



Formulation and Evaluation of Polyherbal Body Lotion : A Natural Approach to Skin Care

Ms. Tulsi Jitendra Gupta^[1], Mr. Nayan N. Bondhare^[2]

Ms. Vaishnavi Ramesh Gade^[3], Ms. Vijaya Pralhad Thakare^[4],

Mr. Vijay Keshav Rathod^[5]

^(1,3,4,5) Student of B pharm Final Year ^[2] Assistant Professor, in the Dept of Pharmaceutics,

Ishwar Deshmukh Institute of Pharmacy, Digras, Maharashtra

Abstract:

This research focuses on the formulation and evaluation of a herbal body lotion incorporating aloe vera gel, neem extract, turmeric extract, and various natural excipients. The lotion was formulated to offer multiple skin benefits, including hydration, moisturization, and soothing effects, while leveraging the antibacterial, anti-inflammatory, and antioxidant properties of the herbal ingredients. The formulation was prepared using a blend of natural emulsifiers, oils, and humectants to ensure proper texture, spreadability, and skin compatibility. The preparation involved aloe vera gel (25 mL), neem extract (5 mL), turmeric extract (2 mL), along with excipients like glycerin, coconut oil, stearic acid, rose water, distilled water, honey, triethanolamine, and a few drops of sandalwood oil for fragrance. The lotion was evaluated for physical appearance, pH, viscosity, spreadability, stability, microbial contamination, and skin irritation. Results showed that the lotion maintained an ideal pH (5.6), good viscosity (950 cP), and effective moisturization properties, with a 28% increase in skin hydration over four hours. No microbial contamination was detected, and no irritation was observed in the patch tests, confirming the safety of the product. The stability of the formulation was also confirmed, with no signs of phase separation over the course of four weeks. These results suggest that the developed herbal body lotion has the potential to be a safe, effective, and eco-friendly alternative to synthetic skincare products.

Keywords: Herbal body lotion, Aloe vera gel, Neem extract, Turmeric extract, Antibacterial, Antioxidant

Introduction:

The Herbal Body Lotion (referred to as “Products”) in this paper is made by this study. In order to provide unique cosmetic advantages, these products are painstakingly crafted utilizing a foundation of permitted cosmetic components plus one or more herbal constituents. Fragrant plants and their derivatives are used in cosmetics to make herbal lotions. Customers of herbal products have found this strategy popular, which has increased demand for natural substances and extracts in cosmetics. Non-friction solutions are used externally as lotions. The skin is directly treated to substances using absorbent materials that have been saturated with them, such as gauze or cotton wool. Locally, lotions can soothe, cool, or shield [1]. A herbal body lotion is a viscous mixture that is rubbed over the skin to enhance its appearance. Lotions wash the skin and take out sebum. Blood circulation, skin moisturization, astringency, freshness, bleaching, and therapeutic benefits are all enhanced by this chemical [2].

Many substances Can be added throughout the manufacturing process to enhance the cooling, relaxing, drying, or protecting qualities of lotions [3]. Herbs and their derivatives are used in herbal cosmetics to provide fragrance. Because herbal products are becoming more and more popular, the cosmetics industry has to use more natural components and extracts [4]. Simple, therapeutic, emulsion, and suspension formulations are available for lotions. Among these health benefits are the enhancement and quickening of wound healing [5] Known for its application in cosmetic preparations [6], it also possesses antifungal potency [7], anti-inflammatory, hypoglycemic, or antidiabetic activities, and immunomodulatory, anticancer, and gastro-protective qualities [8]. These phytochemicals include organic compounds, pyrones, alkaloids, anthraquinones, polysaccharides, flavonoids, carbohydrates, coumarins, tannins, chromones, and vitamin, protein, and mineral components [9]. Traditional herbal remedies, derived from plant extracts, have long been used in skincare for their therapeutic properties.. Among these, herbal body lotions are a prominent category, known for their ability to hydrate, soothe, and protect the skin without causing harm.

Herbal Ingredients in Skincare

In recent years, plant-based ingredients such as Aloe vera, Neem, and Turmeric have attracted considerable attention in the field of cosmetic formulation. Each of these plants offers unique benefits that can be harnessed in topical applications. Aloe vera, with its high water content, is renowned for its moisturizing and skin-healing properties. It helps in treating dry skin, reducing inflammation, and promoting wound healing. Neem, a well-known medicinal plant, has antibacterial, antifungal, and anti-inflammatory properties, making it ideal for treating skin infections and irritation. Similarly, Turmeric, an ancient herb, is rich in curcumin, which possesses antioxidant, anti-inflammatory, and skin brightening properties. The combination of these herbal extracts, along with natural emulsifiers and oils, has the potential to create an effective, skin-friendly lotion that not only nourishes the skin but also provides therapeutic effects. Coconut oil, glycerin, rose water, and honey are

commonly used in skincare products for their ability to hydrate, moisturize, and soothe the skin. Sandalwood oil, known for its pleasant fragrance and calming properties, can further enhance the sensory experience.

Formulation of Herbal Body Lotion:

The process of formulating a body lotion involves the combination of oil-based and water-based ingredients into a stable emulsified system. Emulsifiers like stearic acid and triethanolamine play a crucial role in ensuring that the oil and water phases blend together, creating a smooth, homogenous product. The formulation was designed to address common skincare concerns such as dryness, inflammation, and microbial infections. Furthermore, the lotion was prepared with a focus on skin safety, stability, and efficacy, ensuring that the final product could be marketed as both a cosmetic and therapeutic agent.

Significance of the Study

The main goal of this study is to evaluate the physical, chemical, and biological properties of the formulated herbal body lotion. The study will also investigate the effectiveness of the lotion in enhancing skin hydration, which is a primary benefit for consumers seeking natural skincare solutions. This study contributes to the growing body of knowledge on the benefits and formulation of herbal-based skincare products, emphasizing the role of natural ingredients in improving skin health. It also offers a novel formulation that can be further developed for commercial use.

Objectives of the Study

To formulate a herbal body lotion using aloe vera gel, neem extract, and turmeric extract. To evaluate the physical characteristics (appearance, pH, viscosity, spreadability) and sensory properties (texture, fragrance). To determine the moisturizing efficacy and hydration potential of the lotion. To assess the stability and shelf life of the lotion under varying environmental conditions. To perform skin irritation and microbial safety tests to ensure the product's safety for topical use.

56% soluble solids in the gel. Desiccated Matter aloe gel has a 55% polysaccharide and a sugar content. (17%), proteins(7%), lipids(4%), minerals (16%), and 1% of chemicals are phenolic.

Ideal properties of a body lotion:

An ideal body lotion should be smooth and easy to spread on the skin without leaving a greasy residue.

It must provide long-lasting hydration to maintain skin moisture levels throughout the day.

The formulation should be stable under various storage conditions without phase separation or degradation.

It should possess a pleasant fragrance and acceptable color that appeals to users.

The lotion must be non-irritating and suitable for all skin types, including sensitive skin.

investigates any possible emollient impact.

Get rid of greasy secretions throughout the application procedure ^[10]

Herbal body lotion benefits

- Herbal body lotions nourish the skin using plant-based ingredients that are rich in vitamins, antioxidants, and essential oils.
- Natural extracts like neem, turmeric, and aloe vera exhibit antimicrobial properties, which help prevent skin infections.
- Regular use of herbal lotions may improve skin tone and texture by promoting collagen production and reducing blemishes.
- These lotions are generally biodegradable and eco-friendly, minimizing environmental harm.
- Moisturizing: Aloe vera retains skin moisture, preventing dryness and keeping skin hydrated.
- Soothing and Healing: Reduces inflammation and promotes healing, beneficial for irritated or sunburned skin.
- Anti-aging: Antioxidants fight harmful molecules to reduce fine lines and wrinkles • Antimicrobial: Protects the skin from infections, useful for minor cuts and acne.
- Skin Regeneration: Promotes collagen production and skin repair.. ^[11]

Applications of herbal body lotion:

- Skin softening, smoothing, cooling, moisturizing
- Anti-allergic & Antiseptic
- Anti-inflammatory, Cleaning, Protective, Antipyretic.
- Antifungal, Fairness, Anti-aging, Anti-wrinkle.

Materials:

Sr.no	Ingredients	Role
1.	Aloevera gel	Moisturizer, soothing
2.	Neem extract	Antibacterial, anti-inflammatory
3.	Turmeric extract	Antioxidant, antimicrobial
4.	Stearic acid	Emulsifying agent
5.	Coconut oil	Emollient, base oil
6.	Glycerine	Humectant
7.	Rose water	Fragrance, skin toner
8.	Distilled water	Solvent
9.	Honey	Natural preservative and humectant

10.	Triethanolamine	Emulsifier,pH stabilizer
11.	Sandalwood oil	Natural fragrance

Experimental work:

Equipment Used:

- 1.Digital Weighing Balance – for accurate measurement of ingredients.
- 2.Hot Plate with Magnetic Stirrer – for uniform heating and mixing of phases.
- 3.Mechanical Stirrer – for emulsification and lotion formation.
- 4.Beakers, Measuring Cylinders, Spatulas – for basic formulation handling.
- 5.Thermometer – to monitor temperature during formulation.
- 6.Rotary Evaporator – for solvent evaporation in extract preparation.
- 7.pH Meter – to measure the final product's pH
- 8.Sterile Containers – for storage of final lotion.
- 9.Brookfield Viscometer – to measure the viscosity and flow behavior of the lotion.
- 10.Refrigerator – to store extracts and for storage of the final lotion during stability testing and to prevent microbial growth.

Role of ingredients in formulation

1. **Aloevera :**

Aloe vera is obtained from the leaves of *Aloe barbadensis* Miller, which belongs to the family Asphodelaceae. It contains various chemical constituents such as polysaccharides (mainly acemannan), glycoproteins, enzymes (like amylase and lipase), vitamins (A, C, E, and B12), minerals (such as calcium, magnesium, and zinc), saponins, and anthraquinones (like aloin and emodin).

Kingdom: Planta, Order: Asparagales, Family: Xanthorrhoeaceae (formerly Asphodelaceae)

Genus:Aloe, Species: Aloe vera, Active Constituents :Polysaccharides, Anthraquinones, Glycoprotein ^[12].

Benefits of Aloevera:

Is used as a moisturizer, to reduce pimples And acne and also used for treatment of Burn Wounds .Is used as an



antifungal and anti-inflammatory and it is also used to reduce scar, Pigmentation, redness and itching of the skin It has vitamin C and E Beta carotene in abundance. Therefore, it has anti-aging properties. It also contains antimicrobial properties and is anti-inflammatory. It has cooling properties and it is rich in antioxidants and minerals that boost the healing process. It also helps moisturizing and soothing effects. Soothes Burns ,Heals Wounds, Eases Intestinal Problems ,Reduces Arthritic Swelling .Heals Psoriasis Lesions ^[13], Gum Infections.

2.Neem leaves:

Neem is obtained from the plant *Azadirachta indica*, which belongs to the family Meliaceae. The main chemical constituents of neem include azadirachtin, nimbin, nimbidin, nimbolide, and quercetin.

Kingdom: Plantae ,**Order:** Sapindales, **Family:** Meliaceae, **Genus:** *Azadirachata* , **Species:** *Azadirachta indica*

Benefits of neem extract:

Neem oil contains fatty acids, antioxidants, and antimicrobial compounds, and these can benefit the skin in a range of ways. Research shows that these compounds may help fight skin infections, promote wound healing, and combat signs of skin aging. The stem, root bark, and fruit are used as a tonic and astringent. Some people apply neem directly to the skin to treat head lice, skin diseases, wounds, and skin ulcers; as a mosquito repellent; and as a skin softener.^[14]

Neem oil contains fatty acids, antioxidants, and antimicrobial compounds, and these can benefit the skin in a range of ways. Research shows that these compounds may help fight skin infections, promote wound healing, and combat signs of skin aging. Fights acne, Supports healthy skin aging, Reduces pigmentation. Soothes skin conditions like eczema



3.Turmeric:

Turmeric is obtained from the dried rhizomes of *Curcuma longa* Linn., which belongs to the family Zingiberaceae. The major chemical constituents of turmeric include curcuminoids (such as curcumin, demethoxycurcumin, and bisdemethoxycurcumin) and volatile oils (like turmerone, atlantone, and zingiberene).

Kingdom: Plantae, Order: Zingiberales, Family: Zingiberaceae, Genus: *Curcuma*, Species: *Curcuma longa*

Chemical Constituents

Cymene – 1 to 2%, Tumeron – 5% , Curcumin – 3 to 4% ,Demethoxycurcumin – 6%

Uses of Turmeric:

Glowing skin, Boosts healing , Potential Risks , May help other skin condiation ^[15]

Benefits of Turmeric:

Turmeric exhibits strong anti-inflammatory properties, which help in reducing skin redness, swelling, and irritation. It acts as a powerful antioxidant, The antimicrobial nature of turmeric helps fight acne-causing bacteria and prevents skin infections. It contributes to skin brightening by reducing pigmentation, dark spots, and uneven skin tone Turmeric promotes faster wound healing by enhancing collagen production and tissue repair. Its anti-aging properties help diminish the appearance of fine lines and wrinkles, maintaining youthful



skin.

4. Honey:

Honey is also known as honey. It belongs to the family Apidae.

Kingdom: Animalia, Order: Hymenoptera , Family: Apidae ,Genus: Apis

Benefits of honey

Honey is an excellent preservative for aloe due to its long shelf life and compatibility with various substances. Honey is primarily composed of sugar, along with a combination of amino acids, vitamins, minerals, iron, zinc, and antioxidants. Honey is utilized for its various health benefits, including its anti-inflammatory, antioxidant, and antibacterial properties. Honey helps retain moisture in the skin's deeper layers, promoting a healthy and



youthful appearance^[16]

Glycerine :

Glycerin uses as moisturizer. It soothes dry and irritated skin It treated acne and scars.

It helps to reduce wrinkles .It has anti-aging property



Rose Water:

Rose water is a rich source of anti-inflammatory property. It helps to provide a cooling effect and help in reducing itchiness and redness. It helps to smoothen skin irritation. It hydrates and moisturize the skin. It helps maintain the skin's ph balance. It improves skin texture and softness. It has anti- inflammatory property



Coconut oil

Coconut oil is moisturizing agent and provide dry skin. It promotes wound healing and reduce inflammation. It contains antibacterial and antifungal properties. It has anti- oxidant property.



Sandalwood oil:

Sandalwood: Red sandalwood is also known as chandan

Kingdom:Plantae **Clade:**Eudicots **Clade:**Rosids **Order:**Fabales , **Family:**Fabaceae, **Genus:**Pterocarpus ,
Species:P. santalinus

Use of red sandalwood:

It is primarily used for skin care and beauty purposes.

It is very effective in treating blemishes, rashes and acne.

It also helps in the removal of tan and dullness because of its cooling properties. ^[15]

Benefits of sandalwood oil: Soothes skin irritation and inflammation Fights acne-causing bacteria and fungi. Deeply moisturizes and softens dry skin, Slows signs of aging and promotes collagen and Calms the mind with its soothing aroma



Stearic acid

Stearic acid used as emulsifier to thicken and stabilized the lotion. It has emollient property which helps to moisturize skin to keep it softer and smoother. It has occlusive property, protecting the skin surface from Trans-Epidermal Water Loss (TEWL).

It helps the skin's pH level ^[17]



Triethanolamine

Acts as an effective emulsifier to blend oil and water phases. Stabilizes the lotion and prevents phase separation. Enhances the smoothness and spreadability of the lotion. Adjusts and maintains skin-friendly pH levels. Supports the performance of other emulsifiers. Indirectly boosts shelf life by stabilizing .

Preparation before the formulation

Make sure your workspace is spotless and sterilize all of your packaging supplies. When making this recipe, it is advised that you use gloves, protective clothes, and a hair net.

Materials and methods:

Fresh neem leaves (*Azadirachta indica*) and turmeric rhizomes (*Curcuma longa*) were obtained from a local herbal garden. Aloe vera gel was freshly extracted from matured leaves of *Aloe barbadensis*. Stearic acid, triethanolamine, and sandalwood oil were procured from a certified pharmaceutical supplier. All other chemicals and reagents used were of analytical grade. Distilled water was used throughout the study.

Extraction of Herbal Ingredients:

Aloe Vera Gel Extraction:

Fresh aloe vera leaves were collected and thoroughly washed under running water to remove dirt and impurities. The outer green rind of the leaves was carefully peeled using a sterile knife to collect the transparent mucilaginous gel from the inner portion. The collected gel was homogenized using a blender to obtain a smooth, uniform consistency and filtered through muslin cloth to remove fibrous materials. The resulting fresh gel was stored in a clean container under refrigeration until further use

Neem Extract (Aqueous)

Fresh neem leaves were thoroughly washed with distilled water to remove dirt and contaminants. The clean leaves were then shade-dried for 2–3 days and ground into a coarse powder using a mechanical grinder. About 10 g of the powdered leaves were mixed with 100 mL of distilled water and heated at 60–70°C for 30 minutes with intermittent stirring. After cooling to room temperature, the mixture was filtered first through muslin cloth and then through Whatman No. 1 filter paper to obtain a clear aqueous extract. The extract was stored in a clean, amber-colored container at 4°C until use.

Turmeric Extract (Aqueous)

Fresh turmeric rhizomes were washed thoroughly, sliced, and shade-dried for 4–5 days. The dried pieces were then powdered using a grinder. A quantity of 10 g of turmeric powder was extracted with 100 mL of distilled

water by heating the mixture at 60–70°C for 30 minutes. After cooling, the extract was filtered through muslin cloth followed by Whatman No. 1 filter paper to obtain a clear aqueous turmeric extract. The extract was stored in a sterile, amber-colored bottle at 4°C until formulation

Formulation table :

Ingredients	Quantity	Role
Aloe vera gel	20 mL	Moisturizer, skin soothing
Neem extract	5 mL	Antibacterial, anti-inflammatory
Turmeric extract	3ml	Antioxidant, antimicrobial
Stearic acid	3g	Emulsifying agent
Coconut oil	5ml	Emollient, base oil
Glycerine	3ml	Humectant
Rose water	5 ml	Fragrance, skin toner
Distilled water	Q. S.	Solvent
Honey	2ml	Natural preservative & humectant
Triethanolamine	1ml	Emulsifier, pH stabilizer
Sandalwood oil	Few drops	Natural fragrance

Formulation of herbal body lotion:

1. Oil Phase Preparation:

Stearic acid and coconut oil were accurately weighed and melted together in a beaker using a water bath at 70–75°C. The mixture was stirred until a clear oil phase was obtained.

2. Aqueous Phase Preparation:

Aloe vera gel, glycerine, honey, rose water, neem extract, and turmeric extract were combined in another beaker. The mixture was heated gently to around 70°C and stirred to ensure homogeneity.

3. Emulsification:

While both phases were still warm, the aqueous phase was slowly added to the oil phase with continuous stirring using a mechanical stirrer. Stirring was continued for about 15–20 minutes to ensure complete emulsification and uniform mixing.

4. Addition of Triethanolamine

Triethanolamine was added dropwise to the warm emulsion to enhance emulsification and adjust the consistency. Stirring was continued to incorporate it thoroughly.

5. Cooling and Perfume Addition:

The mixture was allowed to cool gradually to room temperature with continuous gentle stirring. After cooling, a few drops of sandalwood oil were added as a natural fragrance.

6. Final Adjustment:

The final volume was made up to 50 mL using distilled water if needed. The prepared lotion was transferred into a sterilized container and stored at room temperature for further evaluation.

Composition of aqueous phase:

Sr.no	Ingredients	Quantity
1.	Aloevera	20 ml
2.	Neem extract	5 ml
3.	Turmeric extract	3 ml
4.	Glycerin	3 ml
5.	Honey	2 ml
6.	Rose water	5 ml
7.	Distilled water	Q.s

Composition of oil phase:

Sr.No.	Ingredients	Quantity
1.	Stearic acid	3ml
2.	Coconut oil	5ml

Evaluation Parameters for Herbal Body Lotion

The herbal body lotion formulation will be evaluated using the following parameters:

1. Physical Appearance:

- **Description:** Visual inspection for clarity, color, and uniformity.
- **Method:** The lotion should be smooth, free of any lumps or undissolved particles. The color should be consistent, and the product should not show any separation over time.

2. pH Determination:

- **Description:** The pH of the lotion is an essential factor, as it affects the stability and compatibility with the skin.
- **Method:** The pH is measured using a calibrated pH meter. A 1 g sample of the lotion is dissolved in 10 mL of distilled water, and the pH is recorded.
- **Expected Range:** 4.5 – 6.5 (ideal for topical application).

3. Viscosity:

- **Description:** Viscosity determines the spreadability and texture of the lotion.
- **Method:** The viscosity of the lotion is determined using a Brookfield viscometer at 25°C.
- **Expected Range:** A medium viscosity (500 – 1500 cP) is ideal for easy application without being too runny or too thick.

4. Spreadability:

- **Description:** Spreadability assesses how easily the lotion can be applied and spread over the skin.
- **Method:** A fixed amount (1 g) of the lotion is placed between two glass plates, and the area covered by the lotion is measured after applying a specific weight for a set time.
- **Expected Result:** The lotion should spread smoothly and cover a larger area easily.

5. Stability Test:

- **Description:** To determine the physical and chemical stability of the lotion over time, especially under different conditions.
- **Method:** The lotion is stored at various temperatures (e.g., 4°C, 25°C, and 40°C) for several weeks, and periodic checks for phase separation, color change, and odor are performed.
- **Expected Result:** The lotion should remain stable, with no phase separation or significant changes in appearance.

6. Skin Irritation Test:

- **Description:** To evaluate the safety of the formulation for topical application.
- **Method:** A patch test is conducted on a small area of skin (e.g., the forearm) to check for any allergic reactions or irritation. The skin is observed for 48 hours after application.
- **Expected Result:** No irritation, redness, or allergic reaction should be observed.

7. Moisturizing Effect (Skin Hydration Test):

- **Description:** To assess the moisturizing effect of the lotion.
- **Method:** Skin hydration is measured using a corneometer before and after applying the lotion. Measurements are taken at specific intervals (e.g., 1 hour, 4 hours) after application.
- **Expected Result:** The lotion should show a significant increase in skin hydration, indicating its moisturizing properties.

8. Microbial Limit Test:

- **Description:** To ensure the safety and hygiene of the formulation.
- **Method:** A sample of the lotion is tested for the presence of pathogenic microorganisms like E. coli, Salmonella, and Staphylococcus aureus.
- **Expected Result:** The lotion should be free from harmful microbial contamination.

9. Organoleptic Properties:

- **Description:** Sensory attributes such as odor, texture, and feel on the skin.
- **Method:** A panel of evaluators will assess the lotion for its fragrance (sandalwood oil) and its texture during application (smooth, non-greasy, or oily).
- **Expected Result:** The lotion should have a pleasant fragrance and a smooth, non-greasy feel on the skin.

10. Shelf Life Test:

- **Description:** To assess the duration for which the lotion remains effective and stable.
- **Method:** The lotion is stored under ambient conditions and tested for stability, color, pH, and microbial contamination at regular intervals (e.g., every month) for up to 6 months.
- **Expected Result:** The lotion should maintain its properties throughout the shelf life period.

11. Homogeneity And Transparency:

The homogeneity test was evaluated through tactile and visual inspection. This was completed Graphically

Parameter	Method used	Result obtained	Inference
Appearance	Visual inspection	Light yellow, smooth, no lumps	Acceptable
PH	pH meter(1% dispersion in water)	5.6	Skin compatible
Viscosity	Brookfield viscometer	950cP	Good consistency
Spreadability	Two- slides method with weight	6.8	Easily spreadable
Skin irritation	Human patch test(n=5 volunteers)	No reaction observed	Safe for topical use
Moisturizing effect (Corneometer reading (hydration increase%)	+28% hydration after 4 hours	Effective moisturizing agent
Microbial load	Standard plate count method	Within acceptable limits	Microbiologically safe
Fragrance evaluation	Sensory panel(n=5)	Pleasant, mild sandalwood aroma	User acceptable
Stability (4 weeks)	Observed under different conditions	No change in colour or consistency	Stable

following lotion settling in appropriate beakers. Formulas were examined for transparency, lotion removal efficiency, after-feel, and smear kind. ^[18]

12. Washability Test:

For 10 minutes, a dollop of lotion was applied to the hand's skin and let it run under the force of the tap water. It was observed when the lotion was fully eliminated. ^[19]

Evaluation Parameters and Results:

Results and discussion:

The herbal body lotion formulated using aloe vera gel, neem extract, and turmeric extract was successfully prepared and evaluated based on standard cosmetic parameters. The formulation exhibited a smooth texture, light yellow color, and homogeneous consistency without any phase separation. The pH of the lotion was found to be 5.6, which lies within the acceptable range for topical formulations and is suitable for human skin. Viscosity measurement showed a moderately thick consistency (950 cP), ideal for easy application and stability. The spreadability value was recorded at 6.8 cm, indicating that the lotion spreads smoothly over the skin surface with minimal effort. Stability studies carried out over a period of four weeks at varied storage conditions showed no signs of color change, odor development, or phase separation, confirming the physical stability of the formulation. The microbial load was within acceptable limits, ensuring safety for use. A patch test conducted on volunteers revealed no signs of skin irritation or allergic reactions, confirming the lotion's dermal compatibility. Moisturizing efficiency tested using a corneometer showed a 28% increase in skin hydration after 4 hours of application, indicating effective moisturization. Sensory evaluation by a panel of volunteers revealed positive feedback regarding the fragrance (due to sandalwood oil), non-greasy texture, and soothing after-feel.

Direction for use

To be used externally only. Use a small amount on your hand in rougher spots like knees and elbows. Apply the lotion to your body by making tiny circular movements with your hand.

Conclusion

The herbal body lotion formulated with natural ingredients such as aloe vera, neem, and turmeric demonstrated promising results in terms of safety, stability, and effectiveness. The formulation maintained a favorable pH, appropriate viscosity, and good spreadability. It was well-tolerated on human skin and showed excellent moisturizing properties without causing irritation. The incorporation of plant-based extracts imparted additional therapeutic benefits such as antibacterial, antioxidant, and soothing effects, supporting the use of herbal actives in cosmetic formulations. Overall, the product holds potential for further development as a natural, skin-friendly body lotion suitable for daily use.

References:

1. Nikita M. Rathi, Shital V. Sirsat, Surekha S. Tayade, Abhijit S. Khot; Akshay C. Formulation and Standardization of Herbal Lotion 4 April 2022;7.
2. Dr. Kuntal Das, Nirali Prakashan. A review of herbal lotion, First Edition: February 2020.
3. Dr. Ashok A Hajare, Dr. Durgacharan A. Bhagvat, Nirali Prakashan, First Edition: June 2017.
4. Lawless J, Allen J. Aloe vera-Natural wonder care. Harper Collins Publishers, Hammersmith; c2000. P. 5 12.
5. Grace OM, Simmonds MSJ, Smith GF, Van Wyk AE. Therapeutic uses of Aloe L.(Asphodelaceae) in southern Africa. *J Ethnopharmacol.* 2008;119(3):604–14.
6. Rosca-Casian O, Parvu M, Vlase L, Tamas M. Antifungal activity of Aloe vera leaves. *Fitoterapia.* 2007;78(3):219–22.
7. Hamman JH. Composition and applications of Aloe vera leaf gel. *Molecules.* 2008;13(8):1599–616.
8. Eshun K, He Q. Aloe vera: a valuable ingredient for the food, pharmaceutical and cosmetic industries—a review. *Crit Rev Food Sci Nutr.* 2004;44(2):91–6.
9. Salehi B, Albayrak S, Antolak H, Kręgiel D, Pawlikowska E, Sharifi-Rad M, Uprety Y, Tsouh Fokou PV, Yousef Z, Amiruddin Zakaria Z, Varoni EM (2018) Aloe genus plants: from farm to food applications and phytopharmacotherapy. *Int J Mol Sci* 19(9):2843.
10. Miller LG. Herbal Medicinals: selected clinical considerations focusing on known or potential drug-herb interactions. *Arch Intern Med.* 1998;158:2200–11.
11. Formulation and Evaluation of Herbal Cream Containing Aloe Vera Leaf Extract,” *Journal of Chemical and Pharmaceutical Research.*
12. Akao T, Che Q, Kobashi Q (1996) A purgative action of barbaloin is induced by Eubacterium sp. Strain BAR, a human intestinal anaerobe, capable of transforming

Barbaloin to aloe-emodinanthrone. *Biol Pharm Bull* 19(1):136–138. to ref 79 in article

Article CAS PubMed Google Scholar

13. Banerjee D, Kumar M, Mukopadayay S. Formulation and evaluation of herbal body lotion: review *International Journal of Health Sciences*. 2022;6(S2):13342–13349.

14. Salunke Pandit, Hingane LD. Preparation and Evaluation of Herbal Lotion. *International Journal of Advances in Engineering and Management(IJAEM)*, 2022.

15. Banerjee, D., Kumar, M., & Mukopadayay, S. (2022). Formulation and evaluation of herbal body lotion: A review. *International Journal of Health Sciences*, 6(S2), 13342–13349.

16. Debjit B, Harish G, Kumar BP, Duraivel S, Aravind G, Sampath Kumar KP. Medicinal uses of *Punicagranatum* and its health benefits. *Journal of Pharmacognosy and Phytochemistry*. 2013;1:5.

17. Ravindra RP, Muslim PK. Comparison of physical characteristics of vanishing Cream base. Cow ghee and shata-dhautaghrita as per pharmacopoeial standards. *International Journal of Pharma and BioSciences*. 2013;4(4):14-21.

18. Devi PM, Menda JP, Reddy T, Deepika R, Sastry TP. Preparation and Characterization of Wound Healing Composites of Chitosan, Aloe Vera and *Calendula officinalis*-A Comparative Study. *Am J Phytomedicine Clin Ther* [Internet]. 2014;2(1):61–76. Available from:

Myasar AK, Mudhafar ANA, Ahmed ZA. Comparative study of new formula of ultrasound gel with commercial ultrasound gel. *Drug Invent Today*. 2019;12(11):2822–6.

19. Vishakha Shinde; Kundan Tiwari; Formulation and Evaluation of Lemongrass Lotion

20. Kumar, V., & Sharma, A. (2020). A review on herbal cosmetics. *International Journal of Pharmaceutical Sciences and Research*, 11(2), 1000–1010.

21. Kaur, J., & Arora, R. (2019). Development and evaluation of herbal body lotions. *Journal of Natural Remedies*, 19(3), 137–145.

22. Singh, P., & Mishra, A. (2018). Role of medicinal plants in skincare: A review. *International Journal of Herbal Medicine*, 6(5), 45–49.

23. Indian Pharmacopoeia (2020). Government of India, Ministry of Health and Family Welfare, Volume II.

24. Kokate, C.K., Purohit, A.P., & Gokhale, S.B. (2019). *Pharmacognosy*. Nirali Prakashan.