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Formulation and Evaluation of Polyherbal Sunscreen Cream

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ABSTRACT: The objective of the present work was to develop sunscreen cream containingaloe vera, coconut oil, vinca, rose water, vitamin E. Ultraviolet radiation has been demonstrated to cause skin disorders, including sunburn and relative symptoms of prolonged exposure. It has been reported that sunscreen have beneficial effect in reducing the incidence of skin disorders (sunburn,skin aging) through their ability to absorb the rays and release from the body in the form of heat. The value of spreadability indicated that the cream was easily spreadable by small amount of shear. Cream formulation shows good extrudability. Among these formulation F1 showed excellent extrudability.

KEYWORDS: Sunburn, herbal sunscreen, SPF, topical cream.

I. INTRODUCTION

Sunscreen is a chemical compound that help protect you from UV rays' sunburn is caused by ultraviolet B radiation but ultraviolet a may be more damaging to the skin. Sunscreen should ideally block both wavebands.

The aim of this study was to develop herbal topical sunscreen formulation based on some fixed oils, in combination with some medical plants. Regular use of sunscreen reduces the development of actinic keratosis, squamous cell carcinoma and melanoma. Sunscreen may be organic or inorganic chemicals. Sunscreen is also known as sunblock lotion. The product that absorbs or reflect the sun's ultraviolet radiation and protect the skin. The increasing incidence of skin cancers and photo damaging effects caused by ultraviolet radiation has increased the use of sun screening agents, which have shown beneficial effects in reducing the symptoms. Sun screening agents should be safe chemically inert, non-irritating nontoxic, photo stable an able to provide complete protection to the skin against damage from solar radiation.

Sunscreen agents are for external use only .The use of sunscreen as photo protecting agents for Uv protection. The sunscreen formulation is which when applied topically protect the treated area from sunburn sunscreen depends on ability to protect against Uv induced sunburn and their chemo preventive activity excessive solar ultraviolet radiation are responsible for various skin damages such as sunburn ,skin pigmentation premature aging and photo carcinogenesis .The main mechanism of skin damage by uv radiations is formation of Reactive Oxygen Species(ROS) that interact with proteins lipids and subsequently alter them. UVB and to a lesser extent UVA are responsible for inducing skin damages

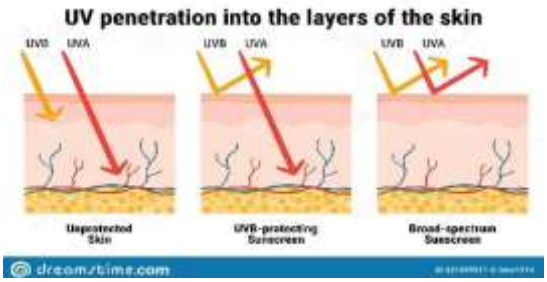
1.2 Types of mechanism:

Herbal sunscreen also known herbal sunblock. Herbal suntan lotion is a lotion, spray or other topical product that helps protect the skin from the suns UV radiation and which reduce sunburn and other skin damage Sunscreen can be classified into two types sunscreen.

1) Physical sunscreen
Those that reflect the sunlight.

2) Chemical sunscreen
Those that absorb the UV light and release in the form of heat.

1.3 Penetration of UV rays on skin



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1.4 Benefits of sunscreen

• Protect against sunburn
• Avoid inflammation and redness
• Avoid blotchy skin and hyperpigmentation
• Stop DNA damage
• Prevent the early onset of wrinkles and fine lines
• Lower skin cancer risk
• Shields from harmful UV rays
• Maintain the brightness of your natural complexion
• Maintain the look and texture of your skin
• Delays premature signs of aging
• Reflects UVA and UVB rays
• Works immediately when applied on the skin

II. ROLE OF ACTIVE INGREDENTS

- **Aloe vera**

i. It prevent against sunburn.
ii. It moisturizes skin.
iii. Reduces inflammation
iv. Helps in healing process

- **Rose water3. Role of excipients**

Sr No:-	Ingredients	Uses
1	Cetostearyl alcohol	Emulsifier
2	Stearic acid	EmollientCo-emulsifier
3	Cetomacrogol- 100	Emulsifier
4	Lanolin	Emollient
5	Glycerin	Humectant
6	Methylparaben	Preservative
7	Propylparaben	Preservative
8	Plant extract	Active ingredient
9	Distilled water	Vehicle

i. It lighten skin pigmentation.
ii. It removes oil and dirt from skin.
iii. Maintain PH level of skin.
iv. It hydrate and nourishes the skin and provide glow to the skin.

- **Vitamin E**

i. It removes impurities from the skin.
ii. It has antioxidants and anti inflammatory properties.

- **Vinca**

i. Antioxidant activity.
ii. Antimicrobial activity.
iii. Wound healing activity.

- **Coconut oil**

i. Keep the skin soft and smooth.
ii. Prevent against premature aging.
iii. Use as moisturiser and remove dead skin cells.
iv. Anti inflammatory properties and prevent redness on skin.
v. It has antiviral,antifungal,antibacterial properties.

- **Rose oil**

i. It refine your skin texture
ii. It prevent drying of skin.
iii. It is useful in condition like psoriasis and dermatitis.

- **Olive oil**

i. It contain vitamins, antoxidants, fats that Keep the skin healthier.
ii. It has anti inflammatory and antimicrobial Properties.

III. EXPERIMENTAL WORK

1. Flake/powder ingredients, such as Cetostearyl alcohol and stearic acid Lanolin, Glycerin, Vitamin-e Capsule , sometimes dry blended in advance, are dispersed into the oil phase.
2. The water phase is prepared separately, containing emulsifiers and stabilizers such as Cetomacrogol 1000 , Aloe vera, Vinca extract, Rose water, Methyl paraben and Propyl paraben, Distilled water.
3. The two phases are then mixed to form an emulsion. This is aided by heating to between 110 and 185°F (45 - 80°C) depending on ingredients.
4. Then Cool the emulsion in ice water bath and continuously stirred.
5. Mixing is continued until the end product is homogeneous.

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6. Transfer it into the container and cover it with foil.

Quantity of Ingridients

Sr. No	Ingredients	F1 Coconut oil	F2 Rose oil	F3 Olive oil
1.	Aloe vera	25%	25%	25%
2.	Rose water	10%	10%	10%
3.	Vinca-flower extract	20%	20%	20%
4.	Vitamin E	10%	10%	10%
5.	Oil	10%	10%	10%
6.	Cetosteryl alcohol	0.07%	0.07%	0.07%
7.	Steric acid	2%	2%	2%
8.	Cetomacrogol 1000	4.5%	4.5%	4.5%
9.	Lanolin	2.5%	2.5%	2.5%
10.	Glycerin	7.8%	7.8%	7.8%
11.	Methyl paraben	0.2%	0.2%	0.2%
12.	Propyl paraben	0.02%	0.02%	0.02%
13.	Distilled water	q.s	q.s	q.s

IV. RESULT AND DISCUSSION

Sr. No.	Test	F1 Coconut oil	F2 Rose oil	F3 Olive oil
1	Colour	White	Creamy White	Creamy White
2	Odour	Pleasant	Pleasant	Pleasant
3	Appearance	Smooth	Smooth	Smooth
4	PH Test	7.04	7.66	8.03
5	Consistency	Good	Good	Good
6	Grittiness	No	No	No
6	Spredability	7 Sec	9 Sec	12Sec
7	Washability	Easily Washable	Washable	Washable
9	Refractive Index	1.448	1.444	1.467
10	SPF Value	12.13	4.12	11.65

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Calculation :

Absorbance of sunscreenformulations

Wavelength (nm)	Employed EE (λ)	F1	F2	F3
290	0.015	1.583	0.470	1.450
295	0.0817	1.308	0.451	1.320
300	0.2874	1.290	0.434	1.218
305	0.3278	1.190	0.420	1.210
310	0.1864	1.140	0.414	1.035
315	0.0837	1.085	0.403	0.960
320	0.0180	1.052	0.418	0.850

Calculation of SPF by using formula

spectrophotometric=CF×€EE(wavelength)×I(wavelength)×Abs(wavelength)

Where,CF=correction factor (10),EE= erythrogenic effect of radiation with wavelength, Abs=spectrophotometric absorbance values at wavelength.

Sun protection factor value of different formulation

Name of formulation	SPF value
F1	12.13
F2	4.12
F3	11.65

Discussion

- In the present research work comparison of 3 sunscreen cream containing different oil were done. In which formulation 1 shows good SPF 12, Refractive Index 1.448 , Spreadibility 7 sec and easily washable as compare to other 2 formulation.
- Current research work is to develop sunscreen cream containing herbal active pharmaceutical ingredient. Because herbs used in cosmetic products are safe and effective to use, suitable for all skin type, animal testing not required, shows no side effect and most important it is inexpensive. As we know synthetic sunscreen products shows harmful effects such as skin photosensitivity, irritancy, and it may penetrate the stratum corneum and reaches blood vessels and produces skin tumor / cancer and produces white patches which are difficult to wash.
- So by developing the herbal sunscreen cream we can avoid such side effect. Therefore we develop 3 formulations containing different oils like coconut, rose ,olive oil but it was found that formulation containing coconut oil is more stable it has good SPF, Refractive Index, Spreadability, Consistancy and easily washable.

V. CONCLUSION:

The current study aimed to create a stable polyherbal sunscreen with a suitable SPF. Coconut oil-based sunscreens (F1) were found to be stable than F 2 Olive oil and F3 Rose oil sunscreens cream , have good antioxidant activity, and have SPF values 12 ,11 and 4 respectively. It can be stated that the current study will hopefully lead to improvements in the treatment of sunburns produced by UV radiation exposure. The study also demonstrates that UV Spectroscopy is the most efficient, acceptable, and repeatable approach for

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determining the performance of herbal sunscreens. As a result, the findings of this study can help regulatory agencies, scientific organizations, and manufacturers set standardized standards for polyherbal sunscreens.

Few chemical sun screening agents such as avobenzone, octocrylene, oxybenzone enter the bloodstream within an hour after application on skin. These chemicals may cause various harmful effects in human. Thus it was concluded that herbal sun screening agent is more advantageous than chemicals because ofits minor side effects.

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