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REVIEW ON PREPARATION AND EVALUATION OF SUNSCREEN CREAM

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ABSTRACT

Presently herbal sunscreens are widely used by almost everyone on this planet to prevent from harmful effects of UV radiation from sunlight, Due to the hasty-paced life of today, our life is affected by pollution and harsh synthetic chemicals, hence, nature has rendered us with its everlasting notable ingredients of herbal. The major cause of sunburn is UV rays which leads to precarious skin cancer. Sunscreen is a topical product that absorbs or reflects some of the sun's UV radiation on the skin from excessive exposure to UV radiation. It has the potential to prevent Sunburn and reduce the harmful effects of the sun such as premature aging and skin cancer.

The present research work portrays the formulations and evaluation of tapical photoprotector, containing antioxidant, anti-malignant, wound healing. moisturizer, & other photo-protective.

KEYWORD'S: *Sun protection factor, UV protection, Broad spectrum protection*

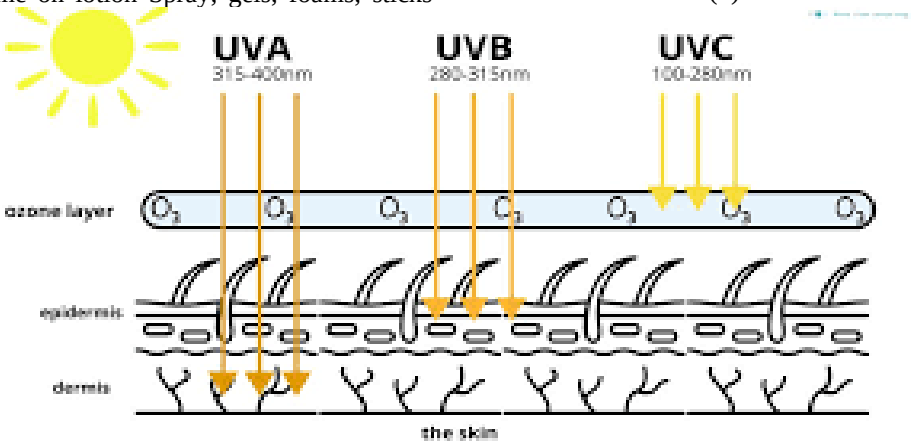
INTRODUCTION

Cosmetics are defined as "The items with mild action on human body for the purpose of cleaning, beautifying adding to the attractiveness, altering the appearance, or keeping or promoting the skin or hair in good condition" while functional cosmetics even after falling the cosmetics are designated as “Items fulfilling specific conditions like skin whitening, minimizing the appearance of items in the face and body, protecting from the sun and sun tanning. (1)

Sunscreen also known as sunblock or Suntan lotion, is a photoprotective topical product for the skin that absorbs or reflects some of the sun's ultraviolet (UV) radiation and thus helps protect against sunburn and most importantly prevent skin cancer. Sunscreen come on lotion Spray, gels, foams, sticks powders and other topical products. Sunscreen are common supplements to clothing particularly sun sunglasses, protective sunhats and special sun protective clothing and other form of protection (e.g- Umbrellas). (2)

The light emitted by consists of Frequency bonds of infrared, visible and ultraviolet radiation of these UV rays are harmful to most humans (UV spectrum 100-400 nm).

UVA (315-400nm) radiation penetrates the skin and cause damage to cell membrane, cause ageing of skin.
UVB (280-315 nm) rays cause skin cancer cause damage to cornea and lens of eye.
UVC (100-200 nm) generally absorbed by earth's atmosphere and are not harmful. (3)



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Ideal properties of sunscreen-

1) Must absorb a broad range of UV rays causing sunburn.
2) Must be stable in the presence of sunlight.
3) Should be able to provide complete protection for skin.
4) Should be safe effective, chemically inert, at low temperature.
5) Should not cause irritation, sensitization and toxicity.
6) Activity against UVA and UVB radiation.
7) Anti-oxidant property.
8) Anti-cancer property.
9) Anti-mutagenic property. (4)

Advantages of Herbal Sunscreen Cream

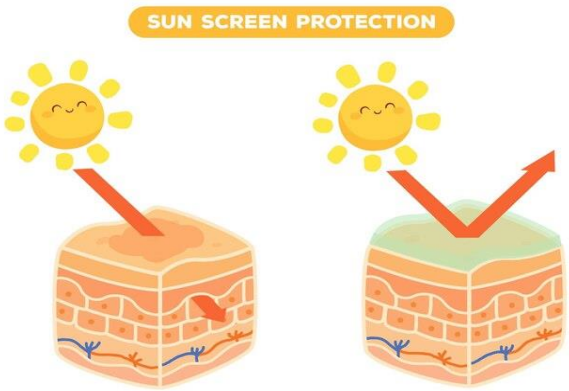
1) Easily available
2) Do not show allergy
3) Easy to manufacture
4) Cheap in cost
5) No side effect
6) Effective with small quantity
7) No special equipments needed for preparation
8) Renewable resources.(5)

Disadvantages of Herbal Sunscreen Cream

1) They are difficult to hide taste and odour.
2) Manufacturing process are time consuming & complicated.
3) Herbal drug have slow effects as compare to allopathic dosage form it also requires long term therapy. (6)

Importance of Sunscreen Cream

UV radiation is crucial for human healing through aiding mineral absorption and vitamin D3 production. However, direct interaction with DNA, RNA, proteins, and lipids poses health risks like potential carcinogenesis. To shield the skin effectively, topical application of active molecules with UV-absorbing or reflecting properties is optimal. Sunscreen has gained importance in the current scenario due to its ability to protect skin from damage and health risks like skin cancer and premature aging. Making sunscreen a part of your daily routine can help maintain your skin's health and appearance regardless of age. (7)



Why we use sunscreen?

- To much-unprotected sun exposure leads to
- Premature skin ageing
- Sun burn
- Skin cancer (8)



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Mechanism of Photoprotection

UV rays mediated photo oxidative damage reaches the dermal capillary via epidermis and dermis and cause depletion of enzymatic and non-enzymatic anti-oxidants in stratum corneum, epidermis and dermis. Photo oxidation of pre-existing melanin and its precursors will occur which result in immediate and persistent pigment darkening.

Sunscreen act by preventing and minimizing the damaging effects of the ultraviolet sunrays following exposure to the sunscreen have been demonstrated to increase the tolerance of the skin to UV exposure. The work on two mechanisms:

Scattering and reflection of UV energy from the skin surface mineral based on inorganic sunscreen works on this mechanism they provide a coating that blocks sun rays from penetrating through the skin. (9)

Aim and Objectives:

Aim: To study the formulation and evaluation of herbal sunscreen cream

Objectives:

1) Sunscreen inhibit the transmission of UV (ultra- violet) radiation into the skin by reflecting, absorbing or scattering such radiation.
2) Sunscreen have been recommended as a form of protection against sunlight, with protection increasing with higher sun protection factor
3) To develop sunscreen formulation using herbal ingredients.
4) To develop various formulation.
5) To perform physiochemical characterization.
6) To achieve maximum stability of formulation, and UV protection effects.(10)

Materials And Methods

Aloe vera

Aloe-vera gel is used in cosmetic lotion for it's moisturizing and revitalization. It blocks UVA and UVB rays and maintain skin natural moisture balance. It stop the sunburn and stimulate immune system intervention.(11))



Coconut oil

coconut oil keeps the skin soft and smooth while preventing premature ageing of the skin, coconut oil for skin use as a moisturizer, remove dead skin cells. Coconut oil has anti-inflammatory properties which reduce redneeson skin this can be helpful for both dry and oily skin conditions by reducing inflammation of the skin.(12)



Rose Water

Rose water contain vitamin B. which often used in sunscreen and sun product. It helps to bolster the effectiveness of SPF. Rose water can be used to lighten the skin pigmentation. Rose water con remove oils and dirt from your skin by unclogging yours pores. (13)

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Vitamin E Capsule

Vitamin E it provides extra protection against acute UVB damage and protect against cell mutation caused by sun and pollution exposure. Vitamin E it help cleanse your skin and removing the impurities.



Preparation of Sunscreen lotions

Ingredients	Quality
Rosemary extract	1gm
Turmeric extract	0.5gm
Alovera gel	5gm
Coconut oil	2ml
Rose water	1ml
Cetyl alcohol	2gm
Stearic acid	4gm
Glycerine	2ml
HPMC	3gm
Propyl paraben	19gm
Carbopol	2gm
Vitamin E	1ml
Triethanolamine	1g

Preparation Method

1) Prepare alovera gel and add little amount of carbapol in it and heat it to form a gel.
2) weight an accurate quantity of cetyl alcohol, stearic acid, glycerine, HPMC, propyl paraben, mix it well and melt it. (15)
3)In a beaker add 1g of triethanolamine and accurate quantity of water, heat it upto. 80-85 degree Celsius.
4)Transfer alovera extract in mortar and pestle. (16)
5) Add rosemary extract, turmeric extract, tomato extract, and triturate all the chemicals with continuous mixing.
6)Transfer it in a suitable container and label it properly. (17)

Evaluation of sunscreen

1) Physical parameters -

Colour - The colour of formulation was checked manually and observed.
Odour - The smell of formulation was checked by applying preparation on hand & feel the fragrance.
Appearance - visually checked the appearance of the formulation (18)

2) Determination of PH-

The PH of sunscreens was determined using digital pH meter. pH was measured after 1g of the formulation was dissolved in

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100ml of newly prepared distilled water for 2 hrs. The purpose of this study was to guarantee that the pH of the produced herbal sunscreens in similar to the pH of the skin after 24 hours of use. The result were triple-checked, and S.D. was recorded. (18)

3) Determination of Viscosity-

The brookfield viscometer was used to test viscosity, with the proper number of spindles Selected. A 50ml beaker was used to hold 50g of preparation until the spindle groove was dipped and the rpm was set. Sunscreen viscosity was measured at 5, 10, 20, 50 & 100 xpm. The viscosity was computed using the factor obtained from the reading (19)

4) Spreadability-

About 0.5 gm of cream was placed in a circle. Of 1cm diameter on a 20x20 cm glass plate over which the second glass plate was placed. A weight of 500gm was allowed to rest on the upper glass plate for 5 min & then on increase in the diameter of the cream due to spreading was noted.

5) Irritancy test-

Mark on area (one. sq. cm) on the left hand dorsal surface. The lotion was applied to the specified area and time was noted. Irritancy erythema, edema was checked if any for regular interval up to 24 hrs & reported.

6) Stability testing-

Stability testing of prepared formulation was conducted at room temp studied for 7 days And then the formulation was studied at 45 ± 1°C for 20 days. The formulation was kept both at room and elevated temp. And observed on 0th, 5th, 10th, 15th, 20th days for all the evaluation parameters. (20)

7**) Determination of SPF-**

A UV visible spectrophotomete was used to examine the in-vitro efficacy of herbal sunscreens. A 0.10%. solution (w/v) of herbal sunscreen. lotions in ethanol was made by dissolving 0.050g of herbal sunscreen lotions in 50.0ml of ethanol Between 290 and 320 mm, aliquots of each herbal sunscreen were scammed at 5nm intervals.(21)

Future Prospects of sunscreen-

The future of sunscreen cream looks promising with a number of trends and innovation on the horizon, including.

1. Brood-spectrum sunscreens -

Brands may promote the use of broad-spectrum Sunscreens to protect against visible light. infrared (IR), as well as UVA & UVB rays.

2. Lighter formulations -

Suncare products may become lighter and less sticky or greasy, them thanks to new ingredients and particle shapes.

3. Natural ingredients-

Natural plant extracts and botanicals may become more popular in sunscreens, due to their many benefits.

4. Novel technologies-

New technologies and approaches are being explored to address problems with existing Sunscreens

5. Protection from environmental aggressors-

Sunscreens may be able to protect against pollution, blue light, UV rays. and IR in addition to UV rays.

6. Higher SPF-

Sunscreens may combine UV filters with botanicals, vitamins, DNA repair enzymes and film forming polymers to achieve a higher SPF.

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