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Formulation and Characterization of Phythosomal Topical Gel of Mimosapudica.Linn

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Abstract

The core objective of the present study was to formulate and characterize Mimosapudica topical phytosomal gel. Mimosapudica is an important traditional medicinal plant. Some investigations reported that it showed the antimicrobial and wound healing activity. Phytosomes are vesicular drug delivery system which has proved to be beneficial in providing good absorption and better bioavailability over the herbal conventional extracts. The phytosomes were formulated using Mimosapudica extract. The formulated phytosomes were characterized using various methods like entrapment efficiency, percentage yield, stability studies, drug content, in-vitro drug diffusion studies, anti-microbial activity and SEM. The topical phytosomal gel of Mimosapudica was prepared. The formulated gel was evaluated pH, Spreadability, Extrudability, Drug content, in vitro drug diffusion study and drug release kinetics. The stability studies were carried out as per ICH guidelines. The prepared phytosomal gel was safe, convenient, and efficient and also showed better penetration into the skin. Thus, it can be concluded that the topical phytosomal gel may serve as promising dosage form in the treatment of microbial effect.

Keywords: Mimosapudica, Phytosomes, Topical drug delivery, antimicrobial activity.

1. INTRODUCTION

Mimosa pudica Family Mimosae known as sensitive plant in English and lajvanti or chuimui in local Hindi language. The plant is distributed throughout in India in moist locality. A diffuse prickly under shrub, is about 45-90 cm in height. Leaves bipinnately compound, pinnate 2-4 delicately arranged with 10-20 pairs of leaflets, rachis clothed with ascending bristles. Flowers pink, in globose heads, penduncles prickly, usually in auxiliary pairs all along the branches. Fruits bristly pods, flat, straw colored consisting of 3-5 one seeded segments. The roots and leaves are commonly used in treatment as bitter, astringent, acrid, cooling vulnerary, alexipharmic, diuretic antispasmodic, emetic, constipating and febrifuge. The present study intends to study about the phytoconstituents and antimicrobial activity of the plant extracts of Mimosa pudica against pathogenic microbes [1]. The species epithet ‘’pudica’’ is a Latin equivalent for ‘’shrinking’’ or ‘’Bashful’’ because of its curious nature and easy procreation. There are several reports on the antimicrobial activity of Mimosa pudica L. has been extensively used in Siddha, Ayurvedic, Unani and Homeopathi medicine and become modern medicine. It is also used in Jaundice, Asthma, Conjunctivitis, Cut wound, ulcer and glandular swelling liver is considered metabolism detoxification, secretary function, in the body and its disorders are numerous with the no side effective (Aarthi and Murugan, 2011) . Phytosomes are said to be containing natural herbal formulations. Most of the Plants are having medicinal properties because to the presence of many active constituents which are mainly the secondary metabolites like flavonoids, terpinoids, tannins, glycosides, alkaloids .The plant has been well documented for its use as Antiseptic, Antimicrobial, Antimalarial,

Immunostimulating and Diuretic activity and is used as remedy for Flu, Cough, Rabies, and Tuberculosis etc, (Mukesh Chandra et al., 2010) . It is known to possess sedative, emetic, and tonic properties and has been used traditionally in the treatment of various ailments including Alopecia, Diarrhoea, Dysentery, Insomnia, Tumour, and urinogential infections, etc (Dr Duke's phytochemical and Ethnobotanical database, 2007) [2]. Medicinal properties of plants are the most precious gift of Mother Nature to Mankind. The primary benefits of using plant derived medicines are that they are relatively safer than synthetic alternatives, offering profound therapeutic benefits and affordable treatment [3]. The WHO estimates that 70 to 95% of the population in developing countries resort to traditional medicine, more precisely phytotherapy, to solve their health problems [4]. Mimosa plant has a history of use for the treatment of various ailments and the most commonly used plant part for this purpose is the root, but flowers bark and fruit can also be utilized. Several research works have been carried out to study about the phytochemical components of Mimosa pudica(Ahmad g, et al 2001; Arthur, 1954.) and also about the antimicrobial activity of the plant(Palacios. et al., 1991). The major chemical substances of interest in these surveys were the alkaloids and steroidal sapogenins, however also been reported (Lozoya and Lozaya, 1989) [5]. M. pudica is most commonly used as an ornamental plant and as an insect repellant. This current research deals with the comprehensive examination on pharmacognostical and phytochemical investigations [6].

2. Materials And Methods

2.1. Materials

Mimosapudica leaves were obtained as a gift sample from Hapamuni herbals. And all other solvents and chemicals used were of analytical grade.

2.2. Methods

Preparation of Plant extract:

A. Solvent used

Ethanol

B. Extraction procedure Maceration method

- 25 g of powdered plant material was taken.
- Solvent was added in a 250 ml ethanol.
- The mixture was kept for 72 hours with intermittent shaking. The extract was filtered using what man filter paper.
- The filtrate was concentrated using a water bath at 40- 45degreeC.
- Final extract stored in an air tight container.

2.3. Determination λmax

The stock solution was prepared by dissolving 10mg of powdered Mimosapudica extract in the range of 20 120µg/ml and the diluted solutions absorbance were measured in UV spectrophotometer at 320nm.

2.4. Preparation of Phytosomes:

Accurately weighed quantity of lecithin and cholesterol were taken in Round bottom flask (RBF) and it was dissolved in 10ml of chloroform then sonicated for 10mins. The organic layer was removed and the thin layer of phospholipids was formed. This is then mixed with ethanolic extract of Momosapudica. Again these are sonicated, then it was stored at freezer (2.8°C) for further use.

Table 1. *Composition of phytosome formulation of Mimosapudica*

Formulation code	Mimosa pudica extract	Cholesterol	Lecithin	Ethanol(ml)	Chloroform	Sonication Time (min)
F1	10	15	40	5	5	5
F2	10	15	45	5	5	10
F3	10	15	50	5	5	15
F4	10	15	55	5	5	20
F5	10	15	60	5	5	25
F6	10	15	65	5	5	30
F7	10	15	70	5	5	35

2.5. Evaluation of Phytosomal complex

The prepared phytosomal complex were studied for Microscopic view, Fourier Transformer-Infra Red Spectroscopy (FTIR) analysis, Percentage Practical Yield, Entrapment efficiency, Drug content as per the standard procedures.

2.6. Determination of Particle size

The particle size of Mimosa pudica phytosomes was measured by particle size analyzer.

2.7. Determination of Zeta potential

Zeta potential is the most important parameter for physical stability of phytosomes. 5ml of this diluted sample was transferred to a cuvette and the zeta potential was measured.

2.8. In-vitro Drug Diffusion Study through Egg Membrane

The in-vitro diffusion study was carried out by using Franz Diffusion Cell. The egg membrane was mounted between the donor and receptor compartment. The receptor compartment contains 15ml of pH 6 phosphate buffer and the temperature was maintained at 37˚C and was constantly stirred. The samples were withdrawn at specific time intervals and they were analyzed at 320nm using UV spectrophotometer.

2.9. Anti-Microbial Activity

The optimized formulation was tested in-vitro for its antimicrobial activities against E.Coli, P.aeruginosa , S.aureus by paper disc diffusion method known antibiotic such as chloramphenicol was used as a reference (as standard drug) against bacteria. From inhibition zone, anti-microbial activity was critically examined.

2.10. Scanning Electron Microscopy (SEM) Analysis

Scanning electron microscopy study was done to determine the surface morphology, size and shape of prepared Mimosa pudica phytosome formulation.

2.11. Formulation of Phytosomal Gel of Mimosa pudica

Carbopol 934 is dispersing into distilled water and the gel base was prepared. 0.1% phytosomal solution of Mimosa pudica is added to ethanol and this is mixed with the Carbopol gel base and other ingredients are mixed. The optimized formulation was prepared and the gel was stored in a suitable container.

Fig 1. *Mimosa pudica phytosomal gel*

Table 2. *Formulation of phytosomal gel of Mimosa pudica*

Ingredients	FOR 25gm
Carbopol 934	0.25gm
Triethanolamine	0.125ml
Methyl paraben	0.25ml
Ethanol+0.1% phytosome solution	2.5ml
Distilled water	21.8ml

2.12. Evaluation of Gels of Phytosome Complex

The optimized gel was tested for homogeneity, Measurement of pH, Drug content, Rheological study, Spreadability, Extrudability and In-vitro drug release study.

2.13. Drug Release Kinetics

Drug release kinetics was performed using model dependent method in which the dissolution profile of the formulation has been subjected various kinetics like zero order, first order, Higuchi's and Korsmeyer-Peppas model.

2.14. Stability Studies

The stability studies were conducted for the optimized formulation as per ICH guidelines.

3. RESULTS

Evaluation of Phytosomal Complex

3.1. Optical Microscopy

Optical microscopy was observed that the vesicles formed and were found to be of uniform size and shape. Microscopic view of Mimosa pudica phytosomes From the FTIR –Studies, the complex formation was indicated by the formation of strong hydrogen bonding between hydroxyl group of phospholipids and extract phytoconstituents in Mimosa pudica phytosome form. And there was no appearance or disappearance of peaks, and it showed that the excipients are more compatible.% Practical yield of different formulations was shown in Table no .3 have higher % Practical yield of 94.72%. The entrapment efficiency was calculated from the absorbance obtained from the supernatant solution. The formulation F6 showed highest release entrapment efficiency of 85.05%. The drug content of Mimosa pudica extract in the complexes was found to be in the range of 74.45% - 88.54%. The formulation F6 showed the maximum drug content of 87.56%. The results were shown in Table no 3.

Table 3. *Results of Percentage Practical Yield, Percentage Entrapment Efficiency & Drug Content*

Formulation	Precentage practical yield	Precentage entrapment efficiency	Drug content (%W/W)
F1	90.28	85.09	87.05
F2	83.15	83.94	86.41
F3	87.51	78.38	85.15
F4	84.56	74.43	83.51
F5	82.47	70.91	81.24
F6	94.72	80.71	88.54
F7	81.62	66.15	74.45

3.2. Determination of partical size:

Particle size refers to the diameter or dimensions of individual particles present in a material, usually expressed in micrometers (μm) or nanometers (nm).

It indicates how small or large the particles are in a formulation.

- Smaller particle size → better absorption and bioavailability
- Uniform particle size → improved stability and consistency
- Larger particle size → may lead to sedimentation or poor absorption

In a Mimosa pudica phytosomal gel, particle size affects drug release, penetration through skin, and overall effectiveness.

If you want, I can also give a one-slide short answer or diagram for your project.

- SZ-100
- S.P.Area Ratio Mean S. D. Mode Measurement Results
- Date : 18 FEB 2026
- Measurement Type : Particle Size Sample
- Name : Mimosa pudica phytosomal gel

- Scattering Angle : 173
- Temperature of the Holder: 25.2deg. C
- Dispersion Medium Viscosity : 0.891mPa.s
- Transmission Intensity before Meas. : 9590
- Distribution Form : Standard
- Distribution Form(Dispersity) : Monodisperse
- Representation of Result : Scattering Light Intensity
- Count Rate : 1064kCPS

Calculation Results

Table 4. *Article size calculation table*

Peak no.	S.P.Area Ratio	Mean	S.D.	Mode
1.	1.00	950.4nm	216.1nm	890.7nm
2.	---	--- nm	--- nm	--- nm
3.	---	--- nm	--- nm	--- nm
Total	1.00	950.4nm	216.1nm	890.7nm

Cumulant Operations

- Z-Average : 2162.8nm
- PI : 0.872

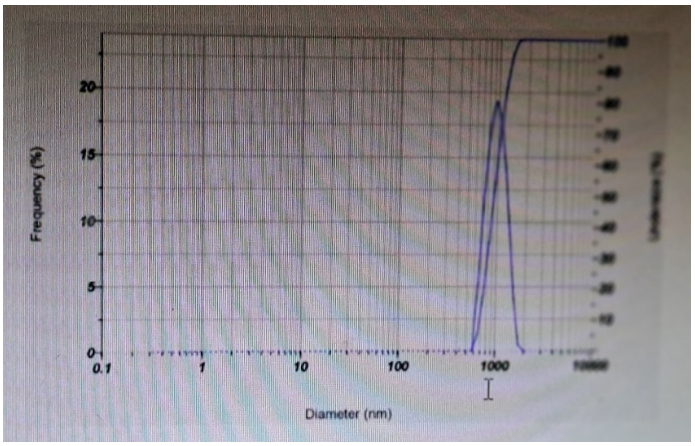

Fig 2. *Particle size*

3.3. Zeta potential

Zeta potential is the electrical potential (charge) present at the slipping plane of a particle dispersed in a liquid medium. It indicates the degree of electrostatic repulsion or attraction between particles in a colloidal system.

In simple terms:

It tells how stable a suspension or dispersion (like gels, emulsions, or phytosomal formulations) is.

High zeta potential (positive or negative) → good stability (particles repel each other)

Low zeta potential → poor stability (particles may aggregate)

In phytosomal gel of Mimosa pudica, zeta potential helps determine whether the formulation will remain uniformly dispersed or clump together.

If you want, I can also give a diagram or one-slide version for your presentation.

- SZ-100
- Zeta Potentia: l Electrophoretic Mobility 2 Measurement Results
- Date : 18 FEB 2026

- Measurement Type : Zeta Potential Sample
- Name : Mimosa pudica phytosomal gel
- Temperature of the Holder: 25.2deg. C
- Dispersion Medium Viscosity : 0.892mPa.s
- Conductivity : 0.423mS/cm
- Electrode Voltage : 3.3V
- Calculation results

Table 5. *Zeta potential calculation result*

Peak no.	Zeta potential	Electrophoretic Mobility
1.	-45.7 mV	-0.000355 cm2/Vs
2.	--- mV	--- cm2/Vs
3.	--- mV	--- cm2/Vs

- Zeta Potential (Mean) :-45.7mV
- Electrophoretic Mobility Mean :-0.000355cm2/Vs

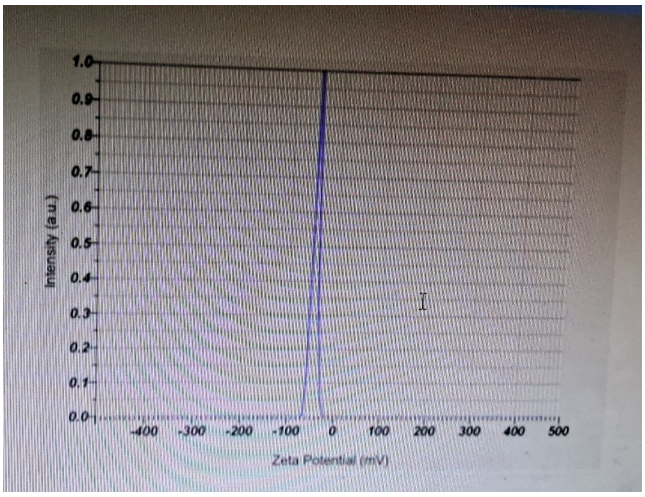

Fig 3. *Zeta potential*

3.4. In-vitro drug diffusion study of phytosome

From the In-vitro Drug Diffusion Study, the Formulation 7(F7) showed the higher cumulative percentage of drug release at 24th hour .Thus formulation (F7) was selected as best formulation and it was incorporated into a gel by using Carbopol 934 as a polymer, it was shown in figure 4.

This sustained release pattern indicates that the phytosomal formulation enhances drug permeation and provides prolonged therapeutic action, making it suitable for topical drug delivery.

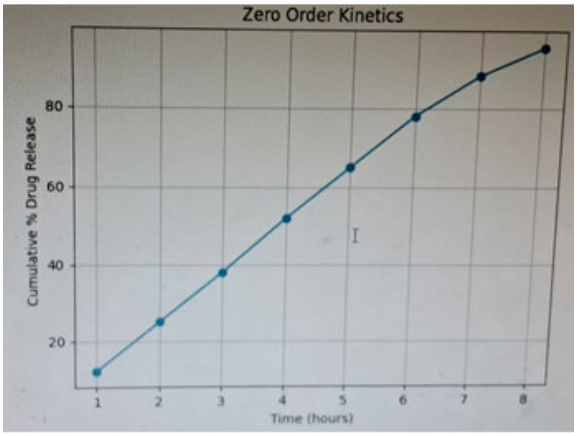

Fig 4. *In vitro drug diffusion profile*

3.5. Anti - Microbial Activity

3.5.1. Preparation of the Bacterial Inoculum:

Stock cultures were maintained at 4° C on slopes of nutrient agar and potato dextrose agar. Active culture for experiments were prepared by transferring a loop full of cells from stock cultures to test tubes of 50ml nutrient broth bacterial cultures were incubated with agitation for 24hours and at 37°c on shaking incubator and fungal cultures were incubated at 27°c for 3-5 days. Each suspension of test organism was subsequently stroke out on nutrient agar media and potato dextrose agar. Bacterial cultures then incubated at 37°c for 24 hours and fungal incubated at 27°c for 3-5 days. A single colony was transferred to nutrient agar media slants were incubated at 37°c for 24 hours and potato dextrose slant were incubated at 27°c for 3-5 days. These stock cultures were kept at 4°c. For use in experiments, a loop of each test organism was transferred into 50ml nutrient broth and incubated separately at 37°c for 18-20 hours for bacterial culture.

3.5.2. Well Diffusion method

The antibacterial activity and antifungal activity of GEL Sample was determined by Well Diffusion method (Bauer *et al*., 1996).. The 2-20 µl of fabric was placed into the media. After that, the plates were incubated at 37°C for 24 hours. Assay was carried into triplicates and control plates were also maintained. Zone of inhibition was measured f4rom the edge of the well to the zone in mm. The tested cell suspension was spread on muller hintonagar plate and potato dextrose agar. Well were put into the agar medium using sterile forceps. Plant extract were poured on to wells. Then plates were incubated at 37°c for about 24 hours and control was also maintained. Zone of inhibition was measured from the clear zone in mm.

Antibacterial activity was performed by agar diffusion method. Van der Watt *et al.,* 2001. The stock culture of bacteria *(E.coli and Strephloococcus)* were received by inoculating in nutrient broth media and grown at 37 % for 18 hours. The agar plates of the above media were prepared. Each plates was inoculated with 18 hours old cultures the bacteria were swab in the sterile plates. All the plates were incubated at 37°C for 24 hours and the diameter of inhibition zone was noted in mm.

Agar well diffusion method has been used to determine the antimicrobial activities and minimum inhibitory concentrations or plant extracts against Gram positive, Gram negative bacteria. The extracts exhibited antibacterial activities against tested microorganisms.

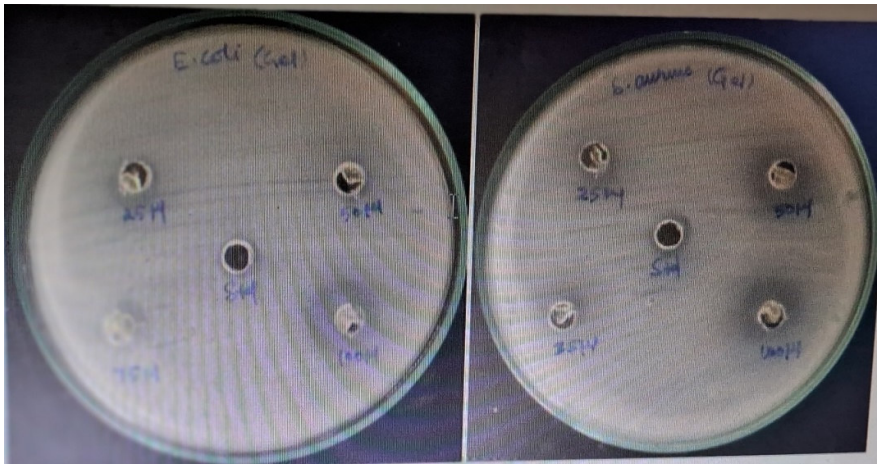

Fig 5. *Anti-microbial activity of E.Coli, S.aurues*

Gel

Table 6. *Organism's concentration of E.coli, S.aureus*

Organisms concentration	E.Coli	Strephylococcus Aureus
25 µl	0.5 mm	2 mm
50 µl	1.0 mm	3 mm
75 µl	2.0 mm	3.5 mm
100 µl	4.0 mm	4.0 mm
Standard	3.0 mm	3.0 mm

3.6. Scanning Electron Microscopy Analysis

Gel Activity

The phytosomal gel prepared from Mimosa pudica leaves extract enhances skin permeation and improve bioavailability of phytoconstituents. Phytosomes are phospholipid complexes that increase stability and therapeutic effectiveness of herbal drug.

SEM View

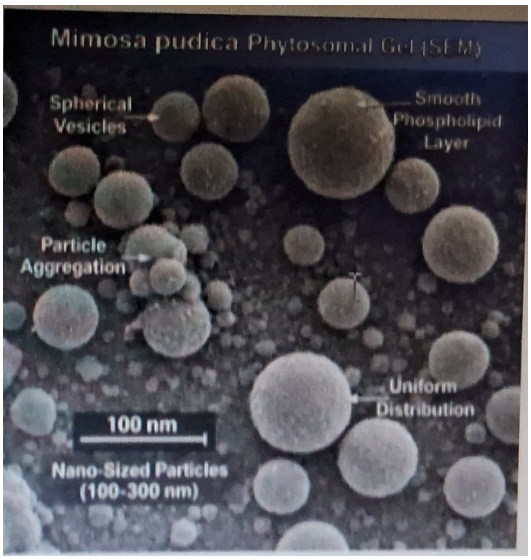

Fig 6. *SEM Study of phytosomal gel ofmimosa pudica leaves*

3.7. SEM Observation

The SEM micrograph shows spherical phytosomal vesicles with smooth surface morphology and uniform distribution. Particle size is observed in the nanoscale range (~100–300 nm), confirming successful phytosome formation suitable for topical drug delivery.

3.8. Evaluation of Gels of Phytosome Complex:

The optimized gel was tested for homogenisity, pH, Drug Content, Rheological study, Spreadability, Extrudability and the results are shown in table 6.

From the visual inspection of the prepared gel formulation (F6) showed good appearance and homogeneity. The pH of optimized gel formulation was 5.5. The drug content of the optimized gels was estimated spectrophotometrically at 320nm. The drug content in which the best formulation contained 91.71% showed in Table 5. The viscosity of the optimized gel formulation was found by the Brookfield's viscometer. The viscosity of the formulation increases as concentration of polymer increases. The viscosity of the optimized gel was found to be 0.891 centipoise. Spredability denotes the extent of area to which the gel readily spreads on application to skin or the affected part. The spredability of the fabricated gel formulation was carried out and it was found to be 4.5cm which denoted that it has good spredability. The optimized gel formulation was shown optimum extrudability. Because, the extrudability was decreased within the concentration of gelling agent. Homog eneity p H

Table 7. *Evaluation parameters of Gel*

Formulation	Homogeneity	pH	Drug content (%)	Viscosity(centipoises)	Spredability (cm)	Extrudability (gm/cm2)
Optimized gel	Good	5.5	91.71	0.891	4.5	9.1

3.9. GCMS analysis

Medicinal plants continue to be a major source of bioactive compounds with pharmaceutical potential, particularly in traditional medicine systems where plant extracts are used to treat a range of ailments. Mimosa pudica L. (Family: Fabaceae), commonly known as the sensitive plant, is traditionally used in Ayurveda and other folk medicines for its reputed wound-healing, antimicrobial, antivenom, and anti-

inflammatory effects. The characteristic rapid thigmonastic movement of its leaves has made it a subject of both biochemical and botanical interest.

Phytochemical profiling of plant extracts is a crucial step in correlating biological activities with chemical constituents. Gas Chromatography–Mass Spectrometry (GC-MS) has emerged as a central analytical tool for profiling secondary metabolites due to its ability to separate complex mixtures and provide molecular identification through mass spectral libraries. In GC-MS analysis, compounds are first volatilized and separated by gas chromatography based on their retention time and volatility, followed by mass spectrometric detection that yields mass-to-charge (m/z) patterns for structural elucidation.

Previous studies have employed GC-MS to profile the phytochemical contents of various parts of M. pudica, revealing a diverse array of volatile and semi-volatile compounds including fatty acids, alkaloids, flavonoids, glycosides, phenols, and terpenoids. Such compounds have been linked to important pharmacological activities in other medicinal species. However, comprehensive chemical profiling of M. pudica leaf extracts remains comparatively limited. Therefore, the present research aimed to systematically identify primary and secondary metabolites present in the ethanol leaf extract of M. pudica using GC-MS analysis, providing foundational data for subsequent pharmacological evaluation.

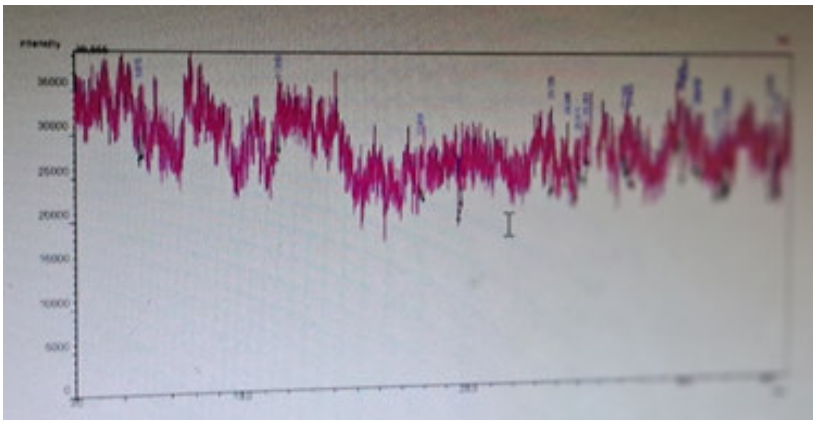

Fig 7. *Gas chromatography-Mass Spectroscopy of ethanolic extract of Mimosa pudica*

Peak Report TLC

Table 8. *GCMS Profile of the extracellular of Mimosa pudica Extract*

Peak#	R.Time	Area	Area%	Height	Height%	Name
1.	25.351	26046	3.81	5995	4.24	Cyclopentane,3-butyl-1-dipenylmethylene
2.	27.403	50637	7.40	8308	5.87	2,4-Dichloro-5-ethyl-3-methylphenol,trifluoroacetate
3.	30.615	34640	5.06	7387	5.22	2-(1,2-Dihydroxypropan-2-yl)-6a-hydroxy-8,9-dimeth
4.	31.670	45450	6.64	4023	2.84	Octylsilanetriol.3TMS
5.	34.352	26483	3.87	8834	6.25	L-LYSINE,N2,N6-BIS(TRIMETHYLSILYL)-,TRIM

4. DRUG RELEASE KINETICS

4.1. Zero Order Kinetics

Zero-order kinetics describes a system where the drug is released at a constant rate, independent of its concentration. In this model, a plot of cumulative percentage drug release versus time gives a straight line. The zero-order plot of the phytosomal gel showed a nearly linear relationship, indicating that the formulation is capable of maintaining a controlled and constant drug release over time.

This type of release is ideal for maintaining consistent drug levels in the body for prolonged periods. However, slight deviations from linearity suggest that the system may not follow perfect zero-order kinetics.

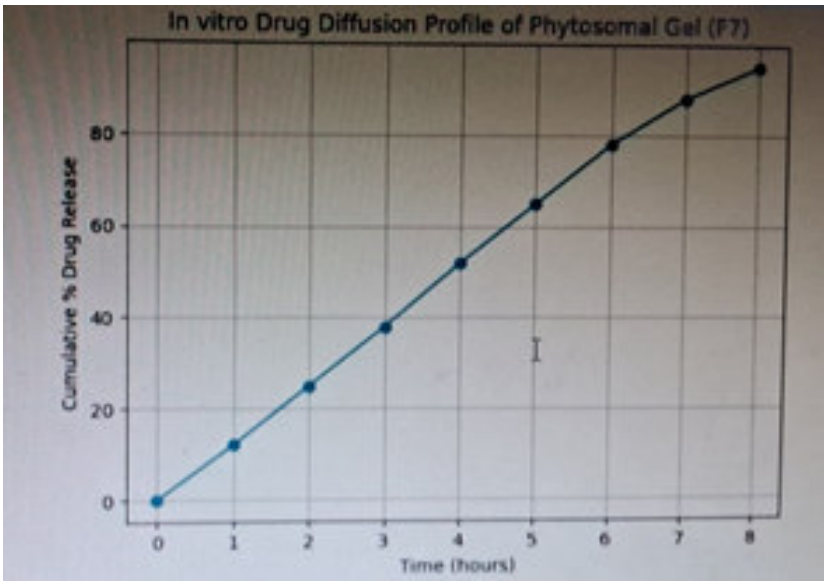

Fig 8. *Zero order kinetics*

4.2. First Order Kinetics

First-order kinetics explains drug release that is dependent on the concentration of the drug remaining in the formulation. A plot of log percentage drug remaining versus time is used to evaluate this model. In the present study, the first-order plot showed a linear relationship, indicating that the drug release rate decreases over time as the concentration of the drug reduces.

This suggests that the formulation exhibits concentration-dependent release characteristics, which is common in many conventional dosage forms.

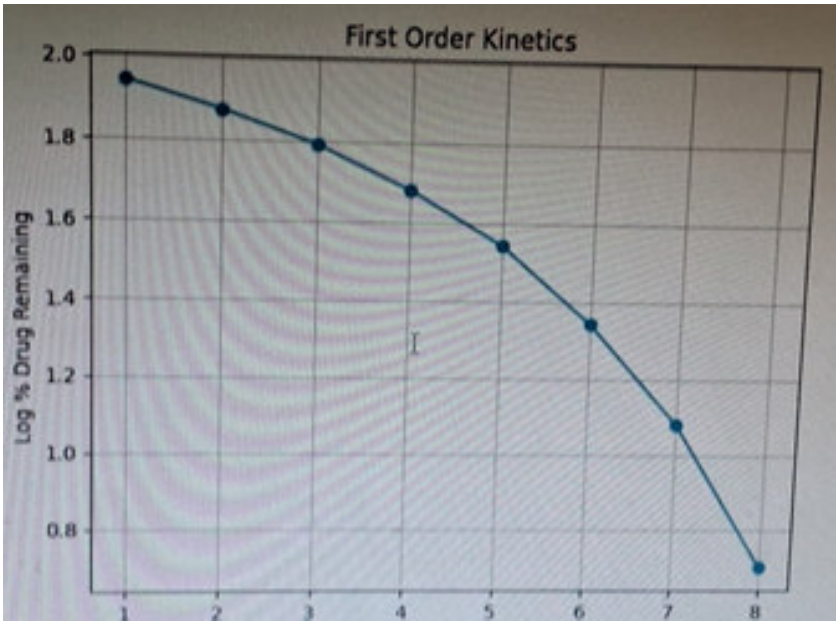

Fig 9. *First order kinetics*

4.3. Higuchi Model

The Higuchi model describes drug release as a diffusion-controlled process based on Fick's law. It is represented by plotting cumulative percentage drug release versus the square root of time. In this study, the Higuchi plot showed good linearity, indicating that the drug release from the phytosomal gel follows a diffusion mechanism.

This confirms that the drug diffuses slowly from the phytosomal matrix into the surrounding medium, which is beneficial for sustained release applications.

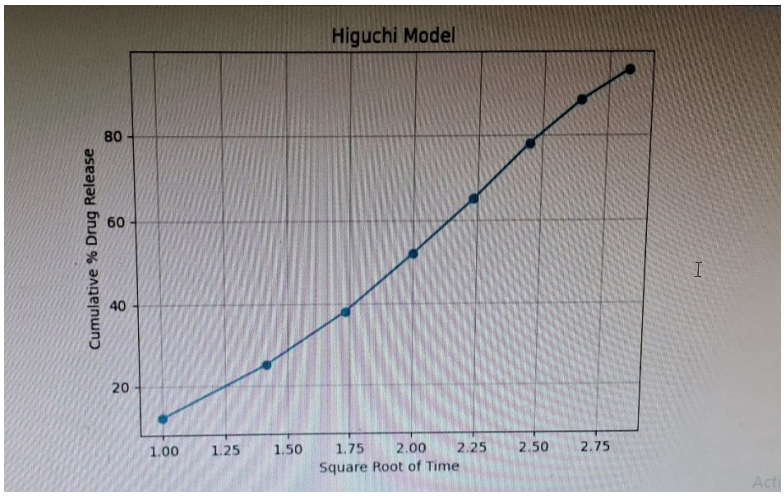

Fig 10. *Higuchi model*

5. DISCUSSION

Mimosa pudica plant is selected based on the literature survey. The results of FTIR study confirmed that the complex formulation.UV spectrophotometric study was used to determine the λmax of Mimosa pudica . Mimosa pudica phytosomes were prepared by antisolvent precipitation technique. A total of 7 formulations were prepared. All the formulations were evaluated for pH, spreadability, extrudability, drug content, rheological studies and in vitro drug diffusion study. The optimized formulation showed excellent antimicrobial activity. From this formulation (F6) was selected as best formulation based on the in-vitro release and it was incorporated into a gel by using Carbopol 934 as a polymer.The prepared phytosomal gel formulation was subjected to various evaluation studies such as percentage yield, solubility, drug content, entrapment efficiency, in-vitro drug release studies. Release kinetic data revealed that the gel formulation followed Non-Fickian diffusion mechanism. Stability studies were conducted as per ICH guidelines and it showed that no significant change in homogeneity, drug content, pH, spreadability, extrudability, viscosity, in-vitro diffusion studies.

6. CONCLUSION

6.1. Wound Healing

It promotes faster healing of wounds by enhancing tissue regeneration and reducing inflammation. It is commonly used in topical formulations for cuts, burns, and ulcers.

6.2. Anti-inflammatory Activity

The plant exhibits significant anti-inflammatory effects, helping to reduce swelling, redness, and pain in various conditions.

6.3. Antimicrobial Activity

Mimosa pudica shows activity against bacteria and fungi, making it useful in treating skin infections and preventing microbial growth.

6.4. Anti-anxiety and CNS Effects

It has mild sedative and anxiolytic properties, traditionally used to manage stress, anxiety, and nervous disorders.

6.5. Anti-diarrheal Activity

The plant is used in the treatment of diarrhea and dysentery due to its astringent properties.

6.6. Anti-ulcer Activity

It helps protect the gastric mucosa and is used in managing ulcers.

6.7. Antioxidant Activity

Rich in phytoconstituents like flavonoids and tannins, it helps in scavenging free radicals and reducing oxidative stress.

6.8. Treatment of Piles and Hemorrhoids

Traditionally used to reduce bleeding and inflammation associated with piles.

6.9. Skin Disorders

Used in treating various skin conditions such as eczema, rashes, and infections.

The present study on the formulation and characterization of phytosomal topical gel of Mimosa pudica was successfully carried out, demonstrating the effectiveness of phytosome-based drug delivery. The phytosomal complex was prepared using suitable methods, and the results confirmed successful formation of vesicular structures with desirable physicochemical properties such as appropriate particle size, good stability, and uniform distribution.

The prepared topical gel exhibited satisfactory characteristics including suitable pH, good spreadability, homogeneity, and viscosity, indicating its suitability for dermal application. Evaluation parameters such as percentage yield, entrapment efficiency, and drug content showed improved values, especially in the optimized formulation, confirming efficient incorporation of phytoconstituents into the phytosomal system.

Furthermore, in vitro drug diffusion and release kinetics studies revealed a sustained and controlled drug release pattern, predominantly following diffusion-controlled mechanisms. The stability studies also indicated that the formulation remained stable without significant changes in its properties.

In conclusion, the phytosomal topical gel of Mimosa pudica offers a promising and effective approach for enhancing the bioavailability and therapeutic efficacy of herbal drugs. This novel delivery system can be further explored for clinical applications in wound healing and anti-inflammatory treatments.

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