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To formulate and evaluate lantana camara leaves extract infused anti-acne cream

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❖ **ABSTRACT**

Plant-based knowledge in medicine has a long history in India. Known to treat a number of illnesses, lantana camara is utilized in many traditional medical formulations. Formulating and testing an anti-acne cream with Lantana camara leaf extract—a plant with antimicrobial and anti-inflammatory qualities is the goal of this study. Using conventional phytochemical extraction techniques, the extract was produced and added to a cream base at different concentrations. The formulations' physical attributes, pH, stability, spreadability, and antibacterial efficacy against the organism that causes acne, Staphylococcus aureus, were evaluated. The cream with Lantana camara extract at a concentration of 2% in the first batch was shown to have antibacterial and anti-inflammatory properties, making it a safe and effective beginning concentration. 3% is the concentration of the second batch, which is still safe and has a more potent antibacterial and anti-inflammatory effect. 4% formulation contain was found to have a high antibacterial and anti-inflammatory power while remaining within a generally safe dermal limit. Additionally, the concentration demonstrated a better anti-acne effect, significant antibacterial activity, good physicochemical stability, and favorable skin compatibility.

The aforementioned results underscore the potential of Lantana camara leaf extract as a natural and efficacious acne treatment approach. Certain evaluation tests are carried out to determine whether a cream is appropriate for human skin and whether it irritates the skin after application.

Keywords- Lantana camara Linn., hepatotoxicity, Staphylococcas aureus, E. coli, Ethanolic extract, antibacterial cream

1.Introduction:

1.1 LANTANA CAMARA

The vivid and adaptable plant Lantana camara, also referred to as lantana, is indigenous to the tropical and subtropical regions of the Americas. Known for its vibrant and robust blooms, lantana is widely employed in landscapes and gardens due to its hardiness and visual appeal. Clusters of tiny, tubular blooms in a variety of colors, including as red, orange, yellow, and pink, are produced by the plant; they typically undergo color changes as they grow. Beyond its aesthetic appeal, Lantana camara has drawn interest because to its ecological impact and possible medical uses. Despite being praised for drawing pollinators and butterflies, it can also be invasive in some areas, reducing biodiversity in the area.

Exploring Lantana camara's horticultural applications, ecological relevance, and the measures required to control its spread are all important parts of comprehending its complexnature [1]. Pruritus, often known as itching, is an uncomfortable feeling that makes people scratch, which may temporarily relieve the discomfort but may also aggravate it or harm the skin. Rashes or hives may cause itching, which can be localized or widespread. Itching sets off a scratch response, whereas pain typically results in a withdrawal reflex, despite the fact that both include unpleasant sensations and unmyelinated nerve fibers in the skin. Common reasons of itching include pregnancy, allergens, parasites, skin disorders, allergies, and underlying medical illnesses such as thyroid, kidney, or liver ailments. Treatment options vary from self-care measures, such as avoiding allergens and using moisturizers, to medical intervention for persistent or severe cases [2]

LANTANA CAMARA

Figure No 1: Lantana Camara

Cream:

Pharmaceutical creams are semisolid formulations that comprise one or more pharmaceutical ingredients dissolved or distributed in an oil-in-water (O/W) emulsion, water-in-oil (W/O) emulsion, or another kind of water-washable base. The oil-in-water emulsions known as "vanishing creams" have high proportions of water and stearic acid or other oleaginous substances.

When the cream is applied, the water evaporates, leaving a thin layer of stearic acid or other oleaginous substances behind. The main uses for creams are in topical skin care products and those that touch mucous membranes, such those found in the rectum and vagina. Due to their ease of application and removal, creams are preferred by many patients and doctors over ointments. To meet patient and physician preferences, pharmaceutical companies often produce topical medicine compositions in both cream and ointment bases.[3]

A vanishing cream is an example of an O/W cream, while cold cream is an example of a W/O cream. Creams are often soft and spreadable. Since an emulsion with an aqueous external continuous phase (O/W) is easier to remove than one with a nonaqueous external phase (W/O emulsion), creams are typically classified as either non-washable or washable.[4]

Preparation of cream:

A range of mineral and vegetable oils, as well as fatty alcohols, fatty acids, and fatty esters, can be used to make creams. During the preparation process, the solid excipients are melted. Soaps, detergents, and non-ionic surfactants are examples of emulsifying agents. When making creams, a base dissolved in the aqueous phase hydrolyzes a fatty acid in the oil phase to generate soaps.Separating the formula's components into lipid and aqueous sections is typically part of the preparation process. All water-insoluble components are found in the lipid section, while the water-soluble components are found in the aqueous portion.[5]The filtrate, or water phase, was placed in a beaker and gradually heated to about 70°C. The components for the emollient phase were added to a different beaker and heated gradually until they melted. The water phase was gradually added to the oil phase while being constantly stirred once both phases had reached around the same temperature. The liquid was stirred until it emulsified and began to thicken. After allowing the mixture to cool to between 40 and 45°C, humectant, preservatives, and fragrance were added. To make sure that everything was dispersed evenly, the mixture was thoroughly mixed once again. Before sealing, the cream was allowed to cool fully in a sterile wide-mouth container.[6]

Advantages

Latana Camara Anti-Acne Cream offers several potential advantages for individuals dealing with acne-prone skin:

1. Helps Reduce Acne & Blemishes

- Formulated to target pimples, blackheads, and whiteheads.
- May contain antibacterial properties to fight acne-causing bacteria.

2. Controls Oil Production

- Helps regulate excess sebum, reducing the chances of clogged pores.
- Provides a mattifying effect for oily skin types.

3. Soothes Inflammation & Redness

- Contains ingredients that calm irritated skin and reduce redness.
- May help in faster healing of acne lesions.

4. Prevents Acne Scarring

- Aims to fade acne marks and hyperpigmentation over time.
- Promotes smoother and clearer skin.

5. Hydrates Without Clogging Pores

- Provides lightweight moisture suitable for acne-prone skin.
- Non-comedogenic, meaning it won't block pores.

6. Can Be Used Daily

- Gentle enough for regular use as part of a skincare routine.
- May work well under makeup or sunscreen.

- **Disadvantages**

1. May Cause Dryness or Peeling

- Some acne-fighting ingredients, like salicylic acid or benzoyl peroxide, can lead to dry or flaky skin.
- Requires proper moisturizing to prevent excessive dryness.

2. Possible Skin Irritation

- Sensitive skin types may experience redness, itching, or a burning sensation.
- Patch testing is recommended before full application.

3. Not Suitable for All Skin Types

- While effective for oily and acne-prone skin, it may be too strong for dry or extremely sensitive skin.

4. Might Take Time to Show Results

- Acne treatments often take weeks to show noticeable improvements.
- Some users may not see immediate effects.

5. Potential for Allergic Reactions

- Certain ingredients may trigger allergic responses in some individuals.
- Checking the ingredient list is essential for those with known allergies.

6. Could Lead to Increased Sun Sensitivity

- Some acne-fighting ingredients can make the skin more sensitive to sunlight.

- Daily use of sunscreen is necessary to prevent sunburn or pigmentation.

❖ Review of literature:

Pandit Deepika is the author of the formulation and characterization of an antibacterial cream using leaf extract from Lantana camara.

The purpose of the study was to assess the antibacterial activity of the plant Lantana camara leaves' ethanolic extract against E. coli and Staphylococcus aureus species. The physical and antibacterial qualities of the herbal antibacterial cream are also assessed in order to create a stable and effective product Methods: A reference disk of antibiotics was used to evaluate the antibacterial activity of the ethanolic extract using the disk diffusion method. A certain amount of the herbal extract was combined with varying amounts of other substances to create the antibacterial cream.

Formulation and Evaluation of Herbal Cream Using *Lantana camara* Plant; Author: Praveen Rathod;

Stability tests, irritancy tests, and physicochemical evaluations were performed on the developed cream. The lotion contains methyl paraben to stop microbiological contamination, neem to cool irritated skin and control oil production, and Lantana camara leaves for their anti-itching and antifungal qualities. According to the study, the itching cream's F2 formulation had good physical characteristics and didn't irritate the skin.

A REVIEW OF THERAPEUTIC PROPERTIES OF LANTANA CAMARA; Author: Mohd Zeeshan;

The created formulation's physicochemical analysis revealed no lumps, a consistent color dispersion, and no fiber or particle. It was also noted to have high spreadability and ease of washing. The disc diffusion method was used to test the antibacterial activities of Lantana Camara. The antibacterial analysis of the developed formulation demonstrated inhibitory action against Staphylococcus aureus and Staphylococcus epidermis at the dose/concentration suggested.

A COMPREHENSIVE REVIEW OF *LANTANA CAMARA* AND ITS DIVERSE PHARMACOLOGICAL EFFECTS; Author: Jagdish Atmaram Waghmare

Because of its many pharmacological qualities, Lantana camara, a perennial shrub belonging to the Verbenaceae family, has attracted a lot of interest. The Indian System of Medicine is among the many medical systems that have long utilized this plant, which is known for its possible antipyretic, antispasmodic, and anti-inflammatory properties. Examining Lantana camara's morphology, location, and phytochemical makeup, this thorough review highlights the plant's medicinal uses as well as the processes that underlie its pharmacological effects.

PHYTOCHEMICAL AND MEDICINAL STUDY OF LANTANA CAMARA LINN. (VERBENACEAE); Author: LALITA BATTASE ;

There are numerous more phytoconstituents in the plant, including terpenoids, alkaloids, glycosides, saponins, steroids, sugars, flavonoids, and coumarins. Its pharmacological actions include anti-inflammatory, analgesic, anti-cancer, antitubercular, antimicrobial, antibacterial, antifungal, antiulcerogenic, anthelmintic, anti-hyperglycemic, and antioxidant properties. It also has larvicidal effects on mosquitoes. Seventy-two papers were cited in this review article, which was prepared by analyzing numerous research and review articles from 1956 to March 2021. In this article, the several phytochemicals found in L. camara were reviewed.

❖ Material and method:

Materials for Extraction:

● Chemicals and extract:

Extract Of Lanatna Camara

Ethanol

Water

Appratus:

Soxhlet Appratus

Beaker

Filter Paper

Collection of extract:

FIG 2: LANTANA CAMARA EXTRACT

EXTRACTION BY SOXHLET APPRATUS:

• Using the Extraction Soxhlet Apparatus technique, lantana Camara powder was extracted. In an RBF, 20g of coarsely ground Lantana Camara powder was mixed with 100ml of ethanol. The mixture was then heated in a water bath to 100°C for three hours. The filtrate was then collected in a different beaker after passing through filter paper.

FIG 3: EXTRACTION

FIG 4: Filtrate

Formulation preparation:

The Anti-Ance cream was prepared using following constituents:

Sr. No.	Ingredients	Use	Components (For 100 gm)
1	Glycerin	Humactant	6 gm
2	Cetyl alcohol	Stabilising Agent	1 gm
3	Mineral Oil	Emollient	5 gm
4	Propyleneglycol	Emulsifier	2 gm
5	Petrolium Jelly	Lubricant	2 gm
6	Triethanolamine	Emulsifier	1.5 gm
7	Propyl Paraben	Preservative	0.15 gm
8	Steric Acid	Thickning Agent, Emulsifing Agent	11 gm
9	Methyl Paraben	Preservative	0.15gm
10	Lactic Acid	Anti Acne Agent	0.15 gm
11	Purified Water	Vehicle	63 gm
12	Lantana Camara Extract	Active ingredient	4 gm
13	Orange peel Extract	Active ingredient	4 gm
14	Perfume	Fregrance	q. s

❖ **Method of preparation**:

1)1) All of the equipment needs to be thoroughly cleaned and washed.

2)2)The ingredients for the oil phase are combined in one beaker, while the ingredients for the water phase are combined in another.

1)3)The temperatures in both procedures range from 70 to 75 °C.

2)4)The heating components are continually stirred.

3)5)Carefully record the heated material's temperature.

1)6)The heating is stopped and the combination is well stirred when the material reaches a temperature of more than 70°C.

2)7)Combine the Water and Oil phases, then pour the resulting mixture into the mortar.

1)8)Only one direction should be used for the trituration when adding essential ingredients like mineral oil and orange peel extract.

2)9)The colour and perfume are added to the product when the temperature is 45°C.

10)Prepare the product, fill the container with it, and label it. suitable container, label the container

❖ **Determination of evaluation parameter:**

Evaluation of anti acne cream was done as follows-

Physical evaluation:

The odor, color, consistency, and status of the cream were the physical evaluation factors used to assess it.

a) **Color:** The cream's color was determined through visual inspection. Table displays the outcome.

Fig : Colour

b) **Odor:** It was discovered that cream has a distinctive smell.

C) **State:** A visual examination of the cream state was conducted. Table displays the cream's semi-solid-state outcome.

Fig : State

D) Consistency: By manually rubbing cream on the hand, the formulation was evaluated. The consistency of the cream is smooth.

Fig : Consistency

e) ph: ph of prepared herbal cream was measured by using digital ph meter. The solution of cream was prepared by using 100 ml of Distilled water and set aside 2h. ph was determined in three times for solution and the average value was calculated. Results were shown in following table .

Fig : pH

f) Wash ability: formulation was applied on the skin and then ease extends of washing with water was checked. Results were shown in following table .

g) Phase separation: A suitable wide mouth container was used to transfer the manufactured cream. The oil phase and aqueous phase separation were not visible after 24 hours and when set aside for storage. followimg Table displayed the results.

Fig : Phase separation

h) Spread ability: The amount of time it took for two slides to separate from the cream lying between them under a particular stress was used to calculate the spread ability. Slides speed up the time it takes for the two to separate spread ability. Two standard-sized glass slides were captured. A suitable-sized slide was then used to display the cream formulation. After that, the formulation was placed over the other slide. In order to push the cream uniformly and thinly in the area between the two slides, a weight or other particular force was then applied to the upper slide. After the weight was removed, any excess formulation that had adhered to the slides was scraped off. Spread ability = m x l/t

In this,

m= standard weight which is placed on the upper slide

l=length of glass slide

t= time taken in seconds

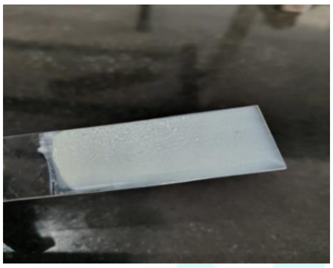

Fig : Spread ability

i) Test for non-irritancy: Mark a 1 square centimeter region on the dorsal surface of the left hand. The designated area was covered with the cream, and the time was recorded. We monitored and reported any erythema, edema, or irritability at regular intervals for up to 24 hours.

Fig : Non-irritancy test

j) After feel: It was determined that there was a good degree of residue and emolliency slipperiness following the application of the prescribed amount of cream.

Fig : After feel

h) Container Filling :

- **Result and discussion:**

Antimicrobial assay

Three concentrations of lantana camara extract i.e. 10 microgram, 20 microgram and 30 microgram were prepared and their activity was checked against staphylococcus aureus bacteria.30 microgram concentration showed maximum zone of inhibition followed by 20 microgram and the least was 10 micrograms. It was noted that as the concentration of extract increased, zone of inhibition was also increased.3 batches of cream with varying quantity of lantana camara extract, each containing 1 gm, 1.5 gm and 2 gm were prepared. Activity of these three batches against staphylococcus aureus was checked and it was observed that maximum zone of inhibition was shown by formulation containing 2 gm of extract followed by 1.5 gm followed by 1 gm of lantana camara extract. Based on this determination the final formulation was chosen having the maximum activity against staphylococcus aureus i.e., formulation containing 2 gm extract and further post evaluation tests are carried on this formulation.

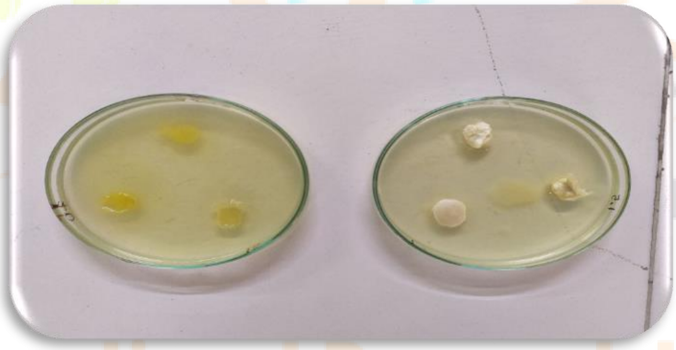

Fig : Microbial assay of extract and formulation (0 hr)

Fig : Microbial assay of extract and formulation (24 hrs)

❖ **Result of evaluation parameter:**

Table : Evaluation parameter

Sr no	Parameters	Results
1.	Colour	White colour
2.	Odour	Characteristic
3.	State	Semi-solid
4.	Consistency	Smooth
5.	pH	5.58
6.	Wash ability	Easily washable
7.	Phase separation	No phase separation
8.	Spread ability	6g.cm/sec
9.	Non-irritancy	Non-irritant
10.	After feel	Emollient

This study focused on creating and assessing a sunscreen cream with lantana camara extract. Findings under the evaluation parameters included the Table details the physical assessment, pH, spread ability, wash ability, non-irritancy test, viscosity, and phase separation..[7,13]

❖ Conclusion

The globe is shifting towards the traditional use of safer, natural products. In the current study, a formulation of herbal anti-acne face cream that contains a combination of anti-inflammatory herbal plant material that is useful for preventing acne formation is evaluated. This mixture, which combines herbal components with oil- and water-based materials, is extremely environmentally friendly.

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