

## Formulation and Evaluation of Herbal Sunscreen

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### ABSTRACT

The objective of this work is to formulate and evaluate a cosmetic (Herbal sunscreen) for protection of skin from the natural ingredients which have different properties such as emollient, moisturizer, base, anti-acne, anti-sweating in the ingredients such as papaya, lavender oil, tomato, aloe vera, honey, carnauba wax, corn starch, green tea etc.

### I. 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 definition are designated as "Items fulfilling specific conditions like skin whitening, minimizing the appearance of lines in the face and body, protecting from the sun and sun tanning". 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 as lotion, spray, gels, foams (such as an expanded foam lotion or whipped lotion), sticks, powders and other topical products. Sunscreen are common supplements to clothing, particularly sunglasses, sunhats and special sun protective clothing, and other form of protection (eg. umbrellas, etc.)

Many natural ingredients have properties that protect you from sun. sandalwood is one of them. There are others like seed oil, sunflower oil, sesameoil, sheabutter, jojoba oil coconut oil, saffron and vitamin E oil. These are commonly called indoor tanning lotions when designed for use with tanning bed and just suntan lotion if designed for outdoor use may not have special protection in them.

Herbal sunscreen (also known as herbal sunblock, suntan lotion) is a lotion, spray or topical product containing herbal ingredients which helps to protect from the UV radiations of the sun and hence lowering the risk of skin cancer.

- Advantages of herbal sunscreen.
  - 1- Easily available.
  - 2- Do not provoke allergy.
  - 3- Easy to manufacture.
  - 4- Cheap in cost.
  - 5- Effective with small quantity.

### II. MATERIAL AND METHODS

#### Papaya (carica papaya)

Papaya is indeed a boon in treating dry skin issues and helps in hydrating the skin. There are special anti oxidant and enzymes present in papaya which help in treating dry and flaky skin. Papaya is rich in antioxidant such as lycopene which may defend against the signs of aging. Papain can also remove the damaged keratin that can build on the skin and form small bumps. The moisturizing property of papaya helps in removing the dead skin cells, dryness and skin lines.

#### Tomato (Solanum lycopersicum)

Tomato juice on face works as a natural astringent and constricts wide pores and inhibits the accumulation of dirt and oil. It helps to protect from sunburn and sun tanning. Tomatoes are full of antioxidant including vitamin C. One can use tomato to remove the pores and blackheads on the face. The main ingredient lycopene in tomato helps to lighten, whiten, and brighten the skin, hence it is mostly preferred in the herbal cosmetic preparation. All this aspects makes tomato a versatile and a popular ingredient for skin conditions.

#### Aloe vera (Aloe barbadensis miller)

Aloe vera is the one of the most widely used herbal remedied on skin condition. This is because of the gel component of the plant that are known to heal the skin from variety of minor ailment. Including sunburn it also helps to prevent dry skin, cut on

face, cold sores eczema, acne etc. the anti-inflammatory and anti-bacterial property of aloe vera helps to heal the skin rashes. it also works as an emollient. Skin hydration, whitening of skin, removed of dark circles and prevention of premature aging are the most common properties of aloe vera.

**Honey** (*Apismellifera*)

In its natural form honey is made by enzyme activity, plant matter and live bacteria coming together to create a powerful ingredient with hundreds of practical use. Raw honey helps in balancing bacteria on the skin which makes it help to remove acne on the skin. Honey speeds up the skin cells healing processes. Raw honey is also an exfoliator which means apply it on the face takes off dry, dull skin and reveals new skin cells underneath. it can also help the skin conditions such as psoriasis.

**Corn starch** (*foeniculum vulgare*)

Corn starch may be a convenient and cost-effective remedy for skin irritation, soothing the skin, sunburns and to reduce the skin itchiness. It works as an active ingredient and penetrates the skin. Corn starch is a natural moisture absorbing powder which is often used as an alternative to chemically formulated talcum powder. The anti-inflammatory and anti-bacterial properties help to soothe the irritated skin and refresh the body without harming the skin. It easily soaks the oil and sebum from skin and leaves it as a soft and supple. Excluding sunburns corn starch also helps to remove the stickiness from the skin which occur while applying different ingredients and cosmetics on the skin or face.

**Green tea** (*Camellia sinensis*)

Green tea's anti-inflammatory properties can help to reduce the skin irritation, skin redness and swelling. Applying green tea on the skin can soothe minor cuts and sunburns too. Due to its effective properties, studies have also found topical green tea to be an effective remedy for dermatological conditions. Green tea can help to lighten the dark spots and blemishes from the skin making it good for complexion conditions. The powerful antioxidant property can help to get fresh and glowing skin.

**Lavender Oil** (*Lavandula*)

Lavender oil gently moisturizes the skin, and is non-comedogenic for pores. It is naturally anti-bacterial that is it kills the acne-causing bacteria that might infiltrate the pores. This makes the purple flower perfect for preventing, calming, and healing painful acne breakouts.

**Method of Preparation.**

Four different formulations were prepared with varying concentration of all ingredients named as F1 to F4. Concentration of each ingredient is mentioned in the table below. Required quantity of bees wax and liquid paraffin was taken in a beaker and heated on a water bath to obtain a molten mixture (Phase A). In another beaker papaya was mashed. Other ingredients are mixed together and both the solutions are mixed together with continuous stirring till cream like consistency is obtained. Preservative, perfume are added and then packed in suitable container.

**Table no 1:** Formulation table

Sr. No	Name of ingredients	Scientific name				
			F1	F2	F3	F4
01	Papaya	<i>Carica papaya</i>	20	15	18	21
02	Liquid paraffin	----	07	09	10	06
03	Lavender oil	<i>Lavandula</i>	08	08	07	07
04	Tomato juice	<i>Solanum lycopersicum</i>	04	03	02	05
05	Corn starch	<i>Foeniculum vulgare</i>	03	04	03	04
06	Carnauba	----	20	25	20	18
07	Aloe vera	<i>Aleo barbadensis</i>	25	26	27	28
08	Honey	<i>Apis mellifera</i>	03	02	01	02
09	Green tea	<i>Camilla sinensis</i>	10	08	12	09

**Evaluation of Herbal Sunscreen.**

**1. Organoleptic Properties.**

The appearance and colour are included in the organoleptic property. The pH is measured and was found to be 6.2 by dilution of cream in water

Viscosity was measured by using Brookfield viscometer. Cream spreadability was measured with pre-published methods.

## 2. Sun Protection Factor.

Sun protection factor (SPF) was measured with a UV-2000S transmittance analyser. The cream was placed on the polymethylmethacrylate plates were tested. Cream base without UV-absorbing agents was used for blank scan. Three samples plates were prepared and kept in dark for 15 minutes for curing. Then the plates were scanned at three different locations and the SPF value was recorded.

## 3. Chromatographic evaluation.

The contents of cosmetics products can be determined and confirmed by chromatography like TLC, HPTLC, HPLC, Gas chromatography.

## 4. Stability studies.

It is carried out at elevated temperature, relative humidity and pH a period of 6 months and all above parameters are evaluated periodically to confirm changes in product.

## 5. Microbial Test.

As herbal products are sensitive to microbial growth, microbial assay was carried out by agar well diffusion method or turbidometric method.

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