

FORMULATION AND EVALUATION OF WOUND HEALING HERBAL CREAM

Dissertation submitted to



Swami Ramanand Teerth Marathwada University, Nanded

In the partial fulfillment of the requirements for

BACHLOR OF PHARMACY

[Sem - VIII]

IN PROJECT WORK BY

Miss. Panchal Pranjali Venkat

Mr. Pandhare Prashant Vitthalrao

Mr. Patil Arjun Pandurang

Mr. Patil Gaurav Balbhim

Mr. Patil Sanket Kishor

Miss. Patil Savita Kishan

Under the Guidelines

Mr. S.J Wakode (M. pharm)

Assistant Professor, Department of Pharmaceutics



Maharashtra College Of Pharmacy,

Nilanga DIST- LATUR(PIN- 413521}

2023-2024

DECLARATION BY THE CANDIDATE

This is to certify that the research work embodied in this project entitled "**Formulation and evaluation of 25 gm of wound Healing Herbal Cream.**" submitted to **Swami Ramanand Teerth Marathwada University, Nanded** was carried out by us at **Maharashtra College of Pharmacy Nilanga** under our supervision in the partial fulfillment of the requirement for the award of degree of **Bachelor Of Pharmacy**. The extent and sources of information and material as has been obtained from other sources has been duly acknowledged in the thesis. The research work is original and has not been submitted in part or full for Degree of this or any other Institute. I hereby further declare that the **Maharashtra College of Pharmacy** shall have the rights to preserve, use and disseminate this dissertation in print or electronic format for academic/ research purpose.

Date:

Place: Nilanga

Name & Signature of Researcher

Miss. Panchal Pranjali Venkat

Mr. Pandhare Prashant Vitthalrao

Mr. Patil Arjun Pandurang

Mr. Patil Gaurav Balbhim

Mr. Patil Sanket Kishor

Miss. Patil Savita Kishan

CERTIFICATE

This is to certify that the research work embodied in this entitled “**Formulation And Evaluation Of 25 gm Of Wound Healing Herbal Cream**” submitted to **Swami Ramanand Teerth Marathwada University, Nanded** was carried out by

Miss. Panchal Pranjali Venkat, Mr. Pandhare Prashant Vitthalrao, Mr. Patil Arjun Pandurang, Mr. Patil Gaurav Balbhim, Mr. Patil Sanket Kishor, Miss. Patil Savita Kishan.

student of **Maharashtra College Of Pharmacy, Nilanga** under the supervision of Mr. S.J Wakode in the partial fulfilment of requirement for the award of degree of **Bachelor of Pharmacy**

The extent and source of information has been obtained by candidate from other sources has been duly acknowledged by her in this. Her research work is original and Bonafide.

Date:

Place: Nilanga

Signature of Head of Institute

Dr. Patil S.S

Principal

Maharashtra College Of Pharmacy,

Nilanga, Dist. Latur

CERTIFICATE

This is to certify that the research work embodied in this entitled “**Formulation And Evaluation Of 25 gm Of Wound Healing Herbal Cream**” submitted to **Swami Ramanand Teerth Marathwada University, Nanded** was carried out by

Miss. Panchal Pranjali Venkat, Mr. Pandhare Prashant Vitthalrao, Mr. Patil Arjun Pandurang, Mr. Patil Gaurav Balbhim, Mr. Patil Sanket Kishor, Miss. Patil Savita Kishan.

student of **Maharashtra College Of Pharmacy, Nilanga** under the supervision of Mr. S.J Wakode in the partial fulfilment of requirement for the award of degree of **Bachelor of Pharmacy**

The extent and source of information has been obtained by candidate from other sources has been duly acknowledged by her in this. Her research work is original and Bonafide.

Date:

Place: Nilanga

Signature of Research Guide

Mr. S.J Wakode

Maharashtra College Of Pharmacy,

Nilanga, Dist. Latur

ACKNOWLEDGEMENT

It's a great pleasure for me to acknowledge all those who have contributed towards the conception, origin and nurturing of this project. I consider myself lucky to work under the guidance of **Mr. S.J Wakode**, Asst. Professor, **Maharashtra college of Pharmacy, Nilanga** for her continuous guidance, constructive criticism and support have always propelled me understanding and constant inspiration throughout the course of the study. It is with affection and reverence that I dedicate often beyond the call of duty; it was pleasure of working under her guidance to perform better work without her help this dissertation would not be as it is.

I am greatly thankful to Respected **Dr. Patil S.S.** Principal, Maharashtra college of Pharmacy, Nilanga for providing much of the stimuli in the form of suggestions, guidance and encouragements at all stages of my work. Without his critical evaluation and deep-rooted knowledge, this thesis would not have become a reality. His constants quest for knowledge and strive for excellence will always remain a source of inspiration to me.

I am thankful to respected teachers Mr. S.V. Garad, Dr. S. V. Usnale, Mr. R.R. More, Dr. M.A. Shetkar, Dr. C.V. Panchal,, Dr. S.P. Kumbhar,, Mrs. P.D. Makne, Mr.S.J. Wakode, Ms..N.B. Bhalke, Mr. P.H. Shaikh, Mr. V.D. Usnale, Mr. S.N. Pawar,

Mr. I. A. Shaikh, Mr. Hunasnalkar, S.G,. Mr.S.S.Buye, Mr. S. R. Machplle, for their guidance, continuous encouragement, helpful discussion, direction, support and helped me in writing this project report

I express my deep gratitude to the Maharashtra college of Pharmacy, Nilanga for the valuable guidance during the course of study.

I must thank all the teaching and non-teaching staff for their valuable support. There are many people who have helped me directly and indirectly to make this work successful; I give my almost sincere thanks to all of them.

Last but not least, I would like to pay high regards to my parents for their sincere encouragement and inspiration throughout my research work and lifting me uphill this phase of life. I owe everything to them. Besides this, several people have knowingly and unknowingly helped me in the successful completion of this project.

Date:

Place: Nilanga

Miss. Panchal Pranjali Venkat

Mr. Pandhare Prashant Vitthalrao

Mr. Patil Arjun Pandurang

Mr. Patil Gaurav Balbhim

Mr. Patil Sanket Kishor

Miss. Patil Savita Kishan

Dr. Shivajirao Patil Nilangekar, Mr. Vijay Kumar Patil Nilangekar,
For providing us excellent infrastructure facilities in the
campus. I am thankful to our beloved principal Dr. S.S Patil
Maharashtra College Of Pharmacy, Nilanga. For providing
excellent facilities required for carrying out our reserch work.

I sincerely thank to my respectable guide Mr. S.J. Wakode the valuable guidance, Motivation and direction which helped me during my project work. I specially thank him for his innovation, constant inspiration and interactive help received from him.

I consider myself privileged to have worked under his guidance as he always shared his experience so kindly and patiently spite of his busy schedule and unfailing advice , constant encouragement during project work.

Thanking You,

Miss. Pranjali Venkat Panchal

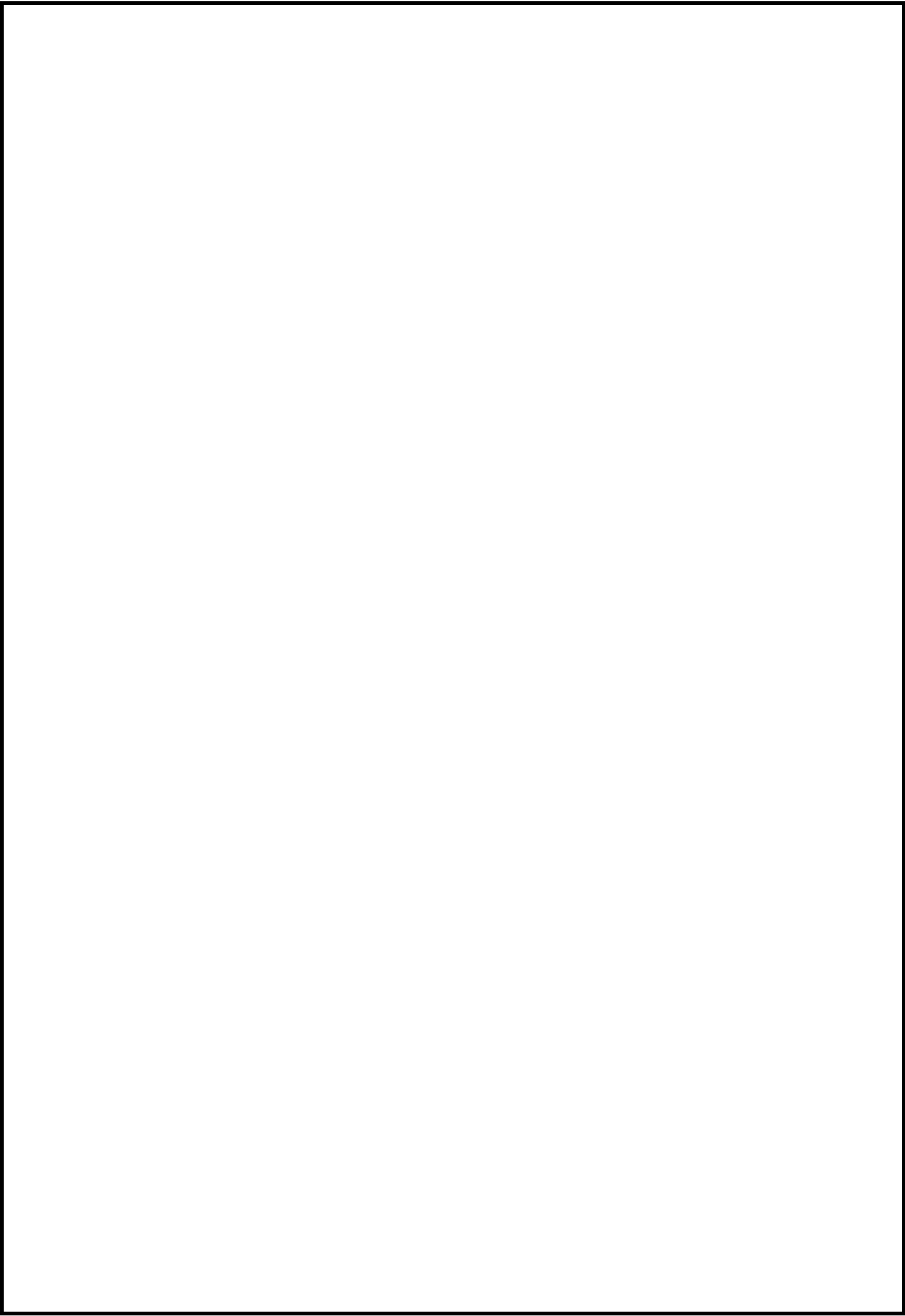
Mr. Prashant Vitthalrao Pandhare

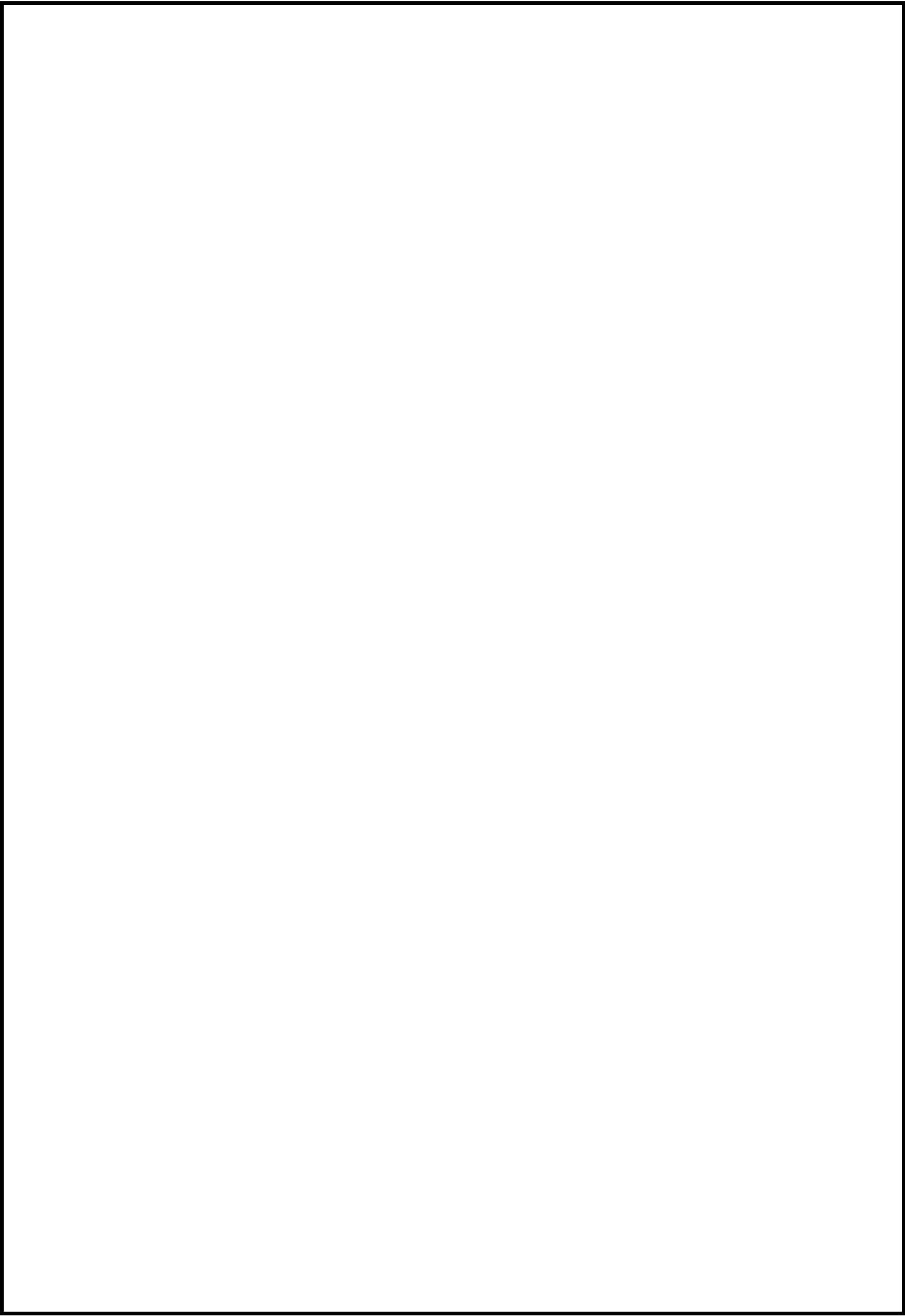
Mr. Arjun Pandurang Patil

Mr. Gaurav Balbhim Patil

Mr. Sanket Kishor Patil

Miss. Savita Kishan Patil







INDEX

Sr. No	Content	Page No.
1	Abstract	1
2	Introduction	2
3	Collection of plant for Extraction	3
4	Material used in Wound Healing Herbal Cream	4-9
5	Preparation of Extract	10
6	Preparation of Herbal Cream	11
7	Formulation And Evaluation of Herbal Cream	12-15
8	Applying of wound healing cream	16
9	Stages of wound healing	17
10	Result and Discussion	18-19
11	Conculusion	20
12	References	21-23

ABSTRACT

The main aim to present work is to formulate and evaluate herbal cream by using Tridax procumbens extract. In order to make formulation which has less side effects and better healing of wound.

A wound is a physical trauma where skin is cut or punctured for that healing process cream is beneficial for wound healing for Tridax procumbens shows various activities like Antibacterial, Antifungal, Antimicrobial, Antioxidant and Wound healing.

The cream is not only transparent and viscous it is also easily spreadable and healing power of the cream is very fast.

They are also known as “COATBUTTONS”

The cream formulation is designed by using excipient such as Steryl alcohol, Beeswax, Methylparaben, Propylparaben and Liquid paraffin.

INTRODUCTION

Cream are the semi solid dosage form and intended for topical application to the skin, applied on the surface of skin for therapeutic or protective action.

These preparation are used for the localized effects produced at the site of their application by drug penetration into the skin.

It is semisolid emulsion of oil and water.

For prevention and to cure disease recently attention is paid towards utilization of ecofriendly and biofriendly plant based product. Herbal remedies play an important role in curing various ailments.

Therefore turning to safe, effective and time tested ayurvedic herbal formulation would be preferable option.

Herbal medicine in wound healing management involves disinfection and providing suitable environment for natural healing process.

COLLECTION OF PLANT FOR EXTRACTION

TRIDAX PROCUMBENS



The tridax procumbens are commonly know as coatbuttons. They are the species of flowering plants. They are best known as a wide spread weed and pest plant.

The tridax procumbens were collected from the surrounding of Maharashtra college of pharmacy Nilanga. By selecting the disease free plant leaves. As the plant are used as the traditional medicine.

Further the collected leaves are washed with the distilled water. The cleaned plant part leaves are then allowed for complete shade drying and then made to fine powder and stored in the air tight container.



MATERIAL USED IN WOUND HEALING HERBAL CREAM

- **Tridax procumbens:**
- **Botanical Name:** Tridax daisy
- **Family** : Asteraceae
- **Kingdom** : Plantae
- **Genus** : Tridax

Chemical Constituents:

The flavonoid procumbentin has been isolated from the aerial parts of tridax procumbens. Other chemical compound isolated from the plant includes alkyl ester, sterols, pentacyclic triterpenes, fatty acids and polysaccharides.

USES

- Tridax procumbens are used in India for wound healing.
- They are also used as anticogulant, antifungal, and insect repellent.
- Its leaves extraction is used for infectious skin diseases in flock medicines.
- The extracted juice from the leaves is directly applied on the wound.



STEARYL ALCOHOL

➤ STEARYL ALCOHOL

- It works by forming a layer over the skin and prevents water loss from the surface of skin.
- It works as a stabilizer and emulsifier and prevents the separation of oil from water in various formulations.
- Stearyl alcohol acts as an emulsifier and makes the cream smoother.
- It is a white waxy solid that is derived from stearic acid a saturated fatty acid that occurs naturally in animals and natural fats.

Chemical Constituents:

It can be used at a concentration of 0.1% to 50% depending on the formulation. It is soluble in water alcohol, ether, benzene.

USES:

- It helps to improve the skin texture while for protecting the skin from bacteria and moisture loss .
- It binds water to your skin and enhances their efficacy.



- **WHITE BEES WAX**

- It is the product made from the honeycomb of the honey bees and other bees.
- Mixing of pollen oil into honey comb wax turns the white wax into yellow colour.
- Early reserch shows that applying a mixture of beeswax, honey and olive oil to the affected area for 12 hr reduces the pain and bleeding.

Chemical Constituents:

It consist of 71% ester, 15% hydrocarbon, 8% free fatty acid and 6% other components.

USES:

- In food and beverages white beeswax are used as stiffening agents.
- They are also used as thickners and emulsifiers in cosmetics.



- **PARAFFIN WAX:**

- Paraffin is a soft colourless solid derived from petroleum coal that consist of mixture of hydrocarbon atom molecules containg between 20 and 40 carbon atom.
- Paraffin hydrocarbon also called alkane any of the saturated hydrocarbons having the general formula C_nH_{2n+2}
- It is distinct from kerosene and other petroleum products that are sometimes called paraffin.

Chemical Constituents:

The paraffins are major constituents of natural gas and petroleum.

USES:

- It is used to smooth the skin .
- It helps to hydrate the skin.
- They are used as preservatives in herbal cream.
- It some times acts as the skin lubricant

- **PROPYL PARABEN & METHYL PARABEN:**

☐ They acts as an antifungal and antimicrobial agent.



PROPYL PARABEN



METHYL PARABEN



- **SORBITOL MONOOLEATE**

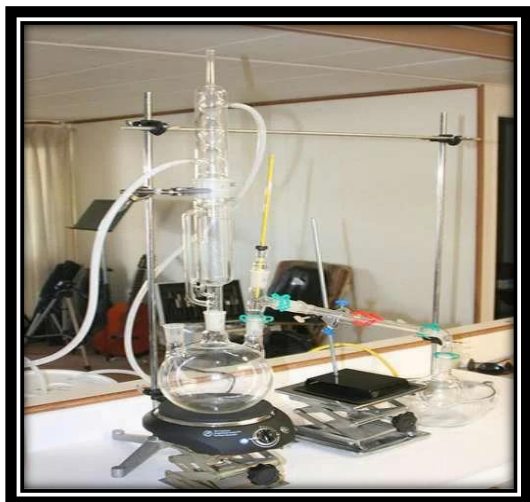
- Sorbitol monooleate is also known as sorbitan oleate.
- It is a w/o emulsifier with an sorbitan monooleate HbL scale value of 4.3.
- It is insoluble in water but can disperse in hot water.
- It is an emulsifier, thickener, and stabilizer found in food products house hold items and oral pharmaceuticals.
- It is also used as coupling agent and dispersing agents in various products.
- It is also used as friction modifier and emulsifier in personal care products.

USES:

- Sorbitol monooleate is used as wetting agent , coupling agent and dispersing agent in various products
- In cosmetics and pharmaceutical creams it is used as friction modifier and emulsifier.

PREPARATION OF EXTRACT FOR WOUND HEALING

HERBAL CREAM:



SOXHLET APPARATUS

- Firstly take the dried leaves of tridax procumbens.
- Then crush the leaves into fine powder and make fine powder of it.
- Then weight the powder (upto 50 gm)
- Then take 250 ml of methanol as base in round bottom flask.
- Then transfer the fine powder of drug into soxhelet appratus.
- Heat it at temperature about 90 degree untill the extract is obtained.
- Then collect the concentrated extract in beaker.
- Keep it for evaporation on hot water bath .
- Then finally collect the extract in the beaker and use for further

❖ PREPARATION OF WOUND HEALING HERBAL CREAM:

Procedure:

Firstly heat liquid paraffin and beeswax in beaker and maintain the heating temperature on water bath .



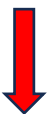
In another beaker take stearyt alcohol and melt it on water bath.



Then mix both the oily phase in beaker .



Then in the another beaker take the extract of drug and also add propyl and methyl paraben as well as sorbitol monooleate.



Then add few drops of rose oil as a fregrence.



Then mix all the ingredients from both beaker together and stirr continuously untill semi solid mixture is formed.



And now cream is ready for further evaluation test.



After that cream is poured in the air tight container.

➤ **FORMULATION TABLE:** **(FOR 25 GRAM)**

Sr.no	Ingredients	Quantity F1	F2	F3
1	Tridax procumbens	2 gm	2 gm	2 gm
2	Stearyl alcohol	10 gm	10 gm	10 gm
3	Sorbitol monooleate	4 ml	4 ml	5 ml
4	Paraffin	1 ml	2 ml	3 ml
5	Propyl paraben	0.015 gm	0.015 gm	0.015gm
6	Methyl paraben	0.025 gm	0.025 gm	0.025gm
7	White beeswax	7 gm	6 gm	5gm
8	Rose oil	1ml	1ml	1ml
9	Distilled water	q.s	q.s	q.s

EVALUATION:

Physicochemical Evaluation:

1. Determination of Ph:

The ph of herbal cream was determined by using a digital ph meter.

2. Spreadability:

Spreadability was determined by placing excess sample (1 gram) in between two slides which was compressed to uniform thickness by placing a definite weight 50 gram for definite time of 5 min.

The time required to separate the two slides was measured as spreadability.

The spreadability was calculated by using the formula

$$S = \frac{M \cdot L}{T}$$

Where as

M=wt tied to upper slide

L=length of glass slide

T=time taken to separate the slide

3. Washability:

The washability test was carried out by applying a small amount of cream on hand and then it was washed with the help of tap water. The formulation was easily washable.

4. Non-irritancy test:

The preparation shows no redness and irritancy. Observation of the state was done for 24hr.

EVALUATION TABLE:

Physical Evaluation:

Parameters	Observation		
	F1	F2	F3
Colour	Dark green	Dark green	Dark green
Odour	Pleasant	Pleasant	Pleasant
State	Semi solid	Semi solid	Semi solid
Texture	Smooth	Smooth	Smooth

Physicochemical Evaluation Test:

Parameters	Observation		
	F1	F2	F3
Ph Determination	6.59	6.51	6.42
Spreadability	Satisfactory	Satisfactory	Easily spreadable
Washability	Easily washable	Easily washable	Easily washable
Non-irritancy test	No irritation	No irritation	No irritation

HOW TO APPLY WOUND HEALING HERBAL CREAM



Firstly clean the wound area with clean water with the help of cotton. Then apply the cream on the affected part and cover the wound with the suitable bandage where necessary.

Apply two to three times a day depending upon the severity of the wound.

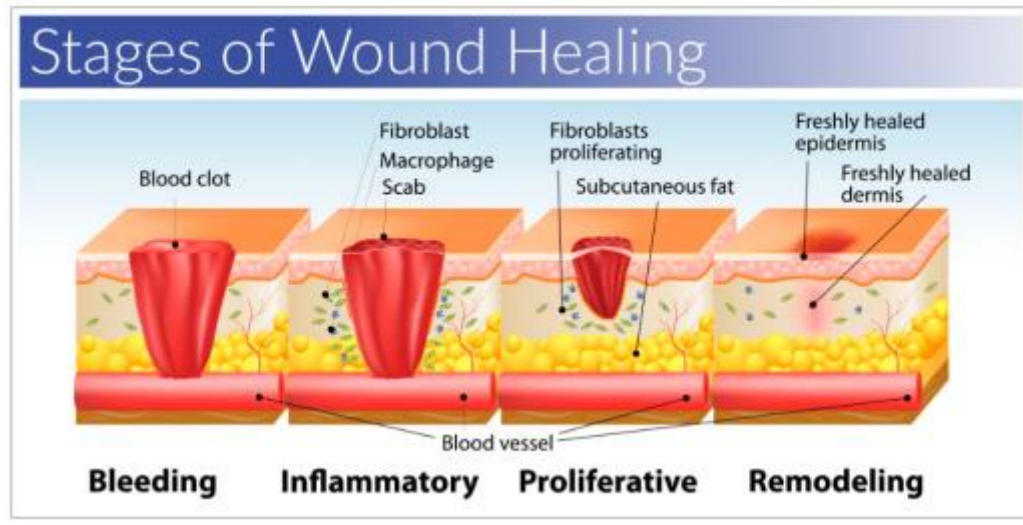
Consult a health care professional in case of a deep and long standing wound.

Protect from dust after applied.

Avoid contact with eyes.

Wash hand with soap after the application of cream.

STAGES OF WOUND HEALING



Inflammatory phase:

It begins within the minute of the injury and lasts about 3 days.

Destructive phase:

Begins before the inflammation and ends at last about 2-5 days.

Proliferative phase:

Begins at last from 3-24 days.

Maturation phase:

The final stage of healing and may take more than a year.

➤ RESULT AND DISCUSSION

RESULT:

Sr.NO	Evaluation Parameters	Observation		
		F1	F2	F3
1	Colour	Dark green	Dark green	Dark green
2	Odour	Pleasant	Pleasant	Pleasant
3	State	Semi solid	Semi solid	Semi solid
4	Texture	Smooth	Smooth	Smooth
5	Ph Determination	6.5	5.9	6.2
6	Spreadability	Satisfactory	Satisfactory	Easily spreadable
7	Washability	Easily washable	Easily washable	Easily washable
8	Non-irritancy test	No irritation	No irritation	No irritation

COMPARATIVE STUDY

F1 Formulation:

In F1 formulation the prepared cream was hard in nature because of the quantity of beeswax was 7gm and the cream was not smooth and it was not easily spreadable .

F2 Formulation:

In F2 formulation we reduced the quantity of beeswax to 6gm but still the cream was not giving good spreadability as expected.

F3 Formulation:

In F3 formulation again we reduced the concentration of beeswax to 5gm .Now the formulated cream is smooth and is spreading easily on the skin.And also the cream is easily washable ,smooth in texture,and the cream is not giving any irritation on application.

After performing all the evaluation parameters the F3 formulated cream is now easily washable, easy to spread, smooth in texture,pleasant odour, and semi solid in state and not giving any irritation after application.

- **DISCUSSION:**

The present study was done to prepare and evaluate the herbal cream. For this the herbal extract were prepared by using extraction process to obtain the good yield of extract and there was no any harm to the chemical constituents and their activity.

The simple method was used to perpare cream so that uniform mixing of the herbal extract with the cream base was occurred which was stable during the storage.

The physicochemical properties were studied which shows satisfactory result for ph determination, spreadability, washability, viscosity, non- irritancy test and other.

Also this formulation was placed for stability study at different temperature. There were no changes observed in spreading ability, diffusion study as well as irritant effect.

- **CONCLUSION:**

The aim of this review was to formulate different herbs into cream for wound healing. The review also provides important information about the *Tridax procumbens* plant.

The cream contains the properties of *Tridax procumbens* that helps to provide nourishment for wounds. *Tridax procumbens* contains various phytochemicals that shows anti-inflammatory, antioxidant and antibacterial activity that are important for wound healing.

REFERENCE:

- 1 Santosh Kumar Maurya and Dinesh Kumar Verma, Phytochemical and pharmacological review of *Tridax procumbens* L. World Journal of Pharmaceutical Research, 2021,10,2277- 7105
- 2 Sneha Mundada, Ruchi Shivhare, Pharmacology of *Tridax procumbens* a weed: Review. International journal of PharmaTech Research, 2010,2(2),1391- 1394.
- 3 Rajaram S. Sawant and Ashvin G. Godghate, Preliminary phytochemical analysis of leaves of *Tridax procumbens* Linn. 2013, 2(3), 388.
- 4 Pandurangan P, Review on wound healing activity, International Journal of pharmacognosy and Chinese medicine. 2022, 6(1):000224.
- 5 Kavitha R, Prasanna G. Phytochemical screening and in vitro anti-inflammatory activity of aerial parts of *Tridax procumbens* L, International Journal of Pharmaceutical Sciences Review and Research, 50(2), 2018, 115-119.
6. Agrawal Surendra, Mohale Deepak, Talele G S. Pharmacological activities of *Tridax procumbens* (Asteraceae), International Journal of Phytomedicines and Related Industries, 2(2), 2010, 73-78.

7. Meshram R L, Patil M B. Demonstration of anti-inflammatory activity of alcoholic and hydroalcoholic extracts of *Tridax procumbens* using a rat paw edema assay, *Biosciences and Biotechnology Research Communications*, 4(1), 2011, 47-51.
8. Loyd V. Allen Jr, Howard C. Ansel. *Ansel's Pharmaceutical Dosage forms and Drug Delivery Systems, Ointments, Creams and Gels*, 9th Edition, 2011, 323-325.
9. Japan Patel, Brijesh Patel, Hardeepsingh Banwait. Formulation and Evaluation of Topical Aceclofenac Gel Using Different Gelling Agent, *International Journal of Drug Development and Research*, 3(1), 2011, 156-164.
10. Deshmukh A S, Morankar P G, Kumbhare M R. Review on Analgesic Activity and Determination Methods, *Pharmtechmedica*, 3(1), 2014, 425-428.
11. Prabhu V V, Nalini G, Chidambaranathan N, Kisan S S. Evaluation of Anti-Inflammatory and Analgesic Activity of *Tridax Procumbens* Linn Against Formalin, Acetic Acid and CFA Induced Pain Models, *International Journal of Pharmacy and Pharmaceutical Sciences*, 3(2), 2011, 126-130.
12. Morankar P G, Deshmukh A S, Kumbhare M R, Kale S S. Antioxidant Activity of *Couroupita guianensis* AUBL, *Pharmtechmedica*, 3(2), 2014, 464-468
13. Agrawal S S, Talele G S, Surana S J. Antioxidant Activity of Fractions from *Tridax procumbens*, *Journal of Pharmacy Research*, 2(1), 2009, 71-73.
14. Pai C, Kulkarni U, Borde M, Murali S, Mrudula P and Yashwant Deshmukh. Antibacterial Activity of *Tridax*

procumbens with Special Reference to Nosocomial Pathogens, British Journal of Pharmaceutical Research, 1(4), 2011, 164-173.

15. Bhagwat D A, Killedar S G, Adnaik R S. Anti-diabetic activity of leaf extract of Tridax procumbens, International Journal of Green Pharmacy, 2008, 126-128.

16. Opong R A, Nyarko A K, Dodoo D, Gyang F N, Koram K A, Ayisi N K. Antiplasmodial Activity of Extracts of Tridax Procumbens And Phyllanthus Amarus in In Vitro Plasmodium Falciparum Culture Systems, Ghana Medical Journal, 45(4), 2011, 143-150.

17. Sankaranarayanan S, Bama P, Sathyabama S, Bhuvaneswari N. Anticancer Compound Isolated From The Leaves of Tridax Procumbens Against Human Lung Cancer Cell A-549, Asian Journal of Pharmaceutical and Clinical Research, 6(2), 2013, 91-96.

18. Jindal A, Kumar P. In Vitro Antifungal Potential of Tridax Procumbens L. Against Aspergillus Flavus And Aspergillus Niger, Asian Journal of Pharmaceutical and Clinical Research, 6(2), 2013, 123-125.

19. Mahajan R, More D. Evaluation of Anticoagulant Activity Aqueous and Ethenolic Extracts and Their Isolated Phytochemicals of Some Medicinal Plants, International Journal of Pharmacy and Pharmaceutical Sciences, 4(4), 2012, 498-500.

Thank you