



# "FORMULATION AND EVALUATION OF ANTISEPTIC AND ANTI-INFLAMMENTORY ACTIVITY OF SKIN CREAM CONTAINING CURCUMA LONGA"

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## ABSTRACT

The purpose of the present research. work was to formulate and evaluation of antiseptic, Anti-inflammatory activity of skin cream containing curcuma longa of crude drug comprising extracts of curcuma longa (Turmeric) marketed formulation and one in Lab Formulation were subjected to comparative standardization. There is a growing demand for herbal cosmetics in the world market and they are invaluable gifts of nature. Therefore we tried to make a antiseptic, Anti-inflammatory activity of skin cream containing curcuma longa containing the extract of curcuma longa in along with cetrimide. The extract of curcuma longa has antiseptic activity, anti- inflammatory activity and also increase Skin's texture. The cetrimide mixture of different quaternary ammonium Salt including CTAB Cetrimide is a Cationic surfactant It is used as Cleansing agent in seborrhea and acne vulgaris as antiseptic in the treatment of superficial wounds, burns and minor skin infections and has emollient properties Hence all these properties are beneficial to normal human keratinocytes and it is safe and stable too formulate and evaluation antiseptic Anti-inflammatory activity of skin cream containing curcuma longa cream do not have any side effect without any or unwanted effect it gives treatment in burns and skin infections. The prepared cream was evaluated with different parameter like appearance, PH, viscosity and Stability viscosity, along with irritancy test

stability parameter of the formulation showed that there marketed & in lab formulation during. The study period The cream was found to be more stable during Stability that it is possible to develop. Cream containing herbal extract and can be used as antiseptic purpose.

Keywords :-

1. Turmeric Skin cream
2. Standardization.

**List of Abbreviations:-**

e.g	Example
PH	Hydrogen ion concentration
O/W	Oil in Water
W/O	Water in Oil
Min	Minute
Gm	Gram
<sup>0</sup> C	Degree Celsius
S. No	Serial Number
Hr	Hour
ext	Extract

## INTRODUCTION

Creams are the semisolid dosage forms and intended for topical application to the skin, placed on the surface of eye, or used nasally, vaginally or rectally for therapeutic or protective action or cosmetic function. These preparations are used for the localized effects produced at the site of their application by drug penetration in to the underlying layer of skin or mucous membrane. These products are designed to deliver drug into the skin in treating dermal disorders, with the skin as the target organ

Creams are semi-solid emulsions of oil and water. They are divided into two types: oil- in-water (O/W) creams which are composed of small droplets of oil dispersed in a continuous phase, and water-in-oil (W/O) creams which are composed of small droplets of water dispersed in a continuous oily phase. Oil-in-water creams are more comfortable and cosmetically acceptable as they are less greasy and more easily washed off using water. Water-in-oil creams are more difficult to handle but many drugs which are incorporated into creams are hydrophobic and will be released more readily from a water-in-oil cream than an oil-in-water cream. Water-in-oil creams are also more moisturizing as they provide an oily barrier which reduces water loss from the stratum corneum, the outermost layer of the skin.

World Health Organization (WHO) as well our country has been promoting traditional medicine because they are less expensive, easily available and comprehensive, especially in developing countries. [1]

Curcuma longa, or turmeric is a perennial herb and member of the Zingiberaceae (ginger) family and is cultivated extensively in Asia mostly in India and China. The rhizome, the portion of the plant used medicinally, yields a yellow powder. Dried Curcuma longa is the source of turmeric, the ingredient that gives curry powder its characteristic yellow color. It has many names such as Curcuma in the Arab region,

Indian saffron, Haridra (Sanskrit, Ayurvedic), Jianghuang (yellow ginger in Chinese), Kyoo or Ukon (Japanese). [2],[3]

In China it is ingested orally and applied topically for urticaria and skin allergy, viral hepatitis, inflammatory conditions of joints, sore throat and wounds. [4]

Properties of ingredients used in cream Formulation.

Turmeric -[1]

Botanical Name	: Curcuma longa
Kingdom	: Plantae
Order	: Zingiberales
Family	: Zingiberaceae
Genus	: Curcuma
Species	: C. Longa

Turmeric uses For skin. [5]

1. Cures Dermatitis.
2. Healing Wounds.
3. Anti-Aging.
4. Lighten Your Skin.
5. Heal Wounds.
6. Lighten Acne Scars.
7. Cures Acne.
8. Heal Cracked Heels.

Use of Turmeric for Medicinal Purposes. [6], [7]

Even though the turmeric herb has been around for thousands of years, in recent years attention has been brought to this herb for its medicinal properties. Many state that it has antiseptic qualities and has been taken orally or applied to a wound when it's raw. Traditionally turmeric was used quite often to help prevent infection. When taken orally, it has been used to treat numerous infections, such as various stomach ailments. All of these traditional methods of treatment have been proven to be helpful in most cases. The healing properties are said to come from the rhizomes found in the herb, which is called curcumin.

## Cetrimide - [8]

Form	- Free Flowing Powder.
Colour	- Creamy white, voluminous.
Odure	- Faint odour
Test	- Bitter test
Solubility	- Freely soluble in water but Soluble in warm water. In soluble in solvent ether
Uses	- Used as bactericide & astringent.

## Cetostearyl Alcohole - [1]

Cetostearyl alcohol is a mixture of cetyl alcohol and stearyl alcohol that comes from vegetable & synthetic sources.

Form	- Waxy Solid
Colour	- White
Odour	- Very faint, waxy
Solubility	- It is oil soluble, but it is not water soluble
Uses	- Emulsion stabilizer opacifying agent non- Ionic surfactant.

## Liquid Paraffin - [2]

## Properties of liquid paraffin

Form	- Liquid
Colour	- Colourless
Odour	- Odourless
Melting point	- Undetermined
Boiling point	- 300 <sup>0</sup> C

## Uses of liquid paraffin -

- ▶ Liquid paraffin is used as a barrier cream by providing a layer of oil on the surface of the skin to prevent water evaporating from the skin surface.
- ▶ It is an emollient, sometimes known as skin lubricant.
- ▶ It is used to soothe, smooth and hydrate the skin.

## Rose water - [9]

Rose water is created by distilled rose. Petals with steam. Rose water is Fragrant and it's sometimes used as a mild natural fragrance as an alternative to chemical filled perfumes.

Uses -

Used as fragrant purpose.

Used to reduces skin redness.

Helps prevent and treats infection.

## MATERIAL & METHODS -

### Plant material - [10]

The marketed certified cream was purchased from Shree Ayurveda Medical Shop Camp Pune, Maharashtra. The turmeric powder used for formulation of in lab cream was purchased From Azad Medical Camp Pune, Maharashtra

### Composition of cream - [8]

**Table No-1. Composition of Marketed cetrimide cream**

Sr. No.	Ingredients	Concentration
1	Certimied	0.015g
2	Cetostearyl alcohol	0.6 g
3	Liquid Paraffin	6 g
4	Methyl Parabon	0.02 ml
5	Distilled water	50 ml
6	Rose water	qs

**Table No-2. In Lab Composition Of Skin Cream**

Sr. No.	Ingredients	Concentration
1	Turmeric	0.02 ml
2	Certimide	0.015 g
3	Cetostearyl alcohol	0.6 g
4	Liquid Paraffin	6 g
5	Purified water, freshly boiled and cooled	50 ml
6	Rose water	qs

Table No. 3. Functions of Ingredients -

Sr. No.	Ingredients	Function
1	Turmeric	Excellent antiseptic.
2	Certimide	Wound cleansing, minor burns.
3	Cetostearyl alcohol	Emulsion stabilizer, opacifying agent non-ionic surface.
4	Liquid Paraffin	Moisturizer improve the texture of Skin.
5	Water	Solvent.
6	Rose water	For fragrance.

## METHOD OF PREPARATION - [11]

### Preparation of Alcoholic Extract of Crude drug -

Take 5grams crude drug i.e. Turmeric in conical Flask and then 100 ml of ethanol was added to it then the Conical flask was capped with aluminum foil.. Then this mixture was placed for maceration for 5 days.

### Preparation of oil phase -

Cetostearyl alcohol and liquid paraffin was taken into China dish and this mixture was melt at 70°C..

### Preparation of Aqueous phase :-

Cetimide and water are taken into a another china dish and warm until it get mixed to same temp as that or melted cetastearyl alcohol & liquid paraffin.

### Preparation of cream :-

Add warm aq. phase in warm oily. Add phase at the same temperature perform stir gently until cold Homogenize the cream in mortar.

### Container and storage -

Store in wide mouth glass bottle, do not use Rubber or plastic containers. Store in cool place.

**LITERATURE SURVEY**

<b>Sr. No.</b>	<b>Year Of Publication</b>	<b>Name of Authors</b>	<b>Title</b>	<b>Name OF Drug</b>	<b>Reference No.</b>
1	15 Jan 2023	Soni Muhsinin, Dini Zamzami Salsabilla, Yanni Dhiani Mardhiani, Garnadi Jafar.	Formulation and Evaluation of Turmeric Kombcha facial Toner with potential as an Anti-Acne Agent.	Turmeric	12
2	2022	Chandrashekhar B. Badwaik, Updesh B. Lade, Tikesh Agrwal, Prachi Barsagade, Madhuri Nandgave, Nilam Gaddamwar.	Formulation and Evaluation of Herbal Face scream	Turmeric	13
3	2022	Kaban Vera Estefania, Jansen Sila lahi, Sumaiyah, Denny Satria,	Formulation and evaluation of cream turmeric extract preparation from turmeric rizomes (Curcuma domestica val)	Turmeric	14
4	2022	Zeel Shal, Shweta Prasad, Arti Soni, Shailaja Shah, Mantasha Shaikh, Riddhi Trivedi.	POLY HERBAL SKIN CLARIFYING AND UV PROTECTION CREAM	Cetastearyl Alcohol, Liquid Paraffin	15
5	2020	Chauhan Lalita, Gupta Shalini	Cream: A review on Classification, Preparation Method, Evaluation and its application.	Turmeric	16
6	2020	Wegdan Alyshehata Md Sohail,	Development And evaluation of herbal	Turmeric	17

		Dr. Tanveer Alam.	cream containing curcumin from curcuma longa.		
7	2020	Somayeh Esmaeili, Saleh Omid Malayeri, Homa Hajmedhdi-poor, Hamid Reza Resekh, Roya Yaraee, Hamid Reza Moghimi.	The role of lecithin on topical anti-inflammatory activity of turmeric (Curcuma longa L.) ointment	Turmeric	18
8	2019	Riya Arora, Geeta Aggarwal, Gitika Arora Dhingra, Manju Nagpal.	HERBAL ACTIVE INGREDIENTS USED IN SKIN COSMETICS.	Turmeric	19
9	2019	A. K Mohiuddin	Skin care cream : formulation use	Cetastearyl Alcohol	20
10	2018	Avish D. Maru, Swaroop L. Ahoti.	FORMULATION AND EVALUATION ON OF MOISTURIZING CREAM CONTAINING SUNFLOWER WAX.	Liquid Paraffin	21
11	2018	Rahul Kumar Varma, Preeti Kumar, Rohit Kumar Maurya, Vijaykumar, R. B. Varma, Rahul Kumar Singh.	Medicinal Properties of turmeric (Curcuma longa) : A Review	Turmeric	22
12	2014	Akash S. Mali, Karekar P, Dr. Yadav A. V.	Formulation and Evaluation of Multipurpose Herbal Cream.	Turmeric, Liquid Paraffin	24



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13	2010	Abhijeet Pandey, Jui V. Jagtap, Aditi A. Patil, Richa N. Joshi, B. S. Kuchekar.	Formulation and evaluation of anti- bacterial and anti-fungal activity of herbal ointment, containing Aloe-vera, Azadirachta indica and Curcuma longa.	Turmeric	29
					30
					31
					32
					33

## AIM, JUSTIFICATION, OBJECTIVE-

### Aim :-

"Formulation and evaluation of antiseptic and anti-inflammatory activity of skin cream containing curcuma longa"

## Justification :-

Formulating a skin cream with antiseptic and anti-inflammatory Properties would be useful for treating a variety of skin conditions such as acne, rashes, or cuts and wounds it may also have potential for preventing infections or reducing inflammation in the skin. Antiseptic and anti-inflammatory proper ties in skin cream can help to Prevent and treat bacterial infections and reduce inflammation caused by various skin condition.

**Antiseptic properties:-** Antiseptic agents are substances that inhibit the growth and development of microorganisms. when applied to the Skin, they can help prevent the growth. of bacteria, viruses, and fungi that can cause skin infection.

**Anti-inflammatory agents:-** Anti-inflammatory agents can help p to reduce the inflammation and sooth Irritated skin.

By combining these properties in a stir cream, you can help to protect the skin from bacterial infections and induce Inflammation caused by various skin conditions. This can help promote healing and improve the overall health and appearance Of the skin.

## Objective:-

The object for a skin cream containing antiseptic and anti-inflammatory Properties is the provide a safe and effective topical treatment for various skin conditions. The specific objectives may include.

### 1) Prevention and treatment of bacterial infections :-

One of the primary Objectives of a skin cream containing antiseptic properties is to prevent and treat bacterial infections of the skin. The cream should be Formulated with acting ingredients that can inhibit the growth of bacteria and other. microorganisms that can use infection such a staphylococcus aureus and pseudomonas aeruginosa.

### 2) Reduction of inflammation and irritation :-

Another important objective is to reduce inflammation and irritation of the skin. The cream should contain anti-inflammatory agents that can help to sooth the skin and alleviate symptoms of skin conduction such as eczema Psoriasis, and acne,

### 3) Important or overall skin health and appearance:-

The skin cream should also aim to improve the overall health and appearance of the skin. This may include reducing redness promptly Skin healing, and enhancing skin hydration.

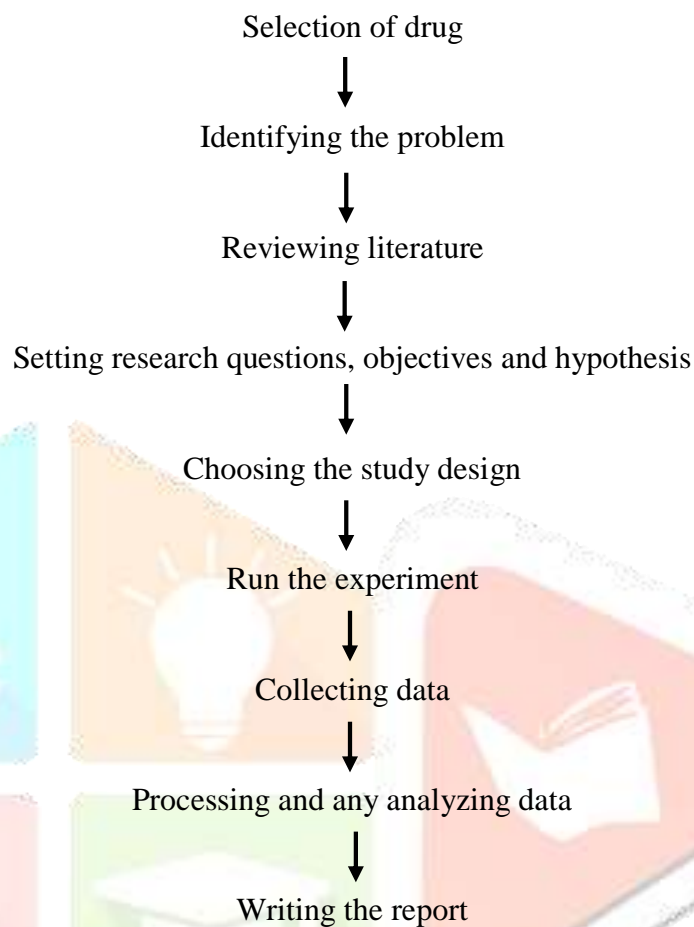
### 4) Safety and tolerability:-

The cream should be formulated with ingredients that are safe well-tolerated by the skin, the cream should be non- irritating and free from allergens and other potential irritants.

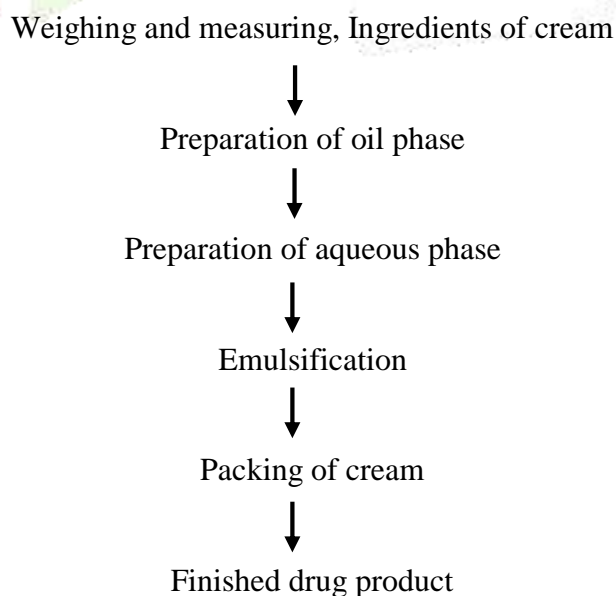
### 5) Convenience and ease of use: -

The cream should be easy to apply and convenient to use, with a pleasant texture and Fragrance that makes it appealing to users

### PLAN OF WORK :-



### PLAN FOR FORMULATION :-





Ingredients



Preparation Oil Phase






Preparation of aqueous phase










Mixing of cream




**EXPERIMENTAL -**

List of Instruments



Sr. No	Name of Instrument	Picture
1	Mortar and pestle :- Mortar and pestle are implements used since ancient times to prepare ingredients or substances by Crushing and grinding them into a fine paste or powder.	
2	Thermometer :- Used to measure the temperature of the solutions or work conditions.	
3	Stirrer :- Used to mix chemicals and Liquids For laboratory purpose	

4	Spatula :- Small scoop used to transfer powder & crystal chemicals.	
5	Bunsen Burner :- Used for heating and exposing items to flame.	
6	Wire gauze :- Used to support a container Such as beaker or flask during heating.	
7	Beaker :- Used to hold & heat liquids	
8	Cylindrical measure cylinder :- A relatively Slim glass or plastic cylinder used specifically for calibrating beakers or measuring a liquid volume.	
9	Conical flask :- This shape allows the flask to be sealed with a bung for heating purposes, while also allowing a researcher the freedom to shake or stir the flask without Spilling liquid	
10	Funnel :- For pouring liquid or other ID I Substance through a small Home opening	

## Instruments Used for Formulation :-

Sr. No	Instrument	Model	Company
1	PH meter - PH meter is an instrument used to measure hydrogen ion activity in solutions. Diagram- 	PH 300 –Sansel	Embraer Phenom 300
2	Weighing machine A weighing machine is an instrument that is used to determine the weight or mass of an Object Diagram- 	Vaman	An ISO9100-2008
3	Reflux Condenser A reflux Condenser is an apparatus commonly used in organic chemistry to Prevent reactant of solvent loss in a heated chemical reaction Diagram- 		

**TABLE FOR CHEMICALS –**

Sr. No.	Chemical Name	Function	Picture
1	Turmeric	Contains curcumin a potent antioxidant and anti-inflammatory compound that can improve skin health.	
2	Certimide	Antiseptic and disinfectant properties that can help prevent and treat skin infection.	
3	Cetyl Alcohol	Acts as an emollient to soften and smooth the skin also helps to thicken the cream.	
4	Liquid Praffin	Provides a protective barrier that prevents moisture loss from the skin and helps to keep it hydrated.	
5	Water	Acts as a solvent and helps to hydrate the skin.	
6	Rose Water	Has anti-inflammatory and soothing properties that can help to reduce skin irritation and redness.	

**EXPERIMENTAL EVALUATION TEST -****Evaluation Parameters**

The following parameters were checked to evaluate the skin cream marketed formulation and in lab formulation.

**Appearance.** [34]

When formulations were kept for long time, it found that no change in Color of cream.

**Determination of Type of Emulsion.** [35]**Dilution Test**

In this test the emulsion is diluted either with oil or water. If the emulsion is o/w type and it is diluted with water, it will remain stable as water is the dispersion medium" but if it is diluted with oil, the emulsion will break as oil and water are not miscible with each other. Oil in water emulsion can easily be diluted with an aqueous solvent, whereas water in oil emulsion can be diluted with an oily liquid.

**PH of the Cream** [34,36]

The pH meter was calibrated using standard buffer solution. About 0.5 g of the cream was weighed and dissolved in 50 ml of distilled water and its pH was measured.

**Homogeneity** [37,38]

The formulation was tested for homogeneity by visual appearance and touch. The appearance of the cream was judged b color, pearl science and roughness and graded.

**Type of Smear** [37,38]

It was determined by applying the cream on the skin surface of human volunteer. After application of cream, the type of film or smear formed on the skin were checked.

**Removal** [37,38]

The ease of removal of the cream applied was examined by washing the applied part with tap water.

**Determination of Emolliency** [37,38]

Emolliency, slipperiness and amount of residue left after the application of fixed amounts of cream was checked.

**Acid Value** [39]

Taken 10gm of substance dissolved in accurately weighed, in 50 ml mixture of equal volume of alcohol and solvent ether, the flask was connected to reflux condenser and slowly heated, until sample was dissolved completely, to this 1 ml of phenolphthalein. Added and titrated with 0.1N NaOH [1], until faintly pink color appears after shaking for 30 Seconds.

Acid value  $n \times 5.61/w$



Where,

N= the number of ml of NaOH required.

W= the weight of substance.

### **Saponification Value [39]**

Introduce about 2gm of substance refluxed with 25 ml of 0.5N alcoholic KOH for 30 minutes to this 1ml of phenolphthalein added and titrated immediately with 0.5 N HCl

$$\text{Saponification value } (b-a)*28.05/w$$

Where.

A= the volume of titrant in ml

B= the volume of titrant in ml

W=the weight of substance in gm

### **Irritancy Test [39]**

Mark an area (1sq.cm) on the left hand dorsal surface. The cream was applied to the specified area and time was Irritancy, erythema, edema, was checked if any for regular intervals up to 24 hrs and reported.

### **Stability study [40]**

Stability study over a period of three months was conducted. The physical appearance, pH value, drug content, were determined periodically after the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> month after cream preparations.

## **RESULTS DISCUSSION -**

### **Appearance**

When formulations were kept for long time, it found that no change in color of cream (Table No. 4)

### **Type of emulsion**

This dye confirms that all formulations were o/w type emulsion cream.

### **PH of the Cream**

The pH of the cream was found to be in range of 6-7 which is good for skin pH. All the formulations were shown pH nearer to skin required (Table No. 4)

## Homogeneity

Both formulations produce uniform distribution of extracts in cream. This was confirmed by visual appearance and by touch (Table No. 4)

## Type of smear

After application of cream, the type of smear formed on the skin were non greasy (Table No. 4).

## Removal

The cream applied on skin was easily removed by washing with tap water.

## After feel

Emolliency, slipperiness and amount of residue left after the application of fixed amount of cream was found (Table No. 4).

## Acid value and Saponification value

The results of acid value and saponification value of all formulation were presented in Table No. 5 and Table No.6 and Showed satisfactorily values.

## Irritancy Test

The both formulation shows no redness, edema, Inflammation and irritation during irritancy studies. These formulations are safe to use for skin (Table No. 7).

**Table No. 4 Physicochemical parameters.**

Sr.no	Parameters	Marketed cream	In house cream
1.	Appearance	Yellowish color	Yellowish color
2.	Dilution test	o/w emulsion	o/w emulsion
3.	pH	6.7	6.8
4.	Homogeneity		
	A.By visual	Homogeneous	Homogeneous
	B.By touch	Smooth and consistent	Smooth and consistent
5.	Smear	Non greasy	Non greasy
6.	Emolliency	No residue left	No residue left

**Table No.5 Acid value.**

Sr.no	Formulation	Acid value
1.	Marketed	20.25
2.	In lab	21.31

**Table No.6 Saponification Value.**

Sr.no	Formulation	Saponification Value
1.	Marketed	28
2.	In Lab	14.025

**Table No. 7 Irritant test.**

Sr.no	Formulation	Irritant	Erythema	Edema
1.	Marketed	Nil	Nil	Nil
2.	In lab preparation	Nil	Nil	Nil

**DISCUSSION -**

In the present work, it was decided to evaluate and formulate Antiseptic, Anti-inflammatory activity of skin cream containing curcuma longa. The Antiseptic, Anti-inflammatory activity of skin cream was O/W type emulsion, hence can be easily washed with plane water that gives better customer compliance. Our study indicated that the marketed as well as in lab formulations found to be more stable. Both formulations marketed and In lab had almost constant pH. Homogeneous, emollient, non-greasy and easily removed after the application. The stable formulations were safe in respect to skin irritation and allergic sensitization. The extract of curcuma longa has antiseptic activity, anti-inflammatory activity, and also increases The cetrimide has emollient properties. Hence all these properties are beneficial to normal human keratinocytes and it is safe and stable too.

**SUMMARY AND CONCLUSION -****Summary -**

The objective of the present work was to Formulate and evaluate the skin cream for antiseptic Anti-inflammatory activity. Although various type of cream is considered for antiseptic & Anti-inflammatory activity but these are still appears to be limited. In rate of tissue regeneration Plants and more potent healers because they promote the repair mechanism in the Natural way. In this modern era. The knowledge and experience of usage of herbs and being blend with advanced cosmetic technology to develop a safe and effective product. In this present study, skin. Cream was prepared using herbal plant Such as curcuma longa. Initially the research work started with a wide and thorough literature survey various Formulation were prepared by varying a amount of excipients such as Certimide, cetostearyl Alcohol, Liquid paraffin. Formulation of skin cream for wound healing was Successfully developed that met the relevant pharmaceutical characteristics. The prepared formulation on then evaluated for parameter such as like PH, physical Properties, Acid value, Saponification value, washability, Irritancy, Sensitivity test from the present study It can be concluded that it is possible to develop creams containing herbal extracts.

## Conclusion -

Formulation of skin cream for anti-septic & anti-inflammatory activity was successfully developed that met the relevant pharmaceutical properties. The prepared formulation showed good Spread ability, no evidence of phase separation and good consistency during study period. Stability parameter like visual appearance, nature, PH of Formulate Showed that there was no significant variation during study period. The prepared formulation showed proper PH range is approximately PH 6.8. It confirms the Compatibility of the formulation with skin secretions. Thus present study Concluded that it is possible develop Herbal Cream Containing herbal extract can be used as antiseptic and For Anti-inflammatory purpose.

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