

“Formulation and evaluation of Herbal Cream-O-gel Using Lantana Camara leaf extract”

S.V.Usnale^{1*},P.D.Makane*,A.D.Kulkarni¹,A.A.Khadakumarge¹,S.S.Patil¹, S.P.Kumbhar¹,
C.V.Panchal¹

¹Maharashtra College of Pharmacy, Nilanga, Dist. Latur, (M.S.)

Date of Submission: 02-05-2026

Date of Acceptance: 11-05-2026

ABSTRACT

To evaluate the wound healing effect of topical formulation of Lantana camara Linn flower , Lantana camara is a common medicinal plant belonging to the family Verbenaceae, traditionally applied for the treatment of wounds, infection, itching, and inflammation. The leaves of Lantana camara contain several bioactive phytoconstituents such as alkaloids, flavonoids, glycosides, terpenoids, saponins, and steroids, which have potential antioxidant, anti-inflammatory, antimicrobial and anti-itching effects. Lantana camara has been established to treat a number of conditions, and is used in various traditional folk medicines. The leaves of these plants can be extracted and incorporated as part of a cream base.

The goal of this study was to evaluate a formulation of herbal anti-itching cream containing an extract of Lantana camara leaves. The formulation includes Lantana camara leaf extract for itching relief and to soothe the skin, dimethicone in order to regulate oil secretion and maintain skin moisture, and methyl paraben as a preservative to stop microbial contamination. More studies, including biological and clinical evaluation, should be conducted to confirm the therapeutic potential and usability of the formulation in humans.

The degree of contraction of wound, period of epithelialisation as well as tensile strength in incision model for different groups were compared and correlated. The test drug showed significant pro-wound healing potential in terms of all the parameters studied as compared to control and standard drug. The histopathological findings also correlated with the observed wound healing.

Lantana cream o gel formulation can be better alternative of Povidone iodine, which has some delayed wound healing action. Further research in terms of long term dermal toxicity and determination of active principle of the extract is warranted.

Keywords: Lantana camara, wound healing, Anti-itching cream, Herbal formulation, Evaluations.

I. INTRODUCTION

Wound infections are one of the most common hospital acquired infections and are an important cause of morbidity and account for 70-80% mortality. A wound provides a moist, warm, nutritive environment conducive to microbial colonization and proliferation. Wound healing is a dynamic self-recovery body mechanism, which involves a series of events like clotting, inflammation, granulation tissue formation, re-epithelialisation, collagen synthesis and wound contraction. Healing of a clean uninfected surgical incision closed by surgical sutures, is referred to as healing by primary union or by first intention. Re-epithelialisation to close the wound occurs with formation of a relatively thin scar. In case of excision wounds, large defects on skin is created causing extensive loss of tissue. The healing of these wounds occurs by secondary union or by second intention, which involves a more intense inflammatory reaction with formation of abundant granulation tissue and extensive collagen deposition, leading to the formation of a substantial scar, which generally contracts. Reducing the risk of infection through effective management of wound bio-burden is thus an essential aspect of wound care. Herbal products may be considered due to their decolonizing activity against a number of microbes. Soni et al had reviewed the herbal active constituents (tannins and flavonoids) as regards their wound healing activity. From time immemorial, it was well documented that weeds were the favourite alternative herbal medicaments for the mankind. Weeds produce secondary metabolites to protect themselves or produce allelopathic chemicals to inhibit growth of other plants. Lantana camara is a significant weed comprising an array of active metabolites like alcohols, alkaloids, terpenes and terpenoids. Several authors have reported antibacterial efficacy of Lantana camara, but no study had been carried out about its wound healing potential. Moreover, the Lantana weed extract used in this study was sourced from the local area which

may be different from other reported varieties because of a geographical impact on variation of synthesis of active constituents due to disparity in genetic architecture of plants. In this background, this work was conducted to screen the wound healing activity of *Lantana camara* flower.

1.1 Topical Drug Delivery System

Over the last decades, the treatment of illness have been accomplished by administrating drug to human body via various routes namely oral, sublingual, rectal, parenteral, topical, inhalation, etc. The Topical drug delivery system can be defined as direct effects of formulation or drug containing medication to the skin to get localizing effect of drug or directly cure cutaneous disorders or the cutaneous manifestations of general diseases (eg. psoriasis) with the intent of containing the pharmacological or the effect of drug to the surface of skin or within the skin semisolid formulations in all their diversity dominate the system for topical delivery, but foams, sprays, medicated powder, solutions and even medicated adhesive system are in use. Dermatological products applied to skin are diverse in formulation and range in consistency from liquid to powder but the most popular products are semisolid preparation.

Advantages of topical drug delivery system

- Avoidance of first pass metabolism.
- Avoidance of Gastro-intestinal incompatibility
- Avoid of risk.
- Convenient and easy to apply.
- Easy termination of medication, when needed.

1.2. Cream-O-Gel

Cream-O-Gel is the topical preparations which can be applied on the skin. Creams-O-Gelis defined as “viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type” dosage forms which consistency varies by oil and water.

Cream-O-Gel can be Ayurveda, herbal or allopathic which are used by people according to their needs for their skin conditions. They contain one or more drugs substances dissolved or dispersed in a suitable base. Cream-O-Gelis used for cosmetic purposes such as cleansing, beautifying, improving appearances, protective or for therapeutic function. These topical formulations are used for the localized effect for the delivery of the drug into the underlying layer of the skin or the mucous

membrane. These products are designed to be used topically for the better site-specific delivery of the drug into the skin for skin disorders. Cream-O-Gel are considered as a pharmaceutical product as they are prepared based on techniques developed in the pharmaceutical industry; unmedicated and medicated Cream-O-Gel are highly used for the treatment of various skin conditions or dermatoses. They contain one or more drugs substances dissolved or dispersed in a suitable base. Creams may be classified as o/w or w/o type of emulsion on the basis of phases. The term ‘cream’ and ‘Gel’ has been traditionally applied to semisolid formulated as either water-in-oil or oil-in-water.

1.3 TYPES OF SKIN CREAM-O-Gel

They are divided into two types:

a. Oil-in-Water (O/W)

Cream-O-Gel which is composed of small droplets of oil dispersed in a continuous phase, and an emulsion in which the oil is dispersed as droplets throughout the aqueous phase is termed an oil-in-water (O/W) emulsion.

b. Water-in-Oil (W/O)

Cream-O-Gel which is composed of small droplets of water dispersed in a continuous oily phase. When water is the dispersed phase and oils the dispersion medium, the emulsion is of the water-in-oil (W/O) type.

1.4 ADVANTAGES

- i. They give prolong contact in their site of application than any other pharmaceutical semi-solid dosage forms.
- ii. Injured area can be dried quickly by creams than other semi-solid preparations.
- iii. Non-irritating when applied to the skin. Easily water washable. Easy to wipe away.
- iv. Less greasy compared to ointment.
- v. Easy to spread on the skin's surface.

1.5 DISADVANTAGES

1. Stability is not as good as ointment.
2. They are less hydrophobic than other semi-solid preparation, so risk of contamination is high than the others.

1.6 IDEAL CHARACTERISTICS

- i. It should liquefy at body temperature.
- ii. It should penetrate the epidermis (via natural opening).
- iii. Its viscosity should be low enough to permit easy spreading.
- iv. It should be non-toxic.
- v. It should be non-irritant.
- vi. It should be non-inflammatory.

1.7 EVALUTION TESTS

1. pH of the cream
2. Viscosity
3. Rheological behavioral of the cream-o-gel
4. Determination of Type of cream-o-gel
 - a. Dilution Test
 - b. Dye Solubility Test

II. INTRODUCTION OF PLANT

Lantana camara is a genus of thorny shrubs belonging to the family Verbenaceae, and represented by two species in India and Australia. Currently, Lantana camara is becoming increasingly popular as an ingredient in several traditional therapeutic systems in Australia, as well as in other countries. According to a questionnaire survey, carried out using a population sample of hundred, the distribution of Lantana camara was found to be common in the dry zone, compared to the wet zone of Australia. Most of the users are of the opinion that the best ingredients for traditional therapeutic systems can be obtained from plants grown in the dry zone. Therefore, the aim of this study is to interpret the phenetic variation and determine the phenolic composition in leaf extracts and of Lantana camara in different climatic zones in Australia. Medicinal plants are an important resource to traditional health care systems. It is estimated that 70-80% of the rural population in developing Asian nations depends on traditional medicine for primary healthcare today. According to the World Health Organization (WHO), more than 80% of the World's population relies on traditional herbal medicine for their primary health care needs. These valuable herbal traditions found in developing countries have always been considered an important component of the cultural heritage of the world and traditional use and management of medicinal plants. Lantana camara. (Family: Verbenaceae) known as Lantana or Common Lantana (in Australia), Vanacchedi (Sanskrit name), Raimuniya (in Hindi), Ghaneri (घाणेरी) (in Marathi) and also called as "Wild Sage, Lantana Weed," in English. It has long been used by the tribes of Australia and in India. Ghaneri leaves act as an Antifungal antibacterial, antidiabetic, anti cancer and its paste is used in folklore to extract any extraneous materials from body tissues without surgery. Extracts of leaves had exhibited in vitro broad spectrum anti inflammatory and analgesics activities. Juice or paste of leaves used along with tobacco to destroy worms in sores. This plant is yet to be scientifically evaluated as an effective drug for

wound healing effects including wound in animal models.



Fig.no.1 Lantana Camara

2.1 PLANT PROFILE

Botanical name: Lantana camara.

Common Name: Wild Sage, Lantana Weed.

Family: Verbenaceae.

Synonyms: Lantana aculeata L, Camara vulgaris Benth (L.)

Genus: Lantana

Plant Form: perennial, evergreen shrub.

Habit: a scrambling, woody perennial shrub that typically grows to a height of 2–4 metres.

MORPHOLOGY OF LANTANA CAMARA

Family: Verbenaceae (In India, it is also sometimes referred to as the Sagvan family) Family (Hindi name): Sagvan family.

Family (as per the APG System III):-Clade (Angiosperms).

Basionym: Carl Linnaeus.

Species Name (as per The Plant List): Lantana camara linn.

Common name: Wild Sage.

Habit: subshrub.

Habitat: It is primarily a light-loving plant that flourishes in open, unshaded areas. Flower, Fruit: throughout the entire year.

Distribution: Andhra Pradesh: Anantapur district, Chittoor district, Kadapa district, Nellore district, Guntur district, Kurnool district

Karnataka: Bengaluru district, Mysuru district, Hassan district, Kodagu (Coorg) district, Dakshina Kannada district, Uttara Kannada district, Kolar district, Udupi district, Shivamogga district

Kerala: Kannur district, Wayanad district, Kozhikode district, Palakkad district, Thrissur district, Idukki district, Kollam district

Tamil Nadu: All districts of Tamil Nadu

World Distribution: India, Australia, Myanmar.

VERNACULAR NAME

Raimuniya (रईमुनिया), Caturang, Laltena (Hindi);
Ghaneri (घाणेरी), Tantani (तणतणी) (Marathi)

Unnichedi, Arasimala (Tamil);
Vanacchedi, Chaturangi (Sanskrit);
Kakke, Natahu, Kaadujola, (Kannada);

III. MATERIALS AND METHODS

3.1 Drug

Table No.1 Drug

1.	Lantana Camara	Collected from Farmlands of Latur region.
----	----------------	---

3.2 Chemicals

Table No.2 Chemicals

Sr.No.	Excipients/Solvents	Suppliers
01	Soya Lecithin	MCP Nilanga Pharmaceutical Lab
02	Ethanol	MCP Nilanga Pharmaceutical Lab
03	Cholesterol	MCP Nilanga Pharmaceutical Lab
04	Propylene Glycol	MCP Nilanga Pharmaceutical Lab
05	Glycerin	MCP Nilanga Pharmaceutical Lab
06	Propyl Paraben	MCP Nilanga Pharmaceutical Lab
07	Xanthan Gum	MCP Nilanga Pharmaceutical Lab
08	Rose oil	MCP Nilanga Pharmaceutical Lab
09	Distilled water	MCP Nilanga Pharmaceutical Lab

3.3 Equipment's

Table.3. List of Equipment's

Sr. No	Equipment	Company
1.	Magnetic Stirrer	LABGO Magnetic Stirrer
2.	UV Spectrophotometer	Shimadzu (1800)
3.	FT-IR Spectrometer	Perkin Elmer UARI Two.
4.	pH Meter	Hanna Instruments Italy.
5.	Mechanical Stirrer	Remi Mechanical stirrers
6.	Thermometer	Labworld mercury thermometer

7.	Electronic Balance	Citizen CTG -302
8.	Brookfield Viscometer	AMETEK Brookfield DV2T Viscometer
9.	Petri dishes	AGLO microscopes
10.	Water Bath Apparatus etc.	Hanna Instruments Italy.

IV. EXPERIMENTAL WORK

4.1 Collection of Bougainvillea Spectabilis Leaves: - Leaves of Bougainvillea spectabilis are collected from the region of Nilanga.

4.2 EXTRACTION: -

Leaves of B. spectabilis were collected and washed with distilled water and dried in hot air oven. Then after proper drying, the leaves were powdered in the mixture. Then 200g Powder of B. spectabilis+400ml

distilled water was taken in a volumetric flask and then stirs for 2min then placed for 72hrs.

Then the solution was taken and stirred well then solution was filtered properly with filter paper, then filtered solution was placed on water bath at 80 to 100 degree Celsius. For 48 hours, Then the filtrate or the filter product in which a clear solution or clear extract of B. spectabilis was used in the preparation.



Fig.no.2 Sample Of Extraction

4.3 FORMULATION

Table.4 Formulations table for Herbal Cream-O-Gel

Sr.no.	Ingredients	F1H	F2H	F3H	F4H	F5H	F6H
01	Extract	2	2	2	2	2	2
02	Soya Lecithin (gm)	1	2	3	1	2	3
03	Ethanol (ml)	20	20	20	30	30	30
04	Cholesterol (gm)	0.2	0.2	0.2	0.2	0.2	0.2
05	Propylene Glycol (ml)	10	10	10	10	10	10
06	Glycerin (ml)	3	3	3	3	3	3
07	Propyl Paraben (gm)	0.2	0.2	0.2	0.2	0.2	0.2
08	Xanthan Gum (gm)	1	1.5	2	2.5	3	3.5
08	Distilled water	q. s	q.s	q.s	q. s	q. s	q. s
09	Rose Oil	q. s	q.s	q.s	q. s	q. s	q. s

4.4 Procedure

1. In this method, accurately weighed 200 mg of extract was dissolved in ethanol and propylene glycol was added to it and heated to 40°C.
2. In a separate vessel, Soya Lecithin and Cholesterol were dispersed in distilled water by heating on a water bath at 40°C until a colloidal solution was obtained.
3. Once both the mixtures reached at 40°C, the drug solution was added to the soya lecithin dispersion of water in a closed vessel under stirring at 3000 rpm.
4. After adding, mixing was continued for another 10 minutes to get microparticulate dispersion.
5. The optimized ethosomal suspension was incorporated into Cream-O-Gel.
6. To the mixture of specified amount add Xanthan Gum and glycerine, dispersed slowly with gentle stirring for 2 min followed by addition of Propyl Paraben (preservative) with continuous stirring.
7. Finally, formulation was stored under refrigeration (2-8°C) until further use.

Evaluation Parameters

5. PHYSICAL EVALUATION

In this test, the cream was observed for color, odor, texture, state.

5.1 IRRITANCY: -

Mark the area (1cm²) on the left- hand dorsal surface. Then the cream was applied to the hand and then the time was noted. Then it is checked for irritancy, erythema, and edema if any for an interval up to 24 hours reported.

5.2 WASHABILITY

A small amount of cream was applied on the hand and it is then washed with tap water.

5.3 pH

0.5g cream was taken and dispersed in 50ml distilled water and then PH was measured by using digital pH meter.

5.4 VISCOSITY

Viscosity of cream-o-gel was done by using Brooke field viscometer at a temperature of 25 using spindle No.05 at 5.0 RPM.

5.5 PHASE SEPARATION

Prepared cream was kept in a closed container at a temperature of 25-100 away from light. Then phase separation was checked for 24 h for 30d. Any change in the phase separation was observed / checked.

5.6 SPREADABILITY

The Spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two

slides better the Spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

Spreadability= $m \times l/t$

Where, m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t=time taken in seconds

5.7 GREASINESS

Here the cream was applied on the skin surface in the form of smear and checked if the smear was oily or grease-like.

5.8 FT-IR Spectroscopy

ANALYSIS FOR SAMPLE: IR spectrum of Leaf extract and Formulated herbal cream were carried out using FTIR by ATR (attenuated total reflection) sampling method.

5.9 IN-VITRO DIFFUSION STUDIES

In-vitro diffusion was carried out on Franz diffusion cell having 57ml capacity and whatman filter paper no.41 used as diffusion membrane. Pieces of whatman filter paper no.41 were soaked in phosphate buffer pH 9.0 for 24 hrs prior to experiment. Diffusion cell was filled with phosphate buffer pH 6.0 Whatman filter paper no.41 was mounted on cell. The temperature was maintained at 37±0.5° then the formulation was spread on the filter to form thin layer. The time point for cream-o-gel were different. A sample of 1ml was withdrawn at predetermined time intervals, the solution was filter with 0.45micron filter paper and make up the volume with 5ml of PB pH 6.0 and equivalent amount of fresh dissolution fluid equilibrated at same temperature was replaced. The sample was diluted to 5ml of PB pH 6.0 for determination the standard was prepared which was of same concentration of that sample. The amount of permeated drug was determined using a UV-Spectrophotometer at 265 nm.

VI. Result and discussion

6.1 Organoleptic Characteristics

Evaluation includes the color, odour, texture & state of the cream.

Table: 5 Organoleptic Properties

Sr.no	Formulation	Colour	Odour	Texture	State
1.	F1	Lig-Green	Pleasant	Smooth	Semisolid
2.	F2	Lig-Green	Pleasant	Smooth	Semisolid
3.	F3	Grey white	Mild	Smooth	Semisolid
4.	F4	Grey white	Mild	Smooth	Semisolid
5.	F5	Greenish	Pleasant	Smooth	Semisolid
6.	F6	Greenish	Pleasant	Smooth	Semisolid

6.2 Homogeneity

Cream applied to the glass object, covered with a glass cover. Observed homogeneity and cream surface visually.

6.3 Creamtype

Cream type evaluation using the color method. The cream is trimmed with a methylene blue solution or

a solution of SudanIII on the glass object, then observed under the optical microscope

6.4 Viscosity

The viscosity of the different sample was obtained by Brookfield viscometer (Brookfield engineering laboratories, Inc., MA, and USA) with spindle No.6at10rpm at temperature of $37 \pm 0.5^\circ\text{C}$.

Table: 6 Viscosity Result

SR.NO.	Formulation	Observation
01	F1	11,360
02	F2	9,080
03	F3	10,280
04	F4	14,160
05	F5	15,600
06	F6	5,760

6.5 Measurement of pH

pH measurement was carried out by using pH meter.

Table:7 pH

Sr.no	Formulation	Observation
1.	F1	6.28
2.	F2	6.28
3.	F3	6.33
4.	F4	6.57
5.	F5	7.14
6.	F6	7.09

6.6 Spreadability

The Spreadability was expressed in terms of time in seconds taken by two slides to slip off from the cream, placed in between the slides, under certain load. Lesser the time taken for separation of the two slides better the Spreadability. Two sets of glass slides of standard dimension were taken. Then one slide of suitable dimension was taken and the cream formulation was placed on that slide. Then other slide was placed on the top of the formulation. Then a weight or certain load was placed on the upper slide so that the cream between the two slides was

pressed uniformly to form a thin layer. Then the weight was removed and excess of formulation adhering to the slides was scrapped off. The upper slide was allowed to slip off freely by the force of weight tied to it. The time taken by the upper slide to slip off was noted.

$$\text{Spread ability} = m \times l/t$$

Where, m= Standard weight which is tied to or placed over the upper slide (30g)

l= length of a glass slide (5 cm)

t= time taken in seconds.

Table no.8 Spredability Observation

Sr.no	Formulation	Observation
1.	F1	6.2
2.	F2	4.2
3.	F3	08
4.	F4	5.5
5.	F5	7.8
6.	F6	7.7

6.7 Washability

Washability test was carried out by applying a small amount of cream-o-gel on the hand and then washing it with tap water. All six formulations were easily washable.

Table:9 Washability Observation

Sr.no	Formulation	Observation
1.	F1	Easily Washable
2.	F2	Easily Washable
3.	F3	Easily Washable
4.	F4	Easily Washable
5.	F5	Easily Washable
6.	F6	Easily Washable

6.8 Phase separation

Prepared cream-o-gel was kept in a closed container at a temperature of 25-100°C away from light. Then phase separation was checked for 24 h for 30 d. Any change in the phase separation was observed/checked. According to the results no phase separation was observed in all the six formulations.

Table 10: Phase separation observation table:

SR.NO.	Formulation	Observation
01	F1	No phase separation
02	F2	No phase separation
03	F3	No phase separation
04	F4	No phase separation
05	F5	No phase separation
06	F6	No phase separation

6.9 FTIR RESULT

The FTIR analysis was simple method to assume the compatibility of a sorted excipients blend with the pure drug. Spectral examination was executed using FTIR to explore the generation of new compound or any chemical change in the functional portion of the

add mixtures among the blends. Infrared spectroscopy was utilized in pharmaceutical investigation for its authentication and structure elucidation of drug. The peaks given in the Table could be considered as the characteristic peaks of Cream.

Herbal Extract Result

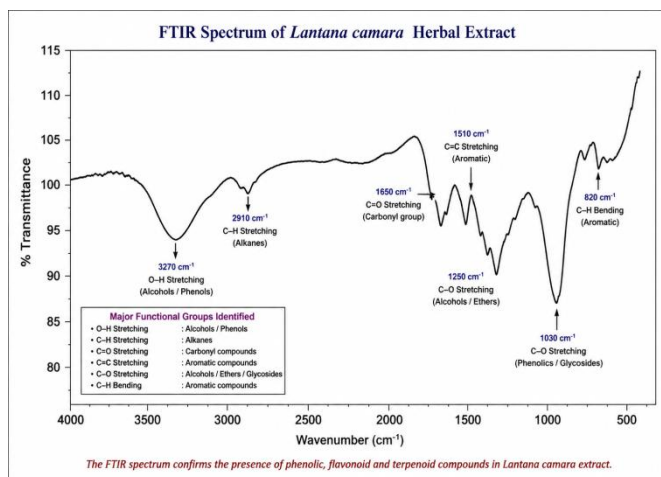


Fig.no 3 FTIR Aq Extract peak 1

Table No.11 Herbal Extract Result

Spectrum Name	Number Of Peaks
Administrator 980	07

Administrator 980 Details:

Peak Number	X (cm-1)	Y (%T)
1	3270	~94
2	2910	~99
3	1650	~96
4	1510	~98
5	1250	~91
6	1030	~87
7	820	~102

6.10 In-vitro Diffusion Study

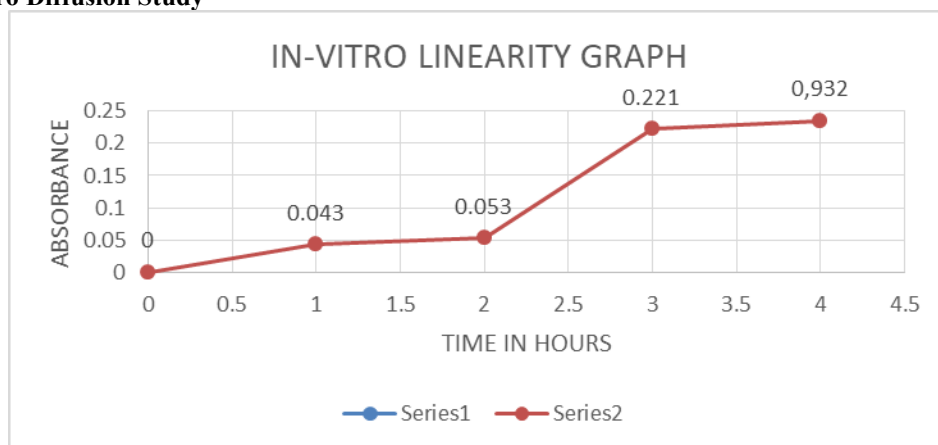


Fig.no. 4 In-vitro Linearity Graph

Table: 12 Observation of In-Vitro

Sr. NO.	Time In Hours	Wavelength in nm.	Absorbance	Conc.	Drug release	% Drug Release

.1.	1hr.	274.00	0.043	1.178	0.005	0.5
2.	2hr.	274.00	0.053	2.512	0.013	1.3
3.	3hr.	274.00	0.221	6.055	0.133	13.3
4.	4hr.	274.00	0.234	6.411	0.150	15.0

VII. DISCUSSION

The herbal cream-o-gel prepared by using leaf extract of lantana camara L. O/W cream was prepared. According to Acharya Sushruta, among the 60 measures of comprehensive wound management, wild saga (paste) is indicated in cases of chronic wound, which is full of slough, deep seated in muscle and reluctant to heal. The paste performs both the functions of Shodhana (cleansing) and Ropana (healing) in cases of DushtaVarna Extracts of the lantana camara leaves exhibited a broad spectrum anti oxidant activity, which is an important requirement of wound healing by controlling, and reducing the microbial load. lantana camara is having the ability to disinfect and destroy the micro-organisms in cases of sores acted as a disinfectant and promoted excellent healing. The signs of Dushta Vrana (chronic wound) mentioned in the classics are Ativivrita (broad base), Bhairava (ugly look), Putipuyamansa (pus discharge), Gandha (foul smell), Vedana (pain), Dirghakalanubandhi (chronicity). In this case, almost all these signs were observed was correlated with "Dushta Vrana." Sushruta mentioned prognosis of diabetic wound as "krichrasadhya" (difficult to treat), which is experienced even in today's practice. According to Acharya Sushruta among the 60 measures of wound treatment, "Kalka" (application of paste) is a measure indicated for non-healing wounds located in muscle and having slough. The paste performs both functions of "Shodhana" (cleaning) and "Ropana" (healing) in Dushta Vrana. Katupila has Kashaya rasa which provides Lekhana (scraping) that helps to slough out necrosed tissue and preparing the wound for healing. Kashaya rasa has Grahi and Stambhana properties which helped to stop discharge from the wound. Katupila has been emphasized for its antimicrobial, antiseptic and wormicidal properties. These properties assisted in cleaning the wound and help to inhibit the growth of microorganisms. Antioxidant activity of lantana camara seems due to the presence of flavonoids, tannins in abundant quantity.

VIII. SUMMARY AND CONCLUSION

6 batches (F1-F6) of this herbal cream-o-gel were prepared. Formulation and evaluation of all 6 batches were carried out different evaluation

parameters like pH, Viscosity, spreadability were performed. pH (7.14), viscosity (15,600) Spreadability (7.8) depending on the result obtained from this evaluation parameter F5 batch is optimized batch. FTIR and In-vitro release study is carried out for Optimized batch.

Lantana camara has been used for treating wound healing, skin infection, external wounds & cough and asthma in traditional medicines in Australia & India. Various species of the genus. Lantana camara is used to treat many diseases including Renal health, Dental care, worm infection, intestinal worms, sterility in many African & asian countries.

REFERENCES

- [1]. Jyothi M Joy, Vamsi S, Satish C, Nagaveni K. Lantana camara Linn: A Review. Inter. J. of Phytotherapy. 2012; Vol 2, Issue 2: 66-73.
- [2]. CSIR. Wealth of India, Vol VI. Council of Scientific and Industrial Directorate, New Delhi, 1962:31.
- [3]. CSIR. The Useul Plants of India. Publication and Information Directorate, CSIR, New Delhi, 1992:316.
- [4]. Rastogi RP, Mehrotra BN: Compendium of Indian Medicinal Plants; Vol.1. Central Drug Research Institute, New Delhi: Lucknow and Publication and Information Directorate, CSIR, 1995:238..
- [5]. Sheela D, Abdul Rahim M, Arunagirinadhan N, Ramya B, Indra V. GC-MS profiling and antibacterial activity of Wrightia tinctoria and Lantana camara leaves extract. Intern. J. Zool. Invest. 2021;7(2):920-38
- [6]. Shimray ST, Sharma HK. A REVIEW ON: ITCH-CAUSING AND ITCHRELIEVING PLANTS. Current Trends in Pharmaceutical Research. 2022;9(1).
- [7]. Monika, Dhingra N. A Perspective on Therapeutic Potential of an Invasive Weed, Lantana camara. In Phytochemical Genomics: Plant Metabolomics and Medicinal Plant Genomics 2023 Jan 1 (pp. 145-173). Singapore: Springer Nature Singapore. Shah M, Alhar by HF, Hakeem KR. Lantana camara: a comprehensive review on phytochemistry, ethnopharmacology and

- essential oil composition. *Lett. Appl. Nanoscience*. 2020;9:1199-207.
- [8]. Varsha Barethiya*, Abhijeet Kukde, Ashish Badwaik, Dr. Alpana Asnani, Dr. Gouri Dixit "Formulation and Evaluation of Vitamin E Enriched Cold Cream with Almond oil as an Internal Phase" *Int. J. Pharm. Sci. Rev. Res.*, 63(2), July - August 2020; Article No. 11, Pages: 71-75
- [9]. Al-Snafi AE. Chemical constituents and pharmacological activities of *Lantana camara*-A review. *Asian J Pharm Clin Res*. 2019 Oct;12912:10-20.
- [10]. Ahmed ZF, Shoaib AE, Wassel GM, El-Sayyad SM. Phytochemical study of *Lantana camara* L. *Planta medica*. 1972 May;21(03):282-8.
- [11]. Mahalingam RC, Xiaoling L, Bhaskara RJ. "Semisolid Dosages: Ointments, Creams and Gels", *Pharmaceutical Manufacturing Handbook*. 2006; 2(3): 267-274.
- [12]. Singh M, Sharma S, Khokra LS, Kumar SR. "Preparation and evaluation of herbal Cosmetic Cream", *Pharmacologyonline*. 2011; 5(2):1258-64.
- [13]. Das K, Dang R, Machale MU, Ugandar R, Lalitha B. "Evaluation for safety assessment of Formulated vanishing cream containing aqueous Stevia extract for topical application. *Ind J Novel Drug Deliver*. 2012; 4(1):43-51.
- [14]. Khalid AS, Saringat HJ, Khan GM. "Haruan (*Channa striatus*) incorporated palmoil Creams: Formulation and stability studies". *Pak J of Pharm Sci*. 2005; 18(1):1-5.
- [15]. Biswas TK, Mukherjee B, "Plant medicines of Indian origin for wound healing activity: a Review" *The international journal of lower extremity wounds*, 2003; 2(1):25-39.
- [16]. Kiran K, Asad M, "Wound healing activity of *Sesamum indicum* L seed and oil in rats"
- [17]. Hayakawa H, Minaniya Y, Ito K, et al. Difference of curcumin content in *lantana camera* L. (*Verbenaceae*) caused by hybridization with other *Curcuma* species. *Am J Plant Sci*. 2011;2(2):111-119.
- [18]. Martin P, Nunan R. Cellular and molecular mechanisms of repair in acute and chronic wound healing. *Br J Dermatol*. 2015;173(2):370-8.
- [19]. Clark RA. Fibrin and wound healing. *Annals of the New York Acad of Sci*. 2001;936:355-67.
- [20]. Bhat RS, Shankrappa J, Shivkumar HG. Formulation and evaluation of polyherbal wound treatments. *Asia J Pharma Sci*. 2007;2(1):11-7.
- [21]. Gurtner GC, Werner S, Barrandon Y, Longaker MT. Wound repair and regeneration. *Nature*. 2008;453:314-21.
- [22]. Bairagi S, Pathan I, Nema N. Analgesic and Anti-Inflammatory Activity of Crude Leaf and Bark Extract of *Lantana Camara*. *Marmara Pharm J*. 2017; 21(4): 810-817.
- [23]. Sharma P, Shrivastava B, Sharma GN, Jadhav HR: Phytochemical and pharmacological profile of *lantana camara* L: An overview. *J Adv pharm Educ Res*. 2013; 3(4): 294-305.
- [24]. Prabhu P, Ravichandran S, Manikgantan E, Priyanka, Vijayakumar P, Nagalakshmi. Molecular effect of *lantana camara* leaves against Dengue vector *aedes aegypti*. *Int J Pharm. Technol*. 2019; 11(1):3164-31656.
- [25]. Dange V, Shid S, Patil S, Vambhurkar G, Bhutkar M. Formulation and evaluation of novel herbal gel by using lemongrass oil. *Res. J. Pharma. Dosage Forms and Tech*. 2019; 11(12): 67-70.
- [26]. Yadav A, Mohite S. A Brief review: Microwave chemistry and its applications. *Res. J. Pharma. Dosage Forms and Tech*. 2020; 12(3): 191-197.
- [27]. Gottrup F, Melling A, Hollander D. An overview of surgical site infections: aetiology, incidence and risk factors. *E.W.M.A. Journal*, 2005,5(2):11-15.
- [28]. Wilson APR, Gibbons C, Reeves BC, Hodgson B, Liu M, Plummer D et al. Surgical wound infections as a performance indicator: agreement of common definitions of wound infections in 4773 Patients. *B.M.J.*, 2004,329:720-722.
- [29]. Bowler PG, Duerden BI, Armstrong DG. Wound Microbiology and Associated Approaches to Wound Management. *Clin Microbiol Rev*, 2001, Apr,14(2):244-269.
- [30]. Kumar V, Abbas AK, Nelson F, Aster JC, James AP. Tissue renewal, regeneration and repair. In: Robbins and Cotran, editor. *Pathologic Basic of Disease*, 8th ed. Philadelphia: Elsevier Saunders, 2010:79-110.