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Formulation and Evaluation of Herbal Beard Balm



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ABSTRACT

This research article outlines the formulation and development of herbal beard balm made from a blend of natural ingredients, including coconut oil, almond oil, rosemary oil, kalonji oil, hard paraffin, yellow soft paraffin, extra pure paraffin, beeswax, emulsifying wax, aloe vera gel, glycerin, and vitamin E capsules. Each ingredient was selected for its unique properties and benefits for beard care. Coconut oil provides deep moisturization, while almond oil is rich in vitamins and minerals that promote healthy beard growth. Rosemary oil has antimicrobial properties that help to prevent beard dandruff, and kalonji oil is rich in fatty acids that help to condition and soften beard hair. Hard paraffin, yellow soft paraffin, and extra pure paraffin provide structure and stability to the balm, while beeswax and emulsifying wax create a smooth texture that is easy to apply. Aloe vera gel and glycerin provide hydration and soothe the skin, and vitamin E capsules provide antioxidants that protect against environmental stressors. The resulting herbal beard balm offers a natural, effective solution for men looking to maintain and improve the health and appearance of their beards.



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INTRODUCTION:

Beards have become a popular fashion trend in recent years, with many men seeking ways to maintain and improve the health and appearance of their facial hair. However, maintaining a healthy beard can be a challenge, as it requires proper nourishment and hydration to prevent dryness, itching, and irritation. In response to this growing demand, the development of natural and effective beard care products has become a priority for the personal care industry. This report presents the formulation and development of a herbal beard balm made from a combination of natural ingredients, including coconut oil, almond oil, rosemary oil, kalonji oil, hard paraffin, yellow soft paraffin, extra pure paraffin, beeswax, emulsifying wax, aloe vera gel, glycerin, and vitamin E capsules. The balm was formulated to provide nourishment and hydration to the beard while also promoting healthy growth and preventing irritation. The formulation was optimized through a series of experiments to ensure stability, efficacy, and consumer acceptability. The resulting herbal beard balm offers a natural, effective solution for men looking to improve the appearance and health of their beards.

TOPICAL DRUG DELIVERY

Over the last decades, the treatment of illness has been accomplished by administering drugs to the human body via various routes namely oral, sublingual, rectal, parental, topical, inhalation etc. Topical delivery can be defined as the application of a drug containing formulation to the skin to directly treat cutaneous disorder or the cutaneous manifestations of a general disease (eg. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of the skin or within the skin semisolid formulations in all their diversity dominate the system for topical delivery, but foams, spray, medicated powders, solutions and even medicated adhesive systems are in use.

Benefits of topical drug delivery system

- Avoidance of first pass metabolism.
- Convenient and easy to apply.
- Avoid risk.
- Inconveniences of intravenous therapy and of the varied conditions of absorption like Ph changes presence of enzymes gastric emptying time etc.

- Achievement of efficacy with lower total daily dosage of drug by continuous drug input.
- Avoid fluctuation of drug levels inter and intra patent variations.

Introduction of Balm

The balm is a type of skin care or grooming product that is used to soothe, moisturize and protect the skin. It typically contains a blend of natural ingredients such as oils, waxes and butter that helps to nourish and protect the skin from dryness and environmental stressors. Balms can be used for a variety of purposes, such as to moisturize dry lips soothe irritated skin, or protect and nourish the hair and scalp.

Structure of Hair

Hair is a complex and fascinating structure that is made up of several layers and components. Understanding the structure of hair is important for identifying different types of hair, developing effective hair care and treating various hair and scalp conditions.

Structure of Hair Shaft is composed of 3 parts:

1. The Cuticle
2. Cortex
3. Medula



Detailed Structure

- Hair Follicle: Sac like structure surrounding the root
- Cortex: Middle layer of hair shaft, composed of long chains of keratin protein
- Hair Shaft: Visible part of the hair that protrudes from the skin
- Medulla: Innermost layer of hair shaft, not present in all hair types
- Cuticle: Outermost layer of hair shaft, composed of keratin rich cells
- Hair Matrix: Group of cells located at the base of the hair bulb.

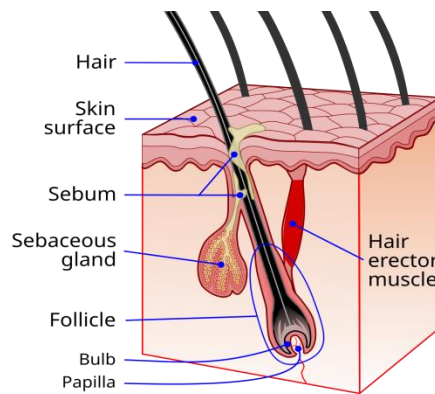


Figure-1 Structure of hair

Supportive Organs

- Sebaceous Gland: Produces sebum, a natural oil that moisturizes and protects hair scalp.
- Arrector Pili Muscle: Responsible for causing the hair to stand up or “goosebump” during cold or experiencing certain emotions.

The Hair Cycle:

The hair cycle is the process by which hair grows, sheds, and regenerates. It is a complex and dynamic process that is regulated by various internal and external factors. Understanding the hair cycle is important for identifying and treating various hair and scalp conditions, as well as developing effective hair care and styling practices.

The hair cycle consists of three main stages: anagen, catagen, and telogen. The duration of each stage can vary depending on the individual and other factors, such as age and hormones. On average, the hair cycle can take anywhere from two to seven years to complete.

Stages Of Hair Cycle

1. Anagen Phase: Active growth phase. Lasts for 2-7 years.
2. Catagen Phase: Transitional phase. Lasts about 2 weeks.
3. Telogen Phase: Final phase. Lasts approximately for 3 months

Hair Growth Cycle

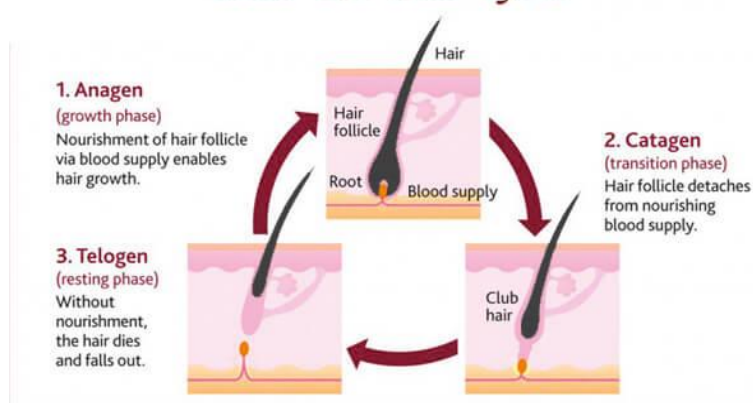


Figure:2 Hair growth cycle

Beard Balm

Beard balm is a grooming product that is specifically designed to help men maintain and style their facial hair. It typically contains a blend of natural oils, butters, and waxes that work together to moisturize and condition the hair and skin beneath the beard. Beard balm can also help to tame fly aways and stray hairs, while providing a subtle shine or hold to the beard. It is a versatile product that can be used for a variety of beard styles, from short and neat to long and unruly. By using beard balm regularly, men can achieve a healthier, more manageable, and better-looking beard.

Mode of Action of Beard Balm

The mode of action (MoA) of beard balm made from coconut oil, almond oil, rosemary oil, kalonji oil, and aloe vera gel is similar to that of other beard balms in terms of moisturizing and conditioning the hair and skin.

- Coconut oil is a natural emollient that helps to soften and moisturize the hair, while also providing important nutrients like vitamin E and fatty acids. Almond oil is rich in vitamins and minerals that help to nourish and protect the hair, while also providing a soothing and calming effect on the skin.
- Rosemary oil is known to stimulate hair growth and improve hair thickness, while also providing antibacterial properties that can help prevent infection and inflammation. Kalonji oil, also known as black seed oil, is rich in antioxidants and vitamins that promote hair health,

including thymoquinone, which has been shown to improve hair thickness and reduce hair loss.

- Aloe vera gel is known for its soothing and moisturizing properties, and is often used in hair and skin care products to help calm inflammation and irritation. In beard balm, aloe vera gel can help to soothe dry and itchy skin beneath the beard, while also providing a boost of moisture and nutrients to the hair.
- Combined, these ingredients work together to provide a nourishing and moisturizing effect on the hair and skin, while also promoting healthy hair growth and providing a natural shine and hold to the beard.

Advantages of beard balm :

- Moisturizing and nourishing the beard and skin beneath it, making it soft and shiny.
- Providing a subtle hold and shaping effect to the beard, making it look well-groomed.
- Stimulating hair growth and improving hair thickness, which can promote a fuller, healthier-looking beard.
- Protecting the skin and hair from environmental damage, such as sun exposure and pollution.
- Soothing and reducing redness and irritation on the skin, making it less itchy and uncomfortable.
- Preventing infections due to the antimicrobial and anti-inflammatory properties of some ingredients, which can help to keep the beard and skin healthy.
- Attracting and retaining moisture to the skin and hair, preventing dryness and flakiness.
- Repairing damaged skin and hair due to the healing properties of some ingredients, such as aloe vera and vitamin E.

Application Method

Balm can be applied topically to the skin using clean hands or a small applicator. Here is a general application method for using balm:

1. Wash the affected area: Before applying the balm, make sure to wash and dry the affected

area thoroughly.




2. Take a small amount of balm: Scoop a small amount of balm using your finger or a small applicator. The amount of balm you need will depend on the size of the affected area.
3. Rub the balm into the skin: Gently rub the balm into the skin using circular motions until it is fully absorbed. Pay extra attention to the affected area and surrounding skin.
4. Repeat as necessary: Depending on the severity of the condition, you may need to apply the balm several times a day. Follow the instructions on the product label or consult with a healthcare professional for specific recommendations.






It's important to note that balm is for external use only and should not be ingested. If you experience any adverse reactions, such as skin irritation or an allergic reaction, stop using the balm immediately and consult with a healthcare professional.

Experimental Work

Formula to yield 100mg Herbal Beard Balm

Table: 1 formula table for the beard balm

SR. NO.	INGREDIENTS	Quantity	INGREDIENT USE
1.	Coconut Oil 	7 ml	Coconut oil is a natural oil that has been used for centuries to promote hair growth. It is rich in medium-chain fatty acids that penetrate the hair shaft and nourish the hair from the inside out. Coconut oil also contains vitamin E, which can help to strengthen hair and reduce hair breakage.
2.	Almond Oil 	5 ml	Almond oil is a natural oil that is rich in vitamins and minerals that are essential for healthy hair growth. It contains high levels of vitamin E, which can help to strengthen hair follicles and reduce hair breakage. Almond oil also contains fatty acids that can nourish and moisturize the hair and scalp, promoting healthy hair growth.
3.	Rosemary Oil 	2 drops	Rosemary oil is an essential oil that has been shown to promote hair growth. It contains antioxidants that help to stimulate blood circulation to the scalp, which can promote healthy hair growth. Rosemary oil can be mixed with a carrier oil, such as almond oil, and applied directly to the scalp as a conditioning treatment.

4.	<p>Kalonji Oil</p> 	3 ml	Kalonji oil, also known as black seed oil, is a highly concentrated oil that is extracted from the seeds of the <i>Nigella sativa</i> plant. It can help to reduce dandruff and other scalp conditions, promote healthy hair growth, and add shine and softness to the hair.
5.	<p>Beeswax</p> 	4 gm	Beeswax is a product made from the honeycomb of the honeybee and other bees. Yellow and white beeswax are used as thickeners, emulsifiers, and as stiffening agents in cosmetics.
6.	<p>Emulsifying Wax</p> 	1 gm	Emulsifying Wax NF is a complete vegetable-derived emulsifying wax used to create oil-in-water emulsions. It can be used to make thick or thin emulsions, depending upon the concentration used. It is Deep moisturizer and Provides smooth consistency to balm.
7.	<p>Aloe Vera Gel</p> 	10gm	Aloe vera is a natural plant that is known for its healing properties. It contains enzymes that can help to repair damaged hair and promote healthy hair growth. Aloe vera can be applied directly to the scalp as a conditioning treatment or added to hair care products.
8.	<p>Vitamin E Capsules</p> 	2gm	It is Ideal to stabilize oils and fats in cosmetic products (prevents rancidity).it is an Antioxidant, gives moisturizing and soothing properties on the skin .
9.	<p>Hard Paraffin</p>	4 gm	Barrier-forming
10.	<p>Yellow Soft Paraffin</p>	6 gm	Skin-protecting
11.	<p>Extrapure Paraffin</p>	1 gm	Moisture-sealing
12.	<p>Glycerin</p>	7ml	humectant

Formulation of Beard Balm:

Below is a general formulation for a basic balm:

- Carrier oils: Carrier oils serve as the base for the balm and help to deliver the active ingredients to the skin. Some common carrier oils used in balm formulations include coconut oil, olive oil, jojoba oil, and sweet almond oil.
- Beeswax: Beeswax is a natural wax that is often used in balm formulations to help thicken and solidify the mixture. It also provides a protective barrier on the skin and helps to seal in moisture.
- Herbs: Herbs can be added to balm formulations for their therapeutic benefits. For example, lavender can help to soothe and calm the skin.
- Essential oils: Essential oils are highly concentrated plant extracts that are added to balms for their therapeutic properties and fragrant aroma. Some common essential oils used in balm formulations include tea tree oil, peppermint oil, and eucalyptus oil.
- Vitamin E: Vitamin E is a natural antioxidant that is often added to balms to help protect the skin from damage caused by free radicals.

To formulate a balm, the carrier oil and beeswax are melted together over low heat until fully combined. The herbs and essential oils are then added to the mixture and stirred until fully incorporated. Finally, the mixture is poured into a container and allowed to cool and solidify before use. The exact proportions of each ingredient can vary depending on the desired consistency and therapeutic effects of the balm.

Procedure

1. Weigh all the ingredients properly according to formula.
2. Melt the hard paraffin and extra pure paraffin then dissolve beeswax, yellow soft paraffin and emulsifying wax in it.
3. Then add coconut oil, rosemary oil, kalonji oil and almond oil in it.
4. Then add Aloe Vera gel and Vitamin E capsules in it and stir the mixture properly.
5. Let this mixture cool down and solidify.



Figure-3 Melted mixture



Figure-4 Solidified beard balm

Evaluation Parameters of Beard Balm:

1 pH measurement:

The pH of the balm was determined at 25 °C using a pH meter, standardized using pH 4.0 and 7.0 standard buffers before use and an average of triplicates was determined.

2 Phase Separation:

The prepared balm was transferred in a suitable wide mouth container. Set aside for storage, the oil phase and aqueous phase separation were evaluated after 24h.

3 Viscosity:

Brookfield Synchro-Lectric Viscometer (Model RVT) with helipath stand was used for rheological studies. The sample (50 g) was placed in a beaker and was allowed to equilibrate for 5 min before measuring the dial reading using a T-D spindle at 10,20,30,50,60,100 rpm. At each speed, the corresponding dial reading on the viscometer was noted. The spindle speed was successively lowered and the corresponding dial reading was noted. The measurements were carried in triplicate at ambient temperature. Direct multiplication of the dial readings with factors given in the Brookfield viscometer catalog gave the viscosity in centipoises. An average of three replicates was computed.

4 Spreadability:

The spreadability of test samples was determined using the following technique: 0.5 g test formulation was placed within a circle of 1 cm diameter pre-marked on a glass plate over

which a second glass plate was placed. A weight of 500 g was allowed to rest on the upper glass plate for 5 min. Spreadability refers to the area covered by a fixed amount of cream sample after the uniform spread of sample on the glass slide. The increase in the diameter due to spreading of the test formulation was noted. Average of three determinations was noted.

5 Irritancy Test:

The balm was applied on the dorsal left-hand surface. Irritancy, erythema, edema was checked every hour up to 24h for 7 days and reported.

- **Results of evaluation of Herbal Beard Balm:**

1. Visual result:



Figure-5 Visual result after applied side compared with reference

2. Evaluation Parameter Result

Table-2 Result table

Sr.No	PARAMETERS	RESULTS
1.	Colour	Yellowish
2.	Odour	Aromatic
3.	Texture	Smooth
4.	PH	6.0
5.	Spreadability	7.4g. cm/sec
6.	Phase separation	No phase separation
7.	Viscosity	39010 cps
8.	Patch test	Non allergenic

3.Final product and Label:



CONCLUSION

In conclusion, the formulation and evaluation of the herbal beard balm have demonstrated its efficacy and safety as a comprehensive solution for beard care. The carefully selected ingredients, including coconut oil, almond oil, rosemary oil, kalonji oil, and aloe vera gel, offer a range of benefits for the beard and underlying skin. The balm has been found to effectively moisturize and nourish the beard, resulting in softness, shine, and improved manageability. The inclusion of rosemary oil and kalonji oil stimulates hair growth, promoting a fuller and healthier-looking beard. Aloe vera gel provides soothing properties, reducing redness and irritation on the skin. Importantly, through rigorous evaluation, the herbal beard balm has been deemed safe for use, ensuring the well-being of the user. Overall, this formulation addresses various aspects of beard health, offering a holistic approach to beard care and grooming.

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