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RESEARCH ARTICLE
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FORMULATION AND IN VITRO EVALUATION OF TRANSDERMAL ANTIFUNGAL POLYMERIC FILM

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ABSTRACT:
Polymeric films are thin, flexible layers made of natural or synthetic polymers used in drug delivery, packaging, and biomedical applications. They offer advantages such as controlled drug release, ease of administration, and improved patient compliance. Most research on luliconazole focuses on topical or nano-based delivery, but a transdermal film is a relatively unexplored yet promising approach. This project bridges a gap in dermatological drug delivery, making it a novel and impactful study. Unique Drug Delivery Approach Transdermal films for antifungal drugs are not extensively explored, especially for luliconazole, which is conventionally used in topical creams, gels, or solutions. A polymeric film formulation could enhance patient compliance, reduce systemic side effects, and provide controlled drug release Luliconazole is a potent imidazole antifungal with broad-spectrum activity, but its transdermal delivery has not been widely studied. Developing a film formulation could improve its skin penetration, stability, and efficacy compared to conventional dosage forms.

Keywords: Polymeric film, Transdermal drug delivery system, Fungal infection, Luliconazole, Antifungal

INTRODUCTION

The application of a medication-containing formulation to the skin to treat cutaneous disorders directly is known as transdermal drug delivery. When other drug delivery methods (such as oral, sublingual, rectal, or parental) are ineffective or when a local skin illness such a fungal infection occurs, the transdermal drug delivery technique is typically used [1]. The transdermal delivery system's primary benefit is avoiding first pass metabolism. Another benefit of using oral medication is avoiding the hazards and hassles of intravenous therapy as well as the various circumstances of absorption, such as pH fluctuations, the presence of enzymes, and gastric emptying time. The transdermal medication delivery mechanism is typically utilised when other drug administration methods are ineffective. The study is also being conducted in order to avoid the dangers and inconveniences of intravenous therapy as well as the various absorption conditions, such as pH fluctuations, the presence of enzymes, and gastric emptying time. Localized medication delivery via cutaneous, ocular, rectal, and vaginal channels is made simple and straight forward by transdermal drug administration. These are applied to the healthy or sick skin as a wide range of preparations for both cosmetic and dermatological purposes [2]. The aim of the present study was “Formulation And In Vitro Evaluation of Transdermal Antifungal Polymeric Film Luliconazole Drug”. Due to increase in number of side

effect that are cause by the other route of administration there is an increase in the demand of topical dosage form also it has many advantages over other dosage form. And polymeric film is a new dosage form that have been developed in order to formulate a new and stable dosage form

MATERIALS AND METHOD

Materials:

- **Active Pharmaceutical Ingredient (API):** Luliconazole purchased from Swapnaroop Drugs and Pharmaceuticals
- **Polymers**: Hydroxypropyl methylcellulose (HPMC), Triethyl citrate, Carbopol 940, and Eudragit RL100 were selected for their film-forming properties and ability to modulate drug release were purchased from Sms Pharmaceuticals & Fisher Scientific India Pvt. Ltd respectively
- **Plasticizers**: Propylene glycol and glycerol were used to enhance the flexibility and mechanical properties of the films were purchased from Virupaksha Organics Limited (Hyderabad)
- **Solvents**: Ethanol and dichloromethane were employed for dissolving the polymers and drug were purchased from Fisher Scientific India Pvt. Ltd
- **Other reagents**: Phosphate-buffered saline (PBS, pH 7.4) for release studies, and agar medium for antifungal activity tests.[3]

Methods:

PREFORMULATION STUDY

Organoleptic Properties

The drug sample was observed for their visual appearance, colour, and feel upon application such as grittiness, grassiness, smoothness, stuffiness and tackiness.

Determination of Aqueous Solubility

The determination of aqueous solubility of luliconazole estimated through Saturation shake - flask method. An optimum amount of luliconazole dissolved in distilled water and acetate buffer pH 5.5 then followed by vortex and centrifugation at 50 rpm at 37 °C for 48 hrs, resulting solution filtered and analysed spectrophotometrically at 299 nm. Qualification is taken in triplicate. 29 The solubility of Luliconazole was determined in various solvents (ethanol, methanol, dichloromethane, phosphate buffer pH 7.4, and water). An excess amount of Luliconazole was added to 10 ml of each solvent and shaken at 25°C for 48 hours. The solutions were filtered, and the concentration of dissolved drug was determined using UV Visible spectrophotometry. [4]

pH

The stability of Luliconazole was studied at different pH levels (pH 4, 7, and 9) by dissolving the drug in buffer solutions and incubating at room temperature for 7 days. The samples were analysed spectrophotometrically for degradation.[5]

Melting Point Determination

The melting point of Luliconazole was determined using a digital melting point apparatus. This test confirmed the purity and thermal stability of the drug, which are critical for its processing and formulation.[6]

Spectral Analysis of Luliconazole

UV – Visible Spectrophotometry Analysis

Determination of λ Max of Luliconazole

The absorption maximum of luliconazole determined as per standard protocol with some modification. In brief, stock solution of luliconazole developed at concentration of 1 mg/ml in methanol. Further, it followed by serial dilution to get concentration of luliconazole as 2, 4, 6, 8, 10 µg/ml, and then it proceeded to UV spectrophotometric analysis at λmax of 299 nm. Qualification is taken in triplicate and obtained data were analysed statistically. [7]

Fourier-Transform Infrared (FTIR) Spectroscopy

FTIR spectroscopy was performed to evaluate the compatibility of Luliconazole with selected excipients. Physical mixtures of the drug and excipients (1:1 ratio) were prepared and analysed for any shifts or disappearance of characteristic peaks, indicating potential interactions.[8]

Differential Scanning Calorimetry (DSC)

DSC analysis was conducted to determine the thermal behaviour of Luliconazole and its mixtures with excipients. Thermograms were recorded from 30°C to 300°C at a heating rate of 10°C/min. Any changes in the melting point or the appearance of new peaks were assessed to identify possible incompatibilities.[9]

Preparation of Polymeric Films

The transdermal films were prepared using the solvent casting method, which involves the following steps:

1. **Polymer Solution Preparation**: Polymers (HPMC, EC, and Eudragit RL100) were weighed accurately and dissolved in a mixture of ethanol and dichloromethane (1:1 ratio) under constant stirring.
2. **Drug Incorporation**: Luliconazole was dispersed into the polymer solution using a magnetic stirrer to ensure homogeneity.
3. **Plasticizer Addition**: Propylene glycol or glycerol was added to the mixture to improve the flexibility of the films.
4. **Casting**: The prepared solution was poured into a Petri dish and spread uniformly. The solvent was allowed to evaporate at room temperature for 24 hours.
5. **Cutting and Storage**: The dried films were cut into uniform sizes (2 × 2 cm^2) and stored in desiccators to prevent moisture absorption.[10]

Formulation Design (Composition in % w/w)

Table 1: Formulation Design (Composition in % w/w)

Ingredients	F Batch 1	F Batch 2	F Batch 3	F Batch 4	F Batch 5	F Batch 6	F Batch 7	F Batch 8	F Batch 9
Luliconazole	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5
HPMC K4M	2.0	3.0	4.0	2.0	3.0	4.0	2.0	3.0	4.0
Carbopol 940	0.5	0.5	0.5	1.0	1.0	1.0	1.5	1.5	1.5
Triethyl Citrate	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0
Propylene Glycol	5.0	5.0	5.0	7.0	7.0	7.0	10.0	10.0	10.0
Water (q.s.)	90.5	89.5	88.5	87.5	86.5	85.5	83.5	82.5	89.0

Physicochemical Characterization

1. **Thickness**: Measured using a digital micrometre at five different points on each film.
2. **Weight Uniformity:** Determined by weighing individual film samples using an analytical balance.
3. **Folding Endurance**: Assessed by folding the film repeatedly at the same spot until it broke.
4. **Moisture Content and Uptake**: Measured by weighing films before and after exposure to controlled humidity conditions (75% and 93% RH).[11]
5. **Tensile strength**: A universal tensile test machine was used to determine the peak load and tensile strength of the film. The tensile strength was calculated by using the following formula.

Tensile strength = (load at break)/ (original width) (original thickness)

In Vitro Drug Release Studies

The release of Luliconazole from the films was studied using Franz diffusion cells:

- **Setup**: The film was mounted on the donor compartment, and PBS (pH 7.4) was used as the receptor medium.
- **Sampling**: Aliquots (5 mL) were withdrawn at intervals (1, 2, 4, 6, 12, and 24 hours) and replaced with fresh medium.

• **Analysis**: Samples were analysed spectrophotometrically to calculate the cumulative drug release.[10]

Invitro dissolution study:

The in vitro dissolution study for luliconazole transdermal antifungal polymeric films is conducted using a USP Type II (Paddle) apparatus filled with 500 mL of phosphate buffer saline (PBS, pH 7.4) maintained at 32 ± 0.5°C to simulate skin temperature. Precisely cut 1 cm² film samples (weighed for uniformity) are placed in dissolution vessels, and the paddle is rotated at 50 rpm to ensure gentle agitation without film damage. Aliquots (5 mL) are withdrawn at predetermined intervals (0.5, 1, 2, 4, 6, 8, 12, and 24 hours), filtered through a 0.45 µm membrane, and analysed via UV spectrophotometry at 300 nm or HPLC to quantify luliconazole release. After each sampling, an equal volume of fresh dissolution medium is replenished to maintain sink conditions.

Antifungal Activity (HALOZONE TEST)

The antifungal efficacy of the films was evaluated using the agar diffusion method:

1. **Test Organisms:** Candida albicans and Trichophyton rubrum were cultured on Sabouraud dextrose agar.
2. **Procedure:** Films were placed on inoculated agar plates and incubated at 37°C for 48 hours.
3. **Outcome Measurement:** The diameter of the zone of inhibition was measured to determine antifungal activity.[12]

Evaluation of luliconazole

Physicochemical property

Physicochemical Properties of polymeric film dispersions were characterized as colour, Odor, pH, and solubility of polymeric film in aqueous medium. [13,14]

FTIR spectra

Drug characterization study by FTIR was carried out as per standard procedure. The spectra analysis performed by Win-IR, Bio-Rad FTS spectrophotometer. Individual sample assorted with potassium bromide and later proceeds for spectroscopical observation under range of 4000 to 400 cm−1. [15,16] These detected principal peaks confirmed purity and authenticity of luliconazole similar to referenced report. [17,18]

Table 2: FTIR interpretation of luliconazole

Characteristics Peaks	Reported (cm-1)	Observed (cm-1)
C-H stretch	2850 – 3000	2937.59
C≡N Stretch	2100 – 2400	2150.63
C=C aromatic stretch	1450 – 1650	1587.42
C=C-C Aromatic ring stretch	1510 – 1450	1425.40
Para C-H distribution	860 – 800	854.47
C-Cl stretch	600 – 800	792.74

RESULT AND DISCUSSION

Preformulation Studies

Appearance of drug

The active drug was evaluated for various parameters through the standard test and accordingly the results have been mentioned in following table.

Table No 3: Result analysis of Luliconazole

Test	Specification	Observation	Conclusion
Description	White to off-white Color powder	White to off-white Color powder	Complied
Odor	Odorless	Odorless	Complied

Melting Point

Table No 4: Melting Point of Luliconazole.

Sr. No.	Standard Melting Point	Observed Melting Point
01	151-156°C	152-153°C

Solubility determination in various solvents

Table No 5: Solubility of Luliconazole in solvent

Solubility	Partially soluble in Water	Practically Partially soluble in water	Complied
	Highly soluble in methanol	Practically Highly soluble in methanol	Complied
	Highly soluble in ethanol	Practically Highly soluble in ethanol	Complied
	Slightly soluble in Phosphate buffer 7.4	Practically Slightly soluble in Phosphate buffer 7.4	Complied

Determination of the absorption maximum of luliconazole in methanol

The absorption maximum of luliconazole determined as per standard protocol with some modification. In brief, stock solution of luliconazole developed at concentration of 1 mg/ml in methanol. Further, it followed by serial dilution to get concentration of luliconazole as 2, 4, 6, 8, 10 µg/ml, and then it proceeded to UV spectrophotometric analysis at λmax of 299 nm. Qualification is taken in triplicate and obtained data were analyzed statistically.

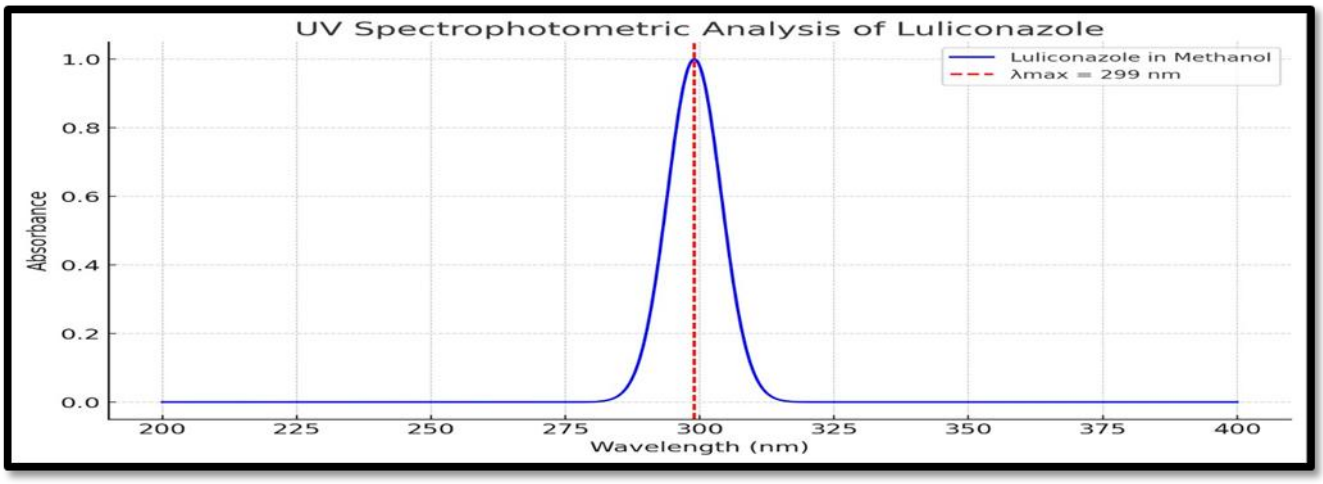

Figure No 1: UV Spectra of Absorption maxima of luliconazole in methanol

FT-IR Analysis:

Drug characterization study by FTIR was carried out as per standard procedure. The spectra analysis performed by Win-IR, Bio-Rad FTS spectrophotometer. Individual sample assorted with potassium bromide and later proceeds for spectroscopical observation under range of 4000 to 400 cm^{-1}. [19,20] These detected principal peaks confirmed purity and authenticity of luliconazole similar to referenced report. [20,21]

Table 6: FTIR interpretation of luliconazole

Characteristics Peaks	Reported (cm^{-1})	Observed (cm^{-1})
C-H stretch	2850 - 3000	2937.59
C≡N Stretch	2100 - 2400	2150.63
C=C aromatic stretch	1450 - 1650	1587.42
C=C-C Aromatic ring stretch	1510 - 1450	1425.40

para-C-H distribution	860 - 800	854.47
C-Cl stretch	600 - 800	792.74

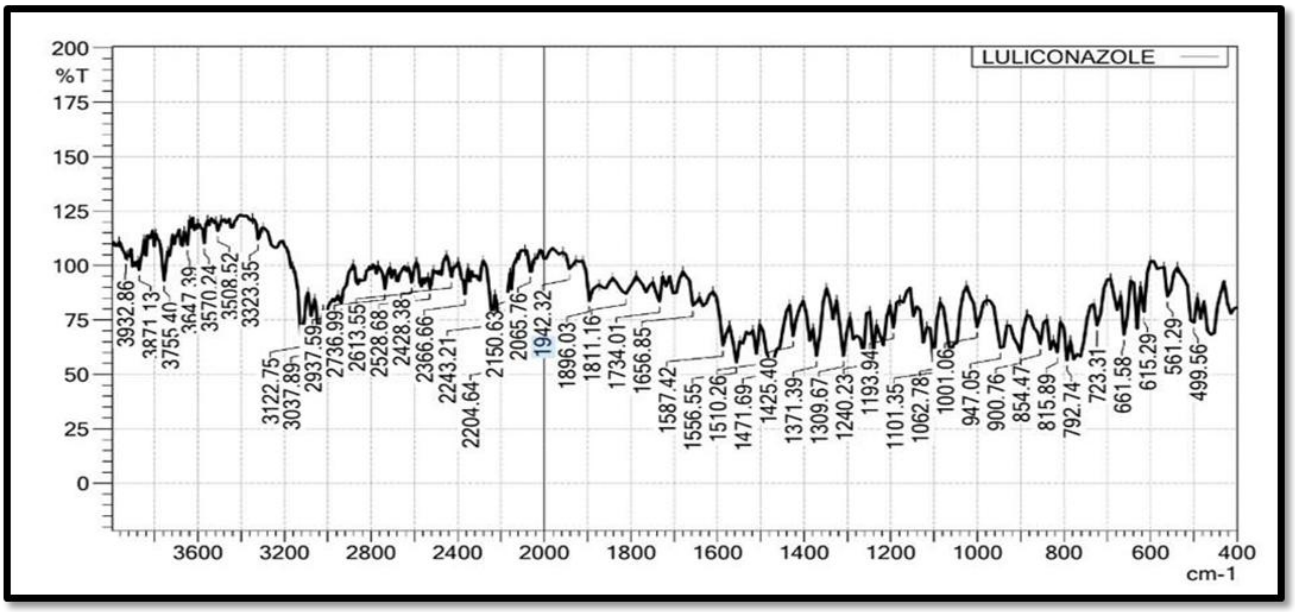

Figure No 2: FTIR spectrum of luliconazole

Table 7: FTIR interpretation of luliconazole polymeric film

Characteristics Peaks	**Reported (cm-1)**	**Observed (cm-1)**
OH Stretching	3176.76	3192.19
CH2 Stretching	2817.36	2880.41
CH (Aromatic Stretching)	2966.52	2956.87
C = N Stretch	1560.41	1562.34
CH (Aromatic bending)	1456.80	1456.20
C - F Stretch	1133.93	1139.39

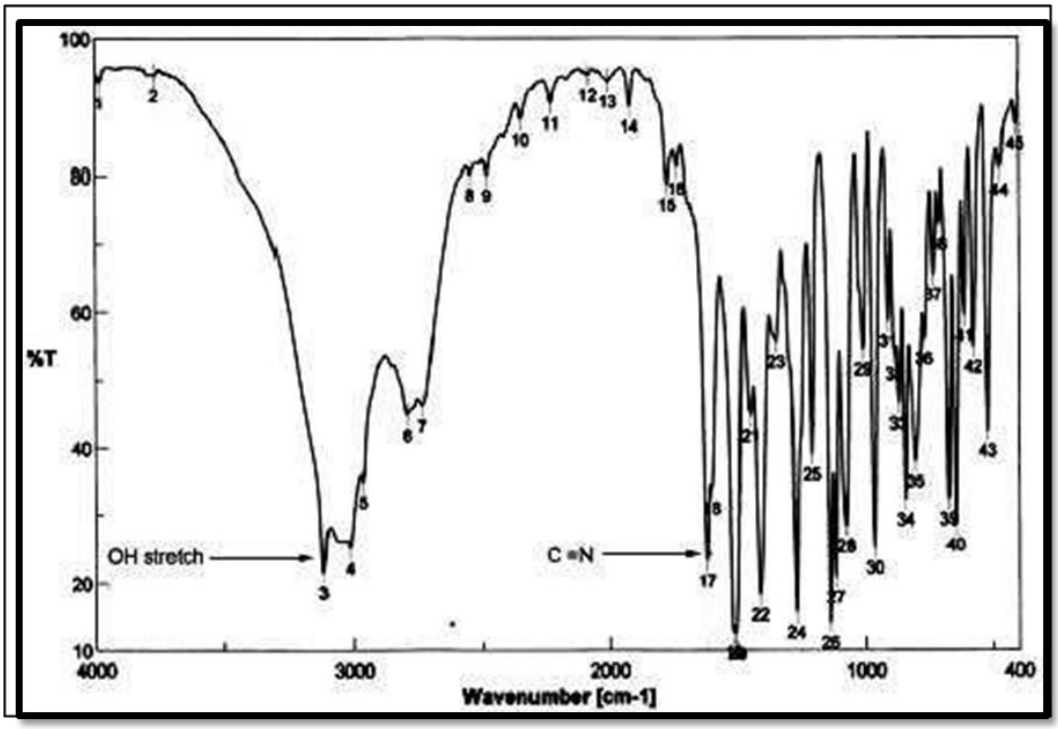

Figure No 3: FTIR spectrum of luliconazole polymeric film

Calibration Curve of luliconazole

Calibration Curve of luliconazole in methanol

The graph of Value Absorbance Vs Concentration for pure Luliconazole was achieved at 299 nm with a concentration range of 2 to 12 µg/ml. The calibration curve was plotted using both the concentration and absorbance data.

Table No 8: Absorbance value at various concentration of luliconazole in methanol

Sr.No.	Concentration (µg/ml)	Absorbance
1	0	0
2	2	0.270
3	4	0.450
4	6	0.600
5	8	0.740
6	10	0.850
7	12	0.97

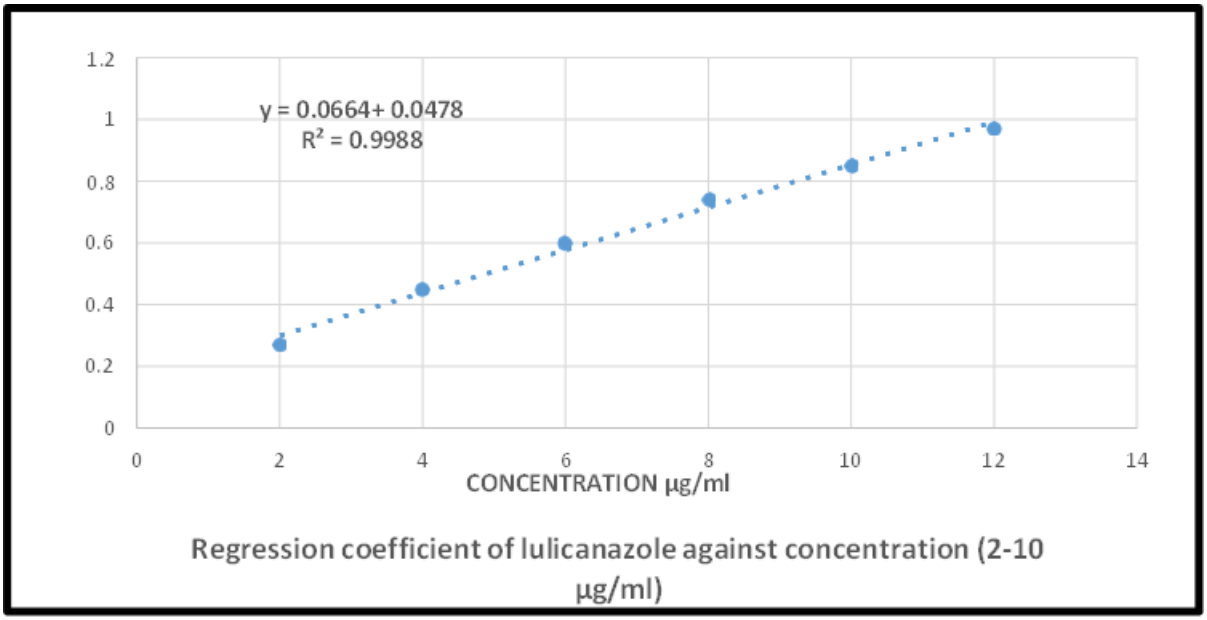

Figure No 4: Calibration Curve of luliconazole in methanol (regression coefficient against the different concentration of luliconazole (2-10µg/ml)

Calibration Curve of Luliconazole in Phosphate Buffer Solution pH 7.4

The graph of Value Absorbance Vs Concentration for pure Luliconazole was achieved at 299 nm with a concentration range of 5 to 25 g/mL. The calibration curve was plotted using both the concentration and absorbance data.

Table No 9: Absorbance value at various concentration of Luliconazole in Phosphate Buffer Solution pH 7.4

Sr.No.	Concentration	Absorbance
1	05	0.023
2	10	0.042
3	15	0.061
4	20	0.078
5	25	0.083

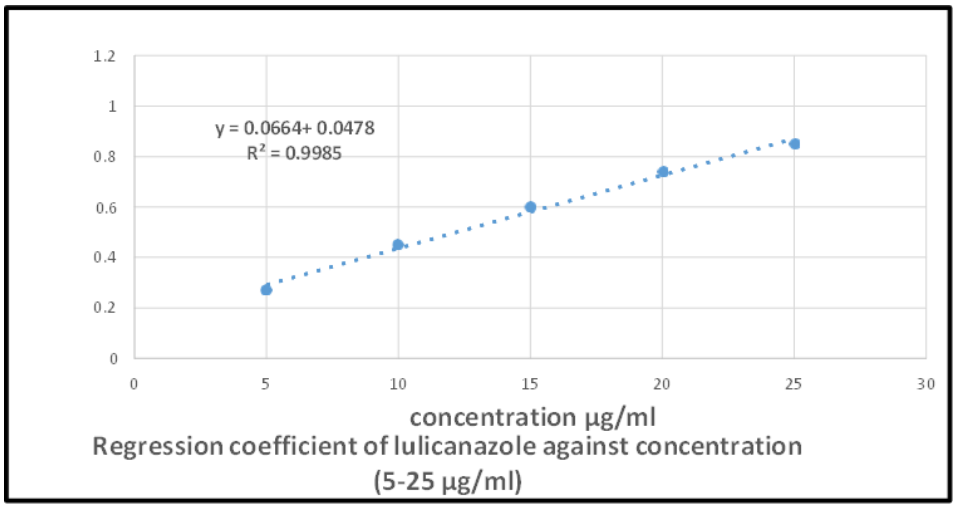

Figure No 5: Calibration Curve of luliconazole in Phosphate Buffer Solution pH 7.4 (regression coefficient against the different concentration of luliconazole (5-25µg/ml)

Drug Excipient Compatibility Study

Studies on the compatibility of medicine excipients are a crucial stage in the development of new medications. A drug substance's chemical makeup, the type of delivery system needed, and the proposed manufacturing method must all be carefully considered before a drug substance is formed into the intended dosage form. Drug ingredients are frequently coupled with excipients, which have specific functions. Although excipients are pharmacologically inactive, under the correct circumstances they can engage in chemical reactions and physical interactions with drug molecules. Excipients for use in pharmaceutical formulation have either been approved or rejected using compatibility tests on medication excipients. The API was taken in various ratios and thoroughly mixed both on its own and with each excipient.

Table 10. Drug- Excipient Compatibility Study Ratio

Sr. No.	Sample	Ratio
1	Luliconazole: Eudragit RS100	1:1
2	Luliconazole: Carbopol 940	1:1
3	Luliconazole: HPMC K4M	1:1
4	Luliconazole: Triethyl citrate	1:1
5	Luliconazole: Propylene glycol	1:1

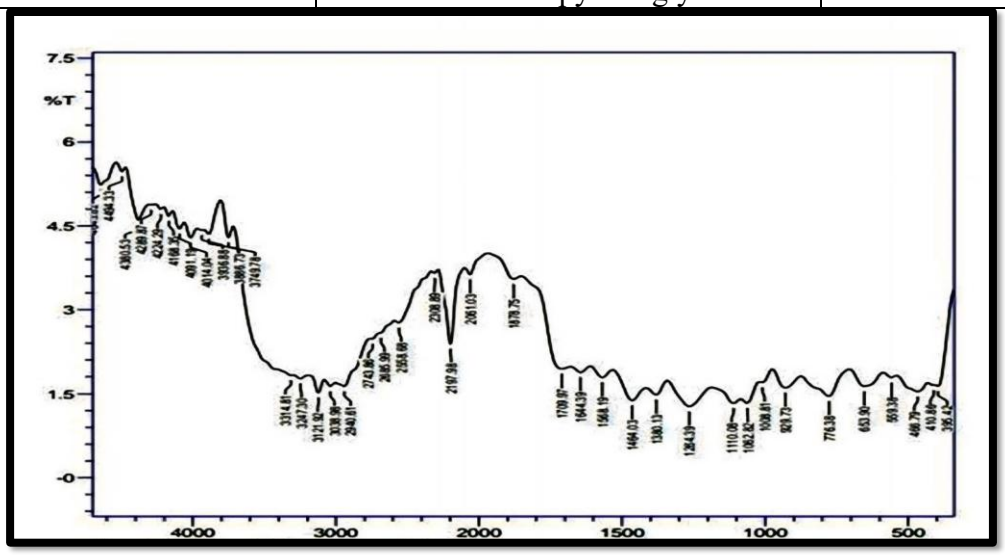

Figure No 6: FTIR spectrum of luliconazole and Polymers

Evaluation of Luliconazole Polymeric Films

A prepared Evaluation of Prepared Luliconazole polymeric film was inspected visually for color. Homogeneity, consistency. All formulations showed white, white buff color, appearance therefore showed suitable homogeneity and consistency. And the observations are mentioned in Table No. 8.

Table No 11. Physical Evaluation of Formulations

Formulation Code	Color	Feel of application
F1	White	Smooth
F2	White	Smooth
F3	White	Smooth
F4	White	Smooth
F5	White	Smooth
F6	White	Smooth
F7	White	Smooth
F8	White	Smooth
F9	White	Smooth

Table No 12: Physicochemical Characterization

Formulation Code	Thickness (mm)	Folding Endurance	Tensile Strength (kg/cm2)	Weight Uniformity		Moisture Content and Uptake			
				Weight (mg)	Deviation (%)	Initial Weight (mg)	Dried Weight (mg)	Moisture Content (%)	Moisture Uptake (%)
F1	0.16 ± 0.02	53 ± 2	3.16 ± 0.03	102.5	3.2	102.5	99.3	3.1	4.5
F2	0.16 ± 0.01	57 ± 2	3.16 ± 0.03	98.7	2.1	98.7	96.1	2.6	4.9
F3	0.15 ± 0.02	50 ± 2	3.36 ± 0.03	101.3	1.8	101.3	98.2	3.1	5.0
F4	0.15 ± 0.01	45 ± 2	3.36 ± 0.03	99.5	0.5	99.5	96.7	2.8	4.3
F5	0.15 ± 0.01	45 ± 2	3.36 ± 0.03	100.2	0.2	100.2	97.1	3.1	4.7
F6	0.18 ± 0.02	50 ± 2	2.83 ± 0.03	103.1	4.3	102.5	99.3	3.1	4.5
F7	0.16 ± 0.01	53 ± 2	3.16 ± 0.03	97.8	3.5	98.7	96.1	2.6	4.9
F8	0.16 ± 0.02	58 ± 2	3.16 ± 0.03	100.5	0.5	101.3	98.2	3.1	5.0
F9	0.17 ± 0.01	51 ± 2	3.15 ± 0.03	102.0	2.0	99.5	96.7	2.8	4.3

pH

pH of prepared Luliconazole polymeric film were measured by using pH meter. The pH of the Luliconazole polymeric film formulation was in the range of 4.4 to 6.7 which considered acceptable to avoid the risk of irritation upon application.

Table No 13: pH of Luliconazole Polymeric Films

Formulation Code	pH
F1	6.5
F2	6.7
F3	6.7
F4	6.3
F5	6.8
F6	6.5
F7	6
F8	6.9
F9	6.7

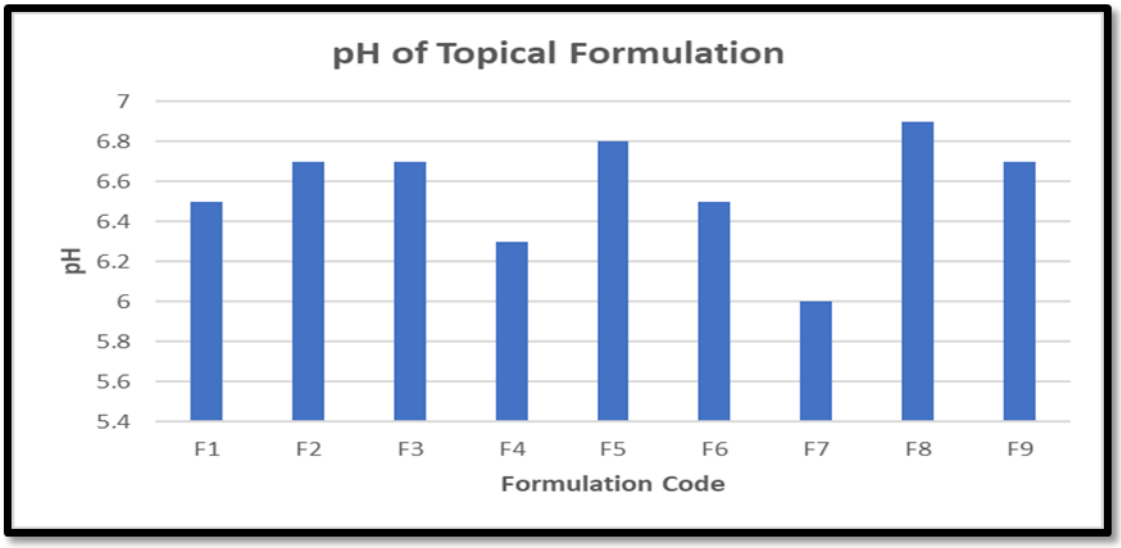

Figure No 7: Comparison of pH of factorial batches

Drug Content

The % Drug content of Topical polymeric film Factorial formulations (F1 to F9) was found to be range 95.18 to 98.26 it was observed that % drug content of Hydrogel depends on practical skill. Here, as the optimum % drug content be achieved by result reproducibility. can be achieved by result reproducibility. Drug content of all the formulations are shown in Table 12.

Table No 14: Drug content (%) of Luliconazole Polymeric Films

Formulation Code	Drug content (%)
F1	96.25
F2	95.62
F3	96.87
F4	98.12
F5	97.13
F6	96.45
F7	98.26
F8	95.18
F9	97.56

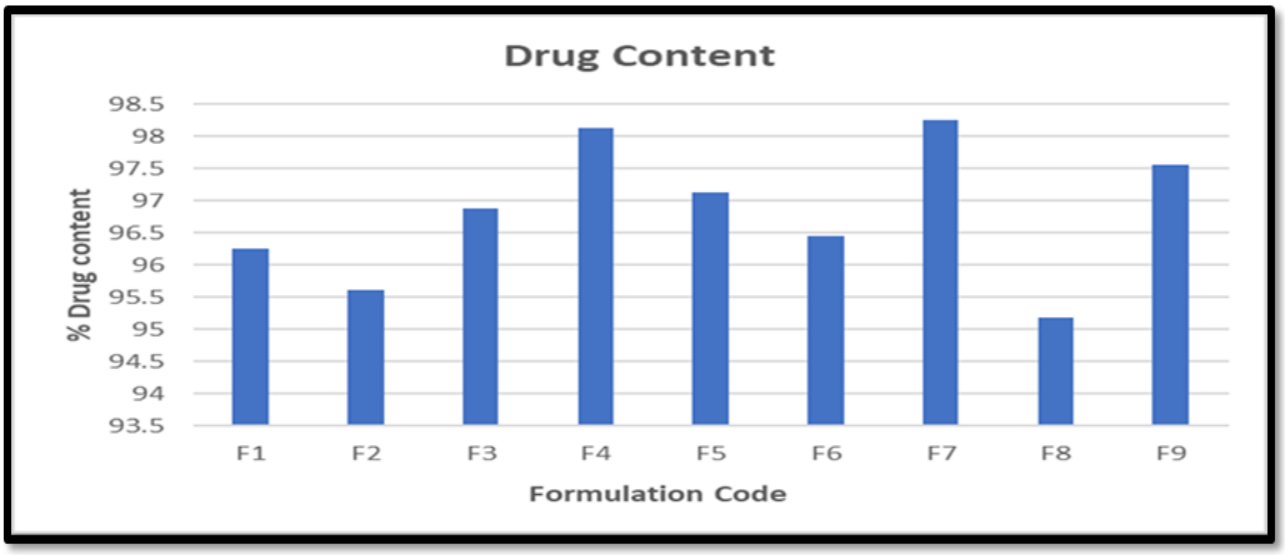

Figure No 8: Comparison of Drug content (%) of Factorial Batches

Table No 15: In Vitro Drug Release of Factorial Batches F1-F9

Time (Hr.)	F1	F2	F3	F4	F5	F6	F7	F8	F9
0	0	0	0	0	0	0	0	0	0
1	1.64	2	1.13	1.44	1.33	1.14	1.12	1.24	1.23
2	5.63	5.25	5	4.81	4.64	4.35	4.32	4.07	4.05
3	10.5	10.67	9.83	8.4	8.17	7.78	8.14	7.83	7.8
4	17.64	17.53	16.44	15.21	14.97	12.88	12.57	11.96	11.9
5	30.78	26.57	24.57	22.96	22.64	20.34	19.44	18.5	18.42
6	45.14	38.57	36.35	34.75	34.07	31.66	30.64	26.25	26.15
7	60.14	54.07	50.04	49.54	48.81	45.32	43.46	38.72	38.58
8	79.49	73.26	68.76	65.14	64.32	59.79	58.82	53.82	53.15
9	80.34	78.20	69.04	66.16	66.23	60.81	59.85	55.92	54.51

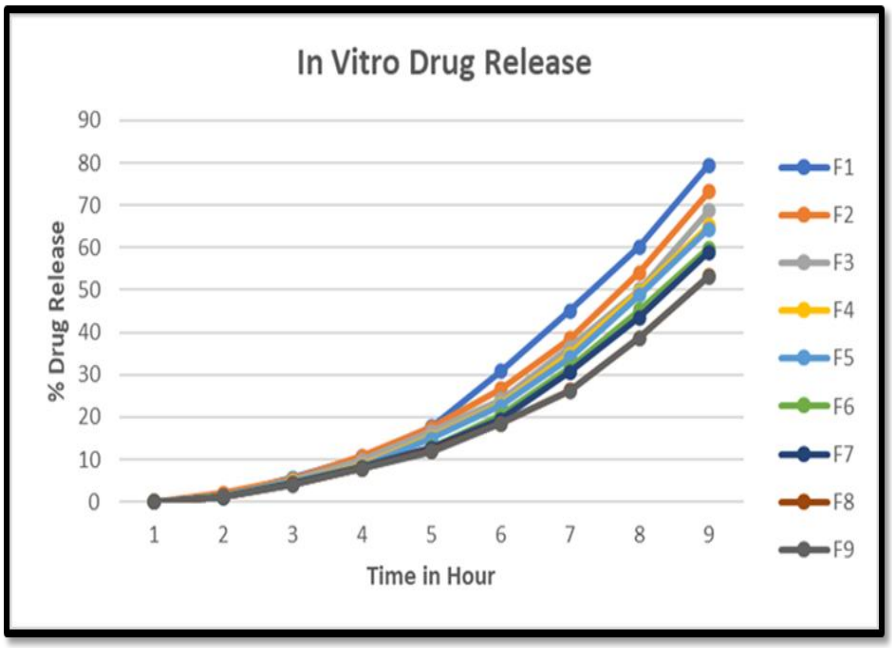

Figure No 9: Comparison of % Drug Release of Factorial Batches F1 to F9

Invitro dissolution study

F1 formulation shows 98.87 % drug release at 8 Hours. whereas F2 shows 94.71% drug release at 8 hours, F3 shows 99.58 % drug release at 10hours. so, the concentrations of the polymers were further increased to get sustained release.

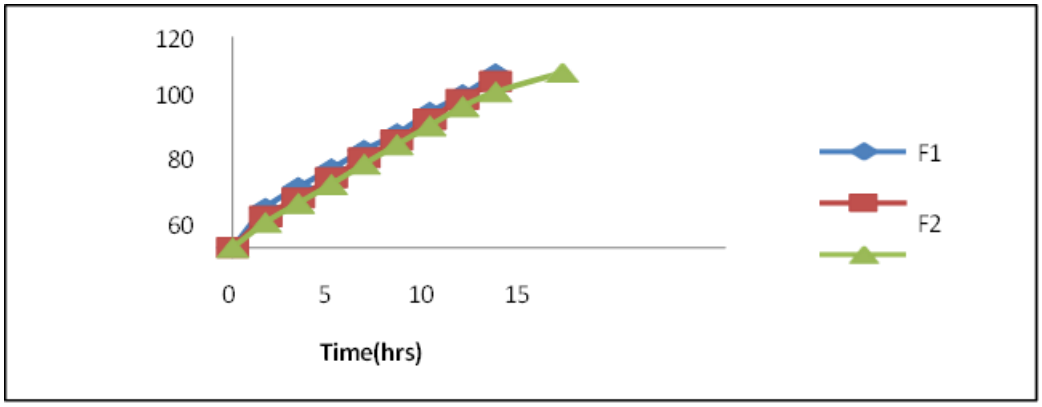

Figure No 10: Invitro dissolution profile of F1-F3

F4 formulation containing shows 91.16 % drug release at 10 Hours, whereas F5 containing shows 97.06 % drug release at 10 hours where as F6 shows 99.16 % drug release at the end of 12 hrs.

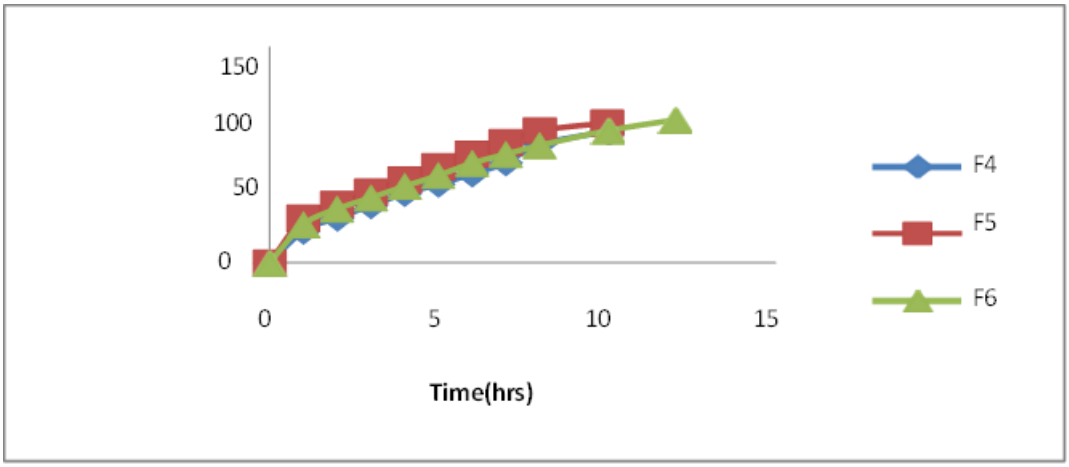

Figure No 11: Invitro dissolution profile of F4-F6

F7 formulation shows 91.03% drug release at 12 Hours but not in a sustained manner. where asF8 shows 90.32% drug release at 12 hours but not in a sustained manner. Whereas F9 containing shows 99.63 % drug release at the end of 12 hrs. So, formulation F9 is considered as the optimized formulation as it releases maximum amount of drug at the end of 12hrs. Further drug release kinetics studies were performed for F9 formulation

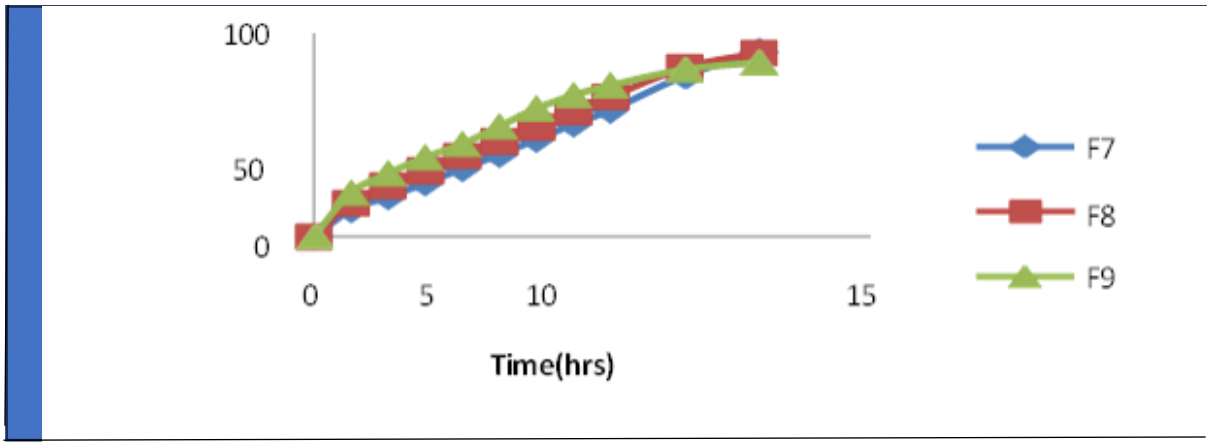

Figure No 12: Invitro dissolution profile of F4-F6

Table No 16: Drug release data of Luliconazole polymeric film (F1-F9)

Time (hrs.)	F1	F2	F3	F4	F5	F6	F7	F8	F9
0	0	0	0	0	0	0	0	0	0
1	22.43	17.84	14.38	22.05	31.16	26.63	13.25	16.52	21.66
2	34.25	28.31	25.36	31.24	40.75	37.42	19.62	25.06	3.13
3	44.86	39.77	36.18	39.72	49.12	45.13	26.39	32.43	39.18
4	55.45	50.98	47.59	48.19	57.76	53.08	33.46	39.75	45.59
5	64.85	61.28	58.68	54.62	66.83	60.67	40.55	46.89	54.36
6	76.9	73.2	69.5	61.7	75.5	69.1	47.8	54.0	63.1

	6	6	6	3	2	3	3	6	3
7	86.98	84.46	80.39	69.43	83.63	75.36	55.49	61.32	69.73
8	98.87	94.71	88.76	82.36	91.86	81.41	62.42	68.78	74.53
10			99.58	91.16	97.06	91.62	79.26	83.26	82.36
12						99.63	91.62	90.62	85.65

Stability studies

The stability study of optimum batch (F1) revealed that there is slightly reduction in drug content was observed over period of 45 days. No significant change was Observed in % drug content. The release condition depends upon the temp and duration of period. Drug release (after 8 Hrs.) at various storing condition 2-8^{0}C, 25^{0}C, and 40^{0}C Hence formulation was found to be stable for 45 days.

Table No 17: Stability study for Factorial Batch F1 at 2-80C at Humidity 60 ± 05%

Duration Time	Drug Content (%)	% Drug Release	pH of Formulation
0	97.26	79.82	6.4
15	97.26	79.82	6.4
30	97.26	79.81	6.4
45	97.21	19.81	6.3

Table No 18: Stability study for Factorial Batch F1 at 250C at Humidity 64 ± 05%

Duration Time	Drug Content (%)	% Drug Release	pH of Formulation
0	97.26	79.82	6.4
15	97.22	79.78	6.3
30	97.22	79.77	6.1
45	97.19	97.74	6

Table No 19: Stability study for Factorial Batch F1 at 400C at Humidity 54 ± 05%

Duration Time	Drug Content (%)	% Drug Release	pH of Formulation
0	97.26	79.82	6.4
15	96.86	79.77	6.3
30	96.17	79.75	6
45	95.93	97.72	5.9

Discussion:

Firstly, pre-formulation studies were carried out parameters like organoleptic character, melting point, solubility etc. were studied and the drug was spectrophotometrically analysed using UV spectrophotometer. FTIR study confirmed the purity of the drug. polymeric film where design using different concentration of Carbopol 940, HPMC, eudragit RS 100 and propylene glycol. Mentha oil was used to enhance drug penetration from this preparation. formulation was evaluated for drug contain determination, Viscosity measurement, In-Vitro release study. Thus, Formulation and comparative study of various polymer was performed. The purpose of transdermal drug delivery system is to allow therapeutic quantity of drug to correct place in body and to achieve and sustain desired effect of drug for a while. In present investigation, we have designed polymeric film loaded with luliconazole to enhance skin permeation and controlled drug release at targeted site and

incorporate them in transdermal film of Carbopol 940 with good skin retention time. physicochemical property of prepared film determined as per standards protocol to overcome compliance after patient use. Even spectroscopical analysis reveals no chemical interactivity between luliconazole and excipients. microscopic examination (optical microscopy and scanning electron microscopy) of film showed uniform distribution of drug inside film with good order of kinetics of drug release. Hence, it can be concluded that luliconazole polymeric film provides controlled release of drug and these systems can be good source as drug carriers for lipophilic drugs, bioavailability enhancer for poorly water-soluble drugs by nanoparticles, drug delivery system.

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