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FORMULATION AND EVALUATION OF HERBAL SUNSCREEN CREAM FROM ETHANOLIC EXTRACT OF ANNONA SQUAMOSA LEAVES

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Abstract: Sunscreen is a chemical compound that makes a difference to ensure UV beams. In spite of the fact that bright B light causes sunburn, bright A may be more destructive to the skin. The event of actinic keratosis, squamous cell carcinoma, and melanoma is diminished by schedule sunscreen utilize. Chemicals in sunscreen can be either natural or inorganic. Sunscreen utilize has expanded as a result of the rising frequency of skin cancer and the photo-damaging impacts of UV light. The plant's antioxidant, anti-inflammatory, clean, and antibacterial qualities, among others, are utilized to secure skin from different pathogens. Sunscreens ought to be totally able to secure the skin from sun harm and ought to be chemically inactive, non-irritating, +9on-toxic, photostable, and secure. The sun's UVA and UVB radiation cause skin cells to get harmed as a result of the skin creating receptive oxygen species.

To viably avoid photo maturing and skin cancer, sunscreen ought to moreover contain antioxidant specialists.An home grown sunscreen cream is made utilizing plant extricates, such as Annona squamosa L. Vit E and the polyphenolic drug. can be utilized as an viable photoprotector (sunscreen) against the unfavorable impacts of UVA radiation. The show investigate work assesses photo absorptive properties and screening of sunscreen movement of distinctive extricates of takes off of Annona squamosa L. in the bright locale (200-400nm) and its comparison with a well-established standard sunscreen medicate, P-aminobenzoic corrosive (PABA). This plant contains phenols and flavonoids that have set up it hasfabulous antioxidant activity.

Index Terms - herbal Sunscreen, SPF(sun protection factor),skin burn.

I. INTRODUCTION

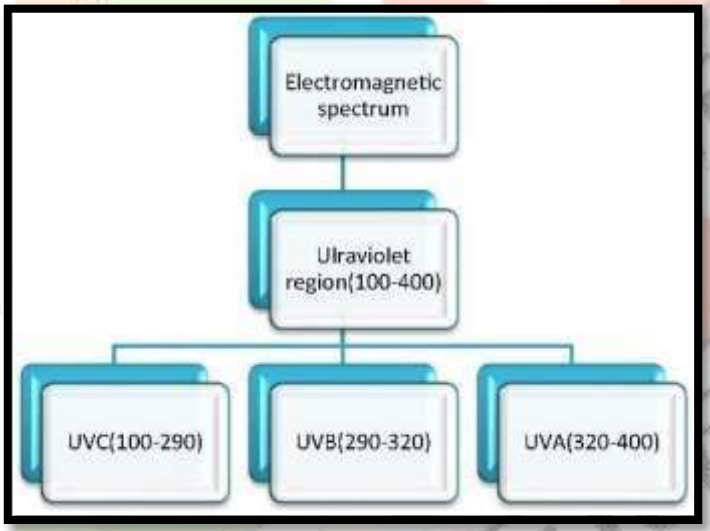
Sunscreen is too referred to as sunblock cream; which is connected to the skin to shield it from the sun's damaging beams and dodge sunburn. Sunscreen is a chemical substance that makes a difference and shields you from UV radiation, which is what causes

sunburn. Based on a combination of therapeutic plants and a few settled oils, sunscreen is defined. Sunscreen can be an organic or inorganic shower gel or other topically connected arrangements that diminish sunburn and other skin harm while protecting the skin from the sun's UV beams. The sun's UVA and UVB radiation cause skin cells to get damaged as a result of the skin creating responsive oxygen species.

There are two categories of sunscreen;

Physical sunscreen – Those that reflect the sunlight. Chemical sunscreen – Those that assimilate the UV light.

Only outside utilization is allowed for sunscreen operators. The application of sunscreen gives UV assurance. The sunscreen formulation's capacity to avoid UV-induced sunburn and its chemo-preventive action determine how well it will shield the treated locale from sunburn when connected topically. The era of Reactive Oxygen Species (ROS), which are associated with proteins and lipids and in this way alter them, is the essential component of skin harm by UV radiations. The sun's bright beams UVB and UVA, to a lesser degree, cause skin harm. [1] Sunscreen ought to contain antioxidants specialists in expansion to sunblock agents to be effective in the assurance of photo maturing and skin cancer.



II. Classification of Sunscreen –

Broadly, sunscreens are classified as either topical or systemic based on the course of organization. Topical sunscreens are partitioned into two classes; Natural and inorganic substances based on their instrument of security. Inorganic sunscreens are someof the time alluded to as sunblocks ss 2022.

1. Organic sunscreens
These are for the most part fragrant compounds connected with a carbonyl bunch. They are broadly classified into three categories based on the run of assurance; UVB (290–320 nm) and UVA (320–400 nm) and broad-spectrum sunscreens that cover the whole range (290–400 nm). Cases of natural sun-screens covering UVB

incorporate (PABA) and its subsidiary padimate O. salicylates counting Octisalate and Homosalate, cinnamates counting Octinoxate and cinoxate, octocrylene, benzylidene, and dibenzoyl menthanes. UVA channels incorporate benzophenones; oxybenzone and sulisobenzone, avobenzone and meradimate, Methylanthranilanate, and ecamsule. Broad-spectrum natural channels that cover both UVA and UVB incorporate besoctrizole, and silatriazole among others.

2. Inorganic sunscreens
They are particles that diffuse and reflect UV beams to the environment. They act as a physical boundary to indent bright and UV light. The most commonly utilized particulate sunscreens are titanium dioxide and zinc oxide. They are considered wide range as they cover the whole bright range. The inorganic sunscreens are too alluded to as sunblocks, a term coined from their instrument ofphotoprotection

3. Systemic sunscreens
These are sunscreens that are ingested into the body and gather in the skin managing security from the UV beams. Common cases beneath this category have appeared. The utilization of systemic sunscreens for everyday schedules is negligible, as such the center of this article is on topical sunscreens as these prevail in the market.

III. Mechanism of photoprotection

Sunscreen acts by averting the skin from UV presentation. They work on two characteristic components:
UV radiation from the skin's surface is scattered and reflected by mineral-based, inorganic sunscreen work on this componentprevents sunbeams from the skin's surface.
Organic sunscreen works on this component by retaining UV energy and changing it into warm energy in this way reducing itsruinous impacts and the profundity to which can enter the skin.

IV. Main role of ingredients used in the formulation

Annona Squamosa leaves –
Annona squamosa, moreover known as sugar-apple or custard apple, is a tropical natural product tree that has a place in the Annonaceae family. It is characterized by its special natural product with a sweet and velvety mash. The takes off of Annona squamosa are oval or circular, gleaming green, and have a somewhat wavy or scalloped edge. These takes are organized on the other hand on the branches of the tree

Kingdom	Plantae
Subkingdom	Tracheobionta
Superdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Magnoliidae
Order	Magnoliales
Family	*Annonaceae*
Genus	*Annona*

Species	*Annona squamosa*
Pharmacological properties	Antibacterial, insecticidal, antidiabetic, antitumor, anticancer Antiviral, antifeedant

Fig.1:Annona Squamosa leaves

V. Formulation

this was defined as Oil in water (O/W) emulsion-based cream (semisolid detailing). The emulsifier (steric corrosive) and other oil- soluble constituents (Cetyl liquor, Almond oil) were mixed in the oil stage (Portion A) and warmed to 75ºc. The additive and other water-soluble constituents (Methyl paraben, Propyl paraben, Triethanolamine, Propylene glycol, extricate) were mixed in the watery stage (Portion B) and to 75ºc. After warming, the watery stage was gradually included in the oil stage with ceaseless blending until a smooth cream was shaped. Vitamin A was blended well—the sunscreen composition is given in the taking after the table(1)

Sr. no.	**Ingredients**	**Formula % W/W**	**Role**
1	Stearic acid	8.5	Free fatty acid
2	Cetyl alcohol	3.5	Emulsifier
3	Starch	1.5	Thickening agent
4	SLS	1	Surfactant
5	Almond oil	15	Improve sun protection
6	Rose oil	qs	Flavoring agent
7	Glycerol	3	Natural moisturizer
8	Extract	3.5	Aq. Phase
9	Vitamin E	2 capsules	Moisturizer
10	Triethanolamine	qs	Surface active agent
11	Water	qs	

VI. Evaluation Test

1. Physical Parameter -

Sr. no.	Parameters	Observation
1	Appearance	Cream
2	Color	Greenish
3	Texture	Smooth
4	Consistency	Good
5	Test of irritancy	No irritation reaction

2. PH Determination –

The pH level of sunscreen is an important factor to consider as it can affect its stability and compatibility with the skin. Sunscreens typically have a pH level ranging from 4 to 8. It is essential for sunscreen to have a pH level that is close to the skin's natural pH level, which is around 4.7 to 5.75, to ensure it is gentle and non-irritating. The specific pH level of asunscreen product can vary depending on its formulation and ingredients.

Take 1 gm of prepared cream dissolve it in the 10ml distilled water, and measure its PH with a digital PH meter.

Fig. 2: Digital PH meter

3. Homogeneity:
The definitions were tried for homogeneity by visual appearance and by touch.

4. Spreadability:
The spreadability of homegrown sunscreens decided their helpful proficiency. The fitting sum of homegrown sunscreen was connected between two slides, and beneath indicated stack bearings, and the two sides took the time in seconds to slide off. Spreadability was characterized as the sum of time it took to isolate two slides in less time. The equation for calculating it is:

Formula:

$$\textbf{Spreadability (S)} = M \times L/T$$

Where,
S= Spreadability,
L= Length of a glass slide,T=Time,
M = Weight tied to the upper slide.

Fig 3: Spreadability test

5. Irritancy test:
The cream was connected to the skin surface and time was famous. Irritancy, erythema, and edema were checked if anyfor standard interims up to 24 hrs. and detailed.
6. Thermal soundness:
The cream is put away at different temperature ranges i.e.;25 c, 30 c, 37 c, and 40 c. It was watched for physicochemicalproperties. It ought to not be an oil stage partition in cream. They are thermally stable.

VII. Sun Protective factor

Method: The 1gm of cream was weighed and exchanged to a 100 ml volumetric carafe, and at that point weakened with ethanol and water (40:60). after the weakening, ultrasonication was performed for 5 minutes, and the filtrate was collected, to begin with, 10 ml of the filtrate was catapulted. A volumetric jar of 50 ml was filled with 5.0 ml of an aliquot, which was at that point weakened to volume utilizing ethanol and water (40:60). After that, 5.0 ml of the aliquot was exchanged to a 25 ml volumetric carafe and the volume was wrapped up with a 40:60 proportion of ethanol and water. Each delivered aliquot's absorbance values were measured from 290 nm to 320 nm at 5 nm interims utilizing a clear arrangement of refined water.

VIII. Observation –

Sr. no	Parameters	Observation
1	Colour	Greenish
2	Odor	Characteristics
3	Spreadability	Good and uniform
4	PH	6.7
5	Test for irritancy	NO irritation reaction

Fig.4: Preparation of herbal sunscreen

IX. Benefits of Herbal sunscreen-

- Decrease the chance of skin cancer
- Secure against sunburn
- Dodge irritation and redness
- Dodge messy skin and hyperpigmentation
- Halt DNA harm
- Avoid the early onset of wrinkles and fine lines
- Lower skin cancer hazard
- Shields from destructive UV rays
- Keep up the brightness of your characteristic complexion
- Keep up the see and surface of your skin
- Delays untimely signs of maturing
- Reflects UVA and UVB beams
- Works promptly when connected to the skin.

X. Advantages of Herbal Sunscreen-

- Effortlessly available
- No side effects
- No uncommon hardware is required for the preparation
- They are inexpensive
- Fixings are effectively available
- Renewable resources
- Be non-poisonous and non-irritant
- Be impartial
- Be steady to heat
- Simple to manufacture

X. Disadvantages

- They are troublesome to stow away taste and odor
- Fabricating handles is time-consuming and complicated
- Home-grown sedate has moderate impacts as compared to allopathic dose shape it moreover requires long-termtreatment

XI. RESULTS AND DISCUSSION

Herbal sunscreens are sunscreen products that contain natural ingredients such as **Annona Squamosa leaves extracts, almond oil, Vitamin E**, etc. to provide sun protection. These ingredients are often believed to have antioxidant and anti- inflammatory properties that can help protect the skin from sun damage. Herbal sunscreens are typically considered to be gentler on the skin compared to chemical sunscreens, making them a popular choice for individuals with sensitive skin or those looking for more natural skincare options. However, it is important to note that the effectiveness of herbal sunscreens may vary, and it is essential to choose a product with adequate sun protection and broad-spectrum coverage.

XII. Conclusion –

The use of herbal sunscreens can be a beneficial option for individuals looking for natural skin care products with potential antioxidant and anti-inflammatory properties. Herbal sunscreens are often gentler on the skin and may be suitable for those with sensitive skin. However, it is important to note that the effectiveness of herbal sunscreens in providing adequate sun protection may vary, and it is crucial to choose a product with a high SPF and broad-spectrum coverage to ensure protection against both UVA and UVB rays. Additionally, reapplication of herbal sunscreen, as directed, is essential to maintain its effectiveness throughout sun exposure.

XIII. ACKNOWLEDGMENT

Thepreferred spelling of the word “acknowledgment” in Americaiswithoutan“e” after the “g”.Avoid the stilted expression, “Oneofus(R.B.G.)thanks..” Instead ,try“R.B.G.thanks”.Put applicable sponsor acknowledgments here ;DONOT place the monthe first page of your paper or a safe note.

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