Section A-Research paper
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In vivo studies of fraction isolated from chloroform extract of *Abelmoschus esculentus L* (Malvaceae) stem as potential antidiabetic agent in alloxan induced diabetic rats

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Abstract:

Background: *Abelmoschus esculentus L* (Malvaceae), commonly named Lady finger is one of the commonly used medicinal plants. Historically it is found that stem of *A. esculentus L* contain a variety of compounds that have been linked to diabetes mellitus. Okra stem contained the greatest concentration of phenolic and flavonoid compounds. Okra had a lot of fibre. **Objective:** The present study was carried out to investigate the traditional use of *Abelmoschus esculentus L* stem in alloxan monohydrate -induced diabetes in rats alongwith antidiabetic chemical constituents in stem and was tested for in vivo biological activities. **Methods**: The ethanolic, aqueous and chloroform extract was obtained by the Reflux extraction method, and fractionation was done with column chromatography and TLC. The antidiabetic chemical constituent has been confirmed by Gas Chromatography-Mass Spectroscopy (GC-HRMS) analysis. For in vivo activities, rats with diabetes mellitus caused by alloxan monohydrate were selected and the anti-diabetic indicators assessed were body weight, blood glucose level, insulin and urine volume. **Results:** Fraction of the Chloroform extract showed presence of Lysine, Leucine, Dodeanoic acid, Pentanoic acid in GC-HRMS Study**.** In GC-HRMS analysis determine Leucine is present in highest area of 2565054.20 with molecular weight 265. This Chemical constituent decreased blood glucose levels and has positive effects to cure diabetes. The extracts and fraction with oral dose were compared with standard drug metformin (150 mg/kg b. w). *A.esculentus* chloroform extract Fraction (AECEF) showed better effect than other extracts used for study. **Conclusion:** From the results we can conclude that *Abelmoschus esculentus L* plant, is having various antidiabetic compounds with effective activity.

"PHARMACOGNOSTIC, PHYTOCHEMICAL AND PHARMACOLOGICAL STUDY OF ETHANOL EXTRACT OF AEGLE MARMELOS ROOT BARK"

Renuka S. Solunke[1], Dattaprasad N. Vikhe[1*], Vilas B Ghawate[2], Vaibhav V. Bhone[3]

Abstract:
The study includes pharmacognostic evaluation, phytochemical analysis, and pharmacological activity of the ethanol extract obtained from the root bark. The pharmacognostic evaluation involved the macroscopic and microscopic examination of the root bark, determining its organoleptic characters, size, shape, surface features, and other parameters. Physico-chemical standards such as loss on drying, total ash, acid-insoluble ash, water-soluble ash, and extractive values were also determined to assess the quality and purity of the root bark. Phytochemical analysis of the ethanolic and aqueous extracts revealed the presence of various phytoconstituents including carbohydrates, reducing sugars, alkaloids, glycosides, cardiac glycosides, flavonoids, triterpenoids, tannins, and steroids. These phytoconstituents are known for their medicinal properties and contribute to the therapeutic potential of the root bark. The pharmacological activity of the ethanol extract was evaluated through anticancer assays using the onion tip root assay and potato disk assay methods. The results showed significant inhibitory effects on tumor growth, indicating potential antitumor activity.Overall, this comprehensive study provides valuable insights into the pharmacognostic evaluation, phytochemical analysis, and pharmacological activity of Aegle marmelos root bark. The findings contribute to the understanding of its medicinal properties and support its potential use in pharmaceutical and natural product research.

Keywords: Aegle marmelos, Pharmacognostic evaluation, Phytochemical analysis, Pharmacological activity, Medicinal plants, Ethanol extract

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PHYTOCHEMICAL INVESTIGATION AND PHARMACOLOGICAL ASSESSMENT OF CARALLUMA ADSCENDENS (ROXB.)

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Abstract:
The present study focus on microscopy, phytochemical and morphological investigation of ethanolic extract of Caralluma adscendens (Roxb.) Bark. These plant shown various activity. Pharmaceutically valuable varieties of Caralluma adscendens from nodal explant, is described. The morphology of the Caralluma treated cells, control, and positive control were observed under reverse phase inverted microscope. , used by tribal Indians to suppress hunger and known as "famine food" with no history of adverse effects, which contains pregnane glycosides. This plant has been investigated for its myriad biological effects such as antihyperglycaemic and hypolipidaemic, hepatoprotective, antioxidant activity and came out with promising results. study of microscopy and phytochemical investigation take plant from hatti village, tahsil chandwad, district Nashik. Hese plants due to their several medicinal values are fast disappearing and are threatened to become rare due to indiscriminate collection and over exploitation by the pharmaceutical industry, agriculture, mining activities, and lopping for fodder used as an anti-obesity agent and appetite suppressor. It is also seen that the pregnane glycosides isolated and identified from African Hoodia are reported as anti-obesity and appetite-suppressant compounds. On reviewing the studies undertaken on the chemistry, pharmacology, and therapeutic potential of Caralluma is currently used as a "natural slimming" food supplement, likely due to its content in pregnane glycosides. In the present study, a commercially available

Keyword: Caralluma adscendens (Roxb)., makad shingi, morphology, microscopy, phytochemical investigation, traditional use, medicine use

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"SCREENING OF ABORTIFACIENT ACTIVITY OF DYEROPHYTUM INDICUM BARK EXTRACT USING FEMALE RATS"

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Abstract:

Introduction : Dyerophytum indicum first reported in Oman and is a small plant or herb having height of 1-2m, it is a flowering plant. Dyerophytum indicum is straight under shrub with striate branches and stems. Literature survey reports the presence of pytoconstituent Plumbagin, Coumarins, Napthoquinones and Flavonoid etc.

Material and Method: Dried and powdered bark of the plant *Dyerophytum indicum O. Ktze.* was extracted successively with various solvents viz. Pet. Ether, Ethyl Acetate, Ethanol in Soxhlet extractor . The phytochemical screening revealed the presence of alkaloids, flavonoids, simple phenolics, steroids, tannins and saponins. The potential abortifacient activity of Petroleum Ether, Ethyl Acetate, Ethanol extracts of *Dyerophytum indicum bark extract performed* in female albino rats and oxytocin was used as standard.

Result and Discussion: The abortificient activity reports that ethanolic extract shows significant result as oxytocin.

Keywords: Abortificient,Dyerophytum indicum, Plumbagin, Pharmacognostical, phytochemical.

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Original Article

DESIGN, DEVELOPMENT AND OPTIMIZATION OF MOUTH DISSOLVING TABLET OF AMBRISENTAN USING DESIGN EXPERT SOFTWARE

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ABSTRACT

Objective: The rationale of the current work is to design, develop and optimize of mouth dissolving tablet of ambrisentan to treat hypertension.

Methods: Sodium starch glycolate and crospovidone were used as the super disintegrants in the direct compression method to create nine ambrisentan mouth-dissolving tablet formulations. Wetting time, drug content, *in vitro* disintegration time, dispersion time, and dissolution time were all assessed for the produced formulations.

Results: Based on the results obtained, formulation F6 containing 30 mg of crospovidone exhibited good wetting time, dispersion time, disintegration time and drug release. The hardness of formulations AS1 to AS9 was found to be in the range of 2.5 to 3.11 Kg/cm^2. The friability of formulations AS1 to AS9 was found to be less than 1%. A water absorption ratio was performed for ensuring the moisture sorption and water uptake properties of super disintegrants. The *in vitro* drug release of formulation AS6 containing a concentration of Crospovidone 30 mg, shows 91.30% drug release respectively at the end of 12 min.

Conclusion: The mouth-dissolving tablets of ambrisentan were successfully designed, developed, and fabricated. It can be reasonably concluded that the AS6 batch of mouth-dissolving tablets of ambrisentan with 30 mg of crospovidone exhibited maximum cumulative drug release in 12 min.

Keywords: Superdisintegrants, Ambrisentan, Crospovidone, Optimization, Mouth dissolving tablet

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INTRODUCTION

Mouth-dissolving drug delivery systems (MDDDS) are a new class of formulations that combine the benefits of traditional tablet and liquid dosage forms while also providing additional benefits over both of the older dosage forms [1]. They allow both the ease of ingesting offered by a liquid formulation and the convenience of a tablet formulation [2]. Compared to the main alternative, oral liquids, MDDDS has the luxury of offering far more precise dosing [3]. This type of formulation is specifically made for patients who have dysphagia, are elderly, young, bedridden, traveling, or are psychotic and unable to swallow standard oral medications. For dysphagic, pediatric, and geriatric patients with swallowing issues, MDDDS are the most practical dosage forms since they dissolve/disintegrate quickly when placed in the mouth [4]. They are a fantastic choice for travelers and people who are bedridden because they do not require water for administration. Psychotic individuals cannot conceal them in the mouth since they simply disappear when put there. Due to the line extension of the current formulation, these medications not only improve patient compliance but also generate significant profits for the makers [1, 3].

A persistently raised blood artery pressure is a defining feature of hypertension, also known as high or rising blood pressure. Every part of the body receives blood via the veins from the heart. With each beat, the heart pumps blood into the vessels [5]. Blood pressure is produced as a result of the heart's pumping action on the walls of blood vessels (arteries). When the pressure is greater, the heart must use more effort to pump blood. Hypertension, a serious medical disease, can increase your risk of having heart, brain, kidney, and other issues. The disorder affects more than a billion people worldwide-roughly 1 in 4 men and 1 in 5 women-and is a substantial cause of premature death. The fact that low-and middle-income countries account for two-thirds of cases of hypertension is partially attributable to the increase in risk factors in those populations over the past few decades. The current work aims to design, develop, and fabricate a mouth-dissolving tablet of ambrisentan to treat hypertension [5].

MATERIALS AND METHODS

Materials

The active pharmaceutical ingredient Ambrisentan was procured from MSN laboratories, Hyderabad. The other excipients, such as magnesium stearate, purified talc, and mannitol, were procured from SD Fine Chemicals (Mumbai). Sodium starch glycolate and crospovidone sodium were purchased from Prerana Enterprises (Ahmednagar), and lactose was purchased from Research fine chem industries (Mumbai).

Methods

Experimental design

3^2 full factorial design was employed for optimization of polymer-plasticizer ratio. This design involved conducting experimental trials in all nine feasible combinations while evaluating each of the two components at three different levels. Crospovidone polymer amount (X1) and SSG plasticizer amount (X2) were considered independent variables, and each factor was examined at levels of-1, 0, and+1. Table 1 lists the independent variable levels that were used as well as the entire factorial design layout of the variables. In table 2, the various mouth-dissolving tablet compositions are listed [6].

Table 1: Independent variables design

Factor	The level used, actual (coded)		
Independent variables	**Low (-1)**	**Medium (0)**	**High (+1)**
X1 = Concentration of polymer (mg)	20	30	40
X2 = Concentration of plasticizer (mg)	5	10	15

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RESEARCH ARTICLE

Formulation and Evaluation of Herbal Kajal for its Anti-Inflammatory, Anti-Microbial, Anti-Acne properties

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ABSTRACT:
Kajal is an ancient eye cosmetic, traditionally used in mascara. It is widely used in the Middle East, the Mediterranean, South Asia, and the Horn of Africa as eyeliner to contour and/or darken the eyelids. Some did this to "strengthen the child's eyes", and others believed it could prevent the child from being cursed by the evil eye. With consideration to all these facts, herbal Kajal was formulated and evaluated. Herbal Microwave assisted extracted Kajal (MAEK) and Traditional method extracted Kajal (TMEK) were formulated by using *Anethumgraveolans*, Yasthimadhu, *Ricinuscommunis*, *Ocimum sanctum*, Castor oil and almond oil but the methods of extraction of active constituents was different and evaluated on various parameters. In MAEK all the herbs were extracted by using Microwave assisted extraction method. Green chemistry and microwave assisted extraction was used to obtain high yield, short extraction time, reducing waste and promoting efficiency in extraction. In TMEK all the herbs were extracted by using traditional methods of extraction. The pH, viscosity values proved the significant evaluation. The base satisfied the evaluated parameter values and physical evaluation was suggestive of a cosmetically appealing product.Composition of nutrient agar I.P and cylinder plate method was employed; MAEK showed higher level of zone of inhibition in microbial contamination as compared with TMEK. MAEK was able to inhibit protein denaturation in a concentration-dependent manner as compared with TMEK. Inhibition % of protein denaturation of the formulations was within the range from 53.0% to 76.0% at the concentration range of 25–100 ug/ml. MAEK exhibited a significantly higher level of inhibition compared to TMEK showed the lowest inhibition levels. Herbal Kajal prepared by using Microwave assisted extraction method showed better evaluation parameters as compared with TMEK.

KEYWORDS: Kajal, Herb, MAEK, TMEK, Extract, Anti-microbial, Anti-inflammatory.

INTRODUCTION:
Kajal is worn for a variety of reasons including tradition, beautification, to ward off the “evil eye,” the widespread belief that kajal is medically beneficial for the eyes. Kajal is reported for improvement of vision, strengthening and keeping the eyes healthier. One of the most striking properties of kohl has been observed effect of UV rays emerging fromthe sun and dust of the desert[1]. Firstly, blushes in Arabia were made of antimony trisulfide and the ore stibnite wascalled ‘ethmid’. As this was scarce and expensive, it was slowly replaced over the years by galena (lead sulfide) which has the same grey-black color and shiny appearance like stibnite[2]. Leadintoxicationfollowing operation of camouflage performing from galena “camouflage-gravestone” has been a majorarea of review. On the contrary there are studies which are of a view thatlead is not absorbed through trans corneal route and thusshould not be linked or blame for increased blood leadlevel and lead poisoning after its application[3]. However kohl is unapproved for cosmetic use in the United States since there have been reports linking the use ofkohl with lead poisoning in children[4]. The herbs used for formulation of herbal Kajal were *Ocimum sanctum*, commonly known as holy basil, tulasi or tulsi, is an aromatic perennial plant in the family Lamiaceae. It's native to the Indian key and wide as a cultivated factory throughout

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REVIEW ARTICLE

inventi Spreading Knowledge

Sotagliflozin: A Pharmacological Action for Chronic Kidney, Diabetes and Heart Failure Disease

Rushikesh Daud[1*], S D Mankar[1]

Abstract: A new dual Sodium-glucoSe cotranSporter 1 and 2 (SGLT1/2) inhibitor called Sotagliflozin haS Showed promiSe in the treatment of chronic kidney, diabeteS and heart diSeaSe. DiabeteS mellituS (DM) iS a condition that iS cloSely related to chronic kidney diSeaSe (CKD) and DM iS alSo a major riSk factor for the onSet and progreSSion of CKD. The benefitS of Sotagliflozin for Type 1 diabeteS may alSo outweigh the riSk of diabetic ketoacidoSiS aS a whole. In the current analySiS, the riSk of cardiovaScular diSeaSe and renal failure in people with Type one diabeteS iS eStimated. It iS now being determined how Sotagliflozin affectS cardiovaScular outcomeS through itS clinical trialS. In addition to lowering blood Sugar, Sotagliflozin alSo reduced the riSk of cardiovaScular eventS with certain pharmacological and pharmacokinetic way. ReSent clinical Study SupportS the data where Sotagliflozin affectS cardiovaScular eventS in patientS with type two diabeteS who had worSening heart failure conditionS. ThiS extenSive Study focuSeS on the pharmacological aSpectS of Sotagliflozin on glycaemic management, renal outcomeS, cardiovaScular outcomeS and adverSe eventS in order to aSSeSS the Sotagliflozin mode of action and pharmacological Study.

INTRODUCTION

The Sodium/glucoSe cotranSporter family SLC5, which iS one of the largeSt familieS of cotranSporterS, includeS SGLTS. [1] In patientS with Stable heart failure, Sodium-glucoSe cotranSporter 2 (SGLT2) inhibitorS lower the likelihood of hoSpitaliSation for heart failure or death from cardiovaScular cauSeS. However, it iS unknown if SGLT2 inhibitorS are Safe and effective if uSed Soon after a decompenSated heart failure epiSode. [2] The benefitS of Sotagliflozin were moStly driven by the decreaSe in (firSt and SubSequent) hoSpitaliSationS and urgent viSitS for HF, whereaS the effect on CV fatalitieS remained ambiguouS due to the trial'S early end and inSufficient power. [3] In multiple clinical StudieS involving patientS with and without type 2 diabeteS (T2DM), Sodium-glucoSe cotranSporter 2 (SGLT2) inhibitorS conSiStently demonStrated poSitive effectS on the heart, kidney and blood preSSure. [4] Sotagliflozin, a Sodium-glucoSe cotranSporter-1 and Sodium-glucoSe cotranSporter-2 inhibitor, decreaSed the overall incidence of cardiovaScular deathS, hoSpitaliSationS for heart failure and urgent viSitS for heart failure relative to placebo by 33% in the SOLOIST-WHF (Effect of Sotagliflozin on CardiovaScular EventS in PatientS with Type 2 DiabeteS PoSt WorSening Heart Failure) trial. [5] Sodium-glucoSe cotranSporter 2 inhibitorS (SGLT2i) lower cardiovaScular riSk and Slow the progreSSion of diabetic kidney damage in perSonS with type 2 diabeteS. [6] The firSt pharmaceutical claSS that haS been Shown in extenSive clinical StudieS in HFpEF to lower hoSpitaliSation and cardiovaScular mortality iS Sodium-glucoSe co-tranSporter 2 inhibitorS (SGLT2i). In addition, independent of ejection fraction, the dual SGLT 1/2 inhibitor Sotagliflozin haS demonStrated a reduction in cardiovaScular eventS in diabetic HF patientS. Sotagliflozin preventS the onSet of heart failure in patientS with diabeteS and chronic renal diSeaSe and Sotagliflozin on CardiovaScular EventS in PatientS with Type 2 DiabeteS PoSt-WorSening Heart Failure (SOLOIST-WHF) Trial. (SCORED) trial: Sotagliflozin on CardiovaScular and Renal EventS in PatientS with Type 2 DiabeteS and Moderate Renal Impairment Who Are at CardiovaScular RiSk. [7] A brand-new claSS of Sodium-glucoSe co-tranSporter 2 (SGLT2) inhibitorS includeS Sotagliflozin, an oral anti-diabetic medication. The major tranSporter for glucoSe abSorption in the gaStrointeStinal tract, SGLT1 and the kidney-expreSSed SGLT2, which limitS glucoSe reabSorption in the proximal tubuleS, are both targetS of thiS anti-diabetic drug'S unique dual-receptor binding affinity. [8]

CHEMISTRY

((2S,3R,4R,5S,6R)] Sotagliflozin-2-(4-chloro-3-(4-ethoxybenzyl) phenyl)-6- (methylthio) tetrahydro-2H-pyran-3,4,5-triol] having a molecular weight of 424.94 g/mol and the empirical formula C21H25ClO5S [39,40]. It iS a cryStalline Solid that iS very Sparingly Soluble in aqueouS bufferS (about 1 mg/ml) and Sparingly Soluble in organic SolventS (30 mg/ml). [9] ItS chemical compoSition iS (2S,3R,4R,5S,6R).-2-[4-chloro3-[(4-ethoxyphenyl) methyl] phenyl6-methylSulfanyloxane-3,4,5-triol, Figure 1 depictS the Structure.

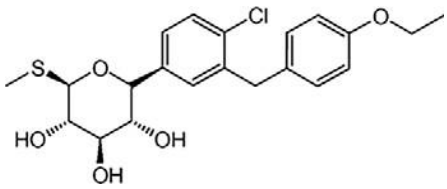

Figure 1: The chemical Structure of Sotagliflozin: (2S,3R,4R,5S,6R)-2-[4-chloro-3-[(4-ethoxyphenyl)methyl] phenyl]-6-methylSulfanyloxane-3,4,5-triol [10]

PHARMACOLOGY

Sotagliflozin haS Shown good efficacy in enhancing glycemic control in both formS of diabeteS typeS I and II, along with additional advantageS of decreaSed weight, glycaemic variability, SyStolic blood preSSure, faSting plaSma glucoSe, poSt-meal glucoSe and recorded hypoglycaemic occurrenceS. By lowering the doSe of inSulin, theSe improvementS were attained. Diabetic ketoacidoSiS, vaginal mycotic infection and diarrhoea are Some of the Side effectS aSSociated with Sotagliflozin

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GUIDELINES AND ETHICAL REQUIREMENTS OF EXPERIMENTAL ANIMALS.

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Abstract:

Animal welfare issues and the ethics surrounding this practice are receiving more attention as more animals are used in research projects. Two key purposes of information dissemination regarding existing ethical issues and alternatives in animal experiments are to increase researcher awareness of potential methods of using animals in the experiment and to ensure that potential users are aware of the established alternatives. For illustration, legislation adopted in many nations during the 1980s mandates that laboratory animal applications be minimized, improved, and replaced whenever possible in accordance with the 3Rs. As a result, scientists from all over the world tried to incorporate the 3Rs into their biomedical research regarding the welfare of the lab animals. But since their revelations, the Qur'an, the Muslim religion's holy book, and Hadiths have included the laws governing how to care for and treat animals. Islam holds that humans should care for animals' welfare and living conditions because they are seen as a representation of Allah's intelligence and power. According to a number of Islamic manuscripts, humans are in charge of providing the bare necessities for animals' well-being and they have their own place in the creation hierarchy. In an effort to promote the provision of thorough ethical regulations in animal experiments, which their establishment could be advantageous for animal ethics committees or research institutes, this paper has attempted to review ethical consideration in animal experiments and regarding resources in this case.

Keywords: *Animals, Ethics, Research, Welfare, experiments, laboratory etc.…*

Introduction:

These guidelines have been prepared by the National Committee for Research Ethics in Science and Technology (NENT They ultimately serve as a set of moral principles for scientists and other individuals who are thinking about performing animal studies. The principles will be helpful when designing initiatives, evaluating them, and evaluating and disseminating findings and outcomes. [1]They are also aimed at encouraging awareness on research ethics and the use of animals in study, both within the research community and in the general public. The use of animals for study purposes and other ethical concerns are also intended to be acknowledged by the research community as well as the general population. [2]Animals used in research are subjected to an extensive spectrum of ethical assessments. [3] In order to make advances for people, animals, or the environment, it is generally acknowledged that using laboratory animals may be necessary in some instances. The widespread understanding is that animals have a moral authority and that how we treat them should be governed by ethical standards. These positions represent such standpoints: [4]

(i) Animals are sentient species with the ability to feel pain, so their interests must be considered when making decisions.

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RP-HPLC Method Development and Validation for Estimation of Dolutegravir Sodium in Bulk Drug and Tablet Dosage Form

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ABSTRACT

Several spectrophotometric and HPLC methods have been reported for determination of Dolutegravir sodium in bulk drugs and in pharmaceutical dosage forms. Hence, in the present study, a new, sensitive, reproducible, suitable and robust reversed-phase high performance liquid chromatography method was developed and validated for the determination of Dolutegravir sodium in bulk drug and in tablet formulation. In RP-HPLC method, Acetonitrile and 0.1 % OPA (70:30 % v/v) was used as mobile phase, at a flow rate of 1.0 ml/min, on HPLC system containing UV- detector with Open lab EZ chrome software and Column Kromasil C18 having dimensions 250 mm X 4.6 mm, 5 µm. The detection was carried out at 258 nm. The method gave suitable retention time that is 3.03 min for Dolutegravir . The results of analysis in the method were validated in terms of Filter study, Solution stability, specificity, Linearity, accuracy, precision (Repeatability and intermediate precision), limit of detection, limit of quantification and robustness. A simple and precise method was developed for the assay of Dolutegravir sodium in bulk drug and in tablet formulation. The method need regular reagents for doing analysis and also less time consuming, it can be performed routinely in industry for routine analysis of bulk drug and marketed product of Dolutegravir.

Keywords: Acetonitrile, Dolutegravir sodium, RP-HPLC, Validation.

INTRODUCTION

Now a days the various analytical methods was reported for the estimation of the dolutrgravir sodium in bulk drug and tablt dosage form. The present work was carried out for the a new, simle , precise, accurate and reproducible method development and the developed method was validated according to the ICH Q2R1 guidelines .

The drug Dolutegravir chemically known as sodium(3S,7R)-13-{[(2,4-difluorophenyl)methyl]carbamoyl}-7-methyl-9,12-dioxo-4-oxa-1,8-diazatricyclo[8.4.0.0^{3,8}]tetradeca-10,13-dien-11-olate, having molecular formula is $C_{20}H_{19}F_2N_3NaO_5$.1 The molecular weight of dolutegravir sodium is 441.36 . It is antiretroviral drug and is used to treat HIV/AIDS.[2-4]It inhibits HIV integrase enzyme by binding to the active site and blocking the strand transfer step of retroviral DNA intergration in the host cell.[5]The strand transfer step is essential in the HIV replication cycle and results in the inhibition of viral activity.[6]

The structure of Dolutegravir dug is shown in figure no.1.[7] Literature survey revealed that fewmethods were available for development and validation of dolutegravir sodium alone or in combination.[4-13]

The objective of the present study is to develop and validate a Reverse Phase High Performance Liquid Chromatographic method for the determination of Dolutegravir sodium in pharmaceutical dosage form which requires less time and minimum solvent consumption and the method reproducibility.

Several methods are available for the validation but veriablity in laboratory to laboratory results so that the present work shown that the reproducibility of the results.

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Development and validation of RP-HPLC method for simultaneous estimation of Ertugliflozin and Sitagliptin in bulk drug and tablet dosage form

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Keywords:
Ertugliflozin, RP-HPLC, Sitagliptin, Tablet

Abstract: To treat type 2 diabetes, in a combined tablet dosage form the ertugliflozin and sitagliptin were administered. Considering the less complication and readily availability of HPLC, the main objective of present study was to develop a new, precise, accurate, linear, robust, and economical RP-HPLC method for the simultaneous estimation of ertugliflozin and sitagliptin in tablet dosage form. Effective chromatographic separation of Ertugliflozin and Sitagliptin was achieved on Kromasil C18 (5 µm 250 mm X 4.6 mm) and the mobile phase containing Methanol and 0.1% OPA in water isocratic elution mode at a flow rate of 1.0mL/min. with column temperature at 30 °C and the injection volume was 20 µL at column temperature at 30°C. At an isosbestic wavelength of 212 nm, ertugliflozin and sitagliptin were found to have retention times of 5.30 min. and 2.05 min., respectively. The method was proven to be precise (%RSD 2%), accurate (>90%), and specific for the simultaneous measurement of both drugs in tablets. As a result, the suggested method with excellent specificity, accuracy, precision, linearity and robustness as well as economical was useful for the regular quality control analysis of ertugliflozin and sitagliptin tablets.

Introduction

Ertugliflozin, chemically known as (1S,2S,3S,4R,5S)-5-[4-chloro-3-[(4-ethoxyphenyl) methyl] phenyl]-1-(hydroxymethyl)-6, 8-dioxabicyclo (3,2,1) octane-2,3,4-triol; (2S)-5-oxopyrrolidine-2-carboxylic acid, is a selective inhibitor of sodium-dependent glucose cotransporters (SGLT), more specifically type 2 diabetes (Fediuk et al., 2020). A new dipeptidyl peptidase-4 (DPP-4) inhibitor drug with the chemical name (R)-3-Amino-1-(3-(Trifluoromethyl)-5,6-Dihydro- (1,2,4) Triazolo (4,3-A) Pyrazin-7(8h)-yl)-4-(2,4,5-Trifluorophenyl) Butan-1-One is sitagliptin. Sitagliptin is an inhibitor of the protease dipeptidyl peptidase-4 (DPP-4), which breaks down the incretin GLP-1. GLP-1 levels that are elevated or sustained can enhance the pancreas's ability to secrete insulin by blocking DPP-4. Sitagliptin reduces hepatic glucose overproduction while increasing insulin production. In order to address decreased insulin levels brought on by beta-cell malfunction and the liver's unchecked synthesis of glucose, sitagliptin only functions when blood sugar levels are raised (Davis et al., 2010). To treat type 2 diabetes, ertugliflozin and sitagliptin were administered in a combined dosage form. There have been a few reported validated analytical techniques for estimating ertugliflozin and sitagliptin by RP-HPLC method (China et al., 2019; Rajeswari et al., 2022; Venkateswara et al., 2018; Raju et al., 2021; Vilas et al., 2022). It was found that no economically validated method was available from the literature for simultaneous estimation of Ertugliflozin and sitagliptin in bulk and tablet dosage form. The goal of the present research is to develop and validate the economical RP-HPLC method for simultaneous estimation of ertugliflozin and sitagliptin in bulk drugs and tablet dosage forms.

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Solubility enhancement and evaluation of Cilnidipine using solid Dispersion techniques

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Keywords:
Cilnidipine, dissolution rate, Solid dispersion, Solubility

Abstract: The poor solubility of Cilnidipine leads to low bioavailability and limits its therapeutic efficacy. To develop a dosage form that is stable, effective and has a higher bioavailability. It is necessary to increase the solubility of such medications. The present study aimed to improve the solubility by solid dispersion technique of Cilnidipine by solid dispersion techniques. Solvent evaporation and melt fusion methods were used to prepare solid dispersions of the drug cilnidipine with various polymers. The solubility of these prepared solid dispersions was evaluated by FT-IR spectroscopy, Differential Scanning Colorimetry and X-ray diffraction. The greatest solubility, of 21.07 µg/mL, was found in the solid dispersion that was developed by solvent evaporation technique employing a combination of Cilnidipine and Poloxamer 188 in a 1:9 ratio. The current investigation showed that solid dispersion using Poloxamer 188 can be a potentially effective method to increase the solubility and rate of dissolution of cilnidipine.

Introduction

The most significant challenge in pharmaceutical preparations is the poor water solubility of hydrophobic medicines. To get the optimal drug concentration in systemic circulation and the best bioavailability to produce the intended pharmacological response, their solubility is a rate-limiting stage in the absorption process (Hasanain, 2016). The solubility of such medications can be increased by creating a formulation that promotes quicker drug dissolution than the crystalline form. (Shah, 2007; Mankar, 2021). Various techniques, including chemical and physical alterations, crystal engineering, particle size reduction, salt generation, complexation, the addition of solvent or surface-active agents, solid dispersion, and others, can be used to make drugs more soluble. The characteristics of the drug, the site of absorption, and the criteria for the dose form all influence the choice of a solubility-enhancing method (Sareen, 2012; Savjani, 2012).

Solid dispersion is the combination of two different solid products, such as a hydrophilic matrix and a hydrophobic drug. The drug may be dispersed as crystalline or amorphous particles that are molecular in nature. When exposed to aqueous solutions, water-insoluble drugs dissolve more quickly and are more bioavailable because the carrier dissolves and the drug is liberated as extremely small colloidal particles. Because of the significant reduction in particle size and increase in surface area, oral absorption and dissolving rates are accelerated. Furthermore, throughout the process of dissolving a medication, no energy is required to alter its crystal structure. The presence of nearby hydrophilic carriers may boost the drug's solubility and wettability (Kalia, 2011).

The most common sign of chronic hypertension is a blood pressure value of 120/80 mmHg or higher. It is the most significant component that may be connected to and serves as an early warning system for numerous bodily disorders. Calcium channel blockers are the most commonly used antihypertensive drugs. Cinidipine is a calcium antagonist of the dihydropyridine fourth generation. L-type and N-type calcium channels may be inhibited by it (Mohana, 2022). Cilnidipine belongs to BCS Class II with low solubility and high permeability

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A Review on Analytical Methods for Estimation of Pazopanib Drug, Biological Fluid and Tablet Dosage Form

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ABSTRACT

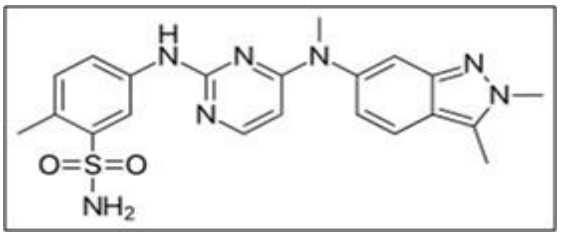
Patients with renal cell carcinoma and soft tissue sarcoma could be treated with pazopanib, according to FDA approval. Antiangiogenic and antitumor effects are exhibit by pazopanib. Analytical techniques are essential for estimating Pazopanib in different dosage forms. Consequently, a review of the Pazopanib analytical techniques is done. Here, we discussed the most recent analytical techniques for estimating apremilast in biological samples, pharmaceutical dosage forms, and bulk. In that, we investigate techniques like UPLC, HPLC, UV-Visible spectroscopy, and the commonly employed hyphenated method, LC-MS. These reported chromatographic methods for the quantification of Pazopanib, however, have a number of shortcomings, including the need for sample preparation, a lack of sensitivity, a complicated mobile phase mixture, and stringent monitoring of important method parameters, such as the mobile phase, flow rate, column temperature, flow gradient, and pH maintenance. This review will be helpful for the researcher who is working on Pazopanib.

Keywords: Antitumour, HPLC, LC-MS, Pazopanib.

INTRODUCTION

Pazopanib is chemically described as 5-({4-[(2, 3-dimethyl-2H-indazol-6-yl) (methyl) amino] pyrimidin-2-yl} amino)-2- methylbenzene-1-sulfonamide. Patients with renal cell carcinoma (RCC) and soft tissue sarcoma may be treated with pazopanib, according to FDA approval. The main way that pazopanib is effective to treat RCC is by inhibiting the intracellular tyrosine kinase of the platelet-derived growth factor receptor as well as vascular endothelial growth factor receptor. Pazopanib inhibits multiple types of receptors tyrokinases, which causes it to have antiangiogenic and antitumor effects.[1] A TKI means multitargeted tyrosine kinase inhibitor with oral activity, pazopanib (GW-786034, Votrient®) targets the VEGFR-1, -2, and -3, PDGFR-1, PDGFR-1, and c-Kit. It is effective by obstructing ATP's ability to bind to the intracellular tyrosine kinase domain of growth factor receptors, which prevents the receptors from autophosphorylating and prevents downstream signal transduction. It is authorised for use as a treatment for metastatic RCC and advanced soft tissue sarcomas in patients who have received chemotherapy by a number of regulatory agencies around the world, including the FDA, EMA, MHRA, and TGA. Additionally, it has been shown to be effective in treating non-small cell lung cancer and ovarian cancer.[2–6]

DRUG PROFILE:[7], [8]



STRUCTURE

Category: Anti- Cancer Agents

Chemical Name of Pazopanib: 5-[[4-[(2,3-dimethylindazol-6-yl)-methylamino] pyrimidin-2- yl] amino]-2-methylbenzenesulfonamide.

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PHYTOCHEMICAL STUDIES AND ANTIUROLITHIATIC ACTIVITY OF *VITEX NEGUNDO* LINN ROOT EXTRACTS

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ABSTRACT

Background: Vitex negundo has many uses in Ayurveda, Homeopathy, and Allopathy to treat several diseases like venereal diseases, Urinary problems, cough and fever, asthmatic pain, female reproductive problems. **Purpose:** This study aimed to perform the comparative phytochemical study, chromatographic profiling, and Antiurolithiatic activity of Vitex negundo linn root extracts. **Methods:** Using maceration extraction, Successive reflux condensation extraction processes were used to prepare petroleum ether, methanol, aqueous, and alcoholic extracts. Preliminary phytochemical study were carried out in plant parts extract. We performed chromatographic profiling of Vitex negundo by using GC-MS. About 18 phytochemicals in Vitex negundo plant root were identified and quantified by using GC-MS. Antiurolithiatic activity was performed to study urolithiasis inhibition potency of root extracts of the selected plant. **Results:** The percentage yield of petroleum ether, methanolic and aqueous extract of Vitex negundo Linn was found to be 1.42 % w/w,0.85%w/w and 1.14% w/w respectively. The Rf value of 0.76, 0.69,0.95,0.61,0.69,0.87 and 0.95 may be due to the presence of flavonoids, alkaloids, tannin, Glycosides The urine samples of normal and treated animals were collected on 14th and 28th day and a comparative analysis has revealed that there was significant increase in the volume & pH of urine in the animals treated with methanolic extract. This study proves that there was significant decrease in calcium oxalate crystals by methanolic root extracts against ethylene glycol induce urolithiasis model in swiss albino rats. It is interesting to note from the GC MS results that the presence of biomolecules such as Dibutyl malate, Heptaethylene glycol monododecyl ether, Suc-L-Phe-OH4-Nitrophenyl, Ajmalicine, alpha-Tocotrienol, Tyroscherin, Caryoptin, Bruceantin, Unii-0E0K1H745W, 4-O-MePdd, Bevirimat, Beta-Carotene, Phytoene, Allochenodeoxycholic acid, Calamin, 3 (Benzylnonanoylaminomethyl) androsterone, Methyl betulinate,Stearoyldelicone etc. correspond well with the reported medicinal roles of Vitex negundo Linn. **Conclusion:** As per present study, The selected plant part of Vitex negundo Linn could be helpful for generating formulations for kidney stone reduction.

KEYWORDS: Urolithiasis, Vitex, root, phytochemical, Medicinal plants.

Preliminary Pharmacognostic and Phytochemical Study on *Corn Silk* and *Sour Orange.*

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Abstract

Aim: *To evaluate Pharmacognostic features including macroscopic, microscopic and physicochemical parameters of the corn silk and sour orange juice.*

Methods: *Corn silk and sour orange were studied macroscopically and microscopically. Preliminary phytochemical investigation of plant material was done.*

Result: *The colour, shape, size, odor, and surface features had been observed from hair of corn silk and peel and juice of sour orange by using electron microscope, Microscope images of cross selection of corn silk and sour oranges existence of cork cells, presence of oil globules, vertical lines, lower epidermis, oil glands, epidermal cells, globular chromoplast, crystalline chromoplast, pictures taken by iPhone camera. Phytochemical testing revealed the existence of flavonoids, alkaloids, tannins, phenols, steroids, acid compounds, glycosides, amino acids, and proteins. Physicochemical parameters including moisture content, ash value, extractive value and fluorescent behavior of corn silk extract and sour orange juice had been identified.*

Conclusion*: The present studies useful in a strive to supplement the data with consider to its identity standardization, and performing additional exploration on Ayurveda approach to medicine.*

Keyword: *Urolithiasis, Ethylene Glycol, Calcium Oxalate, Corn, sour orange*

1. **Introduction:**

Corn silk tea prepared by boiling corn silk in water is applicable for bladder problems. (1) Drinking Corn silk tea increases the manufacture of urine and helps in the easy removal of kidney stones due to its diuretic activity. This is also helping for managing diabetes and blood pressure-related problems. Diabetic patients are advised to consult a physician before taking Corn silk tea as its potency cause too much overcast of blood sugar due to its blood sugar-lowering property. Its ability also causes allergies like skin rash and irritation among hypersensitive particular, (2) Corn, also known as Maize, is one of the most popular cereal grains in the world. It contains various nutrients and phytochemicals (such as carotenoids and phytosterols) that play a very important role in managing various diseases. Corn flour is also very beneficial for health as it contains important B vitamins, iron, potassium, magnesium and other nutrients. Apart from Corn, Corn silk (which are long strands attached to an ear of corn) is also used for medicinal purposes. (3) Citrus aurantium (Rutaceae), the unripe fruit of bitter orange is used in traditional medicine to treat urolithiasis. (4) Previous studies have shown that Citrus aurantium have numerous bioactive compounds, including Polyethoxylated flavones (PMFs), flavonoid glycosides, alkaloids these active components demonstrate pharmacological activity; antioxidant, antimicrobial effect. (5) Citrus fruits, including oranges, grapefruits, and lemons, and the juices produced from these fruits, are central components of the modern diet and enjoy growing popularity with recent health trends. The consumption of these juices might influence the evolution of kidney stones

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Original Article

SimultaneousEstimationofLamivudine,TenofovirDisoproxil Fumarate and Efavirenz in Bulk and Tablet Dosage Form by Cramer's Rule

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ABSTRACT

Background: Cramer's rule is one of the significant techniques applied to settle an arrangement of conditions. In this rule, the upsides of the factors in the framework are to be determined utilizing the determinants of networks. Consequently, Cramer's rule is otherwise called the determinant rule. Few analytical methods for simultaneous estimation of Lamivudine, Tenofovir disoproxil fumarate and Efavirenz available currently are UPLC, RP-HPLC which are quit affordable. UV-Visible method is also available but that are not based on Cramer's rule which affords more accurate results in analytical research protocols. Traditional method needs to separate the LAM, TDF and EVZ before analysis. Proposed method did not need to separate these 3 drugs and only needs to prepare the sample solution directly as per given in the assay procedure and measure the absorbance at 262 nm, 247nm and 272 nm. **Materials and Methods:** Jasco V- 730 double beam UV- Vis-spectrophotometer at wavelength range of 200-400 nm was used for research protocol. Trioday tablet containing three Anti-HIV drugs and manufactured by Cipla were used for the study. Methanol and freshly prepared distilled water was used as solvents. UV-Visible spectroscopy method is applied for simultaneous estimation of Lamivudine, Tenofovir disoproxil fumarate and Efavirenz in their ternary mixture and their tablet dosage form. UV-VIS spectrophotometry is based on the additivity of absorbance of drugs. The drugs show maximum absorbance at 247 nm for Efavirenz, 262 nm for Tenofovir and 272 for Lamivudine in methanol so these wavelengths were selected for further analysis. Matrix was drawn using the standard absorptivity values obtained at all the three wavelengths and the amount of drug in the tablet dosage form was calculated by solving matrix using Cramer's rule. The developed method was validated as per ICH guidelines. **Results:** The maximum wavelength found to be linear in the range of 5-30 µg/mL for Lamivudine and Tenofovir disoproxil fumarate while 10-60 µg/mL for Efavirenz. The precision was carried out at two level viz intra-day and inter-day for which the RSD was found within limit (<%2). Recovery study was carried out on the developed method and the recovery was found to be in the range of 97.5 – 102.5%. **Conclusion:** From analytical data it can be concluded that all the three drugs obey the Beers-Lambert's law at these selected wavelengths of maximum. Method was found to be simple, sensitive, precise and accurate. The developed method can be applied for the routine analysis of the Lamivudine, Tenofovir disoproxil fumarate and Efavirenz in combined dosage form using Cramer's rule.

Keywords: Lamivudine, Tenofovir disoproxil fumarate, Efavirenz, Cramer's rule.

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Tablet containing Lamivudine (LAM), Efavirenz (EFZ), Tenofovir Disoproxil Fumarate (TDF), is prescribed combination used to stop or slow down the progression of HIV infection; also

Formulation and Evaluation of Diclofenac Sodium Fast-Dissolving Tablet by Using Natural Super disintegrant

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ABSTRACT

The emergence of the fast-dissolving drug delivery system stemmed from the desire to offer patients a more convenient method for taking medication. Many individuals find it challenging to swallow tablets and hard gelatin capsules. The primary aim of this research was to develop a consistent formulation for fast-dissolving tablets of Diclofenac sodium, a therapeutic molecule already in use. The objective was to improve its effectiveness while avoiding side effects such as gastric irritation. Various batches of tablets were formulated using the direct compression method, incorporating different concentrations of natural super disintegrants Ocimum sanctum seed powder. The study examined the impact of altering the natural super disintegrant and its concentration on the formulation. The optimized batches were compared to determine the most effective super disintegrants for the Diclofenac sodium Fast-dissolving tablets (FDT) formulation. The tablets underwent evaluation for hardness, thickness, drug content, friability, weight variation, in-vitro disintegrating time study, and in-vitro drug release study.

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REVIEW ARTICLE

A Review on Nasal Self-Emulsifying Drug Delivery Systems: An Alternative Approach to Improve Brain Bioavailability of Poorly Water-Soluble Drugs

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ABSTRACT:
Neurotherapeutic drugs fail to reach the site of action due to poor bioavailability, poor water solubility, limited permeability, hepatic first-pass metabolism, and the blood-brain barrier. The nasal cavity allows drugs to be delivered directly to the brain, bypassing the blood-brain barrier. The nasal cavity also avoids hepatic first-pass metabolism, enhancing the systemic bioavailability of highly metabolized substances. As a result, most neurotherapeutics have physicochemical properties that necessitate their formulation in lipidic nanosystems as self-emulsifying drug delivery systems (SEDDS). These are isotropic mixes of oils, surfactants, and co-surfactants that, when diluted in water, produce micro or nanoemulsions containing high quantities of lipophilic medicines. SEDDS should prevent drug precipitation at absorption sites, boost permeability through absorptive membranes, and improve labile drug stability against enzymatic activity. When the benefits of SEDDS and the intranasal route for brain delivery are combined, an increase in medication brain targeting and bioavailability might be expected.

KEYWORDS: Brain delivery low; intranasal; neurotherapeutics; self-emulsifying drug delivery system.

1. INTRODUCTION :
The prevalence of neurological illnesses has risen in recent years. According to a World Health Organization (WHO) estimate published in 2020, neurological problems affect up to one billion people worldwide. According to global data, 50 million individuals have epilepsy, 62 million have cerebrovascular illnesses, 326 million have migraine, and 24 million have Alzheimer's disease or other dementias. As a result, neurological illnesses are regarded as one of the leading causes of disability and mortality worldwide. Taking this into consideration, efforts are made on a daily basis to find and develop new and effective neuro medicines, even if the majority of new entities fail to enter clinical trials.[1]

Since ancient times, nasal medication administration for systemic effects has been used. In modern pharmaceutics, the nose was predominantly regarded as a conduit for local medication delivery. The inability to distribute protein, peptide-like macromolecules via methods other than parenteral injection prompted scientists to investigate alternate options, including pulmonary and nasal administration.[2] The nasal cavity has the advantages of a wide surface area, quick absorption and action, and avoidance of first-pass metabolism. Furthermore, delivery through the nasal cavity is a safe and convenient method. To reach the system circulation, the medicine must be dissolved and permeate via the mucosal tissues. The nasal cavity, on the other hand, has significant constraints for intranasal delivery, including a short residence period, mucociliary clearance, and a limited administration volume[3].

Indeed, medication transport to the brain represents a significant challenge, drugs must passes intact via absorptive membranes, avoid the hepatic first-pass effect, and eventually cross the complicated blood-brain barrier (BBB). To cross absorptive membranes and the BBB, molecules must be lipophilic, have a low molecular weight (400Da), be nonionizable at

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Home page *www. ajpsonline.com*

REVIEW ARTICLE

A Review on Polymer as Multifunctional Excipient in Drug Delivery System

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ABSTRACT:
Polymer-based drug delivery systems have gained significant attention in the field of pharmaceutical research due to their multifunctional nature. These systems utilize various polymers to encapsulate and deliver therapeutic agents, providing enhanced drug stability, controlled release, and targeted delivery to specific sites within the body. Here, we'll discuss the multifunctionality of polymers in drug delivery systems and their potential applications.

KEYWORDS: Multifunctional Polymer, Polymer Excipient, Polymer Therapeutics, Tissue engineering, Bio imaging, Biosensor.

INTRODUCTION:
Polymers are large molecules composed of repeating subunits called monomers. They are formed through a process called polymerization, where monomers chemically bond together to form a long chain or network structure. The resulting polymer can have a wide range of properties depending on the choice of monomers and the polymerization process.[1]

Properties of polymers can vary significantly and are influenced by several factors, including the chemical structure of the monomers, the molecular weight of the polymer, the degree of polymerization, and the presence of any additives or fillers. Here are some common properties of polymers:[1]

1. Mechanical Properties: Polymers can exhibit a wide range of mechanical properties, from soft and flexible to hard and rigid. Some polymers are highly elastic and can stretch significantly before breaking, while others are more brittle and prone to fracture. [1]

2. Molecular Weight: Polymers can have a range of molecular weights, from a few thousand to millions of atomic mass units. The molecular weight affects various properties, such as mechanical strength, viscosity, and thermal stability. [1]

3. Processing Characteristics: Polymers can be processed using various techniques like extrusion, injection molding, blow molding, and casting. The processability of a polymer depends on factors such as melt viscosity, melt temperature, and the presence of any additives or fillers. [2]

4. Thermal Properties: Polymers have different thermal characteristics, including melting point, glass transition temperature, and thermal conductivity. These properties determine how polymers behave under different temperature conditions and can influence their processing and applications.[3]

5. Chemical Resistance: Polymers can be resistant to various chemicals, including acids, bases, solvents, and oils. However, their resistance depends on the specific polymer composition and the nature of the chemical substances they come into contact with.[4]

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Formulation and Drug Release Study of Rivaroxaban Oral Disintegrating Tablets Using Various Super-Disintegrants

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Abstract: This study aims to improve Rivaroxaban's solubility, dissolution, and bioavailability. Orally disintegrating tablets (ODTs) made with super-disintegrants like crospovidone, sodium starch glycolate, and cross-carmellose sodium will do this. Tablet preparation used direct compression and formulation optimization with design expert software. After a thorough factorial design and evaluation of pre- and post-compression parameters, the F3 batch, which contained Rivaroxaban (7.97%), Crospovidone (3.59%), Croscarmellose sodium (5.18%), Sodium Starch Glycolate (5.18%), Lactose Anhydrous (31.08%), Mannitol (15.94%), MCC (27.89%), SSF (1.59%), and Talc (1.59%), was the best. The enhanced tablet formulation (F3) showed positive qualities, including 3.3 kg/cm² hardness, 23 seconds disintegration time, and 99% drug release after 30 minutes. The innovative Rivaroxaban orally disintegrating tablet (ODT) method disintegrated and dissolved faster than market forms. Rivaroxaban's physical and chemical properties were assessed before formulation. The medication was colorless, scentless, crystalline, and melted at 227°C-229°C, as described in published research. The pharmaceutical was found to be a BCS Class II drug with low water solubility and high solubility in acetate buffer pH 4.5 and 0.1 N Hydrochloric acid. Fourier-transform infrared spectroscopy (FTIR) confirmed no drug-polymer-excipient interactions. Every batch of tablets exhibited uniform thickness (3.5 mm to 3.8 mm) and diameter (10.31 mm to 10.36 mm), indicating good compression without adhering to shaping tools. All samples had a 3-5 kg cm-² hardness, indicating strong mechanical properties. The Roche friability method showed that all batches had good abrasion resistance, ranging from 0.1% to 0.5%. Variations in croscarmellose sodium and crospovidone on tablet disintegration time and hardness were examined using design expert software. The ANOVA showed important factors affecting these attributes. Data-driven polynomial equations predict tablet disintegration time and hardness. These models reveal formulation parameters that affect tablet performance. Thus, the improved F3 batch of rivaroxaban orally disintegrating tablets (ODTs) improves solubility, dissolving, and bioavailability. This may improve treatment outcomes.

Introduction

The introduction of oral anticoagulants in recent years has expanded the range of successful therapy for venous and arterial thromboembolic illness. This is in contrast to conventional vitamin K antagonists (Mueck, 2013). Rivaroxaban, an oral anticoagulant belonging to the oxazolidinone family, acts as a powerful and selective inhibitor of factor Xa, effectively preventing venous thromboembolism in people who have had total hip or knee replacement surgery (Eswarudu et al., 2020). The USA's Food and Drug Administration (FDA) initially approved this medication as an anticoagulant in 2011. Its

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Analytical Method Development and Validation of RP-HPLC Method for Estimation of Pazopanib Drug Sample and It's Dosage Form

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Abstract: The study focuses on developing and verifying a cost-effective Reverse Phase High-Performance Liquid Chromatography (RP-HPLC) technique for quantifying Pazopanib HCl in both bulk and tablet forms. The study aims to develop a cost-effective approach for routine quality control analysis by utilizing the simplicity and wide accessibility of HPLC. A Shimadzu C18 column (5 µm, 250 mm × 4.6 mm) was successfully used to separate Pazopanib HCl via chromatography. The mobile phase consisted of a mixture of Potassium dihydrogen phosphate in water (pH 2.9, corrected with Phosphoric Acid) and Acetonitrile in a ratio of 25:75 v/v. The isocratic elution mode was utilized with a flow rate of 1.0 mL/min, a column temperature of 25°C, and an injection volume of 20 µL. Pazopanib hydrochloride had a retention period of 2.8 minutes when measured at an isobestic wavelength of 215 nm. The described RP-HPLC technique showed exceptional specificity, accuracy, precision, linearity, and durability, rendering it a viable instrument for Pazopanib HCl tablets' regular quality control analysis. This method is both efficient in terms of analytical performance and economically profitable, making it very suitable for frequent pharmaceutical analysis.

Introduction

Pazopanib HCl is a powerful and specific inhibitor of multi-targeted receptor tyrosine kinases. It is used to treat advanced soft tissue sarcomas, bone sarcomas, and renal cell carcinoma by blocking angiogenesis and inhibiting the development of cancer cells. The main inhibitory effects are shown on c-kit, platelet endothelial growth factor receptors -α and -β, and vascular endothelial growth factor receptors-1, 2 and 3. Pazopanib HCl is categorized as a BCS class II medication, with a log P value of 3.2 and low oral bioavailability. It has a low solubility in water, measuring 0.33 mg/ml. The chemical structure is shown as 5-[[4-[(2,3-dimethyl-2H-indazol-6-yl) methylamino]]-2-pyrimidinyl] amino] on hydrochloride, 2-methyl benzenesulfonamide. The compound's empirical formula is $C_{21}H_{23}N_7O_2S$•HCl, and its molecular weight is 473.99 grams per mole. In addition to its proven uses, current studies indicate that it is useful in the treatment of non-small cell lung cancer (Koylu et al., 2022; Verheijen et al., 2022).

Studies have utilized sophisticated analytical methods, such as LC-MS/MS (Verheijen et al., 2016; Verheijen et al., 2018; Minocha et al., 2012; Sparidans et al., 2012; Pressiat et al., 2018) UPLC-QTOF/MS (Patel et al., 2015), and High-Performance Liquid Chromatography – UV (Escudero-Ortiz et al., 2015; Sharada et al., 2016), to quantify pharmaceuticals. In addition, Ultra Violet techniques (Sharada and Babu, 2016; Chaitanya and Pawar, 2015) have been used to estimate this medication.

HPLC has been beneficial in diagnostics and pharmaceuticals. Although several RP-HPLC methods have been documented for estimating Pazopanib HCl in tablet dosage forms and biological fluids, such as those by Shabada et al. (2017), Buralla et al. (2020), Ghode et

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Original Article

Synthesis, Characterization and *in vitro* Anti-bacterial Activity of "2-chloro-*N*-{[(2-chlorophenyl) amino] sulfinyl}-*N*-phenylbenzamide Nucleus and its Derivatives"

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ABSTRACT

Introduction: This study describes a new route to the synthesis of novel (2-chloro-*N*-{[(2-chlorophenyl) amino] sulfinyl}-*N*-phenylbenzamide derivatives. Benzamide-based derivatives were prepared through a reaction of benzoyl chloride with 2-chloroaniline with conventional methods by alkylation with Thionyl chloride and then a reaction with 2-chloroaniline to get target compound i.e., novel 2-chloro-*N*-{[(2-chlorophenyl)amino]sulfinyl}-*N*-phenylbenzamide. Benzamides are structural parent of carbonic acid amide of the benzoic acid. Benzamides has the carbon snippet being attached to oxygen and also a nitrogen group attached with hydrogen atom[2]. In pharmaceutical request; three active medicines have been considerably in used for psychiatry and other affiliated medical fields; i.e., Sulpiride, Amisulpride and Remoxipride. **Objectives:** To synthesize 2-chloro-*N*-{[(2-chlorophenyl)amino]sulfinyl}-*N*-phenylbenzamide derivative and with its Characterization and its biological activity. **Materials and Methods:** The structure confirmations were done by FTIR, Magnetic Resonance Spectroscopy (MRS) and MS. The (2-chloro-*N*-{[(2-chlorophenyl) amino] sulfinyl}-*N*-phenylbenzamide compounds and its derivatives were investigated for *in vitro* screening. Structural activity relationship studies reveal that compounds possessing an electron-withdrawing group exhibit better activity than electron-donating groups. **Results:** Based on the results obtained, when compared to common medicines like Ciprofloxacin; the compounds 2-({[(2-chlorobenzoyl)(phenyl) amino]sulfinyl}amino)phenyl formate (BB8), 2-({[(2-chlorobenzoyl) (phenyl) amino] sulfinyl} amino)phenyl-2-aminophenyl-2-(4-nitrophenoxy) aniline (BB9), 2-({[(2-chlorobenzoyl) (phenyl) amino]sulfinyl}amino)phenyl-2-aminophenyl-2-(3-nitrophenoxy) aniline (BB10) showed good significant activity. Against *S. aureus* and *Pseudomonas aeruginosa*. **Conclusion:** The title compounds and its derivatives were investigated for anti-bacterial Activity. Structural activity relationship studies told that electron-withdrawing group exhibit good activity than the electron-donating groups.

Keywords: Antibacterial, Benzoyl chlorides, 2-Chloro Aniline, Thionyl chloride, Benzoic acid, Para nitro Phenol.

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INTRODUCTION

Lately, the people use and demand for new anti-bacterial, anti-fungal and new fungicides has been adding with the enhancement of people's living norms. Numerous scientists work on new kinds of anti-bacterial, anti-fungal and new fungicides with high effectiveness, low toxin and low residue and they developed new derivatives.[1] Benzamides base heterocyclic derivations having important attention because of their colorful natural conditioning. Benzamides are structural parent of carbonic acid amide of the benzoic acid. Benzamides has the carbon snippet being attached to oxygen and also a nitrogen group attached with hydrogen atom.[2] In pharmaceutical request; three active medicines have been considerably in used for psychiatry and other affiliated medical fields; i.e., Sulpiride, Amisulpride and Remoxipride. Remoxipride medicine was removed from the request due to life hanging side goods in 1993. This group of benzamide pharmocophore gives effective bioactive composites. Benzamide and its derivations have been reported with antimicrobial, analgesic anticancer, carbonic anhydrase inhibitory, cholinesterase inhibitory conditioning and so on. In once exploration, we study about benzamides derivatives.[3] It was observed that benzamides derivations have anti-depressant exertion, anti-convulsant exertion, anti-inflammatory exertion, analgesic parcels, serotonin (5-HT) exertion, antitumor exertion, and anti-microbial activity.[4,5] Particularly, it having both electron withdrawing and electron

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Original Article

Molecular Docking Studies and ADME Prediction of Benzimidazole Derivatives on Anti-convulsant Activity by Inhibiting Voltage-Gated Sodium Channel (NavMs)-5HVX

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ABSTRACT

Background: Epilepsy was described as utmost common be habitual brain complaint. A typical symptom of epilepsy is unbridled storms due to transient neuronal discharges. Despite the fact that numerous novel anti-convulsants have been developed in the Indian request but after treatment of new and current curatives; certain kinds of seizures are still not sufficiently controlled by smaller side goods. **Materials and Methods:** The exploration reported on concentrated work on molecular docking and ADME of the relations that do between the chlorinated benzimidazole derivations and the sodium (Nav) voltage-gated channels. A series of the benzimidazole derivations were planned and studied *in silico* was performed by through a sodium channel inhibitor GABAergic pathway. The medicine- likeness parcels of the designed composites were prognosticated. **Results:** All the designed composites showed good *in silico* ADME and molecular docking parcels and delved for Voltage-gated Sodium Channel (NavMs)-5HVX inhibitory exertion. According to molecular docking studies, all composites showed better commerce with target protein and could be the potent asset of sodium channels via a GABAergic pathway. The designed benzimidazole derivations analogues may be more effective anticonvulsant drugs that are also safer. **Conclusion:** Voltage-gated Sodium Channel (NavMs)-5HVX is one of the crucial enzymes of GABAergic pathway biosynthesis in different natural fiefdoms and is set up in beast and also in humans. Voltage-gated Sodium Channel (NavMs)-5HVX proteins belong to the class of superfamily. It's the most conserved protein. Unlike other enzymes, Voltage-gated Sodium Channel (NavMs)-5HVX also gives strong particularity.

Keywords: Voltage-Gated Sodium Channels, Molecular Docking, Anticonvulsant, Structure-Based Drug Design, 3D QSAR.

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INTRODUCTION

One of the most prevalent neurological problems is epilepsy or seizures, which is set up in all periods. According to World Health Association (WHO), 65 million persons globally are estimated affected by epilepsy.[1-3] It was observed that 80% of them reside in developing or middle-income nations. Still, Epilepsy is a neurological and unbridled seizure. It happens seven times advanced than normal for all habitual diseases.[4-7] Former exploration said that the expenditures of United States on health care including seizures are roughly $15.5 billion annually. The prevalence of epilepsy in the US and India is significant, necessitating the development of safer and more potent anticonvulsants to reduce the expense of treating epilepsy. Numerous efforts have been made by diverse nations in the search for innovative, secure, and efficient epilepsy treatments. There are various or numerous forms of epilepsy like focal or generalized seizures; absence seizure and clonic seizures. Nowadays; new anti-convulsants have been discovered and they're used for focal seizures. Different types of Epilepsy cannot be cure with newer and currenttherapies.[8-12] In epilepsy; it was linked by unbridled storms and it was brought on by excessive transient neuronal discharges. The broad etiology of epilepsy or seizures pattern, important substantiation suggests that more than one medium may be responsible for the colorful convulsions. It was shown by in highly excitable cells; the action eventuality is in the depolarization phase. The initial inward current during the depolarization stage of the action eventuality in cells is produced by voltage-gated sodium (Nav) channels. The diminution of GABAergic transmission is likewise correlated with the voltage-gated sodium (Nav) channels; as excessive glutamatergic neurotransmission increase the physiological abnormalities. So that cases suffering from epileptic seizures. Recently, several structurally various anticonvulsant active stereoisomers have been synthesized, and our lab has been researching them for

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Original Article

Synthesis and Anti-convulsant Activity of 1-[3-(4-Aminophenyl)-3-Oxopropanoyl]- 5,5-Diphenyl imidazolidine -2,4-Dione and its Derivatives

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ABSTRACT

Background: A heterocyclic hydrocarbon with distinct fundamental structural features in its molecular structure of 5, 5-diphenylimidazolidine heterocyclic ring. It is an imidazolidine and aromatic dibenzene fused ring. The flexible heterocyclic compounds that contain two atoms of nitrogen in 5, 5-diphenylimidazolidine. 5, 5-diphenylimidazolidine ring and its derivatives have a robust and promising biological action. In this study, we create a number of 1-[3-(4-aminophenyl)-3-oxopropanoyl] derivatives. A compound with anticonvulsant properties is -5, 5-diphenylimidazolidine-2,4-dione (AC1). The Strychnine Induced Convulsion Method was used to test the pharmacological samples for anticonvulsant action. The compound 5,5-diphenylimidazolidine-2,4-dione was synthesized together with its 14 total derivatives. **Materials and Methods:** Benzoin; Benzil; Urea; Glacial Acetic Acid; 4-amino benzoic acid; Con. HNO_3; Formic Acid; 2-Nitro Aniline; 4-Nitro Aniline; Aniline; Acetyl Chloride; Formic Acid; 4- amino Phenol are used for the synthesis. IR, NMR and MS are used for interpretation. **Results:** Our research led us to the conclusion that a variety of compounds have strong anti-convulsant properties. The compound 5,5-diphenylimidazolidine-2,4-dione (AB); 1-acetyl-5,5-diphenylimidazolidine-2,4-dione (AC); 1-[3-(4-hydroxy-2-[2-oxo-4 (phenylamino) ethyl]butanedioicacid)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (AC5); 1-[3-(4-oxo-4-(oxo(4-phenylamino)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (AC6); 1-[3-(4-(phenylamino)benzoicacid)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione(AC7) gives strong anti-convulsant effects against phenytoin drug. **Conclusion:** The title compounds and its derivatives were examined for their ability to treat convulsion. Studies of the relationship between structure and activity revealed that compounds containing 5, 5-diphenylimidazolidine derivatives that have an electron-withdrawing group have higher activity than those that have an electron-donating group.

Keywords: 5, 5-diphenylimidazolidine, Benzil, Urea, 4-amino benzoic acid, 2-Nitro Aniline, 4-Nitro Aniline, Aniline, Strychnine, Anti Convulsant Activity, Phenytoin.

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INTRODUCTION

In 1954, the 5, 5-diphenylimidazolidine nucleuses was found. It has a combined imidazolidine and dibenzene ring. Its structure resembles that of the medication phenytoin.[1] Due to its numerous pharmaceutical applications, 5, 5-diphenylimidazolidine has significant heterocyclic nuclei. Scientist Brecker created the first 5, 5-diphenylimidazolidine in 1956.[2] In Figure 1, 5, 5-diphenylimidazolidine was displayed. Today, the moiety of choice, 5, 5-diphenylimidazolidine, has a wide range of pharmacological characteristics.

The chemical compound 5, 5-diphenylimidazolidine-2,4-dione has a molecular weight of 252.273 and a chemical formula of $C_{15}H_{14}N_2O_2$. Since 1960, a substance with one imidazolidine and two benzene rings has been widely employed for pharmacological purposes. The active ingredients for numerous medications are composed of 5, 5-diphenylimidazolidine -2, 4-dione rings, which exhibit good outstanding basic properties since they contain 2 nitrogen atoms in their structure. Epidemiological studies indicate that 60 million people globally suffer from epilepsy, which is a prevalent condition of the brain.[3-5] This number is increased by about 2,40,000 new cases per year.

Only 30% of patients with uncontrolled seizures have been cured despite the availability of more than 40 different anti-epileptic medications in the Indian market.[6-9] As a result, research on antiepileptic compounds is currently quite active. The study of novel anti-convulsant drugs is the key focus. Based on the type

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Original Article

Synthesis, Characterization, and *in vitro* Antimicrobial Screening of Some "1*H*-Pyrazole's and 4*H*-Chromen-4-One's Derivatives with Penta- Fluoro-Benzoic Acid and 2,3,4,5-Tetra-Fluoro-Benzoic Acid"

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ABSTRACT

Background: The pyrazole nucleus has a five-membered heterocycle with two nitrogen atoms next to one another. The two nitrogen atoms are near in pyrazole nucleus heterocyclic compounds. Chromones are benzoannelated -pyrone-ringed heterocyclic compounds having a single oxygen ring. 4H-chromen-4-one **Materials and Methods:** All Chromones and Pyrazole derivatives were synthesized by conventional reflux method. 1-(4-chloro-2-hydroxy-5-methylphenyl)ethanone, penta fluoro benzoic acid, 2, 3, 4, 5-Tetrafluorobenzoic acid, Pyridine, Hydrazine Hydrate, Guanidine Hydrochloride, Ethanol, Con. Hydrochloric acid and Phosphorus oxychloride i.e. POCl3 were used for the synthesis of Chromones and Pyrazole **Results:** Compared to Ciprofloxacin and Gentamycin, the anti-bacterial results for the substances or their derivatives like 7-chloro-6-methyl-2-(pentafluorophenyl)-4H-chromen-4-one (CC); 5-chloro-4-methyl-2-[5-(pentafluorophenyl)-1H-pyrazol-3-yl]phenol (CD); 5-chloro-2-[2-imino-6-(pentafluorophenyl)-1,2-dihydropyrimidin-4-yl]-4-methylphenol (CE); 1-(4-chloro-2-hydroxy-5-methylphenyl)-3-(2,3,4,6-tetrafluorophenyl) propane-1,3-dione (CG); 7-chloro-6-methyl-2-(2,3,4,6-tetrafluorophenyl)-4H-chromen-4-one (CH); 5-chloro-4-methyl-2-[5-(2,3,4,6-tetrafluorophenyl)-1H-pyrazol-3-yl]phenol(CI); 5-chloro-2-[2-imino-6-(2,3,4,6-tetrafluorophenyl)-1,2-dihydropyrimidin-4-yl]-4-methylphenol (CJ) against *S. aureus* and *Pseudomonas aeruginosa*. Moreover, the compounds code name like 2-acetyl-5-chloro-4-methylphenyl pentafluorobenzoate (CA); 1-(4-chloro-2-hydroxy-5-methylphenyl)-3-(pentafluorophenyl) propane-1,3-dione: (CB); 2-acetyl-5-chloro-4-methylphenyl 2,3,4,6-tetrafluorobenzoate (CF); 1-(4-chloro-2-hydroxy-5-methylphenyl)-3-(2,3,4,6-tetrafluorophenyl)propane-1,3-dione (CG) a derivatives gives potent anti-bacterial activity against *Escherichia coli*. **Conclusion:** The title compounds' and its derivatives' *in vitro* antibacterial activity against a few human pathogenic pathogens were investigated. Gram-positive Gram-negative *Pseudomonas aeruginosa* and *Escherichia coli*, along with *Staphylococcus aureus*, are the bacteria. Studies on the link between structure and activity have shown that compounds containing chromones and derivatives of the pyrazole had higher activity than those containing electron-donating groups.

Keywords: Ciprofloxacin and Gentamycin have antibacterial properties, As do 2,3,4,5-tetrafluorobenzoic acid and 1-(4-chloro-2-hydroxy-5-methylphenyl)ethanone.

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INTRODUCTION

In 1883, German scientist Ludwig Knorr made the pyrazole nucleus discovery. The nucleus and chromones were first discovered by Walther Flemming in 1882. The pyrazole nucleus has a five-membered heterocycle with two nitrogen atoms next to one another. Neighboring nitrogen atoms can be found in heterocylic compounds.[1,2] Chromones are benzoannelated -pyrone-ringed heterocyclic compounds containing a single oxygen ring. 4H-chromen-4-one, also referred to as 4H-1-benzopyran-4-one, is the parent substance. Chromones and pyrazole include considerable amounts of heterocyclic nuclei because of the wide range of therapeutic applications for these elements. In Figure 1 below, chromones and pyrazole are shown. Today, chromones and pyrazole exhibit a variety of pharmacological properties.

Chromones have a molecular weight of 146.14 g/mol and the chemical formula $C_9H_6O_2$. Pyrazole has the chemical formula $C_3H_4N_2$.[3] and a molecular weight of 68.07 g/mol. particularly,

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Research Article

THE LABORATORY WASTE MANAGEMENT IN PHARMACY FIELD

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ABTRACT

The management of pharmaceutical waste plays a significant role in pharmacy schools. Wastes are undesirable substances that can no longer be employed in manufacturing processes and may be eventually become substances that are harmful or not to humans or the environment. The management of hazardous wastes is a crucial component of pharmacy school. Pharmaceutical wastes come in a variety forms, primarily as organic waste or synthetic waste, testing waste, formulation waste, analytical waste, etc. It originates from a variety of departments within the colleges. The college manages these wastes with the aid of a waste management system. In this paper, we employ an alternative method for waste management.

Keywords: Waste products, pharmaceutical waste, Disposal methods.

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Original Article

Synthetic Identification of New Compounds with Anti-fungal Properties of "1-[3-(2-Hydroxyphenyl)-3-Oxop ropanoyl]- 5,5-Diphenylimidazolidine -2,4-Dione and its Derivatives"

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ABSTRACT

Background: 5, 5-diphenylimidazolidine is a heterocyclic hydrocarbon having unique basic structural characteristics in their molecular structure. In this research; we synthesis various 11 derivatives of -[3-(2-hydroxyphenyl)-3-oxopropanoyl]- 5,5-diphenylimidazolidine -2,4-dione with anti-fungal activity. The agar well diffusion method was used to conduct the pharmacological screening for antifungal activity. **Materials and Methods:** All 5, 5-diphenylimidazolidine derivatives were synthesized by conventional method. Benzoin; Benzil; Urea; Glacial Acetic Acid; 4- hydroxyl benzoic acid; Con. HNO_3; Formic Acid; 2- Nitro Aniline are used for the synthesis. The structure confirmations were done by FTIR, NMR spectroscopy and MS. **Results:** In this research; we concluded that; many derivatives give potent anti-fungal activity against fungi. The compound 1-[3-(oxo (phenyl amino)acetic acid)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (BJ); 1-[3-(*N*-phenylformamide)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (BG); 1-[3-(*N*-Phenyl-2-nitroaniline)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (BE); shown better antifungal activity against *Candida albicans*. BJ was shown to be the most effective chemical when compared to Griseofulvin and other common medications because it demonstrated greater antifungal action against *Aspergillus niger*. **Conclusion:** The anti-fungal activity of the title compounds and their derivatives was studied. Studies on the link between structure and activity revealed that compounds containing 5, 5-dimethylimidazolidinone derivatives with an electron-withdrawing group have higher activity than those containing an electron-donating group. 1-[3-(*N*-Phenyl-2-nitroaniline)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (BE); 1-[3-(oxo(phenyl-amino) acetic acid)-3-oxopropanoyl]-5,5-diphenylimidazolidine-2,4-dione (BK) shown better antifungal activity against *Candida albicans*.

Keywords: 5, 5-diphenylimidazolidine, Benzil, Urea, 4- amino benzoic acid, 2-Nitro Aniline, 4-Nitro Aniline, Aniline, Anti-fungal Activity, Griseofulvin.

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INTRODUCTION

In 1954, the 5, 5-diphenylimidazolidine nucleus was found. It has an amalgamated di-benzene and imidazolidine ring. Its structure resembles that of the medication phenytoin.[1] Due to its numerous pharmaceutical applications, 5, 5-diphenylimidazolidine has significant heterocyclic nuclei. Scientist Brecker created the first 5, 5-diphenylimidazolidine in 1956.[2] Two nitrogen atoms are present in 5, 5-diphenylimidazolidine-2, 4-dione (Figure 1).

The molecular weight of 5, 5-diphenylimidazolidine -2, 4-dione is 252.273 and the molecular formula of 5, 5-diphenylimidazolidine-2,4-dione is $C_{15}H_{14}N_2O_2$.[3] In particular, a molecule with an attached 5, 5-diphenylimidazolidine-2,4-dione ring that had both electron withdrawing and electron donating groups shown greater inhibitory ability than normal medication against both bacterial and fungal strains. A wide range of activities, including antimicrobial, anti-inflammatory, analgesic, anti-tubercular, anti-hypertensive, anti-convulsant, and anti-viral activity, are provided by 5,5-diphenylimidazolidine-2,4-dione.[4] Human mucosal health is somewhat impacted by microbial fungi like *Candida albicans* and *Aspergillus niger*. These microbial growths cause the host tissue to be destroyed and can cause fatal infections. Fungal infections of the skin and nails are brought on by the parasites *Candida albicans* and *Aspergillus niger*.

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ANTIDIABETIC POTENTIAL OF MEDICINAL PLANTS FROM AHMEDNAGAR DISTRICT

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ABSTRACT

The field of herbal medicine has grown exponentially in the past several years and due to their natural origins and low side effects, these medications are becoming more and more popular in both developed and developing nations. Anti – diabetic activity of medicinal plants is scientifically evaluated by in – vitro and in – vivo studies. Plants are the huge reservoir for variety of phytochemical constituents like terpenoids, glycosides, alkaloids, saponins, β sitosterol, tannins, phenolics, etc. Different compounds were isolated from the plants and they possess various pharmacological activities. The review covers the list of medicinal plants which having potential antidiabetic activity.

***KEYWORDS:* –** Medicinal plant, Anti – diabetic activity, Review.

INTRODUCTION

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world.

Diabetes mellitus (DM) is commonly referred to as a “sugar” and it is the most common endocrine disorder and usually occurs when there is deficiency or absence of insulin or rarely,

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GARDENIA GUMMIFERA: EFFECTS, ADVANTAGES AND FUTURE PROSPECTS

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ABSTRACT

This review employs a novel methodology to ascertain the present state of the well-known medicinal plant *Gardenia gummifera* Linn. f., which grows in India's tropical woods. In the Ayurvedic medicinal system, it is frequently used for its anthelmintic, carminative, and antispasmodic properties. Had abundant medicinal, antiradical, and insecticidal qualities compared to other parts of the *Gardenia gummifera* plant; nonetheless, the entire plant exhibited medicinal properties such as antispasmodic, carminative, anthelmintic, diaphoretic, and medicine. The purpose of this review is to highlight how many people use medicinal plants, minerals, and organic materials as sources of their medications. Apart from its medical importance, this tree has also been used for culinary and medicinal purposes. although this review also mentions the phytoconstituents found in *Gardenia gummifera*.

KEYWORDS: *Gardenia gummifera*, antispasmodic, ayurvedic, phytoconstituents.

INTRODUCTION

The majority of medical therapies used natural resources before the development of modern medications. This type of care is referred to as traditional therapy. India has exceptionally high standards for its medical procedures, including Ayurveda, Unani, and Siddha remedies. The primary sources of raw materials for Ayurvedic, Siddha, and Unani medicine manufacture are forests. In the Red Data Book, however, a large number of forest flora have accumulated.

Over 90% of basic materials come from forest extraction.[1] Over a thousand plant species are employed in various regions of India for traditional medicinal purposes. There are medicinal

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EFFECTS, PHARMACOLOGICAL ACTIONS, PHYTOCHEMICAL COMPONENTS AND THERAPEUTIC APPLICATIONS OF *ADENIUM OBESUM*

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ABSTRACT

Since ancient times, medicinal plants have been essential to the advancement of humankind and the treatment of a wide range of illnesses. The only secure sources of novel medications to treat both curable and incurable illnesses are medicinal plants. Approximately 25% of prescription medications on the market today come from natural resources. One of the few native medicinal plants, *Adenium obesum* (AO), is a member of the Apocynaceae family. *Adenium obesum* is significant from an aesthetic and ecological standpoint. Its caudex acts as a water store, allowing it to survive dry spells, and its blooms draw pollinators that are essential to the biodiversity of the ecosystem. The plant's cultivation demands specific attention, including proper lighting, welldraining soil, and appropriate, irrigation techniques. *Adenium obesum*'s potential as a medicine has also been piqued by early studies that indicates it may have anti-inflammatory, antioxidant, and anti-diabetic effects. Notwithstanding its widespread appeal, issues including habitat degradation and overfishing pose a threat to its continued survival.

KEYWORDS: *Adenium Obesum,* Apocynaceae, Antiinflammatory, Antidiabetic.

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REVIEW ARTICLE ON TO INVESTIGATE THE FINDINGS, POTENTIAL ADVANTAGES AND SIDE AFFECTS OF *STRYCHNOS NUX VOMICA.*

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ABSTRACT

Strychnos nux-vomica L. belongs to family Strychnaceae. The seed, known as "Kod-ka-kling," has long been used as a traditional Thai medicinal cure. Thai traditional medical textbooks states that S. nux-vomica seed has been used to treat numbness, paralysis, and diseases of the central nervous system. It has also been used as part of a Pikhad-kodpisate remedy, along with the roots of Anacyclus pyrethrum (L.) DC. and the rhizome of Rheum palmatum L., to treat diseases of the oral cavity and oropharynx, fever, menstrual disorders, hemorrhoids, and insect bite wounds. According to earlier research, S. nux-vomica seeds have pharmacological qualities that include anti-inflammatory, analgesic, and anti-tumor effects. But there has never been a defined standard for *S. nux-vomica* seed or crude medication in Thailand. Furthermore, the primary alkaloids in *S. nux-vomica* seeds, strychnine and brucine, have been employed as rodenticides and are said to be toxic.

KEYWORDS: Strychnos Nux Vomica, Strychnine, Brucine, Rodenticides, Paralysis.

INTRODUCTION

The *Strychnos nux-vomica* tree, often known as the vomiting nut or the poison nut tree, is the source of the homeopathic remedy known by the common name *nux vomica*.[1] The primary component of this natural treatment is the tree's seeds.[2] But the seeds also contain brucine and strychnine, both of which are poisonous in high concentrations. *Nux vomica* is used by people for a number of conditions.

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A REVIEW ON TOXICITY OF SODIUM LAURYL SULPHATE AND THEIR GOOD SUBSTITUENTS

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ABSTRACT

Sodium Lauryl Sulfate is a surfactant well known for its cleansing action and are widely used in many industries or for household purpose but its toxicity is the major concern to use. SLS leads to good cleansing action but it has various toxic effects on the environment therefore they are known as emerging contaminants. There is several natural substituents available which have less toxicity as compared to SLS such as ammonium laureth sulphate, lauryl glucoside, sodium cocoyl glycinate, sodium lauryl sulfoacetate, cocyl wheat isethionate, Sodium cocyl isethionate. These substituents are considered milder because they will not strip the moisture from the skin and don't cause toxic results. The use of substituents is demonstrated in the article and risk is reduced to some extent.

KEYWORDS: surfactant, SLS claims, product toxicity, safety review, Alternative used.

INTRODUCTION

A surfactant is a chemical compound that reduces the surface tension between two liquids. They contain both hydrophobic and hydrophilic groups, therefore they are amphiphilic. Surfactants are organic compounds commonly used in detergents, emulsifiers, wetting agents, foaming agents, and dispersants. They are used as wetting agents to lower the surface tension of a liquid and allow for increased spread ability.

There are different types of surfactants such as Anionic surfactants, Non-ionic surfactants, Cationic surfactants, and amphoteric surfactants. That Sodium Lauryl sulphate is an anionic Surfactant that is synthetic that can be dissolved in water and oil.[1] and whose global demand

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REVIEW ON PARENTERAL NUTRITION

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ABSTRACT

Parenteral nutrition (PN) is life-saving a intervention for patients where oral or enteral nutrition (EN) cannot be achieved or is not acceptable. The essential components of PN are carbohydrates, lipids, amino acids, vitamins, trace elements, electrolytes and water. PN is a costly therapy and has been associated with complications. Metabolic complications related to macro and micronutrient disturbances, such as hyperglycemia, thromboembolic complications, and electrolyte imbalance, may occur at any time during PN therapy, as well as infectious complications, mostly related to venous access. However, our present knowledge and technique in this field are far advanced over earlier methods. Now all patients who cannot take food in adequate amounts orally or enterally may be kept in good nutritional status by parenteral nutrition .In this way it is possible to prevent starvation in the patient.

Keywords: Parenteral Nutrition, Lipid Emulsion, Nutrients, Carbohydrates, Hyperglycemia.

I. INTRODUCTION

Parenteral nutrition is defined as intravenous delivery of synthetic and nutritionally equipoise combination of sterile nutrition. This is a method of a supplying nutrient directly into the GIT that is eternal feeding .Parental nutrition also called as a total parental nutrition (1) . Total parenteral nutrition (TPN) is a life preserving method of nutritional support for patients who are not able to ingest, digest, or absorb adequate nutrients to prevent death from lack of food(2). Total Parenteral Nutrition (TPN) is effective pharmacologic treatment that provide nutrients, electrolytes, trace minerals, vitamins, and medications directly into the bloodstream(3).

History

Parenteral or IV nutrition is a medicinal technique that has been obtainable for around 50 years. The successful growth of this mode of therapy, in a contemporary, was start in the late 1930s, but its practical clinical use did not appear until the 1960s. However, the history of this field dates back 350 years. In 1628 William Harvey discover the circulation of the blood and bring about for the rational for IV injection and infusion (4).

Parenteral nutrition has been defined as the intravenous delivery of nitrogen, calories, and other nutrients, sufficient to gain tissue synthesis and constructive metabolism in patients with ordinary or immoderate nutritional needs. The concept of intravenous therapy is old. Sir Christopher Wren, in 1656, is believed to have been the earliest to inject intravenous fluids into animals with achievement (5). In the midlife of parenteral nutrition, the 19th century, the first consequential trials in men can be detect . Around 1832 electrolyte solutions were given intravenously to cholera patients with good clinical results in Scotland. Some decades later Hodder tried infusion of milk in Canada with the same aim, but likely not with the identical effect . The first infusions of glucose go before to the 1890s (6).By the end of the past century and at the origination of the 20th century, it was investigated that nourishing proteins were hydrolyzed in the intestinal tract to amino acids and peptides, which were quickly absorbed . It was then objective to inquire into the effects of IV administration of amino acids and protein hydrolysates. The first successful investigation in this field was described in 1913 by V. Henriques and A.C Andersen in Denmark. They infused a hydrolysate of meat of cow protein into a goat and reached a favorable nitrogen balance. This indicates that IV protein hydrolysate could act as an sufficient substitute to dietary protein in animals (7).

Indications

PN is indicated in sick person who are malnourished and unable to permit enteral nutrition (EN). Malnutrition is defined as Deficiency or excess in nutrient intake imbalance of essential nutrients or impaired nutrients utilization or body does not get enough nutrients (8). Young one with cancer are at threat of gastrointestinal toxicity Linked to therapy such as the chemical substances to treat cancer in high dose, hematopoietic stem cell transplant (HSCT), or total body irradiation. The small intestine is especially capable to damage, and its censorious part in energy and fluid homeostasis may be damaged, leading to intestinal inadequacy. Following

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HAEMOVIGILANCE AND SAFETY OF BLOOD TRANSFUSIONS

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ABSTRACT

To boost the safety and effectiveness of administering blood transfusions and blood products, the nation urgently needs hemovigilance to recognize and prevent the incidence or recurrence of transfusion-related adverse events. Haemovigilance is a systematic approach of monitoring, identifying, reporting, looking into, and analyzing adverse occurrences and reactions related to the production of blood products and transfusions. As a result, the information gathered will make it easier to take corrective and proactive measures to reduce any potential dangers related to the collection, processing, and transfusion of patient blood. In collaboration with the National Institute of Biologicals (NIB), Noida, Uttar Pradesh, and the Ministry of Health and Family Welfare of the Government of India, the Indian Pharmacopoeia Commission launched the Haemovigilance Program of India (HvPI) in 2012. The primary goal of the Indian government's program is to monitor incidents, adverse responses, and occurrences related to the administration of blood products and transfusions. This article's primary goal is to provide a quick overview of the system that tracks the transfusion reaction at every stage.

KEYWORDS: Blood Transfusion reaction, haemovigilance, blood safety, Haemovigilance programme in India.

INTRODUCTION

The Greek word haema means blood and vigilance derived from the Latin word vigilans means watchful. Haemovigilance is a set of surveillance procedures covering the entire transfusion chain, from donation and processing of blood and it’s components, to their provision and transfusion to patients and their follow -up. It includes the collection and assess the information on uses, adverse effects of blood and blood products and to The Greek term haema, which

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(RESEARCH ARTICLE)

Check for updates

Preliminary phytochemical screening of various extracts of jade (*Crassula ovata*) plant in India

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Abstract

Medicinal plant are chief antidote for numerous diseases and have been used since time immemorial. Many years have passed since the *Crassula ovata* plant was utilised as an ornamental and therapeutic herb in some communities, such as the Khoi in South Africa and Chinese culture. This manuscript covers a detailed pharmacognostic evaluation of *Crassula ovata*. Whole plant *Crassula ovata*, including morphology, microscopy, physicochemical, and phytochemical screening. Microscopy of different plant part was done by performing transverse sections, which were identified by the different staining reagents and dyes. The whole plant's physicochemical constants, which consist of moisture content, extractive value, and ash value, were determined. Phytochemicals screening was done for methanol, ethanol, chloroform, acetone and water extract of *Crassula ovata*. Phytochemical analysis from the extracts was performed using the standard methods. Phytochemical analysis of the extract indicated the present of Saponin, phenol, phytosterol, steroid, terpenoid, flavonoid, carbohydrates and proteins. The Pharmacognostic evaluation generated data of *Crassula ovata* may be used as tools for quality control of drugs in the future, for healing of diversity of disease conditions.

Keywords: Phytochemical Screening; *Crassula ovata*; Jade Plant, Pharmacognostic Evaluation; Morphology; Microscopy

1. Introduction

Several ethnic communities in North East India use plants as a source of traditional herbal medicines to treat a wide range of illnesses. since of their distinctive characteristics, medicinal plants are currently viewed as being very important since they represent a major source of therapeutic phytochemicals that have the potential to be developed into new medications.[1]

Jade plan or *Crassula ovata,* is a medicinal herb that has long been used for treating diabetes symptoms. But till date, sporadic attempts have been made for the scientific and methodical validation of these traditional claims. Therefore, the present study was designed to investigate phytochemical screening, antioxidant, antimicrobial and antidiabetic activity of the leaf of *Crassula ovata*.[1] The native plant of South Africa is *Crassula ovata*. Although it is a widespread houseplant worldwide, it is primarily found in the Northern Hemisphere, especially in dry, cold climates with limited water sources. Thanks to Crassulacean Acid Metabolism (CAM), the *Crassula ovata* plant can photosynthesize with minimal water loss. The plant endures droughts, being grazed on, stomped on, or pushed over because of its succulent water-storing leaves, stems, and roots. It can even take root from a single leaf. Any fallen leaves that are left around the base of the plants put down roots and sprout new growth. They can also be chopped, put in a water container to promote the growth of roots (this normally takes two weeks), and then planted in soil. Bees, flies, wasps, butterflies, and beetles are all attracted to the blossoms of *Crassula ovata*. The seeds resemble fine dust and are dispersed by wind. Additionally, wasps can build their nests on the stems.[1] The leaves of *Crassula ovata* were traditionally used to treat warts by slicing

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A COMPREHENSIVE EXAMINATION OF *SEMECARPUS ANACARDIUM LINN.* AS A POTENTIAL ETHNOMEDICINAL PLANT

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ABSTRACT

Semecarpus anacardium Linn., belonging to the Anacardiaceae family, is renowned in Ayurveda for its medicinal properties. Since the inception of human civilization, traditional herbal plants have been utilized to address a range of significant disorders. Conventional medical approaches encompass remedies derived from plants, animals, and minerals, along with practices such as massage, spiritual therapies, and a diverse array of techniques specific to various regions and cultures. Bhilwa, an age-old plant, is renowned as a partial healer for its capability to treat nearly half of the recognized ailments. It is accessible in various formulations within both Ayurveda and the Siddha system of medicine. The nuts of this plant encompass a range of biologically active compounds, including biflavonoids, phenolic compounds, bhilawanols, minerals, vitamins, and amino acids, exhibiting diverse medicinal properties. The extract from the fruit and nut demonstrates a spectrum of activities, such as antiatherogenic, anti-inflammatory, antioxidant, antimicrobial, anti-reproductive, CNS stimulant, hypoglycemic, anticarcinogenic, and promotion of hair growth. This review focuses on the distribution, phytochemical composition, and pharmacological properties of *S. anacardium*.

KEYWORD: *Semecarpus anacardium,* Pharmacology activity, Phytochemical composition, Anacardiaceae.

INTRODUCTION

Traditional medicine encompasses the collective wisdom, skills, and methodologies rooted in the theories, beliefs, and experiences unique to various cultures. It is employed for the preservation of health, prevention, diagnosis, enhancement, and treatment of both physical and mental illnesses. Conventional medicine, alternatively known as allopathic, modern

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Research Article

Formulation Development And Evaluation Of Herbal Soap Containing *Aegle Marmelos* Fruit And *Azadirachta Indica* : Antifungal Activity

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ABSTRACT

The utilization of natural ingredients in skincare products has gained considerable attention due to their potential therapeutic benefits and minimal adverse effects. In this study, we focused on formulating an herbal soap using neem and bael fruit extracts renowned for their antimicrobial and skin-soothing properties. The preparation involved extracting active compounds from neem leaves and bael fruit pulp, followed by their incorporation into a soap base. The formulated herbal soap underwent comprehensive physicochemical evaluation, including pH determination, microbial analysis, and stability testing. Results revealed that the neem and bael fruit herbal soap exhibited favorable characteristics, including appropriate pH levels, antimicrobial activity against common skin pathogens, and stability under varying storage conditions. Furthermore, the soap demonstrated potential efficacy in alleviating skin ailments such as fungal infections, eczema, and dermatitis, attributed to the bioactive constituents present in neem and bael fruit. Overall, the development of this herbal soap presents a promising natural solution for skincare, harnessing the therapeutic properties of neem and bael fruit to promote skin health and well-being.

INTRODUCTION

Skin diseases pose significant public health challenges, impacting individuals and communities with pain, suffering, and reduced quality of life. The rise in skin conditions is attributed to the proliferation of harmful synthetic chemicals in skincare products. Fungal skin infections are particularly prevalent and demand attention for both treatment and ongoing skin health maintenance. These ailments, such as acne, eczema, hives, and psoriasis, have afflicted millions over many years. Fungi typically reside in the outer layer of moist skin cells, causing minor irritation, but certain infections can lead to more severe symptoms like itching, swelling, and blistering. Overall, skin diseases present a

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Original Article

Method Development and Validation for Simultaneous Estimation of Teneligliptin and Pioglitazone by UHPLC Method

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ABSTRACT

Objectives: To develop and validate a sensitive, accurate, simple, precise and cost-effective UHPLC method for the simultaneous determination of Teneligliptin and Pioglitazone in pure and its tablet formulation form and validating this developed method as per Guidelines of ICH (Figure 1). **Materials and Methods:** The chromatographic separation was done by using column Agilent C18 (2.5 µm; 4.6x100 mm ID), isocratic mobile phase consists of Methanol: 0.1% TEA (PH-6 WITH OPA) 60: 40%v/v. The flow rate of mobile phase is 0.9 mL/min. The separation was carried out at 241 nm wavelength. The current method for accuracy, precision, linearity, specificity, robustness and ruggedness was validated as per ICH guidelines. **Results:** Teneligliptin and Pioglitazone retention time observed at 2.382 and 3.315 min respectively. The graphs showing peak area against concentration demonstrated linear between 2-10 µg/mL for Teneligliptin and 1.5-7.5 µg/mL for Pioglitazone. This relationship exhibited a high level of linearity with a Regression coefficient (R^2) of 0.999. The determined limit of detection is 0.0843 and 0.0084 µg/mL while the limit of quantification was found to be 0.255 and 0.025 µg/mL for Teneligliptin and Pioglitazone respectively. The assay percentage of the available formulation was found to be 99.72 and 100.51 for Teneligliptin and Pioglitazone. **Conclusion:** The Validation parameters indicate the effective separation of the drug substance from their degradants effectively. This developed method shows the` suitability for the routine quantitative analysis of Teneligliptin and Pioglitazone in its pure and their available pharmaceutical formulations for quality control purpose.

Keywords: Teneligliptin, Pioglitazone, UHPLC, Method development, Validation.

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INTRODUCTION

Throughout the world, the prevalence of common endocrinological disorders, such as Diabetes Mellitus Type 2 (DMT2), is already high and is rising at an alarming rate. According to estimates, there will be more than 500 million diabetes patients by 2030 and over 700 million by 2045. A diverse metabolic disease, diabetes mellitus is characterized by changes in the metabolism of fat, protein, and carbohydrates.[1] A persistent metabolic illness marked by high blood glucose is called diabetes. The common type of diabetes, which affects adults, arises from the body's inadequate response to insulin called as Type 2 DM.[2] Type I, type II, and gestational diabetes are the three main categories of diabetes. The majority of people with diabetes (90%) have type II diabetes. When monotherapy for type II diabetes does not work, combined treatment is often recommended. The FDA has authorized the use of Teneligliptin (TEN) and Pioglitazone (PIO) together to treat type II diabetes.[3]

Dipeptidyl peptidase-4 inhibition done by the gliptins, include the antidiabetic medication teneligliptin. It is {(2S,4S)-4-[4-(3-methyl-1-phenyl-1H-pyrazol-5-yl)-1-piperazinyl]2-pyrroli dinyl(1,3-thiazolidin-3-yl) Methanone} Figure 2. Teneligliptin suppresses postprandial hyperglycemia after meals, which elevates activated Glucagonlike Peptide-1 (GLP-1) levels and acts for 24 hr.[4,5] Teneligliptin's distinct structure, which is made up of five successive rings, gives it a lasting and powerful impact. Teneligliptin is now used as a therapy for conditions in which diet, exercise, and medications from the thiazolidine or sulfonylurea classes do not sufficiently improve glucose control. The oral dose of teneligliptin should start with a dose of 20 mg once day and can be increased up to 40 mg. Patients with renal impairment do not require a particular dosage modification because the drug's metabolites are excreted through the liver and kidneys.[6]

Pioglitazone functions as an insulin sensitizer, chemically described as (RS)-5-(4-[2-(5-ethylpyridin-2-yl) ethoxy] benzyl) thiazolidin-2,4-dione, an oral type II diabetes medication

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Original Article

Synthetic and *in vivo* Antiepileptic Activity of "Benzene Sulfonic Acid and its Derivatives"

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ABSTRACT

Background: A heterocyclic hydrocarbon having a 5, 5-diphenylimidazolidine heterocyclic ring that possesses distinctive fundamental structural characteristics. It is a fused ring of aromatic di-benzene and imidazolidine. The flexible heterocyclic molecules in 5, 5-diphenylimidazolidine that have two nitrogen atoms. The biological activity of the 5, 5-diphenylimidazolidine ring and its derivatives is significant and encouraging. We produce a variety of 4-(chloroethoxy)-3-[2,4-dioxo-5,5-diphenylimidazolidine-1-yl) carbonyl] benzene sulfonic acid and its derivatives in this investigation. In literature survey and molecular docking; it was confirmed that 5, 5-diphenylimidazolidine-2,4-dione gives anticonvulsant effects. The pharmacological samples were examined for their ability to prevent convulsions using the strychnine-induced convulsion method. **Materials and Methods:** Benzoin; Benzil; Urea; Glacial Acetic Acid; 4-Amino Benzoic Acid; Con. HNO_3; Formic Acid; 2- Nitro Aniline; 4- Nitro Aniline; Aniline; Acetyl Chloride; Formic Acid; 4- amino Phenol are used for the synthesis.IR, NMR and MS are used for interpretation. **Results:** Our research led us to the conclusion that a variety of compounds have strong anticonvulsant properties. The compound 4-(2-chloro-N-(2-phenoxyethyl) aniline)-3-[2,4-dioxo-5,5-diphenylimidazolidine-1-yl) carbonyl] sulfonic acid (SPD5)- (scheme II A); 4-(3-chloro-N-(2-phenoxyethyl)aniline)-3-[2,4-dioxo-5,5-diphenylimidazolidine-1-yl) carbonyl] sulfonic acid (SPD6)- (scheme II A); 4-(2,5-dichloro-N-(2-phenoxyethyl)aniline)-3-[2,4-dioxo-5,5-diphenylimidazolidine-1-yl) carbonyl] sulfonic acid (SPD7) (scheme II A) and 4-(N-(2-phenoxyethyl)aniline)-3-[2,4-dioxo-5,5-diphenylimidazolidine-1-yl) carbonyl] sulfonic acid (SPD3) (scheme II A) gives strong anti-convulsant effects against phenytoin drug. **Conclusion:** The title compounds and their derivatives were examined for their ability to treat convulsions. Studies of the relationship between structure and activity revealed that compounds containing 5, 5-diphenylimidazolidine derivatives that have an electron-withdrawing group have higher activity than those that have an electron-donating group.

Keywords: 5, 5-diphenylimidazolidine, Benzil, Urea, 4- amino benzoic acid, 2- Nitro Aniline, 4-Nitro Aniline, Aniline, Strychnine, Anti-Convulsant Activity, Phenytoin.

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INTRODUCTION

The five 5-diphenylimidazolidine nucleuses were discovered in 1954. It comprises a di-benzene and imidazolidine ring joined. Its structure is comparable to that of the drug phenytoin.[1] The heterocyclic nucleus of 5, 5-diphenylimidazolidine are significant due to its many medicinal applications. In 1952, researcher Brecker produced the first 5, 5-diphenylimidazolidine.[2] Figure 1 shows the presence of 5-diphenylimidazolidine. Today's preferred moiety, 5, 5-diphenylimidazolidine, exhibits a variety of pharmacological properties.

The molecular weight of 5, 5-diphenylimidazolidine-2,4-dione is 252.273 and the chemical formula is $C_{15}H_{14}N_2O_2$. Since 1960, a compound containing one imidazolidine and two benzene rings has been frequently used in pharmacology. Many drugs' active components are constructed of 5, 5-diphenylimidazolidine-2, 4-dione rings, which have excellent basic characteristics due to the presence of two nitrogen atoms in their structure. Epidemiological studies show that 60 million people worldwide suffer from epilepsy, a common brain condition.[3-5] This figure rises by roughly 20,000 new cases per year. Despite the availability of more than 40 different anti-epileptic drugs in the Indian market, only 30% of individuals with uncontrolled seizures have been cured.[6-9] As a result, antiepileptic chemical research is now

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TITLE: TO DESIGN IN SILICO ADME SCREENING AND MOLECULAR DOCKING STUDY OF SOME NOVEL PHENOTHIAZINE DERIVATIVES

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ABSTRACT

In present study we have Designed the novel phenothiazine derivatives by using in silico ADME screening and molecular docking as antidepressants activity. Study involves the finding of 60 novel aldehyde derivatives of phenothiazine, which shows the antidepressant activity.

Schematic representation is drawn. ADMET studies of the 60 compounds is done by using software and selected 35 compounds which perfectly fitted into the Lipinski rule of five. After the ADMET screening of the novel compounds, Molecular docking of the 35 compounds is done and found the target for the phenothiazine derivatives for antidepressant activity.

Keywords: ADME Screening, Molecular Docking, Antidepressant, Phenothiazine Derivatives.

I. INTRODUCTION

Current medicines for depression either come up short to produce recovery or initiate undesirable side impacts. So there is still a expansive neglected clinical need[1-2]. The heterocyclic compounds which contain nitrogen and sulfur possess an enormous centrality in the field of medicinal chemistry.[3] The fundamental points in the advancement of new antidepressants were more prominent viability, nonappearance of side effects, lack of toxicity in over measurements and prior onset of action[4]

As assessed by WHO, depression should gotten to be the second biggest illness in terms of horribleness by another decade in the world; as of now one out of each five women, and each twelve men have misery. Not only adults, but two percent of school children, and five percent of young people too endure from depression, and these generally go unidentified.[5]

To the present information, antidepressant drugs utilized in the treatment of major depressive clutters are assumed to act on the central monoaminergic frameworks mainly serotonin (5-hydroxytryptamine, 5-HT) and noradrenaline (NA) synaptic neurotransmissions.

Selective serotonin reuptake inhibitors (SSRIs: paroxetine, fluoxetine, citalopram, escitalopram, fluvoxamine, sertraline) and noradrenaline reuptake inhibitors (NRIs: reboxetine, desipramine) are the major common endorsed antidepressant drugs.[6]

Drug discovery and development is a exceptionally complex and expensive endeavor, which incorporates disease selection, target identification and validation, lead discovery and optimization, preclinical and clinical trials[7,8] Since, Investigation of terminated projects uncovered that the primary cause for drug failure in the development stage was due to adverse pharmacokinetic profiles and ADMET properties, has required the incorporation of the concept of drug-likeness at early stage of drug discovery [9].Computational methodologies play vital roles in early arrange of drug discovery and expected to minimize the risk of toxicity [10]. Phenothiazines have found broad utilize in therapeutic chemistry and its derivatives have been detailed to possess various different biological exercises including antipsychotropic, antidepressant properties [11,12].

The basis for drug design is examining the activity mechanism of a protein by assurance of the correct binding conformation of small molecule ligands in the protein. Molecular docking is one of the most commonly utilized strategies for anticipating the conformation of small-molecule ligands within the suitable target binding site with a high degree of precision [13]. Docking can give hypothetical calculations for target-ligand binding conformation and binding affinity scores, making it valuable for both initial hit compound screening and computational analysis of lead compound binding patterns[14]

RESEARCH ARTICLE

Simultaneous Estimation of Montelukast and Doxofylline in Bulk Drug and Tablet Dosage Form by UHPLC Method

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ABSTRACT

The study's primary goal is to create a novel ultra-high-performance liquid chromatography (UHPLC) technique that is exact, sensitive, and accurate. The primary goal is to calculate the dosages of montelukast and doxofylline in both pharmaceutical and bulk forms. A C18 (AGILENT) column was used to achieve the chromatographic separation of the drug and contaminants. The mobile phase consisted of 0.1% OPA and 57:43% v/v methanol (a pH of 4.2 with TEA). The detection was performed at 278 nm utilizing UV detection. According to the results, dinoxyline and montelukast were effectively eluted at retention durations of 3.523 and 4.918 minutes, respectively, with the flow rate adjusted at 1.0 mL/dinoxyline, with good resolution. The suggested method demonstrated linearity in the dosage ranging from 1 to 5 µg/mL of montelukast and 40 to 200 µg/mL of doxofylline. The range of recovery percentages for montelukast and doxofylline is 100.565 to 101.061%. The method's validation was carried out in compliance with the specifications of the International Symposium on Harmonisation, resulting in good precision, sensitivity, accuracy, linearity, specificity, and robustness. In conclusion, the developed method successfully separates and estimates doxofylline and montelukast. Its application in routine analysis of these compounds in pharmaceutical formulations is viable and reliable.

Keywords: Doxycycline, Montelukast, UHPLC, Simultaneous estimation.

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INTRODUCTION

Doxofylline, or doxophylline, is a pharmaceutical belonging to the xanthine derivative class. It is employed at asthma therapy, exerting antitussive and bronchodilator effects while functioning as a phosphodiesterase inhibitor. And bronchodilators, such as doxofylline, are utilized to alleviate asthma symptoms by clearing lung mucus and reducing airway inflammation. Doxofylline is specifically employed to address symptoms related to asthma and certain respiratory conditions, demonstrating efficacy in diminishing the urge to cough and facilitating increased airflow to the lungs. The chemical composition of doxofylline is described as a 1-(1,3-dimethylpurine-2,6-dione)-1,3-dimethyloxolan-2-ylmethyl. It is essential to use doxofylline under the supervision of a healthcare professional for optimal management of asthma symptoms.

Montelukast, categorized as a leukotriene receptor antagonist (LTRA), is employed to both maintain asthma treatment and alleviate symptoms related to seasonal allergies. It works as an oral CysLT1 antagonist, inhibiting the action of leukocyte D4 and its analogs (LTC4 and LTE4) on the lings and bronchial tubes' CysLT1 cysteinyl leukotriene receptor. This binding effect reduces bronchoconstriction brought on by leukotrienes, leading to diminished inflammation. This reduction in inflammation helps relieve airway narrowing resulting from swelling. Montelukast also induces relaxation in the bronchial tube walls. Not only does it alleviate asthma symptoms, but it also treats high temperature and allergic rhinitis. Chemically, montelukast is defined as [R–(E)]2-(ethenyl] phenyl] 2-(7-chloro-2 quinolinyl) 1– [1– [3– [23– [2-(ethyl-11-methyl acetic acid (methyl phenyl] propyl] thio] methyl] cyclopropane. It's important to note that montelukast and the previously mentioned doxofylline play distinct roles in managing asthma. Figure 1 illustrates the chemical structures of both doxofylline and montelukast.

To enhance patients on ongoing treatment for chronic obstructive pulmonary disease (COPD) with asthma, a combination of doxofylline and montelukast is frequently employed. This combination is commercially available, prompting the selection of these drugs for analytical studies. The literature has already documented various methods for separate valuation of these drugs.[1-12] Additionally, some current

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Original Article

Stability Indicating Method Development and Validation of Teneligliptin by UHPLC Method in Bulk and Pharmaceutical Dosage Form

Sameer Narayan Godase[1], Kavita Bhushan Vikhe[1], Mahesh Hari Kolhe[1,*], Shubham Balasaheb Mhaske[1], Rohit Jaysing Bhor[2], Payal Sopan Gawali[3]

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ABSTRACT

Background: Teneligliptin is a new drug recently approved by FDA for treatment of type 2 Diabetes Mellitus (DMT 2). Very few methods have been reported for analysing its degradation products and their impact on human health. **Materials and Methods:** A precise, specific, and sensitive gradient UHPLC technique was developed and validated to analyze Teneligliptin using an Agilent C18 column (4.6x100 mm ID) with 2.5 µm particle size. The method employs a flow rate 0.9 mL/min and detects the teneligliptin at a wavelength 241 nm. This method comprises a mobile phase consists a mixture of Methanol with 0.1% TEA (60:40%v/v), along with a 20 µL injection volume for duration of 20 min. **Results:** Linearity was found in the range of 2-10 µg/mL having a correlation coefficient of 0.999. The retention time for Teneligliptin was found to be 2.382. Furthermore, the precision and robustness of the method were validated with a remarkable RSD (Relative Standard Deviation) below 2%. **Conclusion:** The method's stability under various stress conditions was confirmed through forced degradation studies conducted on both bulk substances and pharmaceutical dosage forms. Validation of the method followed the guidelines outlined by the ICH for assessing the validation parameters like specificity, linearity, accuracy, precision, robustness, LOQ and LOD.

Keywords: Teneligliptin, Method Development, Validation, Stability Indicating.

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INTRODUCTION

Common endocrinological diseases, such as Type 2 Diabetes Mellitus (T2DM), are substantially expanding globally, presenting a significant concern. According to estimates, there will be more than 500 million diabetes patients by 2030 and over 700 million by 2045. A diverse metabolic disease, diabetes mellitus is characterized by abnormalities in the metabolism of fat, protein, and carbohydrates.[1]

The prevalence of diabetes and its linked cardiovascular issues has become widespread, necessitating immediate focus on pathways and biomolecules implicated in their development. Research has revealed that mutations in the Peroxisome Proliferator-Activated Receptor (PPAR)-γ contribute to the onset of metabolic syndrome in humans.[2] Utilizing PPAR ligands shows promise in addressing metabolic disorders, diabetes, and the associated cardiovascular risks.[3]

In today's world, diabetes and its most abnormal forms represent a serious health concern.[4] A persistent metabolic illness characterized by high blood glucose is called diabetes. The most commonsortofdiabetes, type 2, mainlyaffectsadultsandisbrought on by insufficient or resistant insulin production in the body.[5,6] Teneligliptin, an antidiabetic medication categorized among dipeptidyl peptidase-4 inhibitors or gliptins,[7] is chemically described as {(2S,4S)-4-[4-(3-methyl-1-phenyl-1H-pyrazol-5-yl)-1-piperazinyl]-2-pyrrolidinyl} (1,3-thiazolidin-3-yl) methanone Figure 1. Its action spans 24 hr, working by increasing activated Glucagon-Like Peptide-1 (GLP-1) levels, thereby reducing post-meal hyperglycaemia.[8,9] Patients with DMT2 who administered teneligliptin for 12 weeks showed a significant reduction in their Hemoglobin A1c (HbA1c), fasting blood glucose, and postprandial blood glucose levels. This medication had a promising impact in reducing the risk of diabetes complications and regulating glycemic variations throughout the day.[10]

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Research Article

Formulation and evaluation of Heel Repair Cream by using Turmeric & Mustard oil

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ABSTRACT

The objective of this research was to formulate a cream for the treatment of cracked heels using mustard oil as a key ingredient. The cream formulation, comprising mustard oil, wax, turmeric, coconut oil, camphor ,was prepared and evaluated for various parameters including irritancy, Spreadability, stability, after-feel, and Washability. The results indicated that the developed cream, enriched with mustard oil, exhibited safety, effectiveness, and satisfaction in the treatment of cracked heels. This conclusion suggests that the formulated cream, devoid of irritancy and possessing anti-inflammatory, analgesic, and moisturizing properties, holds promise for skin protection and cracked heel treatment.

INTRODUCTION

The skin is the body's largest organ, covering an area of approximately 20 square feet (about twice the size of a bath). It comprises three layers: the epidermis, which forms a waterproof barrier and determines our skin tone; the dermis; and the subcutaneous tissue. Cosmetics are widely used to maintain and enhance the natural appearance of the face, skin, eyes, hair, hands, etc. Herbal cosmetic products contain active bio-ingredients, nutraceuticals, and pharmaceuticals. They are used for cleansing and beautifying the skin. The earliest recorded use of cosmetics dates back to the Egyptians in 4000 B.C. Pharmaceuticals are primarily drug products that prevent, alleviate, treat, or cure diseases and affect the structure or function of the body. The skin on the feet is often dry, rough, and chapped because there are no oil glands present. T[1,2,3]his dryness can lead to cracking. Factors such as lack of moisturization, excessive exposure to pollution, and certain medical conditions like eczema, diabetes, thyroid disorders, and psoriasis contribute to dry and cracked feet.[4]

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A systematic review on Cinnamomum zeylanicum

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Abstract:

This review explores the diverse pharmacological properties of Cinnamomum zeylanicum, covering its botanical description, phytochemical composition, and diverse health benefits, commonly known as cinnamon. From its antioxidant and anti-inflammatory effects to potential benefits in managing and improving cardiovascular health, the study delves into the scientific evidence supporting its medicinal uses. Beyond its medicinal uses, cinnamon holds a prominent place in culinary traditions worldwide, adding warmth and depth to both sweet and savory dishes. From spiced desserts to savory curries, cinnamon's versatility knows no bounds. However, despite its numerous benefits, caution is advised regarding its consumption in large quantities, particularly for individuals with certain medical conditions or those taking specific medications. Overall, this review underscores the multifaceted nature of cinnamon, therapeutic potential, and culinary significance.

1.Introduction:

The bark from different cinnamon species holds significant importance as a widely used spice globally, not just in culinary practices but also in both traditional and modern medicinal applications. The cinnamon genus comprises around 250 identified species, with trees distributed across the world.[1,2]

The primary utilization of cinnamon is in the fragrance and essence industries, leveraging its aromatic qualities that can enhance various food items, perfumes, and medicinal products [3]. Cinnamon's essential components, namely cinnamaldehyde and trans-cinnamaldehyde (Cin), found in its essential oil, play a crucial role in both its fragrance and the diverse biological activities associated with cinnamon [4]. Research on Cinnamomum osmophloeum (C. osmophloeum) revealed that the essential oil extracted from cinnamon leaves possesses a notable concentration of Cin. As a result, C. osmophloeum is employed as a substitute spice for C. cassia [5]. (E)-cinnamaldehyde, a significant component in the essential oil derived from C. zeylanicum, exhibits antityrosinase activity [6], with cinnamaldehyde identified as the primary compound responsible for this particular activity [7].

Procyanidins and catechins are present in cinnamon bark [8]. The procyanidins in cinnamon bark encompass both A-type and B-type linkages [9–11]. The procyanidins obtained from both cinnamon and berries exhibit antioxidant properties [10, 12].

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Research Article

Formulation and Evaluation of Meloxicam Ointment: A Comprehensive Study on Physicochemical Properties, Pre-formulation Studies, and In Silico Molecular Docking Analysis

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ABSTRACT

Meloxicam, a nonsteroidal anti-inflammatory drug (NSAID), holds promise for topical application due to its potent anti-inflammatory and analgesic properties. This study aimed to investigate the feasibility of formulating a Meloxicam ointment through a combined approach of molecular docking, formulation, and in vitro evaluation. Initially, molecular docking studies were conducted to assess the interaction of Meloxicam with key skin receptors implicated in inflammation, guiding the selection of excipients for optimal drug delivery. Subsequently, Meloxicam ointment formulations were prepared using various bases and evaluated for physicochemical properties, including spreadability, viscosity, and stability. The optimized formulation was subjected to in vitro release studies using Franz diffusion cells, demonstrating sustained drug release over time. Moreover, the anti-inflammatory efficacy of the Meloxicam ointment was evaluated using an in vitro model of inflammation, showcasing significant inhibition of inflammatory markers compared to controls. Overall, this study provides valuable insights into the molecular interactions and formulation parameters essential for the development of an effective Meloxicam ointment, highlighting its potential for topical management of inflammatory conditions.

INTRODUCTION

Meloxicam, classified as an NSAID, is utilized to manage osteoarthritis in adults, rheumatoid arthritis in adults, and juvenile rheumatoid arthritis in pediatric patients. It functions as a nonsteroidal anti-inflammatory medication to alleviate pain stemming from musculoskeletal conditions, osteoarthritis, and rheumatoid arthritis.[1] For people who need to take it once daily, it is a good choice because of its longer half-life compared to

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The Formulation, Development And Evaluation of Ointment for Anti-Inflammatory Activity

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ABSTRACT:
The search for safer anti-inflammatory agents has led to exploration of natural sources such as curcumin and fenugreek. Curcumin, derived from Curcuma longa, and α-linolenic acid from Trigonella foenum-graecum, exhibit significant anti-inflammatory properties. This study focuses on formulating an ointment utilizing these extracts for topical application. Molecular docking techniques were employed to assess the binding affinities of curcumin and α-linolenic acid. The ointment was prepared using various bases and preservatives, and its physicochemical properties were evaluated. Stability studies revealed consistent properties under different temperature conditions. Characterization of the drug extracts and ointment formulations was conducted to ensure efficacy and safety. The ointment showed promising results in terms of stability and efficacy, particularly formulation F2, suggesting its potential as a topical anti-inflammatory therapy with improved patient compliance.

Keyword: Curcumin, α-Linolenic Acid, Ointment, Molecular Docking.

INTRODUCTION:

The array of side Effects associated with available Anti-inflammatory drugs (both steroidal and non-steroidal) has prompted numerous studies to explore natural sources for alternative anti-inflammatory agents. The Curcumin and Fenugreek these are traditionally used as anti-inflammatory Activity. Curcumin demonstrates a wide range of pharmacological effects, including anti-inflammatory, antioxidant, anticancer, antimicrobial, neuroprotective, and cardioprotective properties [1]. Fenugreek exhibit the various pharmacological effects, including hypoglycemic [2], hypocholesterolemia [3], antioxidants [4], and appetite-stimulating properties [5]. Additionally, it demonstrates gastroprotective activity [6] [7], and histopathological examinations of the liver and brain indicate significant protection against ethanol toxicity [8] with aqueous extracts of fenugreek seeds. Known as "Shanbalileh" in Iranian traditional medicine, this plant has been utilized for its hypoglycemic and antirheumatic properties [7]. this study exhibits he topical preparation of ointment by using curcumin (extracted from *Curcuma Longa L.* belonging to family *Zingiberaceae*) and α-Linolenic Acid (extracted from *Trigonella foenum-graecum L.* belonging to family *Fabaceae*)

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Preliminary Phytochemical Screening of Amaranthus tricolor (Linn) Leaves in various solvents.

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ABSTRACT:

The genus Amaranthus has potential activity as a medicinal herb. The present phytochemical investigation focuses on evaluation of the efficacy of ethyl acetate,chloroform,n-hexane,acetone extract of leaves of Amaranthus tricolor Linn. The leaves were collected from the india .The all four extract of leaves of A. tricolor Linn. was prepared and phytochemical screening was done. The extract was prepared by Soxhlet extraction method. The test tube reactions shows and examination revealed the presence of phenols, alkaloids,glycosides,proteins and flavonoids in chloroform, ethyl acetate,n-hexane ,acetone and extracts of A. tricolor. By present work, it can be concluded that the plant A. tricolor is endowed with a significant medicinal activity due to the presence of active constituents like polyphenolic contents and, thus justifying its use in the indigenous system of medicine. The results of primary phtochemical screening ,preliminary phytochemical tests were satisfactory and can be correlated with earlier reports.

Keywords: Amaranthus tricolor, n-hexane,ethyl acetate,chloroform.

INTRODUCTION:

Amaranthus tricolour L. (Amaranthaceae) is an ornamental plant known as Joseph's coat in English and 'laal shak' in the local (Bengali) language. The plant is both cultivated in Bangladesh, and can be found growing on fallow lands. Amaranthus are considered as dominant leafy vegetables in temperate and tropical regions 1,2,3 . Amaranthaceae is a family of 70 species where 4 species are cultivated as leafy vegetables in this region. Amaranthus tricolor Linn is one of the most extensively consumed vegetables in Bangladesh due to its attractive color, nutritious value, and delicious flavor 4. The fundamental knowledge about the characteristics of the leaves, seeds, and flour is crucial for the promotion of the crop for use in the food industry. The Amaranthus tricolor L.(cv. Valentina) leaf extracts do not only have beautiful crimson color, they also contain a large number of biologically active substances and can be used for tea drinks preparation5. In spite of tremendous efforts made in the fi eld of modern medicine, there is hardly any drug that stimulates liver function, offer protection to the liver from damage or help regeneration of hepatic cell.6 The leafy vegetables, A. tricolor comprises an excellent source of proximate and minerals, antioxidant leaf pigments, carotenoids, vitamins, phenolics and flavonoids 7. Natural antioxidants like leaf pigments, carotenoids, vitamins, phenolics and flavonoids have proven for health benefits as they detoxify ROS (ROS, reactive oxygen species) in the human body 7,8

In this study, the phytochemical profiles of the amaranth tricolor, and A. tricolor were investigated to evaluate the levels of phytochemical studies to optimal consumption in terms of alternative raw material for a novel food industry in the future.

MATERIAL AND METHOD:

- **Collection of plant material[9,10]:**

The leaves of Amaranthus tricolor were collected in November 2023 from Beed district in India. The plant was authenticated by DR. Giri sir Department of Botany, from senior PVP COLLEGE PRAWARANAGAR dist. Ahmadnagar. The collected leaves were dried at room temperature.

- Chemical and Reagent[11,12] :Chloroform, n-hexane, acetone,ethyl acetate were used as solvents for the process of extraction .The following chemicals were used for the phytochemical screening test : chloroform,sulphuric acid,Dragendoffs reagent,Molisch reagent,ammonia,acetic acid,hydrochloric acid,ferric chloride,copper acetate,million reagent,fehlings solution,sodium hydroxide,etc.All chemicals were of analytical grades.

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Antidiabetic and Antihyperlipidemic Effects of Crude Fractions from *Chlorophytum borivilianum* Root Methanolic Extract on Streptozotocin Induced Diabetic Rats and Phytochemical Investigation by LCMS Analysis

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Abstract: To evaluate the in vitro and in vivo pharmacological efficacy of the plant *Chlorophytum borivilianum* in diabetes and hyperlipidemia and to confine and describe the synthetic constituents from the roots that are in charge of the action. The present study was carried out to investigate the ethno-medical use of *Chlorophytum borivilianum* root methanolic extract as a potential anti-diabetic and antihyperlipidemic agent in STZ-induced diabetic rats. Extract was tested for *in vitro* and *in vivo* biological activities. Soxhlet extraction was carried out using methanol as a solvent, and TLC and column chromatography were used for fractionation. Liquid Chromatography and Mass Spectroscopic study confirmed the structures of isolated compounds. *Chlorophytum borivilianum* root methanolic extract showed the presence of phytoconstituents as *Dihydrocapsaicin*, *Reserpine*, *Deserpidine*, *Biliverdin-IX-α,* and Cassiamin C having a therapeutic effect. Dihydrocapsaicin was identified at RT 7.572 and the *Chlorophytum borivilianum* root chloroform methanolic extract fraction noticeably depleted increased blood glucose levels and had positive effects on altered lipid profile after administering a dose of 150 mg/kg orally compared with oral hypoglycemic drug metformin. All the results are dose-dependent. Active chloroform-methanol fraction from methanol extract showed the presence of anti-diabetic compound, *Dihydrocapsaicin*. The chloroform-methanol fraction from the methanolic extract of *Chlorophytum borivilianum* root can inhibit the parameters linked to diabetes and hyperlipidemia.

Introduction

Diabetes mellitus is a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbed carbohydrates, fats and protein metabolism. Its result is defects in insulin secretion (Pramanik, 2018; Sarkar et al., 2022; Biswas et al., 2023). Diabetes means the human body's blood sugar level is too high (Roy et al., 2023; Jaiswal and Gupta, 2023). The high sugar level in the blood is not good for human health. Diabetes is a metabolism disorder, which is how our body uses digested food for growth and energy (Sarkar et al., 2022; Sur et al., 2023; Tyagi et al., 2024). Diabetes mellitus has been recognized as a growing worldwide epidemic by many health advocacy groups, including the World Health Organization (WHO). The WHO has estimated that diabetes will be one of the world's leading causes of death and disability within the next quarter century (Aloke et al., 2022) In the Indian system of Ayurveda, tubers of *Chlorophytum borivilianum Santapau and Fernandes* are very famous for their apoptogenic and aphrodisiac properties. *Chlorophytum borivilianum*, commonly known as Safed Musli, is a genus of at least 200-220 species of recurrent flowering plants in the Asparagaceae family, native to the humid and subtropical area of Asia and Africa (Kaushik, 2005; Sundaram et al., 2011). It is found in the oldest mountain ranges on the continent, the Aravalli's, from where it spread to the nearby areas of the sub-continent, currently known as

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Research Article

Formulation And Evaluation Of Capsule Of Nifedipine By Liquisolid Compact

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ABSTRACT

The most suitable and helpful measurement structure is a container. the ability to conceal awful preferences and scents. They might work on the dynamic fixings' bioavailability and promptly break down in the gastrointestinal system's gastric juices. The calcium-channel blocker nifedipine is much of the time used to treat fundamental hypertension and angina pectoris. Nifedipine has a somewhat short half-existence of two hours and is totally solvent in water. Subsequently, it is by and large recognized that the best type of Nifedipine for routine hypertension treatment is in container structure. The essential objective of the exploration was to make and evaluate a hard gelatin case measurement type of nifedipine, which is utilized to treat hypertension. To work on the dissolvability of the prescription, polymers like Transcutol and Stake 400 were utilized.

INTRODUCTION

The improvement of the oral medication conveyance framework primarily relies upon drug solvency, in this manner its oral bioavailability.[1] More than 90 % of dynamic drug fixings a work in progress and 50 % of as of now marketeddosage structures have dissolvability issues. Nifedipine is one of the most intense cal-cium-channel blockers. It is broadly utilized in the treatment of vascular illnesses, for example, hypertension, angina pectoris and Raynaud's peculiarity. it is a profoundly non-polar com-pound, which ingested totally from the gastrointestinal plot. However, has an exceptionally low bioavailability essentially due to presystemic digestion. On account of the restricted aque-ous solvency, it shows unfortunate disintegration attributes and its oral assimilation is dis-arrangement rate limited.The new 'liquisolid" method might be applied to figure out fluid meds (i.e., slick fluid medications and arrangements, sus-annuities or emulsions of water-insoluble strong medications conveyed in nonvolatile fluid vehicles) into powder. liquisolid smaller method is a promising and novel procedure to upgrade inadequately water-dissolvable medications' dissolvability and disintegration rate.[2] In this

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Research Article

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STABILITY INDICATING RP-HPLC METHOD FOR ESTIMATION OF CARIPRAZINE HYDROCHLORIDE IN HUMAN PLASMA

Mohini Shelke, Rahul Godge*, Tejas Sahane, Onkar Pawar, Sujata Kasar

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Keywords
Bioanalytical, Cariprazine Hydrochloride, Forced Degradation, Protein Precipitation extraction, RP-HPLC, Validation

ABSTRACT
Objective: The objective of the study is to create and validate the easy, dependable, accurate, sensitive, and selective RP-HPLC method for estimating Cariprazine HCl in human plasma. **Methodology:** The sample was prepared using the protein precipitation extraction method. The chromatographic separation was performed with an AGILENT C18 column (250mm x 4.6ID) as the stationary phase and a mobile phase consisting of a 75:25 v/v solution of Methanol and 0.1% Orthophosphoric acid at a flow rate of 0.7 ml/min. The DAD detector was used to carry out the detection at 253 nm. Cariprazine HCl had a reduced retention duration of 2.46 minutes. **Results & Discussion:** The calibration curve had a correlation coefficient of 0.998 and was linear over the concentration range of 1–5µg/ml. The method's accuracy was shown at levels between 80%, 100%, and 120% of the specification limit. The developed method exhibited excellent precision, with interday precision ranging from 0.07% to 1.77% and intraday precision from 0.03% to 0.26%. It was discovered that the recovery of Cariprazine HCl was within the 98% range. Cariprazine HCl was discovered to have a Limit of Detection (LOD) of 0.053µg/ml, and the Limit of Quantification was found to be 0.160µg/ml. **Conclusion:** The solution was injected in duplicate, and the % RSD was measured. The results indicate that the proposed method can be effectively utilized for the routine analysis of Cariprazine HCl in human plasma. The forced degradation studies indicate that the drug is susceptible to Hydrolytic and Photolytic degradation.

INTRODUCTION

Research on bioavailability and bioequivalence, the quantitative assessment of drugs and their metabolites, drug development, clinical, pharmacokinetics, and basic biomedical and pharmaceutical sciences investigations rely on methods for measuring medications in biological fluid [1]. Cariprazine HCl has the chemical formula $C_{21}H_{33}C_{l3}N_4O$. Cariprazine is a derivative of piperazine and an atypical antipsychotic drug that was initially created in Hungary [2,3]. Its initial worldwide approval was in the US in September 2015 and was afterward given Health Canada's approval in April 2022. Currently, bipolar I disorder's manic or mixed episodes, depressive periods, and

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RESEARCH ARTICLE

Validated Stability Indicating RP-HPLC Method for the Quantification of Process Related Impurities of Solifenacin and Mirabegron in Pharmaceutical Formulations

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ABSTRACT

To assess solifenacin (SOL) and mirabegron (MER) simultaneously, a verified reverse-phase high-performance liquid chromatography (RP-HPLC) method has been developed to indicate stability. The method was thoroughly evaluated and found to meet satisfactory criteria for precision, linearity, accuracy, limits on detection, and robustness, limits on quantitation. The quantitation wavelength of 231 nm was determined. Linearity was successfully demonstrated across concentration ranges of 5 to 25 µg/mL of solifenacin and 50 to 250 µg/mL of mirabegron. RPHPLC separations was conducted employing a Phenomenex L. C18 column measuring 250 x 4.6 mm and containing particles as small as 5 µm. The methanol and phosphate buffer (pH 7) were combined in a volumetric ratio of 25:75 to create the mobile phase. The separation is accomplished at a 0.7 mL per minute flow rate. Time spent in retention for mirabegron and solifenacin had been established at 5.521 and 9.161 minutes, respectively. Forced degradation studies validated the stability-indicating character of the approach, which included hydrolysis under acidic and basic conditions, exposure to H_2O_2, thermal degradation, and photodegradation. Mirabegron and solifenacin exhibited 10 to 20% degradation under the specified conditions. Importantly, the process evaluated the two prescription drugs in detail with all degradation products generated during the forced degradation experiments. This developed method is characterized as straightforward, specific, and cost-effective, making them suitable of the simultaneous estimate of mirabegron with solifenacin in tabs dose forms.

Keywords: Solifenacin, Mirabegron, RPHPLC technique, Validation, Forced degradation.

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INTRODUCTION

Mirabegron (MER), The compound with the chemical name 2-(pentamethylthiazol-4-yl) four-([(2R)-2-hydroxy-2-phenylethyl] aminoethyl) phenyl] A agonist that activates beta-3 adrenoceptors is acetamide. Large randomized placebo-controlled clinical trials have demonstrated its high safety and efficacy profile. This drug is used to treat urge urine incontinence, urgency, and increased frequency of urination, all of the symptoms of an overactive bladder. A muscarinic acetylcholine receptor antagonist, solifenacin (SOL), is utilized to manage an overactive bladder, where it competitively blocks these receptors to alleviate symptoms. The ingredient is 1-azabicyclo oct-8-yl(1S) chemically 1,4-dihydro-1-phenylhesoquinoline 1methoxylate -2.

A review of the literature reveals that numerous analytic techniques have been devised and published for the estimation of MER by reverse-phase high-performance liquid chromatography (RP-HPLC), high-performance thin layer chromatography (HPTLC) and spectrofluorometry[1-5] and SOL individually or in combination with other drugs by chromatographic and spectroscopic techniqus.[6,10] Also, A literature review considers spectrophotometric, RP-HPLC, fluorometric and thin layer chromatography (TLC) methods for the combined dosage form.[12-15] Even so, there isn't stability indicating the RP-HPLC technique for these two prescription drugs' simultaneous measurement. The "Stability testing of novel medicinal ingredients and products" guideline from stress testing is required by to ascertain the intrinsic durability qualities of the active ingredient by the International Harmonization Council (ICH). Achieving a perfect stability-indicating approach is crucial, providing excellent drug and degradation product resolution. Subsequently, it presents a

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DEVELOPMENT AND VALIDATION OF A QbD-BASED RP-HPLC METHOD FOR VERICIGUAT QUANTIFICATION

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Keywords
Quality by Design (QbD), RP High Performance Liquid Chromatography (RP-HPLC), Vericiguat, Central Composite Design (CCD)

ABSTRACT
Aim: An RP-HPLC method for Vericiguat using the QbD approach was developed and validated by ICH guidelines. **Method:** The ICH (Q2R1) guidelines have been followed in the development and validation of an RP-HPLC technique by considering several validation parameters like linearity, precision, LOD, LOQ, and accuracy. The study was performed on Agilent Tech using the C18 column (4.6x250 mm; 5 µm) and Chemstation 10.1 software with statistical data analysis, and the detector used was UV (DAD). **Results:** The mobile phase used for separation was Methanol: 0.1% OPA in the ratio of (76:24) at room temperature, the flow rate was 0.8ml/min, and the wavelength was 331nm. The results indicated that the quantification limit was 0.7209 µg/ml, and the detection limit was 0.2379 µg/ml. **Conclusion:** The validation studies confirmed that the developed method is fast, accurate, precise, cost-effective, selective, and useful for routine analysis of vericiguat in tablet dosage forms.

INTRODUCTION

Vericiguat is a new, orally soluble guanylate cyclase (sGC) drug used to treat heart failure while reducing hospitalization rates and improving ejection fraction [1-5]. Vericiguat relaxes smooth muscles by inducing vasodilation, thereby improving cardiac function.

More importantly, a comprehensive review of the available lite rature using the RP-HPLC method revealed a lack of specific methods for analyzing veriguat using this cell. This work aims to provide a reliable, accurate, and simple RP-HPLC technique for determining vericiguat dose forms. The procedure has been validated according to ICH guidelines [6-7]. Combining product specification, risk assessment, critical procedures (CPPs), and critical attributes (CQAs) to create a manufacturing environment is quality by design or QbD.

This comprehensive strategy aims to be well integrated into the drug development and review, leading to final drug approval & ongoing monitoring [8]. In the field of analysis this method is called Quality Analysis by Design (AQbD) [9-12]. Using QbD in the analysis process provides easy control by working in the design environment and following the rules of life. Therefore, QbD has attracted the attention of pharmaceutical companies and research centers [13-16]. High-performance liquid

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Synthesis and In-Vitro Anti Bacterial Activity of (E)-1-(3-oxo-3-(p-tolyl) prop-1-en-1-yl)-5,5-Diphenylimidazolidine-2,4-Dione and its Derivatives

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Abstract **Introduction:** 5, 5-diphenylimidazolidine is a heterocyclic hydrocarbon with distinctive basic structural properties in its molecular structure. A novel series of (E)-1-(3-oxo-3-(p-tolyl)prop-1-en-1-yl)-5,5-diphenylimid azolidine-2,4-dione and its derivatives were created by treating different 1-acetyl-5,5-diphenylimidazolidine-2,4-dione (0.025 mol) with an equimolar quantity of 4-methyl benzaldehyde. **Methods:** The structure of synthesised compounds was confirmed using FTIR, NMR spectroscopy, and MS. The agar dilution method was used to test the title compounds and their derivatives for in vitro antibacterial activities against various human pathogenic microorganisms. Ciprofloxacin was used as the standard medication. All of the title compounds were active against some strains of microorganism. According to structural activity connection research, compounds with an electron-withdrawing group have higher activity than compounds with electron-donating groups. **Results:** Based on the results obtained, when compared to common medicines like Ciprofloxacin; the compounds 4-(2,4-dioxo-5,5-diphenylimidazolidin-1-yl)-4-oxobutanoi c acid (SW1)(E)-1-(3-oxo-3-(p-tolyl)prop-1-en-1-yl)-5,5-diphen ylimidazolidine-2,4-dione (SW2)(E)-1-(3-oxo-3-(p-tolyl)prop-1-en-1-yl)-5,5-diphen ylimidazolidine-2,4-dione (SW3) showed good significant activity. **Conclusion:** The antibacterial activity of the title compounds and their derivatives was examined. According to structural activity relationship studies, compounds containing 5, 5-diphenylimidazolidine derivatives with an electron-withdrawing group perform better than compounds with electron-donating groups. Table 3 shows the preliminary antimicrobial testing findings of the produced compounds, including the usual broad spectrum antibacterial medication Ciprofloxacin. The synthetic compounds have been evaluated for their capacity to inhibit (E)-1-(3-oxo-3-(p-tolyl)prop-1-en-1-yl) and their antibacterial activity. Derivatives of -5,5-diphenylimidazolidine-2,4-dione (SW2) have significant antibacterial action.

Keywords Antibacterial, 5, 5-Diphenylimidazolidine-2, 4-Dione, Ciprofloxacin, 4-Methyl Benzaldehyde

1. Introduction

The nucleus of 5, 5-diphenylimidazolidine was found in 1954. It combines the di-benzene and imidazolidine rings. Its structure is comparable to that of the Phenytoin

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Original Article

Docking Sites of Indole Derivative on Mitogen-Activated Protein Kinase (MAPK) Inhibitor (PDB ID- 1A9U) against Inflammation

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ABSTRACT

Background: The serine/threonine kinase p38 Mitogen-Activated Protein (MAP) kinase is one of the most well studied kinases in the inflammatory process. The goal of this study was to see how a p38 MAP Kinase inhibitor (PDB ID- 1A9U) affected the activity of a p38 MAP kinase implicated in inflammation. "Inflammation is a common feature of age-related neurodegenerative diseases in the Central Nervous System (CNS)." The p38 Mitogen-Activated Protein Kinase (MAPK) pathway regulates the synthesis of IL-1 and TNF. **Materials and Methods:** The study focused on molecular docking and ADME of the relationships that exist between [4-amino-3-(1H-indol-1-yl) phenyl] (4-hydroxyphenyl) methanone derivatives and p38 Mitogen-Activated Protein (MAP) kinase. Inhibition of p38 Mitogen-Activated Protein (MAP) kinase pathway, a series of [4-amino-3-(1H-indol-1-yl) phenyl] (4-hydroxyphenyl) methanone derivations were developed and evaluated in silico. The designed composites' medicine-likeness packets were predicted. **Results:** According to molecular docking experiments, all composites had improved interactions with the target protein and may be powerful drugs. The developed [4-amino-3-(1H-indol-1-yl) phenyl] (4-hydroxyphenyl) methanone analogues may be more effective and safer anti-inflammatory medicines. **Conclusion:** According to the findings of this investigation, p38 MAPK inhibitors alone are a unique therapeutic target for inflammatory disorders. p38 Mitogen-Activated Protein (MAP) Kinase is a critical serine/threonine kinase that has been well studied in the inflammatory process.

Keywords: P38 MAPK, Inflammation, ADMET, Indole, Molecular docking, IL-1, TNF.

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INTRODUCTION

The p38 Mitogen-Activated Protein Kinase (MAPK) is a key modulator of inflammation as well as inflammatory and neuropathic pain. Docking-groove dependent interactions are critical for p38 MAPK-mediated signal transduction, as we recently demonstrated. As a result, virtual screening was used to discover potential docking groove-targeted p38 MAPK inhibitors.[1-3] Several indole family compounds were found to have low micromolar inhibitory activity in a p38 MAPK activity assay and in THP-1 human monocytes functioning as inhibitors of LPS-induced TNF release.[4] Because of their powerful *in vivo* effects, p38 MAPK docking-site specific inhibitors have been proposed as a potential innovative method for the treatment of inflammatory pain. Inflammation is a chain reaction caused by innate immune responses to microbial infection. Non-infectious triggers, such as cell damage and tissue injury, can also activate these responses and cause local inflammation.[5,6] Uncontrolled acute inflammation gradually destroys tissues and organs, impairs their activities, and progresses to chronic inflammation and degenerative disorders including osteoarthritis, rheumatoid arthritis, and even cancer. When exposed to a chemoattractant, tissue monocytes transform into macrophages, which engulf and destroy bacteria in phagolysosomes utilising a variety of hydrolytic enzymes.[7] The Mitogen-Activated Protein Kinase (MAPK) p38 is an important signalling protein that regulates the synthesis of numerous inflammatory mediators. As a result, p38 MAPK has been the subject of extensive research in academic institutions as well as numerous pharmaceutical businesses.[8,9] p38 belongs to the MAPK family of serine/threonine kinases, which have a similar general structure and manner of activation by phosphorylation at the activation loop by upstream activators such as MKK3 and MKK6 for p38 MAPK. Of the four p38 MAPK isoforms, p38 and are ubiquitously expressed, with p38 being the most prevalent in inflammatory cells. Many extracellular stimuli,

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Validated Stability Indicating UHPLC Method for the Quantification of Escitalopram and Flupentixol in Pharmaceutical Formulation

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Abstract: To assess Escitalopram and flupentixol simultaneously, a verified method for ultra-phase high-performance liquid chromatography (UHPLC) has been developed to indicate stability. The method was thoroughly evaluated and met satisfactory criteria for precision, linearity, accuracy, limits on detection, robustness, and quantitation. The quantitation wavelength of 235 nm was determined. Linearity was successfully demonstrated across concentration ranges of 1–5 µg/ml of Escitalopram and 20-100 µg/ml of Flupentixol. UHPLC separations were conducted employing a Phenomenex L. C18 column measuring 100 x 4.6 mm and containing particles as small as 2.5 µm. To create the mobile phase, the 1% OPA and methanol (a pH of 4.2 with TEA) were combined in a volumetric ratio of 65:35v/v. Escitalopram and Flupentixol were effectively eluted at retention durations of 3.044 and 4.118 minutes, respectively, with the flow rate adjusted at 1.0 ml. The stability-indicating nature of the method was established through validated forced degradation studies. Which included hydrolysis under acidic and basic conditions, exposure to H_2O_2, thermal degradation, and photo-degradation. Escitalopram and Flupentixol exhibited 10 to 20% degradation under the specified conditions. Importantly, the process evaluated the two prescription drugs in detail with all degradation products generated during the forced degradation experiments. This developed method is characterized as straightforward, specific, and cost-effective, making it suitable for simultaneous estimating Escitalopram and Flupentixol in tabs dose forms.

Introduction

Escitalopram oxalate (ESC) is utilized in the treatment of depression and anxiety, functioning by restoring the balance of serotonin, a natural substance in the brain. Flupentixol HCI (FLU) is employed to alleviate symptoms associated with Schizophrenia and other mental health disorders. Numerous analytical methods for evaluating pharmaceutical drugs in various formulations. A comprehensive literature review has disclosed a range of analytical methods for estimating ESC alone and in combination with other drugs. Similarly, different methods are available for determining FLU alone and in combination with other drugs. Although there is a UV-spectroscopic method for Simultaneous determination of ESC (escitalopram) and FLU (flupentixol) in a combined dosage form (Goulikar et al., 2022; Patel et al., 2016; Darthi et al., 2018; *Singh* et al., 2016; Sakhreliya et al., 2012) also it was achieved using RP-HPLC for Analysis of ESC and FLU in combined dosage form and with other drugs reported in the literature (Panchale et al., 2021; Sellappan et al., 2021; Damor et al., 2017; Kakde et al., 2013; Kadam et al., 2022; *Stefan* et al., 2022; Beula et al., 2022; Nagar et al., 2015; Bindusar et al., 2019; Kumar et al., 2022; Nagar et al., 2015). HPTLC method is also available for determining FLU and ESC in combined dosage form (Malathi et al., 2022). Validated analytical method development for other combination by Rp-HPLC (Gosavi et al., 2023) with stability by Rp-HPLC method for other drugs which is referred for stability parameters (Dey et al., 2020; Deshpande et al., 2023). None have encompassed complete validation according to ICH

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Exploring the Antifungal Potential of 1,2,4-Triazole Derivatives: A Comprehensive Study on Design and Synthesis

Discovery of new antifungal agents is of great importance due to the increased prevalence of fungal infections and the emergence of drug-resistant strains. 1,2,4-Triazole derivatives have shown promising antifungal activity; therefore, this study aimed to design, synthesize and evaluate the antifungal potential of a series of 1,2,4-triazole derivatives. A series of 1,2,4-triazole derivatives were designed and synthesized. The compounds were characterized using FTIR, NMR and MS techniques. In silico studies including ADME properties, drug-likeness and molecular docking were carried out to evaluate the potential of the synthesized compounds as antifungal agents. In vitro antifungal activity was evaluated against *Candida albicans* and *Aspergillus niger* using the agar well diffusion method and zones of inhibition were measured. All synthesized compounds exhibited good physicochemical properties and drug-likeness profiles. Compounds AN5 and AN6 displayed the highest binding affinities of -9.2 and -10.0 kcal/mol, respectively, and showed promising antifungal activity. At a concentration of 100 µg/ml, compound AN5 exhibited zones of inhibition of 19.9 mm and 20.5 mm against *C. albicans* and *A. niger*, respectively, while compound AN6 displayed zones of inhibition of 19.5 mm and 22.5 mm, respectively. The marketed standard, namely itraconazole at the same concentration showed zones of inhibition of 23.8 mm and 24.7 mm. The designed 1,2,4-triazole derivatives, particularly AN5 and AN6, demonstrated promising antifungal activity against *C. albicans* and *A. niger*, making them potential candidates for further development as antifungal agents.

Keywords: 1,2,4-triazole derivatives, antifungal activity, in silico studies, molecular docking, *Candida albicans*, *Aspergillus niger*.

Abbreviation

FTIR: Fourier Transform Infrared Spectroscopy; NMR: Nuclear Magnetic Resonance Spectroscopy; MS: Mass Spectrometry; ADME: Absorption, Distribution, Metabolism and Excretion; CMC: Critical Micelle Concentration; TPSA: Topological Polar Surface Area; Papp: Apparent Permeability; GI: Gastrointestinal; BBB: Blood-Brain Barrier; PPB: Plasma Protein Binding; CYP: Cytochrome P450; PDB ID: Protein Data Bank Identifier; MS: Marketed Standard.

Introduction

Fungal infections have become a major global health problem, affecting millions of people each year. The increase in incidence can be attributed to several factors, including the growing number of immunocompromised individuals, the widespread use of antibiotics and the evolution of drug-resistant fungal strains [1]. Consequently, there is an urgent need for the development of novel antifungal agents with improved efficacy, safety and resistance profiles. Antifungal agents play a critical role in the treatment and prevention of fungal infections. They are used to treat superficial mycoses such as dermatophytosis and systemic mycoses,

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Original Article

Exploring the Anti-bacterial Potential of Novel 2-Aminophenyl-2-(2,4,5-Triphenylimidazole) Acetate Derivatives: A Comprehensive Design and Synthesis Approach

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ABSTRACT

Background: Antibiotic resistance is a growing concern, and the development of new anti-bacterial agents is crucial. 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives have shown potential as anti-bacterial agents in previous studies, and this study aims to further explore their potential. **Materials and Methods:** Several 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives have been developed and synthesized in this work. Using the disc diffusion technique, their anti-bacterial activity was assessed against *Escherichia coli* and *Staphylococcus aureus*. Additionally, the compounds' drug likeness and ADMET (Absorption, Distribution, Metabolism, Excretion, and Toxicity) characteristics were assessed. To learn more about how chemical compounds attach to the biotin protein ligase, molecular docking investigations were carried out. **Results:** The synthesized compounds exhibited varying degrees of anti-bacterial activity, with AC6 showing the highest activity against both *E. coli* and *S. aureus*. The compounds were found to adhere to Lipinski's rule of five, indicating good drug likeness, and exhibited favourable ADMET properties. The molecular docking studies revealed that the compounds had favourable binding modes with biotin protein ligase (PDB ID: 4DQ2). **Conclusion:** The 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives designed and synthesized in this study exhibited promising anti-bacterial activity against *E. coli* and *S. aureus*. The compounds also demonstrated good Drug likeness and favourable ADMET properties. The molecular docking studies provided insights into the binding modes of the compounds with biotin protein ligase. These results suggest that 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives have potential as anti-bacterial agents and warrant further investigation.

Keywords: Anti-bacterial, 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives, Drug likeness, ADMET, Molecular docking.

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INTRODUCTION

The increasing prevalence of antibiotic-resistant bacterial infections has become a global public health concern, necessitating the development of novel anti-bacterial agents to combat these emerging threats.[1] In recent years, numerous studies have focused on the design and synthesis of new compounds with unique chemical structures and mechanisms of action, aiming to circumvent existing resistance pathways and improve the efficacy of anti-bacterial treatments. The biological activities of imidazole derivatives, which include anti-bacterial, anti-viral, and anti-cancer capabilities, have drawn lots of interest as one of the possible scaffolds for such molecules.[2,3]

In this context, the present study explores the antimicrobial potential of novel 2-aminophenyl-2-(2,4,5-triphenylimidazole) derivatives, which combine the pharmacologically active imidazole core with strategically selected substituents to enhance their anti-bacterial activity. This research article delves into the comprehensive design and synthesis approach undertaken to generate these innovative molecules, detailing the rationale behind the choice of functional groups, the optimization of synthetic pathways, and the evaluation of their *in vitro* and *in silico* anti-bacterial properties.[4]

Our investigation begins with a thorough review of the current state of knowledge regarding imidazole derivatives and their antimicrobial activities, providing a solid foundation for the design of our target compounds. We then discuss the molecular

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DESIGN, SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SOME NOVEL SUBSTITUTED PHENYTOIN DERIVATIVES

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ABSTRACT

There is an increasing prevalence of epileptic patients throughout the world and new compounds are necessary to overcome this. While the current available treatment causes abnormal body movement, loss of coordination and confusion, etc. this has led to a demand for more affordable, more effective methods for epileptic patients. Aim of this research is too focused on finding alternative medicinal remedies with significant anticonvulsant activity as well as low adverse effects. This study synthesized, characterized, and evaluated anti-convulsant properties of synthetic Hydantoin hybrid of 5, 5-Diphenylimidazolidione-2, 4-dione derivatives. Hybrid between phenytoin and 1-Oxa-4-azacyclohexane Tetrahydro-1, 4-oxazine Diethylene oximide were synthesized and tested for anticonvulsant activity. **MATERIAL AND METHODS:** Preliminary anticonvulsant activity was performed using subcutaneous phentylenetetrazole (scPTZ) screens in Wistar rats. Standard dose of phenytoin is 100mg/kg is used in this model and dose of PTZ is 85mg/kg is used. **RESULT:** Among synthesized compounds the anticonvulsant activity are shown by AA, AC, AC1, AC6 and AC7 having the highest protection (80%) in the scPTZ test at a dose of 85mg/kg whereas the

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Research Article

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STABILITY INDICATING RP-HPLC METHOD FOR ESTIMATION OF CARIPRAZINE HYDROCHLORIDE IN HUMAN PLASMA

Mohini Shelke, Rahul Godge*, Tejas Sahane, Onkar Pawar, Sujata Kasar

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Bioanalytical, Cariprazine Hydrochloride, Forced Degradation, Protein Precipitation extraction, RP-HPLC, Validation

ABSTRACT
Objective: The objective of the study is to create and validate the easy, dependable, accurate, sensitive, and selective RP-HPLC method for estimating Cariprazine HCl in human plasma. **Methodology:** The sample was prepared using the protein precipitation extraction method. The chromatographic separation was performed with an AGILENT C18 column (250mm x 4.6ID) as the stationary phase and a mobile phase consisting of a 75:25 v/v solution of Methanol and 0.1% Orthophosphoric acid at a flow rate of 0.7 ml/min. The DAD detector was used to carry out the detection at 253 nm. Cariprazine HCl had a reduced retention duration of 2.46 minutes. **Results & Discussion:** The calibration curve had a correlation coefficient of 0.998 and was linear over the concentration range of 1–5µg/ml. The method's accuracy was shown at levels between 80%, 100%, and 120% of the specification limit. The developed method exhibited excellent precision, with interday precision ranging from 0.07% to 1.77% and intraday precision from 0.03% to 0.26%. It was discovered that the recovery of Cariprazine HCl was within the 98% range. Cariprazine HCl was discovered to have a Limit of Detection (LOD) of 0.053µg/ml, and the Limit of Quantification was found to be 0.160µg/ml. **Conclusion:** The solution was injected in duplicate, and the % RSD was measured. The results indicate that the proposed method can be effectively utilized for the routine analysis of Cariprazine HCl in human plasma. The forced degradation studies indicate that the drug is susceptible to Hydrolytic and Photolytic degradation.

INTRODUCTION

Research on bioavailability and bioequivalence, the quantitative assessment of drugs and their metabolites, drug development, clinical, pharmacokinetics, and basic biomedical and pharmaceutical sciences investigations rely on methods for measuring medications in biological fluid [1]. Cariprazine HCl has the chemical formula $C_{21}H_{33}C_{l3}N_4O$. Cariprazine is a derivative of piperazine and an atypical antipsychotic drug that was initially created in Hungary [2,3]. Its initial worldwide approval was in the US in September 2015 and was afterward given Health Canada's approval in April 2022. Currently, bipolar I disorder's manic or mixed episodes, depressive periods, and

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Research Article

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DEVELOPMENT AND VALIDATION OF A QbD-BASED RP-HPLC METHOD FOR VERICIGUAT QUANTIFICATION

Shubham Mandhare, Rahul Godge*, Akshay Vikhe, Shubham Talole

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Quality by Design (QbD), RP High Performance Liquid Chromatography (RP-HPLC), Vericiguat, Central Composite Design (CCD)

ABSTRACT
Aim: An RP-HPLC method for Vericiguat using the QbD approach was developed and validated by ICH guidelines. **Method:** The ICH (Q2R1) guidelines have been followed in the development and validation of an RP-HPLC technique by considering several validation parameters like linearity, precision, LOD, LOQ, and accuracy. The study was performed on Agilent Tech using the C18 column (4.6x250 mm; 5 µm) and Chemstation 10.1 software with statistical data analysis, and the detector used was UV (DAD). **Results:** The mobile phase used for separation was Methanol: 0.1% OPA in the ratio of (76:24) at room temperature, the flow rate was 0.8ml/min, and the wavelength was 331nm. The results indicated that the quantification limit was 0.7209 µg/ml, and the detection limit was 0.2379 µg/ml. **Conclusion:** The validation studies confirmed that the developed method is fast, accurate, precise, cost-effective, selective, and useful for routine analysis of vericiguat in tablet dosage forms.

INTRODUCTION

Vericiguat is a new, orally soluble guanylate cyclase (sGC) drug used to treat heart failure while reducing hospitalization rates and improving ejection fraction [1-5]. Vericiguat relaxes smooth muscles by inducing vasodilation, thereby improving cardiac function.

More importantly, a comprehensive review of the available lite rature using the RP-HPLC method revealed a lack of specific methods for analyzing veriguat using this cell. This work aims to provide a reliable, accurate, and simple RP-HPLC technique for determining vericiguat dose forms. The procedure has been validated according to ICH guidelines [6-7]. Combining product specification, risk assessment, critical procedures (CPPs), and critical attributes (CQAs) to create a manufacturing environment is quality by design or QbD.

This comprehensive strategy aims to be well integrated into the drug development and review, leading to final drug approval & ongoing monitoring [8]. In the field of analysis this method is called Quality Analysis by Design (AQbD) [9-12]. Using QbD in the analysis process provides easy control by working in the design environment and following the rules of life. Therefore, QbD has attracted the attention of pharmaceutical companies and research centers [13-16]. High-performance liquid

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REVIEW ARTICLE

A Review on Simultaneous Estimation of combination of Omeprazole and Domperidone in Bulk and Tablet by RP-HPLC Method

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ABSTRACT:
The main objective of the given study is that to develop and validate stability indicating reverse phase HPLCmethod for the simultaneous estimation of combined Omeprazole and domperidone in solid dosage forms. The method was optimized Shimadzu RP-LC (HPLC) system with a SPD 10A UV detector (BDS C18 column (250×4.6mm I.D Hypersil). methanol and ammonium acetate buffer (60:40). Methanol is used as diluents. The flow rate is 1ml/min and the effluent is monitor at 280nm. Results: The retention time of combined Omeprazole and domperidone was 6.75min. and 9.64min. respectively. The proposed method study was simple, precise,rapid, accurate and. It was economical and suitable for continuous determination of combined Omeprazole and domperidone in pharmaceutical dosage form.For RP-HPLC, separation of components were achieved at a Phenomenex Rp-C_{18} column. The components detected by UV detection at range of 295nm. Thus, the evaluation method is applicable for regular determination of combined omeprazole and domperidone in pharmaceutical formulations.The drugs were placed to different adverse conditions like acid, base, neutral hydrolysis, oxidation, and photo-degradation. The validation of developed method was successfully applied to the simultaneous evaluation of combined omeprazole and domperidone by Reverse Phase-High Performance Liquid Chromatography. Report by RP-HPLC were good assumed.

KEYWORDS: Omeprazole, Domperidone, RP-HPLC, Simultaneous estimation, Half life.

INTRODUCTION:
Omeprazole is chemically (RS)-5-methoxy-2-[[(4-methoxy-3,5-dimethylpyridin-2yl) methyl] sulphinyl]-1H-benzimidazole. The chemical was utilised as a proton pump inhibitor in pharmaceutical preparations to treat peptic ulcers.[1,2] Domperidone is chemically named as 1-[3-(Piperidin-1-yl) propyl]-1,3-dihydro-2H-benzimidazol-2-one.[3] There were many publications that describes various methods for the quantification of these compounds individually or in combination with other drugs. Recently combined dosage form like omeprazole and domperidone successfully quantified in formulation by using UV spectrophotometer.

This method is successfully help to identifying and quantifying the both drugs.[4] According to Literature survey its reveals that several analytical methods like coloumetry, UV sepctrophotometry, HPLC has been established for the evaluation of both drugs.

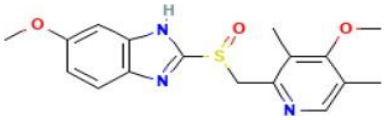

Fig 1: Structure of Omeprazole.

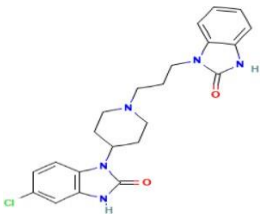

Fig 2: Structure of Domperidone