

FORMULATION AND EVALUATION OF HERBAL ANTI ACNE CREAM

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ABSTRACT

Acne is a common skin disorder predominantly found in adolescents and young adults and has considerable psychosocial effects. Conventional treatments, including benzoyl peroxide, retinoids, and antibiotics, often involve side effects, such as skin irritation, dryness, and the risk of developing bacterial resistance. Such limitations have led to a growing shift toward using herbal treatments, which are perceived to be safer and more sustainable. Herbal formulations which harness the cumulative therapeutic effects of many traditional healers over time provide a rational multi-targeted approach to acne treatment. Herbal formulations have a wide range of pharmacological activities that include antimicrobial, anti-inflammatory, antioxidant, and regulating sebum activity. Discusses the pathophysiology of acne, the traditional

mechanisms of action of Herbal creams, and features herbs commonly used in Herbal preparations for acne treatment such as aloe vera, honey, moringa oleifera. In addition, various formulation and evaluation parameters, and the opportunity for Herbal systems, will be discussed. Future challenges, including standardization and regulatory factors, will be highlighted and future directions, including the importance of clinical trials as well as a discussion around using nanotechnology, will be provided.

KEYWORDS: Herbal Formulation, Acne Vulgaris, Herbal Cream, Anti-inflammatory, Antibacterial, Synergy, Standardization.

1. INTRODUCTION

Acne is a common skin condition characterized by the occurrence of comedones, blackheads, and whiteheads, pimples, and sometimes cysts or nodules. It occurs when the pores on the skin become clogged with dead skin cells, oil, and bacteria. Cream is defined as semisolid which are oil in water (o/w) or water in oil (w/o) type and these semisolid emulsions are intended for the external application. Cream is classified as oil in water and water in oil emulsion. It is applied on outer part or superficial part of the skin and its main ability is to remain for a longer period of time at the site of application. The function of the cream is to protect the skin against different environmental conditions and give soothing effect to skin and treat any infection as well as tan and acne.^[1]

There are different types of creams like cleansing, cold, foundation, vanishing, massage, hand and body cream. The main aim of our work is to develop herbal cream which can give effect like reduce acne and skin irritation, wrinkles and also adding glow to the skin. Acne is a disturbing issue especially for teenagers and adolescence according to global statistics approximately 85% of population will suffer this skin issue at age around 12-25 years, nearly 8% adult at age 23-24 years old and only 3% of adult having acne at age 35-44 years old.

Propionibacterium acne and *Staphylococcus aureus* were responsible for acne since the presence of this bacterium in the sample isolated from acne patient at the same time, the increasing number of resistance of acne-inducing bacteria towards the antibiotic is a worrisome problem. The interest of consumer towards the natural bioactive compound has a functional ingredient in the cosmetic product has arisen due to their various health beneficial effect.^[2]

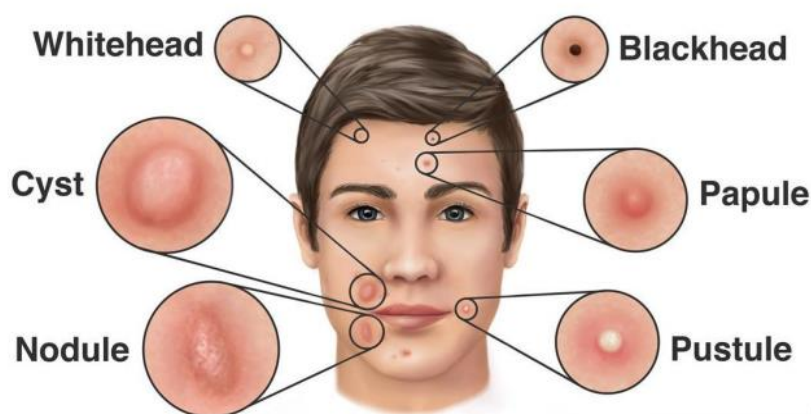


Figure No.01 Different Types of Acne.

A herbal anti-acne cream is a topical skincare product formulated with natural ingredients derived from plants-based ingredients, herbs, and botanicals extracts. These creams aim to Reduce acne and pimples, Soothe and calm the skin, Prevent future breakouts, Improve skin texture and appearance These creams typically avoid harsh chemicals, artificial fragrances, and dyes, making them a popular choice for those seeking natural skincare solutions.^[3]

CAUSES OF ACNE^[4]

Acne is caused by overactive sebaceous glands, dead skin cells clogging pores, and bacteria. Hormones, diet, and certain medications can influence acne development. Bacteria live in the pores present on the face, which multiply when excess secretion oil from oil glands occur, which causes inflammation and redness.

- Hormonal Fluctuations
- Genetics
- Bacteria
- Emotional Stress
- Poor skin routine
- Overactive oil gland
- Medication
- Menstruation

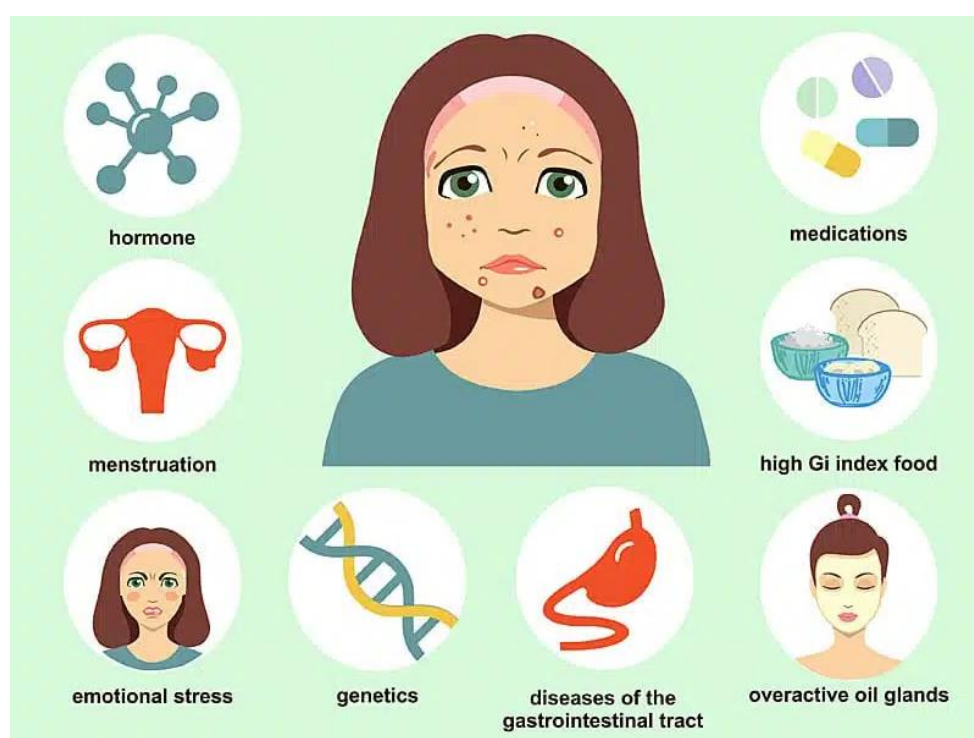


Figure No.02 Causes of ACNE.

SYMPTOMS OF ACNE ON YOUR SKIN INCLUDE

- Pimple
- Papules
- Blackheads
- Whiteheads
- Nodules
- Cysts

1. Pimple

Pimples are a common skin condition caused by clogged or inflamed oil glands or an increased presence of pimple-causing bacteria on your skin. They're a symptom of acne, and there are many different types, including blackheads, whiteheads, cysts and others. Treatments include home remedies and over-the-counter and prescription pills and gels.



Figure No.03 Pimple.

2. Papules

A papule is a small red bump. Its diameter is usually less than 5 milli meters (about 1/5 of an inch). Papules don't have a yellow or white center of pus. When a papule does accumulate pus, it becomes a pustule. Most papules become pustules. This process commonly takes a few days. While tempting, it's recommended to not pop pustules. Doing so can risk bacteria spreading further as well as scarring.



Figure No. 04 Papules.

3. Blackheads

Blackheads are formed by the accumulation of skin debris, bacteria and oil in the opening of a pore. When exposed to air, the Melanin in the oily substance turns dark because of the oxidization process, giving blackheads their name. Blackheads are said to be the first stage of acne, and they might also develop into a pimple. Fortunately, reclaiming your healthy skin and eliminating and preventing blackheads is easy, when done the right way.



Figure No.05 blackheads.

4. Whiteheads

Whiteheads are known as closed comedones. The follicles beneath your skin become filled with bacteria and have a very small opening at the top of your skin. Air isn't able to enter the follicle, so the bacteria inside don't undergo the same chemical reaction that causes blackheads to be dark.



Figure No. 06 Whiteheads.

5. Nodules

Nodular acne also involves bacteria called *p. acne*. Although it's normal to have this type of bacteria on your skin, it can turn into an infection when it gets trapped in your pores alongside sebum and dead skin cells. The resulting infection can go deep underneath your skin, causing the affected pores to become red and swollen. An acne nodule looks like a small bump under your skin. It may be skin-toned, but it can also turn red as the surrounding area gets more inflamed. It doesn't have a "head" like a less severe pimple might. Nodular acne is also painful to the touch.



Figure No.07 Nodules.

6. Cryts

Deep beneath the skin's surface, cystic acne develops as the most severe form of inflammatory acne. This condition occurs when pores become clogged with dead skin cells, oil, and bacteria, leading to deep infection within the skin. Unlike regular pimples on the skin's surface, cystic acne manifests as large, painful bumps filled with pus that develop deep under the skin.^[5]



Figure No.08 Cryts.

Benefits of Anti Acne Cream

Herbal anti-acne creams offer a natural and effective solution for acne treatment while being gentle on the skin. These formulations harness the power of plant-based ingredients to combat acne and improve overall skin health.

- Fights the bacteria that cause Acne & pimples.
- Reduce Breakouts, Whiteheads, and Blackheads.
- Helps to Reduce Acne Scars.
- Reduces the appearance of Blemishes and Dark Spots.
- Penetrates Clogged Pores and helps to prevent future Breakouts.
- Soothes & relieves irritated skin.^[6]

Advantages of Herbal Anti-Acne Creams

Gentle on Sensitive Skin: Unlike synthetic acids (like benzoyl peroxide), herbs provide a mild, soothing effect that minimizes over-drying, peeling, and skin irritation.

Low Side Effect Profile: Natural ingredients generally have fewer severe side effects and can help avoid the risk of antibiotic resistance common with long-term use of standard acne medications.

Skin Nourishment: Herbal extracts (such as aloe vera and honey) double as moisturizers, supporting skin hydration and gradually fading acne scars and dark spots.

Disadvantages of Herbal Anti-Acne Creams

Slower Results: Plant-based actives are less concentrated and often take longer to show visible improvements compared to clinical synthetic treatments.

Inconsistent Potency: The concentration of active compounds in herbs can fluctuate based on the plant's growing conditions, affecting the overall effectiveness of the product.

Risk of Allergic Reactions: Even natural ingredients can trigger contact dermatitis, skin redness, or sensitivities in specific individual.^[7]

2. LITERATURE SURVEY

1. MuhammadAtharAbbasi et.al.(2010)

Acne vulgaris (commonly called acne) is a common skin condition, caused by changes in the pilosebaceous units, skin structures consisting of a hair follicle and its associated sebaceous gland via androgen stimulation. In the present study six new anti-acne compositions were made for the treatment of acne and their efficacy was studied on the volunteers of age group of 20 - 28 years via topical applications. Particular emphasis was placed on treating acne conditions without drying and irritating the skin.

2. Shahid Shah Chaudhary, Roohi Zaman, Shariq Shamsi (2016)

In unani system of medicine (USM) many herbal drugs have been mentioned to be useful in the treatment of various skin diseases, which are considered safe and free from major side effects. Cream was prepared using the extracts of Darchini, Husune Yusuf and Tukhm Khashkhash and then evaluated for their physicochemical parameters like organoleptic characters, pH, water content, total fatty substance, determination of residue, thermal stability, spreadability and specific gravity.

3. CahyaraniIntan Ramadhani et.Al.(2020)

Moringa oleifera L. leaves contain flavonoid, alkaloid, and phenolic compounds which have antibacterial activity. Staphylococcus epidermidis is one of the bacteria that causes acne. The purpose of this study is to compare bacteriostatic ability of the extracts and gel for S. epidermidis bacteria and to get gel formula that can fulfills the physical properties of a good gel.

4. Nishigandha Naresh et. al. (2023)

Formulation and Evaluation of the anti-acne cream for face with almond oil, manjishta, and aloe vera. This ingredient is commonly used to treat acne and has additional properties like anti-aging, anti-inflammatory, and antibacterial properties. These creams are easily washable. these Cream does not cause irritation skin after use. The composition is safe at room temperature.

5. Yogita Sharma, Sandeep Sharma, Richa Ohri (2024)

The current study set out to create an herbal Antiacne cream that may be used to nourish, moisturize, and treat a variety of skin conditions. Different crude drugs like Aloe vera, Clove oil, Rose oil, Tea tree oil are used to formulate cream. The choice of components according to the various therapeutic qualities of the agents.

6. Bhavesh Gupta, Neha Chopra et al., (2023)

The purpose of the study is the compression of bacteriostatic ability of the extracts and gel for formula that can fulfills the physical properties of good gel moringa leaves. Moringa leaves were extracted with maceration method using ethanol 70% in three days. HPMC 4000 as a polymer were used extract was added with variation concentration of 5,10,15% physical evaluation test of gel was organoleptic, homogeneity, PH, viscosity, adhesion, and spread tests for 4 weeks.

7. Vidyadhara Suryadevara, Sandeep Doppalapudi, Sasidhar Reddivallam L.C., 2018

“Formulation and Evaluation of Anti-Inflammatory Cream by Using Moringa oleifera Seed Oil.” The study focused on the preparation and evaluation of herbal cream using Moringa seed oil. The formulation showed good stability, homogeneity, spreadability, and anti-inflammatory activity. ♦Pharmacognosy Research

8. Mythili Suresh, Sri Kessav Mukundan, 2024

“Development and Assessment of a Multipurpose Herbal Cream With *Moringa oleifera* Lam.” The study reported significant antimicrobial and anti-inflammatory activity of the formulated herbal cream. The formulation also showed good pH, stability, non-greasiness, and homogeneity.

3. AIM AND OBJECTIVE**AIM**

Formulation And Evaluation of Herbal Anti Acne Cream.

OBJECTIVE

1. Acne cream reduce skin problem like pimples
2. Prevent acne formation
3. Removing dark spots
4. To treat any illness, tan, acne while also providing skin with calming effect and
5. Protecting skin
6. Reduce sebum production
7. Improve skin texture and appearance

5. PLAN OF WORK

1. Literature Survey
2. Selection & Procurement Of Herbal Ingredients

3. Methodology

- Extraction process
 - Preparation of Extraction
4. Formulation of Herbal Anti-Acne Cream
 5. Evaluation Parameter
 - Organoleptic Evaluation
 - Irritation Test
 - pH Measurement
 - Phase Separation
 - Spreadability Test
 - Washability Test
 6. Result & Discusion

7. Conclusion
8. Reference

6. SELECTION & PROCUREMENT OF INGREDIENTS

➤ ACTIVE PHARMACEUTICAL INGREDIENTS [API]

1. *Moringa Oleifera*^[8]

Botanical Name:- *Moringa Oleifera*

Synonyms:- *Moringa Pterygosperma*, *Hyperanthera Moringa* Horseradish Tree Drumstick Tree, Miracle Tree

Family:- Moringaceae

Kingdom:- Plantae

Order:- Brassicales

Part Used:- Leaves

Chemical Constituents:- Vitamins, Mineral, Fatty Acids, Antioxidants, Amino Acids

Uses:- Moisturizing, Antibacterial And Anti-acne Properties, Antioxidant, Anti-inflammatory, Skin Regeneration.



Figure No.09 *Moringa Oleifera*.

2. HONEY^[9]

Family:- Apidae (Bee Family)

Kingdom:- Animalia (Honey Is Derived From Bees, Which Are Animals)

Order:- Hymenoptera.

Part Used:- Honey (Nectar Collected & Processed By Bees).

Chemical Constituents:- Carbohydrates, Enzymes, Acids, Minerals Antioxidants, Vitamins.

Uses:- Moisturizing, Antibacterial And Antifungal Properties, Wound healing, Anti-inflammatory, Antioxidant effects.



Figure No. 10 Honey.

➤EXCIPIENTS

1. ALOE^[10]

Botanical Name:- Aloe Vera

Synonyms:- Aloe Barbadensis, Aloe Indica, Aloe Vulgaris

Family:- Asphodelaceae

Kingdom:- Plantae

Order:- Asparagales

Part Used:- Leaves

Chemical Constituents:- Vitamins, Minerals, Amino Acids, Polysaccharides, Anthraquinones

Uses:- Moisturizing, Anti-inflammatory Antibacterial And Antifungal Properties.



Figure No.11 Aloe.

4. ACACIA^[11]

Scientific Name:- Acacia spp

Synonyms:- Gum Arabic, Gum acacia

Family:- Fabaceae

Kingdom:- Plantae

Order:- Fabales

Chemical Nature:- complex carbohydrates, polyphenols, and bioactive secondary metabolites

Uses:- Emulsifying and stabilizing agent, Moisturizing, Soothing and calming, Wound healing, Antioxidant effects.



Figure No.12 Acacia.

5. BEESWAX^[12]

Scientific Name:- Cera alba

Synonyms:- Apiary wax

Family:- Genus apis

Kingdom:- Animal kingdom

Order:- Hymenoptera

Chemical Constituents:- wax esters (70–75%), hydrocarbons (10–16%), free fatty acids (10–15%), and free fatty alcohols (1–3%).

Uses:- skincare, household care, crafting, and food preservation.



Figure No. 13 Beeswax.

6. BORAX^[13]

Scientific Name:- sodium tetraborate decahydrate

Synonyms:- sodium borate

Family:- Borate mineral family

Chemical Constituents:- sodium tetraborate

Uses:- Laundry booster, Natural Pesticide



Figure No.14 Borax.

7. LIQUID PARAFFIN^[14]

Scientific Name:- Paraffinum Liquidum

Synonyms:- Petroleum-derived mineral oil

Family:- hydrocarbon family

Chemical Constituents:- Saturated hydrocarbons (alkanes and cycloalkanes)

Uses:- An emollient to treat dry skin, a lubricant laxative for constipation, and an eye lubricant.



Figure No. 15 Liquid Paraffin.

8. ROSE WATER^[15]

Botanical Name:- Rosa damascena

Synonyms:- Rose distillate

Family:- Rosaceae family

Chemical Constituents:- 2-phenylethanol (responsible for the floral scent), citronellol, and geraniol, along with trace plant waxes and hydrocarbons.

Uses:- soothing skincare toner, natural makeup setter, hair mist, and aromatherapy agent to relieve stress.



Figure No.16 Rose Water.

7. METHOD OF EXTRACTION^[16]

1. Moringa oleifera Extract Procedure

Material Needed

1. Moringa Oleifera Powder
2. Distilled Water
3. Filter Paper Or Muslin Cloth
4. Beaker
5. Measuring Cylinder
6. Weighing Balance
7. Hot Plate Or Water Bath
8. Stirring Rod
9. Funnel

Method of Extraction

1. Take a Moringa Oleifera Powder
2. Add Distilled Water
3. Heat At 75°C For 20–30 Min
4. Cool The Mixture
5. Filter The Extract

8. Method of Preparation^[17]

1. Prepare The Aqueous Phase

Take a Clean Beaker add Borax And Rose Water, Then take another beaker of distilled water Add Rose and Borax Solution on it heat up to 75C , After that measure the aloe vera gel & honey and add in aqueous phase.

2. Prepare The Oil Phase

Take a borosilicate beaker, add Liquid Paraffin and beeswax then Heat up to 75C then add Acacia.

3. Combine The Extract

Then Add a Moringa Oleifera Extract on Oil Phase and stir vigorously.

4. Final Mixing

Slowly add the Aqueous phase into Oil Phase, and stir Vigorously it from a Smooth Cream
Then Pour the Cream Into The Container.

Table No. 01: Formulation Of Anti-Acne Cream.

Serial No	Name of Ingredients	Batch F1	Batch F2	Batch F3	Batch F4	Batch F5
1	Moringa Oleifera	2ML	2ML	2ML	2ML	2ML
2	Aloe	0.5g	0.60g	0.4g	0.80g	1g
3	Honey	2.6g	2.6g	2.5g	3.0g	1.5g
4	Acacia	0.75g	0.50g	0.80g	1.5g	1g
5	Beeswax	3g	2.5g	3.5g	2.1g	4g
6	Borax	0.20g	0.10g	0.15g	0.22g	0.14g
7	Liquid Paraffin	5.5ML	6ML	5.5ML	4.5ML	5.5ML
8	Rose Water	Q.S	Q.S	Q.S	Q.S	Q.S
9	Water	Q.S	Q.S	Q.S	Q.S	Q.S
Total Qty	-	15g	15g	15g	15g	15g

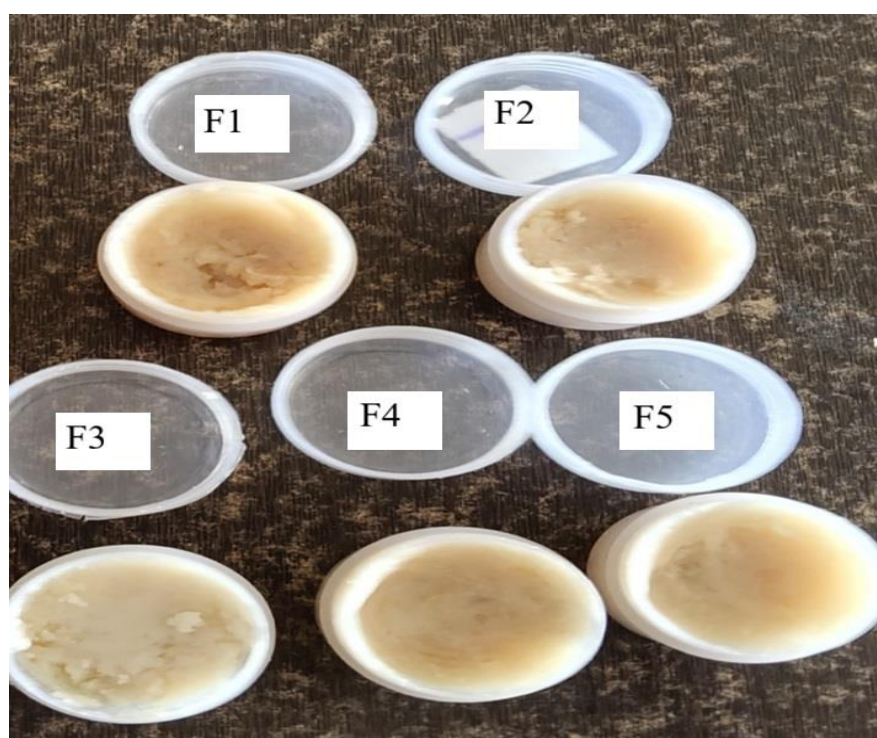


Figure No.17 Formulation of Anti Acne Cream (F1-F5).

9. INSTRUMENT

Table No. 02: List of Instrument Use for Formulation.

Serial No	Name of Instruments	Uses
1	Water Bath/ Hot Plate	Used for heating During Extraction
2	Measuring Cylinder	Used To Measure Accurate Volume Of Liquids.
3	Stirrer	Used For Stirring And Uniform Mixing.
4	Weighing Machine	Used To Weigh Ingredients Accurately.

5	Pipette/Dropper	Used To Add Small Quantities Of Oils.
6	Beaker	Used For Mixing And Preparing The Formulation.
7	Filter Paper	To Filter Extract And Remove Unwanted Particle
8	Funnel	Funnel Is Used To Transfer Liquids Safely And To Support Filter Paper During Filtration For Separating Solid Particles From The Extract.

10. EVALUATION PARAMETERS^[18]

1. Organoleptic Evaluation

Organoleptic evaluation were evaluated manually for its physical property it included- colour, odour, texture, state of appearance

2. Skin Irritation Test (Patch Test)

These test are used to determined the quality of material and the chemicals, as well as whether or not they are damaging to the skin. The cream initially applied to the hand and left on for a while so that we can check for irritation.

3. Washability Test

The Washability of the cream was determined by applying the cream over the skin and the extend of easy washing with distilled water was manually observed. Formulated product was evaluated for following parameter.

4. Phase Separation

Formulation was formulated as W/O cream, so as per days passed, we observed if any phase separation was occurred or not.

5. PH Measurement

The PH meter was calibrated using standard buffer solution. About 1gm of cream was weigh and dissolved in 100ml of distilled water and set aside for 2 hours and then PH was measured.

6. Spreadability Test

The spreadibility was determined by placing excess sample (1gm) in between two slides which was compressed to uniform thickness by placing a definite weight (50gm) for definite time (5gm). The time required to separate spreadability was calculated by following formula, $S=M.L.T$.

11. RESULT

Table No. 03: Organoleptic Evaluation.

In This Test Colour, Odour, Texture, State Were Checked

Sr. No	Formulations	Colour	Odour	Texture	State
1.	F1	Pale Yellow	Pleasant	Even	Semi Solid
2.	F2	Yellow	Pleasant	Not Even	Semi Solid
3.	F3	Pale Yellow	Pleasant	Not Even	Semi Solid
4.	F4	Pale Yellow	Pleasant	Even	Semi Solid
5.	F5	Yellow	Pleasant	Even	Semi Solid

Table No. 04: Skin Irritation.

F1, F2, F3, F4, F5 Showed No Skin Irritation.

Sr. No	Formulation	Irritancy
1.	F1	No Irritation
2.	F2	No Irritation
3.	F3	No Irritation
4.	F4	No Irritation
5.	F5	No Irritation

Table No. 05: Washability

The Washability of the cream was determined by applying the cream over the skin and the extend of easy washing with distilled water was manually observed

Sr. No	Formulation	Washability
1.	F1	Average
2.	F2	Intermediat
3.	F3	Intermediat
4.	F4	Intermediat
5.	F5	Good

Table No. 06: Phase Separation

Formulation was formulated as W/O cream, so as per days passed, we observed if any phase separation was occurred or not.

Sr. No	Formulation	Phase Separation
1.	F1	No Phase Separate
2.	F2	Phase Separate
3.	F3	No Phase Separate
4.	F4	Phase Separate
5.	F5	No Phase Separate

Table No.07: pH

The PH meter was calibrated using standard buffer solution. About 1gram of cream was weigh and dissolved in 100ml of distilled water and set aside for 2 hours and then PH was measured.

Sr. No	Formulation	pH Measurement
1.	F1	6
2.	F2	4
3.	F3	3
4.	F4	8
5.	F5	6.5

Table No. 08: Spreadability

The spreadability was determined.

Sr. No	Formulation	Spreadability
1.	F1	Good
2.	F2	Poor
3.	F3	Poor
4.	F4	Good
5.	F5	Good

12. CONCLUSION

In Conclusion A research study was carried out on the development of an herbal anti-acne face cream that combines anti-inflammatory, anti-bacterial, and moisturizing properties of herbal plant material to help prevent the formation of acne. The formulation and evaluation of the herbal cream have demonstrated remarkable performance, indicative of its potential as a valuable skincare product. By using Moringa Oleifera extract the cream showed anti-acne effect and these herbal ingredients showed significant result the formulations were stable at room temperature and can be safely used on the skin. These cream is non-irritant and easily washable cream. The cream can be spread easily and it gives its effect. It is less greasy and no left over residue of the cream. the odour of rose water make cream more pleasant. The texture is so smooth and it also act as a moisturizer and gives glow to the face.

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