

Formulation and Evaluation of Herbal Cream for Acne Treatment Using Extracts of Green Tea and Eclipta Alba

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ABSTRACT: Acne Vulgaris is a chronic inflammatory skin disorder, particularly during adolescence and young adulthood. Acne characterized by whiteheads, blackheads, pimples, papules. Acne occurs due to excess sebum production, excessive deposition of protein keratin, colonization of follicle by Propionibacterium acne and due to release of local pro-inflammatory chemicals. This review highlights the result of research aimed at assessing the anti-bacterial, anti-inflammatory and anti-oxidant effects of Green tea (Camellia sinensis) and false daisy (Eclipta alba). The study discusses about the anti-bacterial study against Staphylococcus aureus, anti-inflammatory and anti-oxidant effects of these medicinal plants and also studied physico-chemical characteristics of prepared herbal cream for acne treatment.

KEYWORDS: Anti-bacterial, Anti-inflammatory, Anti-oxidant, herbal cream, Green tea, Eclipta alba.

I. INTRODUCTION:

Cosmetics are derived from the Greek word 'cosmetics' which means to adorn. Cosmetics are defined as substance that used in several parts of body and body cavities. (1). Herbal cosmetics are referred as products formulated using various cosmetic ingredients to from the base in which one

or more herbal ingredients are used to provide a cosmetic benefit.

Creams are defined as a semisolid dosage form for topical application which contains one or more drug substance dissolved or dispersed in a suitable base. Creams are versatile skin care preparations designed to hydrate, nourish, beautify and to protect the skin. Creams are formulated in wide range of formulations depend up on concern. Generally creams are classified in to oil in water type and water in oil type creams.(2).

Acne Vulgaris, a chronic inflammatory skin disorder particularly occurs during adolescence and young adulthood. Acne characterized by whiteheads, blackheads, pimples, pustules, papules. Acne occurs due to blockage of skin's hair follicle. Acne occurs due to four abnormal process.

- By excessive sebum production.
- By colonization of hair follicle by Propionibacterium acne.
- Excessive deposition of protein keratin.
- The local release of pro-inflammatory chemicals.

Conventional treatment of acne involves synthetic chemicals which can lead to adverse effects, resistance and relapse.(3).

II. MATERIALS AND METHODS:

INGREDIENTS	PART	USE
Green tea	Leaf	Provides Anti-bacterial, Anti-inflammatory and Anti-oxidant effects.
False daisy	Leaf	Provides Anti-bacterial, Anti-inflammatory effects.

Significance of Ingredients:

SL.NO	INGREDIENTS	ACTIVITY
1	Stearic acid	Emulsifier
2	Bees wax white	Emulsifier
3	Almond oil	Humectants
4	Glycerin	Humectants

5	Water	Vehicle
6	Potassium hydroxide	pH modifier
7	Castor oil	Anti-inflammatory
8	Salicylic acid	Anti-inflammatory
9	Green tea extract	API
10	Eclipta alba extract	API
11	Phenoxyethanol	Preservative
12	Rose oil	Perfuming agent

III. FORMULATION:

SL.NO	INGREDIENTS	REQUIRED QUANTITY
1	Stearic acid	1gm
2	Bees wax white	1gm
3	Almond oil	3.2gm
4	Glycerin	0.5gm
5	Water	11.2ml
6	Potassium hydroxide	0.2gm
7	Castor oil	0.6gm
8	Salicylic acid	0.2gm
9	Green tea extract	2gm
10	Eclipta alba extract	0.03gm
11	Phenoxyethanol	0.1gm
12	Rose oil	2 drops

IV. MATERIALS COLLECTION:

Green tee (*Camellia sinensis*) and false daisy (*Eclipta alba*) were collected from different regions which exhibit anti-bacterial, anti-inflammatory and anti-oxidant effects.

PREPARATION:

1. Collection and drying of green tea leaves and *Eclipta alba* leaves.
2. collection of other excipients.
3. defatting of green tea leaves.
4. extraction of leaves by Maceration method.
5. formulation of herbal cream for acne treatment.
6. evaluation of prepared herbal cream for acne treatment.
7. packing and storage of prepared herbal cream.

V. EVALUATION:

The evaluation of prepared herbal cream are as follows:

➤ Organoleptic properties:

Organoleptic properties include evaluation of herbal cream based on properties like color, odor and texture.

➤ Physiochemical evaluation:

- Determination of homogeneity: The test aims to determine the homogeneity of prepared herbal cream by appearance and touch.

- Spreadability test: 500mg of prepared herbal cream was sandwiched between two slides. A weight of 200gm placed on upper slide. The time taken by the upper slide to slip off was calculated.
- Smoothness test: the test aims to determine the smoothness of prepared herbal cream by touch factor.
- Washability test: A minimal amount of prepared herbal cream applied and washed under tap water to remove the cream.
- pH: pH of the formulation was tested using a digital pH meter.
- In-vitro evaluation:
 - Anti-bacterial test: Agar well diffusion method.

The anti-bacterial activity of sample was tested against *Staphylococcus aureus*. Overnight grown bacterial cultures were evenly spread on Muller Hinton agar plates using sterile swabs. The experiment is conducted by agar well diffusion method, with the addition of sample in 4 different amounts T1=25%, T2=50%, T3=80% and positive control incubated at 37°C. the size of inhibition zone indicated the anti-bacterial property of the sample.

• Anti-inflammatory test: HRBC method

To assess the anti-inflammatory effect, 1ml of HRBC suspension was mixed with an equal volume of plant extracts at four different concentrations such as 2.5, 5, 7.5, 10mg/ml. diclofenac sodium used as standard. The assay mixtures were incubated at 56 C for 30 minutes to induce stabilization of HRBC membranes. After incubation the assay mixtures centrifuged at 3000rpm to separate intact RBC from supernatant solution. The absorbance of solution was measured at 560nm using a spectrophotometer.

• Anti-oxidant test: DPPH assay method

Standard preparation: weighing 4.3mg of DPPH in a 100ml volumetric flask sonicate and make up the volume to the mark with methanol.

Sample preparation:

- Weighed about 250gm of sample prepared in 100ml methanol.
- 2ml DPPH + 1ml methanol + 1ml sample.
- 2ml DPPH + 0.5ml methanol + 1.5ml sample.
- 2ml DPPH + 0ml methanol + 2 ml sample.

The reaction mixture incubated at 37 C and measured at 516nm.

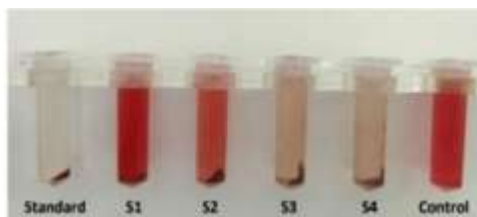
VI. OBSERVATION:

SL.NO	PARAMETERS	OBSERVATION
1	Color	Chocolate brown
2	Odor	Pleasant
3	texture	Uniform
4	Determination of homogeneity	Uniform
5	Smoothness test	Good
6	Washability test	Good
7	Spreadability test	Good
8	pH	5.0

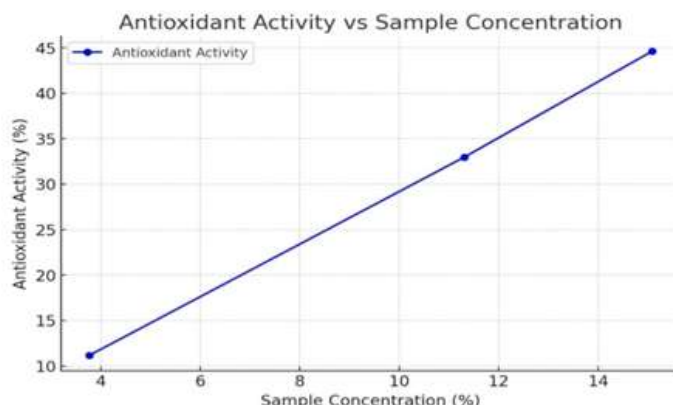
Anti-bacterial test:



Anti-inflammatory test:



Anti-oxidant test:



VII. CONCLUSION:

The herbal cream for acne demonstrated anti-bacterial activity against *Staphylococcus aureus* under tested conditions, as inhibition zones were observed. The sample also exhibits a notable anti-inflammatory activity in the HRBC assay. The percentage membrane protection increased with concentration of the sample, reaching 73.418% at 10mg/ml, compared to 81.646% for the standard. The sample also exhibits a good anti-oxidant activity also. This suggest that sample shows good anti-bacterial, anti-inflammatory and anti-oxidant properties.

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