reduces hair loss

4) It is used for wound healing

5) It is used as anti-inflammatory

□ Moringa:



Moringa Oleifera Lam



Moringa oleifera is native to the sub-Himalayan tracts of India. It's now cultivated extensively in tropical and subtropical regions worldwide, including South and Southeast Asia, etc.



Flavonoids, Alkaloids, Vitamins, Phenolic acid, Minerals, Saponin, etc.



family 'Moringaceae'.



1) It is used as anti-oxidant

2) It is used as anti-inflammatory

3) It is used as anti- microbial

4) It is used to control sugar craving



Fig. 4. *Centella Asiatica*

Chemical Constituents :-

Flavonoids, Alkaloids, Vitamins, Phenolic acid, Minerals, Saponin, etc.

Family :- It belongs to



Uses:-

Fig. 5. *Moringa Oleifera Lam*

❖ Aim & Objective:

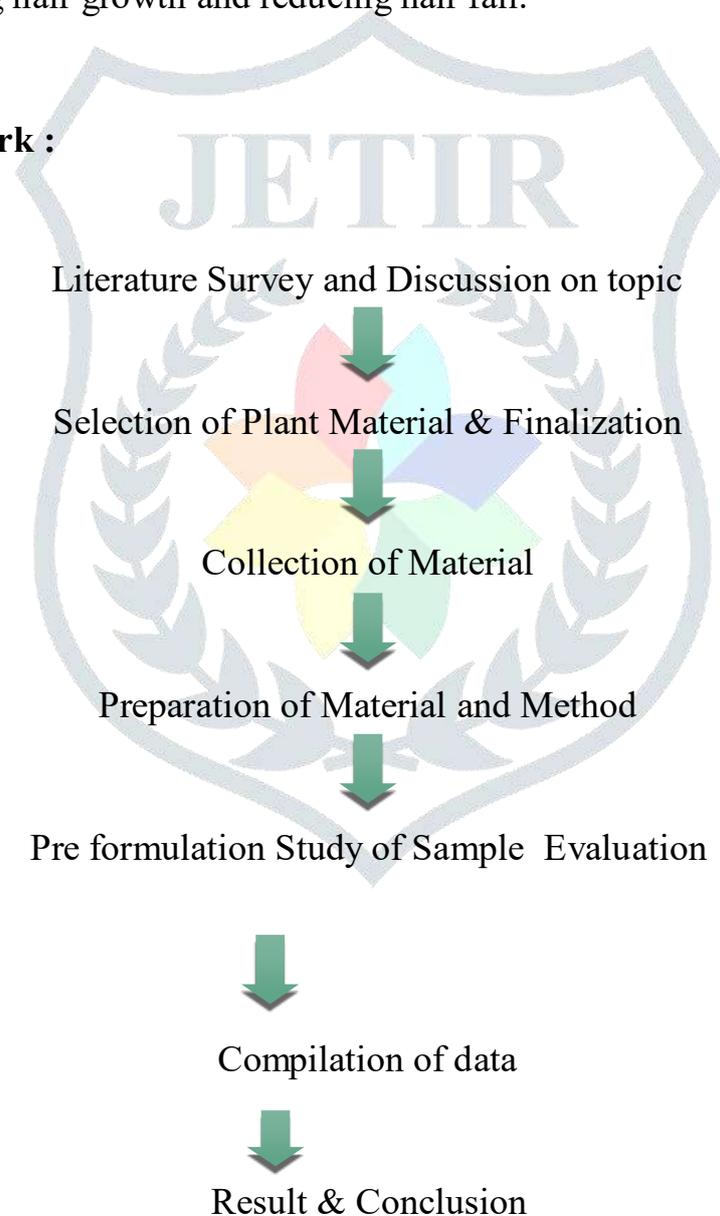
Aim:

Review on Polyherbal Hairspray using *Centella Asiatica* and *Moringa Oliefera Lam*

Objective:

1. To Designed to feature shine to your hair.
2. To growth hair Increase.
3. To promote hair thinning and hair greying.
4. To ensure the final product is sulfate-free, paraben free, alcohol free.
5. To Promoting hair growth and reducing hair fall.

Plan Of Work :



❖ **Materials:**

Sr. No	Ingredients	Uses
1.	Gotu Kola	<ol style="list-style-type: none"> 1. Stimulates blood circulation in the scalp. 2. Strengthens hair follicles and boosts growth.
2.	Moringa Leaf	<ol style="list-style-type: none"> 1. Rich in vitamins and minerals for healthy hair. 2. Prevents breakage and nourishes scalp.
3.	Peppermint Hydrosol	<ol style="list-style-type: none"> 1. Provides cooling effect and soothes scalp. 2. Increases blood flow to hair follicles for growth.
4.	Cucumber Distillate	<ol style="list-style-type: none"> 1. Hydrates and refreshes scalp. 2. Reduces irritation and dryness.
5.	Caffeine Extract	<ol style="list-style-type: none"> 1. Stimulates hair follicles and prolongs growth phase. 2. Helps reduce hair fall caused by hormonal factors.
6.	Hydrolyzed Quinoa Protein	<ol style="list-style-type: none"> 1. Strengthens hair strands and repairs damage. 2. Adds shine and improves elasticity.
7.	Clary Sage Essential	<ol style="list-style-type: none"> 1. Balances scalp oil production. 2. Reduces dandruff and promotes healthy scalp.
8.	Bhringraj Extract	<ol style="list-style-type: none"> 1. Known as a powerful hair growth promoter. 2. Prevents hair thinning and greying.

9.	Geogard Ultra	<ol style="list-style-type: none">1. formulation from spoilage.2. stability.	Protects product
10.	Xanthum Gum	<ol style="list-style-type: none">1. natural thickener/stabilizer.2. smooth texture to the formulation.	Acts as a Provides



❖ **Evaluation Parameters of Hair Spray:**❖ **Comparison Between Rosemary Water Hair Spray And Polyherbal Hair Spray:**

Sr. No	Evaluation Parameter	Information
1	Appearance	<ul style="list-style-type: none"> The overall visual characteristics of the product such as clarity transparency, or presence of turbidity/precipitates. A good-quality hair spray should be clear, free from particles or sediment and have a uniform spray pattern.
2	Colour	<ul style="list-style-type: none"> Colour indicates the aesthetic quality and stability of the formulation. It should remain consistent during storage without discoloration (which may indicate degradation of polymers or additives).
3	Odour	<ul style="list-style-type: none"> The fragrance or smell of the formulation. It should be pleasant, mild, and acceptable to consumers, without any pungent or irritating odour.
4	pH Value	<ul style="list-style-type: none"> The pH of hair spray is crucial for scalp and hair compatibility. It should be in the range of 4.5 to 6.5, close to the natural pH of hair and skin, to prevent irritation or hair damage.
5	Viscosity	<ul style="list-style-type: none"> Viscosity determines the flow properties of the spray solution. It should be low enough for easy spraying through the nozzle but sufficient to form a uniform film on hair strands. Consistent viscosity ensures even distribution and performance.

❖ Conclusion :-

From the reviewed literature, it can be concluded that polyherbal hair sprays offer a promising natural alternative to synthetic formulations. The synergistic action of multiple herbal ingredients provides nourishment, strengthens hair, reduces scalp disorders, and enhances manageability without harmful side effects. Their eco-friendly, cost effective, and consumer-safe profile highlights their potential for widespread use in cosmetic and therapeutic

Polyharbal Hair Spray	Rosemary Water Hair Spray
1. It Contents Gotu kola and moringa leaves extract.	1. It contents only rosemary extracts.
2. It reduces hair fall and drandruff.	2. It reduce only hair fall.
3. Blood circulation in scalp and strong roots of hairs.	3. Blood circulation in scalp only.
4. It can be hydrates reduce hair loss , reduce damage and provide strength of hair growth.	4. It can be only hydrates the hairs.
5. Regular use helps decrease hair fall by nourishing and reinforcing the roots.	5. It's regular used decrease hair fall and some times cause damage hairs.
6. Shown to make hair frizzy and glossy.	6. Shown to make hair oily before use.

hair care anti dandruff thickness inhancer for hairs applications.

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