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Preparation And Evaluation Of Herbal Anti-Aging Cream Using Sweet Potato

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Abstract

This study involves the formulation and evaluation of a herbal anti-aging cream incorporating Ipomoea batatas (sweet potato), known for its rich antioxidant content including anthocyanins, beta-carotene, and vitamins C and E. The formulation was assessed for pH, spreadability, homogeneity, washability, and stability under ICH guidelines. Results confirmed the cream to be a stable, non-irritating, and skin-friendly O/W emulsion suitable for cosmetic use.

Keywords: Sweet potato, herbal formulation, anti-aging cream, anthocyanins, stability, emulsion

1. Introduction

Skin aging is a complex process influenced by intrinsic (genetic and hormonal) and extrinsic (UV exposure, pollution, oxidative stress) factors. Free radicals and ROS contribute significantly to premature aging. Natural remedies, especially those rich in antioxidants, offer safer alternatives to chemical-based anti-aging products. Sweet potato is a potent antioxidant source, making it a promising ingredient for herbal skincare formulations.

2. Materials and Methods

Key Ingredients:

- Sweet Potato (Ipomoea batatas) – Anti-aging agent rich in anthocyanins
- Sunflower Seed Oil – Emollient and vitamin E source
- Rose Water – Toner and pH balancer
- Turmeric – Anti-inflammatory and brightening agent
- Honey – Moisturizer and antibacterial
- Lemon Juice – Astringent and pH regulator
- Aloe Vera Gel – Hydrator and skin soother

- Rosemary Extract – Preservative and antioxidant

Preparation Method:

Sweet potato was dried and powdered. It was mixed with sunflower oil, turmeric, lemon juice, honey, and rosemary extract. The mixture was triturated to form an oil-in-water emulsion. Rose water and aloe vera gel were then added to achieve a final weight of 50g.

3. Evaluation Parameters

Sr. No.	Parameter	Observation	Standard/Remark
1	Colour and Odour	Yellowish, slightly aromatic	Acceptable for cosmetic use
2	pH	5.2	Safe range: 4.5–6.5
3	Spreadability	2.05 ± 0.05 cm	Good spreadability
4	Type of Emulsion	O/W	Suitable for skin application
5	Homogeneity	Smooth and consistent	Visually and physically uniform
6	Washability	Easily washable	No residue left
7	Type of Smear	Non-greasy	User-friendly texture
8	Patch Test	No irritation observed	Passed
9	Accelerated Stability Study	Stable at 45°C for 20 days	No physical/chemical change noted

4. Results and Discussion

The cream exhibited good physical characteristics: smooth texture, pleasant aroma, non- greasy smear, and satisfactory spreadability. The pH was within the acceptable dermatological range. The O/W emulsion was stable with no signs of separation or microbial growth. The patch test confirmed the formulation was non-irritant and suitable for sensitive skin. Accelerated stability studies showed no changes in key parameters, validating the formulation's shelf life.

6. Discussion (Expanded)

The formulation of herbal anti-aging cream using sweet potato as a key ingredient highlights the importance of utilizing naturally occurring phytochemicals in skincare. The presence of anthocyanins, flavonoids, and beta-carotene in sweet potato supports skin rejuvenation, protection against UV radiation, and improved elasticity. When combined with other herbal ingredients such as turmeric, aloe vera, honey, and rosemary extract, the synergistic effect results in a cream with potent anti-inflammatory, antimicrobial, and moisturizing properties.

The use of rose water and aloe vera ensures skin hydration while maintaining the pH balance. Furthermore, lemon juice, a rich source of vitamin C, contributes to skin brightening and acts as an astringent. These ingredients collectively form a holistic approach to combat signs of aging including fine lines, wrinkles, and dryness.

Each parameter was carefully selected and evaluated based on its cosmetic significance and dermatological compatibility. The successful results from stability studies indicate the formulation's potential to retain efficacy over time, which is crucial for product scalability and commercial distribution. In future, long-term in vivo and consumer testing can help assess efficacy under varied skin types and environmental conditions.

7. Future Scope and Recommendations

The development of herbal skincare products has gained significant traction due to increasing awareness around chemical-free alternatives. This study opens the door to several future prospects:

- Further clinical trials on different skin types and age groups to validate efficacy and safety.
- Optimization of formulation using nanoemulsion technology for improved penetration and bioavailability.
- Exploration of other botanical extracts in combination with sweet potato for enhanced anti-aging benefits.
- Long-term stability studies under various climatic conditions.
- Consumer acceptability studies to gather feedback on texture, fragrance, and results.
- Eco-friendly and sustainable packaging options to align with green cosmetics trends.

8. Appendices

Appendix A – Ingredient Details

1. Sweet Potato: Rich in antioxidants (anthocyanins, beta-carotene), vitamins A, C, and E.
2. Aloe Vera: Moisturizing, anti-inflammatory, promotes collagen synthesis.
3. Turmeric: Antibacterial, skin-brightening, reduces hyperpigmentation.
4. Honey: Natural humectant, antimicrobial, promotes wound healing.
5. Sunflower Seed Oil: Source of vitamin E, supports skin barrier function.
6. Lemon Juice: High in vitamin C, lightens pigmentation.
7. Rose Water: Balances skin pH, tones and hydrates.
8. Rosemary Extract: Preservative, antioxidant, improves circulation.

5. Conclusion

A stable, effective, and safe herbal anti-aging cream was successfully formulated using sweet potato and complementary natural ingredients. The product met all evaluation criteria and showed promise for topical cosmetic use. Further in vivo testing and clinical trials are recommended before commercial scaling.

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