

# **FORMULATION OF HERBAL CREAM USING *Tridax Procumbens***

Project report submitted in partial fulfillment of the requirement  
for the degree of Bachelor of Technology

in

**Biotechnology**

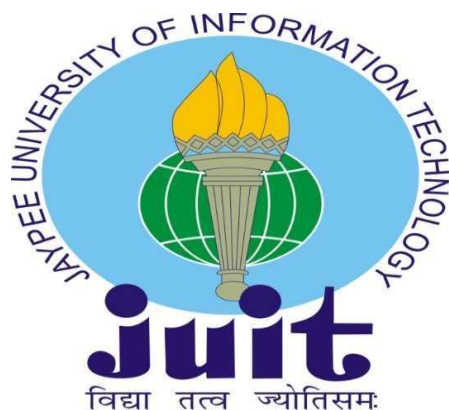
by

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to



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## CANDIDATE'S DECLARATION

I hereby declare that this project “**Formulation of Herbal Cream using Tridax procumbens**” has been done by me under the supervision of **Dr. Ashok Kumar Nadda, Assistant Professor, Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology**. I also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

A handwritten signature in blue ink that reads "Vipasha Sher". The signature is written in a cursive style and is underlined.

Vipasha Sher

201807

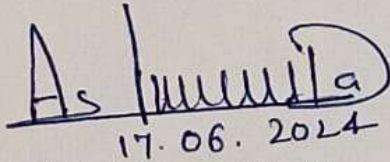
**Date:**

## SUPERVISOR'S CERTIFICATE

This is to certify that the work being presented in the project report entitled "**Formulation of Herbal Cream using Tridax procumbens**" in partial fulfilment of the requirements for the award of the degree of **Bachelor in Technology in Biotechnology**; submitted to the Department of Biotechnology And Bioinformatics, Jaypee University of Information Technology, Waknaghat is an authentic record of work carried out by during the period from July 2023 to June 2024 under the supervision of **Dr. Ashok Kumar Nadda, Department of Biotechnology And Bioinformatics, Jaypee University of Information Technology,**

I also authenticate that I have carried out the above-mentioned project work under the proficiency stream.

This is to certify that the above statement is correct to the best of my knowledge.



17.06.2024

**Dr. Ashok Kumar Nadda,**

**Assistant Professor,**

**Department of Biotechnology & Bioinformatics,**

**Jaypee University of Information Technology.**

**Date: 17.06.2024**

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## TABLE OF CONTENTS

<b>1. ABSTRACT</b> .....	7
<b>2. CHAPTER 1</b>	
Introduction.....	8-10
1.1 Problem Statement.....	9-10
1.2 Objective.....	10
<b>3. CHAPTER 2</b>	
Review of Literature.....	8-11
<b>4. CHAPTER 3</b>	
Materials And Methods.....	12-17
<b>5. CHAPTER 4</b>	
Results.....	23-27
<b>6. CONCLUSION</b> .....	28
<b>7. REFERENCES</b> .....	29-30

## LIST OF FIGURES

Figure No.	Particular	Page No.
1	A)Flower of <i>Tridax procumbens</i> B)Leaves of <i>Tridax procumbens</i>	13
2	Schematic Diagram of <i>Tridax procumbens</i> Showing All its Parts	14
3	Phytochemical and Pharmacological Aspects of <i>Tridax</i>	15
4	Collection and washing of leaves of <i>T. procumbens</i>	17
5	Preparation of Liquid Extract	17
6	Results from the Antimicrobial Susceptibility Test	25
7	Cream Base	26
	Cream formulated from <i>Tridax procumbens</i>	26
8	Formulated Cream stored at two different Temperatures	27

## LIST OF TABLES

<b>Table No.</b>	<b>Particulars</b>	<b>Page No.</b>
Table 1	Classification of <i>Tridax procumbens</i> (Chaudhari,2019)	14
Table 2	Composition of <i>Tridax procumbens</i> Cream	21
Table 3	Qualitative determination of bioactive compounds present in <i>Tridax procumbens</i>	11-16
Table 4	Quantitative determination of bioactive compounds present in <i>Tridax procumbens</i>	17-22
Table 5	Parameters observed on the day of formulation	26
Table 6	Observations of stability test of formulated cream	27

## ABSTRACT

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India's fields are home to a prevalent weed called *Tridax procumbens*. Ancient ages have long utilized the leaves of *Tridax procumbens* to cure wounds. The mature leaves were crushed to make a paste and were further rubbed over the wounded area. Many civilizations have long utilized *Tridax procumbens* to cure cuts, wounds, and skin infections. Its medical properties are attributed to its bioactive constituents, which include alkaloids, tannins, flavonoids, and saponins. However, in previous studies, the anti-healing properties of *T. procumbens* have already been demonstrated. *Tridax procumbens* or coat buttons is a popular perennial plant with a wide range of therapeutic uses. It has antioxidant, antibacterial, anti-inflammatory, and wound-healing qualities. This ongoing study aims to evaluate this wound-healing activity and further formulate an herbal cream from the paste/extract of *T. procumbens*. The extraction process involved isolating bioactive compounds from the aerial parts of *Tridax procumbens*, followed by phytochemical screening. The herbal extract was then incorporated into a cream base, ensuring optimal consistency, stability, and pH suitable for dermal application. The formulated cream underwent rigorous evaluation for its physical properties. Preliminary results indicated that the herbal cream exhibits significant antimicrobial activity and enhanced wound healing. This formulation holds promise as a natural, effective alternative to synthetic topical agents, warranting further clinical studies to confirm its efficacy and safety for widespread dermatological use.

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**Key Words:** *Tridax procumbens*, Phytochemicals, Bioactive Compounds, Qualitative Analysis, Quantitative Analysis, Wound Healing Properties, Herbal Cream



An injury to live tissue on the upper layer of the skin's epithelial integrity is referred to as a wound. According to the World Health Organization (WHO), wounds can cause the skin system to open up or break down, which can further cause disruptions to the anatomy, physiology, and function of the skin. Restoring the skin and tissue's normal structure and function is a part of the wound-healing process. Put another way, the healing process of a wound is a physiological process that involves the replacement of destroyed tissue with new tissue and the restoration of the integrity of the skin (Shrivastav et. al.,2020). For the compromised functional state and broken anatomical continuity to be restored, wounds must heal properly. One of the challenging side effects that have long been known is impaired healing of open wounds. The most beneficial wound healing techniques are those that minimize tissue damage, maximize tissue perfusion, debride nonviable tissue, and create a moist wound healing environment (Yaduvanshi et. al., 2011). Therefore, when given topically, a medication that promotes vascularization, collagenation, and re-epithelization is expected to work best.

Since the dawn of humankind, traditional/herbal remedies have served as the foundation for healthcare systems worldwide. Herbal remedies are plant-based medications prepared by combining various plant parts in different ways. Examples of plant parts thought to have therapeutic qualities include the roots, stems, leaves, bark, fruit, seeds, and flowers. These medicines/remedies are currently in widespread usage as they are more culturally acceptable, better compatible, and adaptable and have fewer adverse effects, because of which they play a significant role in international trade as well. Though this differs greatly between nations, understanding of their therapeutic, pharmacological, and commercial importance is still expanding (Chougale et. al.,2022). Although the value of traditional medicine is well known, there are some disadvantages to it as well, such as a shortage of research, a small body of literature, and low patient participation. Reports from specific media outlets state that 80% of families utilize herbal medicines. The plant's ability to treat illness may stem from the phytochemicals that make up its anti-oxidant, anti-microbial, and antipyretic qualities. Therefore, research on these plants is necessary to have a greater understanding of their characteristics, safety precautions, and utility. All these plant-based medicinal therapies are found in our ecosystem and identifying their morphological, pharmacological, or pharmacogenetic characteristics might help us to clarify their mode of action and active

principle. However, the identification and makeup of many such plants have not been well investigated yet (Madhu et. al.,2016).

Thus, we concentrated on the characteristics of ancient herbs that were widely used to heal wounds, out of which, *Tridax procumbens*, family Asteraceae is likely the largest family of flowering plants, with over 1400 species, 674 of which are found in India. It is a sophisticated and highly specialized family of herbaceous plants, herbs, shrubs, or less commonly trees (Deshmukh et. al,2018). *Tridax procumbens* is widely utilized in the Ayurvedic medical system for a variety of diseases and ailments. It is also known as “*Ghamra*” in Hindi, “*Jayanti Veda*” in Sanskrit, and is also referred to as “coat buttons” in English. It is one of the major grasses with significant medicinal value and is widely found in tropical and subtropical regions and grown mostly during or rainy season. It’s a common weed that grows alongside commercially significant crops. It lives in roadside ditches, hedges, and waste areas all over India (Shrivastav et. al.,2020). In Indian traditional medicine, the plant is frequently used as a hair tonic, anticoagulant, insect repellent, and treatment for diarrhea, dysentery, and wound healing (Nimbekar T.P. et.al.,2019). *Tridax procumbens* has been utilized for its anti-inflammatory, antimicrobial, and wound-healing benefits, making it a promising candidate for modern dermatological applications.

This thesis investigates the preparation and assessment of an herbal cream made from *Tridax procumbens*. Through the utilization of bioactive compounds found in this plant, our goal is to create a topical solution that provides a natural and effective remedy for common skin conditions. A thorough analysis is conducted as a part of the study to determine the active ingredients that give the cream its medicinal properties, followed by the formulation of the cream through verified techniques. Further, the cream’s stability, efficacy other important parameters are evaluated by testing. These assessments are meant to make sure that the final product offers therapeutic advantages. The current research aims to add to the increasing amount of information that supports the use of herbal treatments by fusing traditional knowledge with contemporary scientific methodologies.

### **1.1 Problem Statement**

*Tridax procumbens* is widely used in herbal therapy, however, its utilization in contemporary dermatological formulations is lacking. Nowadays, the majority of skincare products are made of synthetic materials, which can have negative consequences like allergic responses, skin irritation, and environmental issues. Effective herbal substitutes are

also needed since customer demand for sustainable and natural skin care products is rising. Despite being well-known for its properties, *Tridax procumbens* has not yet had its potential as a major component of a standardized herbal cream. The primary obstacles encompass the process of extracting and stabilizing the plant's active chemicals, guaranteeing the effectiveness and safety of the cream formulation, and devising a dependable production method that upholds the plant's therapeutic qualities.

## **1.2 Objective**

The project's main objective of this project is to create and assess a herbal cream formulation based on *Tridax procumbens*, paying particular attention to the product's stability, safety, and effectiveness. The following are the specific goals of the consideration:

- Collection of foliage parts of *Tridax procumbens*
- Extraction and Isolation
- Physio-chemical Analysis
- Formulation Development
- Biological Testing and Evaluation
- Product Optimization

By achieving these objectives, the project aims to create a scientifically validated, effective, and safe herbal cream derived from *Tridax procumbens*, contributing to the advancement of natural skincare solutions.

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The skin or other injured organ heals itself through a very complex process called wound healing. The epidermis, which is the skin's outermost layer, and the dermis, which is the skin's inner or deeper layer, form a protective barrier against the exterior environment. When any trauma or injury breaches this protective barrier, the regular physiological process of wound healing is immediately triggered (Ruchi S. Shivhare et. al., 2019). In case of any exposure to air or microorganisms, the wound leads to wound contamination finally resulting in the development of infection. The healing process of a wound is achieved through four precise and highly programmed phases: hemostasis, inflammation, proliferation, and remodeling. A wound must undergo all four phases in the correct sequence and time frame to heal successfully (Guo & DiPietro, 2010). A dermal wound is any break in the skin's integrity and is a common pathologic disease. A high degree of morbidity is linked to it because of bleeding, discomfort, swelling, inflammation, and loss of function. The characteristics of cutaneous wounds include the migration and proliferation of fibroblasts, endothelial and epithelial cells, connective tissue deposition, angiogenesis, re-epithelization, and wound contraction (Yaduvanshi et. al., 2011). For the compromised functional state and broken anatomical continuity to be restored, wounds must heal properly. Impaired healing of open wounds is one of the problematic side effects that has long been known. It is questionable if systemic medications can speed up healing in a person who is endocrinologically and nutritionally normal. In situations like these, it is most helpful to apply the fundamentals of wound healing, which include reducing tissue damage, removing nonviable tissue, increasing tissue perfusion and oxygenation, enough feeding, and creating a moist environment for the healing process (Yaduvanshi et. al., 2011). Numerous commercial treatments promise to speed up the healing process of wounds, but after using them for a while they result in the development of several issues like; hypo-pigmentation, the emergence of scars, acne, skin burns, etc (Ruchi S. Shivhare et. al., 2019).

Herbal therapy is widely used in both traditional and alternative medicine in both developed and developing nations. The World Health Organisation (WHO) and India have been advocating for the use of traditional medicine because of its lower cost, greater accessibility, and widespread belief among the populace in underdeveloped nations. The therapy of several skin-related issues as well as wounds can be aided by simple traditional

plants. People believe that plant-based materials are more dependable, safe, and have fewer side effects, which is why there is a lot of interest in using phytoconstituents or active extracts derived from herbs (Ruchi S. Shivhare et. al., 2019). Traditional medicines have been practiced for hundreds of years and are considered an effective therapeutic method due to their potential to treat a wide range of ailments and disorders. Traditional medicine offers holistic approaches to health, emphasizing the balance between the body, mind, and environment. Due to its cultural significance and accessibility, traditional medicine continues to be the prevailing source of healthcare in many parts of the world. Traditional medicine has many benefits, as well all know, but it also has some disadvantages, such as a dearth of research, a small body of literature, and low patient compliance. According to data from several print media outlets, 77% of Indian families utilize herbal products. Furthermore, contemporary science has started investigating and confirming the effectiveness of several ancient treatments and procedures. Through the provision of a variety of therapeutic alternatives and the promotion of a deeper understanding of holistic health, this fusion of ancient knowledge and contemporary research continues to enhance the global healthcare environment (Paralkar S D, 2020).

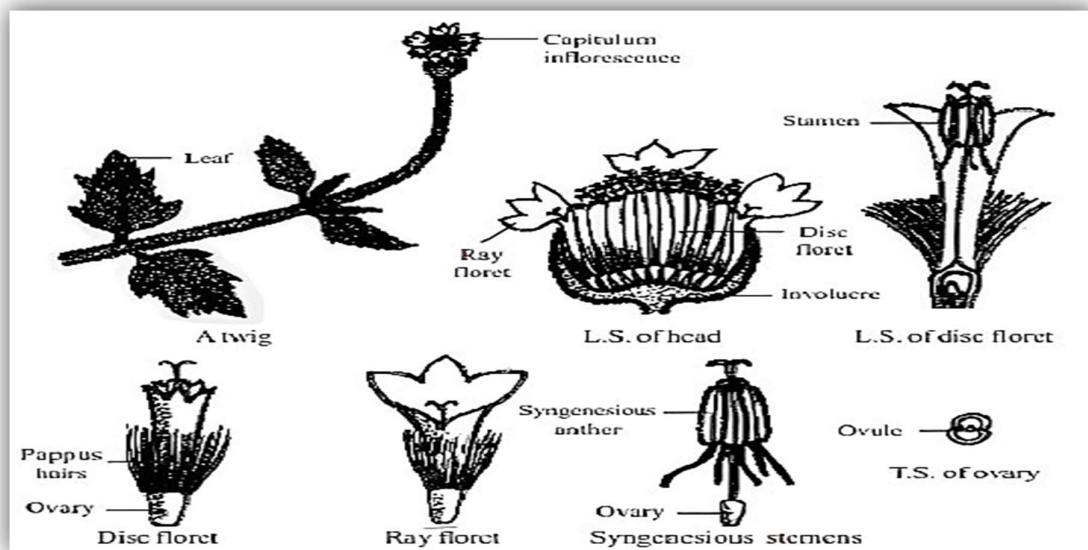
Many different kinds of creams, foams, lotions, and gels are being investigated for wound healing, however, the pace of tissue regeneration in these seems to be restricted. Herbal formulations have emerged as a popular alternative to conventional dermatological products, harnessing the natural therapeutic properties of medicinal plants to provide effective and gentle care for the skin (Mali et. al., 2014). These blends make use of the medicinal qualities of several plant extracts, which are well-known for their bioactive compounds, including essential oils, flavonoids, phenols, and alkaloids which exhibit antibacterial, anti-inflammatory, antioxidant, and skin-soothing effects (Dhyani A et. al., 2019). Herbal cream formulation is a meticulous procedure that combines scientific methods with traditional herbal expertise to produce safe and effective products. The process of formulation starts with the extraction and isolation of bioactive compounds from the desired therapeutic plant. Then, to guarantee that the active ingredients are dispersed uniformly and remain stable, these extracts are combined with a cream base, which is usually made of water, oils, emulsifiers, and stabilizers. Essential oils and other natural preservatives are frequently used to extend the shelf life without sacrificing safety. To preserve the effectiveness of bioactive compounds and get the required texture and consistency, the method demands a careful balancing of the ingredients. Preserving the potency of the active components, avoiding microbiological contamination, and obtaining desired physical features like absorption, spreadability, etc. are important factors to take into

account when formulating herbal creams. The production of extremely efficient herbal creams has been made possible by recent developments in extraction and formulation processes, offering herbal creams as a desirable and feasible substitute for synthetic topical medications in the treatment of a variety of skin problems and maintaining skin wellness (Kapoor et. al., 2010).

Traditionally in India, the fresh juice from the leaves of *Tridax procumbens* a plant in the genus *Tridax* and family Asteraceae, commonly known as Coat Buttons or *Tridax Daisy* has been used as one of the most popular remedies for dermal wounds. *Tridax procumbens* is a small, perennial herbaceous plant with a creeping habit. It has slender, hairy stems that can reach up to 1 meter long. The leaves are opposite, ovate-elliptical in shape, and have serrated margins. The flowers are yellow or white and are arranged in heads that are 1-2cm in diameter. This plant is native to tropical America but has been widely distributed throughout the nation, including India, especially in Maharashtra, Madhya Pradesh, and Chhattisgarh where it is considered an invasive species. *T. procumbens* can bloom all year long and is a prolific bloomer. It is a typical weed found in wastelands, lawns, and gardens.



**Fig.1:** A)Flower of *Tridax procumbens* B)Leaves of *Tridax procumbens*



**Fig.2:** Schematic Diagram of *Tridax procumbens* Showing All its Parts

([https://www.brainkart.com/article/Botanical-description-and-Economic-importance-of-Tridax-procumbens\\_1009/](https://www.brainkart.com/article/Botanical-description-and-Economic-importance-of-Tridax-procumbens_1009/))

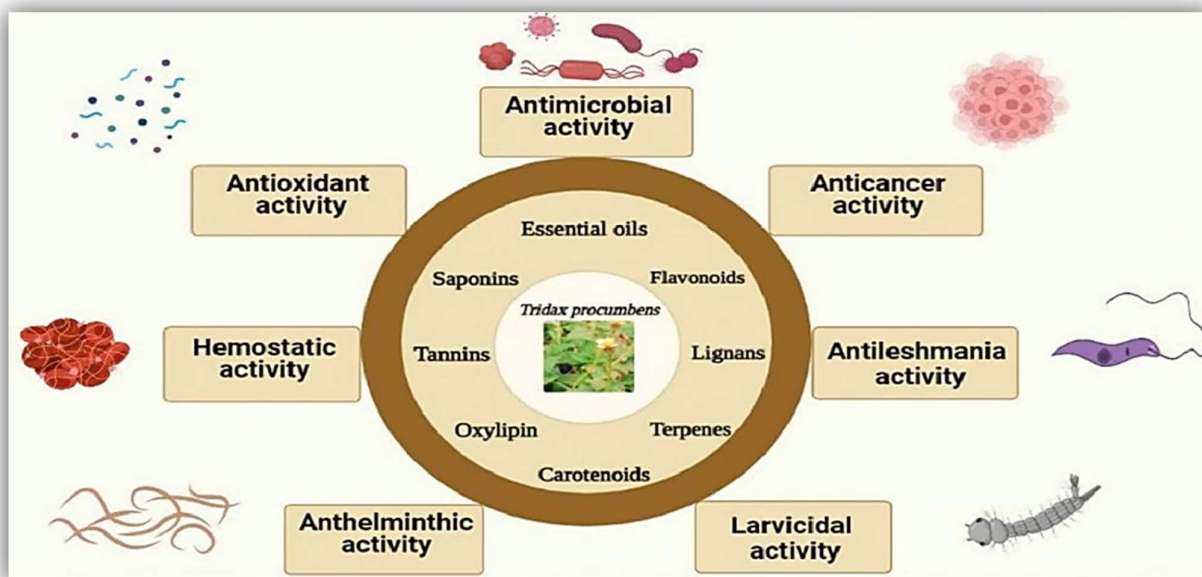
**Table 1:** Classification of *Tridax procumbens* (Chaudhari,2019)

Divisions	Classing
<b>Kingdom</b>	Plantae
<b>Sub-Kingdom</b>	Tracheobionta
<b>Division</b>	Spermatophyta
<b>Subdivision</b>	Magnoliophyte
<b>Class</b>	Magnoliopsida
<b>Subclass</b>	Asteriidae
<b>Order</b>	Asterales
<b>Family</b>	Asteraceae
<b>Genus</b>	Tridax
<b>Species</b>	Tridax procumbens

Despite the reports that it invades numerous crops, *T. procumbens* is a plant renowned for its diverse properties. It has long been used for medicinal purposes to treat liver illness, diarrhea, dysentery, and bronchial catarrh. *Tridax procumbens* is often applied in the treatment of skin disorders, such as cuts, wounds, and infections, and has also been reported to possess hepatoprotective and hypotensive effects. The plant exhibits a wide range of biological activities. In terms of pharmacological properties, ethyl acetate extract shows anti-

inflammatory, anti-cyclooxygenase, and antioxidant properties, while methanol and ethanol extracts demonstrated anti-hyperglycaemic, anti-fungal, and anti-leishmanial properties. This herb's extract has anticoagulant, antiherpetic, and antibacterial properties (Andriana et. al.,2019). A variety of medicinal properties that make it a valuable traditional and modern herbal medicine are:

1. **Anti-inflammatory Properties:** Bioactive substances found in the plant aid in reducing inflammation, because of this it can be used to treat inflammatory diseases such as wounds and other illnesses.
2. **Antioxidant Properties:** The plant has a lot of antioxidants, which aid the body in scavenging dangerous free radicals. In addition to preventing cell damage, this may lower the chance of developing chronic illnesses including cancer and heart diseases.
3. **Antimicrobial Properties:** Significant antimicrobial activity of *Tridax procumbens* has been shown against a variety of bacteria and fungi. These characteristics aid in the healing of wounds and the treatment of infections.
4. **Wound Healing:** *Tridax procumbens* has been utilized historically for its capacity to speed up the healing of wounds. It works well for wound treatment because of its tissue-regeneration qualities.



**Fig.3:** Phytochemical and Pharmacological Aspects of *Tridax*

(<https://doi.org/10.1016/j.phyplu.2021.100199>)



*Tridax procumbens* is said to possess a high concentration of bioactive substances, such as tannins, alkaloids, flavonoids, and saponins which are responsible for its therapeutic qualities. These compounds are thought to be responsible for the plant's medicinal properties. *Tridax procumbens* extracts are frequently used in herbal formulations because of their antimicrobial and wound-healing properties, which makes them useful in topical creams and ointments intended to treat cuts, wounds, and skin infections. Furthermore, the plant's antioxidant and anti-inflammatory qualities are utilized in tinctures and health supplements to fight oxidative stress and lessen inflammation.

The versatility of *Tridax procumbens* in these various products underscores its importance in natural and herbal medicine. As these properties came into notice and gained importance, there is a need to research and develop new herbal medications to improve patient compliance and acceptance. Therefore, the primary goal of the current study is to create and assess an herbal cream that has numerous applications including antimicrobial, anti-inflammatory, and wound healing.

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### 3.1 Collection of Plant Material and Authentication

Fresh leaves of *Tridax procumbens* were collected in the months of May and June from the areas around the University located in Wagnaghat, Solan. The plant was authenticated at Dr. Y.S. Parmar University of Horticulture and Forestry, and herbarium was submitted for further study. The leaves of the plant were washed with running water and were kept for drying.



**Fig.3:** Collection and washing of leaves of *T. procumbens*

### 3.2 Preparation of Liquid Extracts

Leaves of *T. procumbens* were first ground into a fine paste from which the obtained paste was filtered twice through filter paper.



**Fig.4** A) Grinding of leaves B) Filtration through muslin cloth C) Filtration through filter paper D) Liquid extract of *T. procumbens*

### **3.3 Qualitative Analysis**

A series of phytochemical tests were performed to evaluate and confirm the presence of bioactive compounds present in *Tridax procumbens*.

#### **1. Alkaloid Test**

To detect the presence of alkaloids, add a small amount of plant sample paste to a test tube, and then add 2 drops of Mayer's reagent carefully along the sides of the tube. If a white or Smooth precipitate is formed, it indicates the presence of alkaloids.

#### **2. Carbohydrate Test**

To test for the presence of carbohydrates in the plant paste, two to three drops of the Molisch reagent were added to the plant paste and mixed in a test tube. Then, roughly 2-3 drops of sulphuric acid were added. The appearance of a violet ring indicates the presence of carbohydrates.

#### **3. Protein Test**

Add 4-6 drops of copper sulfate solution and 2 ml of sodium hydroxide to the plant paste, mix the contents well by gently shaking the test tube, and allow the mixture to rest for about 4-5 minutes. A bluish-violet color indicates the presence of protein.

#### **4. Amino Acid Test**

After adding plant paste to a test tube, a few drops of ninhydrin reagent were introduced. The test tube was then heated to 40°C and incubated for seven to ten minutes. The appearance of a green or purple color indicates the presence of amino acids in the paste solution.

#### **5. Saponin Test**

A plant paste was placed in a test tube, followed by vigorous shaking and the addition of a few drops of double-distilled water. The formation of foam indicates the presence of saponin.

#### **6. Terpenes Test**

After adding plant paste to a test tube, a small amount of FeCl<sub>3</sub> solution was introduced. If a deep or dark green color appears, this indicates the presence of tannins.

### **7. Glycoside Test**

To detect the presence of glycosides in a plant paste solution, 1 ml of the paste was mixed with 2 ml of H<sub>2</sub>SO<sub>4</sub> and 2 ml of chloroform in a test tube. The solution was thoroughly mixed, and a reddish-brown color ring occasionally appeared, indicating the presence of glycosides.

### **8. Phenolic Test**

To detect the presence of phenols in a plant paste, the paste is first dissolved in water or a mixture of water and ethanol. Then, a few drops of neutral ferric chloride solution (FeCl<sub>3</sub>) prepared in deionized water are added to the mixture. Sodium hydroxide is then added until a permanent brown precipitate is formed. The appearance of a red, green, or purple color is indicative of the presence of phenols in the paste.

### **9. Flavonoid Test**

When an aqueous plant crude paste was mixed with a 2.0% NaOH solution, a deep yellow color was observed, which indicated the presence of flavonoids. The addition of a few drops of dilute acid neutralized the color, confirming the existence of flavonoids in the paste.

## **3.4 Quantitative Analysis**

### **1. Estimation of Total Alkaloids Content:**

10% of acetic acid is added in ethanol, covered, and left to settle for a few hours. To the extract concentrated ammonium hydroxide is added dropwise until the precipitation is complete. The solution is then allowed to settle and the precipitate is collected and washed with dilute ammonium hydroxide followed by filtration, drying, and weighing.

### **2. Determination of Tannin Content:**

Make aliquots of extract in test tubes, and make up the volume accordingly with distilled water and Folin-Ciocalteu reagent followed by the addition of sodium carbonate solution. Vortex the tubes and record absorbance at 725nm.

### **3. Estimation Of Total Flavonoid Content:**

A standard curve was created by preparing various concentrations of gallic acid in methanol, while quercetin was dissolved in methanol to produce a final concentration of quercetin. Then,  $Al_2Cl_3$  was added, and the mixture was incubated for 5 minutes before adding NaOH. The absorbance at 510 nm was measured, and the flavonoid content was estimated in terms of quercetin equivalents.

### **4. Estimation of Total Phenolic Content:**

A reaction mixture was created by combining extracts with 10% Folin-Ciocalteu's reagent, and 5 ml of 7%  $Na_2CO_3$  solution in 13 ml of deionized water. The mixture was allowed to react for two hours at room temperature in the dark, after which the absorbance was measured at 760 nm using a spectrometer. The mean absorbance value was obtained after three repetitions of the experiment, and the total phenolic content was calculated using a calibration curve created with a gallic acid solution.

### **5. Estimation of Steroids**

1 ml of extract was transferred into volumetric flasks. Sulphuric acid and Iron chloride were added followed by potassium hexacyanoferrate solution. This mixture was heated for 30 minutes and diluted. The absorbance was measured at 780nm.

## **3.5 Antimicrobial Testing**

Antimicrobial testing was carried out using the disc diffusion method,

## **3.6 Preparation of Powdered Extract**

Leaves of *T. procumbens* were first ground into pestle and mortar under liquid nitrogen and were then kept in a freezer overnight. The frozen paste was then lyophilized to obtain a fine powder.

## **3.7 Formulation of Tridax procumbens Cream**

The formulation of Tridax procumbens cream was carried out using all the components mentioned in the Table below. Three different phases (water phase, oil phase, and cool down phase) were prepared separately and then mixed. After mixing all the components, homogenization was carried out by giving constant stirring for 20 minutes.

**Table 2:**Compositon of Tridax procumbens Cream

	<b>F1</b>
<b>WATER PHASE</b>	
Glycerin (ml)	0.8
Xanthan Gum (gm)	0.04
Distilled Water	14.46
<b>OIL PHASE</b>	
Stearic Acid (gm)	0.6
Cetyl Alcohol (gm)	0.8
Coconut Oil (ml)	0.6
Polysorbate 80 (ml)	0.8
<b>COOL DOWN PHASE</b>	
Tridax procumbens Powder	0.2
Benzyl Alcohol (ml)	0.2
Esters(ml)	0.1
Citric Acid	0.2

### **3.8 Physio-chemical Characterization of Formulated Cream**

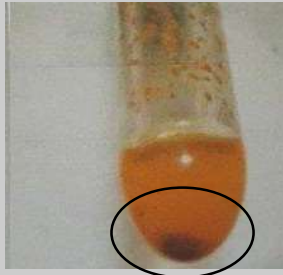


- **Physical Appearance:** Visual inspection is used to assess physical appearance. The formulated product's color, odor, and condition all are included.
- **pH Determination:** pH is determined on a scale of 10. The pH was determined using litmus paper.
- **Phase Separation:** The phase separation is checked by centrifugation. The cream's formulation called for 8000rpm for five minutes.

- **Stability:** The formulated product is stored at different temperatures and parameters such as color, texture, pH, and homogeneity were observed for 30 days from the day of formulation.
  - **Viscosity:** The viscosity is measured by a viscometer using spindle 63 at different rpm. The change in the value of viscosity was recorded as the speed increased.
  - **Spreadability:** The spreadability of the formulated cream is calculated by measuring the diameter. 1ml of the product is poured on a glass plate using a pipette and leave it for 5 minutes. The diameter is measured after 5 minutes using a scale.
-

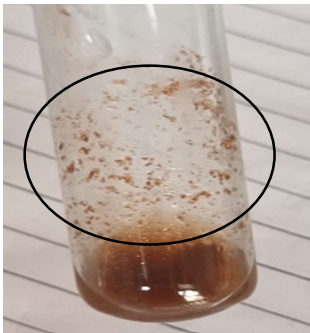
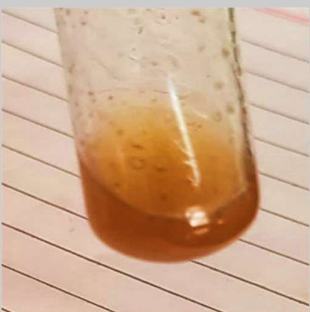
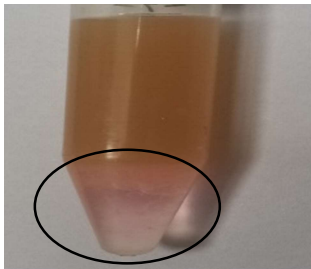
### 4.1 Phytochemical Analysis

The below table shows the results of the qualitative analysis, carried out from the extract of *Tridax procumbens*.

**Table 3:** Qualitative determination of bioactive compounds present in *Tridax procumbens*

NAME OF TESTS	INFERENCE	OBSERVATION
<b>Alkaloids</b>	+	
<b>Carbohydrate</b>	-	
<b>Protein</b>	-	
<b>Amino Acid</b>	-	
<b>Tannis</b>	+	
<b>Saponin</b>	+	



<b>Glycoside</b>	-	
<b>Phenols</b>	+	
<b>Flavonoids</b>	+	
<b>Steroids</b>	+	

The table below shows the results of the quantitative analysis carried out from the extract of *Tridax procumbens*.

**Table 4:** Quantitative determination of bioactive compounds present in *Tridax procumbens*

<b>Plant Source</b>	<b>Alkaloids</b>	<b>Tannis</b>	<b>Flavonoids</b>	<b>Phenols</b>	<b>Steroid</b>
<b>Tridax procumbens</b>	11.152g/kg	22.980%	633.07g/kg	11.25mg/g GAE	58.80

## 4.2 Antimicrobial Testing

An antimicrobial susceptibility test was carried out against *E. coli* and *Bacillus* by disc diffusion method.



**Fig.5** Antimicrobial susceptibility test

## 4.3 Cream Formulation

The cream was formulated using *Tridax procumbens* powder and all the other constituents mentioned above in Table 2. Different parameters were observed in the prepared formulation.

- **Physical Observation:** Observations about color, appearance, pH, texture, and phase separation were made on the same day of formulation. The formulated cream has a smooth, creamy texture and a green color.
- **pH Determination:** The pH value of the formulated sample was measured at room temperature and recorded. On the day of formulation, the samples had a pH value of 7.2.
- **Phase Separation:** Centrifugation was used to verify the phase separation. For five minutes, the formulated cream was centrifuged at 8000rpm.

**Table 5:** Parameters observed on the day of formulation.

PARAMETERS	OBSERVATIONS
COLOR	Green
ODUOR	Pleasant/Sweet
CONSISTENCY	Smooth
STATE	Semisolid
PH	7.2
HOMOGENEITY	Homogenous
SPREADABILITY	16mm
VISCOSITY	1240mPas
WASH ABILITY	Washable



**Fig.6** Cream Base



**Fig.7** Cream formulated by *T.procumbens*

- **Stability Test:** The formulated cream was kept under two different temperatures (at room temperature and 4°C) for thirty days following the formulation's first day, characteristics including the cream's color, consistency, and homogeneity were noted. The cream samples were stable at both temperatures after 30 days as no alterations in the observation were noticed.



**Fig.8** Formulated Creams stored at two different temperatures

**Table 6:** Observations of stability test of formulated creams

NO. OF DAYS	PARAMETERS	4°C	ROOM TEMP.
DAY 1	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous
DAY 5	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous
DAY 10	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous
DAY 15	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous
DAY 20	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous
DAY 25	Color Consistency Homogeneity	Unchanged Smooth Homogenous	Unchanged Smooth Homogenous

## CONCLUSION

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In conclusion, *Tridax procumbens* is a powerful medicinal plant with properties that make it ideal for ointment formation. Its anti-inflammatory, antibacterial, and antifungal properties make it effective in treating a variety of illnesses, ailments, and skin conditions, including eczema, psoriasis, and acne. Furthermore, the process of cream formation from *Tridax procumbens* is relatively simple and can be done using readily available materials. This makes it an accessible and affordable treatment option for many people. The phytochemical constituents such as alkaloids, flavonoids, tannins, saponins, and other phenolic components are thought to play an important role in the healing of wounds by significantly raising the rate of wound closure and epithelization. Using *Tridax procumbens* cream will not only provide relief from skin conditions but will also promote overall skin health.

Thus, it can be said that herbal formulations are a valuable gift from nature. Herbal medicines are thought to be safer than allopathic ones because allopathic medicines tend to have adverse side effects. In a similar vein, *Tridax procumbens* ointment will be a valuable addition to any medicine cabinet. Its effectiveness, accessibility, and affordability make it a must-have for anyone looking for a natural and safe way to treat their skin conditions.

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