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"A Comparative Study Of Standard Drugs And Generic Drugs"

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Abstract

This comprehensive discussion explores the complex pharmaceutical landscape, focusing on the distinct characteristics and benefits of branded and generic medicines. Branded medicines are highlighted for their innovative research, rigorous quality assurance, robust clinical evidence, and enduring patient trust. Despite generic medicines' notable cost-effectiveness, branded medicines play a vital role in advancing medical treatment and patient care, driving innovation and investment in the pharmaceutical industry. Common misconceptions about generic medicines are addressed, emphasizing their equivalence to branded medicines in quality, safety, and efficacy, as well as the stringent regulatory standards that govern their approval. The benefits of branded medicines are outlined in detail, including their innovative research and development processes, stringent quality control measures, comprehensive clinical trials, and the trust they inspire in patients. Ultimately, branded medicines offer a valuable option for patients seeking effective, safe, and reliable treatments, underscoring their importance in the pursuit of optimal healthcare outcomes.

Keywords:- Branded medicines, Generic medicines , Innovative research, Quality assurance ,Clinical evidence ,Patient trust, Cost-effectiveness Bioequivalence, Regulatory standards.

Introduction-

The pharmaceutical landscape is dominated by two distinct categories: branded and generic medicines. While generic medicines offer a cost-effective alternative, branded medicines have their own set of advantages. Branded medicines are innovative products developed by pharmaceutical companies through extensive research and development, clinical trials, and regulatory approvals. They are often considered the gold standard due to their proven efficacy, safety, and quality. This perspective highlights the benefits of branded medicines, exploring their role in advancing medical treatment and patient care.

Benefits of Branded Medicines

- Innovative Research: Branded medicines drive innovation, leading to new treatments and therapies.

- Quality Assurance: Branded medicines undergo rigorous testing and quality control, ensuring high standards.

- Clinical Evidence: Branded medicines are backed by robust clinical trial data, demonstrating efficacy and safety.

- Patient Trust: Branded medicines are often perceived as trustworthy and reliable, providing patients with confidence.

Branded medicines play a vital role in advancing medical treatment and patient care. Their innovative research, quality assurance, and clinical evidence make them a valuable option for patients seeking effective and safe treatments.

Myths about generic drug There are several false beliefs and misunderstandings about generic medications. It is critical to dispel these misconceptions to advance truthful knowledge and comprehension. The following are some widespread misconceptions regarding generic medications:

• Branded medications are more effective than generic medications:

This is a somewhat misperception. The active components, dose form, potency, and mode of administration of generic medications are identical to those of branded medications. To be approved by the FDA, generic medications must exhibit bio equivalency, or a comparable rate and degree of bloodstream absorption compared to brand medications. Most of the times it shows lower effect than branded drug.

• Generic medications are of a lower calibre:

The same high requirements for quality must be met by generic and branded medications. Both branded and generic medications are subject to FDA regulation to guarantee their high quality, safety, and efficacy. The extensive testing required by generic drug producers establishes the product's equivalented to the brand medication.

• Drugs that are generic take longer to act: The mechanism and pace of action of generic medications are identical to those of their brand equivalents.

A generic medication has the same therapeutic effect as a branded medication once it enters the bloodstream.

• Branded and generic medications have varied appearances:

Although a generic drug's colour, shape, or size may differ from that of a branded drug, these modifications have no bearing on the safety or effectiveness of the medication. The FDA makes sure that the active components in generic medications are the same as those in branded medications.

• Brand medications are safer than generic medications:

Before pharmaceuticals are approved by regulatory bodies, both generic and brand medications are subjected to extensive safety testing. The safety profile of generic medications is not identical to of branded medications.

• Drugs bearing a brand are subject to less stringent regulations than generics:

Both branded and generic medications are subject to FDA regulation to guarantee that the same requirements for quality, safety, and efficacy are met. To be approved, generic medications must meet the same stringent requirements as brand medications.

• Doctors do not trust generic medications or recommend them: Many medical experts, including doctors, frequently recommend generic medications. They are aware of the bioequivalence requirements.

Branded medicines have several advantages:

- Innovative Research: Branded medicines are often the result of extensive research and development, leading to new and innovative treatments.

- Quality Control: Branded medicines are subject to rigorous quality control measures, ensuring high standards of manufacturing and quality.

- Clinical Trials: Branded medicines undergo comprehensive clinical trials, providing robust evidence of efficacy and safety.

- Pharmaceutical Industry Growth: Branded medicines drive growth in the pharmaceutical industry, encouraging innovation and investment.

- Patient Trust: Branded medicines are often perceived as trustworthy and reliable, providing patients with confidence in their treatment.

REVIEW OF LITERATURE:

1. V.vargas , Elsa sol`aa , carlo Alessandria , koos de edger

   TITLE:- Preparation and evaluation of azithromycin binary solid dispersions using various polyethylene glycols for the improvement of the drug solubility and dissolution rate

   Description :- Azithromycin is a water-insoluble drug, with a very low bioavailability. In order to increase the solubility and dissolution rate, and consequently increase the bioavailability of poorly-soluble drugs (such as azithromycin), various techniques can be applied. One of such techniques is “solid dispersion”. This technique is frequently used to improve the dissolution rate of poorly water-soluble compounds. Owing to its low solubility and dissolution rate, azithromycin does not have a suitable bioavailability. Therefore, the main purpose of this investigation was to increase the solubility and dissolution rate of azithromycin by preparing its solid dispersion, using different Polyethylene glycols (PEG).

2. Ana Carolina Kogawa and Hérida Regina Nunes Salgado

   TITLE:- Evaluation and Dissolution of Rifaximin and its importance

   Description:- Rifaximin, an oral antibiotic marketed as tablets, does not have dissolution method described either in official compendiums or literature. Thus, all potentialities of the active principle are not enough if it is trapped in its formulation or it is released erroneously. The absence of dissolution method can reduce the drug to the level of an adjuvant. Therefore, the objective of this study was to develop and validate a

successful dissolution method for the evaluation of rifaximin tablets. The method contemplated the parameters for linearity, selectivity, precision, accuracy and robustness. It was found that for the dissolution of the tablets of rifaximin of 200 mg, paddle apparatus at 50 rpm and 900 mL of acetate buffer of pH 5.0 + 0.2 % SLS as dissolution medium are optimum conditions. The method presented is useful and can be applied for the routine quality control of tablets of rifaximin.

3. Anupam Kr. Sachan1, Vineet Kumar and Ankita Gupta

   TITLE:- Comparative in-vitro evaluation of four different brands of metformin HCl

   Description:- Metformin hydrochloride is an oral anti-diabetic drug used mainly to treat type II diabetes mellitus and available as several brands in the market which make it difficult to select the safe, effective and economic one. The aim of this research work was to check, compare and evaluate the quality standards of different brands of Metformin hydrochloride tablets available in local market of Kanpur, India. Four brands of Metformin tablets (500mg) were selected and evaluated comparatively for their physical and chemical parameters as per official method. The physiochemical equivalence of all the tablet brands were assessed through evaluation of both official and nonofficial standards such as uniformity of weight, friability, hardness, disintegration, assay and dissolution rate.

4. Amit Singh , Pramod Kumar Sharma & Deepak Kant Majumdar

   TITLE: Development and validation of different UV-spectrophotometric methods for the estimation of fluconazole in bulk and in solid dosage form

   Description :- A simple, sensitive and accurate UV-spectrophotometric method has been developed for the determination of an antifungal drug, fluconazole (FLZ), in raw material and in tablets. The drug shows maximum absorption at 261 nm in selected four different simulated media, namely gastric fluid simulant (HCl), vaginal fluid simulant (VFS), phosphate buffer (PB) and phosphate buffer saline (PBS) at pH 1.5, 4.2, 6.8 and 7.4 respectively. Beer's law is obeyed in the concentration range 10-100 µg/mL of drug. The limits of detection have been calculated for different media, such as HCl, VFS, PB and PBS and are found to be 2.24, 1.49, 1.42 and 1.19 µg/mL, whereas the limits of quantification are 6.82, 4.50, 4.29 and 3.63 µg/mL correspondingly.

5. Nandre Pratik Ashok and Dr. Gulam Javed Khan

   TITLE:- A simple UV – Spectrophotometric Assay Study on Different Brand Of paracetamol

   Description:- Paracetamol, usually referred to as Acetaminophen, is a drug used to treat fever and mild to moderate discomfort. Tylenol and Panadol are examples of popular brand names The advantages of paracetamol usage for fever are
   Unclear because, at a typical dose, it only marginally lowers body temperature; in that regard, it is inferior than ibuprofen. Acute mild migraines may be helped by paracetamol, however recurring tension headaches may only be
   minimally relieved .However, when the pain is minimal, the aspirin/paracetamol/caffeine combination is effective and is advised as a first-line therapy for both diseases. Ibuprofen is superior to paracetamol in terms of effectiveness for post-surgical pain management.

6. MohdAzam, Neha Sodiyal , Sivanandpatil

TITLE:- A review on Evaluation of tablet

Description:- Tablets are the solid dosage form which are conventional over All pharmaceutical dosage form. They are easy to make than any other dosage form but during their manufacturing many problems will arise which will cause discarding of the large batch and also post compression studies also very important to release out the Dosage form in the market. In this article we mentioned what are the problems (Picking, Sticking, mottling will arise during the tablet manufacturing and their remedies and also what are the Pre & post compression properties (Hardness, Thickness and Weight variation .

AIM AND OBJECTIVE :

AIM:

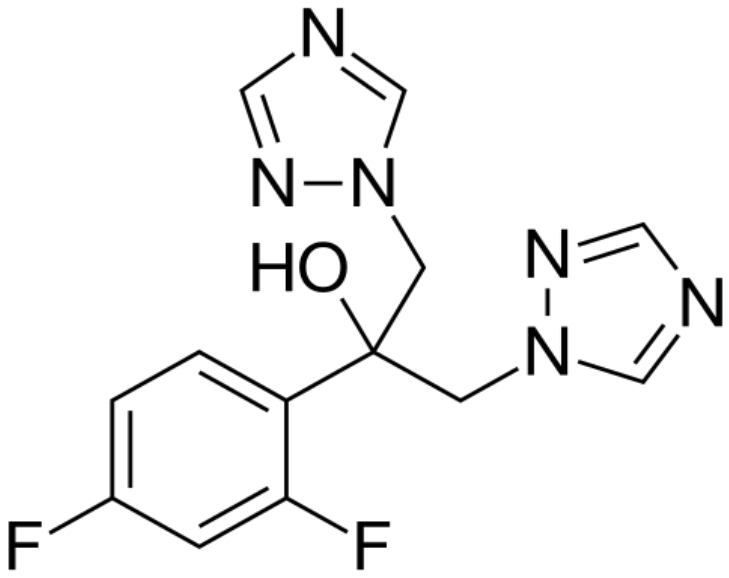
"A Comparative study of Standard drugs and Generic drugs"

OBJECTIVE:-

1. The objective of this study was the evaluation and comparison between five different drugs of different brands which are available in the market.
2. The physicochemical equivalence of five brands of different tablets were determined through the evaluation of both official and non-official standards according to the USP pharmacopoeia & Indian pharmacopoeia including uniformity of weight, friability, hardness, disintegration and dissolution .
3. To compare the pharmaceutical quality of different brands of tablets available in market

Drug Profile:-

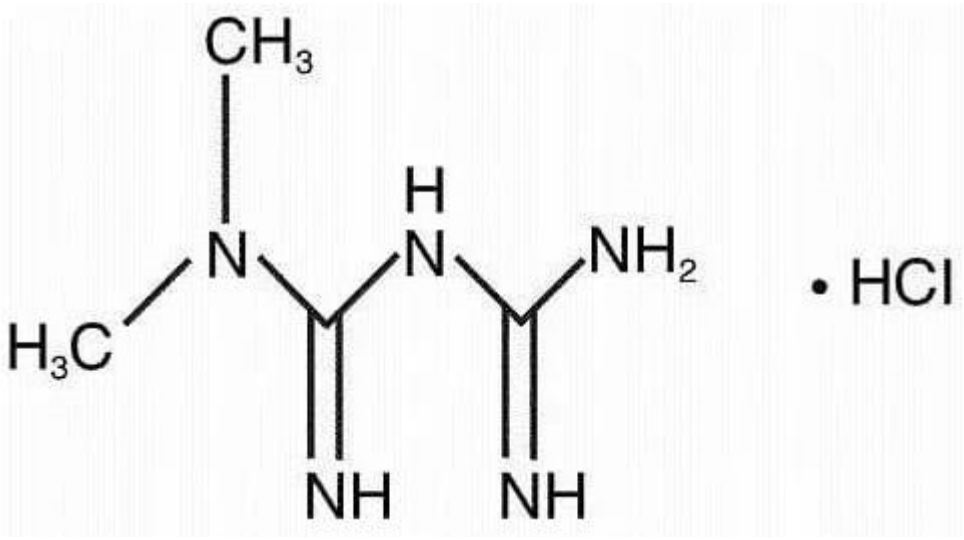
- Drug – **Fluconazole**
- Activity - Antifungal
- Formula - C13H12F2N6O
- Molecular Weight – 306.22 g / mole
- Melting Point - 139 °C (282 °F)
- Structure -



Fluconazole is an antifungal medication used to treat various fungal infections, including vaginal, oropharyngeal, and cryptococcal meningitis. It works by inhibiting fungal cytochrome P450 enzyme, disrupting ergosterol synthesis, and ultimately causing fungal cell death. Fluconazole is available in oral and intravenous formulations and is commonly prescribed for patients with lack of immune systems.

Fluconazole is a first-generation triazole antifungal medication. It differs from earlier azole antifungals (such as ketoconazole) in that its structure contains a triazole ring instead of an imidazole ring. While the imidazole antifungals are mainly used topically, fluconazole and certain other triazole antifungals are preferred when systemic treatment is required because of their improved safety and predictable absorption when administered orally.

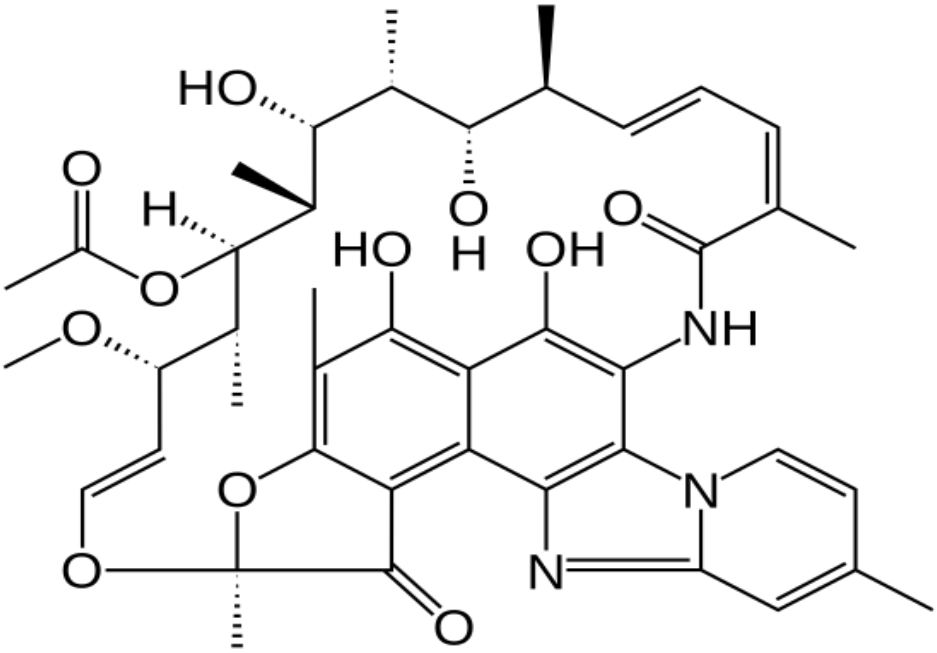
- Drug – Metformin Hydrochloride
- Activity – Decrease blood glucose level
- Formula –C4H11N5
- Molecular weight –129.16 g / mole
- Melting point - 225 °C
- Structure –



Metformin hydrochloride is an oral antidiabetic medication used to treat type 2 diabetes mellitus. It works by decreasing hepatic glucose production and increasing insulin sensitivity. Metformin is often prescribed as a first-line treatment for type 2 diabetes due to its efficacy in lowering blood glucose levels and potential benefits on cardiovascular health.

The molecular mechanism of metformin is not completely understood. Multiple potential mechanisms of action have been proposed: inhibition of the mitochondrial respiratory chain , activation of activated protein kinase inhibition of glucagon-induced elevation of cyclic adenosine monophosphate with reduced activation of protein kinase A (PKA), complex –mediated inhibition of the GPD2 variant of mitochondrial glycerol-3-phosphate dehydrogenase (thereby reducing the contribution of glycerol to hepatic gluconeogenesis).

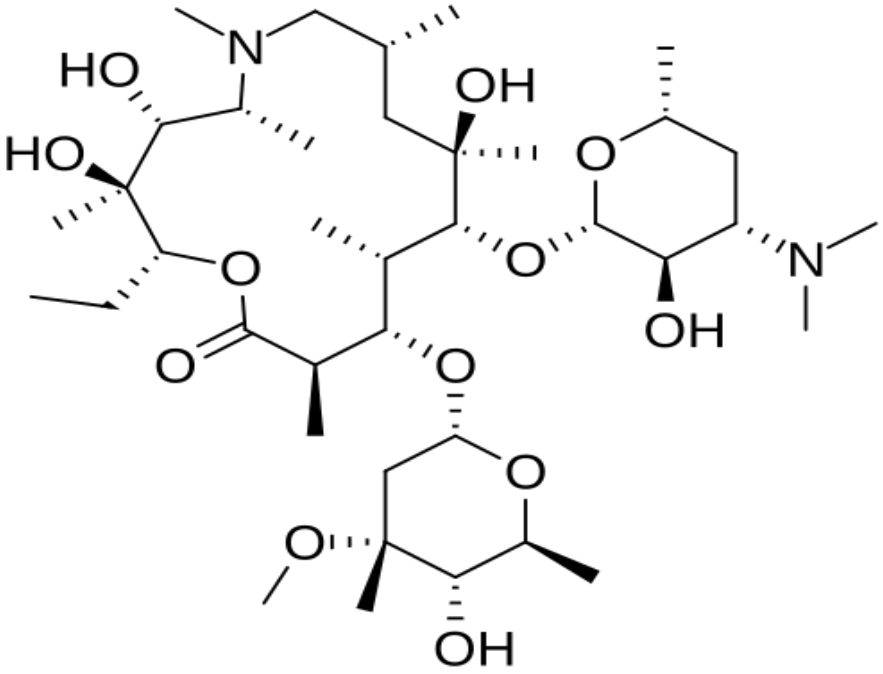
- Drug – Rifaximin
- Activity – Antibiotic
- Formula – C43H51N3O11
- Molecular Weight – 785.89 g / mole
- Melting Point – 200 to 205 °C (392 to 401 °F)
- Structure –



Rifaximin is a broad-spectrum antibiotic primarily used to treat gastrointestinal infections, such as traveller's diarrhea . It targets bacterial RNA synthesis, inhibiting bacterial growth. Due to its localized action in the gut and minimal systemic absorption, rifaximin has a favourable safety profile. It's often prescribed for patients with specific gastrointestinal conditions.

Rifaximin is a non-absorbable, broad-spectrum antibiotic mainly used to treat travelers' diarrhea. It is based on the rifamycin antibiotics family. Since its approval in Italy in 1987, it has been licensed in more than 30 countries for the treatment of a variety of non-infectious gastrointestinal diseases like irritable bowel syndrome and hepatic encephalopathy. It acts by inhibiting RNA synthesis in susceptible bacteria by binding to the RNA polymerase enzyme. This binding blocks translocation, which stops transcription. It was developed by Salix Pharmaceuticals.

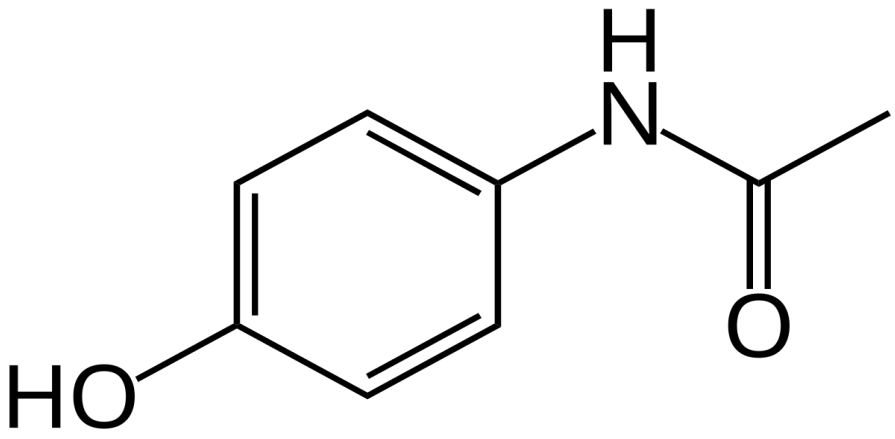
- Drug – Azithromycin
- Activity - Antibiotic
- Formula – C38H72N2O12
- Molecular Weight – 748.996 g / mole
- Melting Point – 113 – 115 °C
- Structure –



Azithromycin is a macrolide antibiotic used to treat various bacterial infections, including respiratory tract infections, skin infections, and sexually transmitted diseases. It works by inhibiting bacterial protein synthesis, ultimately leading to bacterial death. Azithromycin is known for its convenient dosing regimen and is often prescribed for patients with respiratory infections.

Azithromycin is an antibiotic medication used for the treatment of several bacterial infections. This includes middle ear infections, strep throat, pneumonia, traveler's diarrhea, and certain other intestinal infections. Along with other medications, it may also be used for malaria. It is administered by mouth, into a vein, or into the eye.

- Drug – Paracetamol
- Activity – Analgesic
- Formula – C8H9NO2
- Molecular Weight – 151.16 g /mole
- Melting point – 165.6 °C - 168°C
- Structure –



Paracetamol, is a widely used over-the-counter analgesic and antipyretic medication. It is used to relieve mild to moderate pain and reduce fever. Paracetamol works by inhibiting prostaglandin synthesis in the brain, which helps to reduce pain perception and fever. It's commonly used for headaches, fever reduction, and minor aches.

Paracetamol relieves pain in both acute mild migraine and episodic tension headache. At a standard dose, paracetamol slightly reduces fever. it is inferior to ibuprofen and the benefits of its use for fever are unclear, particularly in the context of fever of viral origins. The aspirin/paracetamol/caffeine combination also helps with both conditions where the pain is mild and is recommended as a first-line treatment for them. Paracetamol is effective for post-surgical pain, but it is inferior to ibuprofen.

PLAN OF WORK :


Selection of topic
Review of literature
Drug selection
Procurement of drug
Comparative study
Result and discussion

Methodology:-

1) Weight variation test-

Fig 1 :- weighing balance

The weight of tablet dosage form is measured to check the proper amount of active ingredient in the tablet. Analytical grade weighing balance is used to measure the individual as well as average weight of the tablet and mean standard deviations. weight variation test was performed by taking 20 tablets. Then 20 tablet, were weighed and the average weight is taken. Then each tablet was weighed individually. The percentage deviation can be determined by using the formula.

%Deviation= (Average weight – Individual weight)/Average weight X 100

Procedure:-

First Check the weighing balance.

↓

Collect Sample of 20 tablets.

↓

Weigh the tablets, and record the weight in grams.

↓

Calculate the a[illegible]ge weight of the tablets.

2) Hardness test –

Fig 2 :- hardness tester

The hardness test for randomly selected tablets (05 tablets from each) was determined by Monsanto hardness tester The average crushing strength was determined. Hardness Test is the most important feature for assessing tablet in the study it was found that Tablet passed the test of tablet crushing strength or hardness both these brand have acceptable crushing strength of Between 5kKg/Cm2 to 10kg/ Cm2.

PROCEDURE:-

Hold one tablet between the two faces provided by pushing forward the movable face inside by turning the plunger clockwise.

the 'Zero' in the scale with the pointer.

↓

Enclose front part where tablet is held in a sample polybag.

↓

Start applying pressure on the tablet by gently rotating the plunger

↓

When the tablet breaks, note the hardness (in kg/sqcm) directly from the scale. In case, if the pointer is in between the two divisions of scale, read the hardness as 0.5 kg/sq.cm.

3) FRIABILITY TEST –

Fig 3:- friability test apparatus

According to the USP (2007), tablets should have a friability value below 1%. 20 tablets from each selected brand were weighed and placed to the Friability apparatus. The percentage friability of the tablets was assessed against the US Pharmacopeia (USP) specification, which states that tablets must not lose more than 1% of their initial weight during the friability study. The results, demonstrating compliance with the USP specification, are presented in Table.

$$\text{Friability (\%)} = \frac{\text{Initial Weight (W1)} - \text{Final Weight (W2)}}{\text{Initial Weight (W1)}} \times 100$$

Procedure:-

Prepare the apparatus: Ensure the friability testing apparatus (friabilator) is clean and level.

Weigh the tablets: Accurately weigh the tablet sample, taking into account the weight of the tablets and the unit mass.

Place the tablets in the drum: Carefully transfer the weighed tablets into the rotating drum of the friability tester.

Set the rotation speed and duration: Adjust the friabilator's set the test duration to 4 minutes (100 revolutions).

Rotate the drum: Start the friabilator and allow it to rotate for the specified duration.

Remove the tablets: After the test, carefully remove the tablets from the drum.

carefully remove the tablets from the drum.

Clean the tablets: Gently remove any loose dust or debris from the tablets.

Reweigh the tablets: Accurately weigh the tablets again after cleaning to determine any weight loss.

Calculate the percentage weight loss: Calculate the percentage weight loss using the formula: (Initial weight - Final weight) / Initial weight x 100

4) DISINTEGRATIN TEST –

Fig- disintegration test apparatus

Rapid disintegration of tablets is essential for optimal bioavailability, absorption, and therapeutic efficacy. The test was performed by using tablet disintegration machine . 1000ml of distilled water was taken in each beaker ; the temperature was maintained at 36 - 37°C. In each of the 6 tubes one tablet was placed. The switch button was turned on and the time taken for the tablet to disintegrate was noted down. Disintegration is considered to be achieved when no residues remain on the screen, or if there is a residue, it consists of a soft mass having no palpably firm, unmoistened core, or only fragments of coating (tablets) or only fragments of shell may adhere to the lower surface of the disc. The disintegration time for each tablet was determined and the average time was calculated.

PROCEDURE:-

Disintegration Apparatus:

Ensure the apparatus is properly assembled and calibrated, with a basket-rack assembly and a specified liquid medium (e.g., water, simulated gastric fluid) maintained at 37 ± 2°C.

Place the Tablets:

Introduce one tablet into each of the six tubes of the basket-rack assembly. If specified in the individual monograph, add a disc to each tube.

Operate Apparatus:

Suspend the assembly in the liquid medium and operate the apparatus according to the specified time limit.

Observe and Record:

Lift the basket-rack assembly from the liquid medium and observe the tablets. The tablets are considered to have disintegrated if they are no longer intact and have broken down into small particles.

Results:

The test is considered successful if all tablets have disintegrated. If a small number (1 or 2) fail to disintegrate, repeat the test with additional tablets.

5) DISSOLUTION TEST –

Dissolution directly influences the absorption and bioavailability of the drug. The dissolution of all the chosen brands of metformin hydrochloride tablets met the specified criterion of not less than 80% within 30 minutes, as per the US Pharmacopeia standards. The dissolution test was conducted according to USP pharmacopeia. In a medium containing 900mL of phosphate buffer (pH 6.8), the basket was rotated at a fixed speed of 100 rpm, and the temperature was maintained at 37 ±0.5°C. Six tablets were selected randomly and then subjected to the test. Samples were withdrawn at 10, 15, 20 ,30 & 45 minutes. The paddle was rotated at 100 Revolutions Per Minute (rpm). 10mL of samples were taken from each dissolution test vessel at each sampling time. An equivalent amount of a fresh 10mL dissolution medium was replaced immediately to maintain the vessel volume constant throughout the analysis. The samples were filtered and assayed for drug content by measuring their absorbance at a maximum of 233 nm. Then the total content of metformin hydrochloride in the medium was calculated.

PROCEDURE:-

Choose the right apparatus and medium:

Select the appropriate dissolution apparatus and the dissolution medium (e.g., water, buffer, etc.) based on the specific tablet and its characteristics.

Prepare the medium:

Ensure the medium is at the correct temperature (usually around 37°C) and pH.

Place the tablet:

Introduce the tablet into the dissolution apparatus, ensuring it's submerged in the medium and that there are no air bubbles trapped on the surface.

Operate the apparatus:

Start the dissolution apparatus at a specified speed and time.

Sample the solution:

At intervals, withdraw samples of the dissolution medium and analyse the filtrate to determine the concentration of dissolved drug.

Analyze the samples:

Use techniques like UV-Vis spectroscopy to quantify the dissolved drug in the samples.

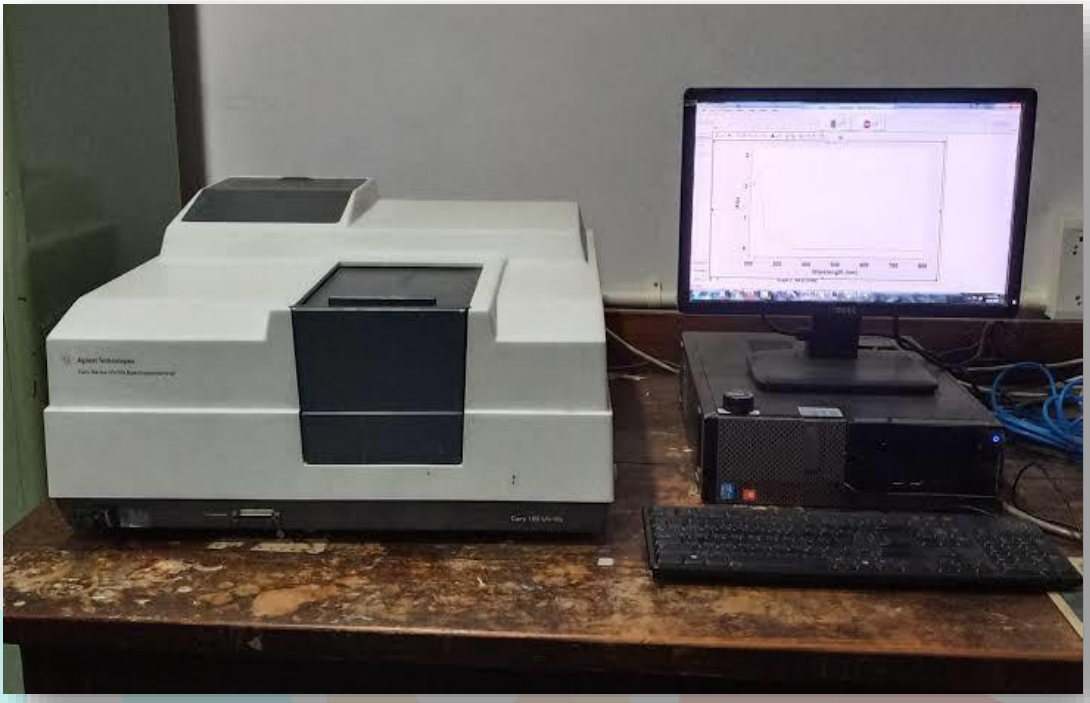
Calculate dissolution rate

Based on the concentration of dissolved drug at each time point, calculate the dissolution rate and the overall extent of dissolution.

Compare with specifications:

Compare the dissolution profile with the established specifications for the tablet to ensure it meets quality control requirements.

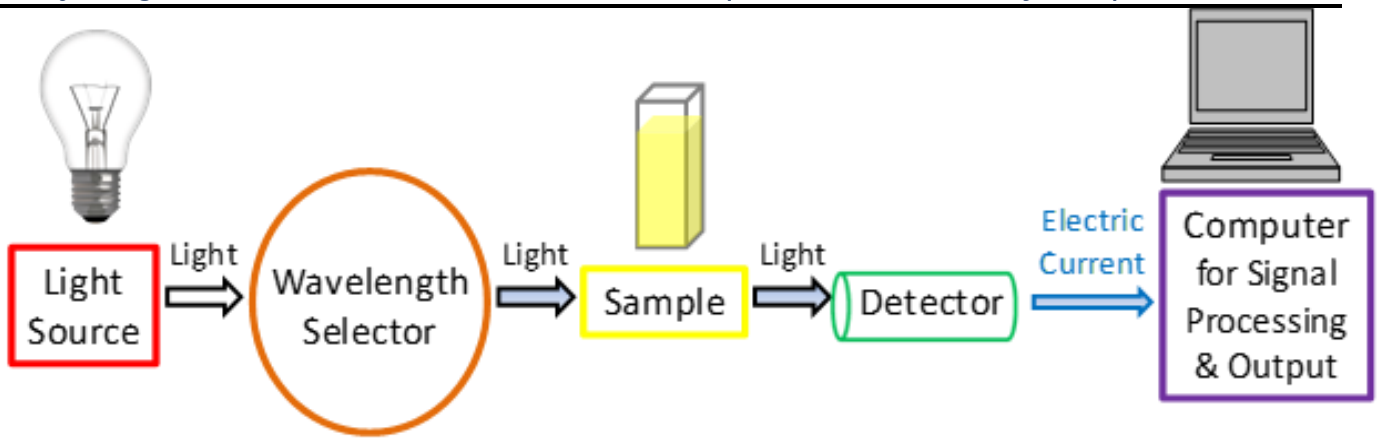
UV VISIBLE SPECTROSCOPY TEST –



Ultraviolet–visible spectrophotometry refers to absorption spectroscopy or reflectance spectroscopy in part of the ultraviolet and the full, adjacent visible regions of the electromagnetic spectrum.

Ultraviolet-visible (UV-Vis) spectroscopy is a widely used technique in many areas of science ranging from bacterial culturing, drug identification and nucleic acid purity checks and quantitation, to quality control in the beverage industry and chemical research. This article will describe how UV-Vis spectroscopy works, how to analyse the output data, the technique's strengths and limitations and some of its applications.

UV-Vis spectroscopy is an analytical technique that measures the amount of discrete wavelengths of UV or visible light that are absorbed by or transmitted through a sample in comparison to a reference or blank sample. This property is influenced by the sample composition, potentially providing information on what is in the sample and at what concentration. Since this spectroscopy technique relies on the use of light, let’s first consider the properties of light. Light has a certain amount of energy which is inversely proportional to its wavelength. Thus, shorter wavelengths of light carry more energy and longer wavelengths carry less energy. A specific amount of energy is needed to promote electrons in a substance to a higher energy state which we can detect as absorption. Electrons in different bonding environments in a substance require a different specific amount of energy to promote the electrons to a higher energy state. This is why the absorption of light occurs for different wavelengths in different substances. Humans are able to see a spectrum of visible light, from approximately380nm,which we see as violet, to 780 nm, which we see as red.



PROCEDURE:-

Tablet Preparation:

Weigh out a portion of the powdered drug ingredient Transfer the powdered mass to a volumetric flask (e.g., 100 mL).

Solution Preparation:

Add a suitable diluent (e.g., methanol, water, or a mixture) to the flask to dissolve the active ingredient. Adjust the volume to a specified level with the diluent. Filter the solution (e.g., through a 0.45 µm membrane filter) if necessary. Prepare a series of standard solutions with known concentrations of the active ingredient.

Blank Solution:

Fill a cuvette with the diluent used to prepare the tablet solution. Place the cuvette in the UV-Vis spectrophotometer and measure the absorbance. This measures the absorbance of the solvent.

Sample Solution:

Fill a cuvette with the prepared tablet solution. Place the cuvette in the UV-Vis spectrophotometer and measure the absorbance. This measures the absorbance of the tablet solution, including the active ingredient.

Standard Solution:

Fill a cuvette with a standard solution of known concentration. Place the cuvette in the UV-Vis spectrophotometer and measure the absorbance.

Result and Discussion :-

Observation Table:-

1) Weight variation test

Glycomet – metformin hydrochloride – STANDARD- USV-500

TABLET	WEIGHT in mg	TABLET	WEIGHT in mg
1	590	11	570
2	590	12	570
3	580	13	580
4	580	14	580
5	570	15	570
6	580	16	580
7	580	17	570
8	580	18	580
9	570	19	570
10	570	20	580

Table 1.0 weight of standard metformin hydrochloride

total weight= 10,390 mg avg weight = 519.5mg

Glycomet – metformin hydrochloride –

GENERIC- CADILA-500

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	600	11	630
2	630	12	640
3	580	13	620
4	590	14	620
5	620	15	620
6	640	16	620
7	650	17	620
8	630	18	630
9	640	19	630
10	640	20	640

Table 1.1 weight of generic metformin hydrochloride

Total weight = 11,860 mg avg weight= 593mg

STANDARD - Fluconazole tablets -150- systopic laboratories-

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	350	11	350
2	360	12	350
3	360	13	360
4	350	14	360
5	360	15	360
6	360	16	350
7	350	17	360
8	350	18	350
9	360	19	360
10	360	20	360

Table 1.2 weight of standard fluconazole

total weight = 7,120 mg avg weight = 356mg

GENERIC - Fluconazole – 400 – leeford

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	850	11	850
2	840	12	850
3	850	13	850
4	850	14	840
5	840	15	840
6	850	16	850
7	840	17	860
8	860	18	860
9	850	19	850
10	850	20	860

Table 1.3 weight of generic fluconazole

total weight = 15,290mg avg weight= 764mg

STANDARD- Rifaximin tablet BP 200mg – Hatero Healthcare

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	270	11	270
2	260	12	270
3	270	13	260
4	270	14	270
5	250	15	260
6	270	16	260
7	270	17	260
8	260	18	270
9	270	19	260
10	270	20	250

Table 1.4 weight of standard rifaximin

Total weight = 4,770 mg avg weight = 238.5 mg

GENERIC- Rifaximin- 400 – rifaclean- Emcure

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	680	11	690
2	740	12	710
3	710	13	710
4	730	14	690
5	740	15	710
6	720	16	720
7	730	17	740
8	680	18	690
9	690	19	680
10	710	20	720

Table 1.5 weight of generic rifaximin

Total weight = 13,630 mg avg weight = 681mg

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	690	11	670
2	690	12	690
3	670	13	670
4	680	14	690
5	690	15	670
6	690	16	670
7	680	17	690
8	690	18	690
9	670	19	670
10	690	20	680

STANDARD – Azithromycin tablet – IP- 500 mg – Indoco

Table 1.6 weight of standard Azithromycin

Total weight = 12,510 mg avg weight =665mg

GENERIC- Azithromycin – tablet 500 – Azilup

TABLET	WEIGHTof Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	810	11	820
2	780	12	750
3	800	13	760
4	720	14	790
5	790	15	760
6	760	16	820
7	780	17	790
8	800	18	780
9	760	19	800
10	810	20	810

Table 1.7 weight of generic Azithromycin

Total weight = 15,690 mg avg weight = 784.5mg

STANDARD - Paracetamol – 500 mg – Aristo Pharmaceuticals

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	600	11	600
2	590	12	610
3	590	13	590
4	580	14	600
5	590	15	590
6	600	16	590
7	590	17	580
8	580	18	590
9	600	19	580
10	580	20	600

Table 1.8 weight of standard Paracetamol

Total weight = 10,630 mg avg weight = 531.5 mg

GENERIC – Paracetamol – 500mg- Cipla

TABLET	WEIGHT of Tablet in mg	TABLET	WEIGHT of Tablet in mg
1	600	11	570
2	600	12	570
3	580	13	580
4	570	14	600
5	580	15	580
6	590	16	570
7	580	17	570
8	580	18	600
9	570	19	580
10	600	20	580

Table 1.9 weight of generic paracetamol

Total weight = 11,650 mg avg weight = 582.5 mg

2) Hardness test –

OBSERVATION TABLE:-

Table 2.0

	STANDARD - Glycomet – HSV	GENERIC – METBETIC - CADILA
TABLET	HARDNESS kg/cm2	HARDNESS kg/cm2
1	4.4	4.5
2	3.8	3.8
3	5.0	4.8
4	4.6	4.2
5	5.0	3.9

comparison of glycomet

	STANDARD – Fluconazole – systopic lab	GENERIC – Fluconazole – leefor
TABLET	HARDNESS kg/cm2	HARDNESS kg/cm2
1	8.0	6.8
2	7.6	7.8
3	8.4	7.8
4	8.8	7.2
5	7.2	6.6

Table 2.1 comparison offluconazole

	STANDARD – Rifaximin – Hatero Health	GENERIC – RifaximiN – Rifaclean Emcure
TABLET	HARDNESS kg/cm2	HARDNESS kg/cm2
1	6.6	6.4
2	6.6	6.5
3	6.2	6.4
4	6.2	6.2
5	6.4	6.4

Table 2.3 comparison of rifaximin

	STANDARD – Azithromycin Tablet IP – Indoc	GENERIC – Azithromycin Tablet Azilup
TABLET	HARDNESS kg/cm2	HARDNESS kg/cm2
1	6.8	6.6
2	7.0	6.4
3	7.0	6.2
4	6.8	6.0
5	6.8	6.4

Table 2.4 comparison of azithromycin

	STANDARD – Paracetamol tablet – aristo pharma	GENERIC – Paracetamol – Cipla
TABLET	HARDNESS kg/cm2	HARDNESS kg/cm2
1	7.2	7.2
2	7.2	7.0
3	6.6	6.4
4	6.8	7.0
5	6.8	6.4

Table 2.5 comparison of paracetamol

3) Friability Test:-

OBSERVATION TABLE :-

	STANDARD - GLYCOMET –	GENERIC- METBETIC –
Initial weight	10.39 g	11.86 g
Final weight	10.29 g	11.75 g
%Friability	0.96 %	0.92 %

Table 3.0 comparison of Glycomet

	STANDARD – Fluconazo SYSTOPIC LAB	GENERIC – Fluconazol LEEFORD
Initial weight (g)	7.15	10.54
Final weight (g)	7.11	10.50
%Friability	0.55%	0.37%

Table 3.1 comparison of fluconazole

	STANDARD – Rifaximin - rifguard	GENERIC – Rifaximin – rifaclean
Initial Weight	13.90	14.19
Final weight	13.85	14.02
%Friability	0.35%	0.30%

Table 3.2 comparison of rifaximin

	STANDARD – Azithromycin indoco	GENRIC – Azithromycin-azilup
Initial weight	13.72	13.72
Final weight	13.70	13.70
%Friability	0.14%	0.46%

Table 3.3 Comparison of azithromycin

	STANDARD –Paracetamol-aristo pharma	GENERIC – Paracetamol-cipla

Initial Weight	12.04	12.78
Final Weight	12.00	12.65
%Friability	0.40%	0.90%

Table3.4 comparison of paracetamol

4) Disintegration test:-

OBSERVATION TABLE:-

	STANDARD – GLYCOMET	GENERIC – METBETIC
TABLET No	DISINTEGRATION Time (min)	DISINTEGRATION Time (min)
1	5.54	5.45
2	6.45	5.56
3	5.23	6.32
4	5.43	5.43

Table 4.0 comparison of glycomet

	STANDARD – Fluconazole -	GENERIC – Fluconazole –
TABLET No	DISINTEGRATION Time (min	DISINTEGRATION Time (min)
1	3.32	2.32
2	3.43	3.43
3	3.54	3.41
4	4.35	3.45

Table 4.1 comparison offluconazole

	STANDARD – Rifaximin-rifguard	GENERIC – Rifaximin-rifaclean
TABLET No	DISINTEGRATION Time (min)	DISINTEGRATION Time (min)
1	9.07	8.56
2	9.23	9.46
3	8.43	10.32
4	9.74	10.43

Table 4.2 comparison of rifaximin

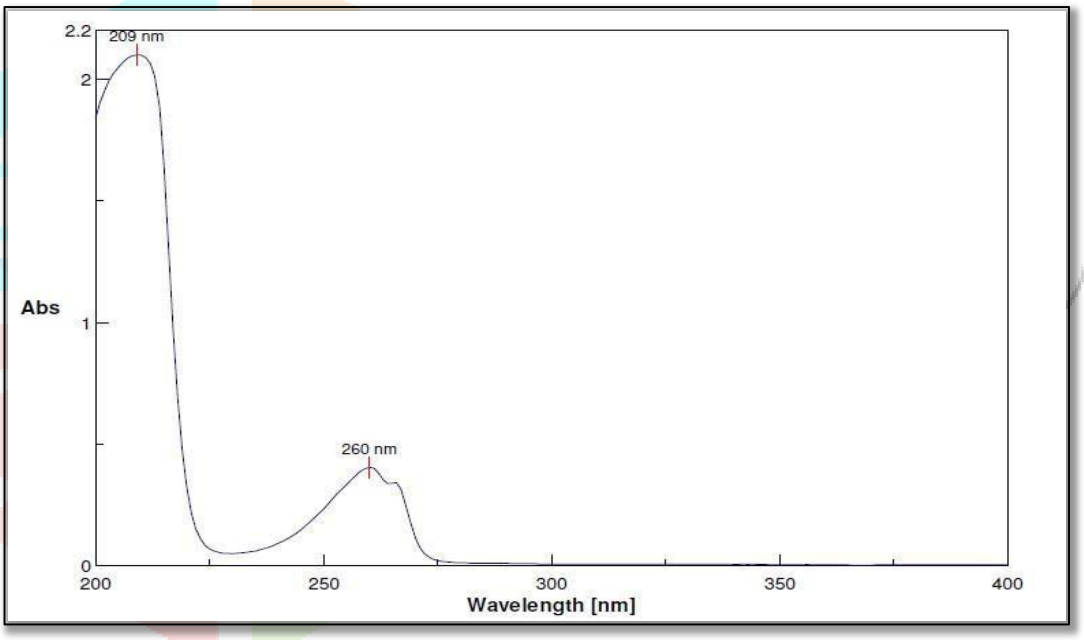
	STANDARD - Azithromycin - indoco	GENERIC – Azithromycin-azilup
TABLET No	DISINTEGRATION Time (min)	DISINTEGRATION Time (min)
1	6.2	6.9
2	6.1	7.3
3	5.7	7.1
4	5.9	7.5

Table 4.3 comparison of azithromycin

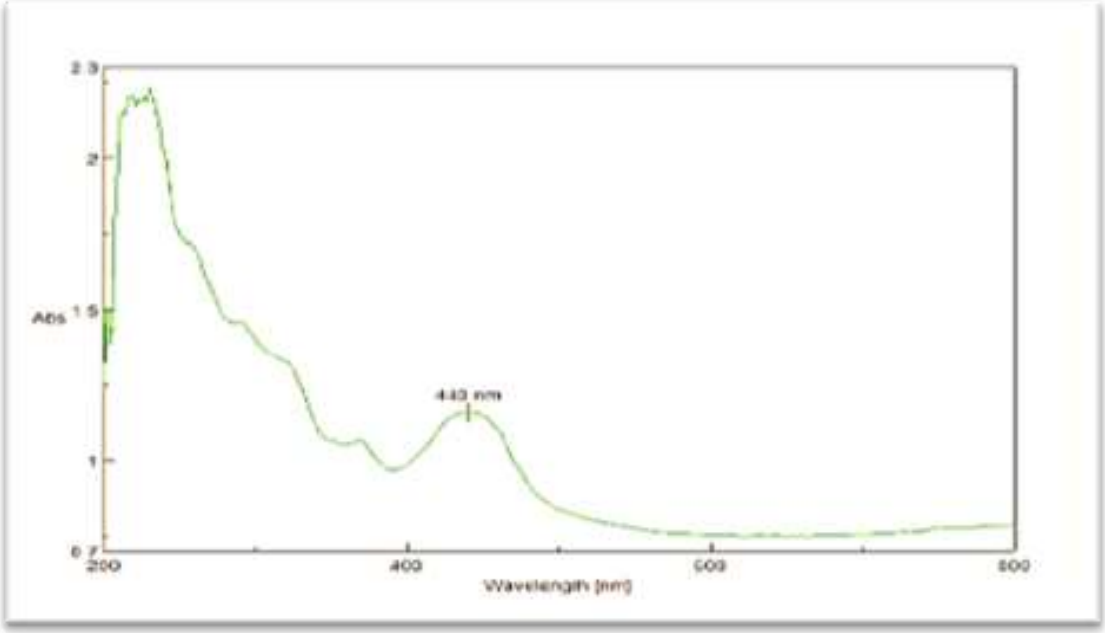
	STANDARD – Paracetamol	GENERIC – Paracetamol
TABLET No	DISINTEGRATION Time (min)	DISINTEGRATION Time (min)
1	5.30	4.50
2	5.35	5.09
3	6.32	6.54
4	5.54	7.03

Table 4.4 comparison of paracetamol

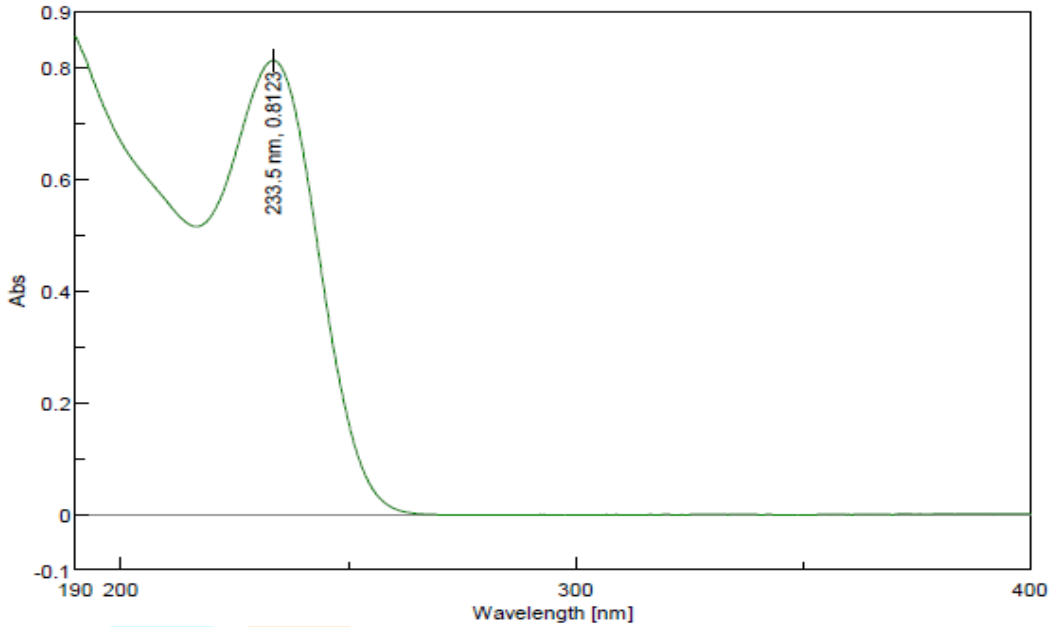
OBSERVATION OF UV-SPECTRUMS OF DRUGS –



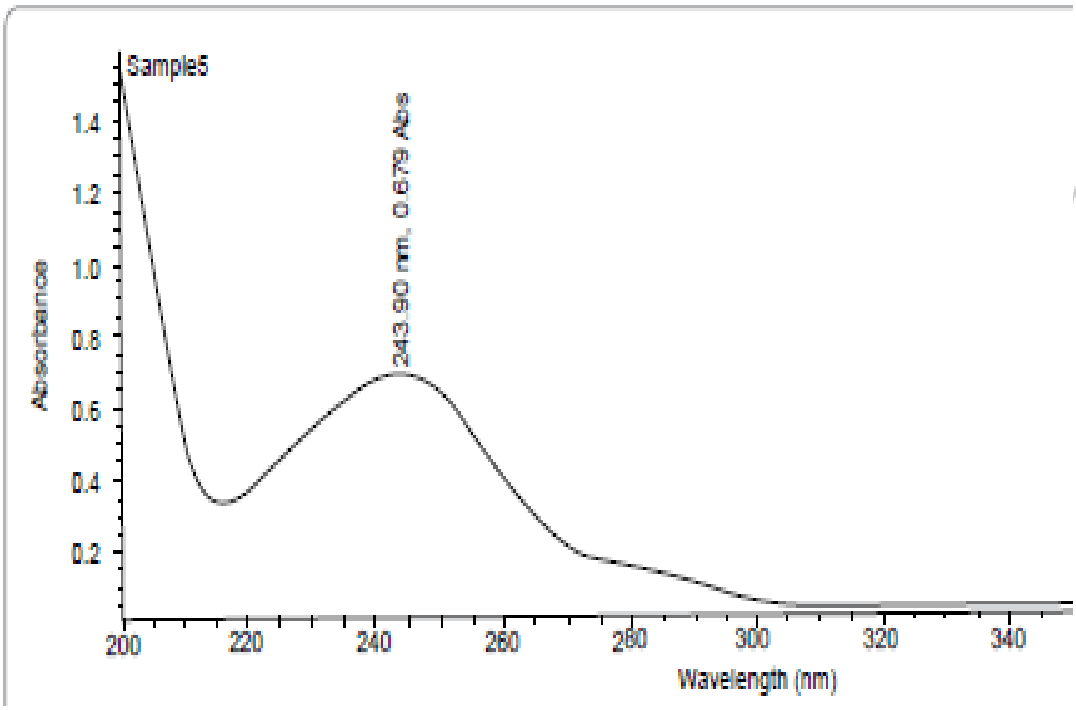
UV Spectrum of Fluconazole



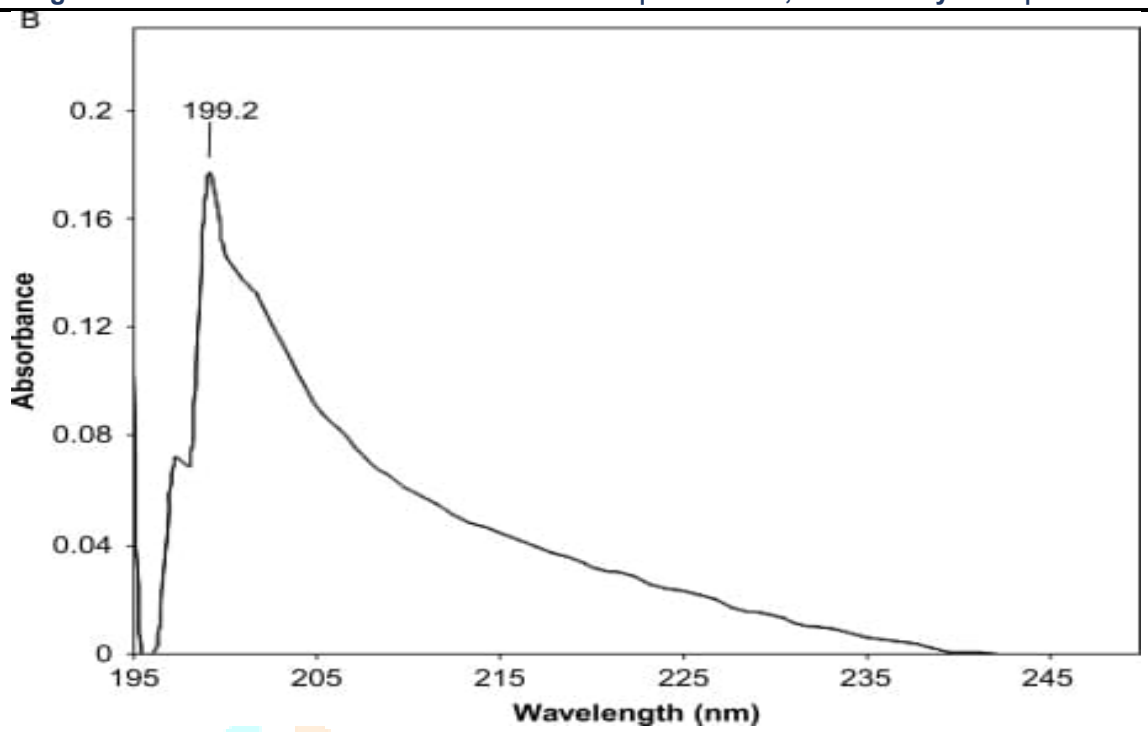
UV Spectrum of Rifaximin (443 nm)



UV Spectrum of Metformin hydrochloide



UV Spectrum of Paracetamol



UV Spectrum of Azithromycin

OBSERVATION TABLE:-

UV- VIS- SPECTROSCOPY:-

	STANDARD – GLYCOMET	GENERIC – METBETIC
TIME (min)	Absorbance (nm)	Absorbance (nm)
5	0.8023	0.8036
15	0.8030	0.0053
30	0.8025	0.8077
45	0.8057	0.8089

Table 6.0 comparison of Glycomet

	STANDARD – FLUCONAZOL- AF 400	GENERIC- FLUCONAZOL- flumet
TIME (min)	Absorbance (nm)	Absorbance (nm)
5	0.0503	0.0566
15	0.1036	0.1120
30	0.2076	0.2260
45	0.2899	0.3448

Table 6.1 comparison of fluconazole

	STANDARD- RIFAXIMIN- rifguard	GENERIC- RIFIXIMIN-rifaclean
TIME (min)	Absorbance (nm)	Absorbance (nm)
5	0.1458	0.1765
15	0.1989	1.2087
30	0.2896	0.2765
45	0.3167	0.2998

Table 6.2 comparison of rifaximin

	STANDARD – AZITHROMYCIN-indoco	GENERIC-AZITHROMYCIN - azilup
TIME (min)	Absorbance (nm)	Absorbance (nm)
5	0.128	0.092
15	0.213	0.204
30	0.243	0.225
45	0.301	0.278

Table 6.3 comparison of azithromycin

	STANDARD – PARACETAMOL-aristo pharma	GENERIC- PARACETAMOL-cipla
TIME (min)	Absorbance (nm)	Absorbance (nm)
5	0.039	0.056
15	0.139	0.169
30	0.285	0.186
45	0.624	0.548

Table 6.4 comparison of paracetamol

5) DISSOLUTION TEST OBSERVATION TABLE :-

	STANDARD – Glycomet	GENERIC–Metbetic
Time (min)	Drug Released (%)	Drug Released (%)
5	10.87	20.94
10	28.63	48.06
15	41.09	71.02
30	55.78	88.25
45	66.05	96.12

Table 5.0 comparison of glycomet

	STANDARD – Fluconazole - AF 400	GENERIC – Fluconazole-flumet
Time (min)	Drug Released (%)	Drug Released (%)
5	36.37	31.50
10	43.98	45.07
15	67.76	53.98
30	78.76	73.61
45	82.63	87.00

Table 5.1 comparison of fluconazole

	STANDARD – Rifaximin -rifguard	GENERIC – Rifaximin-rifaclean
Time (min)	Drug Released (%)	Drug Released (%)
5	29.01	21.65
10	41.31	43.32
15	47.98	58.09
30	68.87	68.98
45	84.68	88.53

Table 5.2 comparison of rifaximin

	STANDARD – Azithromycin -indoco	GENERIC Azithromycin- azilup
Time (min)	Drug Released(%)	Drug Released (%)
5	17	9
10	37	21
15	49	34
30	67	45
45	78	78

Table 5.3 comparison of azithromycin

	STANDARD – Paracetamol -aristo pharma	GENERIC- Paracetamol-cip
Time (min)	Drug Released (%)	Drug Released (%)
5	23	25
10	35	38
15	57	67
30	78	76
45	98	96

Table 5.4 comparison of paracetamol

Summery :

The comparison between generic drugs and standard (branded) drugs reveals that standard drugs exhibit superior performance, enhanced efficacy, better bioavailability, and more consistent treatment outcomes. While generics are not equal in terms of safety and quality. standard drugs' optimized formulations and manufacturing processes contribute to their improved performance. Never the less, generics offer a cost-effective alternative, increasing medication accessibility. Healthcare professionals and patients should get the benefits of standard drugs' superior performance against the cost savings of generics, making informed decisions about treatment options that balance efficacy, safety, and affordability.

Discussion:

It is important to acknowledge that generic medicines offer a cost-effective alternative, increasing accessibility and affordability for patients. But, branded drugs gives you a better quality , therapeutic effect and trust. Ultimately, the choice between branded and generic medicines depends on individual needs and circumstances.

Conclusion:

Generic drugs are not equivalent to branded drugs in terms of safety, efficacy, and quality, But , in Above studies I will suggest that branded drugs may have a better in performance. This can be attributed to various factors affects , such as:

Manufacturing Process: Branded drugs may have more stringent quality control measures, potentially leading to better consistency.

Inactive Ingredients: Differences in inactive ingredients can affect drug performance, and branded drugs may have optimized formulations.

Clinical Trials: Branded drugs are often tested in larger, more diverse populations, which can provide more comprehensive data.

However, it is important that:

Regulatory Standards: Generics must meet the same regulatory standards as branded drugs, ensuring slight equivalence.

Cost-Effectiveness: Generics offer significant cost savings, making them a viable option for many patients.

The performance difference between branded and generic drugs may not be clinically significant for many patients. Consulting with healthcare professionals can help determine the best option for individual needs.

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   Dr. Aney Joice1* and Farheen Mohammed Zubair Sange Assistant Professor Department of Pharmaceutics, M.C.E Society's Allana College of Pharmacy, Pune-411001, Maharashtra, India. Postgraduate Student M. Pharm Department of Pharmaceutical Quality Assurance, M.C.E Society's Allana College of Pharmacy, Pune-411001, Maharashtra, India

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5. Spectrophotometric Determination of Azithromycin Dihydrate in Formulation and its Application to Dissolution Studies Chiluka R , Raut R Department of Pharmaceutics, K. M. Kundnani College of Pharmacy, Mumbai, Maharashtra, India

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8. Estimation of Metformin Hydrochloride by UV Spectrophotometric Method in Pharmaceutical Formulation Ambadas R. Rote, Ravindranath B. Saudagar21M.G.V's

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Ethiopia; 2Department of Pharmacy, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia

23. Study of Effect of Solvents on Absorption Characteristics of Rifaximin in Visible Region and Its Estimation in Bulk and Dosage FormsP. Ravi Kumar*, T Jhansi Chary, K. Sahithi, Amani Baquer Shareef, N Raghavendra Babu Department Of Pharmaceutical AnalysisG.Pulla Reddy College of Pharmacy, Mehidiptanam, Hyderabad, Telangana.

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26. FORMULATION AND EVALUATION OF PH-DEPENDENT COLON-TARGETED TABLETS OF RIFAXIMIN BY DESIGN OF EXPERIMENTRAWOOF MD1,2*, RAJNARAYANA K2, AJITHA M31Department of Pharmaceutics, Jawaharlal Nehru Technological University, Kukatpally, Hyderabad, Telangana, India. 2Department of Pharmaceutics, MAK College of Pharmacy, Ranga Reddy, Telangana, India. 3Centre for Pharmaceutical Sciences, Institute of Science and Technology, Jawaharlal Nehru Technological University Hyderabad, Hyderabad, Telangana, India.

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28. EVALUATION OFEVALUATION OF TABLETS TABLETS TABLETSBY FRIABILITY APPARATUS BY FRIABILITY APPARATUS BY FRIABILITY APPARATUS Mohammad Saleem*, Mohammad Shahin, Bijja Srinivas and Ashraf Begum Sultan Ul Uloom College of Pharmacy, Hyderabad, Telangana, India

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30. Development and validation of different UV-spectrophotometric methods for the estimation of fluconazole in bulk and in solid dosage form Amit Singh1*, Pramod Kumar Sharma2*& Deepak Kant Majumdar3*1R V Northland Institute, Greator Noida Phase-2, Gautam Budh Nagar 203 207, India2Meerut Institute of Engineering and Technology, Meerut 250 005, India3Delhi Institute of Pharmaceutical Sciences and Research, Pushp Vihar-III, M. B. Road, New Delhi 110 017 India

31. A Novel UV-Vis Spectrophotometric Method for Quantifying Rifaximin: Method Development and ValidationShibani Raut1, Geetanjali Amat1, Akshya Ku Mishra2*1Dept. of Pharmaceutical Analysis, GCP Jamadarpali Sambalpur, Odisha, India2Dept. of Microbiology, BKCP, Nuapada, Odisha, India

32. A Novel UV-Vis Spectrophotometric Method for Quantifying Rifaximin: Method Development and Validation Shibani Raut1, Geetanjali Amat1, Akshya Ku Mishra2*1Dept. of Pharmaceutical Analysis, GCP Jamadarpali Sambalpur, Odisha, India2Dept. of Microbiology, BKCP, Nuapada, Odisha, India.

33. Estimation of Metformin Hydrochloride by UV Spectrophotometric Method in Pharmaceutical Formulation Ambadas R. Rote1*, Ravindranath B. Saudagar21M.G.V's Pharmacy College, Mumbai-Agra Road, Panchavati, Nashik (Pune University), Maharashtra, India2KCT's, R. G. Sapkal College of Pharmacy, Anjaneri, Nashik, Maharashtra, India

34. UV-Visible Spectrophotometric estimation of azithromycin and cefixime from tablet formulation by area under curve methodChaitanya A. Gulhane, Anuja S. Motule, Jagdish V. Manwar, Harigopal S. Sawarkar, Prashant V. Ajmire, Ravindra L. Baka lIBSS's Dr. Rajendra Gode Institute of Pharmacy, Mardi Road, Amravati-444 602, MS, India

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37. In vitro Comparative Study of Branded and Generic Market Pantoprazole Sodium Tablets Manoj , Dhanasekar , Sathish Kumar , Sumathi , Sivakumar
Department of Pharmaceutics, Nandha College of Pharmacy, Koorapalayam Pirivu, Pitchandampalayam (P.O.), Erode, Tamilnadu, India.Department of Pharmaceutical Chemistry, Nandha College of Pharmacy, Koorapalayam Pirivu, Pitchandampalayam (P.O.), Erode, Tamilnadu, India