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Formulation Of Cucumber Aloe-Vera Gel Herbal Sunscreen Cream For Skin Brightening

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Abstract:

The increased demand for herbal cosmetics is a result of new ingredients being available, as well as financial incentives for creating profitable products and upholding quality standards. Beauty products are those that are applied to the skin. Face cream is applied cosmetically to have a softening and cleaning effect. The market for herbal cosmetics is growing as a result of new components being available and the financial incentives for creating profitable products and upholding quality standards. Sunscreen is a chemical substance that aids in protecting the skin from UV radiation. UVB radiation causes sunburn, but UVA radiation may do more harm to the skin. The best sunscreen is one that blocks both wavelengths. This study's objective was to employ particular fixed oils and medicinal plants to make a composition of topical herbal sunscreen. This study aims to develop and assess a cosmetic (herbal sunscreen) that protects skin from UV rays by using the natural ingredients like cucumber & aloe-vera.

Keywords: sunscreen, herbal, cream, cucumber etc.

Introduction:

Face creams are preparations that are semi-solid and used to lighten facial skin. Sunburns are treated with creams. Cold cream is helpful for maintaining skin hydration throughout the year, particularly in the winter. With the arrival of Skin issues become more noticeable in the winter. Your skin starts to feel parched and dehydrated. It expands, and then tiny crack lines appear across the cheeks and lips. If appropriate attention is not given, these fissures might get even redder. Using cold cream helps prevent skin issues from getting worse during the winter. Cold cream is used in the winter to shield skin from the elements. Since herbal active components are widely used in cosmetics globally, they are used in skin care products. The demand for herbal cosmetics is growing on the international market; they are an invaluable gift from nature. Many creams are utilized, such as cold cream and moisturizing cream. Bioactive chemicals produced from plants, such as antioxidants, vitamins, essential oils, tannins, alkaloids, colors, carbohydrates, and terpenoids, are used in cosmetic goods to treat the skin and other bodily tissues.

HERBAL SUNSCREEN BENEFITS

- Easily accessible.
- Avoid causing allergies.
- Simple to produce.
- Low price.
- Effective in little amounts.
- No adverse reaction.
- No particular tools are required for preparation.
- Sustainable materials.
- lower the chance of developing skin cancer
- Prevent sunburn
- Avoid free of redness and irritation
- Prevent DNA damage, avoid free of blotchy skin and hyperpigmentation, and delay the appearance of wrinkles and fine lines.
- Reduced risk of skin cancer
- Protects from damaging UV rays
- Preserve the natural glow of your complexion. Preserve the appearance and feel of your skin.

Cucumber:

Cucumis sativus, a popular creeping vine plant, is a member of the Cucurbitaceae family of gourds and yields fruits that resemble cucumbers, which are eaten as vegetables. It is considered a seasonal plant. Cucumbers come in three basic varieties: burpless/seedless, pickling, and slicing. Within each of these variations, various cultivars have been developed. Although the cucumber originated in South Asia, it is currently grown on most continents because to the global trade in cucumber varieties. Despite their lack of close relationship, plants in the genera *Echinocystis* and *Marah* are referred to as "wild cucumbers" in North America. It appears that the origins of cucumbers can be traced to the foothills of the Himalayan highlands, situated north of the Bay of Bengal. This region is currently predominantly inhabited by Bangladesh.



Aloe-vera:

Since ancient times, aloe vera has been used to treat burns and infections. But as cosmetics have advanced, it has become clear that aloe vera is a really key component of cosmetics. It is a miraculous beauty herb since it has about 20 amino acids, enough amounts of minerals like calcium, magnesium, and sodium, enzymes, vitamins, polysaccharides, nitrogen, and other ingredients. These are a few of the most significant uses of aloe vera in cosmetics . Aloe vera is a useful active component to include in your sunscreen blend.It

has been demonstrated to be effective in treating and preventing skin burns . Aloe vera and A. barbadensis leaves are used to make aloe vera gel. Aloe vera gel is used in cosmetic lotions due to its rejuvenating and moisturizing qualities. It blocks UVA and UVB rays while maintaining the skin’s natural moisture balance.



Coconut oil:

Coconut oil prevents premature skin aging and maintains the skin's smoothness and softness. Use coconut oil on your skin to hydrate and exfoliate dead skin cells. Coconut oil moisturizes dry skin, even in those who have eczema or other skin conditions. Its antimicrobial, antifungal, and antiviral qualities aid in wound healing by preventing skin damage from free radicals. Because of its anti-inflammatory qualities, coconut oil helps to relieve redness on the skin, making it suitable for both oily and dry skin types.



Materials & Methods:

Collection of Plant materials:

The fruits of Cucumis sativus called cucumber collected from the local market of Bhusawal, Maharashtra & they were grinded in mixture.

Isolation of cucumber extract:

The cucumber was extracted using a process that was found in books & other literature.

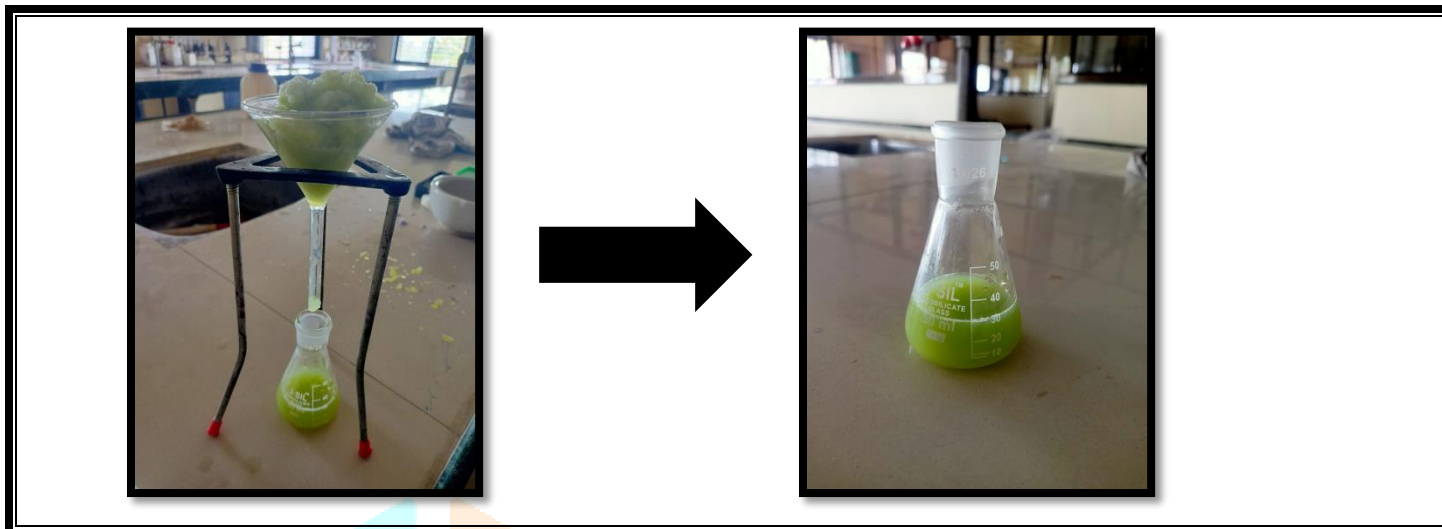


fig. Isolation of cucumber extract

Preparation of Aloe vera Gel:

1. Collect aloe vera leaves.
2. Wash & clean the fresh aloe vera leaves.
3. Cut the leaves into pieces & take out the pulp from them.
4. Now blend the pulp of aloe vera (foam appears) and wait till the foam disappears.
5. Take the small quantity of aloe vera gel which can be formed after blending and add xanthan gum, stir the mixture & keep it for 30 min to 1 hr for hydration.
6. After this add hydrated mixture into a whole aloe vera gel & leave it 4 to 5 hrs to set (put it in refrigerator)
7. Finally aloe vera gel was prepared.

Formulation of cream:

Sr no.	Ingredients	Batches		
		F1	F2	F3
1	Cucumber extract	10	7.5	5
2	Aloe vera gel	7	10	12
3	Coconut oil	3	3	3
4	Methyl paraben	1	1	1
5	Vitamin- E	q.s	q.s	q.s
6	Rose oil	q.s	q.s	q.s
7	Rose water	q.s	q.s	q.s

Preparation of cream:

1. The isolated cucumber extract & aloe vera gel was taken in mortar & pestle.
2. In another container coconut oil, & vitamin –E was taken & mix them.
3. Add this mixture drop-wise to cucumber aloe vera gel mixture & stirred vigorously.
4. Now separately take the measured amount of methyl paraben & add rose water as a quantity sufficient.
5. Add solution of methyl paraben & rose water into the cucumber aloe vera gel mixture & stir vigorously as no lumps were left.
6. Leave it for 10-20 mins to set, hence herbal face cream was prepared.

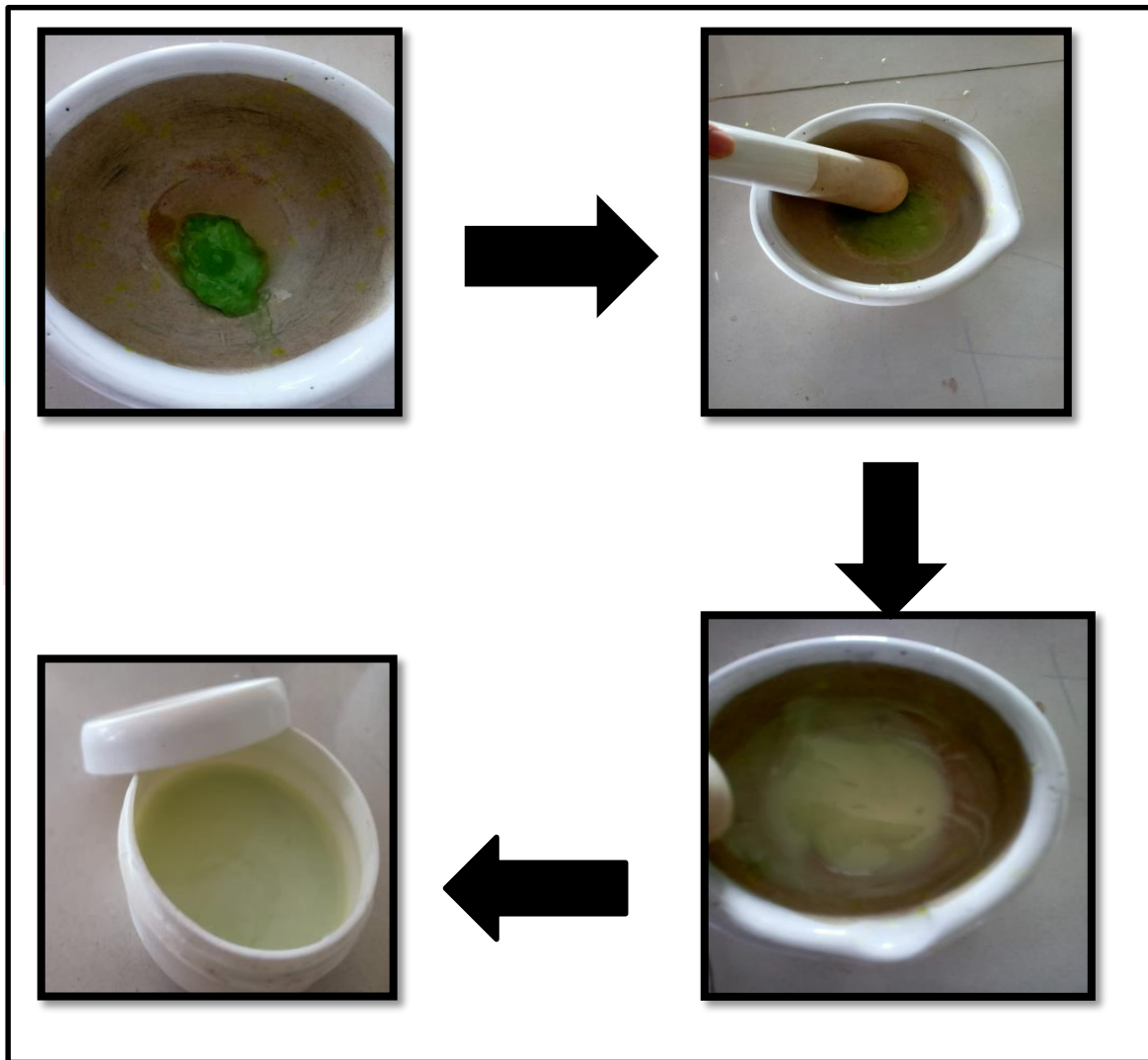


fig. formulation of herbal cream

Evaluation of Herbal Cream:

1. Organoleptic Evaluation

The face cream was evaluated for colour, odour & state. the appearance of the cream was judge by its colour & roughness & graded.

2. Determination of pH

The pH of sunscreen cream was determined by using digital pH meter. pH was measured after 1g of sample was dissolved in 100 ml of distilled water for 2hrs.

3. Determination of Viscosity

The viscosity of the cream was determined by using Brookfield viscometer with the proper numbers of spindles selected. A 50ml of beaker was used to hold the preparation until the spindle groove was dipped & the rpm was set. Sunscreen viscosity was measured at 50, 60 & 100rpm.

4. Irritancy test

On the dorsal surface of the left hand, mark a square centimeter. A certain amount of ready-made herbal cream was applied to the designated region, and the time was recorded. For full day irritability, redness and swelling were recorded and monitored at regular intervals.

5. Phytochemical evaluation:

The aqueous extract of the herbal sunscreen cream was evaluated for the presence of different phytoconstituents as per the standard procedures.

6. Spreadability

the spreadability of sunscreen cream was determined their therapeutic efficiency. The appropriate amount of sunscreen was applied between two slides, and under specified load directions, and the two sides took the time in seconds to slide off Spreadability was defined as the amount of time it took to separate two slides in less time. The formula for calculating it is

$$S=M \times Lt$$

Where,

M-weight tide to upper slide

L- length of glass slide

t- time taken to separate the slides

7. Homogeneity

The formulation was tested for homogeneity by visual appearance & touch.

8. Washability

This test is carried out by simply washing applied sunscreen cream with water.

6. Stability Studies

Stability testing of prepared formulation was conducted by storing at different temperature conditions for the period of one month. The packed glass vials of formulation stored at different temperature conditions like, room temperature and 40°C and were evaluated for physical parameters like color, odour, pH and Texture.

Result & Discussion:**1. Organoleptic evaluation:**

The herbal sunscreen cream evaluated for their morphological characteristics shown in the table.

Sr no.	Parameters	Observation		
		F1	F2	F3
1	Color	Light green	Light green	Light green
2	Odour	Decent	Decent	Decent
3	Appearance	Smooth	Smooth	Smooth
4	Texture	Fine	Fine	Fine
5	pH	5.8	5.9	6.1
6	Washability	Easily washable	Easily washable	Easily washable
7	Homogeneity	Homogenous	Homogenous	Homogenous

Table: Organoleptic evaluation of all formulations

2. Determination of Viscosity

Sr no.	Viscosity	Batches		
		B1	B2	B3
1	50	1821	1562	1067
2	60	1674	1891	1085
3	100	1367	1656	1056

Table: viscosity of herbal cream

Viscosity test was performed for formulations, from the observations batch F1 & F2 had slightly high viscosity & it is found that batch F3 has appropriate viscosity like cream.

3. Irritancy test:

The results of irritancy test were shown in Table. The formulation F3 showed absence of irritation, redness and swelling during irritancy studies. This formulation have safe to use on skin.

Sr.no.	Parameters	Observation		
		F1	F2	F3
1	Irritation	Yes	Nil	Nil
2	Redness	Nil	Yes	Nil
3	Swelling	Nil	Yes	Nil

4. Phytochemical evaluation:

The herbal sunscreen cream was evaluated for phytochemical parameters which are shown in the table

Sr no.	Test	Observation
1	Test for alkaloids Dragendroff's test	Moderately Present
2	Test for Tannins Ferric chloride test	Slightly present
3	Test for Glycosides Killer killani test	Highly present
4	Test for Saponins Foam test	Moderately Present
5	Test for steroids & triterpenoids Liebermann-Buchard test	Highly present

5. Spreadability

Sr no.	Test	Batches		
		B1	B2	B3
1	Spreadability	24.60±0.65	26.15±1.52	26.50±0.45

From the above observation batch F3 show desired spreadability than batch F1 & F2.

6. Stability Studies

The result of stability study of F3 formulation was shown in the table.

Sr no.	Parameters	Room temp.	40±0.5°C
1	Color	No change	No change
2	Odour	No change	No change
3	pH	6.2	6.1
4	Texture	Smooth	Smooth

Conclusion

From the above research study it was conclude that the formulation F3 shows the better results than the other formulations. Thus batch F3 can be used as sunscreen cream to protect the skin from UVR radiation & to avoid pigmentation & also for skin brightening. The batch F3 also shows the better results in irritancy & stability test than batch F1 & F2. So it can be conclude that the batch F3 sunscreen cream was more suitable than the other formulations as a sunscreen cream.

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