Conceptualization And Assessment Of Herbal Tablet Containing *Murraya Koenigii* Using *Linum Usitatissimum* As Natural Binder.

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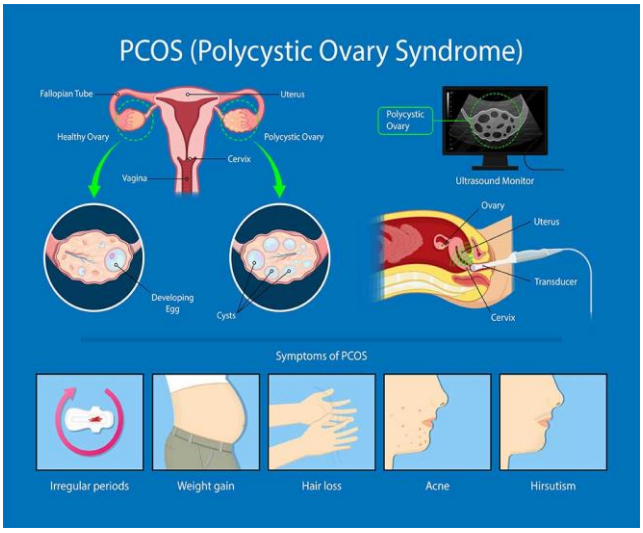
Abstract:
Polycystic Ovary Syndrome (PCOS) is a prevalent endocrine disorder characterized by hormonal imbalances and metabolic abnormalities, often leading to insulin resistance and the development of Diabetes Mellitus (DM). This study aimed to conceptualize and assess the efficacy of an herbal tablet formulation containing Murraya Koenigii, a traditional medicinal plant known for its potential hypoglycaemic properties, with Linum usitatissimum (flaxseed) as a natural binder, in reducing hyperglycaemia associated with DM in PCOS. A randomized, double-blind, placebo-controlled trial was conducted on female participants diagnosed with PCOS and DM. The intervention group received the herbal tablet formulation, while the control group received a placebo. The primary outcomes included changes in fasting blood glucose levels, oral glucose tolerance test results, and glycated haemoglobin levels. Secondary outcomes included assessments of insulin sensitivity, lipid profile, and anthropometric measurements. Safety and tolerability of the herbal tablet formulation were also evaluated. The results of this study will provide valuable insights into the potential of the Murraya Koenigii-based herbal tablet with Linum usitatissimum as a natural binder, as an adjunct therapy for reducing hyperglycaemia in PCOS patients with DM. This research contributes to the development of holistic treatment strategies for managing the complex condition of PCOS-associated hyperglycaemia in individuals with DM.

Keywords: Murraya Koenigii, Linum usitatissimum, hyperglycaemia. Diabetes mellitus, herbal tablet

Introduction:
Herbal formulation refers to a medicinal product or preparation that incorporates various plant-based ingredients, such as herbs, botanicals, or plant extracts, with the aim of promoting health and treating specific ailments. These formulations typically utilize the therapeutic properties of the plants' active compounds, which may include phytochemicals, antioxidants, vitamins, minerals, and other bioactive substances. Herbal formulations can take various forms, such as tablets, capsules, powders, tinctures, teas, or creams, and are often developed based on traditional knowledge, scientific research, and clinical evidence. They are commonly used as natural alternatives or complements to conventional pharmaceutical drugs, with the intention of providing holistic and potentially gentler approaches to health management and wellness. Herbal products play a significant role in various forms, including spices, herbal teas, functional food ingredients, medicinal raw materials, aromatic plants, essential oils, flavourings, fragrant products, and dietary supplements. Across different cultures and for thousands of years, plants have been utilized as medicinal remedies worldwide.[1]
The World Health Organization (WHO) estimates that approximately 80% of the population, particularly in developing nations, still relies on plant-based medicines for primary healthcare. In India, traditional systems of medicine like Ayurveda, Siddha, Unani, Amchi, and local health traditions have long utilized a diverse array of plants to treat human and animal diseases, categorizing them as medicinal plants. With its abundant natural resources and rich traditional medicine history, India holds great potential in the field of medicinal plants. These plants contain various biologically active compounds, such as carbohydrates, proteins, enzymes, fats, oils, terpenoids, flavonoids, sterols, and simple phenolic compounds, which offer therapeutic benefits and contribute to disease management. Natural products derived from plants continue to be a primary healthcare system and a source for both synthetic and traditional herbal medicines.
Scientists have extensively explored the potential of medicinal plants in treating infectious diseases and managing chronic wounds due to the presence of essential constituents. Traditional medicine literature highlights their role as a source of vitamins and domestic remedies for numerous disorders, including diabetes, cancer, and arthritis. The increasing demand for herbal products, both locally and internationally, can be attributed to factors such as population growth, poverty, growing awareness, the high cost of modern medicine, and limited access to trained doctors.
The selection of plants and plant parts for use varies across different regions, influenced by local indigenous knowledge and experiences. Recent research efforts have focused on exploring natural plant products as alternatives for disease

prevention and treatment, considering their affordability and accessibility to a vast majority of the global population. Consequently, there is a need to promote the utilization of medicinal plants as potential sources for the development of new drugs. The global interest in herbal remedies has witnessed a significant upsurge in several parts of the world.[2]



Diabetes Mellitus can be described as a diverse metabolic condition characterized by a consistent state of elevated blood glucose levels, accompanied by disruptions in the metabolism of carbohydrates, proteins, and fats.[3]

Polycystic ovary syndrome (PCOS) is a multifaceted condition characterized by increased androgen levels, disturbances in menstrual cycles, and the presence of small cysts on the ovaries.[4] It can manifest as either morphological, indicated by the presence of polycystic ovaries, or predominantly biochemical, with elevated levels of androgens.

Hyperandrogenism, a key characteristic of PCOS, can hinder the development of follicles, lead to the formation of microcysts in the ovaries, disrupt ovulation, and cause changes in menstrual patterns.[5]

Murraya *Koenigii*, commonly known as curry leaf or *'Kari patta'* in India, belongs to the Rutaceae family, which encompasses over 1600 species and 150 genera.[6]

This plant, known for its distinct aroma and medicinal properties, holds significant value. In India, it is an important export commodity, contributing to foreign revenue.[7]

Several chemical constituents, such as Girinimbine, Murrayazoline, Mahanine, and Mahanimbine, have been extracted from curry leaf. Medicinal plants, including Murraya koenigii, contain a multitude of biologically active compounds that play a crucial role in treating various diseases and improving human well-being.[8]

Moreover, they serve as a valuable source of anti-infective agents, offering cost-effectiveness and minimal side effects.[9]

The presence of essential constituents in these plants has consistently motivated scientists to explore them for potential therapeutic agents in biomedicine research.[10]

Binders are adhesive substances that are incorporated into solid dosage formulations. Their primary function is to provide cohesiveness, which is necessary for the particles within the formulation to bond together during compaction, resulting in the formation of tablets.[11] Flaxseed, also known as linseed, is derived from the flax plant *(Linum usitatissimum)* of the Linaceae family and is cultivated globally for its fibre and oil. Flaxseed contains various components, including 6% mucilage or soluble fibres, 18% insoluble fibres, 25% proteins, and 30-40% oil. Notably, alpha-linolenic acid (ALA) constitutes approximately 50-60% of the total fatty acids in flaxseed.[12]

Furthermore, flaxseed contains lignan, a constituent that possesses antioxidant properties and potential estrogen receptor agonist/antagonist effects in vitro. These properties have led to speculation regarding the potential utility of flaxseed in the treatment of conditions such as breast cancer, prostate cancer, inflammatory bowel disease, lupus nephritis, and type 2 diabetes. However, it is important to note that these hypotheses require further investigation and validation.[13]

Scientific classification:

***a)Murraya Koenigii* (Curry leaves)**

Kingdom	**Plantae**
Sub-kingdom	Tracheobionta
Super-division	Spermatophyta
Division	Magnoliophyte
Class	Magnoliopsida
Subclass	Rosidae
Order	Sapindales
Family	Rutaceae
Genus	Murraya
Species	Murraya koenigii

b)*Linum usitatissimum* (Flax seed)

Kingdom	**Plantae**
Sub-kingdom	Tracheobionta
Super-division	Spermatophyta
Division	Magnoliophyte
Class	Magnoliopsida
Order	Malpighiales
Family	Linaceae
Genus	Linum
Species	Linum usitatissimum
Kingdom	Plantae

Materials and Method:

- List of ingredients:

Serial Number	**Ingredients**	**Source and supplier**
1.	*Murraya Koenigii* extract	Amsar Pvt. Ltd. Indore
2.	*Linum Usitatissimum* extract	Amsar Pvt. Ltd. Indore
3.	Sodium starch glycolate	Analab fine chemicals, Mumbai
4.	PVP K30	Analab fine chemicals, Mumbai
5.	Talc	Analab fine chemicals, Mumbai
6.	PEG 4000	Analab fine chemicals, Mumbai

Serial Number	**Ingredients**	**Category/Use**
1.	*Murraya Koenigii* extract	Active Ingredient
2.	*Linum Usitatissimum* extract	Natural binder
3.	Sodium starch glycolate	Disintegrating agent
4.	PVP K30	Diluent
5.	Talc	Glidant
6.	PEG 4000	Lubricant

- **List of Instruments used:**

Sr. No.	**Instrument**	**Models and manufactures**
1.	UV Spectrophotometer	Shimadzu 1900i, Japan
2.	FTIR Spectrophotometer	Shimadzu, Japan
3.	Digital Balance	LCGC Radwag, Hyderabad
4.	Stability Chamber	Biomedia, Pune
5.	Sonicator	Biomedia LX300
6.	Tablet compression machine	Labtronics LT-115, Mumbai
7.	pH meter	Euiptronics EQ614, Mumbai
8.	Disintegration apparatus	Anjay Engitech New-Delhi
9.	Dissolution apparatus	Testo India Private Limited
10.	Friability apparatus	Thermo Scientific, Mumbai

Method:

1. Drug-excipient compatibility:

The procedure for evaluating drug-excipient compatibility using FTIR involves preparing a physical mixture of the drug and excipient(s) and analysing their FTIR spectra. The range was observed within 4000 cm^ (-1) to 400 cm^ (-1). The spectra are compared to the individual components and controls to identify any changes in absorption bands, indicating potential interactions or incompatibilities. The observed spectral changes are then analysed and interpreted to draw conclusions about drug-excipient compatibility.

2. Differential scanning calorimetry (DSC):

DSC method is used to analyse the physical state of the drug i.e., Murraya Koenigii extract.

The procedure involved placing the samples in aluminium pans, securely sealing the lids with a crimper, and accurately weighing them to a precision. The objective was to examine the thermal properties of the samples within a temperature range of 40-300 °C, using a scanning rate of 10 °C per minute.

3. High Performance Thin Liquid Chromatography (HPTLC):

HPTLC was carried out to identify the various components in the herbal extract, to quantify the active compounds present in the herbal extract, to allow verification of the presence and quantity of key compounds to ensure the consistent and standardization of the herbal product, to study the phytochemical profile of the plant extracts. The mobile phase used for carrying HPTLC was methanol: n-hexane: ethyl acetate (1:3:1 v/v/v). The stationary phase used was Silica Gel 60 F254 (Merck).

Sample Preparation: Weighed 100 mg of extract sample, dissolved in 10 ml of methyl alcohol, sonicated for 30 mins, centrifuged at 10000 rpm for 15 mins and supernatant was filtered and used for spotting.
Saturation time: 20 mins
Spotting volume: 2, 5 µL

Experimental design using central composite design for herbal conventional tablet:
Central Composite Design (CCD) is a widely used experimental design approach that helps in optimizing and studying the response of a system by efficiently exploring the design space.
The independent variables were selected as follow:
X1: Natural binder in mg (*Linum Usitatissimum* extract)
X2: Sodium starch glycolate (disintegrating agent)
The non-independent variables were selected as:
Y1: Disintegrating time
Y2: % Drug release

The Central Composite Design (CCD) for the above dependent and independent variables called for running 13 cycles from F1 to F13 respectively.

During the experimental runs, the dependent factors are measured or observed, and the data collected is analysed to determine the effects of the independent factors on the response variables. Statistical techniques such as regression analysis, ANOVA, or response surface methodology (RSM) are commonly used to analyse the data and establish relationships between the independent and dependent factors.

Formulation of the herbal tablet:
The herbal tablet is a conventional tablet and hence was formulated using direct compression method. The strength of the tablet is 300 mg. The extracts were received from Amsar Pvt. Ltd, Indore and the excipients were received from Analab, Pvt. Ltd., Mumbai.

The respective ingredients were measured as per required on a digital balance following by mixing and then passing it through sieves to get uniform sized particles and were directly compressed in a tablet compression machine using 6-mm bi-concave punches on a Double Rotary Tablet Compression Machine (Rimek 10 station mini press).

The powdered extract of Murraya Koenigii were weighed as required on digital balance and was added in a mortar.

↓

Linum Usitatissimum extract is used as a natural binder and was mixed with the extract of Murraya Koenigii.

↓

The excipients except lubricant were measured and mixed with the above two ingredients in the mortar.

↓

Using a pestle, the ingredients were grounded, mixed, and powdered together

↓

Lubricant was added along with the other ingredients and was grounded.

↓

The powder was passes through sieve with mesh size #40 and #60 simultaneously.

↓

The powder was then filled in the die cavity and was then punched to form the herbal tablet.

The following formulations F1 to F13 were formulated using Central Composite Design from Design of Expert.

Composition for herbal conventional tablet formulated according to Central Composite Design (mg):

INGREDIENTS	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13
Murraya Koenigii	200	200	200	200	200	200	200	200	200	200	200	200	200
Linum Usitatissimum	6	6.41	5	5	5	5	4	5	5	3.58	6	4	5
Sodium starch glycolate	55	60	60	52.92	60	60	65	67.07	60	60	65	55	60
PVP K30	35	35	35	35	35	35	35	35	35	35	35	35	35
Talc	2	2	2	2	2	2	2	2	2	2	2	2	2
PEG 4000	2	2	2	2	2	2	2	2	2	2	2	2	2

Evaluation parameters for herbal conventional tablet:

- **Pre-compression parameters:**

➢ **Bulk Density:**

The bulk density of a powder was determined by measuring its weight and volume without disturbing the cylinder containing the powder. The bulk density was calculated using the equation:

Bulk Density (BD) = Weight of Powder / Bulk Volume.

➢ **Tapped Density:**

To determine the tapped density of the powder, a 25ml measuring cylinder was filled with a carefully weighed sample. A digital bulk density apparatus was used to tap the cylinder, and the final volume was recorded. The tapped density was then calculated using the equation:

Tapped Density (TD) = Weight of Powder / Tapped Volume.

➢ **Carr's Index:**

Carr's index is commonly used to assess the flowability characteristics of powders. An index between 5-15% is considered excellent, up to 21% is acceptable, and anything above 23% indicates poor flow. Carr's index was calculated using the equation:

*Carr's Index = (Tapped Density – Bulk Density) / Tapped Density * 100*.

➢ **Hausner's Ratio:**

Hausner's ratio provides an indication of powder flowability, with a ratio below 1.25 indicating good flow. Hausner's ratio was calculated using the equation:

Hausner's Ratio = Tapped Density / Bulk Density.

➢ **Angle of Repose:**

The angle of repose is a measure of a powder's flowability. In this study, a funnel was held 2 cm above a table surface, and 3.7 gm of powder was released from the funnel, forming a pile. The diameter (d) of the pile was determined by averaging three different circle diameters, and the pile height (h) was measured to determine the tip's elevation from the table surface. The angle of repose was calculated using the equation:

Tan θ = h / r.

Post compression parameters:

1. Weight Variation:

- Select a representative sample of tablets (e.g., 20 tablets).
- Weigh each tablet individually using a calibrated electronic balance.
- Calculate the average weight and percentage deviation from the average weight.
- Compare the individual tablet weights to the target weight or within a specified range.

2. Thickness:

- Measure the thickness of the tablets using a calibrated micrometre or thickness gauge.
- Take measurements at different locations on each tablet.
- Calculate the average thickness and assess its uniformity based on specified requirements.

3. Hardness:

- Use a tablet hardness tester to measure the crushing strength of the tablets.
- Place the tablet between the anvils of the hardness tester and apply gradual force until the tablet breaks.
- Record the force (expressed in kg or N) required to break the tablet.
- Repeat the measurement for multiple tablets and calculate the average hardness value.

4. Friability:

- Select a sample of tablets (e.g., 20 tablets).
- Place the tablets in a friabilator apparatus.

- Run the friabilator for a specified number of rotations (typically 100 or 200) at a defined speed.
- Remove the tablets, brush off any loose dust, and weigh them.
- Calculate the percentage weight loss as the difference in weight before and after the friability test.

5. Disintegration Time:
- Place a tablet in each of the individual disintegration test apparatus.
- Immerse the tablets in a suitable dissolution medium (e.g., water or simulated gastric fluid) maintained at a specified temperature.
- Observe and record the time required for the tablet to completely disintegrate into fine particles.
- Repeat the test for enough tablets to ensure statistical significance.

6. Dissolution Rate:
- Conduct dissolution testing following the specific method defined in the monograph, pharmacopeial standards, or study protocol.
- Place the tablet in a dissolution apparatus with appropriate sink conditions.
- Measure the concentration of the active ingredients released from the tablet at specific time intervals.
- Plot the dissolution profile and calculate parameters such as dissolution efficiency or the percentage of drug released at different time points.

7. Content Uniformity:
- Analyse the content of the active ingredients in multiple tablets using a validated analytical method.
- Prepare a sample solution by extracting the active ingredients from the tablets.
- Quantify the concentration of the active ingredients using suitable analytical techniques (e.g., HPLC, UV-Vis spectroscopy).
- Compare the results against the specified acceptance criteria for content uniformity.

8. Tablet Appearance:
- Visually inspect the tablets for any defects, such as cracks, chips, discoloration, or uneven surfaces.
- Record observations regarding tablet colour, shape, and overall appearance.
- Assess the tablets against predefined specifications or acceptance criteria.[14]

Advantages of Experimental Design (Central Composite Design) for Herbal Conventional Tablet:
The application of Central Composite Design (CCD) for herbal conventional tablet formulation offers a comprehensive approach to optimize and study the tablet formulation. Here are the specific applications of CCD in this context:

1. Optimization of Flax Seed and Sodium Starch Glycolate Levels:
CCD enables the optimization of the levels of flax seed and sodium starch glycolate, which are the dependent factors in the tablet formulation. By varying these factors at different levels, CCD helps determine the optimal combination that achieves the desired tablet properties, such as disintegration time and % drug release.

2. Disintegration Time Evaluation:
CCD allows for the systematic evaluation of disintegration time as an independent factor. Disintegration time is a critical parameter in tablet formulation, as it determines the time required for the tablet to break down into smaller particles in the presence of fluid. CCD helps identify the optimal range of disintegration time for the herbal conventional tablets, ensuring effective drug release and patient compliance.

3. % Drug Release Assessment:
CCD facilitates the assessment of % drug release as an independent factor. % Drug release refers to the amount of drug that is released from the tablet over a specific period. CCD helps establish the relationship between % drug release and the formulation variables, aiding in optimizing the formulation to achieve the desired drug release profile.

4. Response Surface Modelling:
CCD allows for the creation of response surface models to understand the relationship between the formulation variables (flax seed, sodium starch glycolate, disintegration time, and % drug release) and the tablet properties. These models provide insights into the impact of each factor and their interactions, enabling formulation scientists to make informed decisions in optimizing the formulation.

5. Design Space Determination:
CCD helps determine the design space, which is the range of values for the formulation variables that ensures the desired tablet properties. By exploring the response surface and identifying the optimal region, CCD aids in defining the design space for the herbal conventional tablet formulation. [15]

Results and discussion:

- **Organoleptic properties of the herbal conventional tablet:**

Characteristics	Observation
Appearance	Characteristic
Colour	Deep brown
Odor	Odourless
Shape	Circular
Size	1.4mm

- **Pre formulation studies:**

Batch no.	Angle of Repose (θ)	Bulk Density (g/cm^3)	Tapped Density (g/cm^3)	Carr's Index (%)	Hausner's Ratio	Moisture Content (%)
1	30.33 ±0.39	0.61±0.01	0.79±0.01	9.20±0.127	1.08±0.01	1.20±0.05
2	28.48 ± 0.30	0.88±0.01	0.80±0.01	12.39±1.09	1.03±0.01	1.51±0.04
3	32.29 ±0.44	0.75±0.01	0.99±0.01	11.79±1.17	1.11±0.01	1.23±0.04
4	31.50 ±0.25	0.77±0.01	0.89±0.01	11.61±1.46	1.10±0.02	1.24±0.03
5	**30.40 ±0.35**	**0.85±0.01**	**0.88±0.01**	**11.30±0.85**	**1.14±0.01**	**1.66±0.05**
6	37.63 ±0.23	0.66±0.01	0.79±0.01	10.89±0.96	1.11±0.01	1.14±0.08
7	36.65 ±0.22	0.59±0.01	0.95±0.01	13.11±1.00	1.19±0.01	1.66±0.04
8	32.22 ±1.00	0.70±0.01	0.88±0.01	11.36±0.85	1.12±0.01	1.23±0.07
9	27.00 ±1.33	0.82±0.01	0.62±0.01	16.39±0.77	1.19±0.01	1.45±0.07
10	30.11 ±0.55	0.70±0.01	0.78±0.01	8.99±1.99	1.14±0.01	1.66±0.06
11	29.60 ±0.33	0.74±0.01	0.80±0.01	14.71±1.02	1.19±0.01	1.96±0.04
12	38.66 ±0.22	0.98±0.01	0.82±0.01	11.62±1.92	1.16±0.01	1.26±0.07
13	29.35 ±0.39	0.72±0.01	0.77±0.01	10.95±0.93	1.17±0.01	1.96±0.06

- **Post formulation studies:**

Batch No.	Weight variation(mg)	Hardness (Kg/cm2)	Friability
1	1004.66±2.29	5.22±0.31	0.78
2	1006.77±3.23	5.40±0.33	0.44
3	1008.45± 1.25	5.23±0.09	0.67
4	1004.36±3.69	5.60±0.11	0.61
5	**1002.20±3.50**	**5.96±0.22**	**0.66**
6	1006.44±3.54	5.32±0.17	0.74
7	1005.55±3.20	5.40±0.30	0.99
8	1009.41±1.74	5.30±0.44	0.96
9	1013.96±1.66	4.70±0.39	0.88
10	1012.65±3.23	5.66±0.22	0.89
11	1017.78±4.21	6.78±0.03	0.87
12	1015.44±3.63	5.22±0.27	0.92
13	1015.56±1.32	5.36±0.33	0.91

- **Formulation Optimization Using Central Composite Design:**

Central Composite Design was used to optimize *Linum Usitatissimum* and Sodium starch glycolate in herbal conventional tablet to get disintegration time and % Drug release.

Batch	X1: Natural binder (mg)	X2: Sodium starch glycolate (mg)	Y1: Disintegration time (minutes)	Y2: % Drug release
1	6	55	16	51
2	6.41421	60	18	58
3	5	60	13	77
4	5	52.9289	7	50
5	5	60	13	77
6	5	60	13	77
7	4	65	9	53
8	5	67.0711	14	81
9	5	60	13	77
10	3.58579	60	10	47
11	6	65	22	86
12	4	55	8	48
13	5	60	13	77

Table: Responses of Formulation using Central Composite Design

- **Standard Calibration Curve for *Murraya Koenigii:***

Concentration	Absorbance
2	0.0100
4	0.171
6	0.333
8	0.512
10	0.681

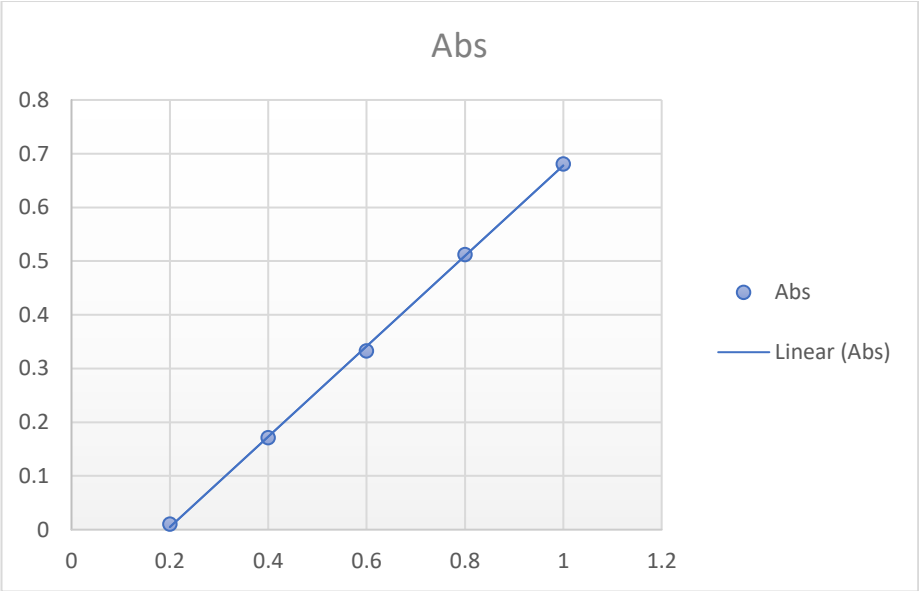


Figure: *Calibration curve of Murraya Koenigii*

- **Differential scanning calorimetry studies of *Murraya Koenigii*:**

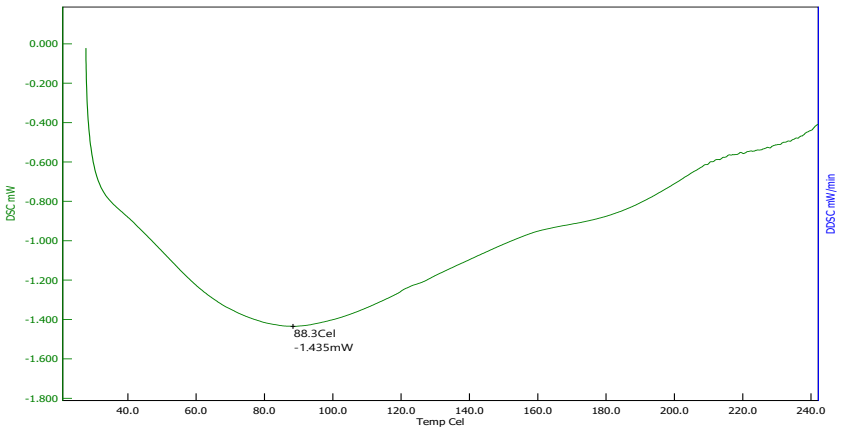
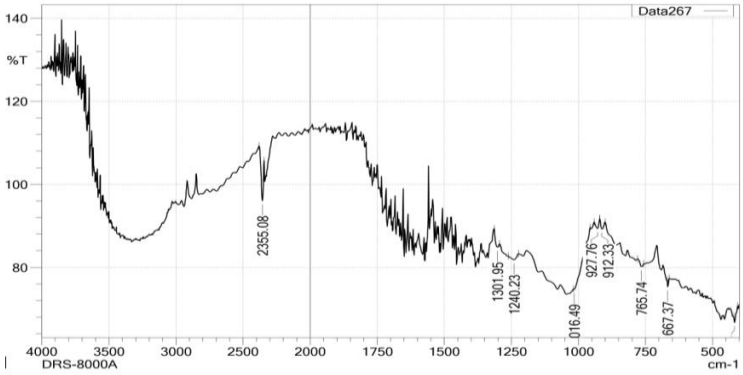


Figure: DSC of *Murraya Koenigii*

- **FTIR analysis of *Murraya Koenigii:***



- **HPTLC analysis of *Murraya Koenigii:***

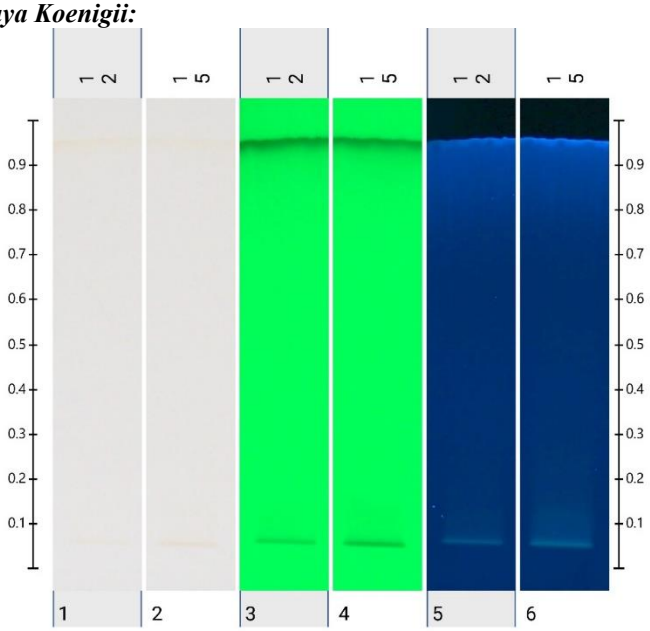


Figure: HPTLC analysis of *Murraya Koenigii*

Visualization image: a) Track 1,2 – white light, Track 3,4– UV 254 nm, Track – 5,6 – UV 366 nm.

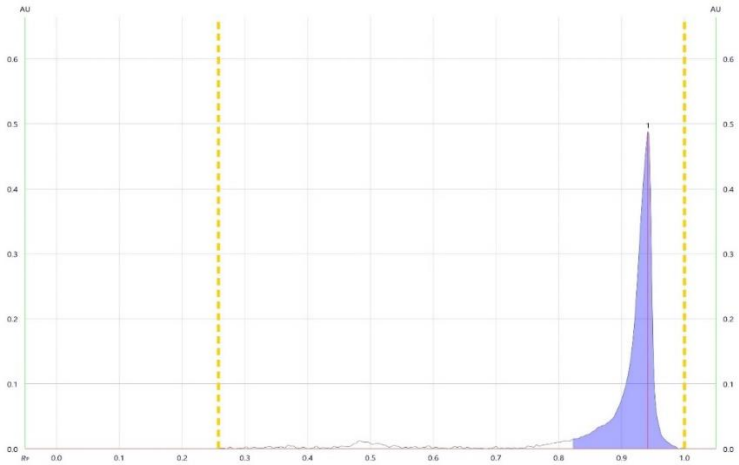


Figure: Densitogram of *Murraya Koenigii*

Observation:

a. The peak can be seen at the solvent front and there is merging of bands.

b. A peak is observed at UV 254 and UV 366 nm. The peak was again scanned at λmax of 254 nm and the densitogram was recorded (b). The Rf on scanning was found to be 0.942

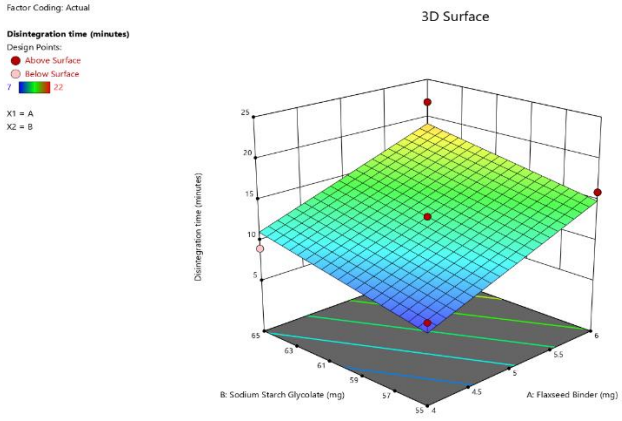


Figure: Response surface plots for the study of the effect of variables on disintegration time

Response	P-value	F-value	R^2	Predicted R^2 value	Remark
Disintegration time	0.0002	23.23	0.8229	0.6090	Significant

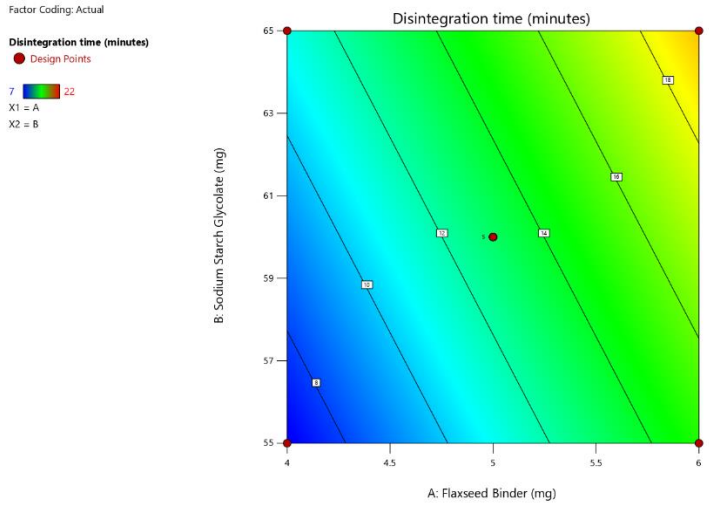


Figure: Contour plots for the study of the effect of variables on disintegration time

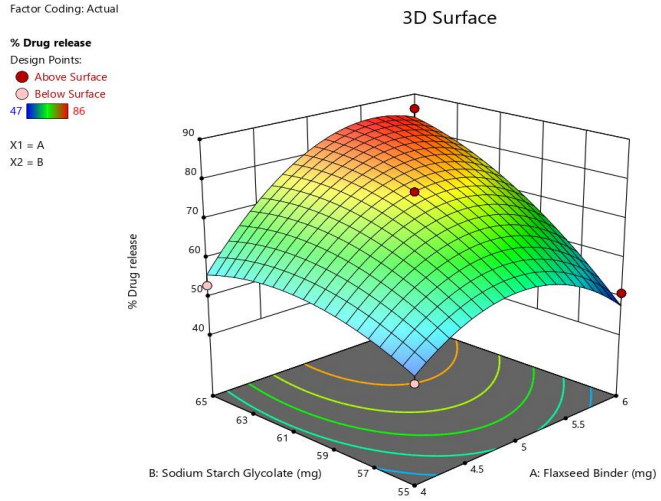


Figure: Response surface plots for the study of the effect of variables on % drug release

Response	P-value	F-value	R^2	Predicted R^2 value	Remark
%Drug Release	< 0.0001	66.02	0.9792	0.8523	Significant

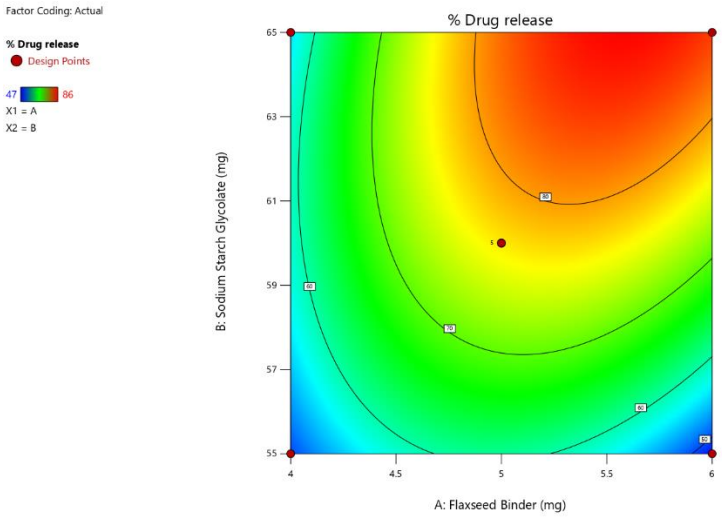


Figure: Contour plots for the study of the effect of variables on % drug release

Conclusion:

In conclusion, this research paper focused on investigating the potential of an herbal conventional tablet containing Murraya Koenigii (Curry Leaf) for reducing hyperglycemic conditions in individuals with Polycystic Ovary Syndrome (PCOS). Additionally, the study explored the utilization of Linum Usitatissimum (Flaxseed) as a natural binder in the tablet formulation. The aim was to evaluate the efficacy and potential of this herbal combination in managing blood glucose levels and improving the hyperglycemic condition commonly associated with PCOS. Based on the findings of this study, the herbal conventional tablet incorporating Murraya Koenigii has shown promising results in reducing hyperglycemia in individuals with PCOS. Murraya Koenigii, a medicinal herb rich in bioactive compounds such as alkaloids, flavonoids, and phenols, has demonstrated antidiabetic properties, including improved insulin sensitivity and glucose metabolism regulation. By incorporating Murraya Koenigii into the tablet formulation, it presents an effective herbal remedy for addressing hyperglycemic conditions in PCOS patients. Furthermore, Linum Usitatissimum, commonly known as flaxseed, has been utilized as a natural binder in the tablet formulation. Flaxseed offers additional health benefits due to its rich content of soluble fiber, lignans, and omega-3 fatty acids. These components have been associated with improved glycemic control, reduced insulin resistance, and cardiovascular risk reduction. The incorporation of Linum Usitatissimum as a natural binder not only contributes to the tablet's integrity but also enhances the overall therapeutic potential of the formulation. The combination of Murraya Koenigii and Linum Usitatissimum in the herbal conventional tablet provides a synergistic effect by addressing multiple aspects of glucose metabolism and insulin regulation. The formulation offers convenience, standardized dosing, and improved patient compliance, making it a viable natural therapeutic option for individuals with hyperglycemia associated with PCOS. While the findings of this research paper suggest the potential efficacy of the herbal conventional tablet containing Murraya Koenigii and utilizing Linum Usitatissimum as a natural binder, further clinical studies are warranted to validate its safety, effectiveness, and optimal dosage regimen. Randomized controlled trials and long-term observations are necessary to establish the long-term benefits and potential side effects of this herbal formulation. After conduction Central composite design and analysing the derived dependent and independent factor, batch **F5** was estimated to be the Optimized batch with required disintegration time and % drug release. This research contributes to the growing body of evidence supporting the utilization of herbal medicine, specifically Murraya Koenigii, in managing hyperglycemic conditions in individuals with PCOS. The incorporation of Linum Usitatissimum as a natural binder highlights the importance of synergistic herbal combinations for enhanced therapeutic outcomes. In summary, the herbal conventional tablet containing Murraya Koenigii, with Linum Usitatissimum as a natural binder, shows promise as an alternative treatment approach for reducing hyperglycemia in PCOS patients. The study emphasizes the importance of exploring natural remedies and warrants further investigation to establish its clinical effectiveness and safety profile.

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