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Research Article

# Formulation And Evaluation Of Herbal Anti-Aging Cream Using Clerodendrum Infortunatum And Eclipta Prostrata

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## ABSTRACT

Herbal formulation is a dosage form consisting of one or more one fresh herbs of processed herbs in particular quantities to provide specific nutritional, cosmetic benefits and are meant for diagnose, treatment and mitigation of disease in human beings. Herbal anti-aging creams are semi-solid dosage forms in which natural ingredients are dispersed to reduce the production of free radicals in skin and manage skin properties for a very long time. It is used for achieving longevity of good health by reducing skin disorders like hyper pigmentation, skin aging, skin wrinkling and rough skin texture. The aim of the present work is to reveal the Pharmacognostic, phytochemical, anti-oxidant activity for the formulation and evaluation of herbal anti-aging cream. The required materials were collected from Kasaragod and subjected to maceration. Later, Pharmacognostic studies like microscopical evaluation, ash value and extractive value were carried out. The preliminary phytochemical studies were carried out using solvents like water and ethanol. Aqueous and ethanolic extract was used for the study of anti-oxidant activity.

## INTRODUCTION

Anti-aging cosmetics is the branch of cosmetics which deal with the removal of aging and wrinkle of the skin. They are predominantly moisturizer-based cosmeceutical skin care products which are marked with the promise of making the customer look younger by reducing, masking or preventing the signs of aging[1]. Herbal antiaging creams are semisolid dosage forms in which natural ingredients are dispersed to reduce the production of free

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radicals in skin and manage skin properties for a very long time. Herbs and plants are used for achieving longevity of good health by reducing skin disorders like hyper pigmentation, skin aging, skin wrinkling and rough skin texture. The synthetic or natural ingredients present helps in supporting health, texture and integrity of skin by maintaining its elasticity, anti-oxidant potential and photoprotection. The present work is to develop herbal anti-aging cream to be applied for treatment of skin aging and removal of wrinkle effect of skin. Herbal anti-aging cream is prepared by using potent medicinal plants such as Clerodendrum infortunatum and Eclipta prostrata(.L.). All of these plants have an effective antioxidant activity. By incorporating the leaf extract of Clerodendrum infortunatum and Eclipta prostrata, herbal anti-aging cream with antioxidant activity can be prepared. For evaluating the antioxidant activity, we use DPPH assay method.

## MATERIALS AND METHOD

### Collection of plant material

The fresh leaves of Clerodendrum infortunatum, Eclipta prostrata(.L.) were collected from Kasaragod district, Kerala(India)in the month of March 2024.

### Authentication of plant material

The plant material was collected from Kasaragod district, Kerala (India) in the month of March 2024.The plant material was identified and authenticated by Smitha K O, Assistant Professor, Horticulture Department, College of Agriculture, Padnnakkad, Kasaragod, Kerala.

### Extraction of plant material

**Extraction of Clerodendrum infortunatum, Eclipta prostrata was carried out separately by maceration.**

The freshly cleaned leaves of Clerodendrum infortunatum were air dried for 72 hours at room temperature and then ground into fine powder. 250 g of powder was extracted by maceration for 24 hours with 500 ml ethanol in a stoppered flask with occasional shaking at 25oC and filtered through whatmann filter paper No 1. Then the crude extract was evaporated to dryness. The extract was preserved after drying and stored at 4oC in air tight container until needed[2]. The freshly collected leaves of Eclipta prostrata were kept under running tap water and dried at room temperature. Then the material was ground into coarse powdered 50 gm of leaf powder was extracted by maceration in 250 ml water. After 72 hours leaf extract were filtered through whatmann filter paper No 1 and the solvent was evaporated. The extract were stored in air tight container until needed[3].

### Preliminary phytochemical screening

The extract of selected plants were subjected to preliminary phytochemical screening to detect various phytoconstituents like alkaloids, glycosides, flavonoids, saponins, tannins and phenolic compounds, carbohydrates, proteins and amino acids and fats and oil[4].

### Formulation of herbal anti-aging cream[5]

Herbal anti-aging cream were prepared by using the extract of Clerodendrum infortunatum and Eclipta prostrata, by incorporating it with other ingredients like stearic acid, cetyl alcohol, glycerin, methyl paraben, triethanol amine and water. Three different formulations were prepared by changing the concentration of ingredients of cream bases as shown in table 1.

**Procedure:**

a. Stearic acid and other oil soluble ingredients like cetyl alcohol,glycerin and triethanol amine
b. were dissolved in the oil phase and heated to 75oC.
c. Methyl paraben were dissolved in the aqueous phase and heated to 75oC.

d. After heating the aqueous phase was added in portions to the oil phase with continuous stirring.
e. When the cream base begins to cool, add the extracts to it and stir well until a smooth cream is obtained.

**EVALUATION OF HERBAL ANTI-AGING CREAM[6]**

**Physical evaluation**

The cream were evaluated manually for its colour, odour, texture and state.

**Irritancy**

1cm2 area were marked at the left hand dorsal surface. Then the cream was applied to that area and the time was noted. Then it is checked for irritancy, erythema and edema if any for an interval of upto 24 hrs and reported.

**Washability**

A small amount of cream was applied on the hand and it is then washed with tap water.

**PH**

0.5gm was taken and dispersed in 50ml distilled water and then PH was measured by using digital PH meter.

**Greasiness**

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like.

**Spreadability**

The spreadability was expressed in terms of time in seconds taken by two glass slides to slip from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides, better the spreadability.

$$S = m \times l/t$$

Where, S=Spreadability
m=Weight tied to the upper slide
l=Length of the glass slide
t=Time taken in sec

**INVITRO ANTIOXIDANT ACTIVITY**

**DPPH Assay method[7]**

The free RSA of the dilute leaf extracts was tested using a 1,1-diphenyl-2-picryl hydrazyl (DPPH) technique.

**Procedure:**

1. A total of 24 milligrams of DPPH were dissolved in 100 mL of methanol for making the stock solution.
2. In a test tube, 3 mL DPPH workable solutions were combined with 100 µL of leaf extract.
3. Three milliliters of solution containing DPPH in 100 µL of methanol is often given as a standard.
4. After that, the tubes were kept in complete darkness for 30 min.
5. The absorbance was therefore determined at 517 nm.
6. The following formula was used to compute the percentage of antioxidant activity.

$$\% \text{ of antioxidant activity} = [(Ac - As) \div Ac] \times 100$$

Where; Ac-Control reaction absorbance.
As-Testing specimen absorbance.

## RESULT AND DISCUSSION

**Extraction of plant material**

The extraction of dried leaves of Clerodendrum infortunatum and Eclipta prostrata were carried out by maceration process by using suitable solvent as shown in fig 1. The extracts obtained were collected and concentrated which is then weighed and kept in a desiccator until used for further studies.

**Preliminary phytochemical screening**

The plant leaves were macerated with different solvents and the extract thus obtained is subjected to preliminary phytochemical screening to detect various phytochemical constituents mentioned in table 2.

**Formulation of herbal anti-aging cream**

Herbal anti-aging cream were prepared as shown in fig 2.

**Physical evaluation**

The physical parameters such as state, colour, odour, texture was checked and the result is as given in table 3.

**Irritancy**

The formulation shows no irritancy.

**Washability**

The formation shows good washability.

**PH**

The PH of the prepared formulation was determined by using digital PH meter. The PH of the formulations are shown in table 4.

**Greasiness**

The formulations are non-greasy.

**Spreadability**

The spreadability of the formulation was evaluated and the result is shown in table 5.

**INVITRO ANTIOXIDANT ACTIVITY**

The antioxidant activity of the plant extract was done by DPPH free radical scavenging assay method. The antioxidant activity was calculated in terms of %inhibition which is shown in table 6 and using graph 1. The main aim of the study is to make herbal anti-aging cream by using medicinal plants such as Clerodendrum infortunatum and Eclipta prostrata(.L.). All of these plants have an effective anti-

**oxidant activity.**

The plant material was subjected to maceration process by using solvents like ethanol and water and then the extract was taken for preliminary phytochemical screening. From the result, ethanol gave more active constituents in case of Clerodendrum infortunatum and water gave more active constituents in case of Eclipta prostrata. The presence of major constituents such as flavonoid, phenolic compounds contribute to antioxidant activity which is beneficial for the anti-aging activity. The three different formulations of anti-aging cream containing leaf extract were prepared and the results revealed that the formulation F2 has better acceptability in terms of evaluation tests like PH and spreadability. The anti-aging activity was measured invitro by DPPH free radical scavenging assay and then the percentage inhibition was calculated. From this results, the cream was considered to be effective for the treatment of aging of skin.

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**Table 1 : Formulation Of Herbal Anti-Aging Cream**

| INGREDIENTS | F1 | F2 | F3 |
|---|---|---|---|
| Clerodendrum infortnatum extract | 2.5 | 2.5 | 2.5 |
| Eclipta prostrata extract | 1.5 | 1.5 | 1.5 |
| Stearic acid | 13 | 11 | 10 |
| Cetyl alcohol | 2 | 4 | 3 |
| Glycerin | 3 | 3 | 3 |
| Methyl paraben | 0.02 | 0.02 | 0.02 |
| Triethanol amine | Q S | Q S | Q S |

Preparing the cream using same quantity of each extracts and by varying the quantity of the cream base.

**Table 2 : Preliminary Phytochemical Screening**

| Sl. No. | Chemical constituents | Clerodendrum infortunatum (Ethanol extract) | Eclipta prostrata(Water extract) |
|---|---|---|---|
| 1 | Carbohydrate | + | + |
| 2 | Proteins | - | + |
| 3 | Glycosides | - | + |
| 4 | Alkaloids | - | + |
| 5 | Tannins | + | + |
| 6 | Saponins | + | + |
| 7 | Flavonoids | + | + |
| 8 | Fats and oils | - | - |

Each plant extracts are taken for phytochemical screening. The sign "-" means absence and "+" means presence of the particular phytochemicals.

**Table 3 : Physical Parameter**

| SI. No. | Specification | F1 | F2 | F3 |
|---|---|---|---|---|
| 1 | State | Semi solid | Semi solid | Semi solid |
| 2 | colour | Pale green | Pale green | Pale green |
| 3 | odour | characteristic | characteristic | characteristic |
| 4 | texture | smooth | smooth | smooth |

State, colour, odour and texture of three formulations.

**Table 4 : Ph Of The Formulation**

| Sl. No. | Formulations | $P^H$ |
|---|---|---|
| 1 | F1 | 6.1 |
| 2 | F2 | 5.48 |
| 3 | F3 | 5.9 |

PH of the formulation using PH meter.

**Table 5 : Spreadability Of The Formulation**

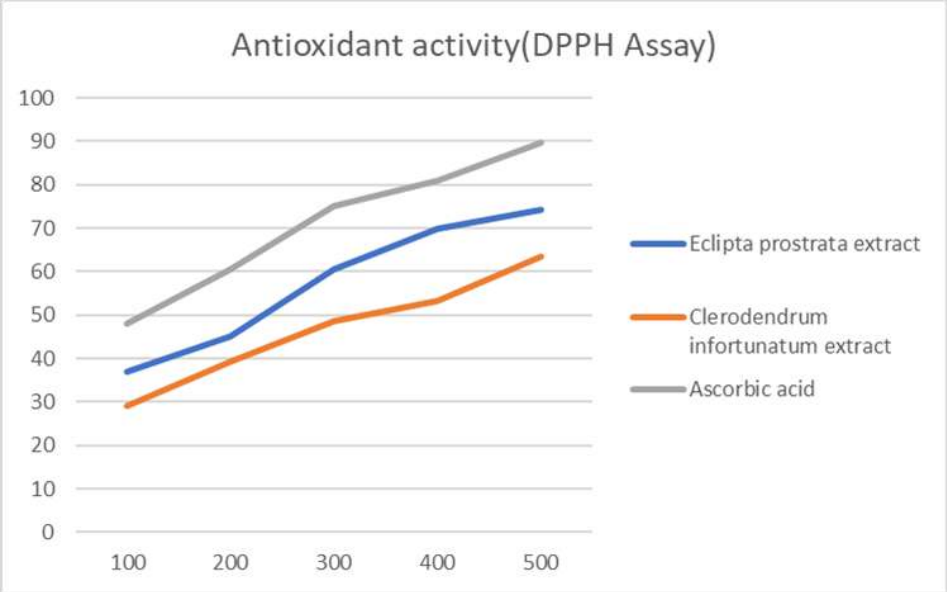
| Sl. No. | Formulation | Spreadability (g.cm/sec) |
|---|---|---|
| 1 | F1 | 30 |
| 2 | F2 | 28 |
| 3 | F3 | 25 |

The spreadability of three formulations were determined by using glass slides and the values are obtained by using the equation.

**Table 6 : Invitro Antioxidant Activity**

| Groups | Concentration (µm/ml) | Absorbance at 517nm | %Inhibition |
|---|---|---|---|
| Control | - | 0.1366 | - |
| Eclipta prostrata extract | 100 | 0.086 | 37.04 |
| | 200 | 0.075 | 45.09 |
| | 300 | 0.054 | 60.46 |
| | 400 | 0.041 | 69.98 |
| | 500 | 0.035 | 74.37 |
| Clerodendrum infortunatum extract | 100 | 0.097 | 28.98 |
| | 200 | 0.086 | 39.23 |
| | 300 | 0.070 | 48.75 |
| | 400 | 0.064 | 53.14 |
| | 500 | 0.050 | 63.39 |
| Ascorbic acid | 100 | 0.071 | 48.02 |
| | 200 | 0.054 | 60.46 |
| | 300 | 0.034 | 75.10 |
| | 400 | 0.026 | 80.96 |
| | 500 | 0.014 | 89.75 |

The antioxidant activity of each plant extract were determined by DPPH assay method, using Ascorbic acid as standard and methanol as blank at 517nm in UV spectrophotometer.




**Graph 1 : Antioxidant activity**

Antioxidant activity of both the extracts and ascorbic acid (standard) were compared.

**Fig 1 : Extracts of leaves**

Leaves of each plant were extracted by maceration using different solvents.

**Fig 2 : Formulation of herbal anti-aging cream**

**Tables and figure titles and legend :**

TABLE 1 : FORMULATION OF HERBAL ANTI-AGING CREAM

Here the ingredients used for preparing the herbal anti-aging cream were taken in an appropriate quantity.

TABLE 2 : PRELIMINARY PHYTOCHEMICAL SCREENING

Each plant extracts are taken for phytochemical screening. The sign "-" means absence and "+" means presence of the particular phytochemicals.

TABLE 3 : PHYSICAL PARAMETER

State, colour, odour and texture of three formulations.

TABLE 4 : $P^H$ OF THE FORMULATION

$P^H$ of the formulation using $P^H$ meter.

TABLE 5 : SPREADABILITY OF THE FORMULATION

The spreadability of three formulations were determined by using glass slides and the values are obtained by using the equation.

TABLE 6 : INVITRO ANTIOXIDANT ACTIVITY

The antioxidant activity of each plant extract were determined by DPPH assay method, using Ascorbic acid as standard and methanol as blank at 517nm in UV spectrophotometer.

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