A Review Regarding the Formulation of a Moisturising Hands Cream Made with Sodium Alginate, Shea Butter, Rose Water and Sweet Almond Seed Oil

Vishal Santosh Kate[1], Garsad R. S.[2], Dr. V.A. Kashid[3], Shubham S. Bhalerao[4], Akash S. Gangurde[5]
MABD Institute of Pharmaceutical Education & Research, Babhulgaon, Yeola (423401) Maharashtra

Abstract—**Demand for natural, plant-based skincare products has surged due to hand dryness brought on by frequent exposure to water, chemicals, and extreme weather. Shea butter, sodium alginate, and sweet almond oil are examples of ingredients with stabilizing and moisturizing qualities that could take the place of artificial ingredients in topical solutions. The purpose of this study was to create a moisturizing hand cream using only natural ingredients and to evaluate its durability, physicochemical properties, and general suitability for routine hand care. The fusion process, which involves heating the oil and aqueous phases separately and combining them at equal temperatures while continuously stirring to create a stable emulsion, was used to make the hand cream. Sodium alginate was added to the aqueous phase, whereas shea butter and sweet almond oil constituted the oil phase. A smooth, uniform cream was created by stirring the resultant liquid until it cooled. Next, in both ambient and accelerated circumstances, the formulation's pH, texture, spreadability, washability, and four-week stability were evaluated. The finished product was easily spreadable, quickly absorbed, and had a creamy, non-greasy feel. Its pH, which ranged from 5.6 to 6.1, was within the range that was suitable for skin. Stability tests showed no discernible changes in color, texture, or pH, and washability was satisfactory, suggesting a stable formulation for the course of the study. Using just plant-derived ingredients, the fusion method effectively created a stable, potent hand cream. The formulation demonstrated the potential of natural ingredients like shea butter, sodium alginate, and sweet almond oil in creating safe, useful, and sustainable skincare products by meeting important performance and quality standards.**

Index Terms—**Moisturising hand cream, Sodium alginate, Sweet almond oil, Fusion emulsification, Evaluation.**

I. INTRODUCTION

Hand creams are necessary cosmetic items made to keep skin hydrated, shield the epidermal barrier, and stop dryness brought on by regular hand washing, chemical exposure, or extreme weather. Demand for hand care formulations based on natural, plant-derived materials rather than synthetic emulsifiers or petrochemical compounds is rising as customers become more conscious of ingredient safety and environmental sustainability (Draelos, 2018). This change has prompted formulators to investigate eco-friendly, biocompatible substitutes that can effectively moisturize skin while maintaining good skin tolerance. A potential blend of natural raw ingredients with complementing functional qualities is Sodium alginate, shea butter, rose water, and sweet almond seed oil. Because of its viscosity-enhancing behavior and biocompatibility, sodium alginate, a polysaccharide produced from brown seaweed, is well known for its thickening, gelling, and stabilizing properties in cosmetic emulsions. Rich in fatty acids and unsaponifiable substances, shea butter has occlusive and emollient properties that promote moisture retention and build the skin barrier. Known for having a high concentration of oleic and linoleic acids, sweet almond seed oil provides superior spreadability and skin-softening qualities while promoting general skin nourishment. Rose water, which is made by distilling rose petals, has aromatic, calming, and mildly astringent qualities that improve the formulation's sensory and functional features.

Despite the advantages of using natural ingredients, there are issues with texture, phase separation, and long-term stability when creating a stable and visually appealing cream without the use of synthetic

emulsifiers. But new studies show that natural polymers like sodium alginate can be useful stabilizing agents, especially when paired with lipid components like plant oils and shea butter. Therefore, developing a high-performing, long-lasting moisturizing hand lotion requires an understanding of the physicochemical interactions between these substances. With an emphasis on their functional functions, compatibility, and contributions to overall product performance, this review explores the formulation possibilities of sodium alginate, shea butter, rose water, and sweet almond seed oil. The review illustrates how these chemicals can be used to create efficient, eco-friendly, and skin-friendly hand care products by summarizing the most recent research on natural cosmetic formulation.

II. MATERIALS AND METHODS

- Ingredients Used

1. Shea Butter:

Fig. 1 : Shea Butter

This butter, which comes from the African shea tree, is high in vital fatty acids and vitamins A and E. It is renowned for its capacity to deeply hydrate, encourage the development of collagen, and relieve dry or irritated skin. It helps retain hydration by forming a moisture-sealing barrier.

2. Sodium Alginate:

Fig. 2 : Sodium Alginate

Sodium alginate, which is derived from brown seaweed, provides the cream its rich, smooth texture and aids in the formation of stable emulsions. Additionally, it creates a thin layer on the skin that improves spreadability and moisture retention.

3. Sweet Almond Oil:

Fig. 3 : Sweet Almond Oil

Oleic and linoleic acids, together with vitamins A and E, are abundant in this lightweight, non-greasy oil. It gives the skin a lovely, silky after-feel while nourishing it, improving complexion, and reducing inflammation.

4. Stearic Acid and Cetyl Alcohol:

Fig. 4 : Steric Acid

Fig. 5 : Cetyl Alcohol

These give the cream structure and aid in the blending of the water and oil phases. They improve stability and give the mixture body without becoming greasy by thickening it.

5. Glycerin:

Fig. 6 : Glycerin

Glycerin is a well-known humectant that draws moisture into the skin's outer layers, promoting suppleness and preventing dryness.

6. Triethanolamine:

Fig. 7 : Triethanolamine

Maintains the consistency and stability of the cream over time by supporting emulsion formation and acting as a pH balancer.

7. Preservatives (Methylparaben and Propylparaben):

Fig. 8 : Methylparaben

Added to prolong shelf life and stop microbiological growth. Because of their broad-spectrum antimicrobial protection, they are frequently utilized in cosmetics.

8. Distilled Water and Rose Water:

Fig 9 : Rose Water

Rose water enhances the cream's sensory appeal by adding a pleasant scent and modest anti-inflammatory qualities, while distilled water acts as the base solvent.

III. FORMULATION PROCEDURE

The fusion procedure, which entails heating and mixing distinct oil and aqueous phases, was used to make the cream. Shea butter, sweet almond oil, stearic acid, cetyl alcohol, white soft paraffin, and liquid paraffin are examples of oil-based substances that were first measured and carefully cooked in a water bath to about 70°C until they were completely melted and homogenous. Preservatives (methylparaben and propylparaben) were added after sodium alginate and glycerin were dissolved in distilled water to create the water phase. In order to ensure seamless emulsification, this phase was also heated to 70°C to match the temperature of the oil phase.

Using a mechanical mixer, the aqueous phase was gradually added to the oil phase while being continuously stirred. As the liquid cooled, stirring was continued, allowing the cream to spontaneously emulsify and thicken. Rose water was added to improve scent once the temperature fell below 40°C, and triethanolamine was added to further stabilize the emulsion and correct pH. The finished cream had no air bubbles and was smooth and well-blended. After that, it was moved into hygienic, sealed containers for assessment.

IV. FORMULATION TABLE

Table 1: Formulation Table

Ingredients	Quantity (%)
Stearic acid	4.0
Cetyl alcohol	1.0
Liquid paraffin	2.0
White soft paraffin	2.0
Glycerin	5.0
Triethanolamine	1.0
Methyl paraben	0.2
Propyl paraben	0.02
Rose water	5.0
Distilled water	q.s. to 100%
Shea butter	5.0
Sodium alginate	1.0
Sweet almond oil	3.0

V. EVALUATION PARAMETERS

1. Organoleptic Properties:

The cream had a smooth texture, a delicate, pleasant floral aroma, and a white, creamy appearance. It absorbed smoothly and spread throughout the skin without feeling greasy.

2. pH Determination

The cream's pH was found to be between 6.5 and 7.0 using a digital pH meter, which is perfect for preserving the skin's natural equilibrium.

3. Spreadability

The cream's outstanding spreadability made it possible to apply it quickly and evenly. This guarantees efficient coverage and improves user comfort.

4. Washability

It was easy to reapply during the day because the formulation wiped off with water.

5. Stability Studies

The cream held up throughout the course of 30 days in a variety of settings, including refrigeration and accelerated aging. There were no indications of textural alterations, discolouration, or separation.

Table 2: Evaluation Table

Sr.No.	Test	Observation
1	Color	White
2	Odor	Pleasant floral
3	Texture	Smooth and creamy
4	pH	6.5 – 7.0
5	Spreadability	Good
6	Washability	Easily washable
7	Stability	No phase separation after 30 days

VI. DISCUSSION

Shea butter, sweet almond oil, and sodium alginate were combined to make a hand lotion that is both effective and in line with the expanding natural skincare trend. Almond oil soothed and calmed sensitive regions, while shea butter provided deep moisturization and skin protection. The smooth texture and moisture retention were enhanced with sodium alginate.

The assessment revealed that the cream's pH was suitable for human skin and that its texture, scent, and usability were all pleasing. The formulation's suitability for consumer usage was further confirmed by the long-term stability data. This demonstrates how natural chemicals in cosmetic formulations can produce outcomes that are on par with or superior to those of their synthetic counterparts.

VII. CONCLUSION

This review showed how shea butter, sodium alginate, and sweet almond oil may be successfully combined in a simple fusion procedure to create a moisturizing hand lotion. The resultant cream has an elegant, non-

greasy texture while successfully hydrating, protecting, and calming the skin. Over time, it continued to be skin-compatible, stable, and enjoyable to use. This formulation presents a potential choice for everyday hand care as consumer demand for safe, natural, and effective personal care products continues to rise.

This kind of cream might be improved and scaled for commercial usage with additional research, including longer-term testing and user trials, offering a natural remedy for daily skincare requirements. This formulation is positioned as an environmentally aware option due to the use of sustainable ingredients. It is appropriate for both personal usage and potential future market entry due to its good user experience and ease of preparation.

REFERENCE

[1] Mazurek, B., Molska, A, & Podgórska, M. Shea butter as a valuable raw material in cosmetic and pharmaceutical applications. Molecules, 2019; 24(22):4031.

[2] Becker, T., Schmid, M., & Müller, K. (2020). Alginate in cosmetic formulations: Properties and applications. International Journal of Cosmetic Science, 42(5), 415–424.

[3] Draelos, Z. D. (2018). Cosmetic dermatology: Products and procedures (3rd ed.). Wiley-Blackwell.

[4] Jäger, C., Schmidt, E., & Buchbauer, G. (2016). Plant oils in cosmetics: Composition, stability, and benefits to the skin. Journal of Essential Oil Research, 28(3), 193–202.

[5] Maranz, S., Wiesman, Z., & Bianchi, G. (2017). The properties and composition of shea butter: A multifunctional fat for cosmetic use. Journal of the American Oil Chemists' Society, 94(4), 539–548.

[6] Sharma, P., & Dwivedi, D. (2019). Therapeutic and cosmetic applications of rose and rose water: A review. Journal of Herbal Medicine, 17, 100255.

[7] Vaughn, J. Fatty Acids in Skin Care: How They Benefit Formulations. Journal of Cosmetic Science, 2019; 70(3):189-200.

[8] Aulton, M. E., & Taylor, K. M. G. (2017). Aulton's Pharmaceutics: The Design and Manufacture of Medicines. Elsevier.

[9] Tadros, T. F. (2013). Emulsion Formation and Stability. Wiley-VCH.

[10] Bajaj, S., Singla, D., & Sakhuja, N. Stability testing of pharmaceutical products. Journal of Applied Pharmaceutical Science, 2012; 2(3):129- 138.

[11] Chen, J., & Stokes, J. R. Rheology and tribology: Two distinctive regimes of food texture sensation. Trends in Food Science & Technology, 2012; 25(1):4-12.

[12] Draelos, Z. D. (2010). Cosmetic Dermatology: Products and Procedures. John Wiley & Sons.

[13] Barel, A. O., Paye, M., & Maibach, H. I. (2009). Handbook of Cosmetic Science and Technology. CRC Press.

[14] Kolb, B., & Ettre, L. S. (2006). Static Headspace-Gas Chromatography: Theory and Practice. John Wiley & Sons.

[15] Schreiner, M. Lipid oxidation in shea butter and its implications for cosmetic formulations. Journal of the American Oil Chemists' Society, 2006; 83(5):401-408.

[16] Lambers, H., Piessens, S., Bloem, A., Pronk, H., & Finkel, P. Natural skin surface pH is on average below 5. Skin Research and Technology, 2006; 12(3):125-131.

[17] Draget, K. I., Smidsrød, O., & Skjåk-Bræk, G. (2005). Alginates from algae. Polysaccharides and Polyamides in the Food Industry, 1, 1-30.

[18] Daston, G. P. Toxicology of parabens: A review of recent studies. Environmental Research, 2004; 94(2):115-122.

[19] Loden, M. Role of topical emollients and moisturizers in the treatment of dry skin barrier disorders. American Journal of Clinical Dermatology,2003; 4(11):771-788.

[20] Soni, M. G., Carabin, I. G., & Burdock, G. A. Safety assessment of esters of p-hydroxybenzoic acid (parabens). Food and Chemical Toxicology, 2002; 40(10):1335-1373.