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Original article

Formulation and Evaluation of Vanishing Cream Incorporating Moringa Oil

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Abstract
Herbal cream offers several advantages over other synthetic creams. This study aimed to formulate and evaluate a vanishing cream incorporating *Moringa Oleifera* seed oil at various concentrations. The research specifically explored the feasibility of using natural beeswax as a *substitute* for the commonly used synthetic structuring agent, stearic acid. Eight formulations were developed across four concentration levels (High, Medium-1, Medium-2, and Low water content). The oil-in-water (O/W) emulsions were prepared by melting an oil phase (structuring agent, lanolin, cetyl alcohol, and Moringa oil) and blending it with an aqueous phase (water, KOH, and propylene glycol) at 70–75°C. The products underwent comprehensive quality control testing, including sensory evaluation, skin sensitivity, absorption time, washability, and pH stability. Our findings indicated that Moringa oil successfully incorporated into both stearic acid and beeswax cream bases without stability issues or air bubbles. Formulations with high water content (~85%) exhibited excellent spread ability and rapid absorption (under 1 minute), whereas lower water concentrations resulted in a greasier skin feel. Stearic acid formulations remained skin-compatible (pH 5.5–7.5), while beeswax formulations showed higher alkalinity (pH 8.0–8.8). All formulations were non-irritant in skin sensitivity tests. So, Moringa oil is a highly suitable candidate for vanishing creams, providing moisturizing and antioxidant benefits while maintaining physical stability. While beeswax is a viable natural alternative, stearic acid remains superior for maintaining optimal pH and the characteristic "vanishing" effect.
Keywords. Moringa Oleifera, Vanishing Cream, Stearic Acid, Beeswax.

Introduction

The human skin is constantly exposed to harmful environmental factors such as ultraviolet (UV) radiation and air pollutants. These factors promote the formation of free radicals and reactive oxygen species, which can lead to oxidative stress, cellular damage, and disruption of skin homeostasis [1]. Exposure to sunlight is recognized as a major factor in the etiology of the progressive, unwanted changes in the skin's appearance. Photochemoprotective agents are capable of preventing the adverse effects of ultraviolet radiation on the skin, which are caused by excessive generation of reactive oxygen species [2]. Natural oils rich in ceramides and unsaturated fatty acids can be used as topical antioxidants to restore lipid structures of skin and prevent UV induced keratinocytes damage [3].

Moringa Oleifera is a versatile medicinal plant native to northern India. The seed oil is particularly valuable for dermatological use as it contains high levels of oleic acid (~74%) and tocopherols (Vitamin E), which contribute to its significant antioxidant and anti-inflammatory effects [4]. Due to its antioxidant properties, Moringa helps tackle the signs of skin ageing [5]. This study aimed to formulate and evaluate a vanishing cream incorporating *Moringa Oleifera* seed oil at various concentrations. The research specifically explored the feasibility of using natural beeswax as a substitute for the commonly used synthetic structuring agent, stearic acid.

Materials and Methods

The vanishing cream was prepared using an oil-in-water (O/W) emulsification method. The primary ingredients included *Moringa Oleifera* oil, stearic acid (common emulsifier), beeswax (natural emulsifier), lanolin, Acetyl alcohol, KOH (neutralizer), propylene glycol, and purified water [6].

Formulation Design (Optimization)

Eight formulations were prepared across four concentration levels (High, Medium, and Low water content):
i-Stearic Acid Group (1S, 2S, 3S, 4S): Ranging from 85.25% to 52.3% water content.
ii-Beeswax Group (1B, 2B, 3B, 4B): Utilizing identical water concentrations for comparison.

Preparation Procedure

The oil phase was prepared by melting stearic acid, beeswax, lanolin, and acetyl alcohol at a temperature of 70–75 °C, after which moringa oil was incorporated. In parallel, the aqueous phase was prepared by dissolving potassium hydroxide (KOH) and propylene glycol in water and heating the solution to 70 °C. Emulsification was then achieved by gradually adding the aqueous phase to the oil phase with continuous stirring, resulting in the formation of a smooth cream.

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Table* 1. *Concentration of (stearic acid/beeswax) in different batches

Formulation code	Material type	% concentration	Concentration level
1S	Stearic acid	85.25%	High
1B	Bees wax	85.25%	High
2S	Stearic acid	77.7%	Medium
2B	Bees wax	77.7%	Medium
3S	Stearic acid	69.5%	Medium
3B	Bees wax	69.5%	Medium
4S	Stearic acid	52.3%	Low
4B	Bees wax	52.3%	Low

Table* 2 *Batch formulation with stearic acid (s)

Ingredient	% Concentration			
	1S	2S	3S	4S
Lanolin	1%	2 %	3 %	5 %
stearic acid	7%	9 %	11%	20 %
Moringa oil	3%	5 %	7%	9 %
Cetyl alcohol	0.5%	1 %	1.5%	3 %
Water purified	85.25%	77.5 %	69.5%	52.3 %
KOH	0.25%	0.5 %	1%	1.7 %
Propylene glycol	3%	5 %	7%	9 %

Table* 3. *Batch formulation with beeswax (B)

Ingredient	% Concentration			
	1B	2B	3B	4B
Lanolin	1%	2 %	3 %	5 %
Bees wax	7%	9 %	11%	20 %
Moringa oil	3%	5 %	7%	9 %
Cetyl alcohol	0.5%	1 %	1.5%	3 %
Water purified	85.25%	77.5 %	69.5%	52.3 %
KOH	0.25%	0.5 %	1%	1.7 %
Propylene glycol	3%	5 %	7%	9 %

Quality Control Tests

Formulations underwent sensory evaluation, skin sensitivity testing, absorption time tests, washability tests, and pH measurements, Freeze Stability Test, Sunlight Stability Test, Emulsion Type Test [8].

Results

Sensory and Organoleptic Evaluation

The sensory evaluation focused on the physical characteristics of the eight formulations (1S–4S and 1B–4B). (Table 4) shows that all formulations appeared as smooth, homogeneous creams. The color of the stearic acid-based creams was characterized as pearly white, while the beeswax-based creams exhibited a slightly yellowish-white hue due to the natural color of the wax.

Table* 4. *Results of sensory Evaluation

formulation Code	Appearance	Texture	Spread ability	Odor	Skin Feel
1S / 1B	Homogeneous	Smooth	Excellent	Pleasant	Non-greasy
2S / 2B	Homogeneous	Smooth	Good	Pleasant	Slightly Greasy
3S / 3B	Homogeneous	Smooth	Fair	Pleasant	Greasy
4S / 4B	Homogeneous	Semi-solid	Poor	Pleasant	Very Greasy

Skin Sensitivity and Irritation

A critical safety evaluation was performed to ensure the topical compatibility of Moringa oil. As it appears in (Figure 1), all formulated batches were applied to the skin and monitored for 24 hours. No redness, edema, or inflammation was observed across any of the test subjects, indicating that both the Moringa oil and the chosen emulsifiers are safe for topical use. The skin sensitivity test showed that all tested formulations were non-irritant. None of the samples produced any signs of skin irritation during the evaluation period.

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Figure 1. Skin sensitivity test.

Functional Performance (Absorption and Wash ability)

As shown in (Table 5), high water content formulations (1S and 1B) have faster skin absorption than those formulations (4S and 4B) with lower water content.

Table 5. Results of Absorption Time Test

Batch Level	formulation Code	Absorption Time
High Water	1S / 1B	< 1 Minute
Medium Water	2S / 2B	2–3 Minutes
Medium Water	3S / 3B	3–5 Minutes
Low Water	4S / 4B	> 5 Minutes

Result of Wash ability Test

The washability test confirmed the oil-in-water (O/W) nature of the vanishing cream, as demonstrated in (Table 6).

Table 6. Results of Wash ability test

Formulation Code	Ease of Removal	Residue after Washing
1S / 1B	Very Easy	None
2S / 2B	Easy	Minimal
3S / 3B	Moderate	Oily
4S / 4B	Difficult	Greasy

pH and Stability Results

The pH of the formulation is vital for skin homeostasis. Stearic acid formulations (1S–4S) exhibited pH values between 5.5 and 7.5, which is compatible with the skin's natural acid mantle. Beeswax-based formulations tended to be more alkaline, reaching pH levels of 8.0 to 8.8.

Emulsion type results

(Figure 2) shows that samples 4B and 4S, which did not stain, indicating a water-in-oil (W/O) type. However, all other formulations were oil-in-water (O/W) emulsions and showed staining. All formulations passed the initial stability tests, including the freeze-stability and sunlight exposure tests, with no significant phase of separation or changes in odor observed during the short-term study period.

Figure 2. Results of the emulsion Type

Discussion

The Herbal vanishing creams are thought to have fewer side effects than synthetic creams, such as itching and burning sensations. Many studies showed that Moringa extracts are rich in antioxidants and anti-inflammatory flavonoids such as quercetin and rutin [9-11].

Currently, semisolid bases are combined with extracts and isolated phytocompounds from medicinal plants to formulate a topical preparation, such as vanishing creams, that can treat skin problems [12]. The

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performance of the vanishing cream was significantly influenced by water content and the choice of structuring agents. High water content (69–85%) facilitated the O/W emulsion dispersion, leading to better vanishing properties. Stearic acid proved superior to beeswax as it maintained pH stability and produced a less greasy residue. Moringa oil contributed positively to the skin feel and emollient properties without disrupting the formulation's physical stability. The pH value of the skin itself is around 5, so the pH value of the formulation should also be in this range to avoid skin irritation during application. However, previous studies showed that the optimal pH value for penetration of drug containing formulation is higher than 7. A pH range of 5-10 is considered acceptable [13,14]. In this study, although the pH of Beeswax-based formulations reaches pH levels of 8.0 to 8.8, we couldn't detect any skin irritation after application of these formulations on the skin, suggesting that beeswax can be used as an alternative to stearic acid with Moringa oil in the formulation of vanishing cream.

Conclusion

Vanishing creams containing Moringa Oleifera seed oil were successfully formulated and evaluated. The formulations exhibited good stability, acceptable pH, rapid absorption, and no signs of skin irritation. Moringa oil demonstrated promising potential as a natural cosmetic ingredient. Future studies may focus on optimization of the formulation and long-term stability evaluation.

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Conflict of interests

The authors declare no conflicts of interest.

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