

Formulation and Evaluation of Herbal Sunscreen Cream by Using *Moringa Oleifera* and *Curcuma Longa*

Miss.Nikita D.Ghorpade [1], Mr.Pankaj V.Vyawhare[2], Miss, Ashwini B.Chaudhary[3]

*Student Of Yashodeep Institute Of Pharmacy[1][3],
Assistant Professor at yashodeep institute of Pharmacy[2],
Chhatrapati Sambhajnagar,Maharashtra,India.,Under The Dr.Babasaheb Ambedkar
Technology University, Lonere .*

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ABSTRACT:

UV radiation enters the human body and has a variety of impacts on it. The current study aims to formulate a herbal sunscreen cream using an alcoholic extract of *Moringa oleifera* and *curcuma longa*, as well as to conduct an evaluation test for fragrance, colour, solubility, and SPF determination. Herbal active ingredients are safer and more effective than synthetic versions. *Moringaoleifer* leaves and *curcuma longa* contain anti-oxidants. It protects the skin from damaging radiations, preventing sunburn, hyper pigmentation, and photoaging. In this effort, we formulate a natural sunscreen cream.

Keywords: Sunscreen, UV Radiation, Antioxidant, SPF, Photoaging

I. INTRODUCTION :

Sunscreen, commonly referred to as sun block or sunscreen, is a topical photo protective agent that helps shield the skin from sunburn and is primarily used to prevent or lower the risk of developing skin cancer. The radiations that sunscreen's active components block. Because of their antioxidant properties, *curcuma longa* and *moringa oleifera* can be utilised to protect skin. Alkaloids, flavonoids, phenolic compounds, B-carotene, protein, and vitamin E are all found in *Moringa oleifera*. These compounds act as natural antioxidants by either reflecting or absorbing UV radiation from the sun, keeping it from penetrating deeper layers of the skin.

The herbal sunscreen will not only protect the skin from the effects of harmful UV rays but also eliminate the use of chemical sunscreens .presently , public awareness has increased regarding the safety of sunscreens using chemicals chemical based sunscreen gets absorbed into the skin and causes discomfort and itchiness of the skin .therefore ,manufacturers all over the world

have begun manufacturing ,herbal sunscreens to prevent side effects caused by synthetic chemical products herbal sunscreen includes various natural ingredients which penetrate deeper layers of the skin plunge the signs of early aging by hydrating the skin turmeric, *moringa oleifera* shows the anti oxidant and anti-Inflammatory effects. They also cause skin tightening, help prevent skin damage ,heal acne, fade scars ,herbal products also provide self color so the use artificial colors are avoided.

Sunscreen products can be formulated in the form of lotions, Creams, Sticks, Aerosols, Gels, Powders and Ointments .sunscreen preparations are designed to be used topically to prevent UV Radiation from entering the skin directly by absorbing or reflecting from the Skin. Regulatory considerations Are also taken into account during the design and development of sunscreen products .

Presently herbal sunscreens are widely used by almost everyone on this planet to prevent from harmful effects of uv radiation from sunlight herbals are prefferable because of fewer side effects and a better safety profile .This study is about the preparation and evaluation of herbal sunscreen creams possessing anti uv radiation effectivness and anti inflammatry properties, Creams were prepared from the extract of plant materials, such as *moringa oleifera* and *curcuma longa*.Total polyphenol,Curcumin and flavanoid content.Evaluation of prepared herbal sunscreen creams was performed.

Sunscreen also known as sun block is a lotion, spray, gel, or other topical product that absorbs or reflects some of the sun's ultraviolet radiation and thus helps protect against sunburn.

Ancient egyptions used extracts of rice, jasmine and lupine plants. again, these ingredients offered low levels of sun protection but were proven to be very beneficial to the skin and are still used in skin care products today.



Fig: 01 Moringa Oleifera

Moringa oleifera is a widely cultivated and highly valuable tree belonging to family moringaceae originating in India. A rich source of nutrients and antioxidants and it is a bioactive compounds like phenolic compounds, flavanoids, terpenoids, lignans.

- Scientific name: Moringaoleifera
- Other common names: Horseradish tree, drumstick tree
- Kingdom: Plantae
- Phylum: Tracheophyta
- Class: Magnoliopsida
- Order: Brassicales
- Family: Moringaceae
- Speciesoleifera

➤ **Uses:**

1. Antioxidant
2. Anti-inflammatory
3. Anticancer



Fig: 02 Curcuma longa

Turmeric is a plant that has a very lengthy history of medicinal use since almost 4000 years in

southeast Asia. Turmeric is used no longer as an important spice but also used in spiritual ceremonies it is used due to its wonderful yellow color. Turmeric is likewise called Indian saffron.

Synonym: Curcuma longa, Curcuma domestica, herbaceous plant, genus Curcuma, saffron, Indian haladi Curcuma.

Biological Source: Turmeric is the dried rhizome of Curcuma longa Linn, belonging to family Zingiberaceae.

Geographical source: They grow in warm, humid climates India, Sri Lanka, the East Indies, Fiji and Australia all have climates they have conducive to growing turmeric.

Uses:

1. Antioxidant
2. Anti-inflammatory
3. Antimicrobial
4. Hyperlipidemia

Phytochemical Test :

1. Test for detection of Phenolic compounds:

- **Ferric chloride test:** To one ml of the filtered plant extract sample add 10% ferric chloride solution green blue or violet color appears. which indicates presence of phenolic compounds.
- **Litmus test :** acidic solution turn blue litmus paper into red and basic solution turn into red litmus paper into blue.
- **Lieberman test:** place the crystals of sodium nitrite in a clean dry test tube and add 1ml of phenolic solution to sodium nitrite solution. Heat the mixture gently and allow it cool dilute the solution with water so that the compounds turned red if phenolic group is present.
- **Bromine water test:** dissolve the given organic compound in glacial acetic acid. add bromine water solution to this dropwise. if the color of bromine disappears then it indicates the presence of phenolic compounds.

➤ **Flavonoids test:**

- **Sodium hydroxide test:** 1 ml of plant extract, add few drops of dilute NaOH solution an intense yellow color is observed.
- **Lead acetate test:** to the plant aqueous extract, add 10% lead acetate solution yellow precipitate is formed. which indicates the presence of flavonoids
- **Shinoda test:** to the aqueous extract of solution added fillings and add few drops

of concentrated HCL a pink or red colour indicates the presence of flavonoid.

➤ **Phytochemical test for curcumin:**

- Powdered drug add in 1 ml of sulphuric acid crimson colour are appears it indicates the



Fig.03 Phytochemical Test

presence of curcumin.

- The 1 ml of boric acid add in aqueous solution of curcuma longa powder gives reddish brown color indicates the presence of curcumin.

- **Extraction of curcuma Longa:**

Collection of curcuma Longa rhizome Dried in shade drying process After drying the curcuma Longa rhizome convert into powder form The curcuma Longa 15 gm powder macerate with 62 ml ethanol for 24 hours After simple maceration process the extract filter with the help of filter paper. The curcuma Longa extract used to formulation of herbal sunscreen cream.

- **Extraction from Moringa oleifera:**

Collection of leaves of moringa oleifera Dried in shade drying process . After drying the moringa oleifera leaves which convert into powder form .The moringa oleifera 15 gm powder macerate with 62ml ethanol for 24 hours After simple maceration process the extract filter with the filter paper .the moringa oleifera extract used to formulation of herbal sunscreen cream

Formulation

Table: 01

| Ingredients | F1 | F2 | F3 | Uses |
|--------------------------|--------|--------|--------|----------------------|
| Turmeric Extract | 1.5 ml | 2.0 ml | 2.5 ml | API |
| Moringa oleifera extract | 1.5 ml | 2.0 ml | 2.5 ml | API |
| Stearic Acid | 9.0 g | 12 g | 12 g | Emollient |
| Triethalamine | 3.5 ml | 2.2 ml | 2.0 ml | Surface active agent |
| Glycerine | 4 ml | 3.0 ml | 3.0 ml | Emollient |
| Methyl paraben | 1.5 ml | 0.3 ml | 0.3 ml | vehicle |
| Cetosteryl alcohol | 1.5 g | 2.0 g | 2.0 g | Emulsifier |

- **Cream Formulation Procedure:**

1. An oil phase cetosteryl alcohol, liquid paraffin, stearic acid containing lipophilic substances .
2. An aqueous phase triethalamine, and glycerin containing hydrophilic substances.
3. They were separately heated in water bath at 60 degree celcius .
4. Afterward,The aqueous phase was gradually

added into the oil phase with constantly stirring until the mixture was congealed at room temperature .

5. The resulted cream bases were treated with the Moringa-oleifera leaves and curcuma longa extract.
6. It should be added gradually and then stirred until homogenous mixture of cream would be

formed and stored air tight container.



Fig : 04 Formulations of F1,F2,F3

Evaluation of Sunscreen Cream

- 1. Appearance And Homogeneity:** It was estimated by visual examination.
- 2. Organoleptic Evaluation:** color , Texture, and smell were among parameters that were measured. Texture and color were assessed using touch and vision ,respectively to Investigate the scent ,the formulation was sensed.
- 3. Spread ability Test:** 0.1 gm sample was applied between two glass slides and was compressed to uniform thickness by placing 100 gm weight for 5 minutes .weight was added to the

pan. Sample was calculated by using radius of circle formed by compressed slide.

4.PH: PHof 1% of aqueous solution of formulation was measured by using a digital PH meter..

5.SPF value determination by UV spectroscopic method: 1 g of each sample was diluted with ethanol by using ultrasonic bath for few minute .and filter with the help of filter paper.After all sample were scanned wavelength between 290 to 320nm in the range of UVB,every 5 min . Measurement of three samples. Mansur equation are applied and calculate SPF values.

II. RESULT:

• **Identification test of Phenolic compounds, Flavonoids and Curcumin:**

| Test Name | Observation | Inference |
|----------------------------------|-----------------------------------|--------------------------------|
| ➤ Ferric chloride Test | Green blue or violet | Presence of phenolic compounds |
| ➤ Litmus Test | Turn blue litmus paper into red | Presence of phenolic compounds |
| ➤ 3.Sodium Hydroxide Test | Intense yellow colour is observed | Presence of flavanoids |
| ➤ Lead acetate Test | Yellow precipitate formed | Presence of flavanoids |
| ➤ Powdered drug + Sulphuric Acid | Crimson colour is formed | Presence of curcumin |

| Evaluation parameter | Method | Result |
|---------------------------------|--------------------|---------------------------------|
| ➤ Physical Characteristics | - | - |
| ○ Apperance | Visual observation | Pale yellow, homogenous mixture |
| ➤ Consistency and Spreadability | - | - |
| ○ Texture | Texture analysis | Smooth and creamy |
| ➤ Spreadability | Visual observation | Spreads easily |
| ➤ PH Measurement | PH meter | 5.5 |

III. DISCUSSION:

In this present work ,we have formulated sunscreen cream from the extract obtained from the leaves of moringa oleifera and rhizome of curcuma

longa and evaluate them. we formulated three F1,F2,F3 Out of three formulations the F1 are not more stable as F2 And F3 so, we perform evaluation test such as colour, odour, spreadability and solubility for three formulation are determine

SPF for the F2 and F3 has a good SPF than the SPF of F1. current research work has to develop sunscreen cream containing herbal ingredient .because herbs used in cosmetic product are safe and effective to use . as we know synthetic sunscreen cream products show harmful effects on photosensitivity ,irritancy, and may penetrate the stratum corneam and reaches blood vessels

formulation". Life, 2023; 13(1): 239.

IV. CONCLUSION:

Recent study Has showed that the chemicals present in the sunscreen enter the blood stream. More rapidly Few chemicals present in the sunscreen enter the bloodstream more rapidly. Few chemical sunscreens agents such as Avobenzone, octocrylene, oxybenzone, and ecamsule enter the blood stream within an hour after Application on skin. These chemicals may cause various Harmful effects in human. Thus it was concluded that Herbal sunscreen cream is more advantages than chemicals because of is lesser side effects.

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