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Formulation & Evaluation of Herbal Sunscreen

Jaybhaye Suvarna Badrinath Prof. V. R. Muley, Dr. S. B. Deshmukh
Kishori College of Pharmacy, Beed

Abstract: *Sunscreen is a chemical substance that aids in uv radiation protection. While sunburn is caused by Ultraviolet b light, ultraviolet a light may be more damaging to skin. Regular usage of sunscreen reduces The risk of melanoma, squamous cell carcinoma, and actinic keratosis. Sunscreen ingredients may be Classified as either organic or inorganic. The growing prevalence of skin cancer and the photodamaging Effects of uv radiation have led to a rise in the usage of sunscreen. [1] the plant's antibacterial, Antiseptic, anti-inflammatory, and antioxidant properties are among those that shield skin from Different infections. Sunscreens should be chemically inert, non-irritating, non-toxic, photo stable, and Safe in order to fully shield the skin from sun damage. [2]*

Because the skin produces reactive oxygen species, the uva and uvb rays of the sun destroy skin cells. Sunscreen should have antioxidants as well in order to successfully prevent skin cancer and photoaging. [1] plant extracts, including triticum aestivum l. (wheat grass), vitamin e, and the polyphenolic Medication, are used to make a herbal sunscreen lotion. [2, 3]..

Keywords: sun protection, triticum aestivum, spf, herbal sunscreen, skin burn

I. INTRODUCTION

Uv protection is befitting very popular because of sunscreen's properties as a photo-protecting agent [4]. Sunscreen Preparation is applied topically, and its purpose is to heal, prevent or resist skin from painful or harmful effects of Sunburn, suntan, sun cancer, and premature skin aging and to escalate the level of sun protection factor (spf) [4,5,6].

Sunscreens are a natural defence mechanism to defend against precarious uv radiation from the skin, which is the outer Covering layer of the body. Its ability to absorb, reflect or scatter some of the sun's uv radiation on the skin from Extravagant exposure to ultraviolet radiation [4]. Skin melanoma, sunburn, photo aging, skin pigmentation, and various Painful or precarious effects are caused by uva and uvb rays [6,7].

Anti-oxidant, wound healing, antifungal, premature Aging, moisturizer, anti- inflammatory, and ant proliferative activities are shown due to the key components of uv Protection like flavonoids, phenolic compounds or herbal oils and also their uv rays absorption capacity in uv-a region[8]

There are ample sunscreen formulations available in the market, which are used to protect skin from sunburn and skin cancer and during the market survey, it is found that there are some adverse effects like cell mutation, dna damage, hormone alteration, and eczema (allergic reaction) by the synthetic sunscreen agents. Various formulations have multifunctional sun protection activity and it is based on their efficacy of uv rays absorption apart but most of the formulations are of high cost and merged synthetic molecules have toxicity and are even carcinogenic [9].

It is extremely difficult to create sunscreen solutions that are effective, adhere to current regulatory standards, are marketable, and satisfy consumer demands. The four Fundamental criteria of effectiveness, safety, registration, and patent freedom serve As checkboxes to verify that a sunscreen product has a chance of being successful following development [10] .

Sun-block formulae must be created for repair, Reduction of sunburn, sun tanning, skin melanoma, and early fine lines and wrinkles, as well as increasing the degree of sun protection factor (SPF) [11].

Sunscreens Are frequently applied to the skin to protect it from the sun's harmful rays and to Reduce the risk of skin disorders caused by the sun's rays. Broad- spectrum sunscreens are now being researched to reduce the long-term effects of high UV radiation[12] . Polyphenols and phenolic compounds, particularly natural oil, are essential Ingredients for UV protection because of their high UV- A absorption [13] .

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UV rays are absorbed by certain bio-active substances In the environment, which protects the skin from their harmful effects. Because Of their safety, absence of unpleasant responses, lack of dangerous chemical Components, and environmental integrity, biologically active compounds have become more popular in cosmetics formulations in recent years[14] . Because synthetic Photo- protective chemicals are more likely to be dangerous and carcinogenic, Phytoconstituents are gaining favor as major cosmetics ingredients due to their Natural anti-cancerous, anti-mutagenic, and non-toxic properties. Genuine herbal Elements in sun-screen are the least irritating to the skin, especially for sensitive Skin [15], include natural components, can regenerate tOohe skin, and give enough protection against pollution and climate changes in the atmosphere. The most often used Herbs in natural sunscreen include aloe Vera, vitamin E, turmeric, and cucumber [16,17]

Aloe vera is a well-known and ancient Liliaceae medicinal plant. This plant is a shrubby or arborescent perennial xerophytic succulent with a pea-green color. Aloe-vera leaf extracts include a lot of polyphenol components and chemicals in them. Aloe vera's 75 potentially active elements include vitamin supplements, minerals, carbohydrates, enzymes, lignin, saponins,

salicylic acids, and amino acids [35-36]. It has successfully treated sunburns, including both first and second-degree burns [37]. Aloe vera gel has been found to protect human skin from all harmful effects of rays. Due to its anti-inflammatory, antibacterial, and wound-healing characteristics, aloe vera has long been used to treat digestive issues as well as skin injuries (burns, wounds, insect bites, and eczemas). The goal of research on this medicinal plant has been to confirm its historical

applications, understand its mode of action, and pinpoint the chemicals that are responsible for these effects. The active ingredients that have received the greatest research are acemannan, aloe-emodin, aloin, aloesin, and emodin [38,39]. Aloe

vera contains both antimicrobial and antibacterial properties. It decreases the creation and secretion of immunosuppressive

cytokines such as interleukin-10, which are secreted by epidermis keratinocytes, and prevents a protracted type of hypersensitivity when exposed to UV radiation (IL-10) [40].

Turmeric is produced by Curcuma Longa, a Zingiberaceae rhizomatous perennial herbaceous plant. Essential oil, tannin, and curcumin are all present in this plant. The extract of curcuma longa has anti- flatulent, anti-inflammatory, anti-fungal, antiparasitic, anti-inflammatory, and anti-cancer properties. Additionally, Curcuma longa has the advantage of inhibiting apoptosis, according to a 2009 survey conducted at the University of Texas [41]. Curcumin has antioxidant and antiinflammatory properties. Curcumin contains over a hundred different constituents, all of which have been identified. Turmeric is primarily made up of essential oil called turmerone, as well as curcuminoids, which are coloring compounds. Curcuminoids

are antioxidants found in the environment, including curcumin de- methoxycurcumin, di-hydrocurcumin, and 5'-methoxycurcumin [42,43].

Vitamin E is a fat-soluble antioxidant with photoprotective capabilities that is vital for human health. Vitamin E from food

(RRR—tocopherol) is different from vitamin E from pills (all-rac-tocopherol).

Because photosynthetic processes can create

vitamin E, it should only be received in small amounts from outside sources [44].

Coconut oil is derived mostly from the dried seeds of edible coconut trees, commonly known as copra [45]. Lauric acid makes

up a major portion of coconut oil. Coconut oil has long been used as a body lotion and for the prevention and healing of dry

skin due to its thick, silky texture. Sunburn compositions including photoprotective coconut oil can lower inorganic UV radiation concentrations, reducing manufacturing challenges and meeting customer desire for more natural goods, however,

humans have also been discovered to have considerable SPF values [46,47]. Vitamin C and polyphenols, which are powerful antioxidants, are abundant in lemons. Lemon is a Rutaceae family medicinal

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plant that grows in tropical and subtropical Southeast Asia [48]. Even though this Citrus fruit has excellent nutritional characteristics, its significant biological effect in current phytotherapy and cosmetics is still unappreciated [49]. Vitamin C is
required for the formation of elastin, the organic anatomical structure of the skin, as well as for sunburn protection.
In the present research, herbal sunscreens were prepared using Carbopol 934 base and coconut base with different herbal
ingredients. Color, pH, viscosity, spreadability, thermal stability, in vitro antioxidant activity, in vitro mutagenicity activity,
in vitro occlusion, and stability of fabricated herbal sunscreen lotions were all examined. By using an in-vitro spectrophotometric approach, the sun protection efficiency of the lotion was assessed in terms of SPF.

Aim And Objective

Aim: Formulation And Evaluation Of Herbal Sunscreen

Herbal Sunscreen is a lotion, spray or other topical product that helps protect the skin from the sun's ultraviolet (UV) radiation, and which reduces sunburn and other skin damage, with the goal of lowering the risk of skin cancer with the help of herbes.

Objectives .

1. It should be resistan to water and perspiration…
2. Itshould allow full transmission of radiation in the range of 300 to 400 NM for tanning effect
3. It should be non volatile.
4. It should have suitable solubility characteristic in suitable vehicle.
5. It should be stable to heat light and perspiration.
6. It should be non toxic, non irritant and non sensitizing..
7. It should be capable of retaining its son scaling property for several hours.
8. It should not stain on body cloth.
9. It should be neutral.

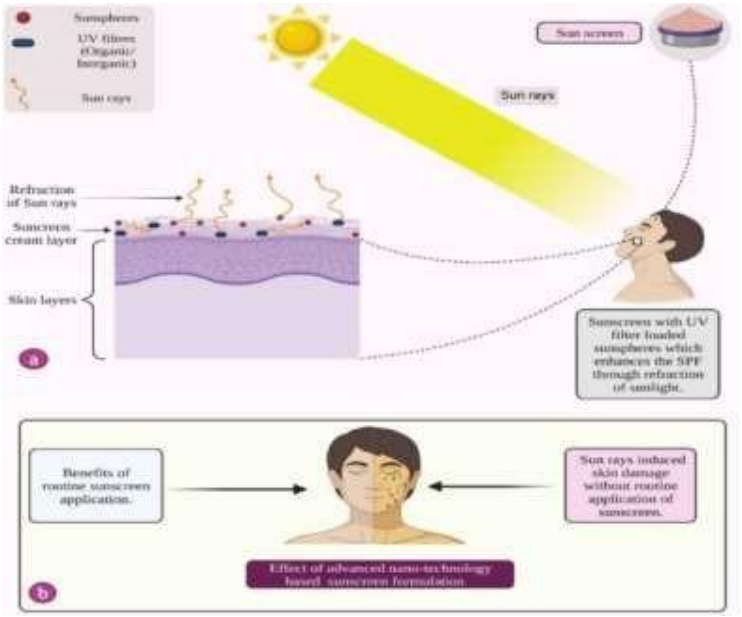

Fig. No.1 sunscreen protection using advanced nanotechnology

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Formulation and Evaluation of Herbal Sunscreen

1. Mechanism of Action

Herbal sunscreens primarily work by:

Absorbing UV radiation (mainly UVB),

Scattering and reflecting UV rays (due to physical barriers), Antioxidant activity to neutralize free radicals,

Anti-inflammatory effects to reduce UV-induced skin damage.

2. Formulation Considerations

Herbal extracts are incorporated into various bases such as creams, lotions, gels, or emulsions.

Stability and compatibility with the base are essential to preserve the efficacy of active ingredients.

Use of natural oils (e.g., coconut, sesame, almond) which may have intrinsic SPF properties.

3. Evaluation Parameters

Sun Protection Factor (SPF): Measured in vitro (spectrophotometric method) or in vivo.

Stability Studies: Checking pH, viscosity, color, and odor over time. Spreadability and Washability: Important for user compliance.

Skin Irritation Tests: Ensuring the safety of the formulation.

Antioxidant Assays: Such as DPPH scavenging to evaluate antioxidant strength.

4. Recent Studies

Kaur et al. (2018) developed a polyherbal sunscreen with SPF comparable to commercial products.

Shivanand et al. (2020) reported on a herbal sunscreen with green tea and turmeric showing significant SPF and antioxidant activity.

Garg et al. (2022) highlighted the role of nano-herbal formulations to enhance penetration and efficacy of botanical sunscreens.

5. Challenges and Future Prospects

Standardization of herbal extracts is difficult due to variability in plant sources. Need for clinical trials to confirm long-term efficacy and safety.

Development of eco-friendly, biodegradable packaging aligns with the ethos of herbal products.

Incorporation of nanotechnology and encapsulation techniques can improve the delivery and stability of herbal sunscreens.

Would you like this expanded into a full thesis chapter or need references in a specific citation style .

Literature Review: Formulation and Evaluation of Herbal Sunscreen with Zinc Oxide, Rose Water, Coconut Oil, Olive Oil, and Aloe Vera

6. Key Ingredients and Their Roles

a. Zinc Oxide

A broad-spectrum physical sunscreen agent that reflects and scatters both UVA and UVB rays.

Non-comedogenic and suitable for sensitive skin.

FDA-approved and known for its anti-inflammatory and antimicrobial effects. Commonly used in nano and micro forms for better dispersion and aesthetic appeal in cosmetic formulations.

b. Aloe Vera (Aloe barbadensis)

Rich in vitamins, enzymes, and polysaccharides with moisturizing, anti- inflammatory, and wound-healing properties.

Provides natural sunburn relief and promotes skin regeneration. Contains aloin, which may offer some UV absorption capacity.

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c. Rose Water
Acts as a natural toner with mild astringent properties.
Soothes irritated skin and provides a cooling effect, making it ideal in sun-care products.
Contains antioxidants that support anti-aging effects and protection against UV- induced damage.

d. Coconut oil
Offers mild sun protection with a natural SPF estimated between 4–7. Contains fatty acids that nourish and moisturize the skin.
Provides a smooth, emollient base and enhances spreadability of sunscreen formulations.

e. Olive Oil
Rich in polyphenols and vitamin E, providing antioxidant protection. Has emollient and anti-inflammatory properties.
Aids in reducing oxidative stress caused by UV exposure.

7. Herbal Sunscreen Formulation Strategies
A typical oil-in-water emulsion is often used, with rose water as the aqueous phase and oils (coconut and olive) forming the lipid phase.
Zinc oxide is dispersed uniformly in the formulation as a fine powder or pre- dispersed in oils.
Aloe vera gel may be incorporated either in the aqueous phase or added at a later stage to preserve its activity.

8. Evaluation Parameters
Sun Protection Factor (SPF)
Determined via in vitro UV spectrophotometric analysis or in vivo tests.
Zinc oxide contributes significantly to SPF, while coconut oil and olive oil enhance it mildly.

Stability Testing
Includes pH, viscosity, homogeneity, and phase separation under different storage conditions (temperature, humidity).
Skin Irritation and Safety
Patch testing on volunteers ensures non-irritancy.
Use of natural ingredients minimizes allergic reactions.
Spreadability and Texture
Evaluated for cosmetic elegance and user acceptance.
Oils contribute to smoothness, while rose water and aloe vera offer a light feel.

Ingredients
1) Zinc oxide powder

Fig. No. 2 zinc oxide powder

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Zinc Oxide powder is widely used in skincare for its protective, soothing, and healing properties. It's often used in sunscreens, diaper rash creams, and other products to protect skin from sun damage, soothe irritations, and promote wound healing. Additionally, zinc oxide can help treat acne, reduce inflammation, and even brighten skin.Prevent sunburn, Protects against UV radiation, Treat redness, rosacea irritation & rashes, Shrink pores and help stop acne, Reduce skin inflamation, Fights eczema, Reduce wrinkles.

Synonyms:

Calamine, Zinc white, Philosopher's wool, Chinese white, and Flowers of zinc.

Biological Source:

While it's primarily produced synthetically, zinc oxide occurs naturally as the mineral zincite.

Chemical Constituents:

Zinc (Zn) and Oxygen (O) and Formed by the ZnO chemical formula.

Physical Properties: White powder, insoluble in water, soluble in acids and some alkalies.

Chemical Properties: A mild astringent and antiseptic.

Uses:

Topical applications: Ointments, pastes, bandages, and dental cement. Cosmetics and skincare: Sunscreen, face powder. Industrial applications: Rubber, plastics, ceramics, glass, and more. Medical applications: Antiseptic properties.

2) Olive oil

Fig. No. 3 olive oil

It is a fat derived from the olive fruit. Olive oil is made up of triglyceride esters of oleic acid and palmitic acid along with traces of squalene, sterols, (phytosterols, and tocosterols), and also consists of polyphenols like esters of s and hydroxyl tyrosol including oleocanthal and oleuropein. Some flavonoids and lignans are also present. Olive oil has been used as a home remedy for skin care. Squalene is utilized as an antioxidant, and moisturizer, and in topical sunscreen Preparation, it is a convenient vehicle to carry other substances [18,19,20].

Benefits

- Relieve Dry Skin
- Soothe itchy skin
- Prevent wrinkles
- Remove makeup
- Treat Dandruff
- Create soft, shiny hair
- Strengthen nails

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- Soft your hands
- Nourishes eye lashes
- Use For Hair conditioner

Biological Source: Plant Origin: Olive oil is extracted from the fleshy part of the ripe olive fruit of the olive tree, Olea europaea.
Synonyms: Common Names: Green gold, olive oil.
Uses:
Culinary: Cooking, flavoring food. Cosmetics: Skin moisturizer, hair care. Medicinal: Traditional remedies, wound care.

3) Coconut Oil

Fig.No. 4 coconut oil

It is a tropical plant that grows and is cultivated numerously by Indonesian people [21]. It contains fatty acids and isreported to possess antioxidant properties photoprotection, and other medicinal activities like anti-bacterial, skin Barrier repair, anti-aging, wound healing, and moisturizing in atopic dermatitis treatment [22-23].

Benefits

- Increase hydration on the face
- Moisturizing facial skin
- Reducing inflammation of the face
- Increases collagen production
- Strengthens the skin's protective barrier layer
- Promote healthy skin.
- Improve dry, brittle hair.
- Detangle hair.
- Improve dry, Cracked heels.

Biological Source: The coconut palm tree (Cocos nucifera) is the biological source. The oil is extracted from the fruit, specifically the kernel, meat, and milk of the coconut.
Synonyms: Coconut fat, Aceite de Coco (Spanish), and Huile de Coco (French).

Uses:
Culinary: Used as a cooking oil, especially in tropical regions.
Cosmetic: Used in skincare, haircare, and massage oils due to its moisturizing and emollient properties.
Industrial: Used in the production of soap, detergents, and pharmaceuticals.

Other: Used in baking, processed foods, and infant formulas.

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4) Aloe vera

Fig. No. 5 Aloe vera

Aloe vera is a good active ingredient to reach in Sunscreen arsenal.it has been proven to both Treat and prevent burns on your skin .the leaves of aloe vera and

A. Barbadensisare the source Of aloe vera gel .aloe vera gel is used in cosmetics lotion for its moisturizing and revitalizinaction. It blocks UVA and UVB rays and maintain skin natural moisture balance.It stop the sunburn and Stimulate immune system intervention.aloe vera gel can be used to help with the healing process Of sunburn it help relieve pain and redness by reducing inflammation .the gel also stimulate the Production of collagen which helpa the healing process.

Benefits

- Moisturises dry skin
- Soothes irritated skin
- Reduces signs of ageing
- Fights acne and blemishes
- Removes dark circles and puffiness
- Treats sunburn

Biological Source: Aloe vera belongs to the family Liliaceae and is native to arid regions of Africa and the Middle East.
Synonyms: Aloe, aloe vera gel, burn plant, aloe spiky.

Uses:

Skin Care: Aloe vera is widely used in topical applications for soothing sunburns, cuts, wounds, acne, and dry skin.
Wound Healing: Due to its ability to promote cell regeneration and reduce inflammation, aloe vera is used to aid in wound healing.
Digestive Health: Historically, aloe vera has been used as a laxative, although this use is less common today due to potential side effects.
Antioxidant Properties: Aloe vera's high concentration of vitamins and antioxidants may offer protection against oxidative damage.

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5) Roose water

Fig. No. 6 Rose Water

It is extracted from the rose by liquid-liquid extraction [24]. One of the most important factors is that they have a good Source of antioxidant activities and also be used for beautifying purposes for their sterling sunscreen [25]. Gelatin and its hydrolysates procured from fish gelatin of tilapia (Oreochromis niloticus) were found to possess a Scavenging effect against reactive oxygen species of UV that renders precarious effects to the skin. It is a novel source Of components that have potential in skin anti-aging products and is also used as an emulsifying agent [26].

Benefits

- Maintains The PH Balance
- Curbs Acne
- Tones Your Skin
- Hydrates Your Skin
- Reduces Puffiness
- Suits Sensitive Skin
- Soothes Skin Conditions

Biological Source: Rosa damascena (Damask rose) is the primary plant source for rose water.

Synonyms: Also called ―attar of roses‖ , ―eau de toilette‖ , ―rose flower water‖ .

Uses:

Cosmetics: Rose water is widely used in skincare products due to its soothing, hydrating, and anti-inflammatory properties. It can be used as a toner, cleanser, moisturizer, or added to masks.

Food and Beverage: Rose water is used in various culinary traditions to add a delicate floral flavor to desserts, drinks, savory dishes, and pickles.

Medicinal: Historically, rose water has been used for its potential to soothe irritated skin, reduce inflammation, and aid in digestion.

Aromatherapy: Rose water is often used in aromatherapy for relaxation, stress relief, and mood enhancement.

PLAN OF WORK

1. Literature Review
2. Material and Instruments
3. Experimental method
   • Sample collection
   • Identification tests

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• Make extraction of Curcuma longa (turmeric) powder
• Filter out the extract
4. Evaluation tests
• Physical parameter
• Determination of pH
• Determination of Viscosity
• Spreadability
• Washability
• Homogeneity
• Stability Testing
• Determination of antioxidant activity
• Determination of SPF

Materials and Quantity

Sr. No.	Name of Ingredient	Quantity
1	Zinc oxide	50 gm
2	Olive oil	25 ml
3	Coconut oil	25 ml
4	Aloe vera	-
5	Rose water	25 ml

Procedure STEP- 1
Firstly, take Zinc oxide in a beaker after that add Olive oil, Coconut oil, in measured quantities and heat up to 75℃.
STEP- 2
Add Rose Water and Aloe Vera in another beaker in measured quantity. Heat the mixture up to75℃.
STEP- 3
Mix both the mixture and stir gently until a smooth cream is formed at room temperature.

Fig No. 7 Formulation of sunscreen

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Sun Protection Factor (SPF) determination

The sunscreen formulation's efficacy can be identified by calculating the sun protection factor (SPF), which is defined As the UV energy required to produce a Minimal Erythemal Dose (MED) in protected skin, divided by the UV energy Required to produce a MED in unprotected skin:

The minimal erythemal dose (MED) is defined as the lowest time interval or dosage of UV light irradiation sufficient to produce minimal, perceptible erythema on the unprotected layer of skin [27,28].

In Vitro SPF values of oily formulations containing vegetable oils and/or organic UV filters were calculated spectrophotometrically and observed absorbance values at 5 nm intervals (290-320 nm) were calculated spectrophotometrically by using the formula:

Where,

CF = Correction Factor (10)

EE($\boldsymbol{\lambda}$) = Erythemal Effect Spectrum

I($\boldsymbol{\lambda}$) = Solar Intensity of Radiation with wavelength $\boldsymbol{\lambda}$

Abs($\boldsymbol{\lambda}$) = Absorbance of the sunscreen product at wavelength $\boldsymbol{\lambda}$

EE × I = Constant Value [29]

Sun Protection Factor Determination

SPF of formulated creams were calculated by the application of equation :

The formulation prepared was scanned under UV Spectrometer and the obtained absorbance for 290 to 320 nm. These Values are multiplied with EE × I values and the obtained values are multiplied by the correction factor 10.

Rancidity

Rancidification is the process of complete or incomplete oxidation or hydrolysis of fats and oils when exposed to air, light, or moisture or by bacterial action, resulting in an unpleasant taste and odor. Rancidity is performed by using the Phloroglucinol solution. The rancidity is due to the oxidation of the fats and oils; during oxidation free fatty acids are liberated. These free fatty acids react with the Phloroglucinol solution and give pink color indicating the rancidity of the product. 10 ml of cream was taken then added 10 ml of concentrated Hydrochloric acid and 10 ml of Phloroglucinol solution and shaken for one minute. The cream should have passed the test if no pink color develops.

PH Determination

PH denotes ―Potential of Hydrogen‖ and is a scale used to specify the acidity or basicity of an aqueous solution. Acidic solutions are measured to have lower ph values than basic or alkaline solutions. The cream in general has a ph of 6 to 9.

Evaluation by UV Spectroscopy

1 gm quantity of formulated cream was weighted, transferred to 100 ml volumetric flask and diluted to volume with n butyl alcohol. Further, it was kept for ultra-sonication for 5 min and filtered through a cotton filter, discarding the initial 10 ml. Afterwards 5 ml aliquot was transferred to 25 ml volumetric flask and the volume was adjusted with n-propyl Alcohol. The absorption spectra of samples were obtained in the range of 290-400 nm using 1 cm quartz cell and n butyl alcohol as blank solution. The absorption data obtained in the range of 290- 320 nm every 5 nm interval.

Viscosity

Viscosity is an important parameter in the evaluation of the cream. Viscosity governs many properties of the cream Such as spreadability, pouring ability of the cream from the container, etc. The viscosity of formulation was determined By using Brookfield Viscometer and Viscosity was found to be in the range of 28000-32000 cp. The Viscosity is Determined by using the following formula:

Viscosity = Dial Reading × Factor. For LV-4 at 6 RPM Factor is 1M (1000)

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How to apply sunscreen

1. Choose a sunscreen that has an SPF of 30 or higher, is water resistant, and provides broad-spectrum (UVA and UVB rays) coverage. When this sunscreen is also a tinted sunscreen with iron oxide, you better protect your skin from developing dark spots. Iron oxide protects your skin from the sun's visible light.
2. Apply sunscreen before going outdoors. It takes approximately 15 minutes for your skin to absorb the sunscreen and protect you. If you wait until you are in the sun to apply sunscreen, your skin is unprotected and can burn.
3. Use enough sunscreen. At a minimum, most adults need about 1 ounce of sunscreen — roughly the amount to fill a shot glass — to fully cover skin not covered by clothing. Depending on your body size, you may need more sunscreen to protect your exposed skin from the sun's harmful rays. Rub the sunscreen thoroughly into your skin.
4. Apply sunscreen to all skin not covered by clothing. Remember your neck, face, ears, tops of your feet, and legs. For hard - to - reach areas like your back, ask someone to help you or use a spray sunscreen. If you have thinning hair, either apply sunscreen to your scalp or wear a wide - brimmed hat. To protect your lips, apply a lip balm with an SPF of at least 30.
5. To remain protected when outdoors, reapply sunscreen every two hours, and immediately after swimming or sweating. People who get sunburned usually didn't reapply, used too little sunscreen, or used an expired sunscreen. [50]

Fig. No. 8 How to apply sunscreen

Evaluation of herbal sunscreen

Appearance	Smooth
Color	Pale Yellow
Consistency	Good
Texture	Smooth
Irritation	Non
Spread ability	Good

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Extrudability	Good
PH	7.3
Rancidity	No Pink color
Viscosity	30200
SPF by UV	30

Benefits of sunscreen
• Reduce risk of skin cancer
• 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.[30,31,32]

Advantages
• Easily available
• No side effects
• No special equipment needed for preparation
• They are inexpensive
• Ingredients are easily available
• Renewable resources
• Be non toxic and non irritant
• Be neutral
• Be stable to heat
• Be non toxic and non irritant
• Be neutral
• Be stable to heat
• Easy to manufacture[33]

Disadvantages
• They are difficult to hide taste and odour
• Manufacturing process are time consuming and complicated
• Herbal drug have slow effects as compare to allopathic dosage form it also requires long

II. CONCLUSION

UV Radiation causes various precarious and damaging effects on the skin. It causes skin cancer, hyperpigmentation, Photo-aging, sunburn and skin irritation. Herbal cosmetics possess property to protect skin from damaging effects of

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Sun rays with no comedogenic and side effects. The present review focuses on the scientific account of herbals in Cosmetics. Active constituents extracted from herbals have a potent UV shielding effect. Herbs are eco-friendly, Compatible, and widespread compared to synthetic ones.

Sunscreen is widely used to prevent sunburn, Premature aging, and skin cancer caused by UV Radiation. The enhanced nature of natural or Herbal sunscreen makes them the favored Option. These are the polyphenols and Flavonoids that have a strong ability to protect Against sun damage. Sunscreen lotion is made With a combination of vitamin E, polyphenolic medication, and extract from wheat grass Plants. It is discovered that the prepared cream Has the greatest SPF rating and the best Physicochemical characteristics.

Result

A sunscreen product should have a wide range of absorbance to be helpful in preventing sunburn and other skin harm. Spreadability, homogeneity, thermal stability, and pH are the factors that affect the formulation's acceptability throughout storage and handling of the product. The cream's formulation lacked any redness, inflammation, or irritation. When a formulation was stored for a long time, there was no noticeable change in the cream's colour.Washing with tap water made it simple to get rid of the cream.

Results of our study revealed that 100% of selected herbal sunscreens are photostable in the UVB range, and 71% of Them are stable in both UVA and UVB range. Subjective study by in vivo SPF determination revealed that 98% of the Sunscreens effectively provide protection to the skin from sunburns. Overall data obtained after quality evaluation Study substantiate that all products are safe and efficacious. Total SPF obtained from formulation is 30 SPF.

Fig. No.9 Final product

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