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Method development and validation of Favipiravir by RP-HPLC

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RESEARCH ARTICLE

Method development and validation of Favipiravir by RP-HPLC

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ABSTRACT

Favipiravir (FVP) shows antiviral activity to tackle many viruses. It is very important for further analytical tests as a potential drug for COVID-19. A simple, accurate, precise, rapid, and gradient reverse phase high-performance liquid chromatography method developed for FVP pharmaceutical formulation. Analysis was carried out by Cosmosil C18 (250 mm × 4.6ID, Particle size: 5 micron). The mobile phase consisted of Methanol: Water (75:25, v:v). pH of Mobile Phase: 3 (pH is adjusted with o-phosphoric acid) The mobile phase was filtered and degassed through a 0.45 mm membrane filter before use and then pumped at a flow rate of 0.8 mL/min. The ultraviolet (UV) detection and column temperature were 227 nm, and 30°C. The retention time of FVP was found to be 4 min. The run time was 9 min under these chromatographic conditions. Linearity for FVP concentration 10–50 ppm has been observed with coefficient of determination of 0.9995. The recovery (%) was in the range of 98.94–99.12%, while the mean RSD (%) is 0.23%. The developed method was found to be sensitive (LOD and LOQ was found to be 0.2236 and 0.6776 resp.) Proposed method has been successfully applied for method development and validation of FVP in pharmaceutical formulations.

Keywords: Favipiravir, High performance liquid chromatography, Method, Development, Validation, Antiviral

INTRODUCTION

In Wuhan, China, a new coronavirus (COVID-19) was discovered in 2019 which was never seen in people before. Coronaviruses are a broad family of viruses that may cause everything from a normal cold to more serious illnesses such as Middle East Respiratory Syndrome and Severe Acute Respiratory Syndrome (SARS). Since the COVID-19 pandemic began to spread over the world, countries have devised several treatment strategies. Several treatments are currently being tested in clinical studies around the world to assess and control COVID-19 outbreaks. As the impact of the COVID-19 pandemic grew, it began to have an impact on world health, and countries began to use various active therapeutic medications.[1]

As a result of the developing COVID-19 epidemic and its potential impacts on world health, active treatment solutions are desperately needed.[1] For the treatment of SARS-CoV-2, variety of medicines are being tested and used.[2-6] Different drugs, including chloroquine, arbidol, remdesivir, and favipiravir (FVP), are conducting clinical studies in several countries to determine their efficacy and safety in treating coronavirus illness.[1,7] FVP is an antiviral medication created by Toyama Chemical for the treatment of influenza. It prevents viral replication by specifically inhibiting the RNA polymerase of RNA viruses. It has antiviral efficacy against alpha, filo, bunya, arena, flavi, and noroviruses, as well as influenza. FVP is deemed to be worth further exploration as a prospective candidate treatment for COVID-19 after a pilot study by Zhongnan Hospital of Wuhan University demonstrated a superior recovery rate in COVID-19 patients in the FVP group compared to the arbidol group.

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HPLC Method Developement and Validation of Raberprazole and Levosulpiride in its bulk and dosage form

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Research Article

HPLC Method Development and Validation of Rabeprazole and Levosulpiride in its bulk and Dosage form

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ABSTRACT

The analytical method is the heart of pharmaceutical analysis. The present work was attempted to develop accurate, simple and sensitive method for simultaneous estimation of Rabeprazole and levosulpiride. The mobile phase was consisted of Buffer: Acetonitrile, with ratio of (70:30) at flow rate was quite satisfactory. In our study, the percentage recovery of LEVO was found to be 99.90%, 100.06%, & 100.1% from 80%, 100%, 120% sample solution, respectively. For RABE was found to be 98.99%, 99.46%, & 100.08% from 80%, 100%, 120% sample solution respectively. The obtained percentage recovery of both drugs was found to be within the range. This indicates the proposed method was more accurate than the existing methods. Precision is determined by using the method to assay a sample for a sufficient number of times to obtain statistically valid results. The precision is then expressed as the percentage relative standard deviation. Acceptance criteria for the precision of method is that % RSD should not be more than 2%. In the present study for intermediate precision % RSD for LEVO and RABE was found to be 0.344, 0.242, respectively. % RSD value indicate a good degree of precision within specified range.t

INTRODUCTION

During last few decades, analytical chemistry has witnessed extensive development in terms of sophistication, quantitation, and instrumentation. Consequently, newer analytical techniques (such as hyphenated techniques FTIR, GCMS, LCMS, HPLC, HPTLC etc.) and their areas of application have increased considerably because of the stringent requirements for testing and monitoring of the drugs for approval; the demand on quality, validation data and performance of analytical methods have gained importance.

Nowadays, most of the people are suffering from various types of disease conditions. This can be happened due to the changed lifestyle. This means improper intake of food, lack of exercise can lead to the disease conditions. Due to this many pharmaceutical industries introduce the new drug molecules or drug combinations in every year, to treat such types of diseases. In this one of the world-wide diseases is Gastric Acidity, which can further lead to Gastroesophageal Reflux Disease [GERD], or Gastric/ Peptic Ulcers.

Hence by taking market survey, considering peoples need we have tried to promote the search-related recent drugs and combinations. Many industries work on the drugs used to treat Gastric Acidity, Gastroesophageal Reflux Disease [GERD], or Gastric/Peptic Ulcers. Instead of single-drug physicians prefer a combination of drugs. Hence by referring the articles on this combination at

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The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor

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The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor

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Abstract---A series of Tacrine-coumarylthiazole derivatives linked through urea were synthesized, and their inhibitory effects on acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) were evaluated for the treatment of Alzheimer's disease. The result revealed that all the synthesized compounds exhibited a moderate inhibitory effect on both cholinesterases. Amongst them, 1-(7-methoxy-1,2,3,4-tetrahydroacridin-9-yl)-3-{4-(2-oxo-2H-chromen-3-yl)thiazol-2-yl}urea (SC4, IC50= 37.09 µM) was found to be the most active compound against AChE, and 11-(6,8-dichloro-1,2,3,4-tetrahydroacridin-9-yl)-3-{4-(6-nitro-2-oxo-2H-chromen-3-yl)thiazol-2-yl}urea (SC10, IC50= 5.89 µM) exhibited the strongest inhibition against BuChE. The selectivity of SC4 and SC10 were 0.85 and 0.04, respectively.

Keywords---acetylcholinesterase, butyrylcholinesterase, coumarin, tacrine, urea, thiazole.

Introduction

Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common form of dementia worldwide, with symptoms of memory loss, cognition defect, and behavioral impairment [1]–[5]. The cause of AD is still unclear and has been described for the several reasons, such as genetic factors [6]–[8], amyloid-β peptides aggregation [9], neurofibrillary tangles (NFTs) [10], cholinergic hypofunction, oxidative stress [11], metal ion dyshomeostasis [12], and inflammation [13], etc. Among them, cholinergic hypofunction has been known as one of the significant causes of AD [14]. Acetylcholine (ACh) plays an important role in attention, learning, memory, and motivation. One of the main ways to increase the ACh level in the brain is the inhibition of cholinesterase enzymes

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Morphological and anatomical characterization of *Plumeria obtusa* L.: An Ayurvedic medicinal plant

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Purity

Abstract

The development of commercial natural products has significant obstacles due to the exploitation, adulteration and substitution of herbs. In order to standardize medicinal plant, the morphological microscopic inspection is the initial stage. The present investigation deals with morphological evaluation of leaf, seed pod, flowers and anatomical evaluation of *Plumeria obtusa* L. seed pod. *P. obtusa* (Apocynaceae) is an outdoor decorative plant. Size, colour, odour and taste of plant material were evaluated under morphological features. The traditional procedure of section cutting was used to analyze the seed pod's anatomy. Using a high-resolution microscope, examinations of microscopic structures were carried out. The plant's leaves are dark green colour, thick and leathery according to the morphological inspection. The winged seed pods are brown to dark brown at maturity stage having T shape double pod with course texture. Stomatal number (7-9 sq. mm), stomatal index (21.88-24.32%), vein islet number (12-15/mm²) and vein termination number (16-20/mm²) were observed in leaf constant evaluation. Cyclocytic and sunken stomata, lignified peripheral and xylem fibres, rhomboidal shape calcium oxalate crystals, vascular bundles, *etc.*, were all discovered in detailed microscopical study. The morphology of leaves and microscopic findings of the plant *P. obtusa* can be used for standardization and authentication.

1. Introduction

Quality control evaluation of ethnomedicine helps in their regulation or authentication purpose (Kumar *et al.*, 2022). The WHO also stressed the need to investigate medicinal plants to understand better their properties, safety and efficacy (Warrier, 2021). In the process of scientific research and botanical quality control, the morphological, anatomical, and microscopic characterization of plants has immense importance (Grazina *et al.*, 2020).The characteristics are applied for authentication of the plants and also for detection of contaminations, adulteration and substitutions in plant products (Michetti *et al.*, 2019; Upton *et al.*, 2011). For microscopic standardization evaluation of structural, cellular and molecular aspects of herb or herbal parts is performed with various microscopic techniques (Tam *et al.*, 2006). As mentioned in many pharmacopoeias, microscopy has been used since long time to identify herbal products. Microscopic studies are preferred due to numerous advantages such as need of small amount of sample, rapidity, reliability, cost effectiveness and simplicity of the procedures (Au *et al.*, 2009).

P. obtusa plant is geographically distributed in northern central America and southern Mexico, Greater Antilles as well as in Florida (Herbal and Natural Medicine, 2021; Nabi and Lalit, 2017). *P. obtusa* is a member of the Apocynaceae family, with common names such as Champa (India), Singapore graveyard flower (Singapore), Melia (Hawaii), White Frangipani (Australia), Araliya (Sri Lanka) and Temple tree (United Kingdom) (Bihani *et al.*, 2021). The *P. obtusa* has many medicinal uses (Bihani *et al.*, 2021; Dogra, 2016; Shinde *et al.*, 2014). Therefore, it is necessary and an important step to standardize it through the suitable depiction of its quality standards.

The morphological and anatomical characters of *P. obtusa* were evaluated in this study with an aim to identify its imperative features so that they can be effectively applied for herbal and herbal products standardization. The studies will aid to justify safe and effective use of herb as medicine by ensuring quality of the herb used.

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Development and Validation of Tafenoquine by High Performance Liquid Chromatography Technique along with Stress Degradation Study of Tafenoquine

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Research Article

Development and Validation of Tafenoquine by High Performance Liquid Chromatography Technique along with Stress Degradation Study of Tafenoquine

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ABSTRACT

The most prevalent parasite disease in humans is malaria. According to estimates, 3 billion individuals worldwide are at danger of developing this illness. For the quantitative detection of tafenoquine, a brand-new, quick, and accurate stability-indicating high performance liquid chromatographic method was created and validated. On an Inertsil ODS-3V column (150 mm 4.6 mm, 5.0 m) with mobile phase methanol and water (80:20) at a flow rate of 1 mL/min, effective chromatographic separation was accomplished. The analyte was seen using a photo-diode array detector at a wavelength of 254 nm. tafenoquine was subjected to acidic, basic, oxidative, thermal, and photolytic conditions in order to force its destruction. The peaks of the degradation products produced were distinct from those of tafenoquine and showed the specificity and stability of the technique. The method was also validated using criteria like specificity, precision, linearity, accuracy, and robustness in accordance with the International Conference on harmonization of technical requirements for registration of pharmaceuticals for human use. The major goal of this research was to create a fast, sensitive, and stable HPLC method for analysing and assessing the purity and stability of tafenoquine in formulations.

INTRODUCTION

Tafenoquine (SB-252263), racemic 8-[(4-amino- than primaquine.[1,2] Compound I is effective 1-methylbutyl) amino]-2,6-dimethoxy-4-methyl-5-(3 trifluoromethyl-phenoxy) quinoline succinate (1:1) as shown in Fig. 1. GlaxoSmithKline and the US Army are now working on a prophylactic malaria treatment for *Plasmodium falciparum* and *Plasmodium vivax*. Compound I is an antimalarial drug made up of 8 aminoquinolines that has higher anti-malarial activity *in-vitro* than primaquine. Compound I is now undergoing phase III clinical studies and is effective against all stages of Plasmodium. It is broken down into a vast number of tiny components throughout time.

In response to primaquine deficiencies, tafenoquine was developed. It is more effective than primaquine at preventing malaria in both the blood and the liver stages.[3-5] Tafenoquine was 7-10 fold more effective than primaquine in the rhesus monkey malaria model as a radical curative and causal preventive medication.[6-7] *In-vitro* investigations also shown that Tafenoquine is at least 5-fold more effective than primaquine against multidrug-resistant *P. falciparum* asexual blood stages.[8] Tafenoquine has been shown to be well tolerated in human tests, with very minor, temporary gastrointestinal side effects.[9]

Tafenoquine totally protected three of the four volunteers in a challenge trial in which they were administered *P. falciparum* sporozoites and considerably slowed the onset of parasitaemia in the fourth.[9] In a holoendemic location, the prophylactic benefit of Tafenoquine against

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Verbena officinalis (Verbenaceae): Pharmacology, Toxicology and role in female health

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Verbena officinalis (Verbenaceae): Pharmacology, Toxicology and role in female health

Review Article

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Abstract

Verbena officinalis Linn (Verbenaceae), the common verbena or vervain, a traditional herb with immense cultural and medicinal significance in the European, Greek, American, Roman and Egyptian countries. Phytochemical analysis suggests the presence of iridoid glycosides, secoiridoid glycosides, phenylethanoid glycosides, flavones, pentacyclic triterpenoids, monoterpenes, sterols and their derivatives. Owing to the presence of these phytochemicals, wide range of pharmacological activities such as antibacterial, antiviral, antifungal, antidiarrheal, antitumour, antidepressant, anxiolytic, gastroprotective and hepatoprotective, etc are reported. Literature survey highlights the distinct role of *Verbena officinalis* in treating dysmenorrhoea, vaginitis, endometriosis, premenopausal night sweating, herbal tonic for pregnant women and lactating mothers and its use as emmenagogue. The review aims to promote studies on *Verbena officinalis* for its therapeutic role in female reproductive health and other ailments. The scientific databases used for compilation of the data were Google scholar, Pubmed the data made available specifically from 2010 to 2022.

Key Words: Ethnomedicine, Female health, Phytochemicals, Toxicity, *Verbena officinalis*, Verbenaceae.

Introduction

Needless to say, plants have immense medicinal properties and used in therapeutics since millennium. Traditional medicine systems, namely Ayurvedic, Unani, Siddha, Aromatherapy, Bach Flower remedies have been using medicinal plants extensively. Plant-based remedies are more acceptable in the public because of its likeliness to be safer than synthetic drugs (1). *Verbena officinalis* Linn, Verbenaceae is herbaceous perennial plant, with its origin in the Europe. *Verbena officinalis* has tiny purple flowers and slightly hairy, diamond shaped green, aromatic leaves. Verbena has been used since millennium in Traditional Chinese, American, European medicine systems. Phytoconstituents include iridoid glycosides, terpenoids, phenylethanoid glycosides and sterols. Pharmacological activities owing to the presence of phytoconstituents include anti-inflammatory, antinociceptive, neuroprotective, gastroprotective, wound healing, anti-tumour, antimicrobial activities and many have been reported in scientific literature.

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Aim

To promote studies on *Verbena officinalis* for its therapeutic role in female reproductive health and other ailments.

Objectives

- To promote studies on *Verbena officinalis* for its therapeutic role.
- To compile all database of *Verbena officinalis* and make it available to researchers to explore its therapeutic effects.

Vernacular names

Vervain, Bon Kariata, Herb of grace, pigeon's grass, Bhekpadee, Tharophijub, Pitta maree (2) L. – vervain Species: *V. officinalis* (3).

Geographical location

Verbena officinalis is found in the Asian, European, American continent as well as grown in China and Japan. In India, it is distributed in the north-eastern territory, mainly in Manipur, Assam, Meghalaya (4, 5, 6).

Cultivation and collection

The herb can be cultivated using seeds, root and stem cuttings. Seed propagation involves sowing seeds in late March. *Verbena officinalis* grows well in sandy

High-performance thin-layer chromatography (hptlc) method development and validation for determination of remogliflozin etabonate and vildagliptin in bulk and its tablet formulation

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Original Article

HIGH-PERFORMANCE THIN-LAYER CHROMATOGRAPHY (HPTLC) METHOD DEVELOPMENT AND VALIDATION FOR DETERMINATION OF REMOGLIFLOZIN ETABONATE AND VILDAGLIPTIN IN BULK AND ITS TABLET FORMULATION

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ABSTRACT

Objective: Within the scope of this investigation, an HPTLC technique for measuring the concentrations of Remogliflozin etabonate (REMO) and Vildagliptin (VIL) in a commercial product named REMO-V, which contains 100 mg of REMO and 50 mg of Vildagliptin (VIL), was developed.

Methods: It was necessary to evaluate the new approach for linearity, precision, specificity, and robustness in order to ensure that it operated properly. The chromatograms were created using a mobile phase containing Chloroform as follows: The concentrations of toluene, methanol, and n-butanol (4.5:4.1:0.5, v/v) were measured on a pre-coated TLC aluminum pre-coated plate (60F 254), and the absorbance at 233 nm was used to determine the amount of each component present. It was necessary to conduct forced degradation testing on bulk medicinal material in order to demonstrate the new method's capacity to demonstrate how stable and specific it is.

Results: The Rf values for Remogliflozin etabonate (0.63), Vildagliptin (0.75), and Remogliflozin etabonate (0.63), respectively, were 0.62 and 0.75. On the REMO side, the linearity of the technique was found to be between 20 and 60 g/band; on the VIL side, it was found to be between 10 and 30 g/band. Having R2 values of 0.9939 for both REMO and VIL, it is clear that there is significant linearity in the way they interact with one another. These are the lower limits of detection and quantification for REMO, which were 0.09 for VIL and 0.38 for REMO, respectively, when compared to the upper limits of detection and quantification for VIL. The lower detection and quantification limits for VIL are also the same as for other pathogens. RSD was less than 2 percent in this study. Thus, the approach was shown to be accurate and exact for both interday and intraday accuracy, indicating that it is reliable. The amount of REMO or VIL that might be recovered is as follows: 98.7 percent to 101.27 percent, and 97.37 percent to 100.83 percent were the results.

Conclusion: It was discovered that the method for determining Remogliflozin and Vildagliptin was easy, accurate, and stable in both its pure form and its tablet dose form and that it could be used to both (REMO-V, Glenmark, Ltd).

Keywords: Remogliflozin etabonate, Vildagliptin, High-performance thin-layer chromatography, Validation, Forced degradation

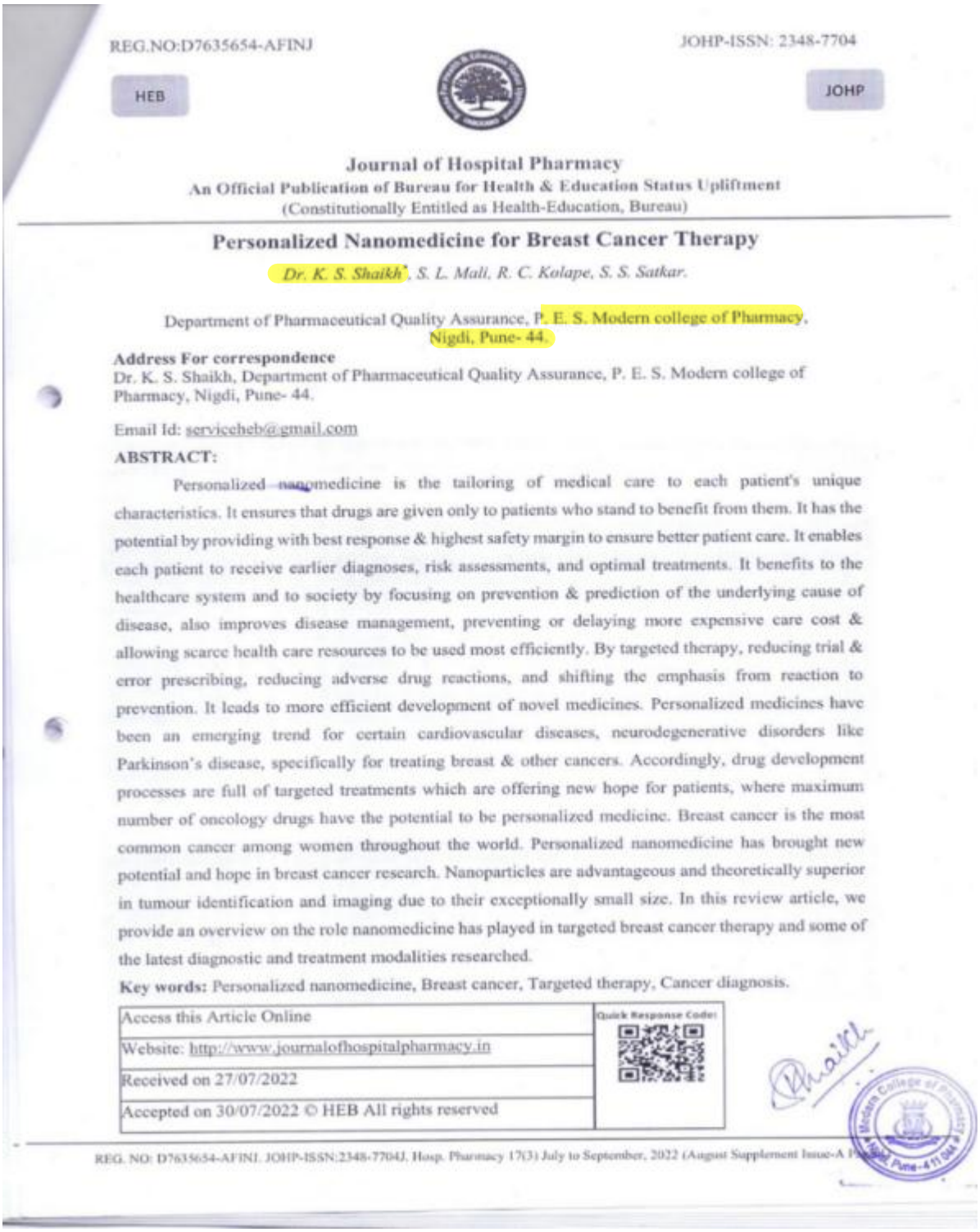
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INTRODUCTION

REMO is the chemical name for Remogliflozin etabonate, which is ethyl [(2R,3S,4S,5R,6S)-3,4,5-trihydroxy-6-[5-methyl-1-[[

Personalized Nanomedicine for Breast Cancer Therapy



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Personalized Nanomedicine for Breast Cancer Therapy

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ABSTRACT:

Personalized nanomedicine is the tailoring of medical care to each patient's unique characteristics. It ensures that drugs are given only to patients who stand to benefit from them. It has the potential by providing with best response & highest safety margin to ensure better patient care. It enables each patient to receive earlier diagnoses, risk assessments, and optimal treatments. It benefits to the healthcare system and to society by focusing on prevention & prediction of the underlying cause of disease, also improves disease management, preventing or delaying more expensive care cost & allowing scarce health care resources to be used most efficiently. By targeted therapy, reducing trial & error prescribing, reducing adverse drug reactions, and shifting the emphasis from reaction to prevention. It leads to more efficient development of novel medicines. Personalized medicines have been an emerging trend for certain cardiovascular diseases, neurodegenerative disorders like Parkinson's disease, specifically for treating breast & other cancers. Accordingly, drug development processes are full of targeted treatments which are offering new hope for patients, where maximum number of oncology drugs have the potential to be personalized medicine. Breast cancer is the most common cancer among women throughout the world. Personalized nanomedicine has brought new potential and hope in breast cancer research. Nanoparticles are advantageous and theoretically superior in tumour identification and imaging due to their exceptionally small size. In this review article, we provide an overview on the role nanomedicine has played in targeted breast cancer therapy and some of the latest diagnostic and treatment modalities researched.

Key words: Personalized nanomedicine, Breast cancer, Targeted therapy, Cancer diagnosis.

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Nanocomposite based drug delivery for periodontal disease

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Nanocomposite based drug delivery for periodontal disease

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***Abstract*---**Periodontal disease is the term used to describe some pathological conditions characterized by degeneration and inflammation of gums, periodontal ligaments, alveolar bone, and dental cementum. Periodontal disease involves destruction of alveolar bone around the teeth leading to defects or rather loss of the tooth if left untreated. This condition is caused by a chronic, mixed infection of Gram-negative and Gram-positive bacteria. Chlorhexidine (CHX) gluconate is an antiseptic, antifungal and bactericidal agent. CHX inhibits plaque formation by binding to anionic salivary glycoproteins and bacteria. Nano Hydroxyapatite (nHAP) is calcium phosphate in morphology and composition like the human hard tissues. Delivery of medications directly into the periodontal pockets alters the inflammatory response and reduces the pathogenic microbiota, an aspect which has attracted great interes. Result: The CHX Nanocomposites were non-toxic to human cells and promoted cell adhesion, proliferation, and spreading. The CHX Nanocomposites were found to be satisfactory in all respects, and CHX encapsulated in nanocomposites may be attractive candidates for the treatment of periodontal disease.

***Keywords*---**Periodontitis, Nanocomposite, CHX, PGS, nHAP.

1. Introduction

Periodontal disease is a word that refers to a group of diseases marked by the degeneration and inflammation of the gums, periodontal ligaments, alveolar bone, and dental cementum. It's a localized inflammatory reaction brought on by a

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Quality-by-design (qbd) approach to chromatographic conditions applied for determination of robustness in silymarin extract

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QUALITY-BY-DESIGN (QBD) APPROACH TO CHROMATOGRAPHIC CONDITIONS APPLIED FOR DETERMINATION OF ROBUSTNESS IN SILYMARIN EXTRACT

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ABSTRACT

In the present study Quality by design approach was implemented for HPTLC method development and validation for robustness. Silymarin found in highest concentration in fruit portion. Silymarin is a flavolignan from *Silybum marianum* plant used for hepatoprotection. Silymarin extract and Silybin were used in the study. Chloroform, ethyl acetate, acetone, formic acid was used for mobile phase optimization.HPTLC method developed and validated. All data analysis of experimental design were performed by using the Design-Expert trial version 7.0.0 (Stat-Ease Inc., Minneapolis, MN,USA) and Box-Behnken method was used for the optimization of chromatographic conditions. Mobile phase ratio, solvent front and chamber saturation time were determinate as critical method parameters.Method was developed and validated using solvent on silica as chloroform: ethyl acetate: acetone: formic acid (40:30:20:10, v/v) (R_f of

Low level quantification of two potential genotoxic impurities in rilpivirine hydrochloride drug substance by HPLC technique

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Low level quantification of two potential genotoxic impurities in rilpivirine hydrochloride drug substance by HPLC technique

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Abstract---The goal of the research work was to develop new specific analytical method for the determination of potential genotoxic impurities 4-Iodo-2,6 Dimethyl aniline and 3-Iodo-2,6 Dimethyl aniline in Rilpivirine hydrochloride drug substances. The method was developed by using reverse phase high performance liquid chromatography technique. The comprehensive method development was done to accomplish right combination of chromatographic conditions and validated as per ICH guidelines. The method utilizes L1-octadecyl chemistry (250 millimeter (mm) x 4.6 mm ID, 5.0 micrometer (µm), HPLC column. Both impurities were detected by ultra violet detector at 210nm. The separation of both impurities was attained with 0.1% Ortho Phosphoric Acid in water and acetonitrile at 1.2 ml/min. The calibration curve exhibited good linearity over the concentration range of 0.12-0.45 µg/ml with coefficient of correlation value greater than 0.999. The accuracy in terms of % recovery of the added known amount was found in the range of 97-100 %. Based on experimental results, developed analytical method can be applied for the low level quantitation of both potential genotoxic impurities in Rilpivirine hydrochloride.

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Docking Study of Selected Phytoconstituents with Acetylcholine Esterase and BChE for its Anti-alzheimers Activity

RESEARCH ARTICLE

Docking Study of Selected Phytoconstituents with Acetylcholine Esterase and BChE for its Anti-alzheimers Activity

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ABSTRACT

In this research, we have observed known constituents from different plants and perform docking of these phytoconstituents with different AChE & BChE PDBs. It found good binding with Different PDBs. For the docking study, we selected 11 PDBs which include 4TPK, 4AQD, 6EP4, 1H22, 4EY5, 2XQF, 6O4X, 6O4W, 4BDT, 6EQQ, 1B41. Selected phytoconstituents was Sabinene (A), α-Pinene (B), 1,8-Cineole (C), Trans-sabinene hydrate (D), α-Terpineol (E), α- terpentyl acetate (F), Methyl Eugenol (G). We have compared the binding energy and number of hydrogen bonds with Galanthamine. Constituents C and G found good anti-alzheimers activity, and D and E have excellent activity with all PDBs.

Keywords: AChE, Alzheimer's disease, BChE, Docking, Herbal, PDBs.

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INTRODUCTION

Alzheimer's disease (AD), one of the most common neurodegenerative illnesses that commonly culminate in dementia and affects middle-aged individuals, affects one in four people over the age of 85.[1] AD is a progressive condition, meaning that dementia worsens over time. There are now an estimated 46.8 million people living with it globally, according to the King's College London-led World Alzheimer Report 2015, and the incidence of depression is expected to roughly double every 20 years, reaching 74.7 million by 2030 and 131.5 million by 2050. US (4.2 million), China (9.5 million), Brazil (1.6 million), Japan (3.1 million), Germany (1.6 million), Indonesia (1.2 million), India (4.1 million), Russia (1.3 million), Italy (1.2 million), and France (1.2 million) are among the 10 nations that had more than one million dementia patients in 2015. As a result, we and our future generations will bear heavier financial responsibilities because of this predicament. Effective treatments and preventative strategies need to be implemented immediately to address this issue.[1]

The whole of AD or any other kind of dementia cannot be cured by any of these medications or therapies. The medications, however, are made specifically to treat AD and may momentarily lessen symptoms or slow the illness's progression. U.S. Memantine and two anti-cholinesterase inhibitors have received FDA approval for use. More study on AD has been conducted in the last ten years, with an emphasis on the processes of oxidative stress and its significance in pathogenesis. The negative effects of net oxygen radicals include high-quality carbonyl-modified neurofilament protein, glycation, lipid peroxidation adduction products, nitration, and free carbonyls cause damage to AD. It is crucial to remember that this harm affects all neurons at risk of dying from AD, not just those with neurofibrillary tangles.[2]

In the shape of vegetables, bark, leaves, fruits, nuts, and other biodiversity, nature has provided us with various natural treatments. These natural products' nutrients are crucial for preventing and treating many neurodegenerative illnesses, including parkinson's disease, AD, and other neuronal disorders. According to prior studies, phytochemicals that occur naturally, such as the polyphenolic antioxidants present in herbs, vegetables, fruits, and nuts, can prevent neurodegeneration and enhance memory and cognitive abilities.[3]

In this study, we chose seven naturally occurring components (dangerous structures) of diverse plants based on cellular infiltration data and pharmacokinetics research. Recent studies have demonstrated the extensive range of biological actions that both natural and synthetic chemicals exhibit, including antifungal, anti-malarial, anti-tubercular, antibacterial, anti-inflammatory, and antioxidant activity.[3]

All seven substances in our study have antioxidant characteristics, and it has been demonstrated that using these compounds for therapy is quite successful.

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Stability Indicating HPTLC Method of Molnupiravir and Comparative Study of Degradant with Marketed Molnupiravir Impurity- A

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Stability Indicating HPTLC Method of Molnupiravir and Comparative Study of Degradant with Marketed Molnupiravir Impurity- A

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Abstract
The purpose of this study was to create, optimise, and validate a high-performance thin layer chromatographic (HPTLC) method for identifying Molnupiravir (MOL) and its impurity (IMP-MOL). (3aR,4R,6R,6aR) -6-(4-(hydroxyamino) -2-oxopyrimidin-1(2H)-yl) Molnupiravir A is 2,2 dimethyltetrahydrofuro [3,4-d][1,3]dioxol-4-yl)methyl isobutyrate (MOL IMP) Over concentration ranges of 0.1 µg/band to 0.6 µg/band and 0.02 to 0.6 µg/band, the proposed technique was employed to analyse Molnupiravir and its impurity, with mean percentage recovery of 99.92%±1.521 and 99.28%±2.296, respectively. This method has been done with the separation of two components and ends with the densitometric measurement of the separated peaks at 276 nm. The separation was done on silica gel HPTLC F254 plates with a Toluene: n-Butanol: Methanol: Water developing system (5:3:1.5:0.5, by volume). The MOL was kept under conditions like oxidative, hydrolytic, thermal stress, and photolytic tests that the International Conference on Harmonization (ICH) requires. In acid, alkali, and oxidative hydrolysis, the MOL was unstable, but it was not affected by acidic, heat or UV light. The alkaline degradation of Molnupiravir was studied using the proposed HPTLC approach. The degradant are separated using HPTLC method, and their structures are confirmed using IR, MS, and NMR spectrum data.

Keywords
Molnupiravir: Impurity: HPTLC: IR: NMR: Mass Spectrometry.

1. INTRODUCTION

The coronavirus disease 2019 (Covid-19) pandemic, which was caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has resulted in about 270 million confirmed cases and over 5.2 million documented deaths around the world.(1) A significant number of patients with Covid-19, mostly elderly adults and those with prior illnesses, require hospitalisation (e.g., obesity, diabetes mellitus, and serious cardiac conditions). (2-4) Several vaccinations that are highly successful in lowering hospitalisation and death have been approved, but immunisation coverage is still insufficient.

Molnupiravir (MOL) is a small-molecule N-hydroxycytidine (NHC) ribonucleoside prodrug with action against SARS-CoV-2 and other RNA viruses, as well as a high resistance barrier.(5-12) NHC is phosphorylated intracellularly to NHC triphosphate after molnupiravir is taken orally.

Molnupiravir (also known as EIDD-2801/MK-4482) is a prodrug of the active antiviral ribonucleoside analogue b-D-N4-hydroxycytidine (NHC; EIDD-1931) (13) (Fig 1). In this paper we discussed the Impurity profile of Molnupiravir – A,(MOL IMP) chemically the impurity A is 3AR,4R,6R,6AR)-6-((E)-4-(hydroxiamino)-2-oxo-3,4-dihydropyrimidine-1(2H)-YL) 2,2-dimethyltetrahydrofuoro[3,4-D][1,3]dioxol-4-yl)methyl having an molecular weight of 369.40 g/mol and molecular formula is $C_{14}H_{23}N_3O_7$ (Fig 2)

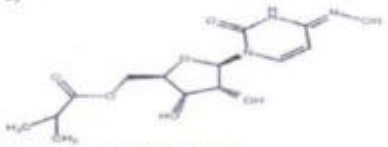


Fig. 1. Structure of Molnupiravir

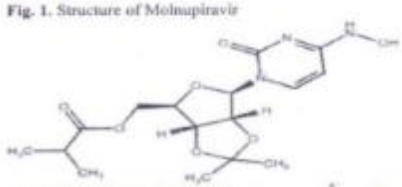


Fig. 2. Structure of Mol. Impurity

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Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles

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Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles

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***Abstract*---**It was noticed from the standard databases such as Scopus, PubMed, ScienceDirect, etc. that a limited UV-Vis spectrophotometric method has been reported for estimating Sorafenib (SOR), but no sophisticated analytical methods have been ever reported in any database for estimating SOR in nanoparticles. The present research involved the establishment of an economic, accurate, robust, and precise analytical method for the quantitative determination of SOR in bulk and nanoparticles utilizing a new validated spectrophotometric method. The spectrophotometric analysis was carried out using double-beam ultraviolet-visible spectrophotometer was employed in developing a new method using methanol and water at a ratio of 80:20 v/v and λmax of 265 nm. The technique was verified using the Q2A and Q2B guidelines of ICH. The newly developed UV-Vis method had desired linearity over the range of 2-12 µg/mL; along with excellent precision, accuracy, ruggedness, and robustness characteristics as observed from % RSD values of less than 2. The present study concluded that the developed UV-Vis method has desired linearity, precision, accuracy, ruggedness, and robustness, and will serve as an excellent technique for the determination of sorafenib in both bulk and nanoparticles without the interference of commonly used chemicals or solvents.

***Keywords*---**sorafenib, ultraviolet visible, bulk, nanoparticles.

Introduction

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Activated Carbon Black: Versatile Adsorbent for the Healthcare Industry

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ticle

ACTIVATED CARBON BLACK: VERSATILE ADSORBENT FOR THE HEALTHCARE INDUSTRY

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ABSTRACT:

Activated carbon black also known as Activated charcoal is a fine black powder that is made by burning biomass in a low oxygen environment which develops pores and increases its surface area. Activated carbon black is used in the food and pharmaceutical industry as a pH regulator, chelating agent and antioxidant synergist. Activated carbon black is highly beneficial to reduce environmental pollution and eliminate contaminants. Even though there is limited clinical data available on the use of Activated carbon black in the medical field, it is a promising natural ingredient that may be explored for various healthcare applications. The use of activated carbon black has increased in the last two decades. Its good adsorbing properties and cost-effective manufacturing process made activated carbon black a widely used adsorbent in industries. Though it is a good adsorbent, the possibility is that the pores will get saturated. Hence, to cut down the re-manufacturing cost of activated carbon black it is important to follow the regeneration step. Thus, the use of activated carbon black can be benefited environmentally and economically. Manufacturing of activated carbon black from the lignocellulosic mass is the research field of interest in today's emerging research trend.

In this review, general properties, manufacturing process, a brief introduction to adsorption mechanisms and applications of activated carbon black in life sciences are discussed.

Keywords: Activated carbon black (ACB), Healthcare, Adsorbent, Pollutants, Pharmaceutical

INTRODUCTION:

The origin of activated carbon black (ACB) is associated with Ancient Egypt (1500 BC), where the Egyptians used its adsorption properties for water purification and medical uses[1]. Around 420 BC, Hippocrates was observed to be dusting powdered charcoal into the wound to remove the odor. In ancient times, Hindu societies were using charcoal as a filter to purify the water[2]. In 1773, Karl Wilhelm Scheele the Swedish chemist was the first to observe gas adsorption on charcoal. A few years ago, activated carbon black began to be used in the sugar industry as a decolorizing agent for syrup[3]. The implicit use of ACB was subsidized during the first World War, whereby ACB was used in a gas mask against poisonous gases. Respiratory defensive biases were developed as particular defensive tools against the use of poisonous gases during wars[3]. In today's time activated carbon black is used to remove pollutants, as a chemical purifier, as an electrode, as a medical tattoo and as a nanocarrier in the pharmaceutical industry.

What is Carbon?

Carbon is an element with atomic number 6, presented with the symbol C. It is non-metallic and quadrivalent, yielding four electrons to form a covalent chemical bond. The carbon atom belongs to group 14 of the periodic table. Earth's crust contains only 0.025% carbon. The different allotropes of carbon are the result of different bond patterns in it. Graphite, diamond, amorphous carbon, and fullerenes are allotropes of carbon[3].

Why Carbon Black is Harmful?

The combustion-generated fraction of primary carbonaceous aerosol, commonly termed 'soot', can be regarded as a form of impure carbon consisting of plains of hexagonal arrays of carbon atoms, similar to graphite's crystalline structure. Several epidemiological studies dealing with this important issue clearly show that the source of combustion is of particular importance to health. Because there is substantial evidence in experimental animals but insufficient evidence in human epidemiological research, carbon black is deemed probably carcinogenic to humans and classed as a Group 2B carcinogen[3]. Primary combustion-derived particles have also been shown to have a higher harmful potential in toxicological investigations[3]. The most common side effect of carbon black exposure is pulmonary illness. Inhaling soot particles irritates the lungs, causing coughing. The eyes, nose, and throat can all be irritated by nano-sized carbon black[3]. Particles can linger deep in the lungs after years of exposure to high amounts of soot. If it persists in the lungs, it can induce bronchitis and eventually obstructive lung disease, which is a chronic ailment. Long-term exposure to very high doses of pure carbon black may raise the risk of cancer in humans, according to animal studies. Carcinogenic compounds are more likely to be found in soot produced by incomplete combustion of hydrocarbons than in pure soot[3].

Activated carbon black over Carbon black:

Though carbon black is carcinogenic to human beings its activated form is the first line adsorbent in purification process. Activated carbon black is preferred over carbon black because of its high adsorption properties and high surface area. The manufacturing process of both the carbon forms is quite similar, although activated form needs an activation step.

General Properties of Activated Carbon Black:

Activated carbon black is more beneficial than non-activated carbon. The common properties like high surface area, more adsorbing strength and high porous structure makes it more different from normal carbon black.

Surface chemistry of Activated Carbon Black:

The presence of heteroatoms on the surface of ACB like nitrogen, phosphorus, sulfur, and oxygen confirms the acidic and basic character of the Activated carbon black surface[4].

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Antihistaminic effects of Azadirachta indica leaves in laboratory animals

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Antihistaminic effects of *Azadirachta indica* leaves in laboratory animals

Research Article

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Abstract

Azadirachta indica (Meliaceae) leaves have been traditionally used in the management of asthma and the current study was undertaken to scientifically validate the benefits of plant as an antihistaminic agent using the suitable animal model. The agents with antihistaminic properties are known to be good antiasthmatic agents; hence, in the current research work, the antihistaminic activity of an ethanolic extract of *Azadirachta indica* leaves (at a dose of 250 mg/kg, i.p.) was evaluated using haloperidol-induced catalepsy and clonidine-induced catalepsy in laboratory rats. The results showed that the ethanolic extract inhibits the catalepsy induced by the clonidine but no remarkable effect was observed on the catalepsy induced by haloperidol. This strongly suggests that, the inhibition is mediated through an antihistaminic action and there is no role of dopamine. Hence, in the present study, it is concluded that, the ethanolic extract has significant antihistaminic activity. The polar constituents in the ethanolic extract of leaves of *Azadirachta indica* may be responsible for the antihistaminic effects and therefore, the ethanolic leaves extract can be a better remedy as an antihistaminic agent.

Key Words: Asthma, Antihistaminic, *Azadirachta indica*, catalepsy bar, Haloperidol, Clonidine

Introduction

Neem is a huge evergreen tree that can reach a height of 20 metres. The leaves are alternating, with 8-19 leaves per leaflet, and they appear in March-April. The leaves have a bitter taste (1).

Through the augmentation of antioxidant activity, suppression of bacterial growth, and manipulation of genetic pathways, plant products or natural products play an essential role in disease prevention and therapy. Because of their low side effects and low cost, the medicinal usefulness of a variety of plants in disease management is still being vigorously explored. It is widely acknowledged that allopathic medications are pricey and have a harmful effect on normal tissues and biological activity. The notion that many pharmacologically active medications are sourced from natural resources, including medicinal plants, is widely recognized (2, 3).

The Bible and the Quran, for example, both promote the use of herbs in health care and prevention. The function of herbs in disease management is also confirmed from an Islamic perspective, with Prophet Mohammed (PBUH) recommending several plants/fruits for disease treatment (4). Many infectious, metabolic, and malignant illnesses are treated with neem components in Ayurveda, Unani, Homeopathy, and modern medicine (5, 6).

In many countries, several types of preparations based on plants or their elements are quite popular in illness management. Based on the fact that neem (Azadirachta indica), a member of the Meliaceae family typically found in India, Pakistan, Bangladesh, and Nepal, has therapeutic implications in disease cure and formulation. Azadirachta indica has a complex of compounds including as nimbin, nimbidin, nimbolide, and limonoids, which play a role in illness management by modulating multiple genetic pathways and other activities. Quercetin and ß-sitosterol were the first polyphenolic flavonoids isolated from fresh neem leaves, and they had antifungal and antibacterial properties (7).

Plant is also described to have antibacterial (8), antifungal (9) and anti-inflammatory (10) properties. Antiarthritic, antipyretic, hypoglycemic, antigastric ulcer, antifungal, antibacterial and anticancer properties have been established by previous researchers (10, 11, 12, 13) and a review described the many therapeutic roles of neem (14). The role of neem and its active components in disease prevention and therapy via modification of numerous biological pathways is summarized in this article.

Catalepsy is a condition in which an animal retains an imposed posture for an extended period of time before returning to its natural position. Catalepsy is

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Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo

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Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo

Research Article

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Abstract

The *Malassezia furfur* fungal infection leads to dandruff formation. Dandruff cannot be fully eliminated but can only be effectively controlled. This study intends to formulate and evaluate the polyherbal anti-dandruff shampoo. The prepared formulation not only cleans the dirt and dandruff but also makes hair soft and lustrous and promotes hair growth. The formulation eliminates the use of harmful chemical ingredients that damages hair. The formulation uses various herbs like *Neem, Bhringraj, Shikakai, Tulsi, Reetha, Aloe vera, Lemon juice, Orange peel, Ginger, Curry leaves, Hibiscus* and other ingredients for preparing base shampoo which make an effective anti-dandruff formulation with smooth and shiny hairs, also provide conditioning and promotes hair growth. The formulated shampoo was subjected to evaluation parameters like visual inspection, pH, viscosity, dirt dispersion, surface tension, foaming ability, foam stability, antidandruff test and stability studies, etc. The major goal of the present study is to formulate and evaluate anti-dandruff shampoo for treating various hair issues. Dandruff is a common disorder affecting the scalp condition caused by yeast Pityrosporum. Dandruff cannot be completely eliminated but can only be managed and effectively controlled. Shampoo is a hair care product used for the removal of oils, dirt, skin particles, dandruff, environmental pollutants and other contaminant particles that gradually build up in hair. Herbal anti-dandruff shampoos were formulated using herbal based ingredients like Lemon Grass Oil, Neem oil, Henna, Aloe Vera gel and other ingredients for preparing base shampoo. The formulated shampoos were subjected to evaluation parameters like visual inspection, pH, viscosity, Percentage of solids contents, Dirt dispersion, Surface tension, Foaming ability and foam stability. The main objective of this study was to eliminate harmful synthetic ingredient from anti-dandruff shampoo formulation and substitute them with a safe natural ingredients.

Key Words: Anti-dandruff shampoo, Ayurvedic Shampoo, Malassezia furfur, Antimicrobial Activity, Polyherbal formulation, Keratolytic agent.

Introduction

Plants consist of many chemical constituents within which carry out various biological functions necessary for resistance or treatment of numerous diseases or disorders.

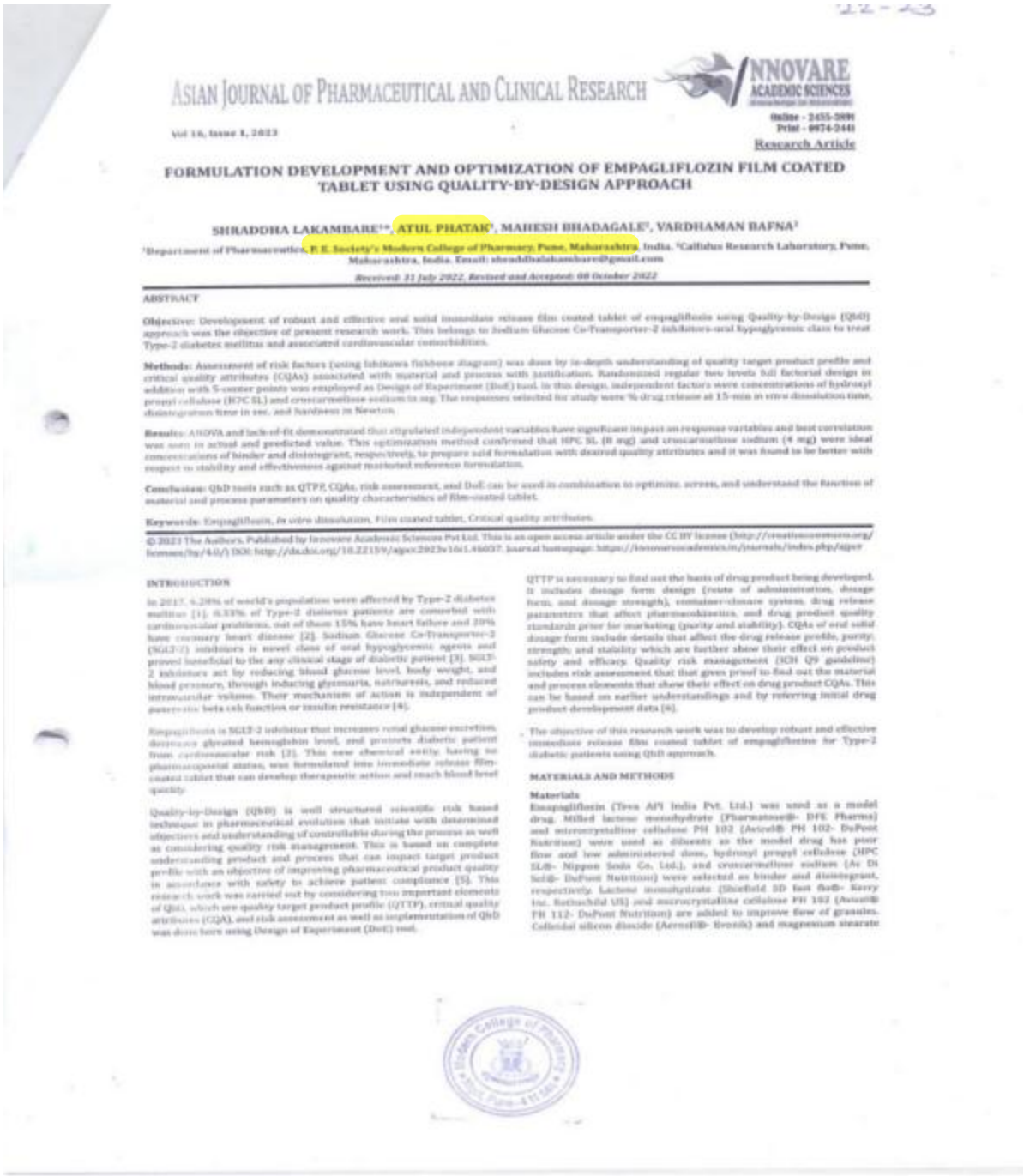
Dandruff is a skin condition caused due to fungus *Malassezia* fungi, which affects the scalp, makes it itchy and greasy (1). Dandruff is a common scalp disorder affecting almost half of the population. Keratinocytes play a key role in the expression and generation of immunological reactions during dandruff formation (2). The severity of dandruff worsens in winter. Various specialized shampoos were used to treat dandruff namely synthetic and herbal preparations.

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The herbal shampoo is a type of cosmetic preparation that uses herbs that is natural ingredients from the plant (3). Any hair cleansing solution, made from the extracts of Ayurvedic herbs and flowers, can be termed as a 'herbal shampoo'. It can also be defined as a hair care product in form of viscous liquid used to remove dirt, oil from the hair and make them clean (4). The shampoo has abundant abilities like lubrication, conditioning, hair growth, reduction of hair loss, maintaining hair color, medication. It also has vital roles like anti-dandruff property, cleansing action, also acts as a keratolytic agent. The main aim of shampoo preparation is to clean dirt and dandruff, also used to make hairs soft and silky (5).

The purpose of the present investigation is to avoid the use of synthetic or chemical preparations that are available in the market. Several herbal ingredients with antidandruff properties were used, which makes hair soft and lustrous, promote hair growth (6). Importantly these preparations are cost effective, not much expensive (7). Various plants used for the formulation such as neem, tulsi, reetha, bhringraj, shikakai, hibiscus.

Formulation Development and optimization of Empagliflozin film coated tablet using Quality by Design approach



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Research Article

FORMULATION DEVELOPMENT AND OPTIMIZATION OF EMPAGLIFLOZIN FILM COATED TABLET USING QUALITY-BY-DESIGN APPROACH

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ABSTRACT

Objective: Development of robust and effective oral solid immediate release film coated tablet of empagliflozin using Quality-by-Design (QbD) approach was the objective of present research work. This belongs to Sodium Glucose Co-Transporter-2 inhibitors oral hypoglycemic class to treat Type-2 diabetes mellitus and associated cardiovascular comorbidities.

Methods: Assessment of risk factors (using Ishikawa fishbone diagram) was done by in-depth understanding of quality target product profile and critical quality attributes (CQAs) associated with material and process with justification. Randomized regular two levels full factorial design in addition with 5-center points was employed as Design of Experiment (DoE) tool. In this design, independent factors were concentrations of hydroxyl propyl cellulose (HPC SL) and croscarmellose sodium in mg. The responses selected for study were % drug release at 15-min in vitro dissolution time, disintegration time in sec. and hardness in Newton.

Results: ANOVA and lack-of-fit demonstrated that stipulated independent variables have significant impact on response variables and best correlation was seen in actual and predicted value. This optimization method confirmed that HPC SL (8 mg) and croscarmellose sodium (4 mg) were ideal concentrations of binder and disintegrant, respectively, to prepare said formulation with desired quality attributes and it was found to be better with respect to stability and effectiveness against marketed reference formulation.

Conclusion: QbD tools such as QTPP, CQAs, risk assessment, and DoE can be used in combination to optimize, screen, and understand the function of material and process parameters on quality characteristics of film-coated tablet.

Keywords: Empagliflozin, *In vitro* dissolution, Film coated tablet, Critical quality attributes.

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INTRODUCTION

In 2017, 9.28% of world's population were affected by Type-2 diabetes mellitus [1]. 6.33% of Type-2 diabetes patients are comorbid with cardiovascular problems, out of them 15% have heart failure and 20% have coronary heart disease [2]. Sodium Glucose Co-Transporter-2 (SGLT-2) inhibitors is novel class of oral hypoglycemic agents and proved beneficial to the any clinical stage of diabetic patient [3]. SGLT-2 inhibitors act by reducing blood glucose level, body weight, and blood pressure, through inducing glucosuria, natriuresis, and reduced intravascular volume. Their mechanism of action is independent of pancreatic beta cell function or insulin resistance [4].

Empagliflozin is SGLT-2 inhibitor that increases renal glucose excretion, decreases glycated hemoglobin level, and protects diabetic patient from cardiovascular risk [2]. This new chemical entity having no pharmacopoeial status, was formulated into immediate release film-coated tablet that can develop therapeutic action and reach blood level quickly.

Quality-by-Design (QbD) is well structured scientific risk based technique in pharmaceutical evolution that initiate with determined objectives and understanding of controllable during the process as well as considering quality risk management. This is based on complete understanding product and process that can impact target product profile with an objective of improving pharmaceutical product quality in accordance with safety to achieve patient compliance [5]. This research work was carried out by considering two important elements of QbD, which are quality target product profile (QTTP), critical quality attributes (CQA), and risk assessment as well as implementation of QbD was done here using Design of Experiment (DoE) tool.

QTTP is necessary to find out the basis of drug product being developed. It includes dosage form design (route of administration, dosage form, and dosage strength), container-closure system, drug release parameters that affect pharmacokinetics, and drug product quality standards prior for marketing (purity and stability). CQAs of oral solid dosage form include details that affect the drug release profile, purity, strength, and stability which are further show their effect on product safety and efficacy. Quality risk management (ICH Q9 guideline) includes risk assessment that that gives proof to find out the material and process elements that show their effect on drug product CQAs. This can be based on earlier understandings and by referring initial drug product development data [6].

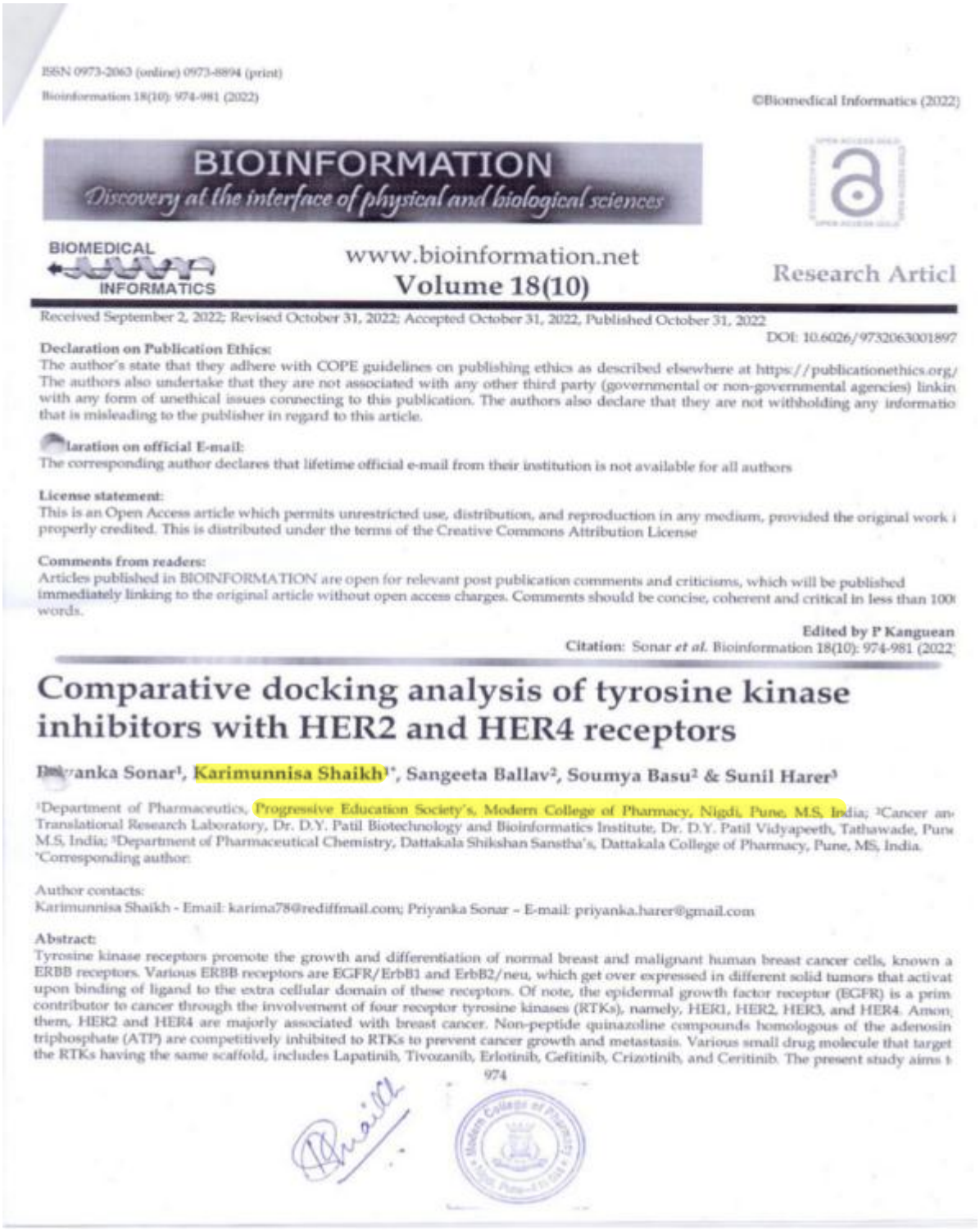
The objective of this research work was to develop robust and effective immediate release film coated tablet of empagliflozin for Type-2 diabetic patients using QbD approach.

MATERIALS AND METHODS

Materials

Empagliflozin (Teva API India Pvt. Ltd.) was used as a model drug. Milled lactose monohydrate (Pharmatose®- DFE Pharma) and microcrystalline cellulose PH 102 (Avicel® PH 102- DuPont Nutrition) were used as diluents as the model drug has poor flow and low administered dose, hydroxyl propyl cellulose (HPC SL®- Nippon Soda Co. Ltd.), and croscarmellose sodium (Ac Di Sol®- DuPont Nutrition) were selected as binder and disintegrant, respectively. Lactose monohydrate (SheBold SD fast flo®- Kerry Inc. Rothschild US) and microcrystalline cellulose PH 102 (Avicel® PH 112- DuPont Nutrition) are added to improve flow of granules. Colloidal silicon dioxide (Aerosil®- Evonik) and magnesium stearate

Comparative docking analysis of tyrosine kinase inhibitors with HER2 and HER4 receptors



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Comparative docking analysis of tyrosine kinase inhibitors with HER2 and HER4 receptors

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Abstract:
Tyrosine kinase receptors promote the growth and differentiation of normal breast and malignant human breast cancer cells, known a ERBB receptors. Various ERBB receptors are EGFR/ErbB1 and ErbB2/neu, which get over expressed in different solid tumors that activat upon binding of ligand to the extra cellular domain of these receptors. Of note, the epidermal growth factor receptor (EGFR) is a prim contributor to cancer through the involvement of four receptor tyrosine kinases (RTKs), namely, HER1, HER2, HER3, and HER4. Amon them, HER2 and HER4 are majorly associated with breast cancer. Non-peptide quinazoline compounds homologous of the adenosin triphosphate (ATP) are competitively inhibited to RTKs to prevent cancer growth and metastasis. Various small drug molecule that target the RTKs having the same scaffold, includes Lapatinib, Tivozanib, Erlotinib, Gefitinib, Crizotinib, and Ceritinib. The present study aims t

Preparation and Evaluation of Anti-Dandruff Hair Oil Using Various Herbs

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SHORT COMMUNICATION OPEN ACCESS

Preparation and Evaluation of Anti-Dandruff Hair Oil Using Various Herbs

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ABSTRACT

Herbal formulation has gained a notable position from ancient time. Nowadays, it is popular to use herbal preparation as it gives effective results without any harmful side effects. Herbal preparation has been remarkably used for its safety and efficacy. Hair loss as well as hair damage is major concern in young generation. The objective of the study is to formulate and evaluate anti-dandruff hair oil using various herbs namely Neem (Azadiruchta indica A. Juss), Black pepper (Piper nigrum), Aloe Vera (Aloe barbadensis miller), Hibiscus leaves (Hibiscus rosa-sinensis L.), tulsi leaves (Ocimum sanctum L.), fenugreek seeds, bhringraj powder, curry leaves, menthol, orange peels, lavender oil. The coconut oil was used as base oil which make an effective anti-dandruff formulation with smooth and shiny hairs, also provide conditioning and promotes hair growth. The formulated shampoo was subjected to evaluation parameters like visual inspection, pH, viscosity, antidandruff test and stability studies, etc. The major goal of the present study is to formulate and evaluate anti-dandruff hair oil for treating various hair issues.

***Keywords:** Anti-dandruff hair oil, Ayurvedic oil, Malassezia furfur, Antimicrobial Activity, Polyherbal formulation, keratolytic agent.*

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INTRODUCTION

Hair being protective and essential part of body, it is very crucial to treat problems related to them. Many young people suffer from hair related problem like hair loss, dandruff and many treatments are available in market. Hair loss occurs due to excess exposure of hair to chemicals, dandruff, disease state of scalp as well as decrease blood flow. There are two types of dandruff: i) Dry dandruff- yeast like fungus causes this dry type of dandruff, ii) Oily dandruff- it is due to excess formation of sebum on scalp of hair [1]. Hence to stimulate hair growth and for anti-dandruff activity it is important to develop novel formulation. Hair care products are used to maintain hair strength and make them healthy [2]. Plant and herbal material based products act as very important tool to treat human disease and also used as cosmetics [3]. Herbal hair oil is formulation obtained from natural sources and using oil base to treat hair related problem. Primary function is to keep hair healthy and good looking.

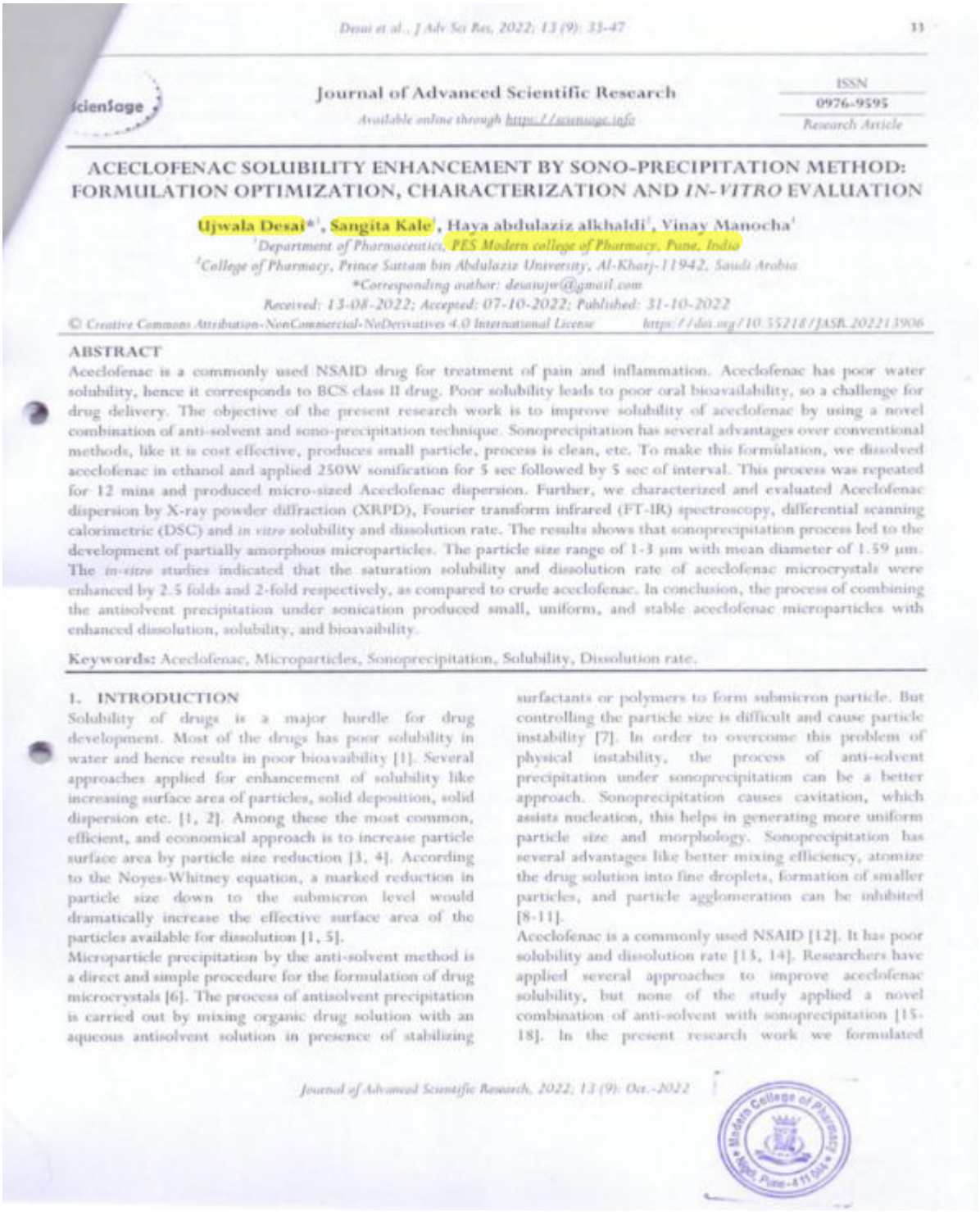
Herbal hair oil is known for improving hair health and scalp health, also used to treat dry scalp and dry hair problems [4]. Herbal hair oil act as good hair growth promoter by providing important nutrient material to hair and scalp for good hair growth [4]. Due to stress and tension hair are becoming old early and gets easily detached from scalp often observed in adult after age 20, nowadays it has become major hair related problem, so putting light on to this issue herbal hair oil is designed and formulated. The main problem associated to hair are dandruff, dry hair, loss of hair is overcome with subsequent use of herbal hair oil [5].

MATERIAL AND METHODS

Collection and storage of malassezia furfur

The yeast like fungus was obtained by scraping dandruff from scalp with use of cotton swab. Cotton was dipped in sterile water and placed in refrigerator for further studies. Streak plate method was used for formation of culture plates of micro-organism and incubated for 2 days. The growth of micro-organism was observed and identification test were performed to confirm the organism.

Aceclofenac solubility enhancement by sonoprecipitation method: Formulation, Optimization, characterization and in vitro evaluation



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Research Article

ACECLOFENAC SOLUBILITY ENHANCEMENT BY SONO-PRECIPITATION METHOD: FORMULATION OPTIMIZATION, CHARACTERIZATION AND *IN-VITRO* EVALUATION

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ABSTRACT

Aceclofenac is a commonly used NSAID drug for treatment of pain and inflammation. Aceclofenac has poor water solubility, hence it corresponds to BCS class II drug. Poor solubility leads to poor oral bioavailability, so a challenge for drug delivery. The objective of the present research work is to improve solubility of aceclofenac by using a novel combination of anti-solvent and sono-precipitation technique. Sonoprecipitation has several advantages over conventional methods, like it is cost effective, produces small particle, process is clean, etc. To make this formulation, we dissolved aceclofenac in ethanol and applied 250W sonification for 5 sec followed by 5 sec of interval. This process was repeated for 12 mins and produced micro-sized Aceclofenac dispersion. Further, we characterized and evaluated Aceclofenac dispersion by X-ray powder diffraction (XRPD), Fourier transform infrared (FT-IR) spectroscopy, differential scanning calorimetric (DSC) and *in vitro* solubility and dissolution rate. The results shows that sonoprecipitation process led to the development of partially amorphous microparticles. The particle size range of 1-3 µm with mean diameter of 1.59 µm. The *in-vitro* studies indicated that the saturation solubility and dissolution rate of aceclofenac microcrystals were enhanced by 2.5 folds and 2-fold respectively, as compared to crude aceclofenac. In conclusion, the process of combining the antisolvent precipitation under sonication produced small, uniform, and stable aceclofenac microparticles with enhanced dissolution, solubility, and bioavaibility.

Keywords: Aceclofenac, Microparticles, Sonoprecipitation, Solubility, Dissolution rate.

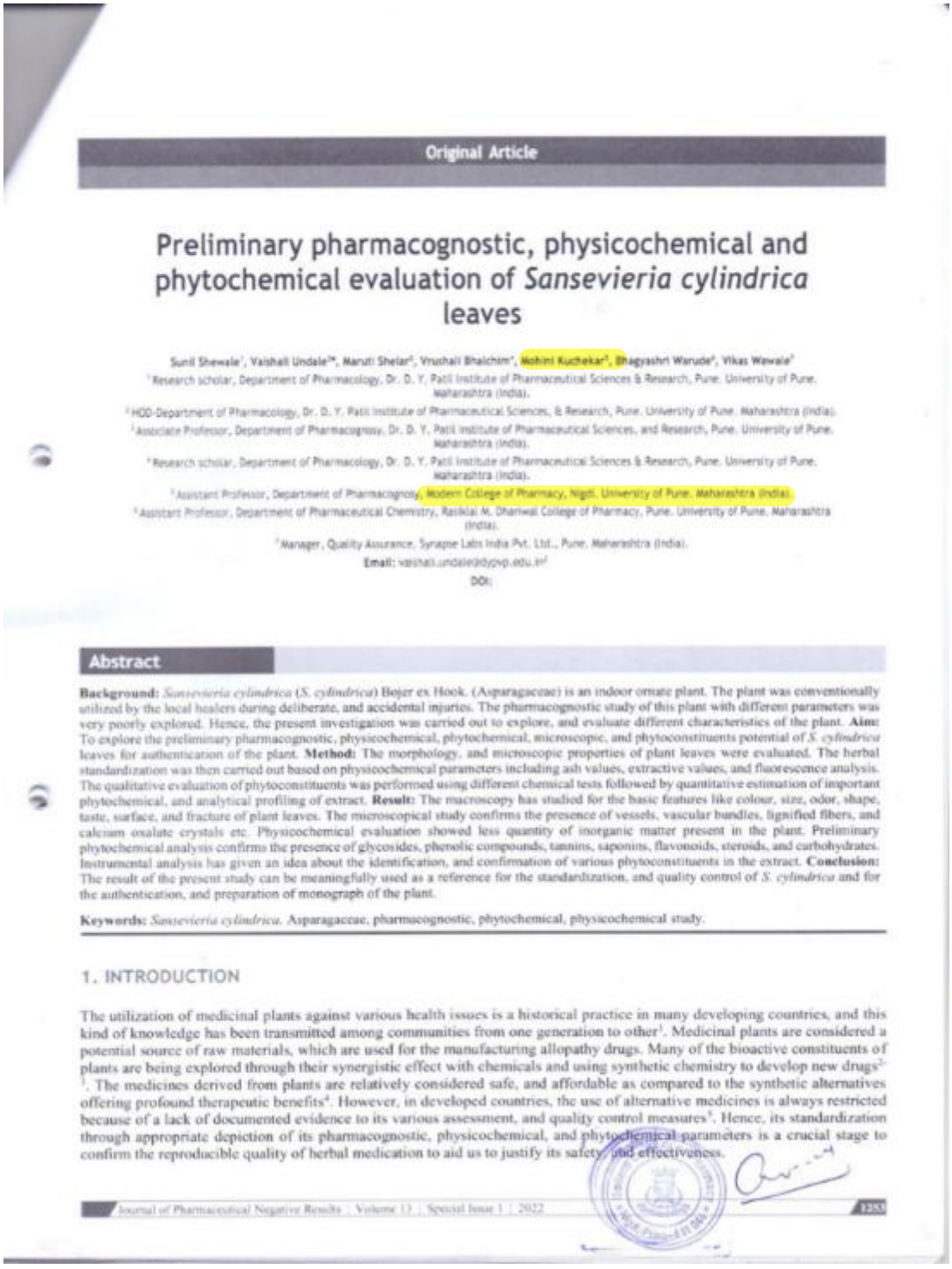
1. INTRODUCTION

Solubility of drugs is a major hurdle for drug development. Most of the drugs has poor solubility in water and hence results in poor bioavaibility [1]. Several approaches applied for enhancement of solubility like increasing surface area of particles, solid deposition, solid dispersion etc. [1, 2]. Among these the most common, efficient, and economical approach is to increase particle surface area by particle size reduction [3, 4]. According to the Noyes-Whitney equation, a marked reduction in particle size down to the submicron level would dramatically increase the effective surface area of the particles available for dissolution [1, 5].

Microparticle precipitation by the anti-solvent method is a direct and simple procedure for the formulation of drug microcrystals [6]. The process of antisolvent precipitation is carried out by mixing organic drug solution with an aqueous antisolvent solution in presence of stabilizing surfactants or polymers to form submicron particle. But controlling the particle size is difficult and cause particle instability [7]. In order to overcome this problem of physical instability, the process of anti-solvent precipitation under sonoprecipitation can be a better approach. Sonoprecipitation causes cavitation, which assists nucleation, this helps in generating more uniform particle size and morphology. Sonoprecipitation has several advantages like better mixing efficiency, atomize the drug solution into fine droplets, formation of smaller particles, and particle agglomeration can be inhibited [8-11].

Aceclofenac is a commonly used NSAID [12]. It has poor solubility and dissolution rate [13, 14]. Researchers have applied several approaches to improve aceclofenac solubility, but none of the study applied a novel combination of anti-solvent with sonoprecipitation [15-18]. In the present research work we formulated

Preliminary pharmacognostic, physicochemical and phytochemical evaluation of Sansevieria cylindrica leaves



Original Article

Preliminary pharmacognostic, physicochemical and phytochemical evaluation of *Sansevieria cylindrica* leaves

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Abstract

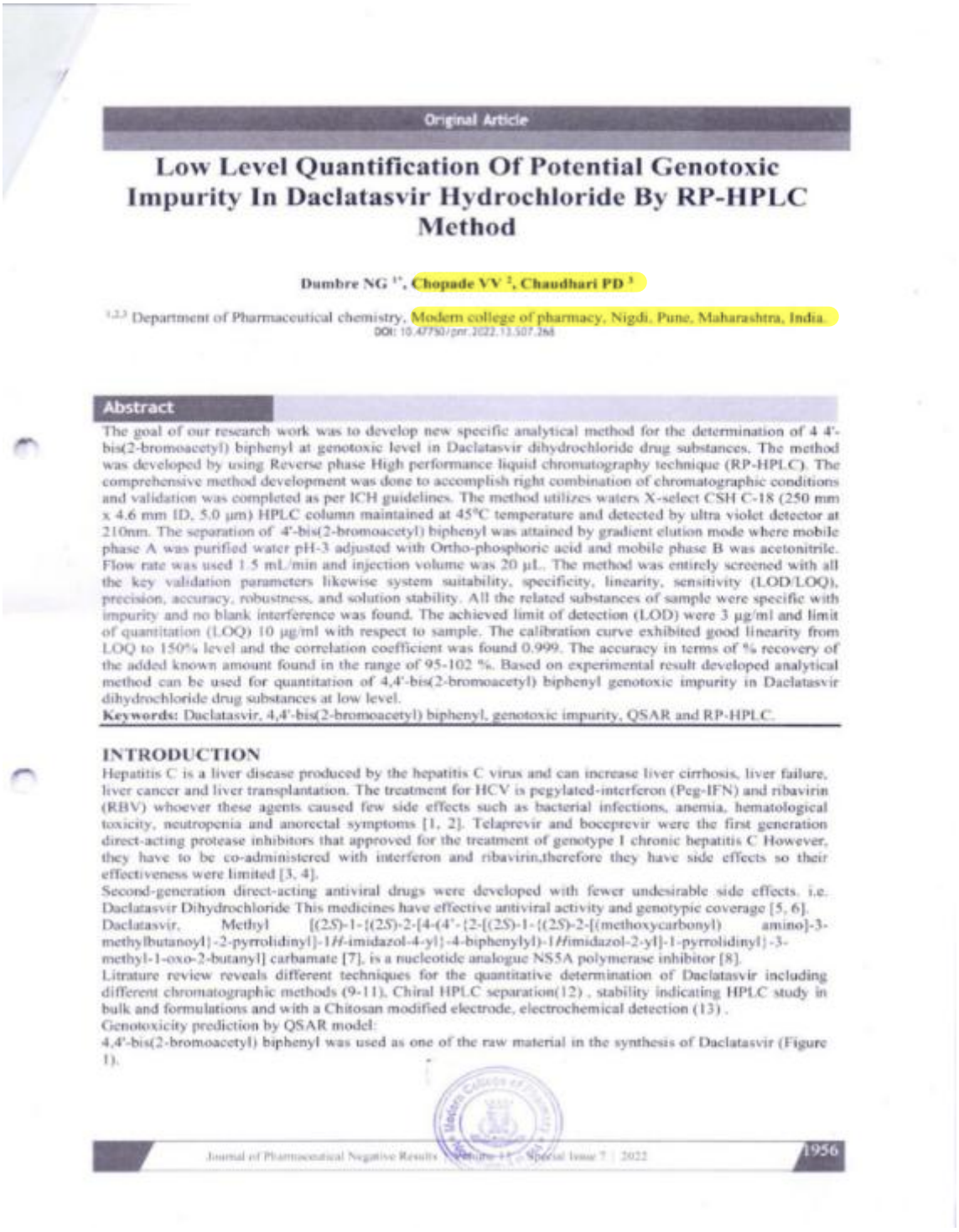
Background: *Sansevieria cylindrica* (*S. cylindrica*) Bojer ex Hook. (Asparagaceae) is an indoor ornate plant. The plant was conventionally utilized by the local healers during deliberate, and accidental injuries. The pharmacognostic study of this plant with different parameters was very poorly explored. Hence, the present investigation was carried out to explore, and evaluate different characteristics of the plant. **Aim:** To explore the preliminary pharmacognostic, physicochemical, phytochemical, microscopic, and phytoconstituents potential of *S. cylindrica* leaves for authentication of the plant. **Method:** The morphology, and microscopic properties of plant leaves were evaluated. The herbal standardization was then carried out based on physicochemical parameters including ash values, extractive values, and fluorescence analysis. The qualitative evaluation of phytoconstituents was performed using different chemical tests followed by quantitative estimation of important phytochemical, and analytical profiling of extract. **Result:** The macroscopy has studied for the basic features like colour, size, odor, shape, taste, surface, and fracture of plant leaves. The microscopical study confirms the presence of vessels, vascular bundles, lignified fibers, and calcium oxalate crystals etc. Physicochemical evaluation showed less quantity of inorganic matter present in the plant. Preliminary phytochemical analysis confirms the presence of glycosides, phenolic compounds, tannins, saponins, flavonoids, steroids, and carbohydrates. Instrumental analysis has given an idea about the identification, and confirmation of various phytoconstituents in the extract. **Conclusion:** The result of the present study can be meaningfully used as a reference for the standardization, and quality control of *S. cylindrica* and for the authentication, and preparation of monograph of the plant.

Keywords: *Sansevieria cylindrica*, Asparagaceae, pharmacognostic, phytochemical, physicochemical study.

1. INTRODUCTION

The utilization of medicinal plants against various health issues is a historical practice in many developing countries, and this kind of knowledge has been transmitted among communities from one generation to other[1]. Medicinal plants are considered a potential source of raw materials, which are used for the manufacturing allopathy drugs. Many of the bioactive constituents of plants are being explored through their synergistic effect with chemicals and using synthetic chemistry to develop new drugs[2-3]. The medicines derived from plants are relatively considered safe, and affordable as compared to the synthetic alternatives offering profound therapeutic benefits[4]. However, in developed countries, the use of alternative medicines is always restricted because of a lack of documented evidence to its various assessment, and quality control measures[5]. Hence, its standardization through appropriate depiction of its pharmacognostic, physicochemical, and phytochemical parameters is a crucial stage to confirm the reproducible quality of herbal medication to aid us to justify its safety, and effectiveness.

Low Level Quantification Of Potential Genotoxic Impurity In Daclatasvir Hydrochloride By RP-HPLC Method



Original Article

Low Level Quantification Of Potential Genotoxic Impurity In Daclatasvir Hydrochloride By RP-HPLC Method

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Abstract

The goal of our research work was to develop new specific analytical method for the determination of 4 4'-bis(2-bromoacetyl) biphenyl at genotoxic level in Daclatasvir dihydrochloride drug substances. The method was developed by using Reverse phase High performance liquid chromatography technique (RP-HPLC). The comprehensive method development was done to accomplish right combination of chromatographic conditions and validation was completed as per ICH guidelines. The method utilizes waters X-select CSH C-18 (250 mm x 4.6 mm ID, 5.0 µm) HPLC column maintained at 45°C temperature and detected by ultra violet detector at 210nm. The separation of 4'-bis(2-bromoacetyl) biphenyl was attained by gradient elution mode where mobile phase A was purified water pH-3 adjusted with Ortho-phosphoric acid and mobile phase B was acetonitrile. Flow rate was used 1.5 mL/min and injection volume was 20 µL. The method was entirely screened with all the key validation parameters likewise system suitability, specificity, linearity, sensitivity (LOD/LOQ), precision, accuracy, robustness, and solution stability. All the related substances of sample were specific with impurity and no blank interference was found. The achieved limit of detection (LOD) were 3 µg/ml and limit of quantitation (LOQ) 10 µg/ml with respect to sample. The calibration curve exhibited good linearity from LOQ to 150% level and the correlation coefficient was found 0.999. The accuracy in terms of % recovery of the added known amount found in the range of 95-102 %. Based on experimental result developed analytical method can be used for quantitation of 4,4'-bis(2-bromoacetyl) biphenyl genotoxic impurity in Daclatasvir dihydrochloride drug substances at low level.

Keywords: Daclatasvir, 4,4'-bis(2-bromoacetyl) biphenyl, genotoxic impurity, QSAR and RP-HPLC.

INTRODUCTION

Hepatitis C is a liver disease produced by the hepatitis C virus and can increase liver cirrhosis, liver failure, liver cancer and liver transplantation. The treatment for HCV is pegylated-interferon (Peg-IFN) and ribavirin (RBV) whoever these agents caused few side effects such as bacterial infections, anemia, hematological toxicity, neutropenia and anorectal symptoms [1, 2]. Telaprevir and boceprevir were the first generation direct-acting protease inhibitors that approved for the treatment of genotype I chronic hepatitis C However, they have to be co-administered with interferon and ribavirin,therefore they have side effects so their effectiveness were limited [3, 4].

Second-generation direct-acting antiviral drugs were developed with fewer undesirable side effects. i.e. Daclatasvir Dihydrochloride This medicines have effective antiviral activity and genotypic coverage [5, 6].

Daclatasvir, Methyl [(2*S*)-1-{(2*S*)-2-[4-(4'-{2-[(2*S*)-1-{(2*S*)-2-[(methoxycarbonyl) amino]-3-methylbutanoyl}-2-pyrrolidinyl]-1*H*-imidazol-4-yl}-4-biphenylyl)-1*H*imidazol-2-yl]-1-pyrrolidinyl}-3-methyl-1-oxo-2-butanyl] carbamate [7], is a nucleotide analogue NS5A polymerase inhibitor [8].

Litrature review reveals different techniques for the quantitative determination of Daclatasvir including different chromatographic methods (9-11), Chiral HPLC separation(12) , stability indicating HPLC study in bulk and formulations and with a Chitosan modified electrode, electrochemical detection (13) .

Genotoxicity prediction by QSAR model:

4,4'-bis(2-bromoacetyl) biphenyl was used as one of the raw material in the synthesis of Daclatasvir (Figure 1).

A Validated Stability Indicating HPTLC Method for Estimation of Bilastine in Bulk and Tablet Dosage Form and Characterization of Impurities by LC-MS Method

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ORIGINAL ARTICLE

A Validated Stability Indicating HPTLC Method for Estimation of Bilastine in Bulk and Tablet Dosage Form and Characterization of Impurities by LC-MS Method

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ABSTRACT

A sensitive, accurate and precise high-performance thin layer chromatographic method was developed for simultaneous estimation of Bilastine/BILAS in bulk and tablet dosage form. The successful separation was achieved on CAMAG HPTLC. The stationary phase and n-Hexane: Methanol: Iso Propyl Alcohol (1:5:4 v/v/v) as mobile phase. Chromatographic analysis was carried out in the reflectance/absorbance mode at 277 nm. The method was validated with respect to linearity, specificity, accuracy, precision, limit of detection and limit of quantitation and applied for analysis of drug in tablet dosage form. The Rf values were found to be 0.53 ± 0.02 for selected drug. The linear regression analysis this for the calibration plots showed a linear relationship in the concentration range 500-2500 ng/band with correlation coefficient 0.997. A validation study has been performed as per ICH guidelines. Functional groups was determined using Fourier transform Infrared spectroscopy (JASCO FTIR—4700). Potassium bromide (KBr) pellet was made and the sample was ground along with potassium bromide. For the characterization of degradation product using LC-MS/MS. For LC-MS study Inertsil C18 column (150 mm length x 2.1 mm , 3 µm particle size) and the mobile phase comprised of 0.1% formic acid and methanol (50:50 v/v) pumped at rate of 0.2 mL/min. was employed for chromatographic separation of Bilastine and its degradation products. The injection volume of drug was 10 µL and temperature of column was 40 °C.

KEYWORDS: *Bilastine, HPTLC, FT-IR, Mass spectrometry, Stress degradation.*

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INTRODUCTION

Bilastine/BILAS is highly non-sedating antihistamine indicated for the symptomatic treatment of allergic rhinoconjuctivities and urticaria[1]. Bilastine is novel ,second generation H1 receptor inhibitor chemically known as 2-[4-(2-{4-[1-(2-ethoxyethyl)-1H-1,3-benzodiazol-2-yl]piperidin-1-yl}ethyl)phenyl]-2-methylpropanoic acid[2] .It is highly selective for the H1 histamine receptor, has a rapid onset and prolonged duration of action. Molecular formula is C28H37N3O3 and molecular weight 463.61g/mol[2]. This plays important role in quality assurance of the product throughout its shelf life. The reason for selection of this method is because there is not much this available on HPTLC of Bilastine. Also drug was subjected to Fourier –Transform Infrared Spectroscopy for finding the functional groups present. Degradation product and the drug were characterized by using LC-MS/MS using Inertsil C18 column (150 mm length x 2.1 mm , 3 µm particle size) was employed for chromatographic separation of Bilastine and its degradation products. The injection volume of drug was 10 µL and temperature of column was 40 °C. This method was adapted for the study of the selected drug because not much literature is available on this drug using HPTLC method, also this method includes stress degradation and further characterization of the impurities using LC-MS technique. Also the method incorporated is novel, accurate, precise and reproducible. This method is cost effective as compared to other reported methods and also it is less time consuming.

Design, synthesis and evaluation of n-(benzo[d]thiazol-2-yl)-2-oxo2h-chromene-3-carboxamide derivatives as potential antioxidant and antibacterial agents

ORIGINAL RESEARCH ARTICLES

DESIGN, SYNTHESIS AND EVALUATION OF *N*-(BENZO[D]THIAZOL-2-YL)-2-OXO-2*H*-CHROMENE-3-CARBOXAMIDE DERIVATIVES AS POTENTIAL ANTIOXIDANT AND ANTIBACTERIAL AGENTS

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ABSTRACT

This research is focused on designing, synthesis and biological evaluation of a series of coumarin based benzothiazole derivatives. The ligands were identified by docking study for antioxidant and antibacterial potential using target proteins PDB:4H1J and PDB:3G75, respectively. The target molecules were synthesized as a series of substituted *N*-(benzothiazol-2-yl)-2-oxo-chromene-3-carboxamides (7a–h) by condensation of substituted benzo[d]thiazol-2-amines with *in situ* synthesized substituted 2-oxo-2*H*-chromene-3-carbonyl chlorides. Infrared spectroscopy and ^{1}H- nuclear magnetic resonance spectra were used to characterize the synthesized molecules. *In vitro* antioxidant activity of compounds was evaluated by DPPH and H_2O_2 radical scavenging assays. Antibacterial potential of compounds was evaluated using well diffusion method against *Staphylococcus aureus* (ATCC 25923), *Escherichia coli* (ATCC 25922) and *Pseudomonas aeruginosa* (ATCC 27853). Among synthesized derivatives, 7a showed good antioxidant potential whereas 7f showed antibacterial activity, which might be employed as lead molecules for future investigation for respective activities.

Keywords: Antibacterial, antioxidant, benzothiazole, coumarin, docking, synthesis

INTRODUCTION

Heterocyclic compounds play a significant role in drug design & discovery. Their derivatization leads to formation of various category drugs, therefore they received considerable attention of many researchers. The incorporation of heterocyclic nucleus can make the molecule more versatile for biological activity and can be converted to drug by lead modification. In the family of heterocyclic compounds, coumarin and benzothiazole played significant role because their derivatives are pharmacologically active and are found in many different categories of drugs. Oxygen-rich heterocyclic coumarin (2*H*-chromen-2-one) derivatives possess many biological activities like antimalarial[1], anticancer[1], monoamino oxidase inhibitor[2], anti-inflammatory[3], antioxidant[3,4], antibacterial[4], antiviral[5], analgesic[6] and antimicrobial[7]. Sulfur-rich heterocyclic benzothiazole (1,3-thiazole) derivatives have been reported to exhibit biological activities like antifungal[8], antimicrobial[9], antibacterial[10], antiviral[11], anticancer[11], antimalarial[12], anti-inflammatory[13] and antioxidant[14]. Condensed heterocyclic derivatives showed antioxidant[15], antimicrobial[16] and anti-inflammatory[17] activities.

Cellular damage is caused by reactive oxygen species produced as a result of severe oxidative stress or inadequate antioxidant scavenging activity. Antioxidants slow down the progress of oxidative damage associated with chronic diseases such as cancer, alzheimer, parkinson, inflammation, depression and cataracts, therefore it is essential to design novel antioxidants. The antioxidant potential of heterocyclic compounds can be determined *In vitro* using DPPH and H_2O_2 scavenging methods. Similarly, increased bacterial

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Anticataleptic effect of Curcuma Amada ethanolic extract in laboratory animals

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ORIGINAL ARTICLE

Anticataleptic effect of *Curcuma Amada* ethanolic extract in laboratory animals

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ABSTRACT

Curcuma amada (Zingiberaceae) rhizomes in various extracts is reported to have mast cell stabilizing property and also the plant is reported to increase the release of dopamine from the brain. So, the current study was undertaken to scientifically validate the benefits of plant as an antihistaminic agent as well as dopaminergic agent. In the current research work, the antihistaminic activity of an ethanolic extract of Curcuma amada rhizome (at a dose of 200 mg/kg, i.p.) was evaluated using haloperidol-induced catalepsy and clonidine-induced catalepsy in laboratory rats. The results showed that the ethanolic extract exhibits the inhibitory effect on the catalepsy induced by the clonidine as well as haloperidol. This strongly suggests that, the inhibition is mediated through both antihistaminic and dopamine agonistic action. Hence, in the present study, it is concluded that, the ethanolic extract has significant anticataleptic activity. The polar constituents in the ethanolic extract of Curcuma amada may be responsible for the underlined effects.

***Key words:** Antihistaminic, Curcuma amada, catalepsy bar, Haloperidol, Clonidine*

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INTRODUCTION

Plants are one of the most important sources of biologically active substances. Secondary metabolites, which are physiologically active biochemical molecules, are responsible for a plant's medicinal properties. *Curcuma amada* is a medicinal herb belonging to *Zingiberaceae* family with various medicinal and biological properties. The purpose of this work is to evaluate the effect of acute administration of ethanolic extract of *C. amada* on the cataleptic behavior in the laboratory animals. Phytoconstituents abound in volatile oils isolated from *C. amada* rhizomes. The main phytocompounds present in the plant are curcuminoids (curcumin, dimethoxy curcumin, bisdemethoxycurcumin), phenolic compounds (caffeic acid, gentisic acid, ferulic acid, gallic acid, cinnamic acid), terpinoids (difurocumenol, amadannulen, amadaldehyde), and essential oils (myrcene and asarone). *C. Amada*'s medicinal properties are due to the presence of curcuminoids. It has anti-bacterial, anti-inflammatory, anti-tubercular, anti-cancer, anthelmintic, anti-allergy, and antipyretic properties and has been used for centuries to treat a variety of ailments. It also has the ability to heal a variety of skin diseases. [1]

The antibacterial activity was studied against different strains of microbes and higher efficacy of the same was observed with the essential oils prepared by Ultrasound-Assisted Extraction and Microwave-Assisted Extraction methods. [2] Difurocumenonol which was isolated from Mango ginger extract showed high antibacterial activity against gram-negative and gram-positive bacteria. [3] As per Ayurvedic, Unani and folk medicines, C. amada in its methanolic extract is used in the treatment of rheumatic disorder due to its analgesic property. It is also used in the treatment of inflammation and fever. [4] Due to its property as an appetizer, alexiteric, antipyretic, aphrodisiac, diuretic, emollient, expectorant and laxative and to cure biliousness, itching, skin diseases, bronchitis, asthma, hiccough and inflammation due to injuries; Ayurvedic and Unani medicinal systems have given much importance to it. The major chemical constituents found in Curcuma amada are starch, phenolic acids, volatile oils, curcuminoids and terpenoids like difurocumenonol, amadannulen and amadaldehyde. UV, IR, LC-MS and 2D-HMQCT NMR spectral data studies were used to deduce the structure of the isolated compound which was named as amadaldehyde, a novel compound. [5]

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Development and validation of novel RP-HPLC method for quantification of lapatinib ditosylate in newer formulation: a quality by design approach

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Original Article

DEVELOPMENT AND VALIDATION OF NOVEL RP-HPLC-DAD METHOD FOR QUANTIFICATION OF LAPATINIB DITOSYLATE IN NEWER NANO-LIPOSOME FORMULATION: A QUALITY BY DESIGN (QBD) APPROACH

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ABSTRACT

Objective: The current study entails quality by design (QbD) enabled the development of a simple, rapid, sensitive, and cost-effective RP-HPLC method for estimation of Lapatinib ditosylate (LPT) in a newly prepared nano-liposomal formulation which has not been reported earlier.

Methods: The chromatographic factors were screened using a fractional factorial design. A central composite design was employed as a response surface methodology. Mobile phase ratio, flow rate, and wavelength were identified as critical method parameters. To minimize retention time, peak area and theoretical plates were employed as critical analytical attributes. A novel nano-liposomal formulation of LPT was prepared by the film hydration method.

Results: The optimized chromatographic condition was obtained at a mobile phase composition of methanol and 0.05% v/v o-phosphoric acid in water (81:19 v/v), flow rate 0.7 ml/min, and peak detected at wavelength 261 nm using DAD detector. The retention time for Lapatinib was 3.702 min. The developed method was validated as per ICH guidelines ICH Q2 (R1). Linearity ($R2= 0.999$) was observed in the range of 10-50µg/ml. The limit of detection and limit of quantitation was found to be 0.6309µg/ml and 1.9120µg/ml, respectively. LPT containing liposome formulation assay was found to be 99.03% and %RSD was less than 1%.

Conclusion: The newly developed RP-HPLC method applying the QbD approach was found to be simple, specific, precise, accurate, linear, and rugged, with good recovery of LPT in the nano-liposome formulation in a cost-effective manner. Hence it can be employed for the quantification of LPT in bulk and pharmaceutical formulations.

Keywords: RP-HPLC, Quality by design, Validation, Lapatinib ditosylate, Liposome

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INTRODUCTION

As per recommended ICH guidelines, validation of HPLC the analytical method does not provide much reliability concerning the reduction in method variability beyond the conventional robust testing. Thus, implementation of quality by design (QbD) principles for analytical method development has now been reported quite popularly for attaining high robustness and enhanced method performance [1]. The QbD method was based on the understanding and implementation of guidelines ICH Q8 Pharmaceutical Development, ICH Q9 Quality Risk Management, and ICH Q10 Pharmaceutical Quality System [2-4]. The QbD approach highlights product and process understanding with quality risk management and controls, resulting in higher product quality assurance, regulatory flexibility, and continual improvement.

Analytical QbD is defined as a science and risk-based paradigm for analytical method development, endeavoring to understand the predefined objectives to control the critical method variables affecting the critical method attributes (CMA) to accomplish enhanced method performance, high robustness, ruggedness, and flexibility for continual improvement [5, 6]. The result of analytical QbD is well known, fit for purpose, and robust method reliably delivers the intended output over its lifecycle, similar to the process QbD [7, 8]. QbD approach facilitates science and risk-based understanding of the major sources of variability, followed by the identification of critical method parameters (CMPs) using risk assessment and factor screening studies. The high-risk variables with a critical impact on the analytical method performance are screened and optimized using suitable experimental designs for augmenting method performance [9]. In the past few decades, literature reports on diverse drugs have vouched for the phenomenal benefits of the QbD approach for developing the analytical methods for drug substances, impurities, and degradation products effectively and cost-effectively [10].

LPT is an orally available selective dual tyrosine kinase inhibitor that inhibits both Epidermal Growth Factor Receptor (EGFR) and Human Epidermal Receptor (HER-2) receptors over-expressed in breast cancer cells [11]. LPT is designed chemically as *N*-(3-Chloro-4-{(3-fluorobenzyl)oxy}phenyl)-6-[5-({[2-(methylsulfonyl)ethyl]amino} methyl)-2-furyl]quinazolin-4-amine having molecular formula $C_{29}H_{26}ClFN_4O_4S$, the chemical structure is shown in fig. 1. LPT is recommended in the treatment guidelines of HER-2 positive breast tumors and also in metastatic breast cancer [12].

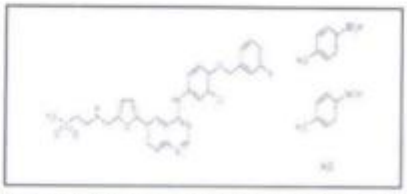


Fig. 1: Chemical structure of lapatinib ditosylate (LPT)

A literature survey reveals high-performance liquid chromatography (HPLC) [13, 14], liquid chromatography-mass spectrometry (LC-MS)/MS [15], and ultra-performance liquid chromatography (UPLC)/MS-MS methods have been developed for the estimation of LPT. Liquid chromatography electro-spray tandem mass [16] and liquid chromatography-mass spectrometry [17-21], were developed for quantitatively determining the LPT in biological samples. However, the reverse-phase high-performance liquid chromatography (RP-HPLC) method for the quantification of LPT in liposome formulation by

Design, Synthesis, Molecular Docking and Antioxidant Evaluation of Benzimidazole- 1,3,4 oxadiazole Derivatives



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Design, Synthesis, Molecular Docking and Antioxidant Evaluation of Benzimidazole-1,3,4 oxadiazole Derivatives

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ABSTRACT

In this research, we synthesised novel benzimidazole-1,3,4 oxadiazole derivatives and studied their antioxidant properties using the DPPH Radical Scavenging Assay. A significant class of substances with a broad range of biological activities is the 1,3,4-benzimidazole family. Furthermore, enabling for various biological activities are the five-membered heterocyclic moieties. Thus, a number of benzimidazole derivatives have been created, there in vitro antioxidant activity has been evaluated, and they have been characterized by FTIR and ^{1}H NMR spectral studies. Compounds **1A, 2A** and **3A** have the highest G-score i.e., - 7.575 kcal/mol, -6.932 kcal/mol, -6.911 kcal/mol, as compared to standards propyl gallate and Ascorbic acid, which had glide scores of -4.757 kcal/mol and -4.50 kcal/mol respectively. The benzimidazole-1,3,4 oxadiazole containing compounds that were created demonstrated impressive antioxidant activity. When compared to the reference standard, ascorbic acid, (IC_{50}-11.51±0.31 µg/ml) Compound 2A demonstrated the strongest antioxidant activity with an IC_{50} value (53.00±1.31 µg/ml) respectively.

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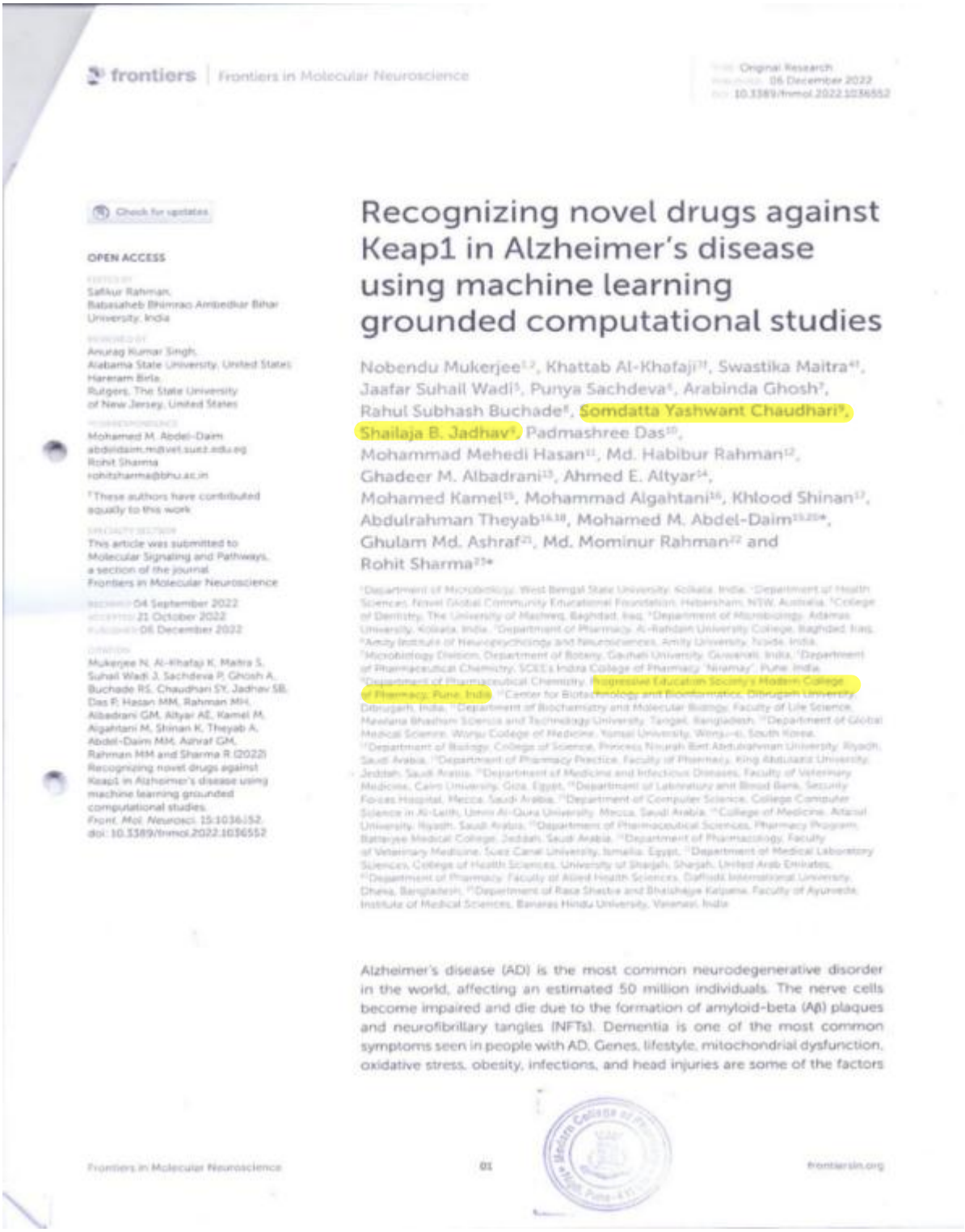
1. Introduction

Antioxidants are one of the body's many defences against oxidative/nitrosative damage [1]. Being a highly reactive atom, oxygen may mix with other elements to create "free radicals," which are potentially dangerous molecules. Free radicals, which may damage nucleic acids, proteins, carbohydrates, and lipids, are molecules or molecular fragments having one or more unpaired electrons in atomic or molecular orbitals [2]. Early ageing, carcinogenesis, atherosclerosis, cardiovascular disease, moderate cognitive impairment, diabetes mellitus, ischemia, Alzheimer's disease, Parkinson's disease, liver injury, inflammation, skin damages, and arthritis are just a few of the disorders that can result from this [3–11]. Regular bodily processes result in the production of free radicals and other reactive oxygen species (ROS), vital metabolic activities or by external factors such exposure to X-rays, ozone, tobacco smoke, air pollution, and industrial toxins [12]. Both enzymatic and non-enzymatic processes result in the constant formation of free radicals in cells [13]. Reactive oxygen species (ROS) such as hydroxyl HO-, superoxide O2-, peroxide ROO-, alkoxyl RO- and nitroxyl NO- radicals cause the oxidative destruction of all organic materials [14]. In general, human physiology involves reactive oxygen species (ROS) and reactive nitrogen species (RNS), two types of free radicals linked to the oxygen atom (O) or their equivalents that are more reactive with other molecules than with oxygen [15,16]. About 5% or more of the oxygen that is breathed in is converted by univalent reduction of oxygen into ROS such superoxide, hydrogen peroxide, and hydroxyl radicals [17]. Because they may scavenge these free radicals to avoid cellular damage by ultimately reducing oxidative stress, antioxidants have a beneficial effect on human health [18]. As a result, oxidation processes may produce free radicals, which harm cells by initiating chain reactions. Antioxidants stop these chain reactions by neutralising or stabilising free radicals, and by self-oxidizing, they prevent subsequent oxidation processes [19]. There have been two suggested primary mechanisms of action for antioxidants [20]. The principal antioxidant donates an electron to the first step, which breaks a chain by providing a free radical in the system with that electron [21]. The role of antioxidants is it aids in lowering free radicals. Normal cell growth is stimulated, and cells are protected against premature and aberrant ageing [22]. Several synthetic antioxidants, such as butylated hydroxy anisole (BHA), tert-butylated hydroquinone (TBHQ),

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Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies



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Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning grounded computational studies

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Alzheimer's disease (AD) is the most common neurodegenerative disorder in the world, affecting an estimated 50 million individuals. The nerve cells become impaired and die due to the formation of amyloid-beta (Aβ) plaques and neurofibrillary tangles (NFTs). Dementia is one of the most common symptoms seen in people with AD. Genes, lifestyle, mitochondrial dysfunction, oxidative stress, obesity, infections, and head injuries are some of the factors

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Virtual Screening, Synthesis, and Biological Evaluation of Some Carbohydrazide Derivatives as Potential DPP- IV Inhibitors



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MDPI

Article

Virtual Screening, Synthesis, and Biological Evaluation of Some Carbohydrazide Derivatives as Potential DPP-IV Inhibitors

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Abstract: Dipeptidyl peptidase-4 (DPP-IV) inhibitors are known as safe and well-tolerated antidiabetic medicine. Therefore, the aim of the present work was to synthesize some carbohydrazide derivatives (**1a**–**5d**) as DPP-IV inhibitors. In addition, this work involves simulations using molecular docking, ADMET analysis, and Lipinski and Veber's guidelines. Wet-lab synthesis was used to make derivatives that met all requirements, and then FTIR, NMR, and mass spectrometry were used to confirm the structures and perform biological assays. In this context, *in vitro* enzymatic and in vivo antidiabetic activity evaluations were carried out. None of the molecules had broken the majority of the drug-likeness rules. Furthermore, these molecules were put through additional screening using molecular docking. In molecular docking experiments (PDB ID: 2P8S), many molecules displayed more potent interactions than native ligands, exhibiting more hydrogen bonds, especially those with chloro- or fluoro substitutions. Our findings indicated that compounds **5b** and **4c** have IC_{50} values of 28.13 and 34.94 µM, respectively, under in vitro enzymatic assays. On the 21st day of administration to animals, compound **5b** exhibited a significant reduction in serum blood glucose level (157.33 ± 5.75 mg/dL) compared with the diabetic control (Sitagliptin), which showed 280.00 ± 13.29 mg/dL. The antihyperglycemic activity showed that the synthesized compounds have good hypoglycemic potential in fasting blood glucose in the type 2 diabetes animal model (T2DM). Taken all together, our findings indicate that the synthesized compounds exhibit excellent hypoglycemic potential and could be used as leads in developing novel antidiabetic agents.

Keywords: DPP-IV; in vivo; carbohydrazide; 2P8S; ADMET; molecular docking

1. Introduction

In silico Molecular docking of Herbal plant extract for Antioxidant activity

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In silico Molecular docking of Herbal plant extract for Antioxidant activity

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ABSTRACT:
The metabotropic glutamate receptors (mGluR1) are key receptors in the modulation of excitatory synaptic transmission in the central nervous system. The main objective of this research was to in silico screen the Leonotis nepetifolia to develop the antioxidant activity. Docking studies on Leonotis nepetifolia have been carried out using V Life MDS 4.3 software. The molecular docking analysis was carried out to better understand the interactions between Leonotis nepetifolia and metabotropic glutamate receptors. Hydrophobic and hydrogen bond interactions lead to the identification of active binding sites. The mint family has enormous economic value; it is a source of fragment plants like lavender and rosemary and flavourful ingredients like menthe and thyme that are used for a variety of therapeutic purposes, including the relief of stomach aches, gas, and loose stools. Additionally, mint contains antiviral and antibacterial properties. The Vander walls, hydrophobic, and hydrogen interaction are responsible for forming the stable compound of the ligand with the receptor. The molecular docking studies resulted in highlighting the ligand and their conformations which efficiently fit into the cavity of the target protein. The above studies are useful in understanding the structural requirements for the design of novel, potent and selective compounds with specific antioxidant activity. Docking is an important tool in understanding the structural requirements for the design of novel, potent and selective inhibitors and can be employed to design new drug discoveries and can be used for antioxidant activity.

KEYWORDS: Leonotis nepetifolia; metabotropic glutamate receptors; Docking study; Antioxidant; drug discovery;

INTRODUCTION:
A library of extremely numerous random compounds has been whittled down into a more manageable list of potentially useful inhibitors using the molecular modelling study method[1].
To better understand how ligands and receptors interact, the molecular docking study is a crucial tool in the drug discovery process. Additionally, a crucial model that is frequently utilised in the drug discovery process is used to link the chemical structures of various compounds to the biological activities that have been discovered for a group of them. A query of this type could be used to search chemical databases for fresh chemical entities.
The structural underpinnings of a dimeric metabotropic glutamate receptor's detection of glutamate. The central nervous system's excitatory synaptic transmission is mostly regulated by the metabotropic glutamate receptors (mGluR1) which are important. In this study, the extracellular ligand-binding region of mGluR1 was crystallized three times, once in a complex with glutamate and twice in two unliganded states. They all displayed disulphide-linked homodimers, whose "active" and "resting" conformations are controlled by a packed alpha-helical structure across the dimeric interface. The domain configurations of the bi-lobed protomer designs can be changed to provide either "open" or "closed" conformation[2]. According to the structures,

Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts

RESEARCH ARTICLE

Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts

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ABSTRACT

Cosmetics have fascinated the human race for ages. Cosmetics have been found to benefit in several ways such as enhancing appearance, protection, cleansing etc. If fortified with the benefit of herbal ingredients, these personal care products have proven to be a boon for many. The current study involves the formulation of seven shampoos using different herbal extracts and their comparative investigation for physicochemical and performance characteristics. Various herbal extracts using components such as coffee, fenugreek, green tea, bringaraj, onion seeds, orange oil, and lemon oil were developed and compared against the marketed standard. The effect of various extracts on the parameters such as surface tension, foam test and foam stability test, viscosity, cleansing test, sag test, dirt dispersion, wetting time and pH was successfully tested. All the formulations were found to be beneficial in eliminating oil, dirt, and dandruff, encouraging smooth, silky hair appearance, fortifying and darkening hair without altering or harming hair tresses. Our findings suggest the incorporation of fenugreek, lemon and orange peels to increase the cleansing ability. However, the inclusion of onion seeds and green tea has been found to be beneficial in the generation and stability of the foam.

Keywords: Bhringraj, Coffee, Cosmetics, Fenugreek, Onion, Herbal Shampoo.

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INTRODUCTION

Several cosmetics have been developed and tested for the fascination of mankind to be attractive and presentable. Hair and scalp remain the most exposed part of the human body to dirt, UV light, pollution, etc. Moreover, hair cleansing is more challenging than other body parts. Therefore, hair fall, itchy scalp, greying, alopecia and dandruff are common worldwide problems. Shampoos are formulated that offer attractiveness besides cleansing the hair and scalp. It also leaves the hair feeling manageable, shiny and smooth. However, there are some special shampoos that contain unique components with odd capabilities, such as medicated, anti-dandruff, conditioning, baby care and premium conditioning shampoos etc.[1-3] There are many different types of shampoos available in the market like powder, liquid, cream, jelly, aerosol, keratin, volumizing and specialized shampoo. The powder shampoo is prepared with the addition of water at time of application. Liquid shampoos are made by means of detergent of low cloud point. The cream shampoo is also named as lotion shampoo, a modified form of a transparent liquid cream shampoo. The jelly shampoo is clear and thick in consistency, prepared by integrating gelling agents. The aerosol shampoo is also named as foam-type shampoo because when the valve is pressed, shampoo comes out of the container as foam. Keratin

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Macroscopic and Microscopic Evaluation of Sansevieria cylindrica Plant

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Original Article

Macroscopic and Microscopic Evaluation of *Sansevieria cylindrica* Plant

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ABSTRACT

Aim and Objectives: The exploitation, adulteration and substitution of herbs is major hurdle for development of commercial natural products. Thus, the microscopic evaluation is the first step towards standardization of medicinal plant. A leaf from *Sansevieria cylindrica* Bojer ex Hook is examined both macroscopically and microscopically in the current study. **Materials and Methods:** *Sansevieria cylindrica* Bojer ex Hook (Asparagaceae) is an indoor ornamental plant. Macroscopic characteristics viz. size and shape, colour, odour and taste were studied. Microscopic evaluations were performed by means of high-resolution microscope. Anatomy of the leaves was examined by following standard method of section cutting. **Results:** The macroscopic assessment showed that the plant leaves are light to dark green in colour having highly fibrous structure. Stomatal constants of 230, 19.6% stomatal index, 53.34/mm2 vein islet number, and 79.12/mm2 vein termination number were noted in the leaves. Anomocytic stomata, unicellular trichomes, xylem fibres, oxalate crystals, vascular bundles, etc. were all revealed in detailed microscopy. **Conclusion:** The macroscopic and microscopic findings of the *Sansevieria cylindrica* leaf are applicable for standardization and authentication of plant.

Keywords: *Sansevieria cylindrica*, Stomata, Xylem, Microscopy, Quality, Purity etc.

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INTRODUCTION

In the process of scientific research and botanical quality control the morphological, anatomical, and microscopic characterization has immense importance.[1] The characteristics are applied for authentication of the plants and also for detection of contaminations, adulteration and substitutions in plant products.[2,3] For microscopic standardization evaluation of structural, cellular and molecular aspects of herb or herbal parts is performed with various microscopic techniques.[4] As mentioned in many pharmacopoeias microscopy has been used since long time to identify herbal products. Microscopic studies are preferred due to numerous advantages such as need of small amount of sample, rapidity, reliability, cost effectiveness and simplicity of the procedures.[5]

Sansevieria cylindrica plant is an indigenous plant of the subtropical province of the African continent and planted in Egypt, India for decorative purpose and belongs to family Asparagaceae.[6,7] It is also called as Snake plant. It grows up to 2 m (7 ft) above soil having snake tongue shaped having stripes, longer, smooth, greenish-gray sub-cylindrical leaves up to 3 cm (1 inch) diameter.[8] The plant has many medicinal, hence its standardization through appropriate depiction of its quality parameters is needed and is a crucial stage.

The macroscopic and microscopic characters of *Sansevieria cylindrica* were evaluated in this study with an aim to identify its imperative features so that they can be effectively applied for herbal and herbal products standardization. The studies will aid to justify safe and effective use of herb as medicine by ensuring quality of the herb used.

MATERIALS AND METHODS

Collection and authentication of plant

The fresh whole plant *Sansevieria cylindrica* was obtained from the Mehenduri village of Tehsil-Akole, District-Ahmednagar, Maharashtra, India. The leaves of plant were then subjected to washing to clearway dust matters and unwanted debris. The herbarium of the plant was prepared and it was sent to Western Regional Center, Botanical Survey of India (BSI), Pune, Maharashtra, India for authentication. The leaves were shade dried and crushed in to powder using an electrical grinder, then sieved by using 20 mesh and stored in an air tight container for further studies.

Chemicals

The chemicals used in the study were of analytical grade and includes Phloroglucinol, Glycerin, Chloral hydrate, etc.

Macroscopic evaluation of plant

Macroscopic evaluation of *Sansevieria cylindrica* leaves have been accomplished according to WHO Quality Control methods of herbal medicine. The colour, size, odor, shape, taste, surface and fracture

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Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuic acid against 5-fluorouracil induced nephrotoxicity in Wistar rats

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Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuic acid against 5-fluorouracil induced nephrotoxicity in Wistar rats

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Nephrotoxicity is a frequent and severe side effect of 5-fluorouracil (5-FU) chemotherapy which limits its use clinically regardless of being one of the most promising chemotherapeutic agents. Here, we assessed the nephroprotective activity of two structurally related phenolic acids 2-pyrocatechuic acid (2,3 dihyroxybenzoic acid) and gentisic acid (2,5 dihyroxybenzoic acid) against 5-FU induced nephrotoxicity in Wistar rats. Intraperitoneal administration of 5-FU at a dose of 20 mg/kg once a day for 5 days produced a significant elevation in serum parameters of the kidney such as uric acid, urea, creatinine, sodium and potassium levels along with severe histopathological changes in renal tissues of rats indicating severe nephrotoxicity. Administration of 2-pyrocatechuic acid (2-PCA) at 10, 30 and 100 by oral route for 9 days and additional 5 days with 5-FU resulted in an amelioration of altered serum parameters in a dose-dependent manner. Moreover, 2-PCA attenuated the renal damage produced by 5-FU demonstrating its efficacy as a nephroprotective agent for the prevention as well as amelioration of 5-FU induced nephrotoxicity. None of the doses of gentisic acid (GA) were found to be effective in this posology when given orally.

Keywords: Chemotherapy, Dihyroxybenzoic acid, Renal toxicity

Chemotherapy is an extensively used, efficacious cancer treatment modality that includes the use of cytotoxic drugs to control or eliminate cancer. The uracil derivative 5-fluorouracil (5-FU), a broadly used antimetabolite chemotherapeutic drug, particularly in the management of several cancers such as pancreatic, gastrointestinal, breast, cervical, colorectal, bladder, esophageal, head and neck cancers by inhibiting both the DNA and RNA synthesis causing cytotoxicity and cell death[1,2]. It has an indiscriminate mechanism of action; its cytotoxicity destroys not only the existing tumors but also other rapidly dividing normal cells in the body as well. Its non-targeted action results in severe toxicities, amongst which one of the most serious adverse effects is nephrotoxicity which restricts its wide clinical usage[3]. Several studies have documented the nephrotoxicity produced by 5-FU chemotherapy. Mechanisms of nephrotoxicity usually comprise of a variable extent of pre-renal hypoperfusion, oxidative stress, obstruction of renal tubules, intrinsic damage to renal tissue and microvascular renal structure leading to renal toxicities including tubule-interstitial damage, glomerular disease, abnormalities in the electrolyte and renal biomarker levels[4].

Phytochemicals, including specific plant phenolic compounds, are essential dietary components[4] because of their potent antioxidant effect, ability to reduce oxidative stress-induced damage to the tissues and their potent chemopreventive and chemoprotective activities[5]. In this line, 2-pyrocatechuic acid (2,3-dihydroxybenzoic acid) is a phenolic acid and natural siderophore occurring in various medicinal plants such as *Boreava orientalis* and rosy periwinkle, fruits such as batoko plum, avocados and cranberries. It possesses wide-ranging pharmacological properties such as free radical scavenging, anti-inflammatory, antiplatelet, antioxidant, antiseptic, antibiotic and iron-chelating activities[6-8]. It is also documented for attenuating ototoxicity produced by aminoglycosides such as gentamicin and kanamycin and for ameliorating vancomycin induced nephrotoxicity[9].

Similarly, gentisic acid (2,5-dihydroxybenzoic acid) is another phenolic acid having widespread occurrence in citrus fruits, grapes, artichoke, sesame, gentians, red sandalwood, rose gum, saxifrage, and

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Effect of Lead, Copper on Glycogen Content in Muscle, Liver, Kidney Tissues of Freshwater Fish Labeo Rohita

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EFFECT OF LEAD, COPPER ON GLYCOGEN CONTENT IN MUSCLE, LIVER, GILL, AND KIDNEY TISSUES OF FRESHWATER FISH *Labeo rohita*

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Original Research Article

ABSTRACT

Heavy metals harm the aquatic ecosystem by persisting in the environment and having the ability to bioaccumulate in aquatic species. Lead is a typical dangerous heavy metal with a very long biological half-life that is not biodegradable and is physiologically non-essential. The goal of the current study was to measure the amount of glycogen in Labeo rohita's muscle, liver, gills, and kidney after exposure to sublethal amounts of lead and copper for 4, 7, 15, and 30 days. The data showed a substantial drop in glycogen levels in the Labeo rohita experimental fish. Both the low concentration (26.426 mg/L) and the high concentration (75.467 mg/L) of muscle glycogen had decreased by a significantly significant amount (P 0.001) after 30 days compared to the control. The amount of hepatic glycogen (7.228 mg/g) was significantly (P 0.001) lower after 30 days compared to the control group. After 30 days of exposure, the reduction in gill glycogen content was found to be (0.689 mg/g) in high concentration and (1.2813 mg/g) in low concentration, in comparison to the control. Both the high concentration of renal glycogen (2.71 mg/g) and the low concentration of renal glycogen (3.16 mg/g) were found to be considerably lower (P 0.001) than the control at 30 days. The impact of poisonous Lead and Copper in some fish tissues was taken into account when evaluating the fish's response to a stressor. As a result, we can detect cadmium stress in fish by looking at their glycogen content.

Keywords: Lead; copper; *Labeo rohita*; fish; glycogen content; heavy metal.

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Preliminary Pharmacognostic, Physicochemical and Phytochemical Evaluation of Plumeria-Obtuse Seed Pods

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Preliminary Pharmacognostic, Physicochemical and Phytochemical Evaluation of *Plumeria-Obtuse* Seed Pods

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ABSTRACT

Plumeria obtuse L. (Apocynaceae) is an ornate outdoor plant. The plant was traditionally used during accidental injuries. However, the pharmacognosy of this plant is very poorly explored. Therefore, we have conducted this study to assess the distinctive qualities of the *P. obtusa*. To investigate *P. obtusa* seed pods' preliminary pharmacognostic, physical-chemical, phytochemical, microscopic, and phytoconstituent potential. Initially, the shape and microscopic characteristics of plant seed pods were assessed. Physicochemical analysis was used for the standardization. Utilizing several chemical techniques, phytoconstituents were evaluated qualitatively. This was followed by quantitative estimation and analytical profiling of various phytoconstituents. The basic characteristics of the seed pod have been documented by macroscopy to be its brown color, sweet aroma, bitter flavor, coarse texture, and rough fracture. Microscopy showed the existence of vascular bundles, lignified fibers, calcium oxalate crystals and arteries. The results of the physicochemical analysis revealed no foreign organic matter, 2.8 % weight-average moisture content and a high total ash value of 14.80 compared to an acid insoluble ash value of 0.70, which indicated that there was less inorganic matter in the plant. The extractive values were 3.93, 6.03 and 10.16 % w/w for water soluble, alcohol soluble and hydro-alcoholic soluble extracts respectively. Flavonoids, glycosides, saponins, phenolic constituents, tannins and carbohydrates were found during early phytochemical analysis. Instrumental analysis has given an idea about functional groups present whereas GCMS technique helped in identification of phytoconstituents. The results of this study can be significantly used as a reference support for quality control and standardization of *P. obtusa* and preparation of a monograph of plant.

Keywords: *Plumeria obtuse*; Pharmacognostic; Phytochemical; Physicochemical Parameters

ABBREVIATIONS:

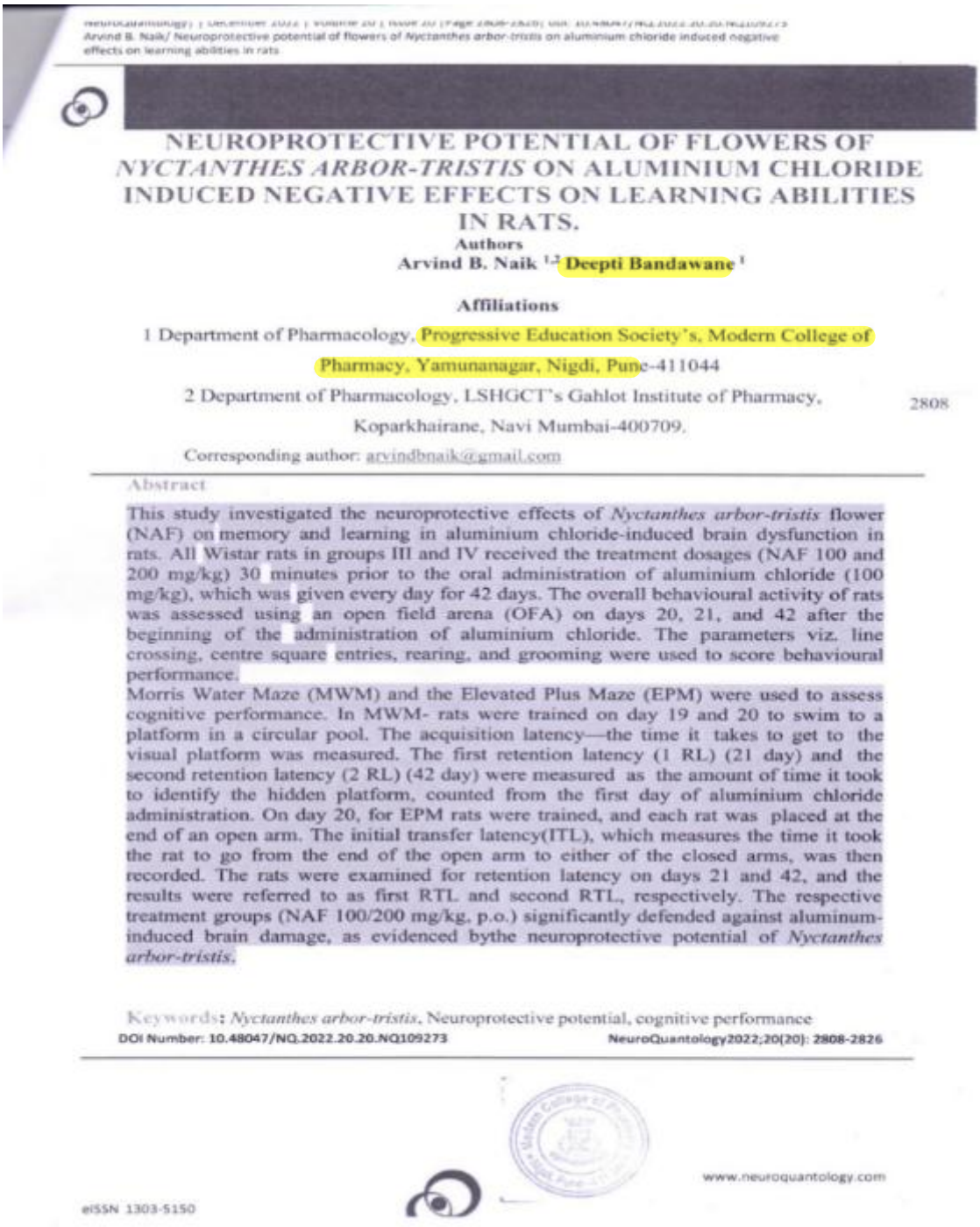
°C	:	Degree celsius
Da	:	Daltons
EI	:	Electron ionization
FTIR	:	Fourier transform infra-red
G	:	gram
GAE	:	Gallic acid equivalent
GCMS	:	Gas chromatography-mass spectroscopy
HOD	:	Head of department
Hz	:	Hertz
LOD	:	Loss on drying
ml	:	Milliliter
µl	:	Microliter
mm	:	Millimeter
µg	:	Microgram
MHz	:	Megahertz
NIST	:	National Institute of Standards and Technology
Nm	:	Nanometer
NMR	:	Nuclear magnetic resonance
PVDF	:	Polyvinylidene difluoride
QE	:	Quercetin equivalent
Rf	:	Retention factor
Sp	:	Species
TLC	:	Thin layer chromatography
UV	:	Ultra-violet
Wt	:	Weight
WHO	:	World Health Organisation

1. INTRODUCTION

In many developing countries, herbs are used to treat various medical conditions. This awareness has been accepted and approved from one age bracket to another in rural communities.[1] In field of innovative allopathy drug research and development, a lot of bioactive components of plants was investigate through combinations with synthetic

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Neuroprotective potential of flowers of nyctanthins arbor-tristis on aluminium chloride induced negative effect on learning abilities in rats



NEUROPROTECTIVE POTENTIAL OF FLOWERS OF *NYCTANTHES ARBOR-TRISTIS* ON ALUMINIUM CHLORIDE INDUCED NEGATIVE EFFECTS ON LEARNING ABILITIES IN RATS.

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Abstract

This study investigated the neuroprotective effects of *Nyctanthes arbor-tristis* flower (NAF) on memory and learning in aluminium chloride-induced brain dysfunction in rats. All Wistar rats in groups III and IV received the treatment dosages (NAF 100 and 200 mg/kg) 30 minutes prior to the oral administration of aluminium chloride (100 mg/kg), which was given every day for 42 days. The overall behavioural activity of rats was assessed using an open field arena (OFA) on days 20, 21, and 42 after the beginning of the administration of aluminium chloride. The parameters viz. line crossing, centre square entries, rearing, and grooming were used to score behavioural performance.

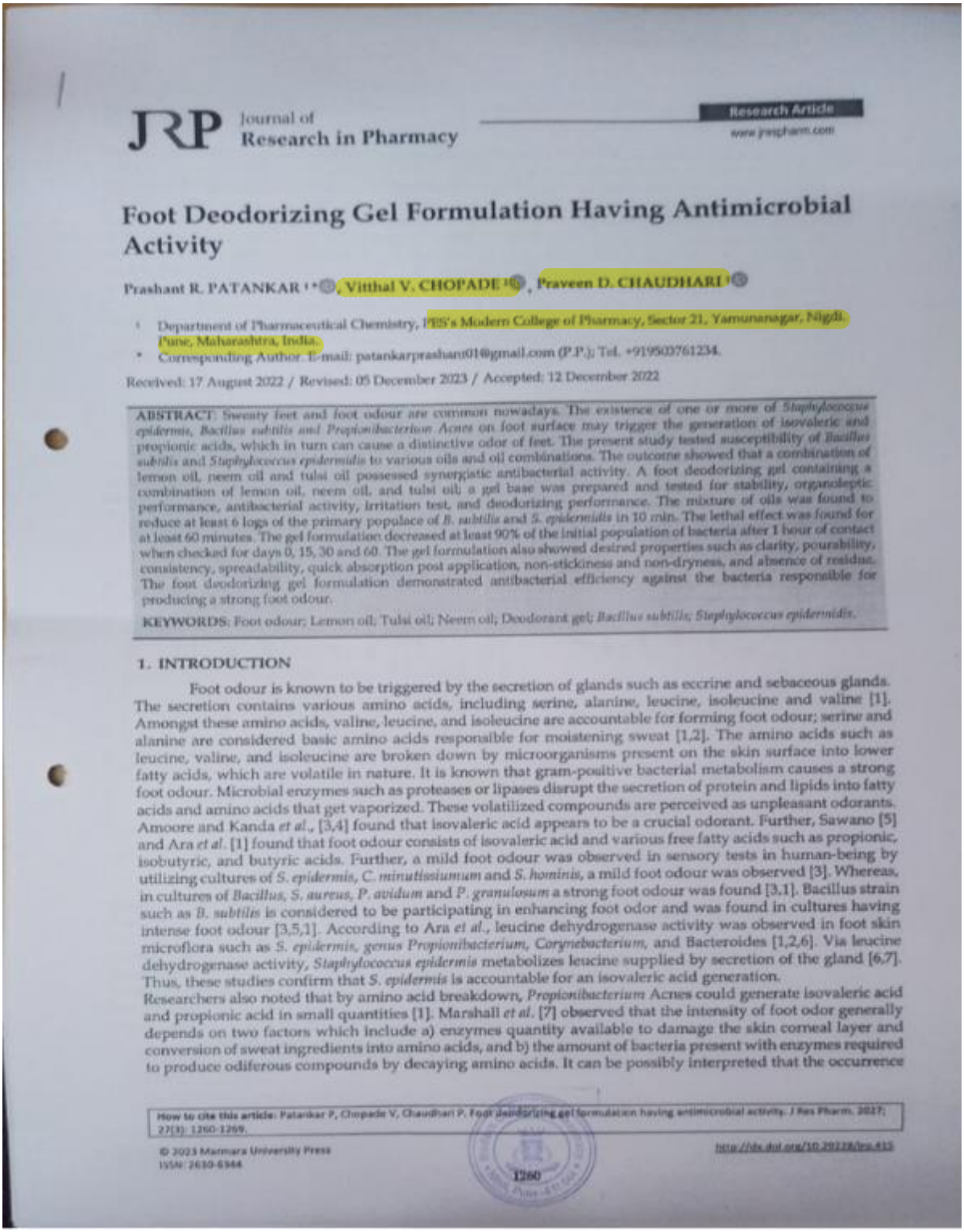
Morris Water Maze (MWM) and the Elevated Plus Maze (EPM) were used to assess cognitive performance. In MWM- rats were trained on day 19 and 20 to swim to a platform in a circular pool. The acquisition latency—the time it takes to get to the visual platform was measured. The first retention latency (1 RL) (21 day) and the second retention latency (2 RL) (42 day) were measured as the amount of time it took to identify the hidden platform, counted from the first day of aluminium chloride administration. On day 20, for EPM rats were trained, and each rat was placed at the end of an open arm. The initial transfer latency(ITL), which measures the time it took the rat to go from the end of the open arm to either of the closed arms, was then recorded. The rats were examined for retention latency on days 21 and 42, and the results were referred to as first RTL and second RTL, respectively. The respective treatment groups (NAF 100/200 mg/kg, p.o.) significantly defended against aluminum-induced brain damage, as evidenced bythe neuroprotective potential of *Nyctanthes arbor-tristis*.

Keywords: *Nyctanthes arbor-tristis*, Neuroprotective potential, cognitive performance

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Foot Deodorizing Gel Formulation Having Antimicrobial Activity



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Research Article

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Foot Deodorizing Gel Formulation Having Antimicrobial Activity

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ABSTRACT: Sweaty feet and foot odour are common nowadays. The existence of one or more of *Staphylococcus epidermis*, *Bacillus subtilis* and *Propionibacterium Acnes* on foot surface may trigger the generation of isovaleric and propionic acids, which in turn can cause a distinctive odor of feet. The present study tested susceptibility of *Bacillus subtilis* and *Staphylococcus epidermidis* to various oils and oil combinations. The outcome showed that a combination of lemon oil, neem oil and tulsi oil possessed synergistic antibacterial activity. A foot deodorizing gel containing a combination of lemon oil, neem oil, and tulsi oil; a gel base was prepared and tested for stability, organoleptic performance, antibacterial activity, irritation test, and deodorizing performance. The mixture of oils was found to reduce at least 6 logs of the primary populace of *B. subtilis* and *S. epidermidis* in 10 min. The lethal effect was found for at least 60 minutes. The gel formulation decreased at least 90% of the initial population of bacteria after 1 hour of contact when checked for days 0, 15, 30 and 60. The gel formulation also showed desired properties such as clarity, pourability, consistency, spreadability, quick absorption post application, non-stickiness and non-dryness, and absence of residue. The foot deodorizing gel formulation demonstrated antibacterial efficiency against the bacteria responsible for producing a strong foot odour.

KEYWORDS: Foot odour; Lemon oil; Tulsi oil; Neem oil; Deodorant gel; *Bacillus subtilis*; *Staphylococcus epidermidis*.

1. INTRODUCTION

Foot odour is known to be triggered by the secretion of glands such as eccrine and sebaceous glands. The secretion contains various amino acids, including serine, alanine, leucine, isoleucine and valine [1]. Amongst these amino acids, valine, leucine, and isoleucine are accountable for forming foot odour; serine and alanine are considered basic amino acids responsible for moistening sweat [1,2]. The amino acids such as leucine, valine, and isoleucine are broken down by microorganisms present on the skin surface into lower fatty acids, which are volatile in nature. It is known that gram-positive bacterial metabolism causes a strong foot odour. Microbial enzymes such as proteases or lipases disrupt the secretion of protein and lipids into fatty acids and amino acids that get vaporized. These volatilized compounds are perceived as unpleasant odorants. Amoore and Kanda *et al*., [3,4] found that isovaleric acid appears to be a crucial odorant. Further, Sawano [5] and Ara *et al*. [1] found that foot odour consists of isovaleric acid and various free fatty acids such as propionic, isobutyric, and butyric acids. Further, a mild foot odour was observed in sensory tests in human-being by utilizing cultures of *S. epidermis*, *C. minutissiumum* and *S. hominis*, a mild foot odour was observed [3]. Whereas, in cultures of *Bacillus, S. aureus, P. avidum* and *P. granulosum* a strong foot odour was found [3,1]. Bacillus strain such as *B. subtilis* is considered to be participating in enhancing foot odor and was found in cultures having intense foot odour [3,5,1]. According to Ara *et al*., leucine dehydrogenase activity was observed in foot skin microflora such as *S. epidermis, genus Propionibacterium, Corynebacterium*, and Bacteroides [1,2,6]. Via leucine dehydrogenase activity, *Staphylococcus epidermis* metabolizes leucine supplied by secretion of the gland [6,7]. Thus, these studies confirm that *S. epidermis* is accountable for an isovaleric acid generation.

Researchers also noted that by amino acid breakdown, *Propionibacterium* Acnes could generate isovaleric acid and propionic acid in small quantities [1]. Marshall *et al*. [7] observed that the intensity of foot odor generally depends on two factors which include a) enzymes quantity available to damage the skin corneal layer and conversion of sweat ingredients into amino acids, and b) the amount of bacteria present with enzymes required to produce odiferous compounds by decaying amino acids. It can be possibly interpreted that the occurrence

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Development & validation of novel RP-HPLC DAD method for quantification of Lapatinib Ditosylate in newer nano-liposome formulation: A quality by Design (QBD) Approach

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Original Article

DEVELOPMENT AND VALIDATION OF NOVEL RP-HPLC-DAD METHOD FOR QUANTIFICATION OF LAPATINIB DITOSYLATE IN NEWER NANO-LIPOSOME FORMULATION: A QUALITY BY DESIGN (QBD) APPROACH

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ABSTRACT

Objective: The current study entails quality by design (QbD) enabled the development of a simple, rapid, sensitive, and cost-effective RP-HPLC method for estimation of Lapatinib ditosylate (LPT) in a newly prepared nano-liposomal formulation which has not been reported earlier.

Methods: The chromatographic factors were screened using a fractional factorial design. A central composite design was employed as a response surface methodology. Mobile phase ratio, flow rate, and wavelength were identified as critical method parameters. To minimize retention time, peak area and theoretical plates were employed as critical analytical attributes. A novel nano-liposomal formulation of LPT was prepared by the film hydration method.

Results: The optimized chromatographic condition was obtained at a mobile phase composition of methanol and 0.05% v/v o-phosphoric acid in water (81:19 v/v), flow rate 0.7 ml/min, and peak detected at wavelength 261 nm using DAD detector. The retention time for Lapatinib was 3.702 min. The developed method was validated as per ICH guidelines ICH Q2 (R1). Linearity (R^2= 0.999) was observed in the range of 10-50µg/ml. The limit of detection and limit of quantitation was found to be 0.6309µg/ml and 1.9120µg/ml, respectively. LPT containing liposome formulation assay was found to be 99.03% and %RSD was less than 1%.

Conclusion: The newly developed RP-HPLC method applying the QbD approach was found to be simple, specific, precise, accurate, linear, and rugged, with good recovery of LPT in the nano-liposome formulation in a cost-effective manner. Hence it can be employed for the quantification of LPT in bulk and pharmaceutical formulations.

Keywords: RP-HPLC, Quality by design, Validation, Lapatinib ditosylate, Liposome

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INTRODUCTION

As per recommended ICH guidelines, validation of HPLC the analytical method does not provide much reliability concerning the reduction in method variability beyond the conventional robust testing. Thus, implementation of quality by design (QbD) principles for analytical method development has now been reported quite popularly for attaining high robustness and enhanced method performance [1]. The QbD method was based on the understanding and implementation of guidelines ICH Q8 Pharmaceutical Development, ICH Q9 Quality Risk Management, and ICH Q10 Pharmaceutical Quality System [2-4]. The QbD approach highlights product and process understanding with quality risk management and controls, resulting in higher product quality assurance, regulatory flexibility, and continual improvement.

Analytical QbD is defined as a science and risk-based paradigm for analytical method development, endeavoring to understand the predefined objectives to control the critical method variables affecting the critical method attributes (CMA) to accomplish enhanced method performance, high robustness, ruggedness, and flexibility for continual improvement [5, 6]. The result of analytical QbD is well known, fit for purpose, and robust method reliably delivers the intended output over its lifecycle, similar to the process QbD [7, 8]. QbD approach facilitates science and risk-based understanding of the major sources of variability, followed by the identification of critical method parameters (CMPs) using risk assessment and factor screening studies. The high-risk variables with a critical impact on the analytical method performance are screened and optimized using suitable experimental designs for augmenting method performance [9]. In the past few decades, literature reports on diverse drugs have vouched for the phenomenal benefits of the QbD approach for developing the analytical methods for drug substances, impurities, and degradation products effectively and cost-effectively [10].

LPT is an orally available selective dual tyrosine kinase inhibitor that inhibits both Epidermal Growth Factor Receptor (EGFR) and Human Epidermal Receptor (HER-2) receptors over-expressed in breast cancer cells [11]. LPT is designed chemically as *N*-(3-Chloro-4-[(3-fluorobenzyl)oxy]phenyl)-6-{5-[([2-(methylsulfonyl)ethyl]amino) methyl)-2-furyl}quinazolin-4-amine having molecular formula $C_{29}H_{26}ClFN_4O_4S$, the chemical structure is shown in fig. 1. LPT is recommended in the treatment guidelines of HER-2 positive breast tumors and also in metastatic breast cancer [12].

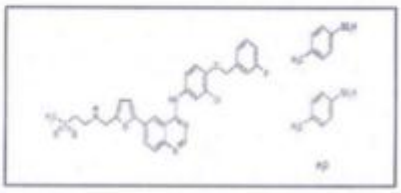


Fig. 1: Chemical structure of lapatinib ditosylate (LPT)

A literature survey reveals high-performance liquid chromatography (HPLC) [13, 14], liquid chromatography-mass spectrometry (LC-MS)/MS [15], and ultra-performance liquid chromatography (UPLC)/MS-MS methods have been developed for the estimation of LPT. Liquid chromatography electro-spray tandem mass [16] and liquid chromatography-mass spectrometry [17-21], were developed for quantitatively determining the LPT in biological samples. However, the reverse-phase high-performance liquid chromatography (RP-HPLC) method for the quantification of LPT in liposome formulation by

Coumarin-Based Sulfonamide Derivatives as Potential DPP-IV Inhibitors: Pre-ADME Analysis, Toxicity Profile, Computational Analysis, and In Vitro Enzyme Assay



molecules

MDPI

Article

Coumarin-Based Sulfonamide Derivatives as Potential DPP-IV Inhibitors: Pre-ADME Analysis, Toxicity Profile, Computational Analysis, and In Vitro Enzyme Assay

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Abstract: Recent research on dipeptidyl peptidase-IV (DPP-IV) inhibitors has made it feasible to treat type 2 diabetes mellitus (T2DM) with minimal side effects. Therefore, in the present investigation, we aimed to discover and develop some coumarin-based sulphonamides as potential DPP-IV inhibitors in light of the fact that molecular hybridization of many bioactive pharmacophores frequently results in synergistic activity. Each of the proposed derivatives was subjected to an in silico virtual screening, and those that met all of the criteria and had a higher binding affinity with the DPP-IV enzyme were then subjected to wet lab synthesis, followed by an in vitro biological evaluation. The results of the pre-ADME and pre-tox predictions indicated that compounds 6e, 6f, 6h, and 6m to 6q were inferior and violated the most drug-like criteria. It was observed that 6a, 6b, 6c, 6d, 6i, 6j, 6r, 6s, and 6t displayed less binding free energy (PDB ID: 5Y7H) than the reference inhibitor and demonstrated drug-likeness properties, hence being selected for wet lab synthesis and the structures being confirmed by spectral analysis. In the in vitro enzyme assay, the standard drug Sitagliptin had an IC_{50} of 0.018 μM in the experiment which is the most potent. All the tested compounds also displayed significant inhibition of the DPP-IV enzyme, but 6i and 6j demonstrated 10.98 and 10.14 μM IC_{50} values, respectively, i.e., the most potent among the synthesized compounds. Based on our findings, we concluded that coumarin-based sulphonamide derivatives have significant DPP-IV binding ability and exhibit optimal enzyme inhibition in an in vitro enzyme assay.

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Solubilizing essential oils and preparing stable, transparent and stain-free liquid roll-on preparation for foot application

SOLUBILIZING ESSENTIAL OILS AND PREPARING STABLE, TRANSPARENT AND STAIN-FREE LIQUID ROLL-ON PREPARATION FOR FOOT APPLICATION

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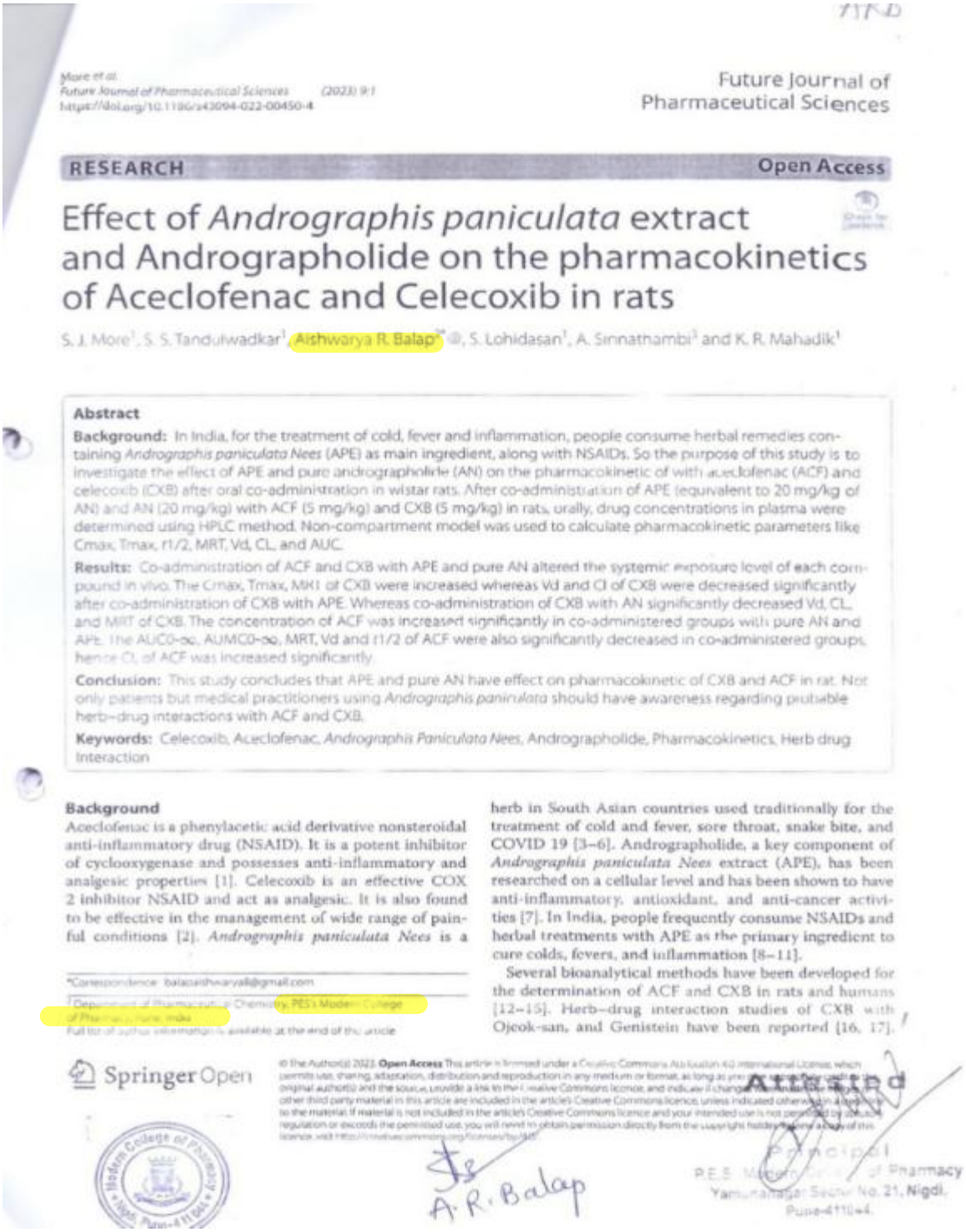
ABSTRACT: Sweating is a biological mechanism that helps to synchronize temperature of human body. Foot odor is produced by metabolism of gram-positive bacteria such as *Staphylococcus epidermis, Bacillus subtilis and Propionibacterium Acnes*. Microbial vegetation present over foot-skin causes break-down of protein as well as lipid containing secretion of exocrine glands. Enzymes responsible for break-down of lipids and proteins are proteases and lipases. It disrupts the protein and lipids into free fatty acids (short-chain) and amino-acids. These are eventually vaporized in atmosphere owing to its type of chemical. Further, such compounds which are volatile in nature finally move to receptors of nose and are noticed as unlikable odorants. Few spray products containing natural oil/s are available. However, these products have stability issue due to phase separation, and it produce stain on foot skin or apparel.The present study focussed on solubilizing the essential oil/s and tested susceptibility of *Bacillus subtilis* and *Staphylococcus epidermidis* to oil combinations. The outcome showed that a combination of lemon oil, neem oil and tulsi oil possessed synergistic antibacterial activity. A foot deodorizing liquid roll-on was prepared using different solubilizers and tested. The liquid roll-on preparation showed desired properties such as stability, clarity, consistency, spreadability, quick absorption post application, non-stickiness and non-dryness, and absence of residue. The foot preparation demonstrated antibacterial efficiency against the bacteria responsible for producing a strong foot odour.

KEYWORDS: Foot odour; Lemon oil; Tulsi oil; Neem oil; Deodorant; liquid roll-on *Bacillus subtilis;Staphylococcus epidermidis*.

1. INTRODUCTION

Foot odour is known to be triggered by the secretion of glands such as eccrine and sebaceous glands. The secretion contains various amino acids, including serine, alanine, leucine,

Effect of Andrographis paniculata extract and Andrographolide on the pharmacokinetics of Aceclofenac and Celecoxib in rats



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RESEARCH Open Access

Effect of *Andrographis paniculata* extract and Andrographolide on the pharmacokinetics of Aceclofenac and Celecoxib in rats

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Abstract

Background: In India, for the treatment of cold, fever and inflammation, people consume herbal remedies containing *Andrographis paniculata Nees* (APE) as main ingredient, along with NSAIDs. So the purpose of this study is to investigate the effect of APE and pure andrographolide (AN) on the pharmacokinetic of with aceclofenac (ACF) and celecoxib (CXB) after oral co-administration in wistar rats. After co-administration of APE (equivalent to 20 mg/kg of AN) and AN (20 mg/kg) with ACF (5 mg/kg) and CXB (5 mg/kg) in rats, orally, drug concentrations in plasma were determined using HPLC method. Non-compartment model was used to calculate pharmacokinetic parameters like Cmax, Tmax, t1/2, MRT, Vd, CL, and AUC.

Results: Co-administration of ACF and CXB with APE and pure AN altered the systemic exposure level of each compound in vivo. The Cmax, Tmax, MRT of CXB were increased whereas Vd and Cl of CXB were decreased significantly after co-administration of CXB with APE. Whereas co-administration of CXB with AN significantly decreased Vd, CL, and MRT of CXB. The concentration of ACF was increased significantly in co-administered groups with pure AN and APE. The AUC0-∞, AUMC0-∞, MRT, Vd and t1/2 of ACF were also significantly decreased in co-administered groups, hence Cl of ACF was increased significantly.

Conclusion: This study concludes that APE and pure AN have effect on pharmacokinetic of CXB and ACF in rat. Not only patients but medical practitioners using *Andrographis paninulata* should have awareness regarding probable herb–drug interactions with ACF and CXB.

Keywords: Celecoxib, Aceclofenac, *Andrographis Paniculata Nees*, Andrographolide, Pharmacokinetics, Herb drug Interaction

Background

Aceclofenac is a phenylacetic acid derivative nonsteroidal anti-inflammatory drug (NSAID). It is a potent inhibitor of cyclooxygenase and possesses anti-inflammatory and analgesic properties [1]. Celecoxib is an effective COX 2 inhibitor NSAID and act as analgesic. It is also found to be effective in the management of wide range of painful conditions [2]. *Andrographis paniculata Nees* is a herb in South Asian countries used traditionally for the treatment of cold and fever, sore throat, snake bite, and COVID 19 [3–6]. Andrographolide, a key component of *Andrographis paniculata Nees* extract (APE), has been researched on a cellular level and has been shown to have anti-inflammatory, antioxidant, and anti-cancer activities [7]. In India, people frequently consume NSAIDs and herbal treatments with APE as the primary ingredient to cure colds, fevers, and inflammation [8–11].

Several bioanalytical methods have been developed for the determination of ACF and CXB in rats and humans [12–15]. Herb–drug interaction studies of CXB with Ojeok-san, and Genistein have been reported [16, 17].

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A. R. Balap

Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac Tromethamine in Bulk and Marketed Formulation

Section: Research Paper

Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac Tromethamine in Bulk and Marketed Formulation

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ABSTRACT:

Objective
A rapid, accurate, selective, and sensitive RP-HPLC method has been developed and validated for estimation of moxifloxacin hydrochloride (MXF) and ketorolac tromethamine (KTA) in the bulk and ophthalmic formulation.
Method: The chromatographic separation was achieved on ODS Phenomenex C18 column (250mm × 4.6mm, 5 µm). The compound was separated using mobile phase 0.025M Potassium dihydrogen phosphate solution: acetonitrile: methanol (30:35:35v/v/v). The pH of mobile phase was adjusted to 3.0 with ortho-phosphoric acid, flow rate was 1.0 ml/min and 25°C column temperature and detection wavelength was set at 300 nm for overall analysis.
Results: The retention time of MXF and KTA was obtained at 2.67 and 5.39 min, respectively. The linearity study was performed in the concentration range of 2 to 20 µg/ml for MXF and KTA with correlation coefficient was found to be 0.999 for both drugs. The percentage purity of MXF and KTA was obtained in the range 98-102%. The limit of detection was 0.148 µg/ml and 0.272µg/ml and limit of quantification was 0.449 µg/ml and 0.824 µg/ml, respectively for MXF and KTA.
Conclusion: The method was validated according to the ICH guidelines with respect to linearity, precision, accuracy, limit of detection, limit of quantification and robustness. Thus, proposed



UV Spectroscopic Method Development and Validation of Rabeprazole and Levosulpiride in its Bulk and Dosage Form



Original Article

UV Spectroscopic Method Development and Validation of Rabeprazole and Levosulpiride in its Bulk and Dosage Form

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Abstract

Logical strategy is the heart of drug investigation. The current work endeavored to foster precise, straightforward, and delicate techniques for concurrent assessment of rabeprazole and levosulpiride. The overlay range of levosulpiride and rabeprazole display λmax of 288 nm and 282 nm for LEVO and RABE. Standard adjustment bends for levosulpiride and rabeprazole were straight with connection coefficient (r) values in the scope of 0.9998-0.9997 at all chosen frequencies. The precision of the technique was affirmed by recuperation contemplated from the tablet at three distinct degrees of 80%, 100 percent, and 120% recuperation in the scope of 99.97-100 percent legitimizes the exactness of the strategy. Intraday and Interday accuracy was checked for UV strategy, and % RSD was viewed as under 2 for UV technique. The created strategy is a fast device for routine examination of rabeprazole and levosulpiride in the mass and the drug dose structure. Considering the possible general improvement of phony medication portions, the proposed strategy could be important for the quality control research offices in developing countries.

Keywords: UV spectroscopy, Rabeprazole, Levosulpiride, Simultaneous estimation, Method development

Introduction

During the most recent couple of years, logical science has seen broad improvement concerning refinement, quantitation, and instrumentation. Thus, more current scientific procedures (for example, joined strategies FT-IR, GC-MS, LC-MS, HPLC, HPTLC, and so on) and their areas of use have expanded impressively in light of the severe prerequisites for testing and observing the medications for endorsement. Interest in quality, approval information, and execution of logical techniques have acquired significance.

Presently a day the majority of the people groups are experiencing different kinds of sickness conditions. This can be happening because of the changing way of life. Implies inappropriate food admission and absence of activity can prompt the sickness. Because of this, numerous drug ventures present new medication particles or mixes annually to treat such sicknesses. In this, one of the overall sicknesses is gastric corrosiveness, which can additionally prompt Gastroesophageal Reflux Illness [GERD] or gastric/peptic ulcers.

Consequently, by taking a business sector overview and considering people groups' needs, we have attempted to advance the pursuit related to late medications and mixes. Numerous enterprises work on the medications used to treat Gastric Causticity, Gastroesophageal Reflux Sickness [GERD], or Gastric/Peptic Ulcers. Rather than a single medication, doctors lean toward a mix of medications. Consequently, by alluding to the articles on this mix at the lab level, we attempted to foster a technique for this blend of antiulcer drugs by keeping ICH rules.

UV is the quickest logical method for the examination of medications separately and in a blend as well. Its effortlessness makes it ideal for the investigation of many medications. Subsequently, it was thought to foster such techniques for examination, which can gauge the medications

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Wheat ergot fungus-derived and modified drug for inhibition of intracranial aneurysm rupture due to dysfunction of TLR-4 receptor in Alzheimer's disease



PLOS ONE

RESEARCH ARTICLE

Wheat ergot fungus-derived and modified drug for inhibition of intracranial aneurysm rupture due to dysfunction of TLR-4 receptor in Alzheimer's disease

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Competing interests: The authors have declared that no competing interests exist.

Abstract

Background

Alzheimer's disease (AD) is a form of dementia that strikes elderly people more frequently than it does younger people. The cognitive skills and memory of Alzheimer's sufferers continue to deteriorate over time. Recent studies have shown that patients with AD have greater amounts of inflammatory markers in their bodies, which suggests that inflammation occurs early on in the progression of the disease. There is a possibility that Aß oligomers and fibrils can be recognised by TLRs, in addition to the microglial receptors CD14, CD36, and CD47. When Aß binds to either CD36 or TLR4, it sets off a chain reaction of inflammatory chemokines and cytokines that ultimately results in neurodegeneration. Diabetes and Alzheimer's disease have both been recently related to TLR4. The activation of TLR4 has been connected to a variety of clinical difficulties that are associated with diabetes, in addition to the internal environment of the body and the microenvironment of the brain. TLR4 inhibitors have been shown in clinical investigations to not only lessen the likelihood of getting sick but also to increase the average longevity.

Result

In this work we used molecular docking and molecular dynamics modelling to investigate the effectiveness of FDA-approved antidiabetic plant derived drugs in combating the TLR4

Active Phytoconstituents and Pharmacological Activities of WithaniaCoagulans (stocks) Dunal (paneer Dodi): Brief Review

l For Basic Sciences ISSN NO : 1006-8

Review article

Active Phytoconstituents and Pharmacological Activities of *Withania Coagulans* (stocks) Dunal (paneer Dodi): Brief Review

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Abstract:

Since ancient times, herbal plants have been used to treat and cure a variety of illnesses. Due to its low incidence of adverse effects and numerous benefits, Ayurvedic medicine is widely used. *Withania Coagulans* (stocks) Dunal (WCD), most commonly known as "paneer dodi" or "Indian winter cherry" or "Indian rennet" is a well-known medicinal plant distributed in south Asia and eastern Mediterranean. In several regions of Pakistan and India, it is a widely utilised medicinal herb. It comes under the family Solanaceae and is also known as Ashwand or Aswand in Hindi. The various parts of plant such as leaves, fruits, roots and flowers have high therapeutic value and used to treat various disorders. It consists of milk coagulating enzymes and other phytoconstituents includes phenolic compounds, free amino acids, alkaloids, saponin, tannin, essential oil and fatty oil. Withanolides are the major active constituents in this plant, which chemically are C28 ergostane-skeleton polyoxygenated steroids. Withanolides are produced by the terpenoid synthesis mevalonate pathway. This article will discuss the distribution, botanical name, taxonomical classification, morphology, chemical composition, biosynthesis and various pharmacological activities of WCD such as antihyperglycemic, antihyperlipidemic, anti-inflammatory, immunomodulatory, antitumor, free radical scavenging activity, wound healing, antibacterial, antifungal, anthelmintic, diuretic, hepatoprotective and cardiovascular in detail.

Keywords: *Withania coagulans*, Withanolides, Milk coagulating enzymes, Phytoconstituents, Antidiabetic.

Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model

RESEARCH ARTICLE

Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model

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ABSTRACT

Indian spices always play a great role in Ayurveda and Indian medicine. So, analyzing these plants for their unknown and specialized activity is great. Nearly all the spices have some activity on the brain and CNS. Bay leaves are one of the most common culinary spices from day to day life of Indians. In this study, we have studied bay leaves for their anti-Alzheimer activity which depends on the inhibition of acetylcholine esterase and butyrylcholinesterase. For this study, firstly bay leaf oil was extracted by hydrodistillation. Further phytoconstituent like alpha-pinene, terpineol, 1,8-cineol, sabinene, and methyl eugenol were isolated and purified by using TLC, HPLC, and column chromatography followed by fractional distillation.

These isolated phytoconstituents were evaluated for their acetylcholinesterase and butyrylcholinesterase inhibition activity in scopolamine-induced rats. This study used galanthamine as a reference, and compared the anti-alzheimer activity of all isolated phytoconstituents.

Keywords: Acetylcholinesterase, Anti-alzheimer activity, Butyrylcholinesterase, Herbal, Hydrodistillation, Phytoconstituents, Scopolamine-induced rats.

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INTRODUCTION

It is indigenous to the Mediterranean area, an evergreen, aromatic shrub or tree that may reach heights of 10 to 18 m. It is either reddish blue or olive green in hue. Short lanceolate or lanceolate, oblong, acuminate stalks alternate with evergreen leaves. The leaves are approximately 3T4 cm broad and 5T8 cm long. The leaves are mostly utilized in cuisine, where their essential oils and dried leaves are used as flavoring and soup ingredients. The leaves are evergreen while they are fresh.[1] For many nations, the bay leaf holds significant cultural importance. For instance, it is seen on the Japanese ten yen note, and in ancient Greece, usage of bay leaves to crown the skulls of champion athletes was extremely significant. It was already noted, the bay leaf plays a crucial part in culinary preparations. Although it hasn't been said to be of great significance in conventional medicine, current scientific investigations have looked into its molecular components. Some experts, who practice complementary or alternative medicine, think that changing one's diet can be a fantastic way to avoid disease (CAM).[2] In past, hysteria and emmenagogues were treated with fruit and bay leaves. Bay fruit powder was infused to have diuretic and carminative (prevent or relieve flatulence) effects. Fatty oils from bay fruit were used externally to cure furuncles, sprains, bruising, and rheumatism as well as to repel insects. Several scholarly articles have demonstrated the analgesic, anticonvulsant and anti-inflammatory properties of bay leaf essential oils.[3-5]

We have also isolated and separated these phytoconstituents from plants by using some instrumental and conventional techniques and further this phytoconstituents studied for its acetylcholine esterase and buterylcholine esterase inhibition activity by using scopolamine-induced rats.

MATERIALS AND METHODS

Selection of Plant

The leaves of *L. nobilis* were collected from the medicinal garden of SGMSPM's Dnyanvilas College of Phamacy, Alandi, Pune, India. Plant leaves authenticated by Dr. D. L. Shirodkar, Botanical Survey of India, Koregaon Park, Pune on dated 21/11/2020.

Isolation of Essential Oil from Bay Leaves

Powder of laurel leaves are subjected to hydrodistillation, Clevenger apparatus was used.[6] For 5 minutes, distillation was carried out utilizing dry leaves and a 1:10 water-to-leaf ratio. Anhydrous sodium sulfate was used to dehydrate the

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Anthelmintic Potential Of Aqueous And Organic Extract Of Seeds Of Samanea saman (Merr)

Original Article

Anthelmintic Potential Of Aqueous And Organic Extract Of Seeds Of Samanea saman (Merr)

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Abstract

The aim of this research study was to evaluate aqueous and organic extracts of seeds of Samanea saman (Merr) for their anthelmintic activity using Indian adult earthworm Pheretima posthuma. Different concentrations of aqueous and organic extract ranging from 10 to 100 mg/ml were made and tested on said earthworm. These extracts were tested for bioassays which include time for paralysis and time for death of the worms. Aqueous as well as organic extract of seeds does not exhibited strong anthelmintic activity at concentration of 100 mg/ml. Lower concentrations also did not produced significant anthelmintic activity. The standard reference drug which is used for comparing anthelmintic activity of these extracts was piperazine citrate at concentration of 10 mg/ml. Both aqueous and organic extracts of seeds of Samanea saman were evaluated and showed no potential anthelmintic activity.

KEYWORDS Anthelmintic activity, Extraction, Piperazine citrate, Samanea saman, Pheretima posthuma.

INTRODUCTION:

Helminthiasis is a worm infestation of humans and other animals even life stock and crops affecting health and food production respectively and has impact on global economic factor.[1] The worms which causes helminthiasis are called as helminths and the drugs which are used for treating helminthiasis are nothing but anthelmintics.[2] There are various types of worms such as hook worms, fluke worms, round worms, tape worms which causes helminthiasis. The names are given according to their shapes. The major organs which get affected in helminthiasis are stomach and intestine and major symptoms of sever helminthiasis include diarrhea, abdominal pain, general malaise and impaired cognitive development. Chronic helminthiasis by hook worm lead to intestinal bleeding and anemia.[3] Pheretima is a genus of earthworms. Pheretima posthuma are long cylindrical shaped worms having length of 15-30 cm. they are mostly found in moist soil and responsible for vegetables and humus. Their life span is 3 to 10 years.[4]

Samanea Samann Merr (family Fabaaceae) commonly known as rain tree is easily available and widely spread plant in the world. It is widely cultivated throughout Mediterranean region and all tropical regions including temperate, tropical and subtropical regions due to its higher commercial scale.

Scientific classification of Taxonomy Kingdom: Plantae, Order: Fabales, Family: Fabaceae, Genus: Samanea Saman. Species: Samanea saman and exhibits the synonym names of Samanea saman such as Albiziasaman, Enterolobium saman, Inga saman, Pithecellobium saman, and Mimosa saman.[5]

Downpour tree is effortlessly known for its qualities like umbrella-molded cover. Downpour tree is filled in the open and ordinarily arrives at 15-25m (50-80 ft) in level. Samanea saman is quite possibly of the main plant in the Pacific as an overhanging tree on little ranches and along street side regions in parks and field. The downpour tree is filled in the tropical climate and its wood has restricted need for cut bowls, make wood, and fuel wood. The leaves and cases of downpour tree are utilized as food because of the great nutritive substance and nitrogen

In-Silico Studies to recognize Repurposing Therapeutics toward Arginase-I inhibitors as a Potential Onco-Immunomodulators



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In-silico studies to recognize repurposing therapeutics toward arginase-I inhibitors as a potential onco-immunomodulators

Magdi E. A. Zaki[1]*, Sami A. Al-Hussain[1], Aamal A. Al-Mutairi[1], Abdul Samad[2], Arabinda Ghosh[3†], Somdatta Chaudhari[4†], Pravin N. Khatale[5†], Prashant Ajmire[5†] and Rahul D. Jawarkar[5*†]

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Rudolf Virchow was the first person to point out the important link between immune function and cancer. He did this by noticing that leukocytes were often found in tumors. Overexpression of arginase 1 (ARG1) and inducible nitric oxide synthase (iNOS) in myeloid-derived suppressor cells (MDSCs) and tumour-associated macrophages (TAMs) depletes both intracellular and extracellular arginine. TCR signalling is slowed as a result, and the same types of cells produce reactive oxygen and nitrogen species (ROS and RNS), which aggravates the situation. Human arginase I is a double-stranded manganese metalloenzyme that helps L-arginine break down into L-ornithine and urea. Thus, a quantitative structure-activity relationship (QSAR) analysis was performed to unearth the unrecognised structural aspects crucial for arginase-I inhibition. In this work, a balanced QSAR model with good prediction performance and clear mechanistic interpretation was developed using a dataset of 149 molecules encompassing a broad range of structural scaffolds and compositions. The model was made to meet OECD standards, and all of its validation parameters have values that are higher than the minimum requirements (R^2_{tr} = 0.89, Q^2_{LMO} = 0.86, and R^2_{ex} = 0.85). The present QSAR study linked structural factors to arginase-I inhibitory action, including the proximity of lipophilic atoms to the molecule's centre of mass (within 3A), the position of the donor to the ring nitrogen (exactly 3 bonds away), and the surface area ratio. As OAT-1746 and two others are the only arginase-I inhibitors in development at the time, we have performed a QSAR-based virtual screening with 1650 FDA compounds taken from the zinc database. In this screening, 112 potential hit compounds were found to have a PIC50 value of less than 10 nm against the arginase-I receptor. The created QSAR model's application domain was evaluated in relation to the most active hit molecules identified using QSAR-based virtual screening, utilising a training set of 149 compounds and a prediction set of 112 hit molecules. As shown in the Williams plot, the top hit molecule, ZINC000252286875, has a low leverage value of HAT i/i h* = 0.140, placing it towards the boundary of the usable range. Furthermore, one of 112 hit molecules with a docking score of −10.891 kcal/mol ($_p$IC$_{50}$ = 10.023 M) was isolated from a study of arginase-I using molecular docking. Protonated ZINC000252286875-

Quantitative structure-activity relationship and group-based quantitative structure-activity relationship: a review

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QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP AND GROUP-BASED QUANTITATIVE STRUCTURE-ACTIVITY RELATIONSHIP: A REVIEW

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Keywords:

QSAR, Physicochemical property, QSAR descriptors, GQSAR, QSAR Model, QSAR Method

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ABSTRACT: Structure-Activity relationship (SAR) only identifies the chemical group responsible for producing the target biological effect in the organism. It was first present in 1865, structural activity relationship was refined dates back to the nineteenth century and now it has advanced from QSAR to 3D QSAR. Quantitative Structure-Activity Relationships (QSAR) are attempted to correlate the structural and biological properties of compounds or molecules. QSAR is used in drug design and medicinal chemistry. By using QSAR, scientists predefined toxicity related to organic molecules and determined the perfect potential biological activity that helps produce drug moiety. Group Based-Quantitative Structure-Activity Relationship (G-QSAR) is fragment dependent method which bases on molecule descriptors. Statistical parameters validate the GQSAR method. The cross-term fragment descriptor is used in GQSAR to study the relation of molecular fragments and variation in biological-based response. It provides a clue for designing new molecules and predicting their activity. In this article, we mainly concentrate on the various QSAR model such as Hansch Analysis, Free Wilson Analysis, various physicochemical properties, QSAR development process, QSAR model, and methodology of the GQSAR model, implementation and working as well as some general aspects in QSAR and GQSAR study.

INTRODUCTION: QSAR is an attempt to quantitatively associate a compound's structure or property descriptor with biological activity. Hansh and Fujita first discovered QSAR to understand the structure-activity relationship of drugs for lead recognition and lead optimization. The computational approach has used to determine constitutional, thermodynamics, fragment constants, conformational, hydrophobicity, topology, electronic characteristics, HBD, HBA, and steric effect parameters.

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Structure refers to the properties or descriptors of a QSAR molecule, and its function corresponds to biological/biochemical experiments. QSAR has made many advances in drug design and drug development. QSARS perform various activities, from protein binding affinities and toxicity measurements to rate constants. It also includes chemical measurements and biological assays.

When a biological property is determined, it is called a QSPR; unlike a biological property, toxicity determination is called a QSTR. The QSAR method does not clarify which part of the molecule needs to be replaced or altered to increase its activity [1]. Interpreting the model created by the QSAR approach is tricky since it uses separate substituent-based descriptors, which do not provide clear instructions about where to improve. GQSAR is an innovative approach based on the fragment

High-Performance Thin Layer Chromatography Method Development to Estimate Phytoconstituents in Hedychium species.

RESEARCH ARTICLE

High-Performance Thin Layer Chromatography Method Development to Estimate Phytoconstituents in *Hedychium* species

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ABSTRACT

Objective: The *H. coronarium* (Zingiberaceae) is a perennial herbaceous plant. Chinese immigrants introduced the *H. coronarium* species as an ornamental plant in 1888. Its attractive flowers make it a desirable ornamental plant. The present study aims to evaluate the physiochemical characteristics and development of the (HPTLC) Fingerprint sequence profile of *Hedychium coronarium* leaves.

Method: Pharmacognostic characteristics and physiochemical parameters were performed according to the method prescribed. The mobile phase confirmation was completed using by performing (TLC). The development of the HPTLC fingerprint was performed with some modifications to get exact separation of phytochemicals using mobile phases such as Toluene: chloroform: ethanol (4:4:1).

Result: Pharmacognostic study reported the presence of unicellular trichomes, vessels, epidermal cells, oil globules, and vascular bundles. Pharmacognostic and physiochemical parameters like color, nature, odor, taste, foreign organic matter, loss on drying, ash value, extractive value, and the foaming index were found to be satisfied as documented in the results. The HPTLC fingerprinting reveals the presence of various chemical compounds expressed as Rf value.

Conclusion: From current scientific research work, *Hedychium coronarium* can be useful in modern medicine as various bioactive secondary metabolites were detected.

Keywords: *Hedychium coronarium*, Zingiberaceae, HPTLC fingerprint, Rf value.

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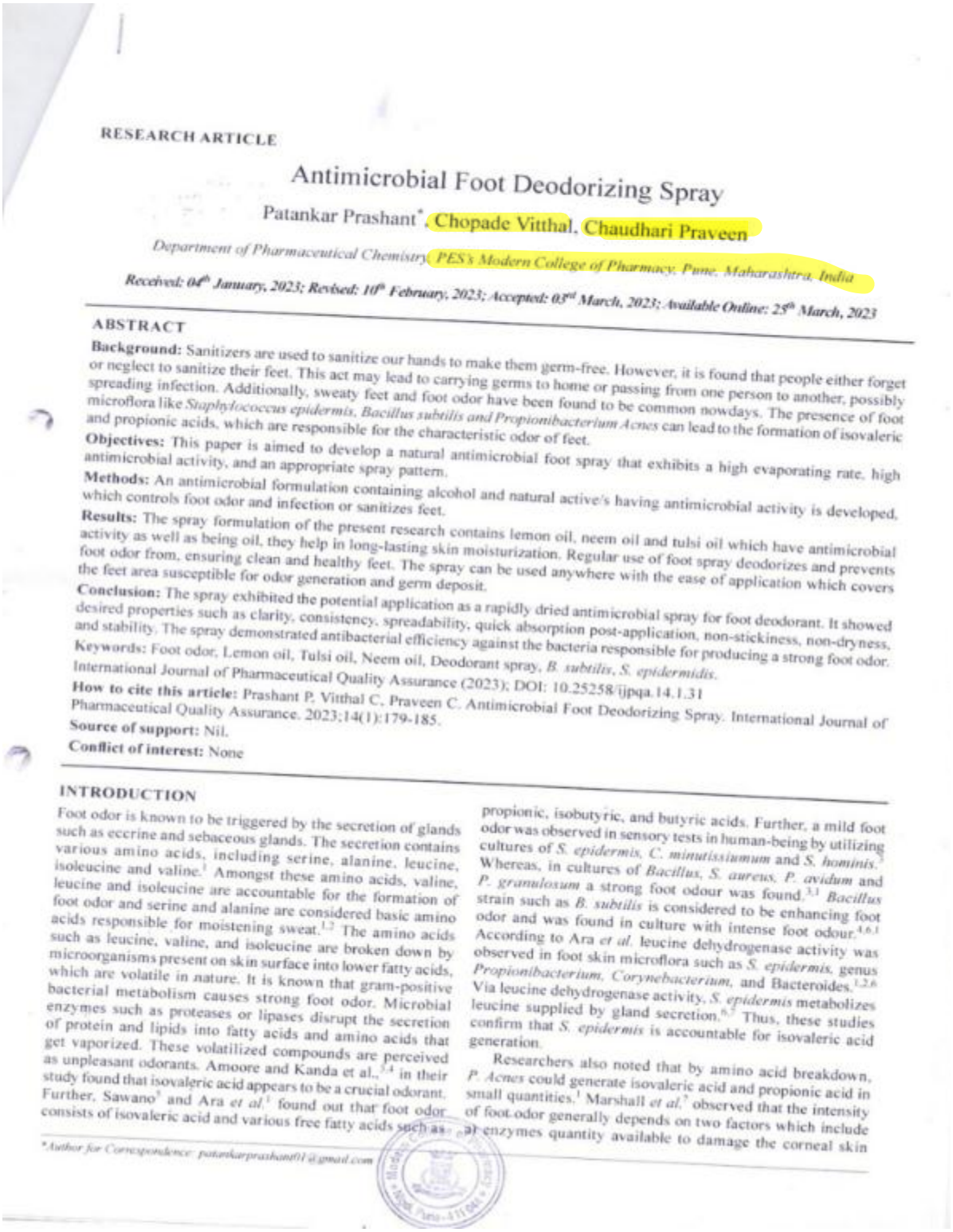
Conflict of interest: None

INTRODUCTION

Recent studies on bioactive chemicals found in plants and dietary sources have drawn a lot of attention. About 80% of the population in poor nations is thought to depend on a traditional system of medicine for their basic healthcare need. These plants show therapeutic potential in the human body due to their bioactive phytochemical components. Recent years have seen tremendous advancement in phytochemistry and pharmacological testing techniques, and as a result, new plant-based medications are entering the market as purified phytochemicals. Pharmacognosy is a field of research where, evolution of novel medicines is very important. It has been recognized that a number of crude compounds are used to make formulations and acts as a repository of therapeutically

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Antimicrobial Foot Deodorizing Spray



RESEARCH ARTICLE

Antimicrobial Foot Deodorizing Spray

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ABSTRACT

Background: Sanitizers are used to sanitize our hands to make them germ-free. However, it is found that people either forget or neglect to sanitize their feet. This act may lead to carrying germs to home or passing from one person to another, possibly spreading infection. Additionally, sweaty feet and foot odor have been found to be common nowdays. The presence of foot microflora like *Staphylococcus epidermis, Bacillus subtilis and Propionibacterium Acnes* can lead to the formation of isovaleric and propionic acids, which are responsible for the characteristic odor of feet.

Objectives: This paper is aimed to develop a natural antimicrobial foot spray that exhibits a high evaporating rate, high antimicrobial activity, and an appropriate spray pattern.

Methods: An antimicrobial formulation containing alcohol and natural active's having antimicrobial activity is developed, which controls foot odor and infection or sanitizes feet.

Results: The spray formulation of the present research contains lemon oil, neem oil and tulsi oil which have antimicrobial activity as well as being oil, they help in long-lasting skin moisturization. Regular use of foot spray deodorizes and prevents foot odor from, ensuring clean and healthy feet. The spray can be used anywhere with the ease of application which covers the feet area susceptible for odor generation and germ deposit.

Conclusion: The spray exhibited the potential application as a rapidly dried antimicrobial spray for foot deodorant. It showed desired properties such as clarity, consistency, spreadability, quick absorption post-application, non-stickiness, non-dryness, and stability. The spray demonstrated antibacterial efficiency against the bacteria responsible for producing a strong foot odor.

Keywords: Foot odor, Lemon oil, Tulsi oil, Neem oil, Deodorant spray, *B. subtilis, S. epidermidis.*

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INTRODUCTION

Foot odor is known to be triggered by the secretion of glands such as eccrine and sebaceous glands. The secretion contains various amino acids, including serine, alanine, leucine, isoleucine and valine.[1] Amongst these amino acids, valine, leucine and isoleucine are accountable for the formation of foot odor and serine and alanine are considered basic amino acids responsible for moistening sweat.[1,2] The amino acids such as leucine, valine, and isoleucine are broken down by microorganisms present on skin surface into lower fatty acids, which are volatile in nature. It is known that gram-positive bacterial metabolism causes strong foot odor. Microbial enzymes such as proteases or lipases disrupt the secretion of protein and lipids into fatty acids and amino acids that get vaporized. These volatilized compounds are perceived as unpleasant odorants. Amoore and Kanda et al.,[3,4] in their study found that isovaleric acid appears to be a crucial odorant. Further, Sawano[5] and Ara *et al.*[1] found out that foot odor consists of isovaleric acid and various free fatty acids such as propionic, isobutyric, and butyric acids. Further, a mild foot odor was observed in sensory tests in human-being by utilizing cultures of *S. epidermis, C. minutissiumum* and *S. hominis*.[3] Whereas, in cultures of *Bacillus, S. aureus, P. avidum* and *P. granulosum* a strong foot odour was found.[3,1] *Bacillus* strain such as *B. subtilis* is considered to be enhancing foot odor and was found in culture with intense foot odour.[4,6,1] According to Ara *et al.* leucine dehydrogenase activity was observed in foot skin microflora such as *S. epidermis*, genus *Propionibacterium, Corynebacterium*, and Bacteroides.[1,2,6] Via leucine dehydrogenase activity, *S. epidermis* metabolizes leucine supplied by gland secretion.[6,7] Thus, these studies confirm that *S. epidermis* is accountable for isovaleric acid generation.

Researchers also noted that by amino acid breakdown, *P. Acnes* could generate isovaleric acid and propionic acid in small quantities.[1] Marshall *et al.*[7] observed that the intensity of foot odor generally depends on two factors which include a) enzymes quantity available to damage the corneal skin

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A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Glimepiride by Hydrotropic Solubilization

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A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Glimepiride by Hydrotropic Solubilization

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Abstract: *An accurate, simple, precise, eco-friendly UV-visible Spectrophotometric method (in accordance with ICH guideline) was developed and validated for estimation of Glimepiride using hydrotropy. Mixed Solvency is another kind of co-solvency where water-soluble substances (fluids, solids, or gases) may act as solubilisers for water-insoluble substances. The method was developed by using 8 M urea, 10% Sodium Citrate, 20% Sodium caprylate. The developed method has the measurement of absorptivity at 237 nm (absorption maximum of Glimepiride) and linearity observed in range 06-16 µg/ml with correlation coefficient 0.9975. The method is simple, fast and accurate and has been applied successfully for the validation of Glimepiride in pharmaceutical dosage forms. Accuracy was determined by recovery studies from marketed formulation and was found to be 100.21-100.76% All other parameters are also evaluates as per ICH Q2 (R1) guidelines and shows the values within acceptable limit.*

Keywords: Glimepiride, Hydrotropy.

1. Introduction

Glimepiride is chemically known as 4-ethyl-3-methyl-N-[2-[4-[(4-methylcyclohexyl) carbamoyl sulfamoyl] phenyl] ethyl] -5-oxo- 2H -pyrrole- 1 –carboxamide. Glimepiride is a member of the second-generation sulfonylurea (SU) drug class used for the management of type 2 diabetes mellitus (T2DM) to improve glycemic control. It stimulates the secretion of insulin granules from the pancreatic beta cells and improves the sensitivity of peripheral tissues to insulin to increase peripheral glucose uptake, thus reducing plasma blood glucose levels and glycated hemoglobin (HbA1C) levels.[1,2,3]

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Development of a New Validated Stability-Indicating High-Performance Thin-Layer Chromatography Method for Determination of Dosulepin HCl in Bulk and Marketed Formulation with Characterization of its Degradants by Liquid Chromatography–Mass Spectrometry



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Original Article

Development of a New Validated Stability-Indicating High-Performance Thin-Layer Chromatography Method for Determination of Dosulepin HCl in Bulk and Marketed Formulation with Characterization of its Degradants by Liquid Chromatography–Mass Spectrometry

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ABSTRACT

Aim: Dosulepin hydrochloride is a tricyclic antidepressant. It acts by inhibition of the reuptake of biogenic amine and increasing available neurotransmitter levels at the synaptic cleft. The objective of this work is to develop a new validated stability-indicating high-performance thin-layer chromatography (HPTLC) method for the determination of dosulepin hydrochloric acid (HCl) in bulk and marketed formulation and characterization of the degradation products by liquid chromatography–mass spectrometry (LC–MS). **Materials and Methods:** The HPTLC method development of dosulepin HCl was performed on aluminum plates precoated with silica gel 60 F254 using dichloromethane: toulene: methanol: glacial acetic acid (GAA) (4:4:2:0.2 v/v) with densitometric detection at 220 nm. The method validation was done using linearity, precision, accuracy, and robustness parameter. **Results:** Linearity range for dosulepin HCl was found in between 150 and 900 ng/band correlation coefficient was 0.996. The % relative standard deviation for accuracy and precision was found <2%. The developed and validated HPTLC method is simple, accurate, precise, and specific. **Conclusion:** This study concludes that the dosulepin HCl undergoes degradation to different extent under different stress conditions. From the peak purity profile studies, it was confirmed that the peak of the degradation product was not interfering with the peak of drugs. Major acidic and oxidation degradation products were isolated and characterized by LC–MS and probable degradation pathway for dosulepin HCl was determined.

KEYWORDS: *Dosulepin HCl, high-performance thin-layer chromatography, liquid chromatography–mass spectrometry, stress degradation*

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INTRODUCTION

Dosulepin hydrochloride or dothiepin hydrochloride (DOS) is a tricyclic antidepressant.[1] Chemically, it is 3-dibenzo (b, e) thiepin-11 (6H)-ylidene-N, N-dimethyl-1-propanamine hydrochloride [Figure 1].[2,3] DOS act by inhibition of the reuptake of biogenic amine and increasing available neurotransmitter levels at the synaptic cleft. This helps to extend the mood-lightening effect of any released adrenaline and serotonin.[4,5] DOS is prescribed in patients who do not respond to alternative antidepressant therapies. It is prescribed in the treatment of major depressive disorders, specifically for aged patients with heart disease, and is proven to be useful for early morning stiffness.[6]

As per literature, several analytical methods have been reported for the determination of DOS in pharmaceuticals

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A.R.Balap

The Efficient Activity of Glabridin and its Derivatives Against EGFR-mediated Inhibition of Breast Cancer



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Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches

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Emerging hepatitis C virus and neuron allied neuro-viral intertwine and its therapeutic approaches

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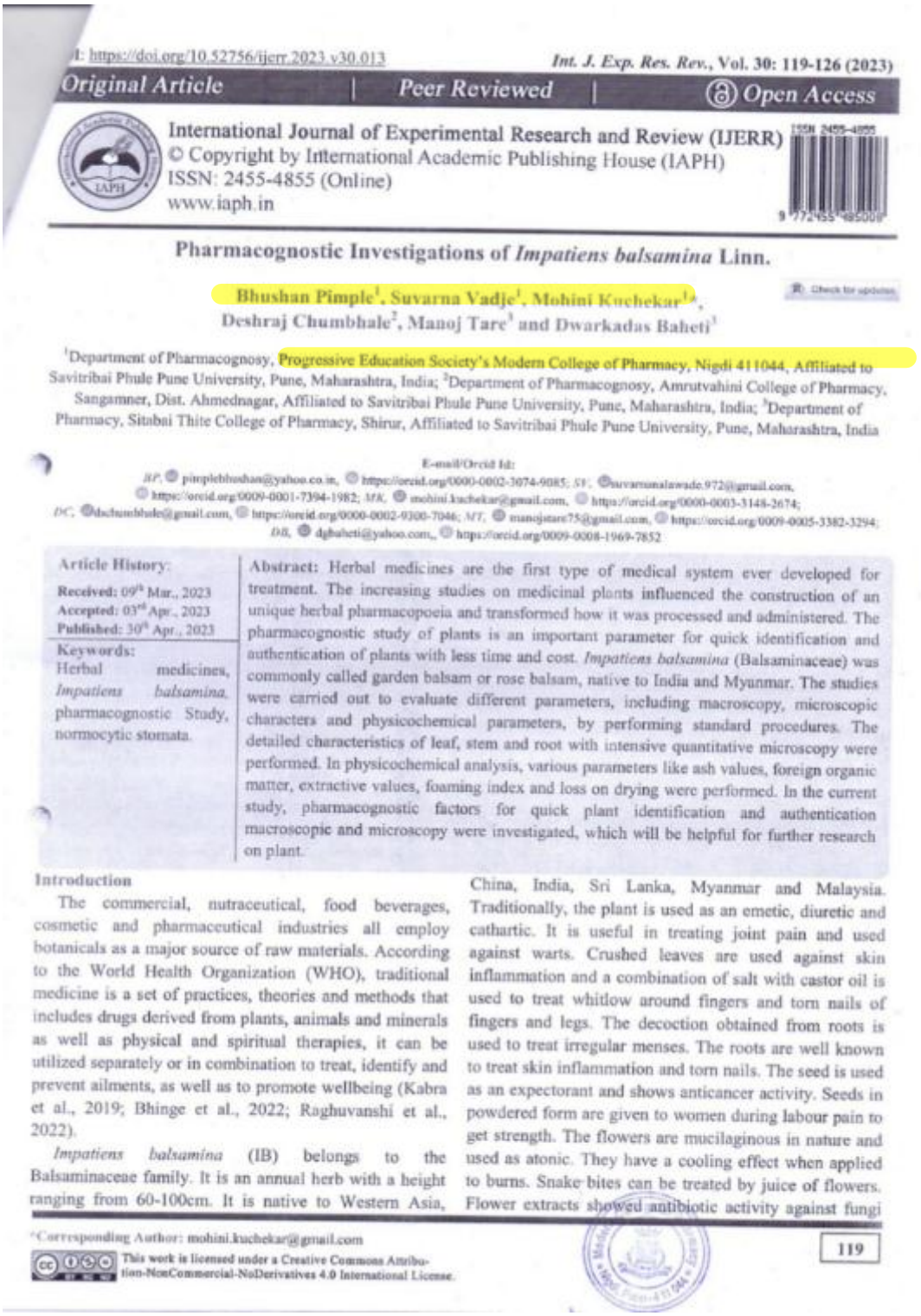
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Pharmacognostic Investigations of Impatiens balsamina Linn.



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Pharmacognostic Investigations of *Impatiens balsamina* Linn.

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Keywords:
Herbal medicines, *Impatiens balsamina*, pharmacognostic Study, normocytic stomata.

Abstract: Herbal medicines are the first type of medical system ever developed for treatment. The increasing studies on medicinal plants influenced the construction of an unique herbal pharmacopoeia and transformed how it was processed and administered. The pharmacognostic study of plants is an important parameter for quick identification and authentication of plants with less time and cost. *Impatiens balsamina* (Balsaminaceae) was commonly called garden balsam or rose balsam, native to India and Myanmar. The studies were carried out to evaluate different parameters, including macroscopy, microscopic characters and physicochemical parameters, by performing standard procedures. The detailed characteristics of leaf, stem and root with intensive quantitative microscopy were performed. In physicochemical analysis, various parameters like ash values, foreign organic matter, extractive values, foaming index and loss on drying were performed. In the current study, pharmacognostic factors for quick plant identification and authentication macroscopic and microscopy were investigated, which will be helpful for further research on plant.

Introduction

The commercial, nutraceutical, food beverages, cosmetic and pharmaceutical industries all employ botanicals as a major source of raw materials. According to the World Health Organization (WHO), traditional medicine is a set of practices, theories and methods that includes drugs derived from plants, animals and minerals as well as physical and spiritual therapies, it can be utilized separately or in combination to treat, identify and prevent ailments, as well as to promote wellbeing (Kabra et al., 2019; Bhinge et al., 2022; Raghuvanshi et al., 2022).

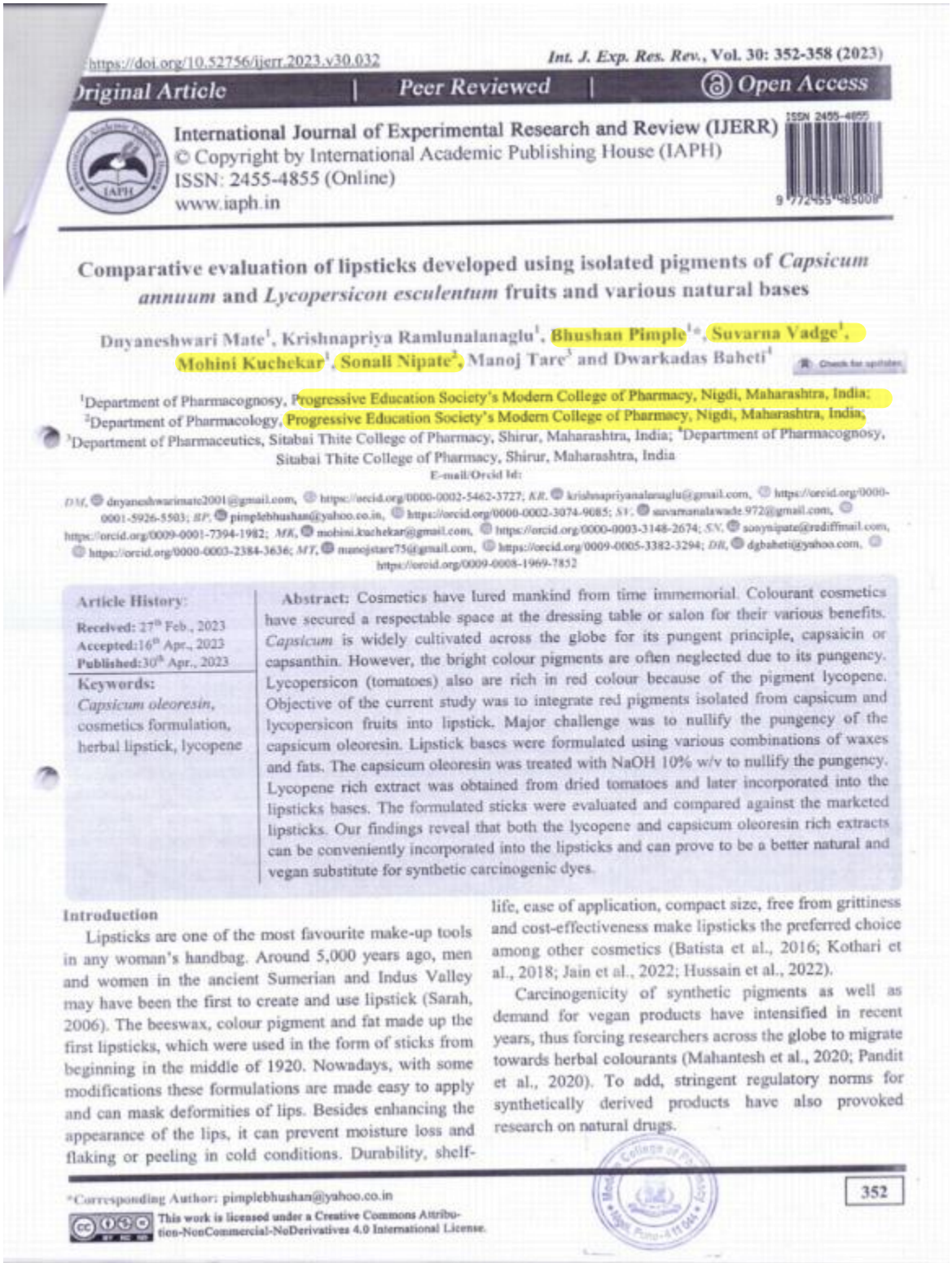
Impatiens balsamina (IB) belongs to the Balsaminaceae family. It is an annual herb with a height ranging from 60-100cm. It is native to Western Asia, China, India, Sri Lanka, Myanmar and Malaysia. Traditionally, the plant is used as an emetic, diuretic and cathartic. It is useful in treating joint pain and used against warts. Crushed leaves are used against skin inflammation and a combination of salt with castor oil is used to treat whitlow around fingers and torn nails of fingers and legs. The decoction obtained from roots is used to treat irregular menses. The roots are well known to treat skin inflammation and torn nails. The seed is used as an expectorant and shows anticancer activity. Seeds in powdered form are given to women during labour pain to get strength. The flowers are mucilaginous in nature and used as atonic. They have a cooling effect when applied to burns. Snake bites can be treated by juice of flowers. Flower extracts showed antibiotic activity against fungi

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Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases



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Comparative evaluation of lipsticks developed using isolated pigments of *Capsicum annuum* and *Lycopersicon esculentum* fruits and various natural bases

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Keywords:
Capsicum oleoresin, cosmetics formulation, herbal lipstick, lycopene

Abstract: Cosmetics have lured mankind from time immemorial. Colourant cosmetics have secured a respectable space at the dressing table or salon for their various benefits. *Capsicum* is widely cultivated across the globe for its pungent principle, capsaicin or capsanthin. However, the bright colour pigments are often neglected due to its pungency. Lycopersicon (tomatoes) also are rich in red colour because of the pigment lycopene. Objective of the current study was to integrate red pigments isolated from capsicum and lycopersicon fruits into lipstick. Major challenge was to nullify the pungency of the capsicum oleoresin. Lipstick bases were formulated using various combinations of waxes and fats. The capsicum oleoresin was treated with NaOH 10% w/v to nullify the pungency. Lycopene rich extract was obtained from dried tomatoes and later incorporated into the lipsticks bases. The formulated sticks were evaluated and compared against the marketed lipsticks. Our findings reveal that both the lycopene and capsicum oleoresin rich extracts can be conveniently incorporated into the lipsticks and can prove to be a better natural and vegan substitute for synthetic carcinogenic dyes.

Introduction

Lipsticks are one of the most favourite make-up tools in any woman's handbag. Around 5,000 years ago, men and women in the ancient Sumerian and Indus Valley may have been the first to create and use lipstick (Sarah, 2006). The beeswax, colour pigment and fat made up the first lipsticks, which were used in the form of sticks from beginning in the middle of 1920. Nowadays, with some modifications these formulations are made easy to apply and can mask deformities of lips. Besides enhancing the appearance of the lips, it can prevent moisture loss and flaking or peeling in cold conditions. Durability, shelf-life, ease of application, compact size, free from grittiness and cost-effectiveness make lipsticks the preferred choice among other cosmetics (Batista et al., 2016; Kothari et al., 2018; Jain et al., 2022; Hussain et al., 2022).

Carcinogenicity of synthetic pigments as well as demand for vegan products have intensified in recent years, thus forcing researchers across the globe to migrate towards herbal colourants (Mahantesh et al., 2020; Pandit et al., 2020). To add, stringent regulatory norms for synthetically derived products have also provoked research on natural drugs.

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Development and validation of chromatographic method for analysis of some polycyclic hydrocarbons in soybean oil

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DEVELOPMENT AND VALIDATION OF CHROMATOGRAPHIC METHOD FOR ANALYSIS OF SOME POLYCYCLIC HYDROCARBONS IN SOYBEAN OIL

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Abstract

Some polycyclic hydrocarbons (PHs) present in almost all edible oils are carcinogenic, teratogenic, neurotoxic and mutagenic at certain levels. There are total 16 PHs which are present in various edible oils. Soybean oil is one of most widely and routinely used for cooking food by all over population. Hence the detection of PHs levels in various soybean oil brands available in market is necessary. Many analytical methods are available for the same but these methods are time consuming and secondly quantity of organic solvents required is also higher. For example HPLC can be used for analysis of PHs in edible oils but it takes more time for analysis. Hence a novel method is developed using supercritical fluid chromatography for analysis of some PHs in soybean oil which reduces time by 5 times as compared to normal HPLC method and also requires less amount of organic solvents for analysis because of the lower viscosity and higher diffusivity in the mobile phases of SFC. The method is validated using various validation parameters and statistically proved using ANOVA.

KEY WORDS- Polycyclic hydrocarbons, Soybean oil, HPLC, SFC, Cancer.

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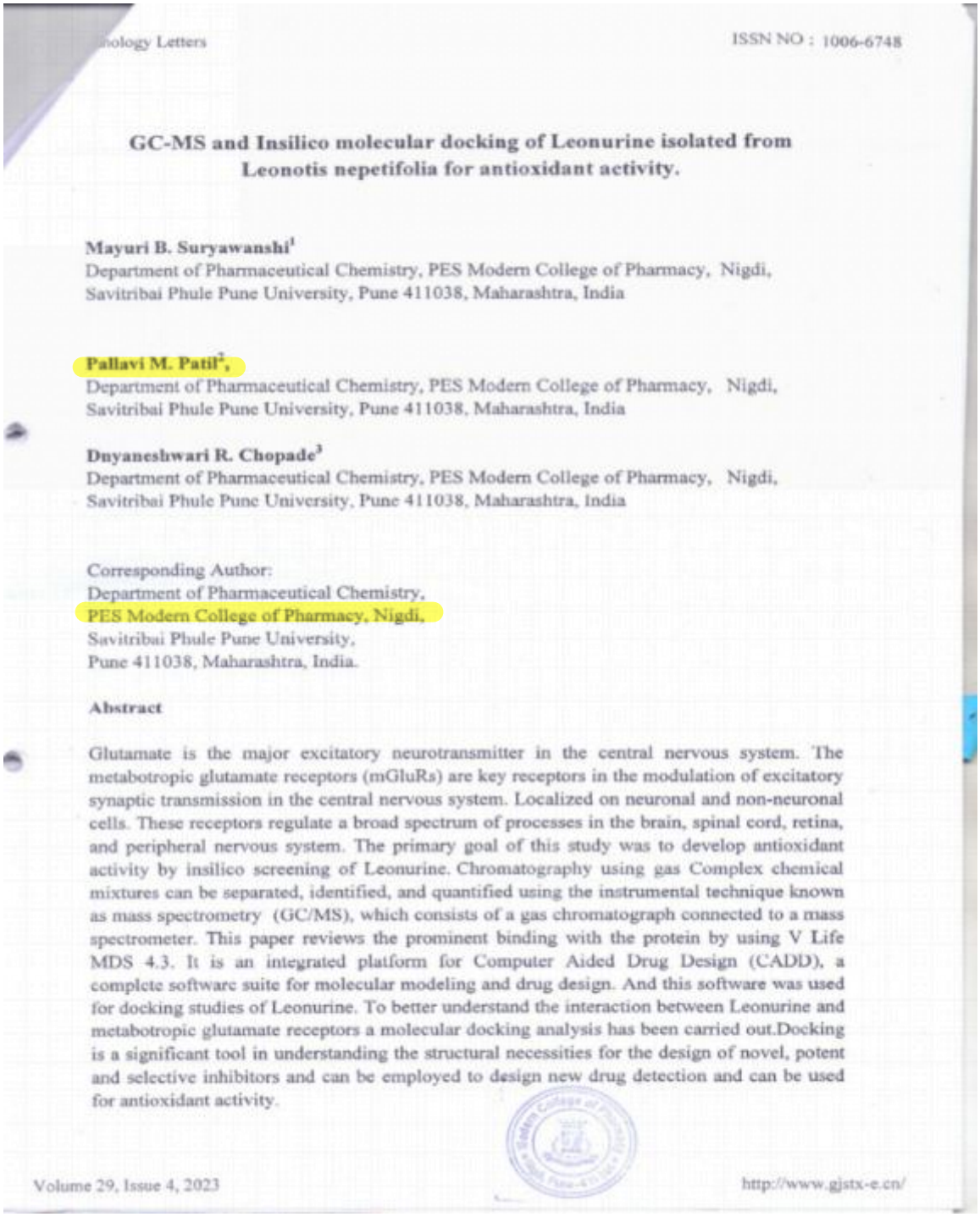
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GC-MS and Insilico molecular docking of Leonurine isolated from Leonotisnepetifolia for antioxidant activity.



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GC-MS and Insilico molecular docking of Leonurine isolated from Leonotis nepetifolia for antioxidant activity.

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Abstract

Glutamate is the major excitatory neurotransmitter in the central nervous system. The metabotropic glutamate receptors (mGluRs) are key receptors in the modulation of excitatory synaptic transmission in the central nervous system. Localized on neuronal and non-neuronal cells. These receptors regulate a broad spectrum of processes in the brain, spinal cord, retina, and peripheral nervous system. The primary goal of this study was to develop antioxidant activity by insilico screening of Leonurine. Chromatography using gas Complex chemical mixtures can be separated, identified, and quantified using the instrumental technique known as mass spectrometry (GC/MS), which consists of a gas chromatograph connected to a mass spectrometer. This paper reviews the prominent binding with the protein by using V Life MDS 4.3. It is an integrated platform for Computer Aided Drug Design (CADD), a complete software suite for molecular modeling and drug design. And this software was used for docking studies of Leonurine. To better understand the interaction between Leonurine and metabotropic glutamate receptors a molecular docking analysis has been carried out.Docking is a significant tool in understanding the structural necessities for the design of novel, potent and selective inhibitors and can be employed to design new drug detection and can be used for antioxidant activity.

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Development and validation of RPHPLC method for assay of fluticasone furoate from nasal spray formulation

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DEVELOPMENT AND VALIDATION OF RP-HPLC METHOD FOR ASSAY OF FLUTICASONE FUROATE FROM NASAL SPRAY FORMULATION

Vitthal Chopade[1*], Vishnu Neharkar[2], Padmanabh Deshpande[3], Makarand Puri[4], Priti Khanapure[1], Vaishnavi Chopade[5], Minal Ghante[6], Jayshree Jagtap[7], Shital Godse[6], Vidhya Bhusari[6], Vasundhara Sawant[6], Sonali Labhade[8], Rajendra Kawade[9], Deepali Kadam[10], Nilesh Jadhav[11], Gaffar Sayyad[12], Dipti Phadtare[13], Shital Godse[6], Pandurang Vijapure[14], Kunal Survade[13], Rahul Mohan[9], Arvind Hatkar[9], Atul Baravkar[15]

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Abstract

The literature search reveals that, several HPLC methods for the determination of Fluticasone furoate in combination with other drugs are reported with long run time, high solvent consumption or with less available instrument as compared with HPLC. There is no any reported HPLC method for individual assay of Fluticasone furoate from nasal spray formulation. So the purpose of present experimental work is to develop a rapid, simple, precise, accurate, specific, and sensitive high performance liquid chromatographic method for assay of Fluticasone furoate from nasal spray formulation. The desired chromatographic separation was achieved on the Inertsil ODS-3V 250 x 4.6 mm, 5µ column, using isocratic elution at 240 nm wavelength. The optimized mobile phase constituted of purified water and acetonitrile in the ratio of 20:80 % v/v delivered at the flow rate 1 ml/min with isocratic elution. The retention time of fluticasone furoate was 5 min. The method was validated according to International conference of harmonization guidelines in terms of accuracy, precision, specificity, robustness, linearity and other aspects of analytical validation. Linearity was established in the concentration range of 27.5 to 82.5 ppm (r^2=1.000). The recoveries obtained were 99.4 -100.5 %. Similarly the % RSD value for precision was also found to be within the acceptable limit. Developed method was simple and convenient which could be successfully applied for the routine analysis.

KEYWORD: Fluticasone furoate, Corticosteroid, Asthma, Allergic Rhinitis, RP-HPLC, Validation, ICH guidelines.

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Hepatoprotective activity of Balsamodendronmukul extract against Paracetamol-induced liver toxicity in rats: In vivo pharmacological and toxicological evaluation,



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Original article

Hepatoprotective activity of *Balsamodendron mukul* extract against Paracetamol-induced liver toxicity in rats: In vivo pharmacological and toxicological evaluation

Activité hépatoprotectrice de l'extrait de *Balsamodendron mukul* contre la toxicité hépatique induite par le paracétamol chez le rat: évaluation pharmacologique et toxicologique in vivo

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Summary

Overuse of the antipyretic agent Paracetamol (PCM) is linked to hepatotoxicity, which limits its clinical use. The goal of this investigation was to find out how well *Balsamodendron mukul* (*B.mukul*) extract protects the liver from acute PCM poisoning. *B.mukul* extract was procured from a standard crude drug supplier in the local market. The PCM-induced hepatotoxicity was screened in experimental animals. Animals that were treated only with excessive PCM (2g/kg) had changes in their serum biomarkers (i.e., serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, alkaline phosphatase, and serum total bilirubin), oxidative stress, Tumor Necrosis Factor-α (TNF-α), and Interleukin-1 proteins. *B.mukul* extracts of 245μg and 332μg revealed 50% of hydroxyl radical scavenging and lipid peroxidation inhibiting, respectively, which was found to be more significant when compared to ascorbic acid treatment. The outcomes confirmed that *B.mukul* extract has strong antioxidant activity, which leads to the inhibition of reactive oxygen species (ROS). Treatment with *B.mukul* extract at doses of 300 and 600mg/kg produced a dose-dependent reduction in the PCM-induced rise of the biochemical parameters. Silymarin at 100mg/kg body weight significantly prevented such rise in the study. Finally, the findings confirmed that the *B.mukul* extract has more potent than silymarin and revealed higher antioxidant and hepatoprotective activity, which could consider a novel approach for the reduction of PCM-induced liver toxicity.

Résumé

Development and Characterization of Lipidic Nano-Cochleate for Topical Delivery of Itraconazole

Development and characterization of lipidic nano-cochleate for topical delivery of Itraconazole

Anuradha G. More[1*], Hrishikesh S. Sonsale[1], Swati S. Mutha[2], Padmaja S. Kore[1], Aishwarya S. Mahangale[1], Akshay N. Deo[1], Mukesh P. Ratnaparkhi[3]

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Abstract

Clinical investigation showed that itraconazole exhibit various adverse effect such as nausea, vomiting, and other gastric disturbances. To minimize these side effects, itraconazolenano-cochleatesformulation was developed and delivered to topical site which can minimize the frequency and intensity of adverse effect. The need of these study due to the drug has low bioavailability (55%) because of low aqueous solubility and first pass effect. Nano-cochleates are prepared by trapping method by using the phosphatidyl serine as a lipid and calcium chloride as a metal cation. In the current study design expert base risk assessment was exploited for the preparation of itraconazole loaded nano-cochleac. The Box-Behnken design was utilize for risk assessment and optimization for various formulation and process parameter. Five central point were utilized in this design for the accomplishment of the goal.The optimized formula yielded 247nm particle size, 0.364 PDI, -30.8mV zeta potential, and 93% entrapment efficiency. An optimized batch in-vitro drug release study was carried out. The selected formulation was loaded into HPMC K 5M gel for in-vitro testing. The antifungal study on Trichophyton rubrum (T. rubrum) culture revealed an 18.5±0.5mm zone of inhibition with the nano-cochleate formulation. A design expert assist in understanding the interaction between process and formulation parameters. In the future, the prepared nano-cochleate gel could be a potential alternative for topical fungal infection.

Keywords: Itraconazole, nano-cochleates, topical drug delivery, design of expert, antifungal formulation

Introduction

Superficial fungal infections of the hair, skin and nails are a major cause of morbidity in the world[1]. Currently, limited number of antifungals are available for treating the fungal infections because of increasing the multi resistance and the adverse effect are the major

Quantification of spironolactone and its impurities present in pharmaceutical dosage forms by stability-indicating HPLC method

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QUANTIFICATION OF SPIRONOLACTONE AND ITS IMPURITIES PRESENT IN PHARMACEUTICAL DOSAGE FORMS BY STABILITY-INDICATING HPLC METHOD

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Keywords:

Development, Validation, Spironolactone impurities

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ABSTRACT: Spironolactone belongs to a group of medicine known as aldosterone antagonist used as sparing diuretic, Spironolactone (aldactone) is potassium -aspiring diuretic agent and has half-life of about 16 hours. Spironolactone one diuretics agents which increases renal excretion of water and solutes (mainly sodium salt). It is used mainly in the treatment of refractory edema in patients with congestive heart failure nephrotic syndrome, or hepatic cirrhosis. On its own, spironolactone is only a weak diuretic, but it can be combined with other diuretics. Spironolactone is 7α-acetyle thio-3-oxo-17α-pregn-4-ene-21,17β-carbolactone. Its molecular formula is C_{24} $H_{32}O_4S$ having a molecular weight 416.58 gm/mole. The possible related compound (degradants and process-related impurities) as Spironolactone related compound –A of Spironolactone having chemical names are S-((2'R, 7R, 8R, 9S, 10R, 13S, 14S)-10, 13-Dimethyl-3, 5'-dioxo-1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16-tetradecahydro-5'H-spiro[cyclopenta[a]phenanthrene-17,2'-furan]-7-yl) ethanethioate.

INTRODUCTION: Spironolactone is primarily used to treat fluid build-up due to heart failure, liver scarring, or kidney disease. It is also used in the treatment of high blood pressure, low blood potassium that does not improve with supplementation, early puberty in boys, acne and excessive hair growth in women and as a part of transgender hormone therapy in transfeminine people [1, 2]. Extended review revels that various analytical methods based on HPTLC, HPLC-APCI-MS [2, 3, 4] UPLC have been developed for determination of spironolactone pharmaceutical dosage form.

According literature survey there is no validated stability indicating HPLC method for spironolactone solution [2, 5, 6]. This paper describes the Validating method for the related substances of Spironolactone solution for Known Impurities. For the Method Validation of Related substances of spironolactone to study validating parameter like specificity, Linearity, Precision [7, 8, 9, 10], Stability in analytical solution [11], also describes the parameter like Accuracy, Robustness [12, 13, 14]. The main advantage of this paperis to analyse spironolactone solution degradants

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Experimental:

Chemical and Reagents: Spironolactone Working Standards Were Obtained from Callidus Research Laboratories. Pvt. LTD, Pune. Water for HPLC, Ammonium acetate, Glacial Acetic Acid, Ammonia Solution, Acetonitrile HPLC grade, Methanol HPLC Grade, Hydrochloric acid Emparta

Dr. A S. Tapkir

Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425

Acute oral toxicity evaluation of hydroethanolic extract of *Brassica Cretica* in wistar albino rats as per OECD 425

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Abstract:

The medicinal herb *Brassica Cretica* (Brassicaceae) has long been employed in traditional cuisine. The study was undertaken to confirm the plant's safety profile. A total of six female rats (n=6) were chosen at random. A hydroalcoholic extract of *Brassica Cretica (*HEBC) was given to a group of six rats at a dose of 2000 mg/kg body weight. Blood samples were taken at regular intervals to evaluate the hematological and biochemical markers. The vital organs were isolated and kept separate for histology examinations. The data suggests that, the extract's LD_{50} is greater than 2000 mg/kg body weight. The body weight, behavior, renal function test, liver function test, and lipid profile remained unchanged.

Key words: Toxicity, Hematology, Organ Function Test

Introduction:

Even though there have been advances in the manufacture of synthetic and semi-synthetic drugs for the treatment of various illnesses, traditional medicines still play a significant role in rural areas. This herbal medication's usefulness is clearly shifting in favour of overuse. [1] As the founder of toxicology, Paracelsus once observed, "There is nothing that is not a poison; all substances are poisons". The appropriate dosage is what distinguishes a treatment from a poison. Research on the therapeutic plants and their safety profiles is urgently needed. [2] Although the

Eur. Chem. Bull. 2023, 12(Special Issue 1), 2442-2454

Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.

Prophylactic effects ofHydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.

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Abstract:

Background

Cardiovascular diseases (CVDs) are increasingly the leading cause of mortality worldwide. One naturally occurring plant, *Brassica Cretica*, is used to address a variety of illnesses, including heart conditions. There is, however, little information available regarding the plant's effectiveness and safety.

Objective:

To evaluate the prophylactic effects of hydroethanolic extract of *Brassica Cretica* leaves on cyclophosphamide-induced myocardial injury.

Methods:

Rats were randomized into 6 groups of 6 rats each, namely Saline control, positive and negative control, hsydroethanolic extract of Brassica cretica (HEBC) in three dose levels. The prophylactic effects of the hydroethanolic extract was evaluated based on anatomical, biochemical and histopathological methods. The parameters such as body weight, cardiac mass to body mass ratio, troponin-I, alanine transaminase (ALT), aspartate aminotransferase (AST), creatine kinase-myoglobin binding (CK-MB), total cholesterol were observed.

Results

Hydroethanolic extract of Brassica Cretica significantly prevented the deleterious effects of cyclophosphamide on body weight ($P<0.001$), ratio of cardiac mass to body mass ($P<0.01$) Cardiac biomarkers such as, Troponin-I ($P<0.01$), ALT ($P<0.001$), AST ($P<0.01$), CK-MB, ($P<0.001$), Lipid profiles including triglycerides ($P<0.001$) and total cholesterol ($P< 0.01$) were



Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic Extract in laboratory animals

Evaluation of wound healing and anti-inflammatory potential of *Daucus Carota* ethanolic Extract in laboratory animals.

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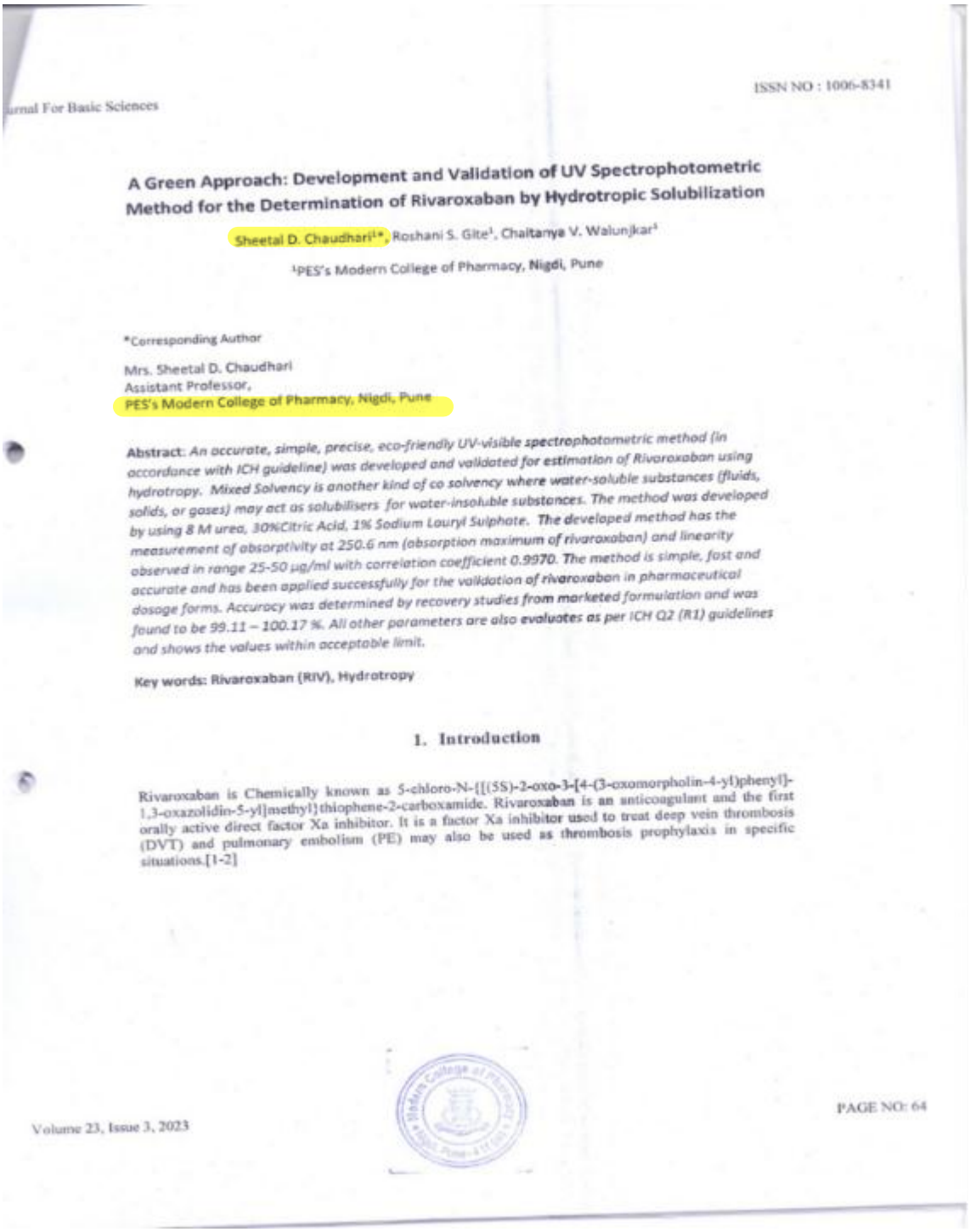
Abstract

Background: Wild carrot, also known as Queen Anne's Lace, was introduced to North America from Europe as a medicinal herb., *Daucus Carota* is sanctified with a wide variety of qualities which are mainly indicated in Ayurveda to be used for Mehahara (treats urinary tract disorders), Deepana (enhances stomach fire), Pachana (helps in digestion), Rochana (stimulates appetite) The ethanol extract of the leaves of D. Carota (DCEE) was investigated for its healing efficiency in a rat excision wound model.

Methods: We divided the three groups of eight rats into excision wounds. The rate of wound contraction in skin wound sites in rats treated with 10% (w/w) betadine ointment or the reference standard medication, 5%, 10%, or 15% (w/w) DCEE ointment, was used to measure healing. Estimates were made of how DCEE affected the amounts of hydroxyproline and hexosamine during the healing process. Also evaluated was DCEE's antibacterial efficacy towards microbes. To comprehend the mechanism of wound healing, the in vivo anti-inflammatory activity of DCEE was examined.

Results: Significant antibacterial action was shown by DCEE against microorganisms. The wound contraction in the excision wound model demonstrated the powerful wound healing capacity of the ointment formulation made with 5%, 10%, and 15% (w/w) DCEE. Hexosamine and hydroxyproline concentrations were also connected to the pattern of healing that was seen. These results were corroborated by the histological features of sections of healed wounds, which showed that the DCEE ointment-treated groups had better tissue regeneration, more

A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Rivaroxaban by Hydrotropic Solubilization



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A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Rivaroxaban by Hydrotropic Solubilization

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Abstract: *An accurate, simple, precise, eco-friendly UV-visible spectrophotometric method (in accordance with ICH guideline) was developed and validated for estimation of Rivaroxaban using hydrotropy. Mixed Solvency is another kind of co solvency where water-soluble substances (fluids, solids, or gases) may act as solubilisers for water-insoluble substances. The method was developed by using 8 M urea, 30%Citric Acid, 1% Sodium Lauryl Sulphate. The developed method has the measurement of absorptivity at 250.6 nm (absorption maximum of rivaroxaban) and linearity observed in range 25-50 µg/ml with correlation coefficient 0.9970. The method is simple, fast and accurate and has been applied successfully for the validation of rivaroxaban in pharmaceutical dosage forms. Accuracy was determined by recovery studies from marketed formulation and was found to be 99.11 – 100.17 %. All other parameters are also evaluates as per ICH Q2 (R1) guidelines and shows the values within acceptable limit.*

Key words: Rivaroxaban (RIV), Hydrotropy

1. Introduction

Rivaroxaban is Chemically known as 5-chloro-N-{[(5S)-2-oxo-3-[4-(3-oxomorpholin-4-yl)phenyl]-1,3-oxazolidin-5-yl]methyl}thiophene-2-carboxamide. Rivaroxaban is an anticoagulant and the first orally active direct factor Xa inhibitor. It is a factor Xa inhibitor used to treat deep vein thrombosis (DVT) and pulmonary embolism (PE) may also be used as thrombosis prophylaxis in specific situations.[1-2]

Identification of d-limonene and rosmarinic acid by gc-ms analysis of kalonji oil with anti-microbial and anti-fungal activities

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IDENTIFICATION OF D-LIMONENE AND ROSMARINIC ACID BY GC-MS ANALYSIS OF KALONJI OIL WITH ANTI-MICROBIAL AND ANTI-FUNGAL ACTIVITIES

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ABSTRACT-The phenolic substances D-limonene (DL) and rosmarinic acid (RA) have been extensively used in food flavoring, soaps, and perfumes, as well as the therapy of many disorders, because of their alluring citrus scent. Utilizing a Clevenger-style device and hydro distillation, the extraction process was completed. Using Shimadzu-QP-2010 ULTRA GC analysis, rosmarinic acid and d-limonene in kalonji oil were identified. The hydro-distillation technique was employed to isolate the essential oil, along with a distillation apparatus similar to that used by Clevenger. Using the essential oils extracted from Kalonji oil, a simple and straightforward Gas chromatography-Mass spectrometry (GC-MS) method was created for the simultaneous detection of d-limonene and rosmarinic acid) having an Agilent HP 5 MS column (30m X 0.25mm X 0.25µm), the split ratio at 10:1, oven temperature 40°C, and the injection temperature was 100°C and helium was used as carrier gas. Staphylococcus aureus (S. coccus), Klebsiella pneumoniae (K. pneumoniae), and Escherichia coli (E. coli) were used as test organisms for the antimicrobial activity, and Fusarium solani was used for the antifungal activity(F. solani).

*Keywords:*D-Limonene, Gas chromatography-Mass spectrometry, Kalonji oil, Rosmarinic acid.

1. INTRODUCTION

The Latin term "Niger," which primarily refers to seeds and is thought to be a flowering species, is where the English word "nigella" comes from [1]. The green plant known as black cumin, also known as kalonji seed, or Nigella sativa L., is a member of the Ranunculaceae family and its seeds contain 34–39% oil. Eastern Europe, the Middle East, and Western Asia all have it growing there [2]. The Kalonji seed and its essential and/or crude oils have a wide range of uses in both conventional health and the food industry. Since it contains a lot of sterols, tocopherols, and important fatty acids, kalonji seed oil is becoming increasingly popular [3].

Either by itself or in conjunction with other veggie oils, it can be used. Research on Kalonji oil seed has shown that it has anti-cancer properties [4], anti-diabetic [5], anti-radical, anti-inflammatory [6], spasmolytic, bronchodilator [7], hepatoprotective [8-9], gastro-protective [10], anti-hypertensive, and renal protective properties. Due to the numerous applications, it can be used for, kalonji seeds also display a variety of antioxidant characteristics and abilities. They are also highly valued industrial oilseeds [11].

Kalonji seeds are effective in the traditional medical system for treating a variety of ailments, including cough, bronchitis, asthma, chronic headache, migraine, dizziness, chest congestion, dysmenorrhea, obesity, diabetes, paralysis, hemiplegia, back pain, infection, inflammation, rheumatism, and hypertension [12].

Design And Characterization of Nanoemulgel For Topical Fungal Infection: Box Behnken Design Approach

Design and Characterization of Nanoemulgel for Topical Fungal Infection: Box Behnken Design Approach

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Abstract

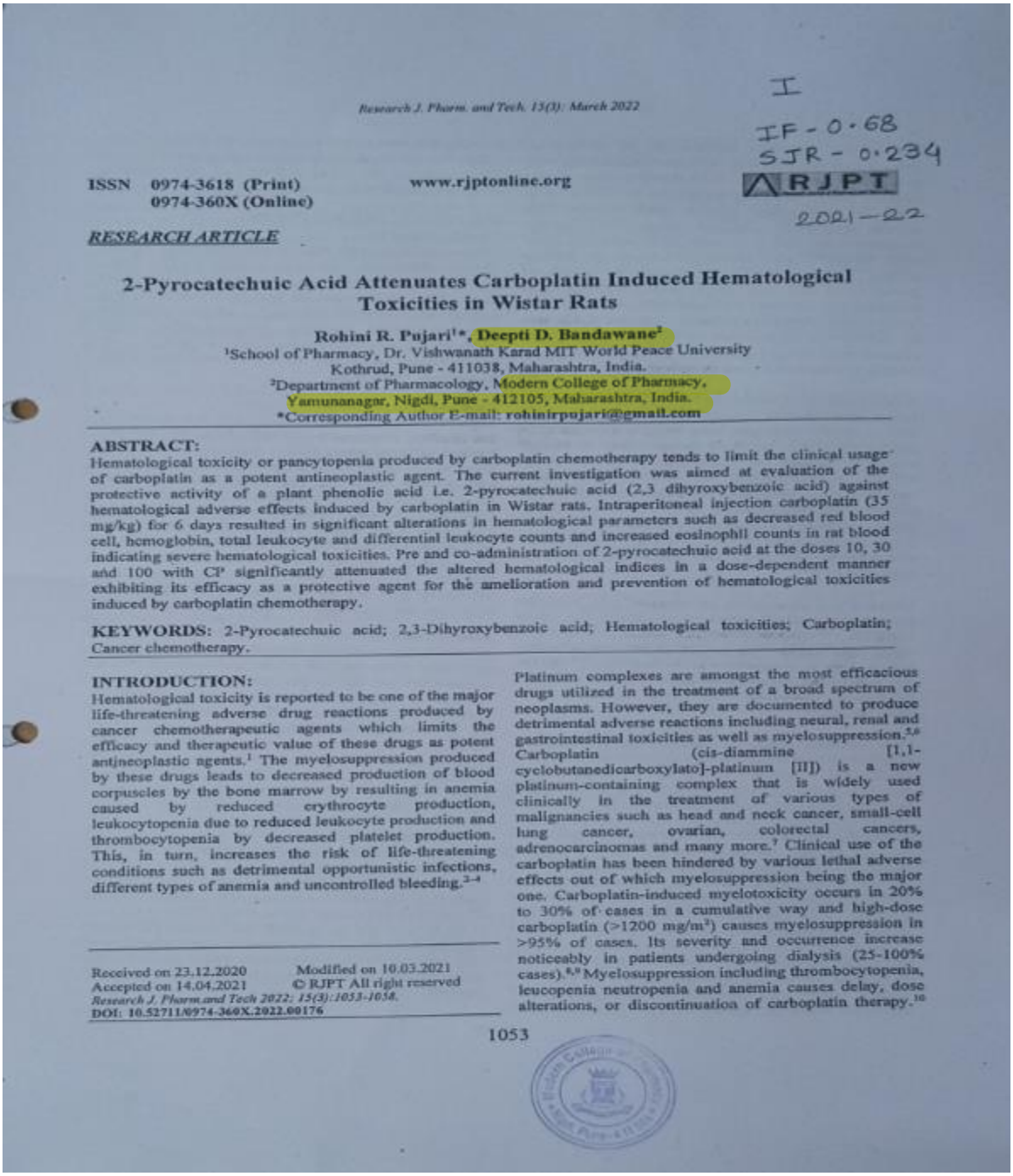
The current study is an innovative attempt to create nanoemulgel (NEG) that incorporates the medicinal properties of argan and ginger oil to treat potentially fatal topical fungal infections. Every year, approximately 1.5 million people worldwide are killed by fungal infections. The essential oils used in this study were argan and ginger oil, both of which have strong antibacterial properties. Argan oil and ginger oil (1:1) were chosen for antifungal activity based on the Minimum inhibitory concentration (MIC) and zone of inhibition. The goal of this study was to create an argan and ginger oil-loaded nanoemulgel for transdermal administration using a box-Behnken statistical design. A three-factor, three-level Box-Behnken design was used to optimise the nanoemulsion. The independent variables investigated were oil concentration (A), Smix concentration (B), and stirring time (C). The best nano-emulgel was made with oil, Smix, and water in a 20:10:70 ratio in 3% HPMC K15 M gel has a globule size of nanoemulsion 185±3.4 nm and a PDI of 0.352 ± 0.102. As a result of the findings, it is possible to conclude that the NEG of argan oil and ginger oil would be an effective treatment for fungal infections.

Key words – Argan oil, Ginger oil, Nanoemulsion, Nanoemulgel, Box-Behnken Design, etc.

Introduction

Fungal infections are one of the worst diseases, killing about 1.5 million people each year throughout the world. The primary factor that makes fungal infections more dangerous is that they are often overlooked by society. Even though there have been significant advancements

2-Pyrocatechuic Acid Attenuates Carboplatin Induced Hematological Toxicities in Wistar Rats



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RESEARCH ARTICLE

2-Pyrocatechuic Acid Attenuates Carboplatin Induced Hematological Toxicities in Wistar Rats

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ABSTRACT:
Hematological toxicity or pancytopenia produced by carboplatin chemotherapy tends to limit the clinical usage of carboplatin as a potent antineoplastic agent. The current investigation was aimed at evaluation of the protective activity of a plant phenolic acid i.e. 2-pyrocatechuic acid (2,3 dihyroxybenzoic acid) against hematological adverse effects induced by carboplatin in Wistar rats. Intraperitoneal injection carboplatin (35 mg/kg) for 6 days resulted in significant alterations in hematological parameters such as decreased red blood cell, hemoglobin, total leukocyte and differential leukocyte counts and increased eosinophil counts in rat blood indicating severe hematological toxicities. Pre and co-administration of 2-pyrocatechuic acid at the doses 10, 30 and 100 with Cl^{a} significantly attenuated the altered hematological indices in a dose-dependent manner exhibiting its efficacy as a protective agent for the amelioration and prevention of hematological toxicities induced by carboplatin chemotherapy.

KEYWORDS: 2-Pyrocatechuic acid; 2,3-Dihyroxybenzoic acid; Hematological toxicities; Carboplatin; Cancer chemotherapy.

INTRODUCTION:
Hematological toxicity is reported to be one of the major life-threatening adverse drug reactions produced by cancer chemotherapeutic agents which limits the efficacy and therapeutic value of these drugs as potent antineoplastic agents.[1] The myelosuppression produced by these drugs leads to decreased production of blood corpuscles by the bone marrow by resulting in anemia caused by reduced erythrocyte production, leukocytopenia due to reduced leukocyte production and thrombocytopenia by decreased platelet production. This, in turn, increases the risk of life-threatening conditions such as detrimental opportunistic infections, different types of anemia and uncontrolled bleeding.[2-4]

Platinum complexes are amongst the most efficacious drugs utilized in the treatment of a broad spectrum of neoplasms. However, they are documented to produce detrimental adverse reactions including neural, renal and gastrointestinal toxicities as well as myelosuppression.[5,6] Carboplatin (cis-diammine [1,1-cyclobutanedicarboxylato]-platinum [II]) is a new platinum-containing complex that is widely used clinically in the treatment of various types of malignancies such as head and neck cancer, small-cell lung cancer, ovarian, colorectal cancers, adrenocarcinomas and many more.[7] Clinical use of the carboplatin has been hindered by various lethal adverse effects out of which myelosuppression being the major one. Carboplatin-induced myelotoxicity occurs in 20% to 30% of cases in a cumulative way and high-dose carboplatin (>1200 mg/m²) causes myelosuppression in >95% of cases. Its severity and occurrence increase noticeably in patients undergoing dialysis (25-100% cases).[8,9] Myelosuppression including thrombocytopenia, leucopenia neutropenia and anemia causes delay, dose alterations, or discontinuation of carboplatin therapy.[10]

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Simultaneous estimation of lamivudune, Tenofovir, Disoproxil Fumarate and Efavirenz in Bulk and tablet Dosage form by cramers rule

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https://www.jpsonline.org

Original Article

Simultaneous Estimation of Lamivudine, Tenofovir Disoproxil Fumarate and Efavirenz in Bulk and Tablet Dosage Form byCramer'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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INTRODUCTION

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

Evaluation of In Vitro and In Silico Anti-Alzheimer potential of ethanolic extract of Nyctanthes arbortristis flowers.

Evaluation of *In Vitro* and *In Silico* Anti-Alzheimer potential of ethanolic extract of *Nyctanthes arbortristis* flowers.

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ABSTRACT:

Alzheimer's disease (AD) is a primary degenerative disease of the central nervous system. Increased level of the enzyme acetylcholinesterase (AChE) plays a key role in the hydrolysis of the neurotransmitter Acetylcholine which worsens the condition of cognitive dysfunction. Among the pathologic hypotheses of Alzheimer's disease, cholinergic deficit and oxidative stress have been implicated as two major hallmarks. Hence, inhibition of cholinesterase and oxidation are the two important strategies in the development of a drug for AD. The *in vitro* antioxidant and anticholinesterase activities of ethanolic extracts of *Nyctanthes arbortristis* Linn. were evaluated using enzymatic and chemical methods. Antioxidant potentials were evaluated by the DPPH assay and lipid peroxidation method. Anticholinesterase activity was measured by the modified Ellman method. The molecular docking study was carried out using the molecular docking tool UCSF Chimera tool to explain the interaction of the major chemical constituents with the enzymes. In antioxidant *in vitro* evaluation, IC_{50} values of the ethanolic extract of *Nyctanthes arbortristis* were found to be 64.96 µg/ml and 79.27 µg/ml for DPPH and lipid peroxidation respectively; The ethanolic extract of *Nyctanthes arbortristis* showed potent anticholinesterase effects with an IC_{50} value of 28.54 µg/ml. The docking experiments showed that Quercetin has the highest binding score among the six major identified compounds. Quercetin also mimics the standard drug galantamine that shows the same H-bond interaction with THR62 amino acid residue resulting in more potent inhibitory activity than galantamine. The ethanolic extract of flowers of *Nyctanthes arbortristis* showed promising antioxidant and anticholinesterase activity and can be used to treat Alzheimer's disease.

Keywords: *Nyctanthes arbortristis*, anticholinesterase, Alzheimer's disease, antioxidant.

1. INTRODUCTION

The oxidation of cell lipids and DNA damage are caused by free radicals such as superoxide anion, hydroxyl and peroxyl radicals, which are generated in biological systems and foods.

In-silico investigation of phytoconstituents from Plumeria obtusa and Sansevieria cylindrica plants for assessment of anti-venom activity against snake venom.

In-silico investigation of phytoconstituents from *Plumeria obtusa* and *Sansevieria cylindrica* plants for assessment of anti-venom activity against snake venom

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Author's contribution:

- Sunil Shewale: Conceptualization, study design, experimental work, manuscript preparation, data curation
- Vaishali Undale: Conceptualization, Supervision, critical review for intellectual content, editing
- Bhagyashri Warude: Critical review for intellectual content, editing
- Vrushali Bhalchim- Experimental work and data curation
- Mohini Kuchekar: Critical review for intellectual content, editing
- Jay Gagare: Experimental work and data curation

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Abstract

Background:

Health threat posed by snake bite is one of the most overlooked areas of active research resulting in deaths of thousands of people every year in many impoverished nations. Therefore, improvement of available therapeutic options along with development of other treatment choices is important for snakebite management which could help in reducing the mortality, and morbidity. Taking this in view, the *in-silico* study was conducted.

Aim: To investigate the interaction of phytoconstituents from *Plumeria obtusa* and *Sansevieria cylindrica* plants with various proteins for assessment of anti-venom activity against snake venom.

Methods: A protein data bank was searched for various important enzymes found in different snake venoms, and were saved in the PDB file. The plant phytoconstituents were selected from published literatures. Structure of phytoconstituents were drawn using Chem Draw software and

A Review on Cubosome: The Novel Drug Delivery System

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A Review on Cubosome: The Novel Drug Delivery System

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Abstract-

Because of the extraordinary advancements in biomedical nanotechnology over the last few decades, traditional drug delivery systems have been transformed into smart drug delivery systems that respond to stimuli. These well-defined nanoplatforms can boost therapeutic targeting efficiency while reducing the side effects/toxicities of payloads, which are vital variables for enhancing patient compliance by responding to specific internal or external triggers. Cubosomes are lipid-based nano systems that are analogous to familiar vesicular systems, such as lipo- and niosomes. They could be used as part of a exceptional drug delivery system that includes hydro-, lipophilic, and amphiphilic drug molecules. In this review, we critically analyze the relevant literature on cubosomes regarding theories of cubosome self-assembly, composition, and manufacturing methods, with an emphasis on tumor-targeted drug delivery applications. Due to the bioadhesive and compatible nature of cubosome dispersion, this review also focuses on a variety of drug delivery applications, including oral, ophthalmic and transdermal.

Keywords- Cubosome, Monoglycerides, Monoolein, Controlled release

Introduction [1-4]

The Father of word "Cubosome" was Larsson since the structure resembles cubic molecular crystals, its internal structure was confirmed in 1967.Cubosomes having particle size ranging between 10-500 nm in diameter and square-shaped structure. Cubosomes are distinct, sub-micron, nanostructured specks of the bicontinuous cubic liquid crystalline phase. Cubosomes are nanoparticles which are self-assembled liquid crystalline particles of certain surfactants with proper ratio of water with microstructure Cubosomes refer as "bicontinuous" because it is having two distinct large interfacial area (continuous, but non-intersecting) consisting hydrophilic regions separated by the bilayer. Cubosomes are composed of polymers, lipids and surfactants with polar and nonpolar constituents hence said as amphiphilic.

Structure [5-10]

It consists of honeycombed (cavernous) structures splitting two internal aqueous channels and a large interfacial area. They contain indistinguishable microstructure as that of its parent with high surface area and their dispersions are less viscid than the parent cubic phase. Cubosomes were first recognized by using X-Ray scattering technique. These appear like square shaped or spherical dots consistent to the presence of pore with aqueous cubic phases in lipid-water system. Cubosomes are merely the liquid crystalline nanoparticles or nanostructure particles.

Advantage [5, 8, 7, 8]

1 .It is economic, biocompatible and non-toxic.

3. The preparation process is easy.

4. It has outstanding bio adhesive qualities.

5 They are thermodynamically stable for a longer period of time.

6. The ability to encapsulate compounds that are amphiphilic, hydrophobic, and hydrophilic.

7. Controlled and targeted release of bioactive substances.

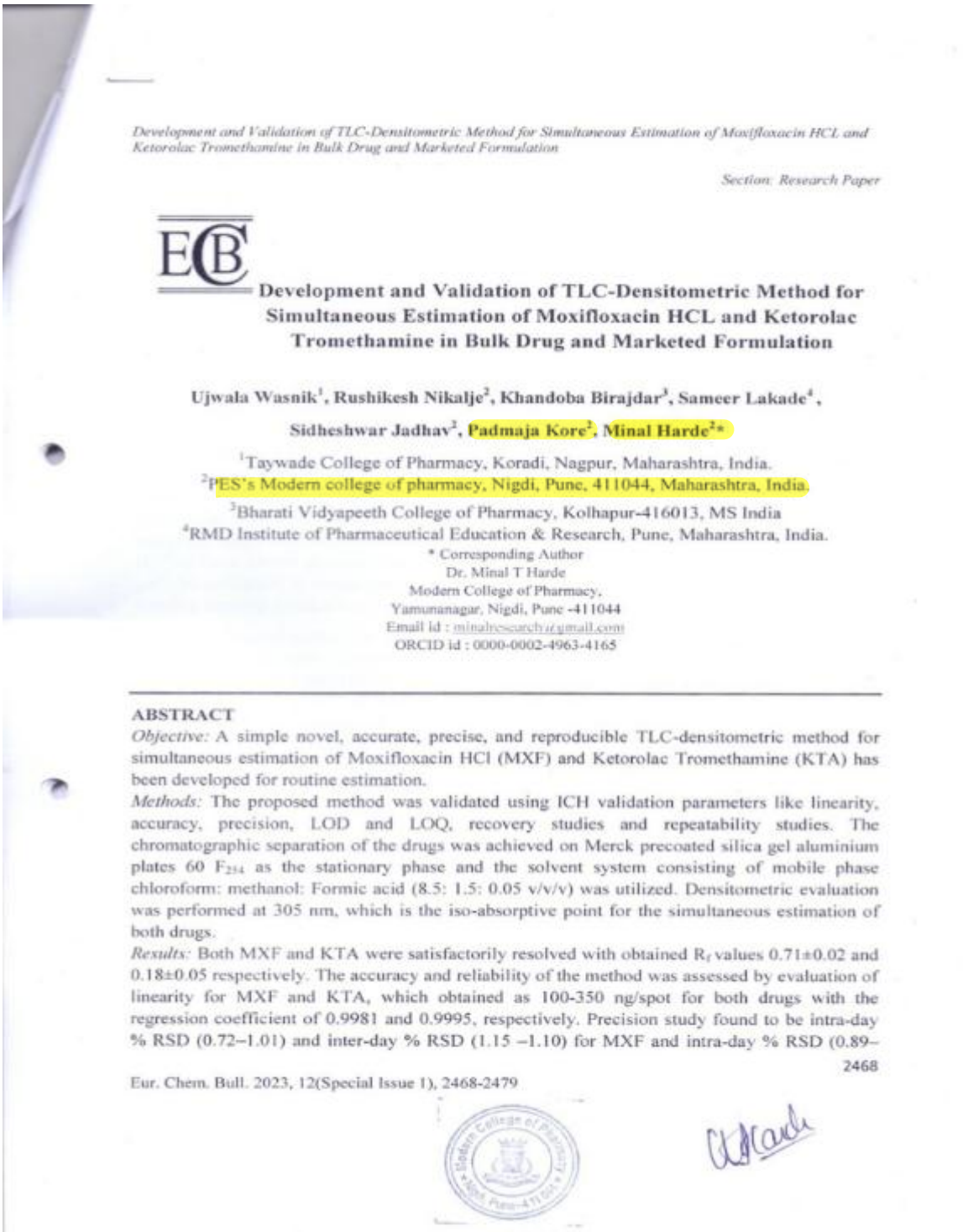
8. High drug loading is caused by increased internal surface area and cubic crystalline formations.

9. These are excellent solubilizes when compared to lipid or non-lipid carriers.

10. The bioavailability range of water- soluble peptides would increase 20-100 times with these cuboidal systems.

11. Cubosomes serve as an excellent vehicle for protecting the sensitive drug from enzymatic degradation.

Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation



Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation

Section: Research Paper

Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation

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ABSTRACT

Objective: A simple novel, accurate, precise, and reproducible TLC-densitometric method for simultaneous estimation of Moxifloxacin HCl (MXF) and Ketorolac Tromethamine (KTA) has been developed for routine estimation.

Methods: The proposed method was validated using ICH validation parameters like linearity, accuracy, precision, LOD and LOQ, recovery studies and repeatability studies. The chromatographic separation of the drugs was achieved on Merck precoated silica gel aluminium plates 60 F_{254} as the stationary phase and the solvent system consisting of mobile phase chloroform: methanol: Formic acid (8.5: 1.5: 0.05 v/v/v) was utilized. Densitometric evaluation was performed at 305 nm, which is the iso-absorptive point for the simultaneous estimation of both drugs.

Results: Both MXF and KTA were satisfactorily resolved with obtained R_f values 0.71±0.02 and 0.18±0.05 respectively. The accuracy and reliability of the method was assessed by evaluation of linearity for MXF and KTA, which obtained as 100-350 ng/spot for both drugs with the regression coefficient of 0.9981 and 0.9995, respectively. Precision study found to be intra-day % RSD (0.72–1.01) and inter-day % RSD (1.15 –1.10) for MXF and intra-day % RSD (0.89–

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HLA-E (Human Leukocyte Antigen-E): Promising Biological agent for Cancer Mitigation

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An International Scholarly Open Access, Peer-reviewed, Refereed Journal

HLA-E (Human Leukocyte Antigen-E): Promising Biological agent for Cancer Mitigation

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ABSTRACT -

Traditional surgical or chemoradiotherapeutic methods typically cannot eradicate metastatic cancer cells, and disease recurrence is very common after treatment. On the other hand, stem cell-based therapies are becoming more and more promising for the treatment of cancer. By homing in on and concentrating on both primary and metastatic tumour foci, stem cells can serve as innovative delivery systems. In preclinical animal models, stem cells modified to stably express different cytotoxic drugs reduce tumour sizes and lengthen longevity. They have also been used as virus and nanoparticle carriers to lessen the negative effects of treatment and improve the effectiveness of initial therapies. Additionally, stem cells can be used in immunotherapy, cancer stem cell-targeted therapy, and applications for anticancer drug screening. However, although treating human malignancies with stem cells.

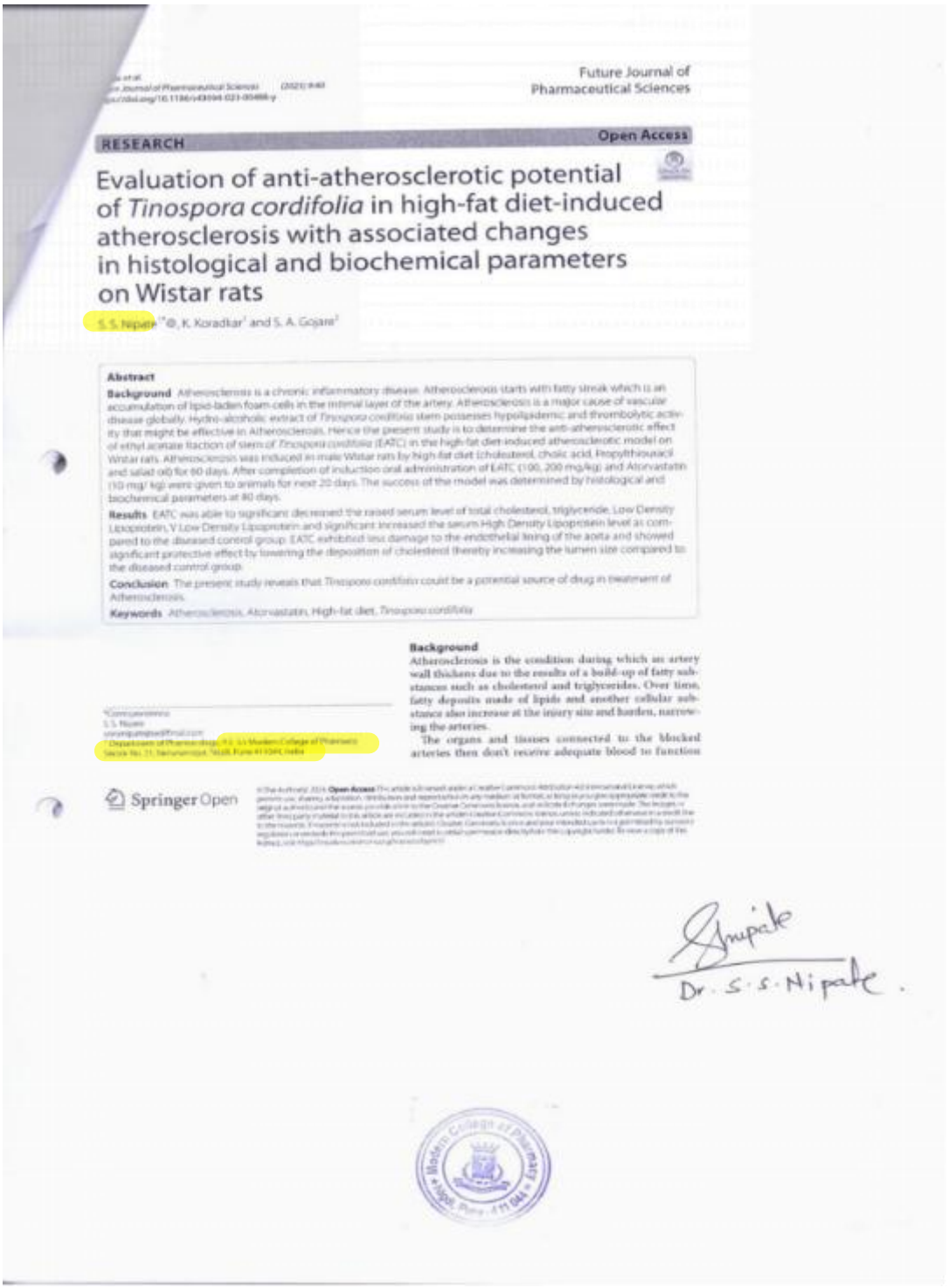
Keywords

Cancer, stem cell, connexins, chemotherapy

INTRODUCTION

Due to population increase and ageing, cancer is a primary cause of death in both industrialised and developing nations, and it is a growing global medical burden. Chemotherapy, fractionated radiation, and surgical resection are the main cancer treatments. However, the effectiveness of many therapeutic choices is constrained by treatment-related adverse effects, off-target effects, and drug resistance. Additionally, conventional medicines typically are unable to eradicate cancer cells that have spread to other parts of the body, making recurrence highly likely. As a result, scientists are attempting to create novel, efficient medicines with minimal to no damage in normal cells. Stem cells are the building blocks from which all other cells with specific roles are derived in the body. The appropriate circumstances in the body or a lab allow stem cells to proliferate to create more cells termed.

Evaluation of anti-atherosclerotic potential of Tinospora cordifolia in high-fat diet-induced atherosclerosis with associated changes in histological and biochemical parameters on Wistar rats



Future Journal of Pharmaceutical Sciences

RESEARCH Open Access

Evaluation of anti-atherosclerotic potential of *Tinospora cordifolia* in high-fat diet-induced atherosclerosis with associated changes in histological and biochemical parameters on Wistar rats

S. S. Nipate*, K. Koradkar and S. A. Gojare

Abstract

Background Atherosclerosis is a chronic inflammatory disease. Atherosclerosis starts with fatty streak which is an accumulation of lipid-laden foam cells in the intimal layer of the artery. Atherosclerosis is a major cause of vascular disease globally. Hydro-alcoholic extract of *Tinospora cordifolia* stem possesses hypolipidemic and thrombolytic activity that might be effective in Atherosclerosis. Hence the present study is to determine the anti-atherosclerotic effect of ethyl acetate fraction of stem of *Tinospora cordifolia* (EATC) in the high-fat diet-induced atherosclerotic model on Wistar rats. Atherosclerosis was induced in male Wistar rats by high-fat diet (Cholesterol, cholic acid, Propylthiouracil and salad oil) for 60 days. After completion of induction oral administration of EATC (100, 200 mg/kg) and Atorvastatin (10 mg/ kg) were given to animals for next 20 days. The success of the model was determined by histological and biochemical parameters at 80 days.

Results EATC was able to significant decreased the raised serum level of total cholesterol, triglyceride, Low Density Lipoprotein, V Low Density Lipoprotein and significant increased the serum High Density Lipoprotein level as compared to the diseased control group. EATC exhibited less damage to the endothelial lining of the aorta and showed significant protective effect by lowering the deposition of cholesterol thereby increasing the lumen size compared to the diseased control group.

Conclusion The present study reveals that *Tinospora cordifolia* could be a potential source of drug in treatment of Atherosclerosis.

Keywords Atherosclerosis, Atorvastatin, High-fat diet, *Tinospora cordifolia*

Background

Atherosclerosis is the condition during which an artery wall thickens due to the results of a build-up of fatty substances such as cholesterol and triglycerides. Over time, fatty deposits made of lipids and another cellular substance also increase at the injury site and harden, narrowing the arteries.

The organs and tissues connected to the blocked arteries then don't receive adequate blood to function

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Dr. S. S. Nipate.

Identification and quantification of two low levels of potential genotoxic impurities in rilpivirine hydrochloride drug substance byHPLC technique

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IDENTIFICATION AND QUANTIFICATION OF TWO LOW LEVELS OF POTENTIAL GENOTOXIC IMPURITIES IN RILPIVIRINE HYDROCHLORIDE DRUG SUBSTANCE BY HPLC TECHNIQUE*

BY

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ABSTRACT

Objective: A rapid, accurate, selective, and sensitive RP-HPLC method has been developed and validated for estimation of 2ABN, 3ABN and 4ABN from standard Rilpivirine HCl.

Method: The chromatographic separation was achieved on the method utilizes L1-octadecyl chemistry (250-millimeter (mm) x 4.6 mm ID, 5.0 micrometer (µm), HPLC column. impurities were detected by ultra violet detector at 255nm. The compound was separated using mobile phase was 0.1% orthophosphoric acid in water : acetonitrile in gradient system with the flow rate at 1.2 ml/min.

Results: The retention time of was obtained at2ABN, 3ABN and 4ABN min, respectively. The linearity study was performed in the concentration range of 50 to 200 µg/ml for the drug Rilpivirine HCl, Impurity A (2ABN), Impurity B (3ABN) and Impurity C (4ABN) with correlation coefficient was found to be 0.999 for both drug and impurities. The percentage purity of Rilpivirine HCl and impurities 2-ABN, 3-ABN, 4ABN was obtained in the range 98-103%. The limit of detection was 0.6482 µg/ml, 0.4127 µg/ml, 0.8653 µg/ml and 0.4546µg/ml for Rilpivirine HCl and Impurity A, Impurity B, Impurity C. limit of Quantification was 1.8492 µg/ml, 1.2678, 1.6757 and 1.3247µg/ml for Rilpivirine HCl and Impurity A, Impurity B, Impurity C.

Conclusion: The method was validated according to the ICH guidelines with respect to linearity, precision, accuracy, limit of detection, limit of quantification and robustness. Thus, proposed method is reliable and cost effective.

KEYWORDS: Rilpivirine HCl, HPLC, ICH guidelines, Method development, Quantification, Validation.

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Stability of co-amorphous solid dispersions: physical and chemical aspects

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STABILITY OF CO-AMORPHOUS SOLID DISPERSIONS: PHYSICAL AND CHEMICAL ASPECTS

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Drug amorphization is one of the major approaches in pharmaceutical sciences to improve the solubility and dissolution rate of poorly water-soluble drugs. Amorphous solid dispersions are widely discussed approach to convert the drug into an amorphous state but due to its high energy state, the system tends to recrystallize upon storage. Co-amorphous system is a single-phase low energy system that falls under the glass solution, a type of solid dispersion. Being low-energy state and single-phase, co-amorphous dispersions are more stable than amorphous solid dispersions. In co-amorphous dispersions, the homogeneous single phase is formed only with low molecular weight co-formers, so the amount of co-former required is relatively low and this reduces the bulk of the system. This aspect of co-amorphous dispersions makes it popular over the amorphous solid dispersions in the area of solid dispersion researchers. This review provides an overview of co-amorphous dispersions and their recent advances. Particularly, this review will discuss various factors (physical and chemical) that affect and provide the stability of the co-amorphous dispersions formulation.

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Keywords: Poorly water-soluble drugs, Co-amorphous dispersions, amorphous solid dispersions, co-formers, stability.

INTRODUCTION

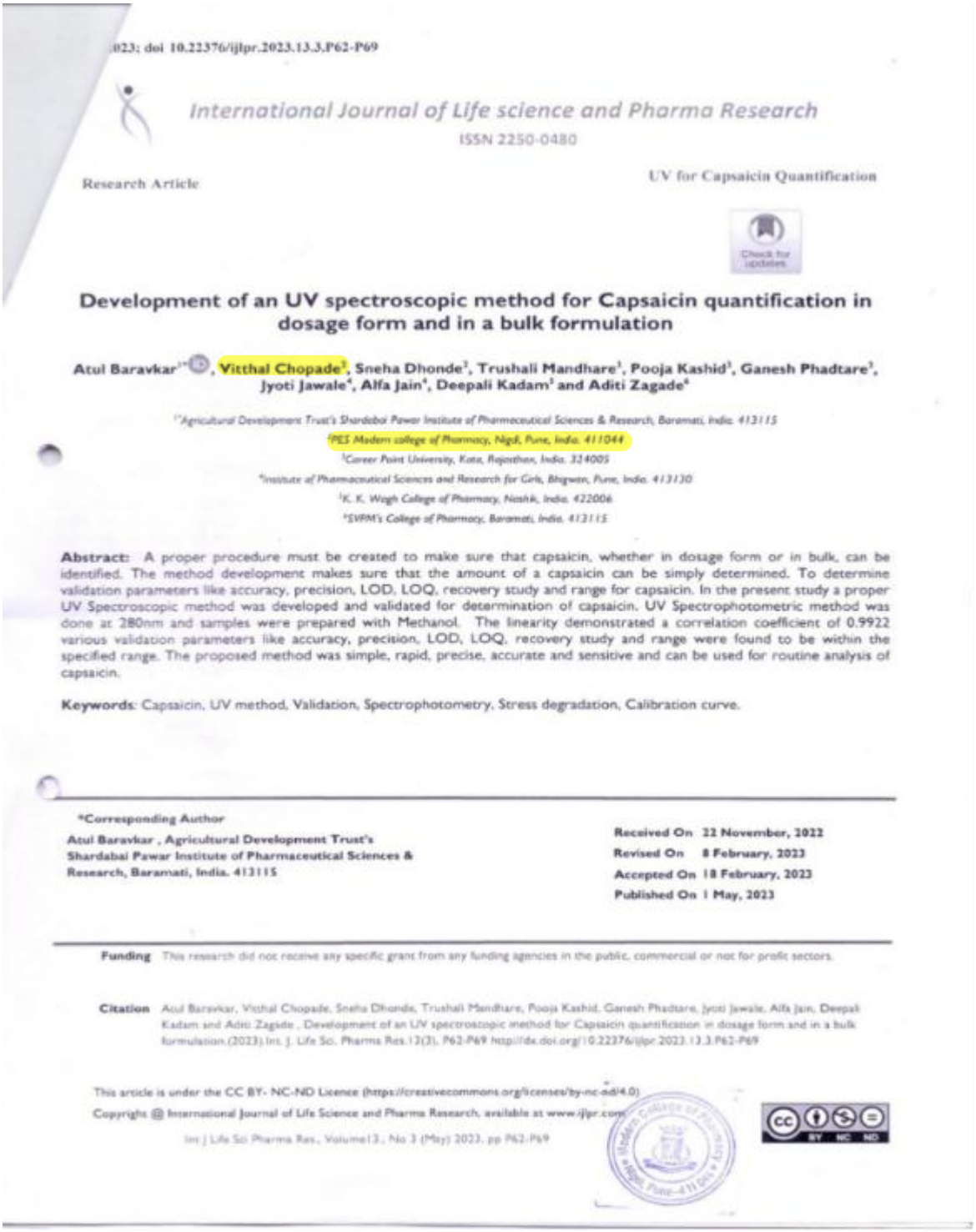
Recently, drug in the amorphous state than crystalline has been extensively studied by researchers and has found promising applicability in the drug delivery field as it results in high bioavailability of drugs. Normally, drugs are in a crystalline state in solid dosage forms which ensures the best stability of the formulations. On the contrary, the most stable crystalline form depicts the poorest solubility behavior [1]. Whereas thermodynamics of solubility reveals that the amorphous form of solids exhibits higher apparent solubility and dissolution rate than that of the crystalline form [2]. Unfortunately, the same solubility thermodynamics also shows that amorphous substances are less stable than crystalline solids. Moreover, the reversion of amorphous to the crystalline state during processing, storage, and administration poses a major challenge for researchers [3, 4].

For several decades, amorphous solid dispersion (ASD) has been the approach of choice for stabilizing the amorphous form of a drug [5-7]. In ASD, the molecules are kinetically entrapped between the polymer chains in a high-

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Development of an UV spectroscopic method for Capsaicin quantification in dosage form and in a bulk formulation



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Research Article

UV for Capsaicin Quantification

Development of an UV spectroscopic method for Capsaicin quantification in dosage form and in a bulk formulation

Atul Baravkar[1*], Vitthal Chopade[2], Sneha Dhonde[3], Trushali Mandhare[3], Pooja Kashid[3], Ganesh Phadtare[3], Jyoti Jawale[4], Alfa Jain[4], Deepali Kadam[5] and Aditi Zagade[6]

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Abstract: A proper procedure must be created to make sure that capsaicin, whether in dosage form or in bulk, can be identified. The method development makes sure that the amount of a capsaicin can be simply determined. To determine validation parameters like accuracy, precision, LOD, LOQ, recovery study and range for capsaicin. In the present study a proper UV Spectroscopic method was developed and validated for determination of capsaicin. UV Spectrophotometric method was done at 280nm and samples were prepared with Methanol. The linearity demonstrated a correlation coefficient of 0.9922 various validation parameters like accuracy, precision, LOD, LOQ, recovery study and range were found to be within the specified range. The proposed method was simple, rapid, precise, accurate and sensitive and can be used for routine analysis of capsaicin.

Keywords: Capsaicin, UV method, Validation, Spectrophotometry, Stress degradation, Calibration curve.

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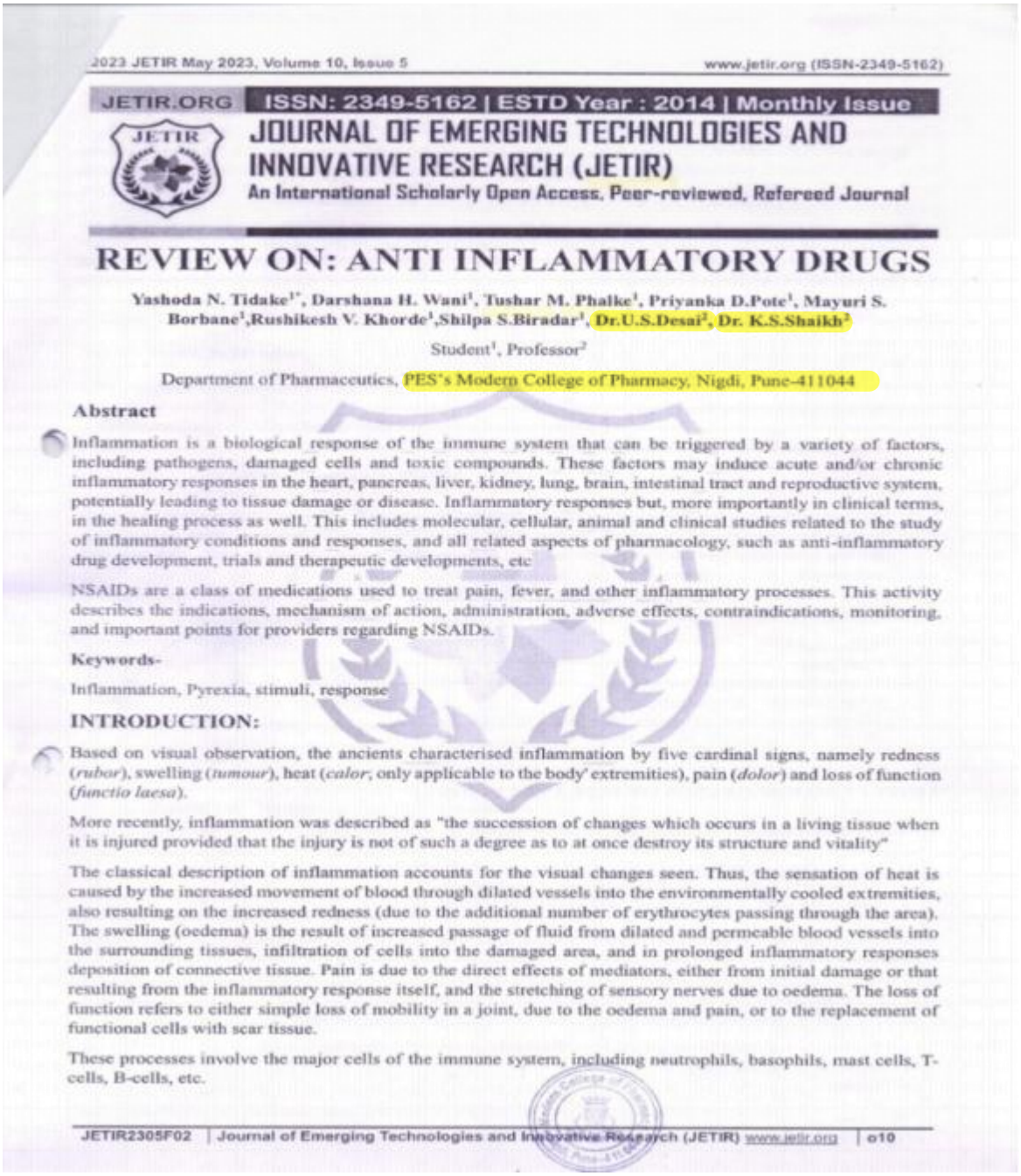
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Review On: Anti-Inflammatory Drugs



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An International Scholarly Open Access, Peer-reviewed, Refereed Journal

REVIEW ON: ANTI INFLAMMATORY DRUGS

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Abstract

Inflammation is a biological response of the immune system that can be triggered by a variety of factors, including pathogens, damaged cells and toxic compounds. These factors may induce acute and/or chronic inflammatory responses in the heart, pancreas, liver, kidney, lung, brain, intestinal tract and reproductive system, potentially leading to tissue damage or disease. Inflammatory responses but, more importantly in clinical terms, in the healing process as well. This includes molecular, cellular, animal and clinical studies related to the study of inflammatory conditions and responses, and all related aspects of pharmacology, such as anti-inflammatory drug development, trials and therapeutic developments, etc

NSAIDs are a class of medications used to treat pain, fever, and other inflammatory processes. This activity describes the indications, mechanism of action, administration, adverse effects, contraindications, monitoring, and important points for providers regarding NSAIDs.

Keywords-

Inflammation, Pyrexia, stimuli, response

INTRODUCTION:

Based on visual observation, the ancients characterised inflammation by five cardinal signs, namely redness (*rubor*), swelling (*tumour*), heat (*calor*; only applicable to the body' extremities), pain (*dolor*) and loss of function (*functio laesa*).

More recently, inflammation was described as "the succession of changes which occurs in a living tissue when it is injured provided that the injury is not of such a degree as to at once destroy its structure and vitality"

The classical description of inflammation accounts for the visual changes seen. Thus, the sensation of heat is caused by the increased movement of blood through dilated vessels into the environmentally cooled extremities, also resulting on the increased redness (due to the additional number of erythrocytes passing through the area). The swelling (oedema) is the result of increased passage of fluid from dilated and permeable blood vessels into the surrounding tissues, infiltration of cells into the damaged area, and in prolonged inflammatory responses deposition of connective tissue. Pain is due to the direct effects of mediators, either from initial damage or that resulting from the inflammatory response itself, and the stretching of sensory nerves due to oedema. The loss of function refers to either simple loss of mobility in a joint, due to the oedema and pain, or to the replacement of functional cells with scar tissue.

These processes involve the major cells of the immune system, including neutrophils, basophils, mast cells, T-cells, B-cells, etc.

Method Development and Validation of Stability-Indicating HPTLC Method for Determination of Brivaracetam

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METHOD DEVELOPMENT AND VALIDATION OF STABILITY-INDICATING HPTLC METHOD FOR DETERMINATION OF BRIVARACETAM

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ABSTRACT:

The objective of this experimental work is the development and validation of stability-indicating the HPTLC method for the determination of Brivaracetam. A simple, fast, specific, rugged, and reproducible analytical method was developed and validated on a Camag HPTLC machine programmed with Camag Linomat 5 sample applicator Camag TLC 3 detector. The stationary phase used was precoated aluminium plates of silica gel $60F_{254}$ plates (10 cm ×10cm) with 250µm thickness, mobile phase used in the ratio of Toluene: Acetone: Methanol (6:2:2), saturated for15 min at room temperature (25°C±2) followed by densitometric scanning at 222nm. The developed protocol was most accurate, reproducible, and detectable towards Brivaracetam without any unwanted interference. When evaluated on various parameters like system suitability, precision, accuracy, linearity, specificity, robustness, LOD, and LOQ, force degradation study, the method is found to be efficient.

Keywords: Method Validation, HPTLC method, Brivaracetam, System suitability.

1. INTRODUCTION

HPTLC is superior to other analytical techniques in terms of total cost and time for analysis. It is an offline process in which various stages are carried out independently [1]. Important features of HPTLC include the ability to analyse crude

Isolation and Characterisation of Nateglinide and its impurity in Bulk and Marketed Formulation by HPTLC Method

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RESEARCH ARTICLE

Isolation and Characterisation of Nateglinide and its impurity in Bulk and Marketed Formulation by HPTLC Method

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ABSTRACT:
The samples were applied on to the plate in the form of band with band length of 5mm. The mobile phase consisted of Chloroform: Methanol in the ratio of 8:2 v/v and 10ml of the mobile phase was used in each chromatographic run. Ascending development technique was carried out in a twin trough chamber saturated with mobile phase vapours for 15 min. The multiple wavelength detector was set at 216 nm, and quantification of the analyte was based on measuring its peak area. Rf for NTG was about 0.59. Calibration curve of NTG was linear in the range 100–600µg/band with correlation coefficient >0.9994. The drug was subjected to forced-degradation conditions of reaction, oxidization and dry heat. Unknown impurity was found in Nateglinide industrial batch stability condition at levels more than 0.1% in HPTLC analysis was characterized preliminarily by ESI-MS/MS studies. The major unknown (unknown-1 and 2) were enriched and isolated by preparative LC and structure was evidenced by 1H NMR spectroscopy, mass spectrometry and FT-IR. This technique will be used for the standard management of each drug substance and drug product. Finally, the projected method made use of hyphenated techniques as a tool for peak identity and purity confirmation.

KEYWORDS: HPTLC, Nateglinide (NTG), Impurity, NMR; ESI-MS/MS, FT-IR.

INTRODUCTION:

Nateglinideis an amino-acid derivative which reduces the blood glucose levels and stimulates insulin secretion. Chemically, it is formulated as (-N-[(trans-4-isopropylcyclohexyl) carbonyl-D-phenylalanine) salt and is used in the treatment of type two diabetes mellitus (USP, 2010). Chronic hyperglycemia is an established risk factor for the micro- and macrovascular complications associated with T2DM and especially for cardiovascular disease-the major cause of morbidity and mortality in subjects with diabetes[1]. It is a well-known fact that drugs undergo physicochemical degradation upon storage. Thus, stability testing of a drug below numerous temperature and humidness conditions is important throughout the drug development method.In addition, stability testing guidelines issued by International Conference on Harmonization (ICH) and other international agencies ICH2003; WHO 2007; CPMP 2002; TPD 2003 require the reporting, identification and characterization of degradation products (DPs). But, as DPs generated during storage may be in very low levels (~0.1–0.5%, w/w), stress studies are suggested to generate them in higher amounts[2]. Still sometimes it is very difficult to isolate these species from the stressed mixture due to their low amounts and subject them to spectral analyses for structural information. Therefore, hyphenated techniques like LC–MS and LC–NMR are currently extensively used for this purpose. Diabetes mellitus is difficult to control with a single oral hypoglycaemic agent and the rate of mono therapy failure is high. Hence combination medical aid with complementary categories of medication that act on completely different aspects of glycemic management would be expected to be an efficient strategy for the

Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral Sclerosis -An updated review

Journal Pre-proofs



Review

Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral Sclerosis -An updated review

Taha Alqahtani, Sharada L. Deore, Anjali A. Kide, Bhavana A. Shende, Ritika Sharma, Rita Dadarao Chakole, Lalita S. Nemade, Nikita Kishor Kale, Sudarshana Borah, Savita Shrikant Deokar, Ashok Behera, Divya Dhawal Bhandari, Nikita Gaikwad, Abul Kalam Azad, Arabinda Ghosh

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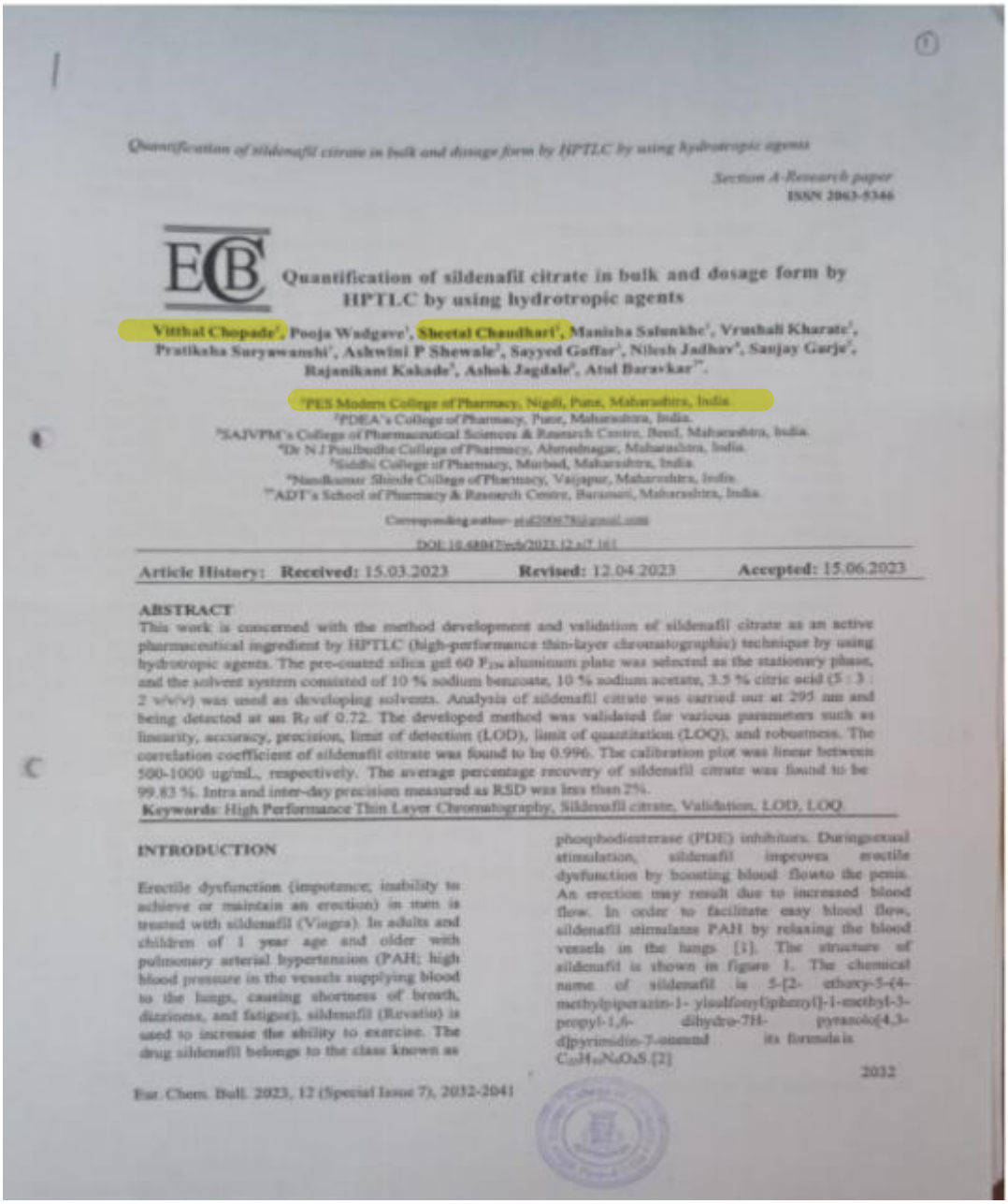
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Quantification of Slidenafil citrate in bulk and dosage form by HPTLC by using hydrotopic agents



Section A-Research paper
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Quantification of sildenafil citrate in bulk and dosage form by HPTLC by using hydrotropic agents

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ABSTRACT

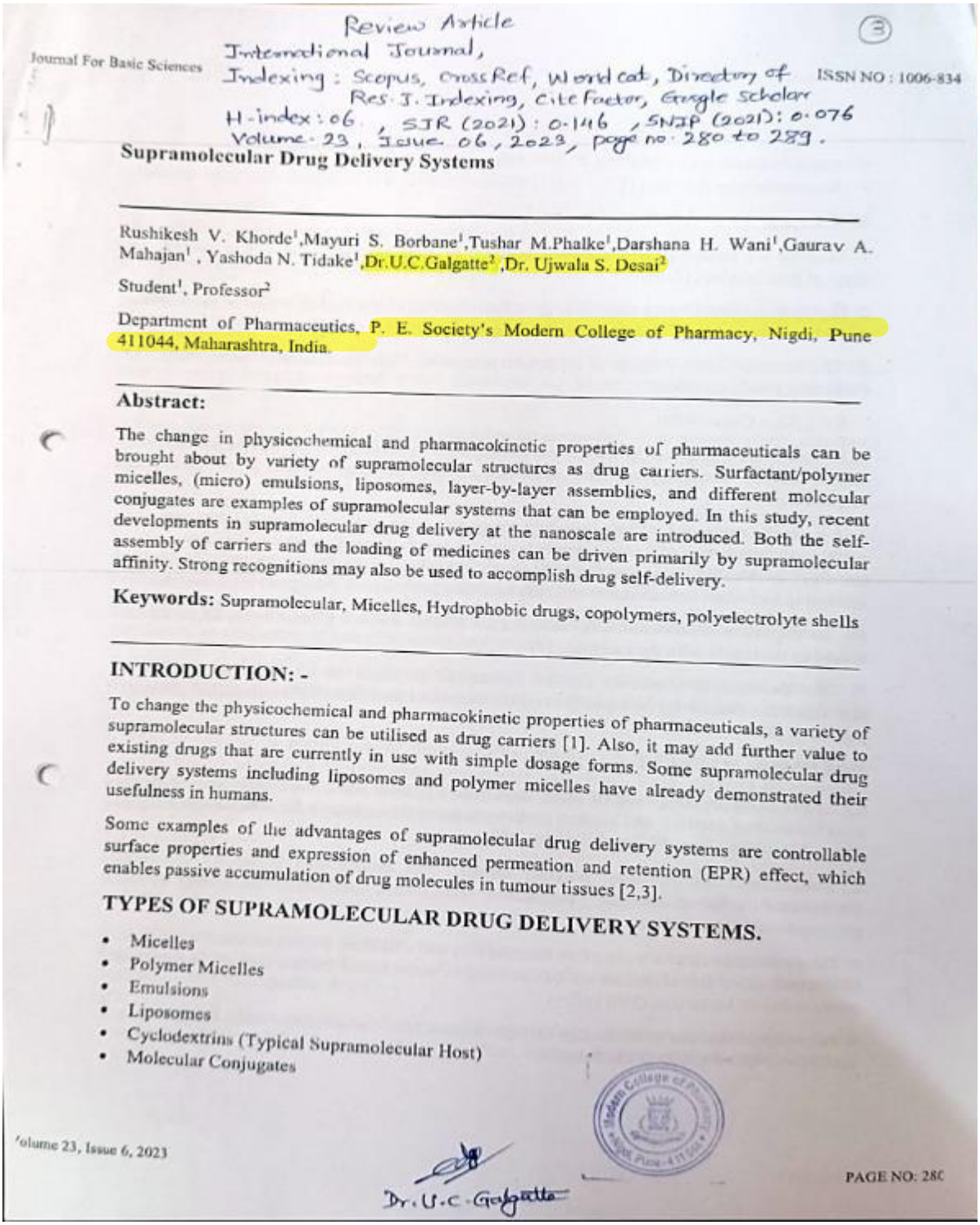
This work is concerned with the method development and validation of sildenafil citrate as an active pharmaceutical ingredient by HPTLC (high-performance thin-layer chromatographic) technique by using hydrotropic agents. The pre-coated silica gel 60 F_{254} aluminium plate was selected as the stationary phase, and the solvent system consisted of 10 % sodium benzoate, 10 % sodium acetate, 3.5 % citric acid (5 : 3 : 2 v/v/v) was used as developing solvents. Analysis of sildenafil citrate was carried out at 295 nm and being detected at an R_f of 0.72. The developed method was validated for various parameters such as linearity, accuracy, precision, limit of detection (LOD), limit of quantitation (LOQ), and robustness. The correlation coefficient of sildenafil citrate was found to be 0.996. The calibration plot was linear between 500-1000 ug/mL, respectively. The average percentage recovery of sildenafil citrate was found to be 99.83 %. Intra and inter-day precision measured as RSD was less than 2%.

Keywords: High Performance Thin Layer Chromatography, Sildenafil citrate, Validation, LOD, LOQ.

INTRODUCTION

Erectile dysfunction (impotence, inability to achieve or maintain an erection) in men is treated with sildenafil (Viagra). In adults and children of 1 year age and older with pulmonary arterial hypertension (PAH; high blood pressure in the vessels supplying blood to the lungs, causing shortness of breath, dizziness, and fatigue), sildenafil (Revatio) is used to increase the ability to exercise. The drug sildenafil belongs to the class known as phosphodiesterase (PDE) inhibitors. During sexual stimulation, sildenafil improves erectile dysfunction by boosting blood flow to the penis. An erection may result due to increased blood flow. In order to facilitate easy blood flow, sildenafil stimulates PAH by relaxing the blood vessels in the lungs [1]. The structure of sildenafil is shown in figure 1. The chemical name of sildenafil is 5-[2- ethoxy-5-(4-methylpiperazin-1- ylsulfonyl)phenyl]-1-methyl-3-propyl-1,6- dihydro-7H- pyrazolo[4,3-d]pyrimidin-7-onesmd its formula is $C_{22}H_{30}N_6O_4S$ [2]

Supramolecular Drug Delivery



Review Article

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Supramolecular Drug Delivery Systems

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Abstract:

The change in physicochemical and pharmacokinetic properties of pharmaceuticals can be brought about by variety of supramolecular structures as drug carriers. Surfactant/polymer micelles, (micro) emulsions, liposomes, layer-by-layer assemblies, and different molecular conjugates are examples of supramolecular systems that can be employed. In this study, recent developments in supramolecular drug delivery at the nanoscale are introduced. Both the self-assembly of carriers and the loading of medicines can be driven primarily by supramolecular affinity. Strong recognitions may also be used to accomplish drug self-delivery.

Keywords: Supramolecular, Micelles, Hydrophobic drugs, copolymers, polyelectrolyte shells

INTRODUCTION: -

To change the physicochemical and pharmacokinetic properties of pharmaceuticals, a variety of supramolecular structures can be utilised as drug carriers [1]. Also, it may add further value to existing drugs that are currently in use with simple dosage forms. Some supramolecular drug delivery systems including liposomes and polymer micelles have already demonstrated their usefulness in humans.

Some examples of the advantages of supramolecular drug delivery systems are controllable surface properties and expression of enhanced permeation and retention (EPR) effect, which enables passive accumulation of drug molecules in tumour tissues [2,3].

TYPES OF SUPRAMOLECULAR DRUG DELIVERY SYSTEMS.

- Micelles
- Polymer Micelles
- Emulsions
- Liposomes
- Cyclodextrins (Typical Supramolecular Host)
- Molecular Conjugates

Dr. U.C. Galgatte

Role Of Neuropeptides In Human Behaviour

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ROLE OF NEUROPEPTIDES IN HUMAN BEHAVIOUR

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Keywords:

Neuropeptide, Orexin, Dynorphin, Enkephalin, Galanin, Oxytocin

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ABSTRACT: Neuropeptides are chemical messengers that are comprised with small chain of amino acid. Neuropeptides are synthesized and released by neurons. Neuropeptides belongs to class of neurotransmitters. Human Behaviour is dependent on social interaction and it is simply modulated by a human's internal state. In humans, we observe different social contexts that can alter anxiety levels and modulate social behaviour. As like dopamine, serotonin, adrenaline these neuropeptides also modulate behaviours such as addiction, intelligence, habits, social behaviour, reproductive system, moods, pain, states of brain like excitement, sadness, happiness, anxiety, hallucination, depression etc. This review is also outlines about the neuropeptide CRF and NPY for their action on addiction, NPY for effect on memory function. Oxytocin is a birth hormone but it also controls major behavioural activities in male and female but mainly in female it increases social behaviour it gives powers to women hence that she can analyse social clues, identity faces, increase memory. In this review we discuss neuropeptides like Orexin, Dynorphin, Enkephalin, Galanin, CGRP, Oxytocin, CRF (corticotropin releasing factor), NPY (Neuropeptide Y), Phoenixin, Kisspeptin and their effects on behaviour on human with some experimental animal proof.

INTRODUCTION: Neuropeptides are involved in homeostatic regulation. They are secreted only from hypothalamic neurons. Neuropeptides are also recognised as neurotransmitters and neuropeptides are secreted from brain areas that are associated with a myriad of motivated, psychopathological behaviours. Neuropeptides were discovered in the mid-1960s by David de Wied. he first reported influence of stress hormones that are involved in homeostatic regulation.

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This review is based mainly on the regulatory role of neuropeptides in sleep, feeding, maternal and social behaviour, as well as the reproductive system, addiction, aggression, depression, anxiety, drug addiction, eating, and social disorders. CRH is the principal mediator of the stress response of the hypothalamic–pituitary–adrenal axis, as well as its function in neuroplasticity and adaptations in chronic stress exposure.

Various neuromodulators and neuropeptides are employed in stress. Astressin, a CRF receptor 1 antagonist that restore sleep to normal levels after CRF blocked controllable stress. Homeostatic processes, social recognition and fear conditioning these all things are regulated by OT neurons, which project to other brain areas. OT reduces anxiety and depression-like behaviours by inhibiting the

Chemical fingerprinting of Curcumin and Berberin in selected Ayurvedic formulation and herbs recommended for skin infection

IJBPAS, June, 2023, 12(6): 2536-2545

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CHEMICAL FINGERPRINTING OF CURCUMIN AND BERBERIN IN SELECTED AYURVEDIC FORMULATION AND HERBS RECOMMENDED FOR SKIN INFECTION

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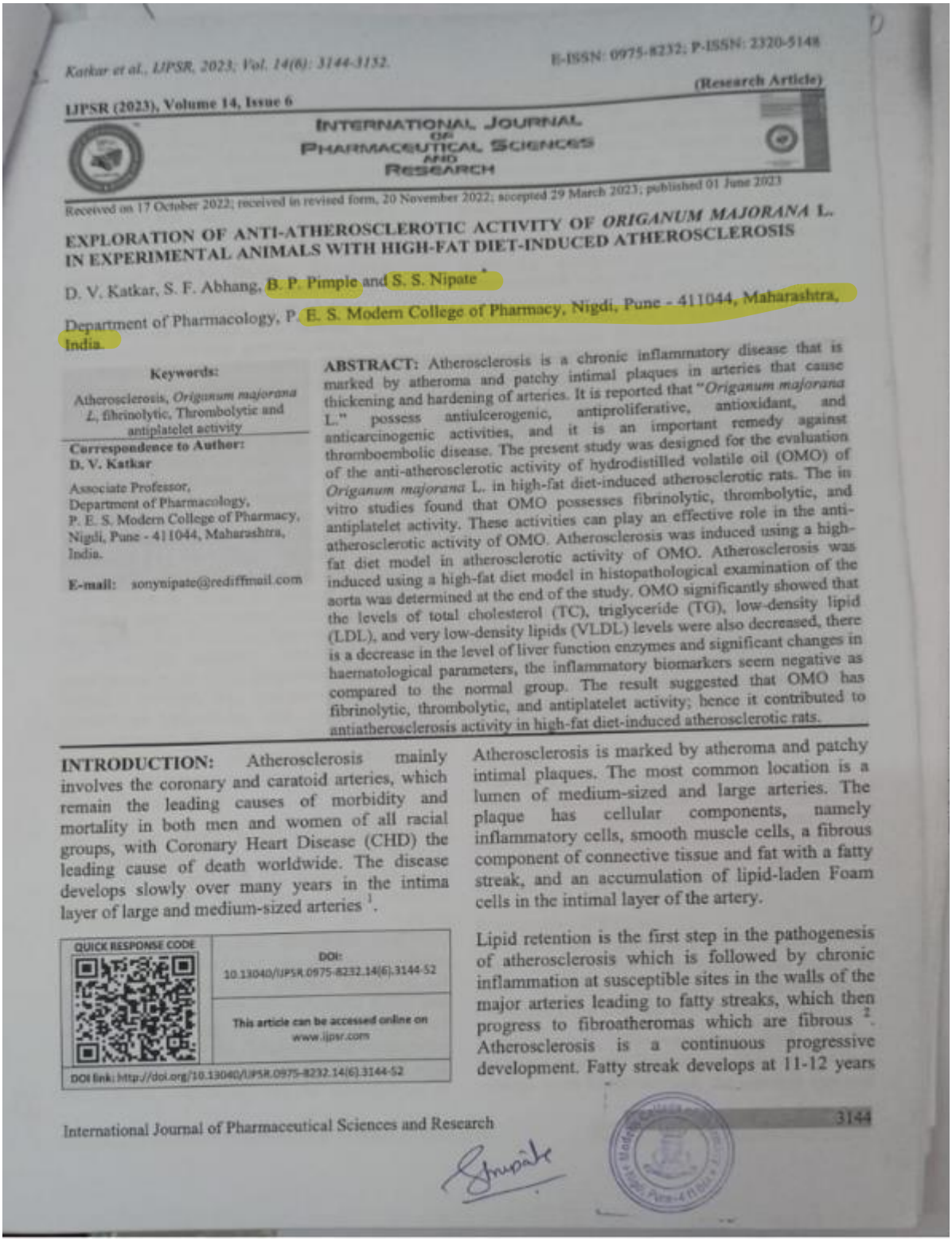
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ABSTRACT

Natural products have great potential to treat diverse kinds of skin diseases. In India more than 75% peoples are depends on the traditional health care system and now a days different natural product-based products are used to treat skin diseases. The objective of this study is to detect the active compounds of particular Ayurvedic medicines suggested for skin treatment. The selected polyherbal liquid preparation traditionally recommended for management of various kinds of skin related infections, like acne, fungal infection, vitiligo, psoriasis, chronic itching.

Exploration of anti-atherosclerotic activity of origanummajorana l. In experimental animals with high-fat diet-induced atherosclerosis



Katkar et al., IJPSR, 2023; Vol. 14(6): 3144-3152. E-ISSN: 0975-8232; P-ISSN: 2320-5148

(Research Article)

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EXPLORATION OF ANTI-ATHEROSCLEROTIC ACTIVITY OF *ORIGANUM MAJORANA* L. IN EXPERIMENTAL ANIMALS WITH HIGH-FAT DIET-INDUCED ATHEROSCLEROSIS

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Keywords:

Atherosclerosis, *Origanum majorana L.*, fibrinolytic, Thrombolytic and antiplatelet activity

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ABSTRACT: Atherosclerosis is a chronic inflammatory disease that is marked by atheroma and patchy intimal plaques in arteries that cause thickening and hardening of arteries. It is reported that "*Origanum majorana* L." possess antiulcerogenic, antiproliferative, antioxidant, and anticarcinogenic activities, and it is an important remedy against thromboembolic disease. The present study was designed for the evaluation of the anti-atherosclerotic activity of hydrodistilled volatile oil (OMO) of *Origanum majorana* L. in high-fat diet-induced atherosclerotic rats. The in vitro studies found that OMO possesses fibrinolytic, thrombolytic, and antiplatelet activity. These activities can play an effective role in the anti-atherosclerotic activity of OMO. Atherosclerosis was induced using a high-fat diet model in atherosclerotic activity of OMO. Atherosclerosis was induced using a high-fat diet model in histopathological examination of the aorta was determined at the end of the study. OMO significantly showed that the levels of total cholesterol (TC), triglyceride (TG), low-density lipid (LDL), and very low-density lipids (VLDL) levels were also decreased, there is a decrease in the level of liver function enzymes and significant changes in haematological parameters, the inflammatory biomarkers seem negative as compared to the normal group. The result suggested that OMO has fibrinolytic, thrombolytic, and antiplatelet activity; hence it contributed to antiatherosclerosis activity in high-fat diet-induced atherosclerotic rats.

INTRODUCTION: Atherosclerosis mainly involves the coronary and caratoid arteries, which remain the leading causes of morbidity and mortality in both men and women of all racial groups, with Coronary Heart Disease (CHD) the leading cause of death worldwide. The disease develops slowly over many years in the intima layer of large and medium-sized arteries [1].

Atherosclerosis is marked by atheroma and patchy intimal plaques. The most common location is a lumen of medium-sized and large arteries. The plaque has cellular components, namely inflammatory cells, smooth muscle cells, a fibrous component of connective tissue and fat with a fatty streak, and an accumulation of lipid-laden Foam cells in the intimal layer of the artery.

Lipid retention is the first step in the pathogenesis of atherosclerosis which is followed by chronic inflammation at susceptible sites in the walls of the major arteries leading to fatty streaks, which then progress to fibroatheromas which are fibrous [2]. Atherosclerosis is a continuous progressive development. Fatty streak develops at 11-12 years

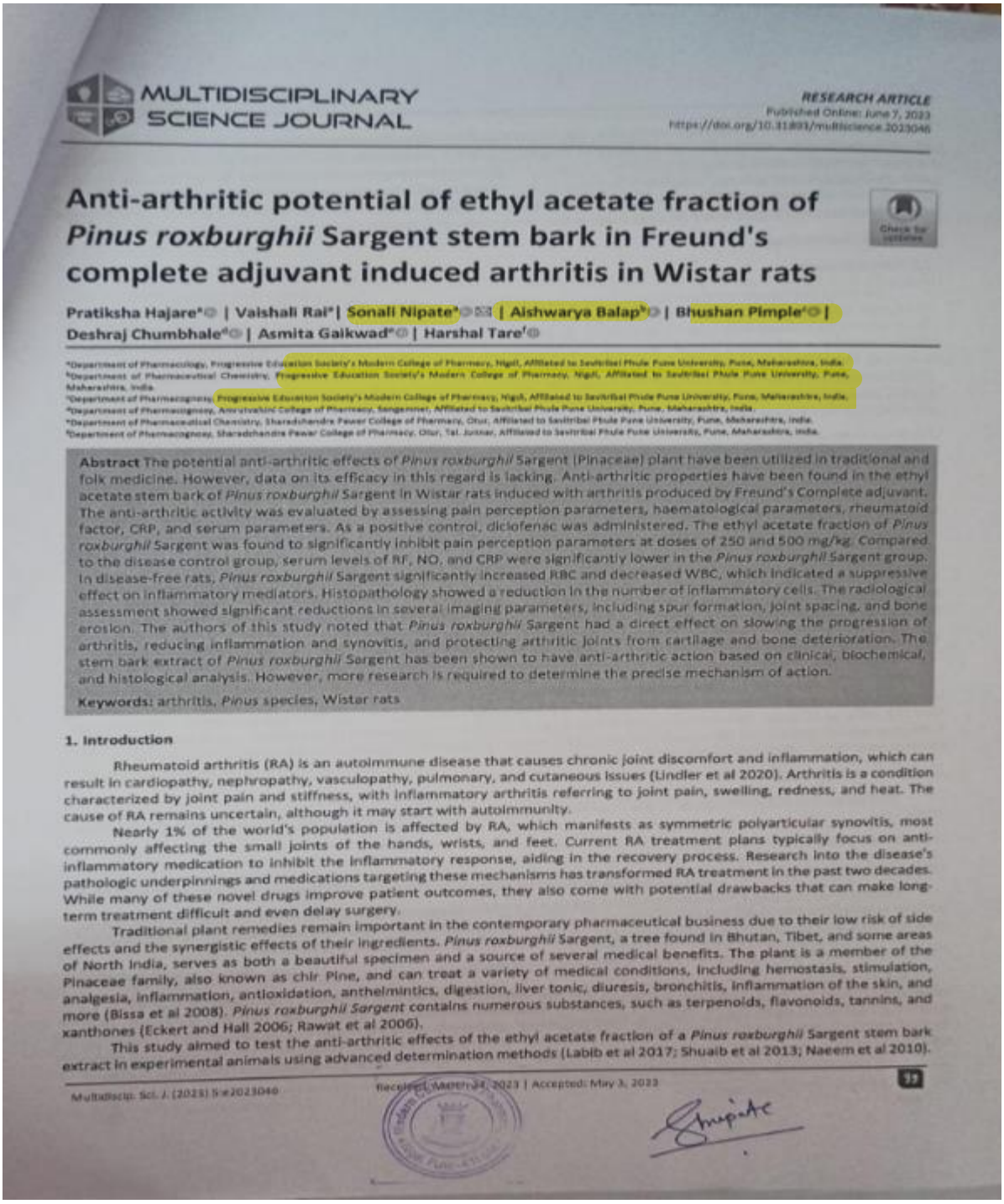
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Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats



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Anti-arthritic potential of ethyl acetate fraction of *Pinus roxburghii* Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats

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Abstract The potential anti-arthritic effects of *Pinus roxburghii* Sargent (Pinaceae) plant have been utilized in traditional and folk medicine. However, data on its efficacy in this regard is lacking. Anti-arthritic properties have been found in the ethyl acetate stem bark of *Pinus roxburghii* Sargent in Wistar rats induced with arthritis produced by Freund's Complete adjuvant. The anti-arthritic activity was evaluated by assessing pain perception parameters, haematological parameters, rheumatoid factor, CRP, and serum parameters. As a positive control, diclofenac was administered. The ethyl acetate fraction of *Pinus roxburghii* Sargent was found to significantly inhibit pain perception parameters at doses of 250 and 500 mg/kg. Compared to the disease control group, serum levels of RF, NO, and CRP were significantly lower in the *Pinus roxburghii* Sargent group. In disease-free rats, *Pinus roxburghii* Sargent significantly increased RBC and decreased WBC, which indicated a suppressive effect on inflammatory mediators. Histopathology showed a reduction in the number of inflammatory cells. The radiological assessment showed significant reductions in several imaging parameters, including spur formation, joint spacing, and bone erosion. The authors of this study noted that *Pinus roxburghii* Sargent had a direct effect on slowing the progression of arthritis, reducing inflammation and synovitis, and protecting arthritic joints from cartilage and bone deterioration. The stem bark extract of *Pinus roxburghii* Sargent has been shown to have anti-arthritic action based on clinical, biochemical, and histological analysis. However, more research is required to determine the precise mechanism of action.

Keywords: arthritis, *Pinus* species, Wistar rats

1. Introduction

Rheumatoid arthritis (RA) is an autoimmune disease that causes chronic joint discomfort and inflammation, which can result in cardiopathy, nephropathy, vasculopathy, pulmonary, and cutaneous issues (Lindler et al 2020). Arthritis is a condition characterized by joint pain and stiffness, with inflammatory arthritis referring to joint pain, swelling, redness, and heat. The cause of RA remains uncertain, although it may start with autoimmunity.

Nearly 1% of the world's population is affected by RA, which manifests as symmetric polyarticular synovitis, most commonly affecting the small joints of the hands, wrists, and feet. Current RA treatment plans typically focus on anti-inflammatory medication to inhibit the inflammatory response, aiding in the recovery process. Research into the disease's pathologic underpinnings and medications targeting these mechanisms has transformed RA treatment in the past two decades. While many of these novel drugs improve patient outcomes, they also come with potential drawbacks that can make long-term treatment difficult and even delay surgery.

Traditional plant remedies remain important in the contemporary pharmaceutical business due to their low risk of side effects and the synergistic effects of their ingredients. *Pinus roxburghii* Sargent, a tree found in Bhutan, Tibet, and some areas of North India, serves as both a beautiful specimen and a source of several medical benefits. The plant is a member of the Pinaceae family, also known as chir Pine, and can treat a variety of medical conditions, including hemostasis, stimulation, analgesia, inflammation, antioxidation, anthelmintics, digestion, liver tonic, diuresis, bronchitis, inflammation of the skin, and more (Bissa et al 2008). *Pinus roxburghii Sargent* contains numerous substances, such as terpenoids, flavonoids, tannins, and xanthones (Eckert and Hall 2006; Rawat et al 2006).

This study aimed to test the anti-arthritic effects of the ethyl acetate fraction of a *Pinus roxburghii* Sargent stem bark extract in experimental animals using advanced determination methods (Labib et al 2017; Shuaib et al 2013; Naeem et al 2010).

A Review Of The Relationship Between Antidepressants And Suicide Risk

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A REVIEW OF THE RELATIONSHIP BETWEEN ANTIDEPRESSANTS AND SUICIDE RISK

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Keywords:

Neurobiology, Suicide, NT disturbances, Impact of social isolation

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ABSTRACT: There are a variety of causes of death, but one of the most common is a suicide, which has an annual global average rate of roughly 13 per 1000000 people. Men commit suicide at a higher rate than women. Suicide rates were reduced by prescribing higher doses of current antidepressants; however, multiple ecological, cohort, case-control, and controlled clinical trials in patients with acute affective disorder discovered that the risk of suicide ideation is higher in younger patients. As a result, this remains a matter of debate whether antidepressants enhance suicidal ideation in younger patients with acute affective illness. This review outlines the neuroscience of suicide and look into the link between antidepressants and suicide.

INTRODUCTION: Antidepressants, particularly Selective Serotonin Reuptake Inhibitors (SSRIs), are commonly prescribed due to the belief and understanding that they are generally safe and helpful for a wide range of diseases, including depression and anxiety. The question of whether certain antidepressant medicines (ADs), particularly Selective Serotonin Reuptake Inhibitors (SSRIs), induce the appearance or intensification of suicidal thoughts in sensitive individuals continues to be debated [1, 2]. Concerns about safety were first raised in the early 1990s, when reports suggested a link between the drug and suicidality [3].

As a result, the link between antidepressant medication use and the risk of suicide has been a source of worry. The Food and Drug Administration (FDA) in the United States has been actively involved in giving guidelines and warnings regarding the use of these medications. In 1991, a public meeting was held to address concerns about anomalous behavior in patients who had been treated with fluoxetine. Suicidal conduct was reported by attendees immediately after they began using the drug [4, 5]. Different clinical research, such as case-control, cohort, ecological, and controlled studies, are aimed to gain additional information about the topic.

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Neurobiology of Suicide: In the Neurobiology of Suicide, three neurobiological systems are engaged.

- ✓ First, urinary cortisol production, CSF investigations, DST non-suppression, and post-mortem brain studies all point to an HPA axis hyperactivity linked to suicidal conduct.

Anticataleptic effect of Xanthium Stramarium Hydroalcoholic Extractin Laboratory Animals

IJBPAS, August, 2023, 12(8): X-X

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ANTICATALEPTIC EFFECT OF *XANTHIUM STRUMARIUM* HYDROALCOHOLIC EXTRACTIN LABORATORY ANIMALS

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ABSTRACT

Xanthium strumarium (*Asteraceae*) fruits have been traditionally used in the management of asthma and the current study was undertaken to scientifically validate the benefits of plant as an antihistaminic agent using the suitable animal model. The agents with antihistaminic properties are known to be good antiasthmatic agents; hence, in the current research work, the antihistaminic activity of anhydroalcoholic extract of *Xanthium strumarium* fruits (at a dose of 100 mg/kg, i.p) was evaluated using haloperidol-induced catalepsy and clonidine-induced catalepsy in laboratory rats. The results showed that, the hydroalcoholic extract inhibits the catalepsy induced by the clonidine but no remarkable effect was observed on the catalepsy induced by haloperidol. This strongly suggests that, the inhibition is mediated through an antihistaminic action and there is no role of dopamine. Hence, in the present study, it is concluded that, the hydroalcoholic extract has significant antihistaminic activity. The polar constituents in the hydroalcoholic extract of fruits of *Xanthium strumarium* may be responsible for the antihistaminic effects and therefore, the hydroalcoholicfruits extract can be a better remedy as an antihistaminic agent.

Keywords: *Xanthium strumarium*, Catalepsy, Asthma, Antihistaminic effects

A review on phytocompounds and pharmacological Activities reported for tagetes erecta

IJBPAS, December, 2023, 12(12): X-X

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A REVIEW ON PHYTOCOMPOUNDS AND PHARMACOLOGICAL ACTIVITIES REPORTED FOR *TAGETES ERECTA*

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ABSTRACT

The use of medicinal plants, their derivatives, and their defined secondary metabolites is increasing worldwide as a natural substitute for synthetically generated chemicals in both Traditional and Allopathic systems of medicine. *Tagetes erecta*, also referred to as Genda Phul (marigold) shows several therapeutic benefits. The plant's various parts are beneficial for fevers, astringent, stomachic, scabies and liver issues, ocular conditions, purify the liver, carminative, colds, rheumatism, bleeding piles, bronchitis. *Tagetes erecta* is a plant includes several significant phytochemical components such as carotenoids, flavonoids, terpenoids from various parts of the plant. It demonstrates a variety of pharmacological effects, including anti-nociceptive, anti-inflammatory, antioxidant, insecticidal, larvicidal, hepatoprotective, antipyretic, wound healing, antifungal, antibacterial, and antiepileptic.

Keywords: *Tagetes erecta*, Astringent, Carotenoids, Hepatoprotective, Antibacterial, Antiepileptic

INTRODUCTION-

Traditional societies around the world make extensive use of medicinal plants and their derivatives, and modern society is starting to catch on as well alternatives to manufactured chemicals that are natural [1]. Over the past few decades, there has been an exponential increase in herbal medicine discipline. It is becoming more well-known in due to its natural resources, both developing and developed countries

A review on phytocompounds and pharmacological activities for musa paradisiaca linn.

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A REVIEW ON PHYTOCOMPOUNDS AND PHARMACOLOGICAL ACTIVITIES FOR *MUSA PARADISIACA* LINN.

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ABSTRACT

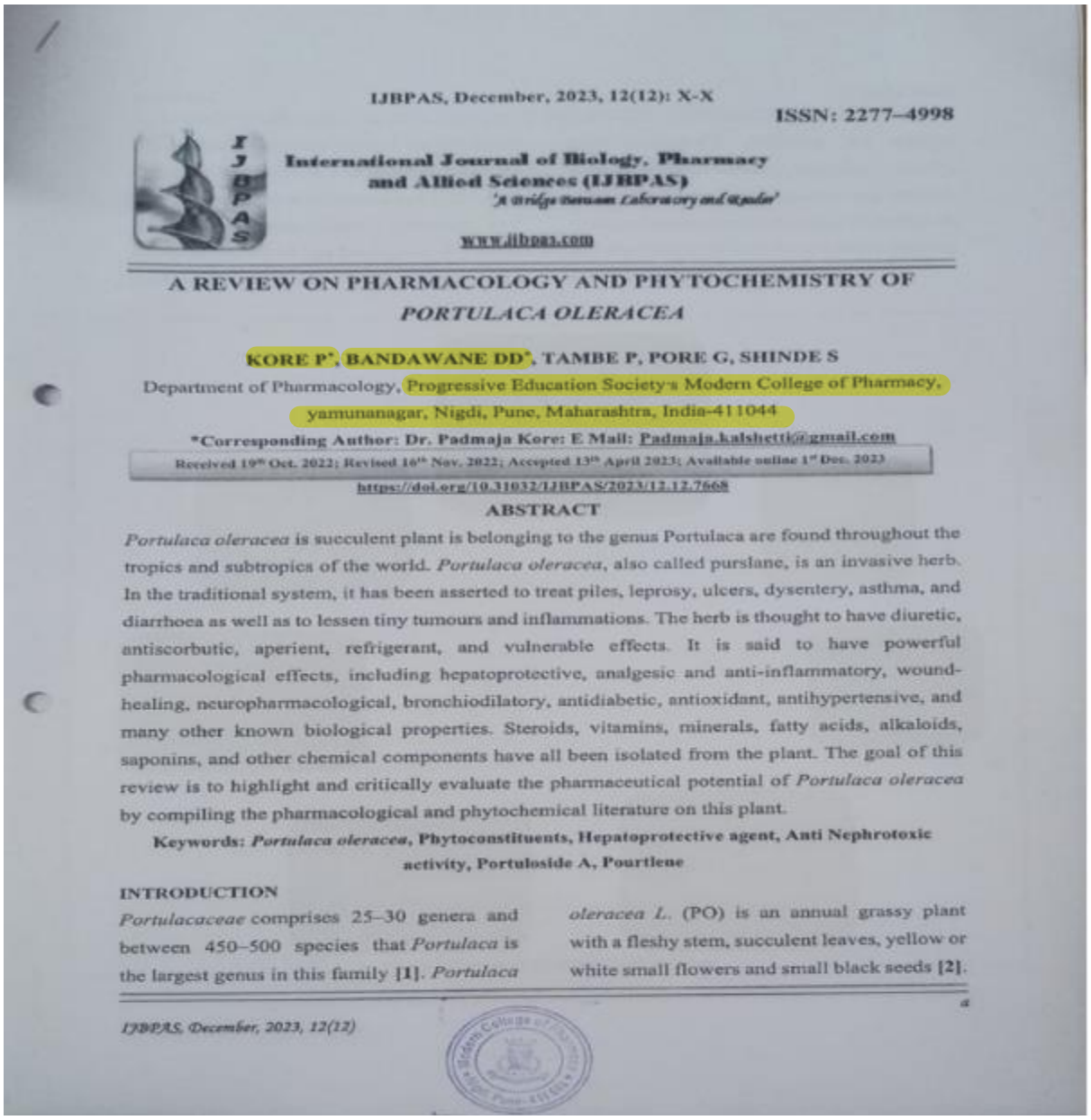
Musa paradisiaca Linn. is a well-known Indian medicinal plant from the Musaceae family. This plant, also known as plantain or banana, produces highly nutritious fruit all over the world. A broad range of phytochemical constituents have been isolated from this plant. The fruits and other parts of the plant are used to treat various diseases in humans in traditional medicine. This review study gives scientific information on medicinal uses, phytochemistry of *Musa paradisiaca* plant parts are widely used to treat different diseases in humans such as diabetes, diarrhoea, hypertension, dysentery, hysteria, leprosy, epilepsy, haemorrhages, renal calculi and ulcers. The main pharmacological activities of this plant are antidiabetic, antioxidant, antidiarrhoeal, antidepressant, antiulcer, antimicrobial, antilipidemic, antihypertensive, antisnakevenom, wound healing, Antiatherosclerotic Activity, hair growth promoting and antimutagenic activity. This review present scientific information on morphology, traditional uses, phytochemistry and pharmacological activities of *Musa paradisiaca*.

Keywords: *Musa paradisiaca*, antidiabetic, antioxidant, antidiarrhoeal

INTRODUCTION

Traditional medicine frequently employs medicinal plants to treat a variety of diseases. The fruit *Musa paradisiaca* (Linn), is a known as the plantain banana, belongs to the Musaceae family and it is indigenous to India and Burma. It thrives in subtropical and tropical environments. Banana is a essential food in numerous countries due to its high

A Review On Pharmacology and Phytochemistry of Portulaca Oleracea



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A REVIEW ON PHARMACOLOGY AND PHYTOCHEMISTRY OF *PORTULACA OLERACEA*

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ABSTRACT

Portulaca oleracea is succulent plant is belonging to the genus Portulaca are found throughout the tropics and subtropics of the world. *Portulaca oleracea*, also called purslane, is an invasive herb. In the traditional system, it has been asserted to treat piles, leprosy, ulcers, dysentery, asthma, and diarrhoea as well as to lessen tiny tumours and inflammations. The herb is thought to have diuretic, antiscorbutic, aperient, refrigerant, and vulnerable effects. It is said to have powerful pharmacological effects, including hepatoprotective, analgesic and anti-inflammatory, wound-healing, neuropharmacological, bronchiodilatory, antidiabetic, antioxidant, antihypertensive, and many other known biological properties. Steroids, vitamins, minerals, fatty acids, alkaloids, saponins, and other chemical components have all been isolated from the plant. The goal of this review is to highlight and critically evaluate the pharmaceutical potential of *Portulaca oleracea* by compiling the pharmacological and phytochemical literature on this plant.

Keywords: ***Portulaca oleracea*, Phytoconstituents, Hepatoprotective agent, Anti Nephrotoxic activity, Portuloside A, Pourtlene**

INTRODUCTION

Portulacaceae comprises 25–30 genera and between 450–500 species that *Portulaca* is the largest genus in this family [1]. *Portulaca oleracea L.* (PO) is an annual grassy plant with a fleshy stem, succulent leaves, yellow or white small flowers and small black seeds [2].

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Advances in Bioresearch

ORIGINAL ARTICLE

Inhibitory Effect of Piperine on Nucleation and Aggregation of Calcium Oxalate Crystals

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ABSTRACT
Piperine is a potent alkaloid obtained from Piper nigrum (Black pepper) and Piper longum (Long pepper) family Piperaceae. The study investigates the inhibitory potential of piperine on anti-nucleation and anti-aggregation of calcium oxalate crystals. Monohydrate and dihydrate crystals of calcium oxalate were synthesized. Piperine was isolated from Piper nigrum fruits by a single step method. The calcium oxalate crystals and piperine were characterized for their purity. Anti-nucleation and anti-aggregation assay of both the crystal types was studied separately. Piperine was found to exhibit significant inhibitory effect on nucleation and aggregation of monohydrate as well as dihydrate crystals of calcium oxalate. Piperine can be effectively employed in the management of urolithiasis and nephrolithiasis.
Keywords *Aggregation assay, Calcium oxalate, Nucleation assay, Piperine, Urolithiasis*

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INTRODUCTION

Piper spp. have been widely implemented in the treatment of several ailments by the ancient systems of medicine. Besides, piperine has been scientifically proven to exert antiviral, anti-inflammatory and bioavailability enhancing properties.

Formation of stone by the deposition of crystal in any part of the urinary system is known as urolithiasis. Majorly, calcium oxalate crystals as found; besides, these calcium phosphate, uric acid, creatinine and struvite can also deposit and lead to crystal formation [1].

In almost 80 % of urolithiasis cases, calcium oxalate monohydrate (COM) has been found to aggravate the condition by exhibiting greater affinity for renal tubular cells [2,3]. Although, calcium oxalate dihydrate (COD) are also the part of stone in many cases, hitherto it can even be observed in the urine of healthy subjects [4]. Current management of urolithiasis involves surgical procedures, medications and diets. Nonetheless, most are ineffective as far as relapses in patients is concerned [5,6,7,8].

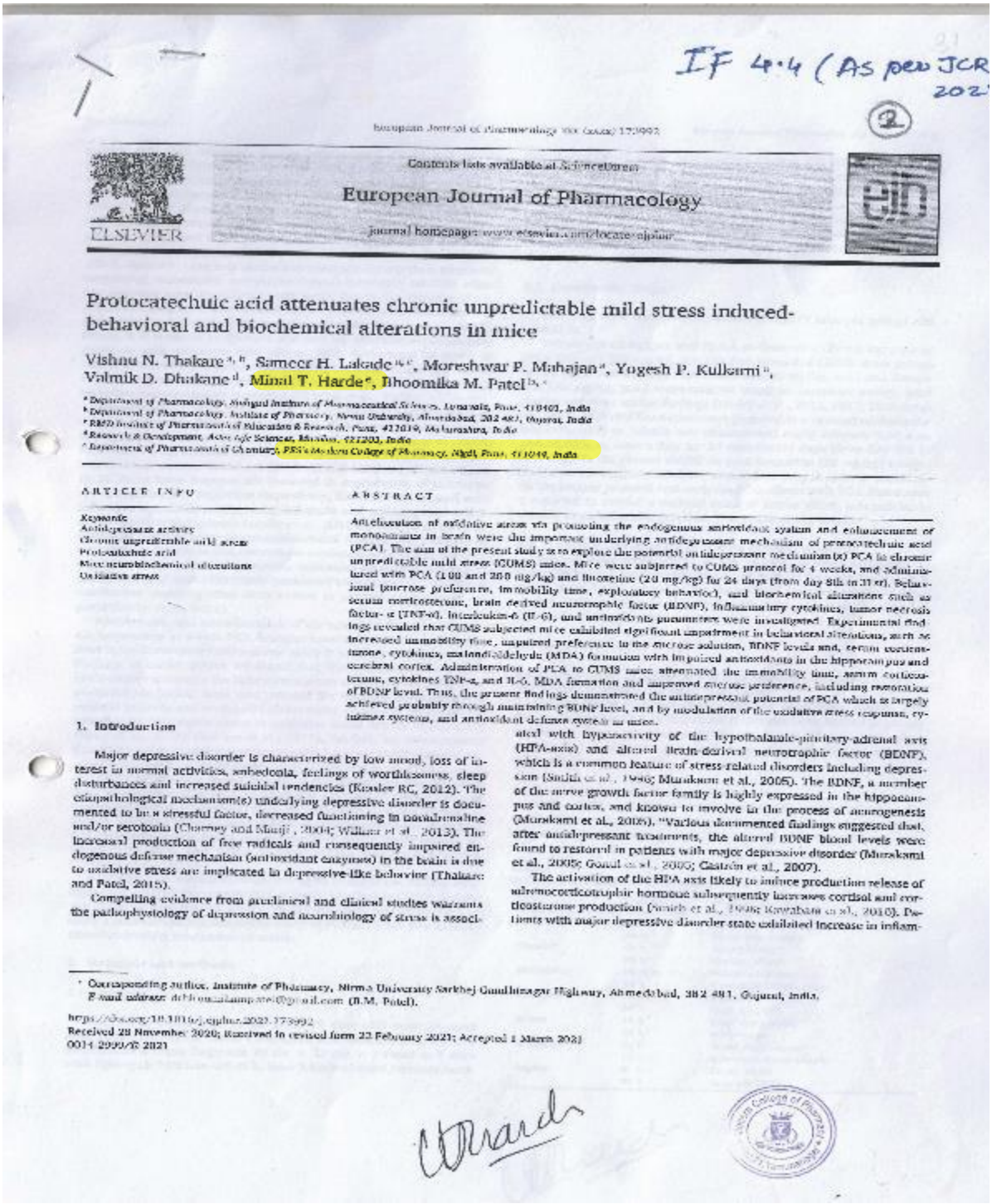
The current study investigates the concentration dependent efficiency of piperine as an inhibitor for nucleation and aggregation of calcium oxalate crystals (monohydrate and dihydrate).

MATERIAL AND METHODS

Black pepper was Purchased from local market. Petroleum ether (b.p.40-60°C) was purchased from (LobaChemiePvt Ltd). Calcium chloride, sodium oxalate were purchase from (Research-lab Mumbai, India).Thin layer chromatography plates were obtained from Merck, Germany.

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Protocatechuic acid attenuates chronic unpredictable mild stress-induced-behavioral and biochemical alterations in mice



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Protocatechuic acid attenuates chronic unpredictable mild stress induced-behavioral and biochemical alterations in mice

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ARTICLE INFO

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Oxidative stress

ABSTRACT

Amelioration of oxidative stress via promoting the endogenous antioxidant system and enhancement of monoamines in brain were the important underlying antidepressant mechanism of protocatechuic acid (PCA). The aim of the present study is to explore the potential antidepressant mechanism(s) PCA in chronic unpredictable mild stress (CUMS) mice. Mice were subjected to CUMS protocol for 4 weeks, and administered with PCA (100 and 200 mg/kg) and fluoxetine (20 mg/kg) for 24 days (from day 8th to 31st). Behavioural (sucrose preference, immobility time, exploratory behavior), and biochemical alterations such as serum corticosterone, brain derived neurotrophic factor (BDNF), inflammatory cytokines, tumor necrosis factor- α (TNF-α), Interleukin-6 (IL-6), and antioxidants parameters were investigated. Experimental findings revealed that CUMS subjected mice exhibited significant impairment in behavioral alterations, such as increased immobility time, impaired preference to the sucrose solution, BDNF levels and, serum corticosterone, cytokines, malondialdehyde (MDA) formation with impaired antioxidants in the hippocampus and cerebral cortex. Administration of PCA to CUMS mice attenuated the immobility time, serum corticosterone, cytokines TNF-α, and IL-6, MDA formation and improved sucrose preference, including restoration of BDNF level. Thus, the present findings demonstrated the antidepressant potential of PCA which is largely achieved probably through maintaining BDNF level, and by modulation of the oxidative stress response, cytokines systems, and antioxidant defence system in mice.

1. Introduction

Major depressive disorder is characterized by low mood, loss of interest in normal activities, anhedonia, feelings of worthlessness, sleep disturbances and increased suicidal tendencies (Kessler RC, 2012). The etiopathological mechanism(s) underlying depressive disorder is documented to be a stressful factor, decreased functioning in noradrenaline and/or serotonin (Charney and Manji, 2004; Willner et al., 2013). The increased production of free radicals and consequently impaired endogenous defense mechanism (antioxidant enzymes) in the brain is due to oxidative stress are implicated in depressive-like behavior (Thakare and Patel, 2015).

Compelling evidence from preclinical and clinical studies warrants the pathophysiology of depression and neurobiology of stress is associated with hyperactivity of the hypothalamic-pituitary-adrenal axis (HPA-axis) and altered brain-derived neurotrophic factor (BDNF), which is a common feature of stress-related disorders including depression (Smith et al., 1995; Murakami et al., 2005). The BDNF, a member of the nerve growth factor family is highly expressed in the hippocampus and cortex, and known to involve in the process of neurogenesis (Murakami et al., 2005). Various documented findings suggested that, after antidepressant treatments, the altered BDNF blood levels were found to restored in patients with major depressive disorder (Murakami et al., 2005; Gonul et al., 2005; Castrén et al., 2007).

The activation of the HPA axis likely to induce production release of adrenocorticotrophic hormone subsequently increases cortisol and corticosterone production (Smith et al., 1995; Kowalczyk et al., 2013). Patients with major depressive disorder state exhibited increase in inflam-

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Design and Development of lornoxicam impregnated dry powder-based liquid crystals

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ORIGINAL ARTICLE OPEN ACCESS

Design and Development of Lornoxicam Impregnated Dry Powder Based Liquid Crystals

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ABSTRACT

The objective of the present work was to fabricate dry powder precursors using GMO, which upon hydration forms cubic phase of lyotropic liquid crystal and it can be used for the fabrication of oral solid dosage forms. Dry powder precursor was evaluated for percentage yield, drug content, Fold scope microscopy, scanning electron microscopy, X-ray diffraction, viscosity and in vitro release behavior. The dry powder precursor was obtained by spray drying method, with GMO, Lornoxicam and magnesium trisilicate. The drug content for optimized batch was92% and release kinetic was 96% (up to 12 hrs.)Surface morphology studies indicated the irregular shape of particles while polarizing light microscopy confirmsthat cubic phase forms upon hydration of powder precursor. The dry powder precursor of cubic phase was prepared in which drug release was entirely governed by the mesophases formed.

Keywords: *Liquid Crystalline powder precursor, Lornoxicam, Lyotropic, Oral drug delivery system.*

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INTRODUCTION

Glyceryl monooleate (GMO), an amphiphilic lipid self-associate to form sequential liquid crystalline mesophases, viz., lamellar, cubic and hexagonal when placed in an aqueous media [1,2].Being nontoxic, biodegradable and biocompatible it has found its utility in various delivery systems and routes of administrations. [3]Delivery system based on partially hydrated lamellar phase [4,5] hydrated cubic gel [6] cubic phase dispersionsand matrixhave been explored bymany researchers. Cubic phase coexists in equilibrium with the excesswater andbeing highly viscous has gained much attention for sustained release.[7,8]The sustained release may be due to slow drugsdiffusionnor increased residence time in its solubilized form. Further, its isotropic nature, relative insensitivity to salts and solvents, robustness and resistance to physical degradation make it most preferred candidate for sustained drug delivery. However, design and development of cubic phase based palatable solid dosage form ofGMOhas limitations due to its intrinsic properties like stickiness and stiffness. Preparation of dry powder precursors, which can be quickly transformed into cubic phase *in situ*, will promote industrial application of the system. Recently, developed spray dried dry powder cubosomes by encapsulating monoolein using ternary (starch monoolein–water) and quaternary (dextran–monoolein –ethanol–water) systems.[9,10]

MATERIAL AND METHODS

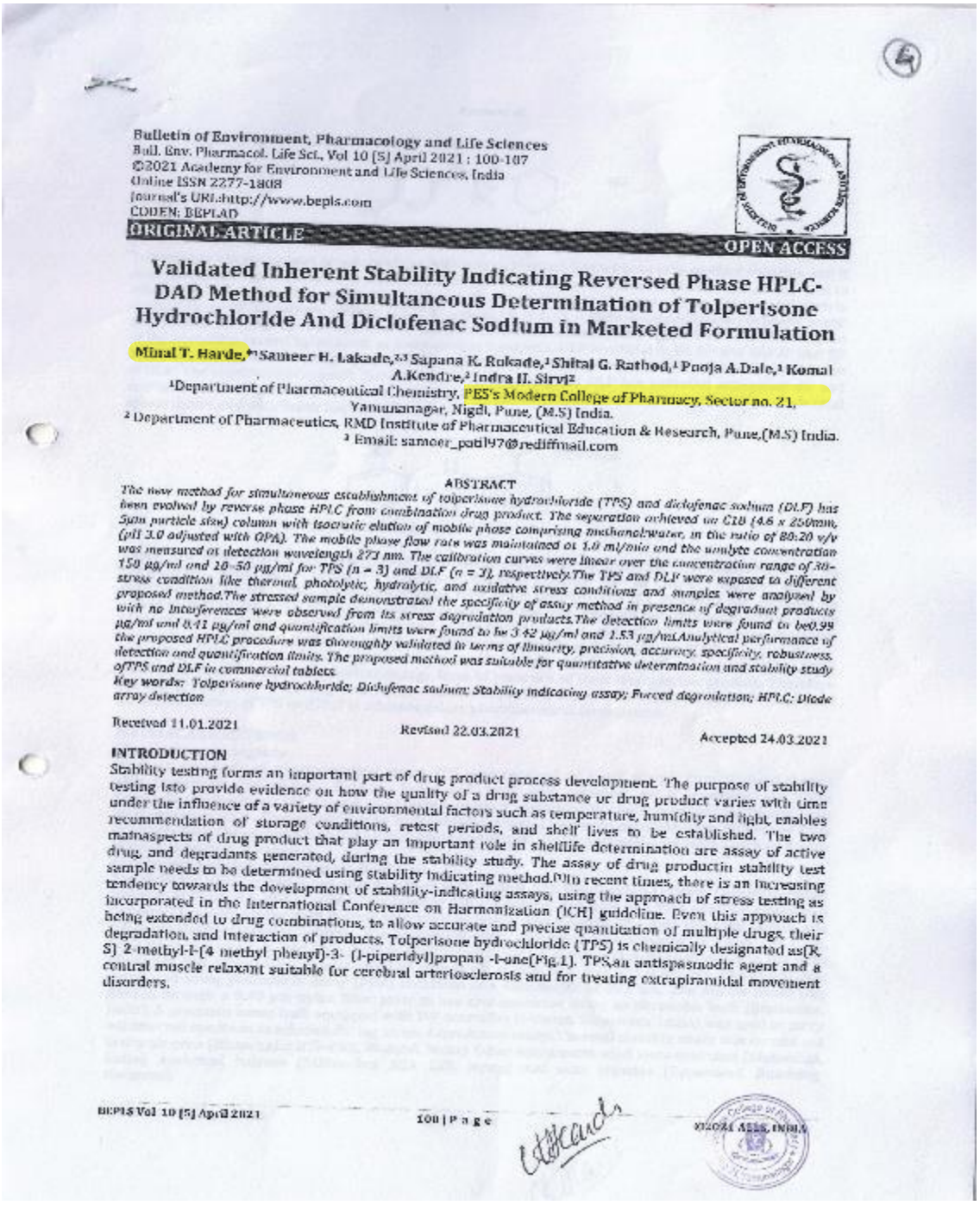
Materials

Glyceryl mono-oleate (MONOGYL- 0100) was generousgift from Mohini Organics Pvt Ltd. Mumbai. Magnesium trisilicate (MTS) was gifted from Merck chemicals Pvt Ltd. Nashik (India).Lornoxicam was obtained as gift sample from Glenmark pharmaceuticals Ltd. Nashik (India). All other chemicals used were of analytical grade.

Preparation of powder precursor

Initially Glyceryl mono-oleate (GMO) was dissolved in sufficient amount of isopropyl alcohol and then MTS and Lornoxicam were dispersed in it. Total solid content of dispersion of all batches was 5.0%. The dispersion was further subjected to spray-drying (SPD P 111, Technosearch Instruments, Mumbai).

Validated inherent stability indicating reversed phase HPLC- DAD method for simultaneous determination of tolperisone hydrochloride and diclofenac sodium in marketed formulation



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ORIGINAL ARTICLE OPEN ACCESS

Validated Inherent Stability Indicating Reversed Phase HPLC-DAD Method for Simultaneous Determination of Tolperisone Hydrochloride And Diclofenac Sodium in Marketed Formulation

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ABSTRACT

The new method for simultaneous establishment of tolperisone hydrochloride (TPS) and diclofenac sodium (DLF) has been evolved by reverse phase HPLC from combination drug product. The separation achieved on C18 (4.6 x 250mm, 5µm particle size) column with isocratic elution of mobile phase comprising methanol:water, in the ratio of 80:20 v/v (pH 3.0 adjusted with OPA). The mobile phase flow rate was maintained at 1.0 ml/min and the analyte concentration was measured at detection wavelength 273 nm. The calibration curves were linear over the concentration range of 30-150 µg/ml and 10-50 µg/ml for TPS (n = 3) and DLF (n = 3), respectively.The TPS and DLF were exposed to different stress condition like thermal, photolytic, hydrolytic, and oxidative stress conditions and samples were analysed by proposed method.The stressed sample demonstrated the specificity of assay method in presence of degradant products with no interferences were observed from its stress degradation products.The detection limits were found to be0.99 µg/ml and 0.41 µg/ml and quantification limits were found to be 3.42 µg/ml and 1.53 µg/ml.Analytical performance of the proposed HPLC procedure was thoroughly validated in terms of linearity, precision, accuracy, specificity, robustness, detection and quantification limits. The proposed method was suitable for quantitative determination and stability study of TPS and DLF in commercial tablets.

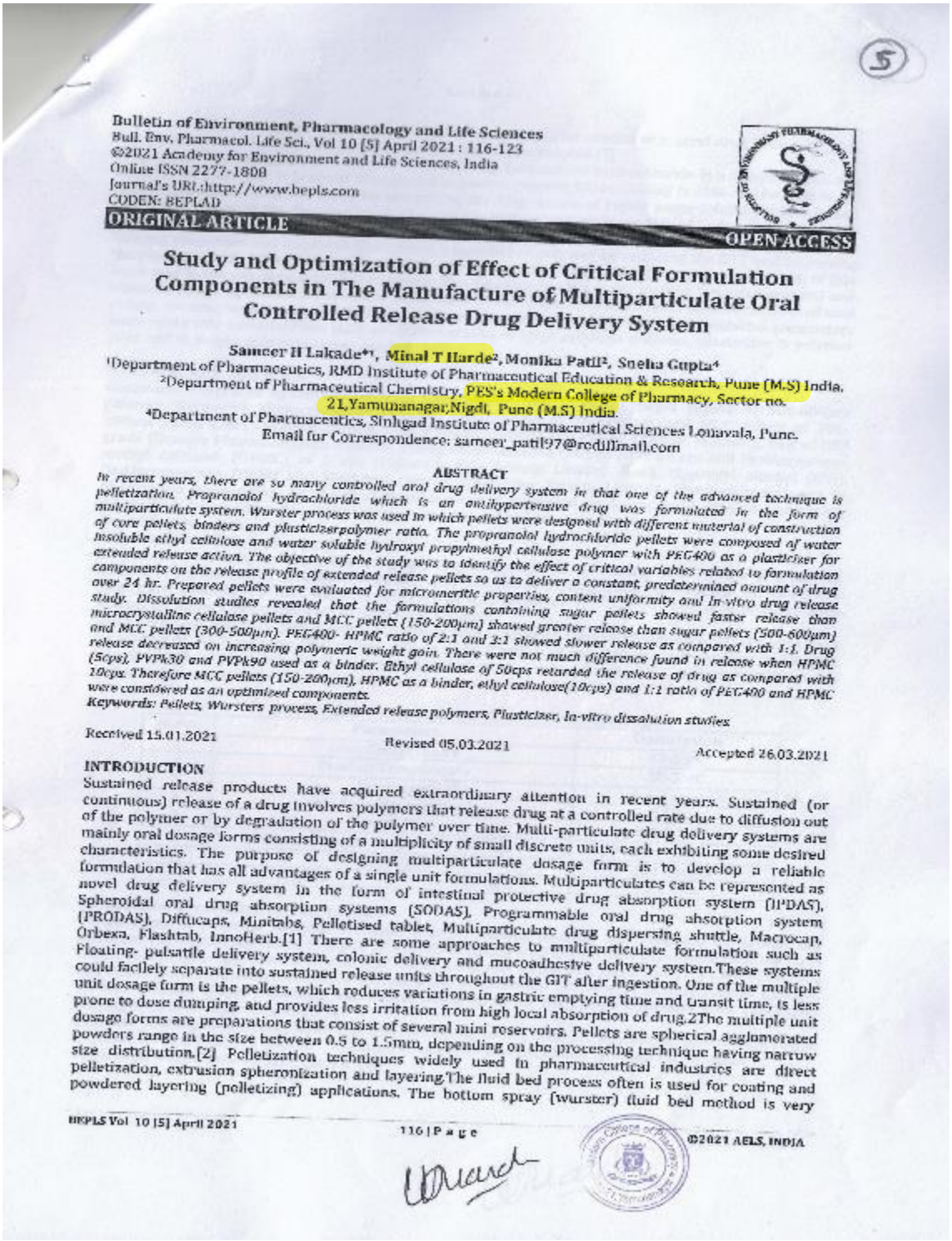
Key words: Tolperisone hydrochloride; Diclofenac sodium; Stability indicating assay; Forced degradation; HPLC; Diode array detection

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INTRODUCTION

Stability testing forms an important part of drug product process development. The purpose of stability testing isto provide evidence on how the quality of a drug substance or drug product varies with time under the influence of a variety of environmental factors such as temperature, humidity and light, enables recommendation of storage conditions, retest periods, and shelf lives to be established. The two mainaspects of drug product that play an important role in shelflife determination are assay of active drug, and degradants generated, during the stability study. The assay of drug productin stability test sample needs to be determined using stability indicating method.[1]In recent times, there is an increasing tendency towards the development of stability-indicating assays, using the approach of stress testing as incorporated in the International Conference on Harmonization (ICH) guideline. Even this approach is being extended to drug combinations, to allow accurate and precise quantitation of multiple drugs, their degradation, and interaction of products. Tolperisone hydrochloride (TPS) is chemically designated as(R, S) 2-methyl-1-(4 methyl phenyl)-3- (1-piperidyl)propan -1-one(Fig.1). TPSan antispasmodic agent and a central muscle relaxant suitable for cerebral arteriosclerosis and for treating extrapiramidal movement disorders.

Study and optimization of the effect of critical formulation components in the manufacturing of multiparticulate oral controlled release drug delivery system



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Study and Optimization of Effect of Critical Formulation Components in The Manufacture of Multiparticulate Oral Controlled Release Drug Delivery System

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ABSTRACT

In recent years, there are so many controlled oral drug delivery system in that one of the advanced technique is pelletization. Propranolol hydrochloride which is an antihypertensive drug was formulated in the form of multiparticulate system. Wurster process was used in which pellets were designed with different material of construction of core pellets, binders and plasticizerpolymer ratio. The propranolol hydrochloride pellets were composed of water insoluble ethyl cellulose and water soluble hydroxyl propylmethyl cellulose polymer with PEG400 as a plasticizer for extended release activn. The objective of the study was to identify the effect of critical variables related to formulation components on the release profile of extended release pellets so as to deliver a constant, predetermined amount of drug over 24 hr. Prepared pellets were evaluated for micromeritic properties, content uniformity and In-vitro drug release study. Dissolution studies revealed that the formulations containing sugar pellets showed faster release than microcrystalline cellulose pellets and MCC pellets (150-200µm) showed greater release than sugar pellets (500-600µm) and MCC pellets (300-500µm). PEG400- HPMC ratio of 2:1 and 3:1 showed slower release as compared with 1:1. Drug release decreased on increasing polymeric weight goin. There were not much difference found in release when HPMC (5cps), PVPk30 and PVPk90 used as a binder. Ethyl cellulose of 50cps retarded the release of drug as compared with 10cps. Therefore MCC pellets (150-200µm), HPMC as a binder, ethyl cellulose(10cps) and 1:1 ratio of PEG400 and HPMC were considered as an optimized components.

Keywords: *Pellets, Worsters process, Extended release polymers, Plasticizer, In-vitro dissolution studies*

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INTRODUCTION

Sustained release products have acquired extraordinary attention in recent years. Sustained (or continuous) release of a drug involves polymers that release drug at a controlled rate due to diffusion out of the polymer or by degradation of the polymer over time. Multi-particulate drug delivery systems are mainly oral dosage forms consisting of a multiplicity of small discrete units, each exhibiting some desired characteristics. The purpose of designing multiparticulate dosage form is to develop a reliable formulation that has all advantages of a single unit formulations. Multiparticulates can be represented as novel drug delivery system in the form of intestinal protective drug absorption system (IPDAS), Spheroidal oral drug absorption systems (SODAS), Programmable oral drug absorption system (PRODAS), Diffucaps, Minitabs, Pelletised tablet, Multiparticulate drug dispersing shuttle, Macrocap, Orbexa, Flashtab, InnoHerb.[1] There are some approaches to multiparticulate formulation such as Floating- pulsatile delivery system, colonic delivery and mucoadhesive delivery system.These systems could facilely separate into sustained release units throughout the GIT after ingestion. One of the multiple unit dosage form is the pellets, which reduces variations in gastric emptying time and transit time, is less prone to dose dumping, and provides less irritation from high local absorption of drug.2The multiple unit dosage forms are preparations that consist of several mini reservoirs. Pellets are spherical agglomerated powders range in the size between 0.5 to 1.5mm, depending on the processing technique having narrow size distribution.[2] Pelletization techniques widely used in pharmaceutical industries are direct pelletization, extrusion spheronization and layering.The fluid bed process often is used for coating and powdered layering (pelletizing) applications. The bottom spray (wurster) fluid bed method is very

ICH Guideline in practice: Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Eperisone hydrochloride and diclofenac sodium in marketed formulation

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ICH Guideline in Practice: Validated Inherent Stability-Indicating HPLC-Dad Method for Simultaneous Determination of Eperisone Hydrochloride and Diclofenac Sodium in Marketed Formulation

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ABSTRACT

A simple, rapid, precise and accurate Isocratic reversed-phase stability-indicating HPLC with diode array detection method was developed and validated for the simultaneous determination of Eperisone hydrochloride (EPS) and Diclofenac sodium (DLF) in commercial capsules. EPS and DLF were degraded together under different stress test conditions prescribed by International Conference on Harmonization. The samples generated were used to develop a stability-indicating high performance liquid chromatographic (HPLC) method for both the drugs. The drugs were well separated from degradation products using a reversed-phase C 18 (4.6 x 250mm, 5µm particle size) column with isocratic elution of the mobile phase comprising of acetonitrile : water, in the ratio of 90:10 v/v (pH 3.5 adjusted with OPA). The mobile phase flow rate was maintained at 0.9 ml/min with the detection wavelength used for quantification of EPS and DLF was 276 nm. The drugs were subjected to different stress conditions like neutral, acidic and alkaline hydrolysis, oxidation, photolysis and thermal degradation. Degradation products produced was a result of stress studies did not interfered with the detection of EPS and DLF, thus the assay can thus be considered stability-indicating. Analytical performance of the proposed HPLC procedure was thoroughly validated with respect to system suitability, linearity, range, precision, accuracy, specificity, robustness, detection and quantification limits. The developed procedure is also applicable to the determination of instability of the drugs in commercial formulations.

Keywords: Eperisone hydrochloride, Diclofenac sodium, Stability indicating assay, forced degradation, HPLC, Diode array detection.

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INTRODUCTION

Eperisone hydrochloride (EPS) is chemically, 4-ethyl-2-methyl-3-piperidinopropiophenone hydrochloride. (Fig.1). [1]. It is official in Japanese pharmacopoeia (JP). It is estimated by potentiometric method as per JP.[2] EPS, an antispasmodic agent and a centrally acting muscle relaxant acts by relaxing both skeletal muscle and vascular smooth muscle, and demonstrates a variety of effect such as reduction of myotonia, improvement of circulation, and suppression of the pain reflex.

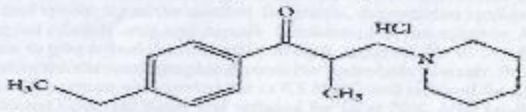


Fig. 1. Chemical Structure of Eperisone Hydrochloride (EPS)

The drug also improves dizziness and tinnitus associated with cerebrovascular disorders or cervical spondylosis. Diclofenac sodium (DLF) chemically it is 2-[2, 6 dichlorophenylamino] benzene acetic acid sodium salt (Fig. 2). DLF is official in IP, BP and USP. IP [3] & BP [4] describes liquid chromatography method & USP [5] describes the potentiometric method for estimation of DLF. It is classified as a non-steroidal anti-inflammatory agent. It is used to treat pain or inflammation caused by arthritis or

Formulation And Evaluation of Lipsticks from The Dyes Of Root Barks of Alkana Tinctoria

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Formulation and Evaluation of Lipsticks from the Dyes Of Root Barks of *Alkana tinctoria*

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ABSTRACT

Alkana tinctoria (Family: Boraginaceae) is a herb indigenous to the mediterranian region. The study aims at separation of several reddish pigments from the root barks of this plant and incorporation into lipsticks. The phytoconstituents were extracted initially using petroleum ether followed by solubilizing the concentrated extract in methanol. Two types viz. methanol soluble and methanol insoluble dyes were separated. Lipsticks were formulated using various concentration of the extracted dyes. Several organoleptic and physico-chemical parameters such as color, odor, size, color of applied area, dimensions, water resistance, load test, softening point and melting points were evaluated. Moreover, TLC and HPTLC were performed using Petroleum ether: Ethyl acetate: Glacial Acetic acid (8:1.5:0.1) and Methanol: water (6.5:3.5) as mobile phase. Alkannin was found in methanol soluble fraction. Methanol insoluble components were able to impart concentration dependent darker shades to the lipsticks in comparison with the methanol soluble components. Moreover, lipsticks formulated of methanol soluble fraction exhibited more durability (in terms of breaking point). The methanol soluble fraction of petroleum ether extract of root bark of Alkana tinctoria can be effectively incorporated for the development of herbal lipsticks or colorants.

Keywords: Alkana tinctoria, ratanjot, alkannin, lipsticks.

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INTRODUCTION

Lipsticks are an age-old formulation that occupies irreplaceable position in the arena of cosmetics. Commercially liptics are avialable in various types *viz* Matte, Shimmer, Metallic, Frost, Glossy, Satin, , etc. Despite their conventional application of protection, enhancing aesthetic appearance and masking the defects; lipsticks nowadays enjoy the privileges of cosmeceuticals [1].

However, scientific reports have underlined the carcinogenicity, allergic contact dermatitis and skin toxicities due synthetic colorants used in the commercial lipsticks[2, 3]. Nevertheless, high cost and meagre availability of luxurious brands have added to the sales of pirated or misbranded product with more carcinogenic colorants.

Alkana tinctoria is a herb of Boraginaceae family [4]. It is indegenous to mediterranena region and commercially known as ratan jot or dyers alkanet [5]. However, is prominently found in Himalayan region [6, 7].

The root bark contains various reddish oil soluble pigments. Since, ages the root bark was used in culinary preparation such as *rogan-josh* etc or in topical oil formulation in order to impart red color. Moreover, the bark also has several health benefits as it is antimicrobial [8],anthelmintic and antiinflammatory [7] antioxidant properties [10]. The tincture of its roots is commonly utilized in microscopy and preliminary phytochemical analysis for testing oils, lipids and fats.

The current study is designed considering the lipophilic nature of these pigments [11]. Efforts are made to incorporate the red pigments in lipsticks, as the lipstic base is completely lipophilic. Various concentrations of different dyes are incorporated and the sticks are evaluated.

MATERIAL AND METHODS

Alkana tinctoria root barks were obtained from local market of Pimpri-Chinchwad region in Pune.Petroleum ether [b.p. 60-80 °C) and methanol was purchased from Merck Life Sciences Pvt. Ltd., Mumbai. Beeswax, parraffin oil were purchased from Yucca Enterprises Mumbai.

Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients

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Research Article

Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients

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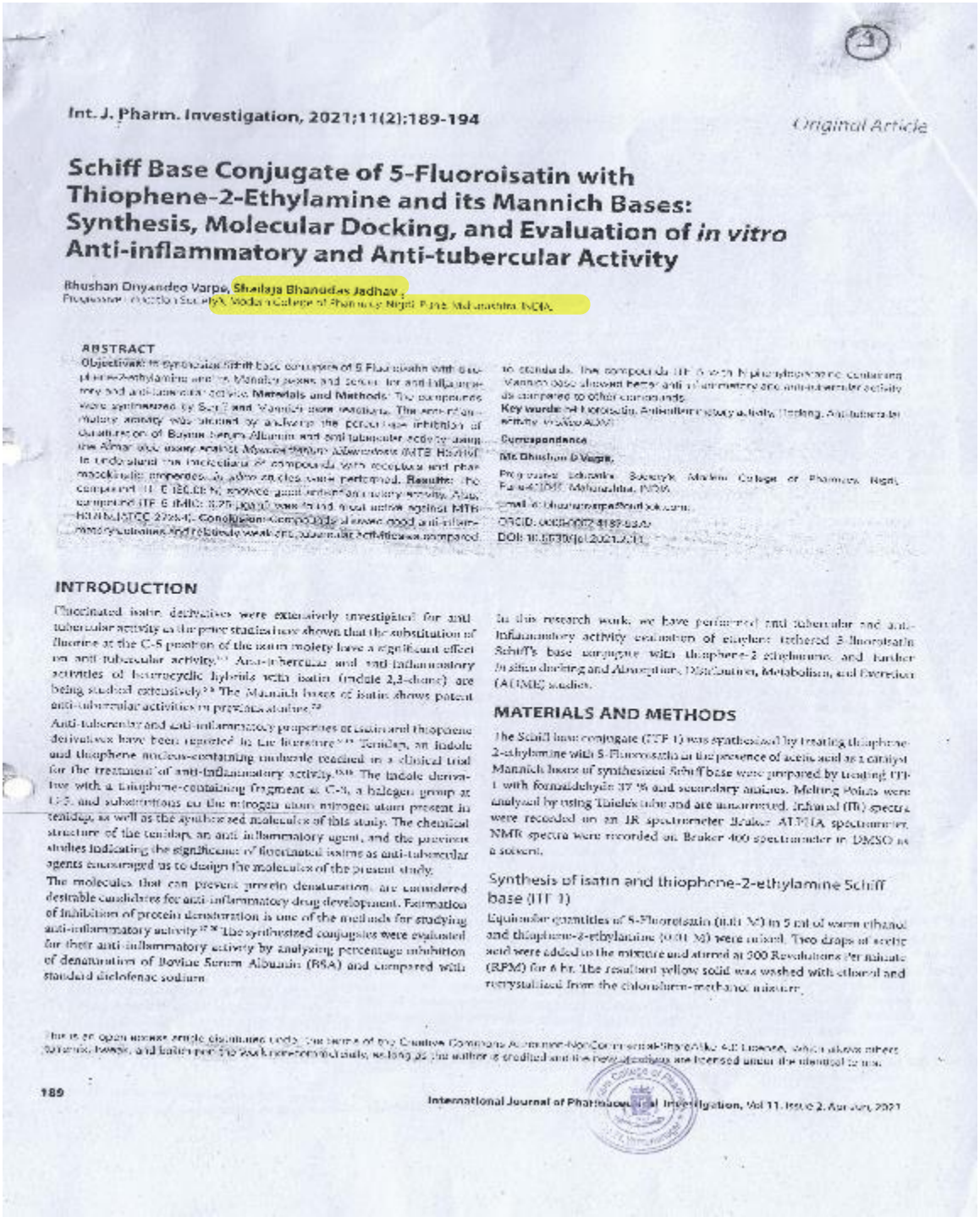
ABSTRACT
The objective of the present study was to prepare and evaluate solid self-emulsifying drug delivery system (S-SEDDS) containing Praziquantel, a poor water-soluble drug. The central composite design was employed to optimize the formulation variables, Capmul MCM (oil), Cremophore RH40 (surfactant) and PEG400 (co-surfactant). Liquid self-emulsifying drug delivery system was appraised for determination of self emulsifying time, globule size and drug release. TEM study confirmed the uniform oil globules of the optimized liquid formulation. The optimized liquid formulation was formulated into free-flowing powder (S-SEDDS) by adsorption on the materials like Aerosil 200, Neusilin US2 and compressed into tablets. The solid state characterization of S-SEDDS powder was performed by using DSC, PXRD and SEM to investigate the physical nature of the drug. Further, the accelerated stability studies for 6 months revealed that S-SEDDS of Praziquantel was found to be stable without any significant change in physico-chemical properties. S-SEDDS of Praziquantel with improved dissolution profile was successfully prepared by using Neusilin US2 as an adsorbent carrier.

Keywords: Praziquantel (PZQ), Solid-self emulsifying drug delivery system (S-SEDDS), Solid-state characterization, Paediatric patients, Stability.

INTRODUCTION
Most of the drugs at the market and New Chemical Entities (NCEs, approx. 75%) from the discovery pipeline are poorly water-soluble, it has never been so important for formulation scientists from academia and pharmaceutical industries to work on improving solubility. Nowadays, there are many challenges associated with formulating paediatric medicines for developing countries and the demand of paediatric medicine still remains at large. Praziquantel (PZQ), an anthelmintic drug used in various countries for the treatment of schistosome and liver fluke infection. It prevents newly hatched insect larvae (worms) from growing or multiplying in your body. Paediatric patients need different oral dosage forms than adults due to differences in swallowing capabilities, taste likings, and dosage requirement. Paediatric patients need new modified dosage forms to fulfill recommended dosing treatments due to age differences when compared to another age group. However, adsorption onto solid carriers such as using MCC grade material is a very recent approach and a limited number of works has been done till now. After the conversion of liquid SEDDS into solids, free flowing powders have flexibility (ease of processing) in designing and developing solid dosage forms (easy to encapsulate the powder) as well as the reduction of intra- and inter-subject variability of drug dissolution profiles, thus lead to improvements in drug safety and efficacy. Bitter drugs are really very difficult for patient to take in oral dosage form, especially by paediatric patients. So, new Dosmion Pharma grade polymer, designed specifically mask the taste of drug was used in the formulation of tablet. This research project is mainly focused on the development of a flexible dosage form suitable for oral administration of PZQ to children.[1,2,3]

MATERIALS AND METHODS
Materials: Praziquantel was kindly donated by Microlab Pvt. Ltd, Goa. Capmul MCM was obtained from Abitech Corporation, U.S.A., Cremophore RH40 was procured from BASF, Mumbai, PEG 400 was obtained from Pure Chem. Lab, Pune, Aerosil 200 was obtained from Oxford Laboratory Reagent, Mumbai and Neusilin US2 was obtained from Fuji Chemical Industry Co. Ltd., Japan. All other chemicals were of analytical grade.
Methods: Solubility study: The solubility of PZQ in various oils (Capmul MCM, Capryol 90, Oleic

Schiff Base Conjugate of 5-Fluoroisatin with Thiophene-2- Ethylamine and its Mannich Bases: Synthesis, Molecular Docking, and Evaluation of in vitro Anti-inflammatory and Anti-tubercular Activity



Int. J. Pharm. Investigation, 2021;11(2):189-194

Original Article

Schiff Base Conjugate of 5-Fluoroisatin with Thiophene-2-Ethylamine and its Mannich Bases: Synthesis, Molecular Docking, and Evaluation of *in vitro* Anti-inflammatory and Anti-tubercular Activity

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ABSTRACT

Objectives: To synthesize Schiff base conjugate of 5-Fluoroisatin with thiophene-2-ethylamine and its Mannich bases and screen for anti-inflammatory and anti-tubercular activity. Materials and Methods: The compounds were synthesized by Schiff and Mannich base reactions. The anti-inflammatory activity was carried by analyzing the percentage inhibition of denaturation of Bovine Serum Albumin and anti-tubercular activity using the Alamar blue assay against Mycobacterium tuberculosis (MTB H37Rv). In silico studies for molecular docking of compounds with receptors and pharmacokinetic properties in silico studies were performed. Results: The compound (TF 1) (IC50: 82.68 µg/ml) showed good anti-inflammatory activity as compared to standard diclofenac sodium (IC50: 71.75 µg/ml). The compound (TF 5 with N-phenylpiperazine containing Mannich base) showed better anti-inflammatory and anti-tubercular activity as compared to other compounds.

Key words: 5-Fluoroisatin, Anti-inflammatory activity, Docking, Anti-tubercular activity, Alamar Blue.

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INTRODUCTION

Fluorinated isatin derivatives were extensively investigated for anti-tubercular activity as the prior studies have shown that the substitution of fluorine at the C-5 position of the isatin moiety have a significant effect on anti-tubercular activity.[1] Anti-tubercular and anti-inflammatory activities of heterocyclic hybrids with isatin (indole 2,3-dione) are being studied extensively.[2,3] The Mannich bases of isatin shows potent anti-tubercular activities in previous studies.[4]

Anti-tubercular and anti-inflammatory properties of isatin and thiophene derivatives have been reported in the literature.[5,6] Tenidap, an indole and thiophene nucleus-containing molecule reached to a clinical trial for the treatment of anti-inflammatory activity.[7,8] The indole derivative with a thiophene-containing fragment at C-3, a halogen group at C-5, and substitutions on the nitrogen atom nitrogen atom present in tenidap, as well as the synthesized molecules of this study. The chemical structure of the tenidap, an anti-inflammatory agent, and the previous studies indicating the significance of fluorinated isatins as anti-tubercular agents encouraged us to design the molecules of the present study.

The molecules that can prevent protein denaturation are considered desirable candidates for anti-inflammatory drug development. Estimation of inhibition of protein denaturation is one of the methods for studying anti-inflammatory activity.[9,10] The synthesized conjugates were evaluated for their anti-inflammatory activity by analyzing percentage inhibition of denaturation of Bovine Serum Albumin (BSA) and compared with standard diclofenac sodium.

In this research work, we have performed anti-tubercular and anti-inflammatory activity evaluation of ciprofloxacin tethered 5-fluoroisatin Schiff's base conjugate with thiophene-2-ethylamine and further *in silico* docking and Absorption, Distribution, Metabolism, and Excretion (ADME) studies.

MATERIALS AND METHODS

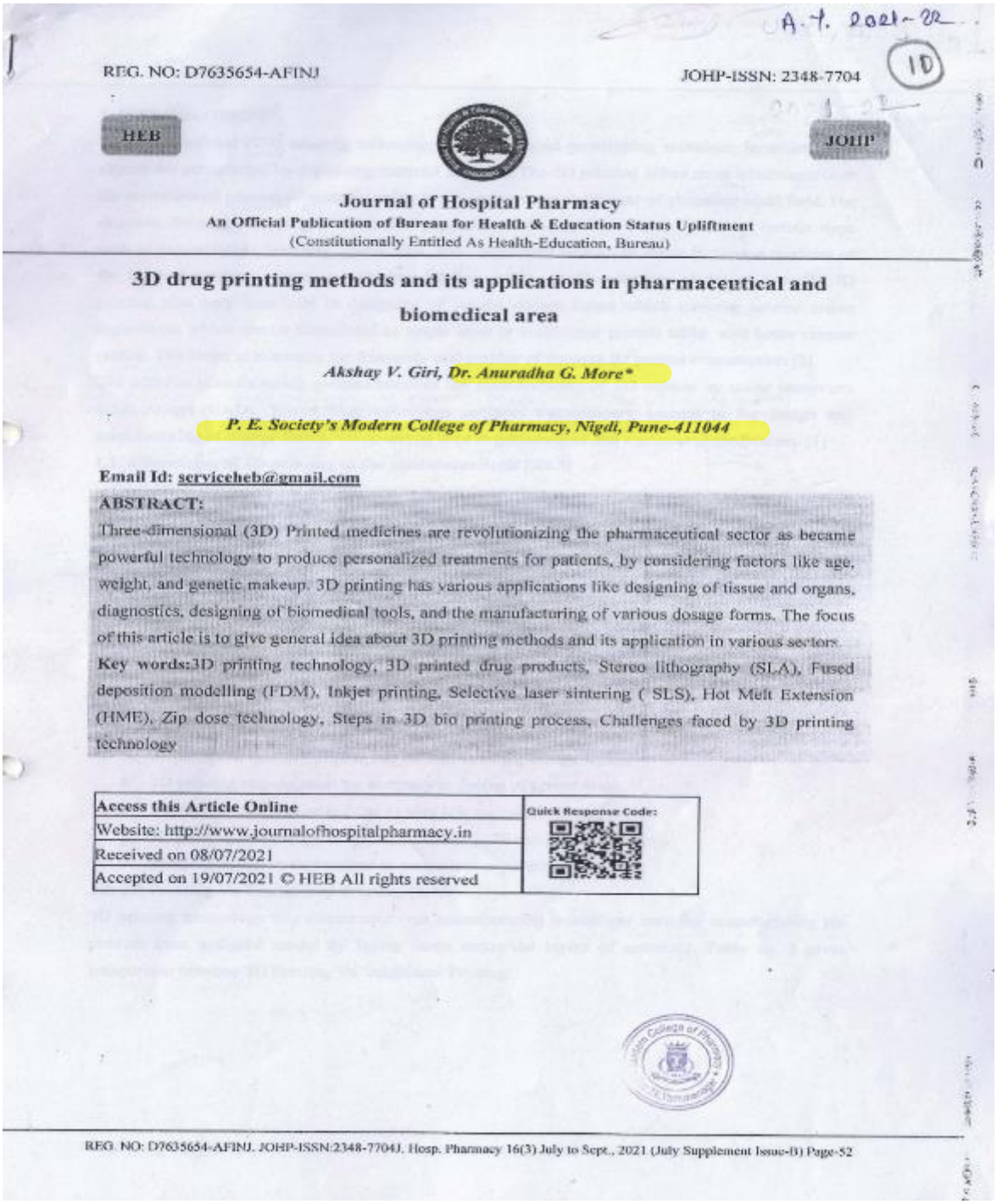
The Schiff base conjugate (TF 1) was synthesized by treating thiophene-2-ethylamine with 5-Fluoroisatin in the presence of acetic acid as a catalyst. Mannich bases of synthesized Schiff base were prepared by treating TF-1 with formaldehyde 37 % and secondary amines. Melting Points were analyzed by using Thiele's tube and are uncorrected. Infrared (IR) spectra were recorded on an IR spectrometer Bruker ALPHA spectrometer. NMR spectra were recorded on Bruker 400 spectrometer in DMSO as a solvent.

Synthesis of isatin and thiophene-2-ethylamine Schiff base (TF 1)

Equimolar quantities of 5-Fluoroisatin (0.01 M) in 5 ml of warm ethanol and thiophene-2-ethylamine (0.01 M) were mixed. Two drops of acetic acid were added to the mixture and stirred at 300 Revolutions Per Minute (RPM) for 6 hr. The resultant yellow solid was washed with ethanol and recrystallized from the chloroform-methanol mixture.

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3D drug printing methods and their application in the Pharmaceutical and biomedical area



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3D drug printing methods and its applications in pharmaceutical and biomedical area

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ABSTRACT:

Three-dimensional (3D) Printed medicines are revolutionizing the pharmaceutical sector as became powerful technology to produce personalized treatments for patients, by considering factors like age, weight, and genetic makeup. 3D printing has various applications like designing of tissue and organs, diagnostics, designing of biomedical tools, and the manufacturing of various dosage forms. The focus of this article is to give general idea about 3D printing methods and its application in various sectors.

Key words:3D printing technology, 3D printed drug products, Stereo lithography (SLA), Fused deposition modelling (FDM), Inkjet printing, Selective laser sintering (SLS), Hot Melt Extension (HME), Zip dose technology, Steps in 3D bio printing process, Challenges faced by 3D printing technology

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Method development and validation of rilpivirine in bulk and solid dosage form by using UV visible spectrophotometric method

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METHOD DEVELOPMENT AND VALIDATION OF RILPIVIRINE IN BULK AND SOLID DOSAGE FORM BY USING UV-VISIBLE SPECTROPHOTOMETRIC METHOD

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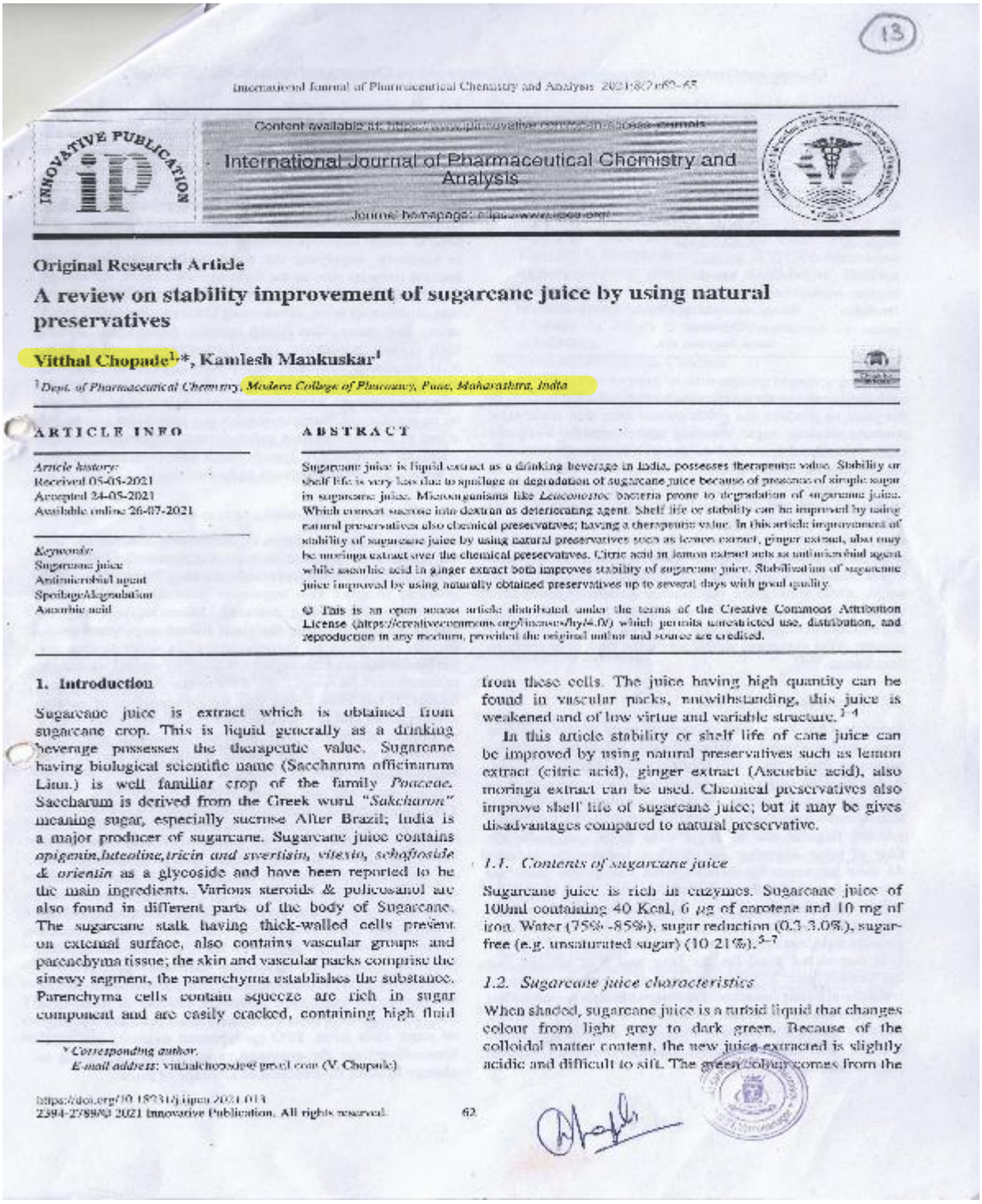
ABSTRACT:

A new, simple, selective, precise and economical UV spectroscopic method was developed for the estimation of Rilpivirine in bulk forms and tablet formulation. The spectrophotometric detection was passed out at an absorption maximum of 304 nm using acetonitrile (50%) and water (50%) as solvent. The method was validated for specificity, linearity, accuracy, precision. The detector response for the Rilpivirine was linear over the selected concentration range 4-20µg/ml with a correlation coefficient of 0.9988. The accuracy was between 98.71 and 99.99%. The precision among six sample preparations was 0.11. The LOD and LOQ are 0.89µg/ml and 2.69µg/ml respectively. The validation was carried out as per ICH guidelines. All the validation parameters were within the acceptable range. The development method was easy, rapid, linear, precise, and consistent. As economical solvent is used, these methods can be used for routine analysis of Rilpivirine in bulk and pharmaceutical formulation.

Keywords: Rilpivirine, Validation, Precision, linearity, RSD.

AAP

A review on stability improvement of sugarcane juice by using natural preservatives



(13)

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Original Research Article

A review on stability improvement of sugarcane juice by using natural preservatives

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Ascorbic acid

ABSTRACT

Sugarcane juice is liquid extract as a drinking beverage in India, possesses therapeutic value. Stability or shelf life is very less due to spoilage or degradation of sugarcane juice because of presence of simple sugar in sugarcane juice. Microorganisms like *Leuconostoc* bacteria prone to degradation of sugarcane juice. Which convert sucrose into dextran as deteriorating agent. Shelf life or stability can be improved by using natural preservatives also chemical preservatives; having a therapeutic value. In this article: improvement of stability of sugarcane juice by using natural preservatives such as lemon extract, ginger extract, also may be moringa extract over the chemical preservatives. Citric acid in lemon extract acts as antimicrobial agent while ascorbic acid in ginger extract both improves stability of sugarcane juice. Stabilization of sugarcane juice improved by using naturally obtained preservatives up to several days with good quality.

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1. Introduction

Sugarcane juice is extract which is obtained from sugarcane crop. This is liquid generally as a drinking beverage possesses the therapeutic value. Sugarcane having biological scientific name (Saccharum officinarum Linn.) is well familiar crop of the family *Poaceae*. Saccharum is derived from the Greek word *"Sakcharon"* meaning sugar, especially sucrose After Brazil; India is a major producer of sugarcane. Sugarcane juice contains *apigenin,luteoline,tricin and sweritsin, vitexin, schaftoside & orientin* as a glycoside and have been reported to be the main ingredients. Various steroids & policosanol are also found in different parts of the body of Sugarcane. The sugarcane stalk having thick-walled cells present on external surface, also contains vascular groups and parenchyma tissue; the skin and vascular packs comprise the sinewy segment, the parenchyma establishes the substance. Parenchyma cells contain squeeze are rich in sugar component and are easily cracked, containing high fluid from these cells. The juice having high quantity can be found in vascular packs, notwithstanding, this juice is weakened and of low virtue and variable structure.[1-4]

In this article stability or shelf life of cane juice can be improved by using natural preservatives such as lemon extract (citric acid), ginger extract (Ascorbic acid), also moringa extract can be used. Chemical preservatives also improve shelf life of sugarcane juice; but it may be gives disadvantages compared to natural preservative.

1.1. Contents of sugarcane juice

Sugarcane juice is rich in enzymes. Sugarcane juice of 100ml containing 40 Kcal, 6 μg of carotene and 10 mg of iron. Water (75%-85%), sugar reduction (0.3-3.0%), sugar-free (e.g. unsaturated sugar) (10-21%).[5-7]

1.2. Sugarcane juice characteristics

When shaded, sugarcane juice is a turbid liquid that changes colour from light grey to dark green. Because of the colloidal matter content, the new juice extracted is slightly acidic and difficult to sift. The green colour comes from the

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To Study the Pharmacokinetic Herb-Drug Interaction of Momordica Charantia Fruit Extract and Pure Charantin with Nateglinide in Rats

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Original Article

TO STUDY THE PHARMACOKINETIC HERB-DRUG INTERACTION OF *MOMORDICA CHARANTIA* FRUIT EXTRACT AND PURE CHARANTIN WITH NATEGLINIDE IN RATS

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ABSTRACT

Objective: *Momordica charantia* fruit extract and antidiabetic drug Nateglinide might be used simultaneously in the treatment of diabetes, so the objective of this study was to investigate pharmacokinetic herb-drug interactions of *Momordica charantia* fruit extract and pure charantin with nateglinide in rats.

Methods: After oral co-administration of Momordica charantia fruit extract (250 mg/kg) and Charantin (10 mg/kg) with nateglinide in rats, drug concentration parameters peak plasma concentration (C_{max}), time to reach peak plasma concentration (T_{max}), elimination half-life ($t_{1/2}$), apparent volume of distribution (Vd), plasma clearance (Cl), and area under the curve (AUC) were calculated by using the non-compartment model.

Results: NAT was absorbed into the circulatory system and reached its peak concentration approximately 2 h after being administered individually. Tmax of groups co-administered NAT+MCE has been changed to 4h. A significant decrease in C_{max} of NAT from 15.28 µg/ml to 11.37 µg/ml and 10.37 µg/ml with NAT with charantin and NAT with MCE groups, respectively. AUC of NAT decreased from 84.53 h/µg/ml to 53.63 h/µg/ml and 47.17 h/µg/ml by co-administration with Charantin and MCE respectively. Co-administration of nateglinide with Charantin and *Momordica charantia* fruit extract decreased systemic exposure level of nateglinide *in vivo* with decreasing C_{max} and AUC and an increase in $t_{1/2}$, Cl and Vd.

Conclusion: From this study, it can be concluded that nateglinide, *Momordica charantia* fruit extract, and pure Charantin existed pharmacokinetic herb-drug interactions in the rat which has to be correlated with the anti-diabetic study. Further studies should be done to understand the effect of other herbal ingredients of *Momordica charantia* fruit extract on nateglinide as well as to predict the herb-drug interaction in humans.

Keywords: *Momordica charantia* extract, Charantin, NAT, Pharmacokinetic herb-drug interactions

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INTRODUCTION

Nateglinide ((2R)-3-phenyl-2-[(4-propan-2-ylcyclohexanecarbonyl) amino]propanoic acid.) (NAT fig. 1) belongs to class of meglitinide used in the treatment of diabetes [1-3]. Momordica charantia (MC) is a part of the cucurbitaceae family. It grows in tropical areas of India, Amazon, East Africa, Asia, and South America. MC contains a collection of biologically active chemicals, including alkaloids, saponins, flavonoids, triterpenes, proteins, and acids. The plant possesses anti-tumorous hypoglycemic, anti-bacterial, anti-parasitic, anti-viral, anti-fertility, and anti-carcinogenic properties. Fruits are used as a traditional medication for the treatment of diseases like illness of the liver, worms, colic spleen, rheumatism, gout, and also useful in the treatment of diabetes and cancer. It is a potent hypoglycemic agent due to the presence of insulin and alkaloids like a mixture of steroidal sapogenins and peptides known as charantin. MC is the most common plant used as anti-diabetic [4-7]. Charantin (fig. 1), an active constituent in the fruits of this medicinal plant, has been reported to have potential hypoglycemic activity [8].

Many polyherbal formulations, consisting of charantin as the main ingredient as anti-diabetic, are available in local Indian markets. In the treatment of diabetes, it is common practice that herbal formulations are either taken with or without the knowledge of health care providers, by the patients for good therapeutic effects. This may lead to either useful or toxic effects. Increasing consumption of medicinal herbs, which are often administered in combination with conventional therapeutic drugs, constituents in herbal preparations may be substrates, inhibitors, or inducers of cytochrome P450 enzymes (CYPs) and have an impact on the pharmacokinetics and pharmacodynamics of any co-administered drugs metabolized by this system [9]. Many studies reported for interaction between Momordica charantia extract (MCE) with various synthetic drugs [10-13]. Unfortunately, not a single attempt has been done to investigate the interaction study of MC and it's one of the major constituent Charantin with NAT, after oral administration in rats. Previously reported literature is present for the bioanalytical method for determining NAT in rats and humans [14-18]. However, there is no analytical method is available for simultaneous estimation of Charantin and NAT. Prompted by the above findings, an attempt to develop a new validated HPLC method for simultaneous determination of Charantin and NAT in rat plasma and application of the developed method for pharmacokinetic study in rats has been done. The study aimed to investigate the herb-drug interactions of MCE and Charantin with NAT by comparing their pharmacokinetic profiles after oral administration in rats.

MATERIALS AND METHODS

Chemicals and reagents

Plant extract

MCE was purchased from Green Heaven Pvt. Ltd, Nagpur (Batch No.:FC/BME/130417/1). All the tests like identification, moisture, acid-insoluble ash, bulk density, tapped bulk density, heavy metals, microbiology test, residual solvent analysis, pesticide residue analysis, and phytochemical analysis were within limits.

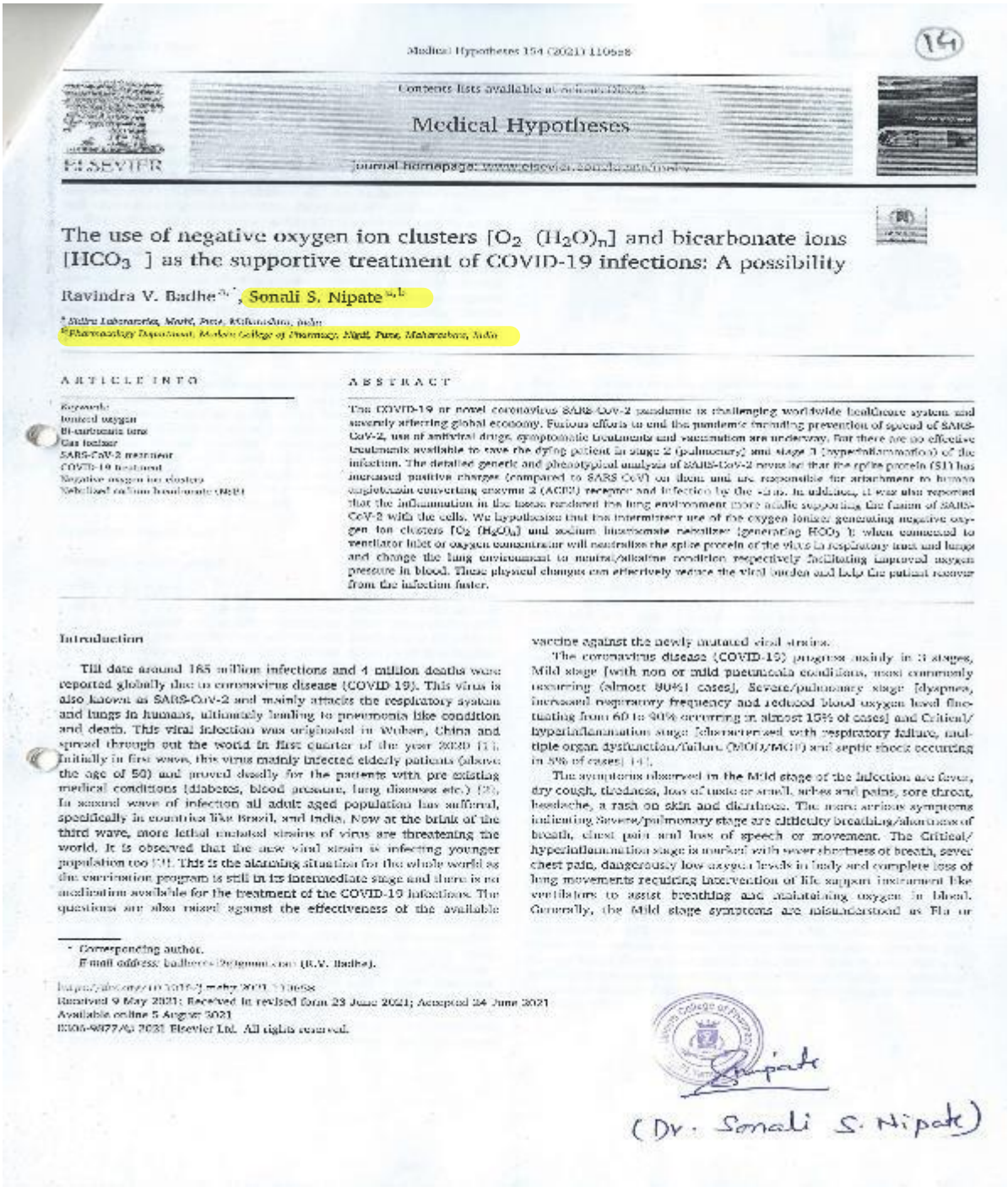
Chemicals

Charantin was purchased from Green Heaven Pvt. Ltd, Nagpur; Nateglinide and Repaglinide were procured from Yarrow Chem. Products, Mumbai.

Animals

Six female Wistar rats weighing 180–200 gm were purchased from the National Institute of Biosciences. The rats were kept in room temperatures (25±2 °C) with 12 h night cycles (12h/12h). The animals had free access to food and water. After acclimatization for

The use of negative oxygen ion clusters [O2−(H2O) n] and bicarbonate ions [HCO3−] as the supportive treatment of COVID- 19 infections: A Possibility



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The use of negative oxygen ion clusters [O_2 $(H_2O)_n$] and bicarbonate ions [HCO_3] as the supportive treatment of COVID-19 infections: A possibility

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Nebulized sodium bicarbonate (NEB)

ABSTRACT

The COVID-19 or novel coronavirus SARS-CoV-2 pandemic is challenging worldwide healthcare system and severely affecting global economy. Furious efforts to end the pandemic including prevention of spread of SARS-CoV-2, use of antiviral drugs, symptomatic treatments and vaccination are underway, but there are no effective treatments available to save the dying patient in stage 2 (pulmonary) and stage 3 (hyperinflammation) of the infection. The detailed genetic and phenotypical analysis of SARS-CoV-2 revealed that the spike protein (S1) has increased positive charges (compared to SARS CoV) on them and are responsible for attachment to human angiotensin converting enzyme 2 (ACE2) receptor and infection by the virus. In addition, it was also reported that the inflammation in the lungs rendered the lung environment more acidic supporting the fusion of SARS-CoV-2 with the cells. We hypothesize that the intermittent use of the oxygen ionizer generating negative oxygen ion clusters [O_2 $(H_2O)_n$] and sodium bicarbonate nebulizer [generating HCO_3^-] when connected to ventilator inlet or oxygen concentrator will neutralize the spike protein of the virus in respiratory tract and lungs and change the lung environment to neutral/alkaline condition respectively facilitating improved oxygen pressure in blood. These physical changes can effectively reduce the viral burden and help the patient recover from the infection faster.

Introduction

Till date around 185 million infections and 4 million deaths were reported globally due to coronavirus disease (COVID-19). This virus is also known as SARS-CoV-2 and mainly attacks the respiratory system and lungs in humans, ultimately leading to pneumonia like condition and death. This viral infection was originated in Wuhan, China and spread through out the world in first quarter of the year 2020 [1]. Initially in first wave, this virus mainly infected elderly patients (above the age of 50) and proved deadly for the patients with pre existing medical conditions (diabetes, blood pressure, lung diseases etc.) [2]. In second wave of infection all adult aged population has suffered, specifically in countries like Brazil, and India. Now at the brink of the third wave, more lethal mutated strains of virus are threatening the world. It is observed that the new viral strain is infecting younger population too [3]. This is the alarming situation for the whole world as the vaccination program is still in its intermediate stage and there is no medication available for the treatment of the COVID-19 infections. The questions are also raised against the effectiveness of the available vaccine against the newly mutated viral strains.

The coronavirus disease (COVID-19) progress mainly in 3 stages, Mild stage [with non or mild pneumonia conditions, most commonly occurring (almost 80%) cases], Severe/pulmonary stage [dyspnea, increased respiratory frequency and reduced blood oxygen level fluctuating from 60 to 90% occurring in almost 15% of cases] and Critical/hyperinflammation stage [characterized with respiratory failure, multiple organ dysfunction/failure (MODS/MOF) and septic shock occurring in 5% of cases] [4].

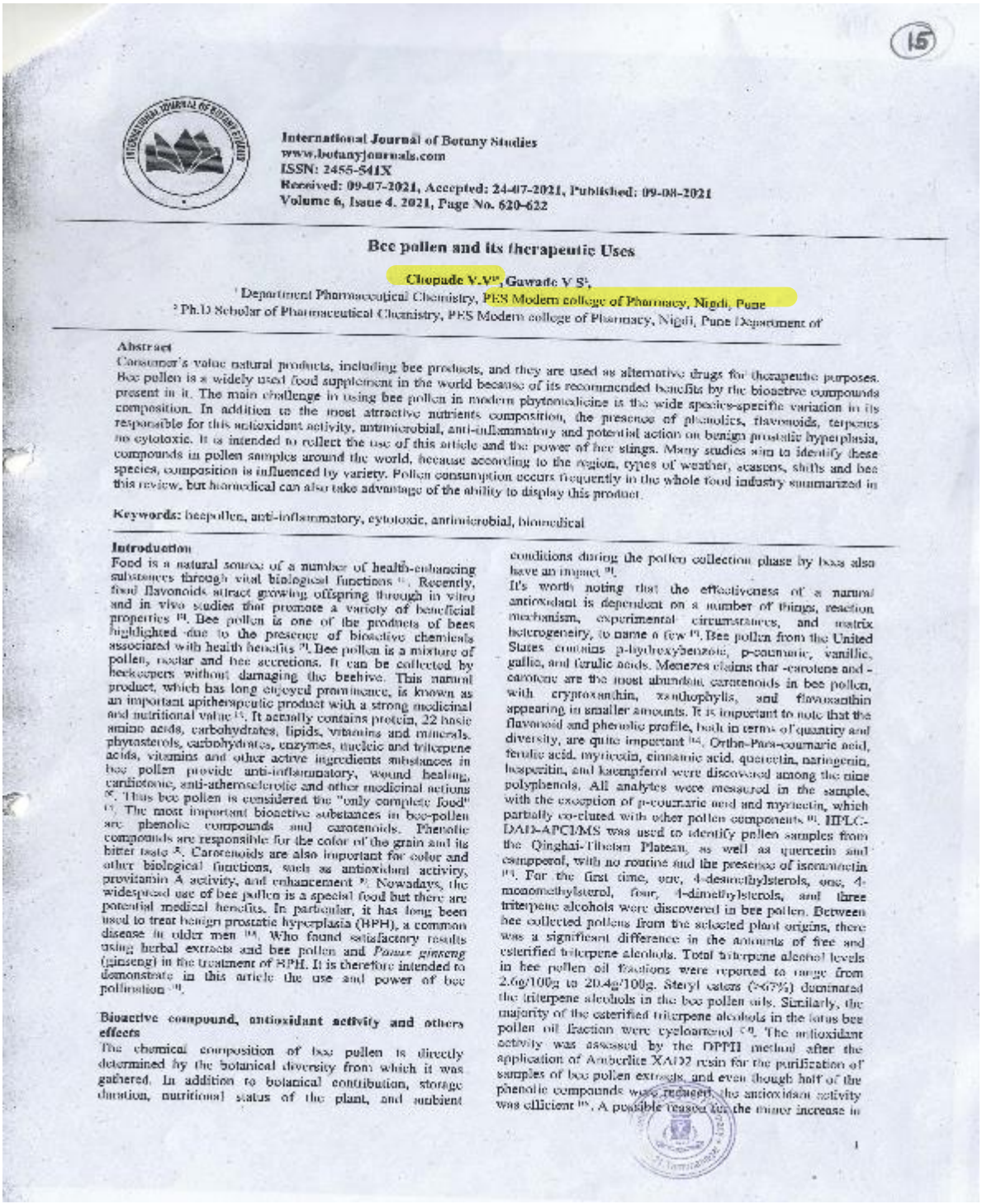
The symptoms observed in the Mild stage of the infection are fever, dry cough, tiredness, loss of taste or smell, aches and pains, sore throat, headache, a rash on skin and diarrhoea. The more serious symptoms indicating Severe/pulmonary stage are difficulty breathing/shortness of breath, chest pain and loss of speech or movement. The Critical/hyperinflammation stage is marked with severe shortness of breath, severe chest pain, dangerously low oxygen levels in body and complete loss of lung movements requiring intervention of life support instrument like ventilators to assist breathing and maintaining oxygen in blood. Generally, the Mild stage symptoms are misunderstood as Flu or

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(Dr. Sonali S. Nipate)

Bee pollen and its therapeutic Uses



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Bee pollen and its therapeutic Uses

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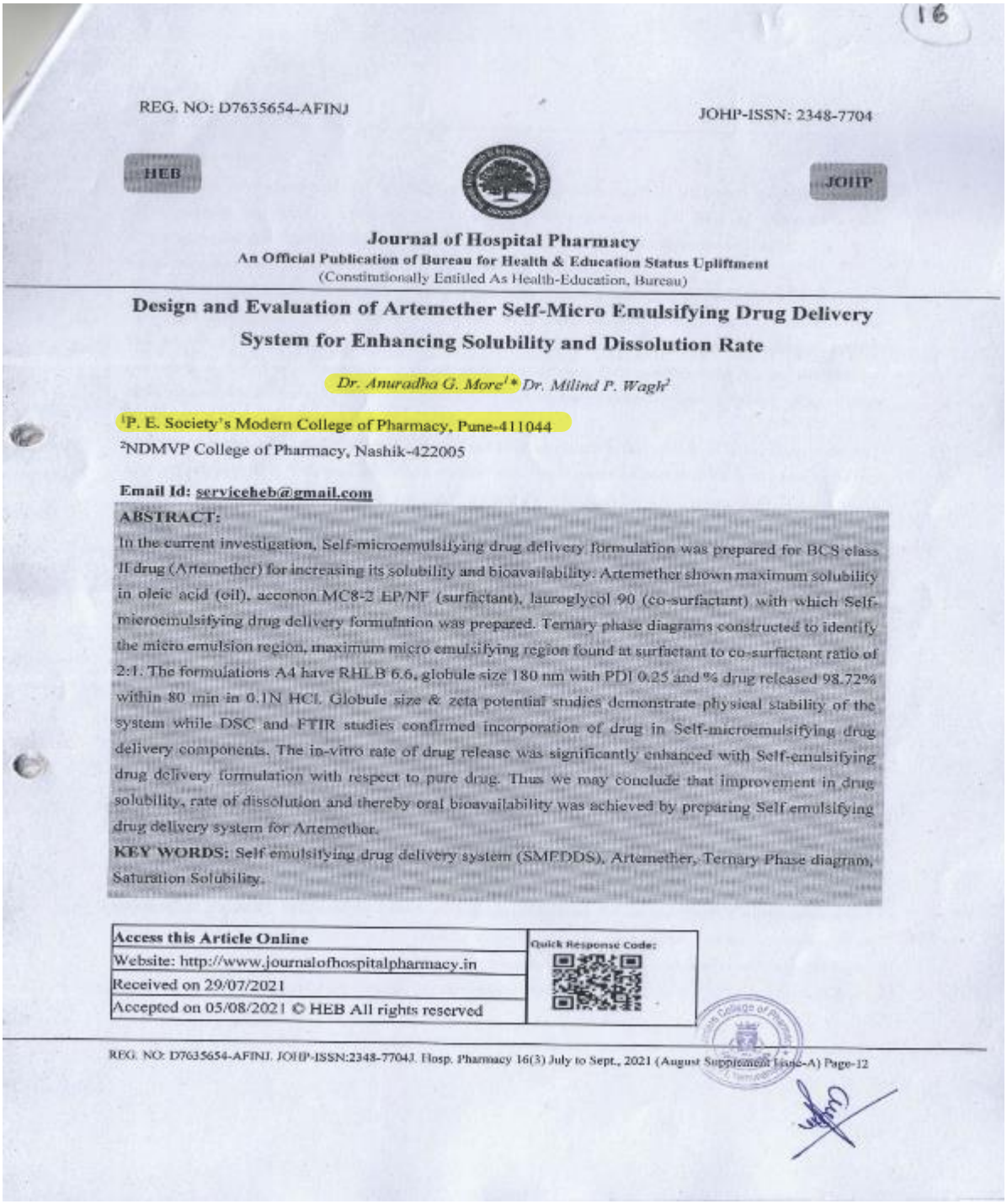
Abstract
Consumer's value natural products, including bee products, and they are used as alternative drugs for therapeutic purposes. Bee pollen is a widely used food supplement in the world because of its recommended benefits by the bioactive compounds present in it. The main challenge in using bee pollen in modern phytomedicine is the wide species-specific variation in its composition. In addition to the most attractive nutrients composition, the presence of phenolics, flavonoids, terpenes responsible for this antioxidant activity, antimicrobial, anti-inflammatory and potential action on benign prostatic hyperplasia, no cytotoxic. It is intended to reflect the use of this article and the power of bee stings. Many studies aim to identify these compounds in pollen samples around the world, because according to the region, types of weather, seasons, shifts and bee species, composition is influenced by variety. Pollen consumption occurs frequently in the whole food industry summarized in this review, but biomedical can also take advantage of the ability to display this product.

Keywords: beepollen, anti-inflammatory, cytotoxic, antimicrobial, biomedical

Introduction
Food is a natural source of a number of health-enhancing substances through vital biological functions [1]. Recently, food flavonoids attract growing offspring through in vitro and in vivo studies that promote a variety of beneficial properties [2]. Bee pollen is one of the products of bees highlighted due to the presence of bioactive chemicals associated with health benefits [3]. Bee pollen is a mixture of pollen, nectar and bee secretions. It can be collected by beekeepers without damaging the beehive. This natural product, which has long enjoyed prominence, is known as an important apitherapeutic product with a strong medicinal and nutritional value [4]. It actually contains protein, 22 basic amino acids, carbohydrates, lipids, vitamins and minerals, phytosterols, carbohydrates, enzymes, nucleic and triterpene acids, vitamins and other active ingredients substances in bee pollen provide anti-inflammatory, wound healing, cardiotonic, anti-atherosclerotic and other medicinal actions [5]. Thus bee pollen is considered the "only complete food" [6]. The most important bioactive substances in bee-pollen are phenolic compounds and carotenoids. Phenolic compounds are responsible for the color of the grain and its bitter taste [7]. Carotenoids are also important for color and other biological functions, such as antioxidant activity, provitamin A activity, and enhancement [8]. Nowadays, the widespread use of bee pollen is a special food but there are potential medical benefits. In particular, it has long been used to treat benign prostatic hyperplasia (BPH), a common disease in older men [9]. Who found satisfactory results using herbal extracts and bee pollen and *Panax ginseng* (ginseng) in the treatment of BPH. It is therefore intended to demonstrate in this article the use and power of bee pollination [10].

Bioactive compound, antioxidant activity and others effects
The chemical composition of bee pollen is directly determined by the botanical diversity from which it was gathered. In addition to botanical contribution, storage duration, nutritional status of the plant, and ambient conditions during the pollen collection phase by bees also have an impact [9].
It's worth noting that the effectiveness of a natural antioxidant is dependent on a number of things, reaction mechanism, experimental circumstances, and matrix heterogeneity, to name a few [9]. Bee pollen from the United States contains p-hydroxybenzoic, p-coumaric, vanillic, gallic, and ferulic acids. Menezes claims that -carotene and -carotene are the most abundant carotenoids in bee pollen, with cryptoxanthin, xanthophylls, and flavoxanthin appearing in smaller amounts. It is important to note that the flavonoid and phenolic profile, both in terms of quantity and diversity, are quite important [11]. Ortho-Para-coumaric acid, ferulic acid, myricetin, cinnamic acid, quercetin, naringenin, hesperitin, and kaempferol were discovered among the nine polyphenols. All analytes were measured in the sample, with the exception of p-coumaric and and myricetin, which partially co-eluted with other pollen components [9]. HPLC-DAD-APCIMS was used to identify pollen samples from the Qinghai-Tibetan Plateau, as well as quercetin and campperol, with no routine and the presence of isorhamnetin [12]. For the first time, one, 4-desmethylsterols, one, 4-monomethylsterol, four, 4-dimethylsterols, and three triterpene alcohols were discovered in bee pollen. Between bee collected pollens from the selected plant origins, there was a significant difference in the amounts of free and esterified triterpene alcohols. Total triterpene alcohol levels in bee pollen oil fractions were reported to range from 2.6g/100g to 20.4g/100g. Steryl esters (>67%) dominated the triterpene alcohols in the bee pollen oils. Similarly, the majority of the esterified triterpene alcohols in the lotus bee pollen oil fraction were cycloartenol [13]. The antioxidant activity was assessed by the DPPH method after the application of Amberlite XAD2 resin for the purification of samples of bee pollen extracts, and even though half of the phenolic compounds were reduced, the antioxidant activity was efficient [14]. A possible reason for the minor increase in

Design and evaluation of artemether self-micro emulsifying drug delivery system for enhancing solubility and dissolution rate



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Design and Evaluation of Artemether Self-Micro Emulsifying Drug Delivery System for Enhancing Solubility and Dissolution Rate

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ABSTRACT:

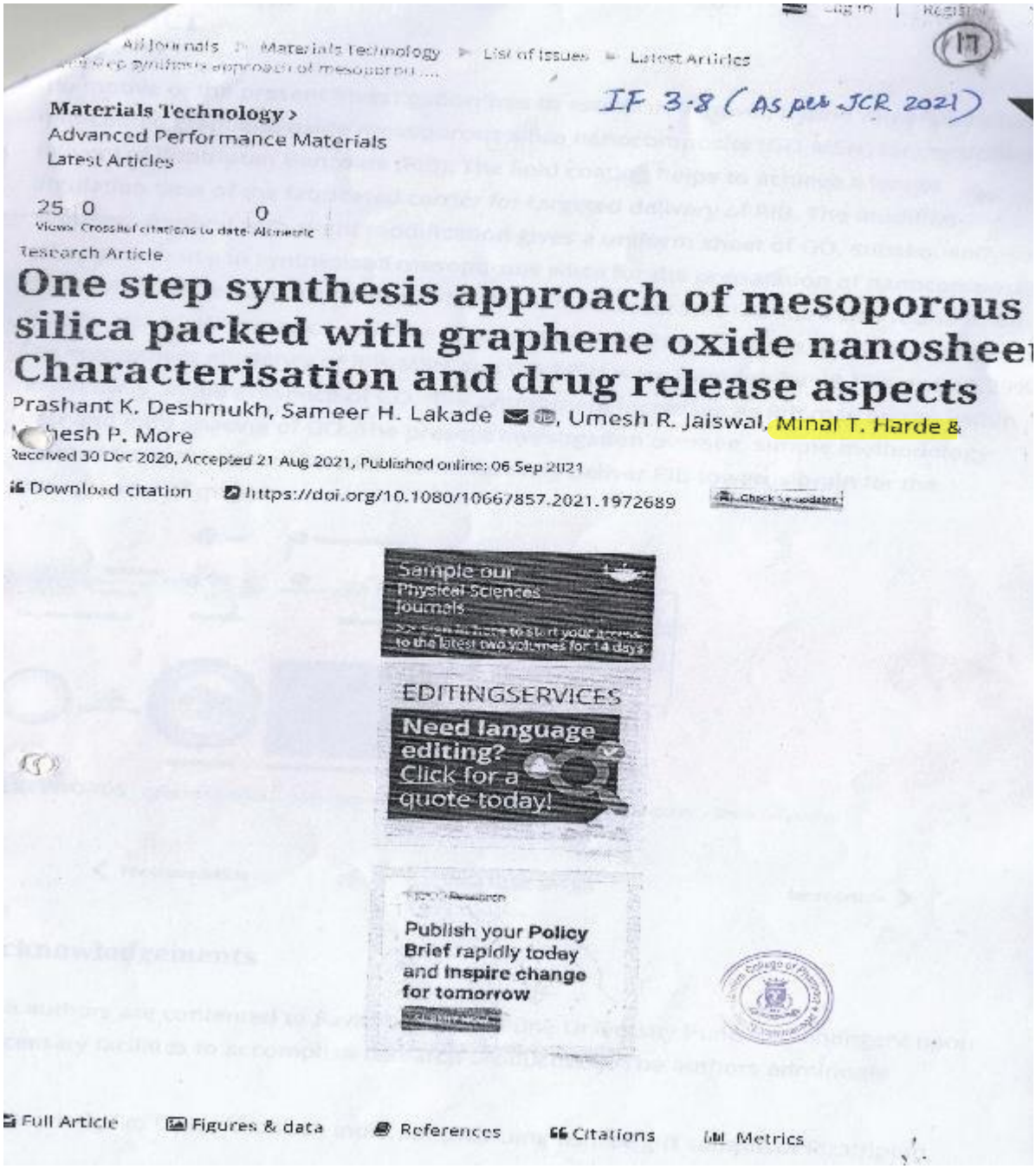
In the current investigation, Self-microemulsifying drug delivery formulation was prepared for BCS class II drug (Artemether) for increasing its solubility and bioavailability. Artemether shown maximum solubility in oleic acid (oil), acconon MC8-2 EP/NF (surfactant), lauroglycol 90 (co-surfactant) with which Self-microemulsifying drug delivery formulation was prepared. Ternary phase diagrams constructed to identify the micro emulsion region, maximum micro emulsifying region found at surfactant to co-surfactant ratio of 2:1. The formulations A4 have RHLB 6.6, globule size 180 nm with PDI 0.25 and % drug released 98.72% within 80 min in 0.1N HCl. Globule size & zeta potential studies demonstrate physical stability of the system while DSC and FTIR studies confirmed incorporation of drug in Self-microemulsifying drug delivery components. The in-vitro rate of drug release was significantly enhanced with Self-emulsifying drug delivery formulation with respect to pure drug. Thus we may conclude that improvement in drug solubility, rate of dissolution and thereby oral bioavailability was achieved by preparing Self emulsifying drug delivery system for Artemether.

KEY WORDS: Self emulsifying drug delivery system (SMEDDS), Artemether, Ternary Phase diagram, Saturation Solubility.

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One-step synthesis approach of mesoporous silica packed with graphene oxide nanosheet: Characterization and drug release aspects



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Research Article

One step synthesis approach of mesoporous silica packed with graphene oxide nanosheet Characterisation and drug release aspects

Prashant K. Deshmukh, Sameer H. Lakade, Umesh R. Jaiswal, Minal T. Harde & Umesh P. More

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Blowfly maggots and their application in human

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Blowfly maggots and their application in human

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Abstract
Maggot has been hailed as the miraculous "medicinal maggot" in the last decade for its diverse properties maggots have so many beneficial properties, their popularity has skyrocketed. Greenbottle blowflies (*Lucilia illustris*; Meigen, *L. sericata*; Meigen) and blackbottle blowflies (*Phaenia regina*; Meigen) are two types of blowfly maggots used in maggot therapy (Diptera: Calliphoridae). While there is a lot of clinical evidence to show that maggots work as debridement agents, there hasn't been a lot of emphasis on the basic science evidence, which is a combination of physical and biochemical actions. It's used to treat pressure ulcers, diabetic ulcers, neurovascular and vascular ulcers, osteomyelitis, postsurgical wound infections, and burns, among other traumatic wounds. Maggots have recently been created, marketed, and delivered to hospitals as a medical device for use in medicine. In comparison to other conventional therapies, there is still limited research on the effectiveness of maggot therapy. Because of the low cost and quick debridement of dead tissue, maggot therapy should be recommended in hospitals.

Keywords: blowfly maggots, greenbottle blowflies, blackbottle blowflies, osteomyelitis, maggot therapy

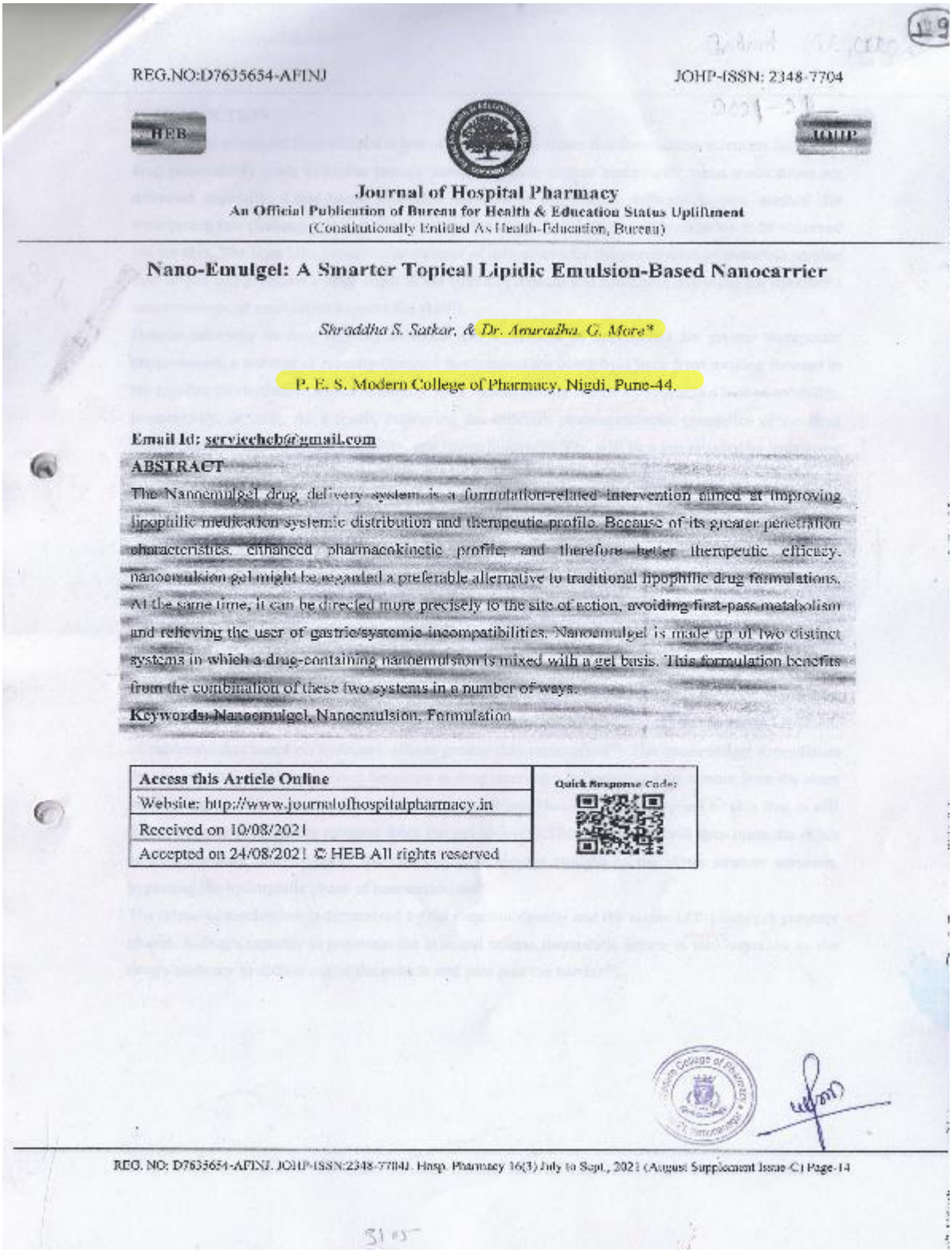
Introduction

For decades, non-healing soft tissue wounds have been treated using maggot therapy [1], also known as maggot debridement therapy (MDT), larval therapy, larvae therapy, bio-debridement, or biosurgery, which is used to treat chronic wounds [3, 4, 5]. It was eradicated for a while due to improved surgical procedures and antibiotics. It has recently made a comeback and inspected medicinal maggots [1]. By generating antimicrobial [15] peptides, maggots are preferred to kill and hinder the growth of many harmful bacteria [3, 5]. Live sterile maggots are preserved in soft wounds of animals and humans for the elimination of dead tissue and disinfection in this therapy [20]. Maggot therapy has three advantages: necrotic tissue debridement, tissue granulation, and wound antiseptic due to maggot antimicrobial activity [4, 6, 28]. The three kinds of blowflies employed in maggot therapy (Diptera: Calliphoridae). Greenbottle blowflies (*Lucilia illustris*; Meigen, *L. sericata*; Meigen) and blackbottle blowflies (*Phaenia regina*; Meigen) are the species in question [5, 8, 11, 14, 19, 21]. Adult flies from all three species are kept in incubators at a temperature of 26.7°C and a relative humidity of 40-60%. Flyrogues do not need to be sterilised, but they should be kept clean. The flies are given a diluted honey and yeast mixture, sugar, or sliced bananas. Flies lay eggs on a piece of beef, and roughly 100 fly colonies lay 1000 eggs per day. Eggs are sterilised with a 10% formalin, or mercuric chloride, alcohol, and hydrochloric acid solution. The larvae are then housed in a sterilised food supply for 24 days before hatching and growing for 7 days. We employed larvae that had been developing for two days for maggot therapy. 200-400 larvae are deposited at the wound site [5, 11, 17, 24, 33]. A dose of 5-10 maggots/cm^2 of wound surface area is used in human medicine. A dose of 5-10 maggots/cm^2 and 8-12 maggots/cm^2 of wound surface area are used in veterinary medicine [9]. The average larva consumes 10-15 grammes of dead tissue per day. Stop feeding the larvae after 4-5 days, when they are fully grown. They are removed from the wound and replaced with a new cluster of larvae. This procedure is performed three to four times [9]. At the wound site, maggots release a mix of proteolytic enzymes (carboxypeptidases A and B, leucine aminopeptidase, collagenase, and serine proteases), which remove dead tissue, bacteria, and foreign debris. The production of sodium bicarbonate by maggots prevents bacteria from growing [9, 12, 24]. They also get rid of calcium carbonate, which helps in phagocytosis [11]. There are two methods for applying maggots to wounds: one is to apply maggots directly to the site, and the other is to use a maggot containing bag with limes to produce an optimal environment for maggots [25, 26, 29].

Therapeutic Application of Blowfly Larvae in the Treatment of Osteomyelitis and Venous Ulcers

In the United States, maggot therapy was employed a few decades ago. Blowfly larvae (Diptera: Calliphoridae) were used to treat osteomyelitis (bone infection) [9, 7, 10]. Osteomyelitis is a bone and bone marrow inflammation. It is a sign of infection that is produced primarily by bacteria, but can also be caused by fungus, parasites, and other microorganisms [5, 7]. Urea and allantoin, which are excreted by maggots, are important in the treatment of osteomyelitis because they reduce secondary infections [11, 16]. An 88-year-old woman was referred to the Emergency Room of San Francisco General Hospital Medical Center with a fluid tumour from a local convalescent hospital. This face tumour was treated using blowfly larvae. 89 individuals with osteomyelitis were treated with blowfly larvae maggots in 1930 [23]. A 74-year-old man was treated with blowfly maggots for venous ulcers [25].

Nano Emulgel: A Smarter Topical Lipidic Emulsion Based Nanocarrier



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Nano-Emulgel: A Smarter Topical Lipidic Emulsion-Based Nanocarrier

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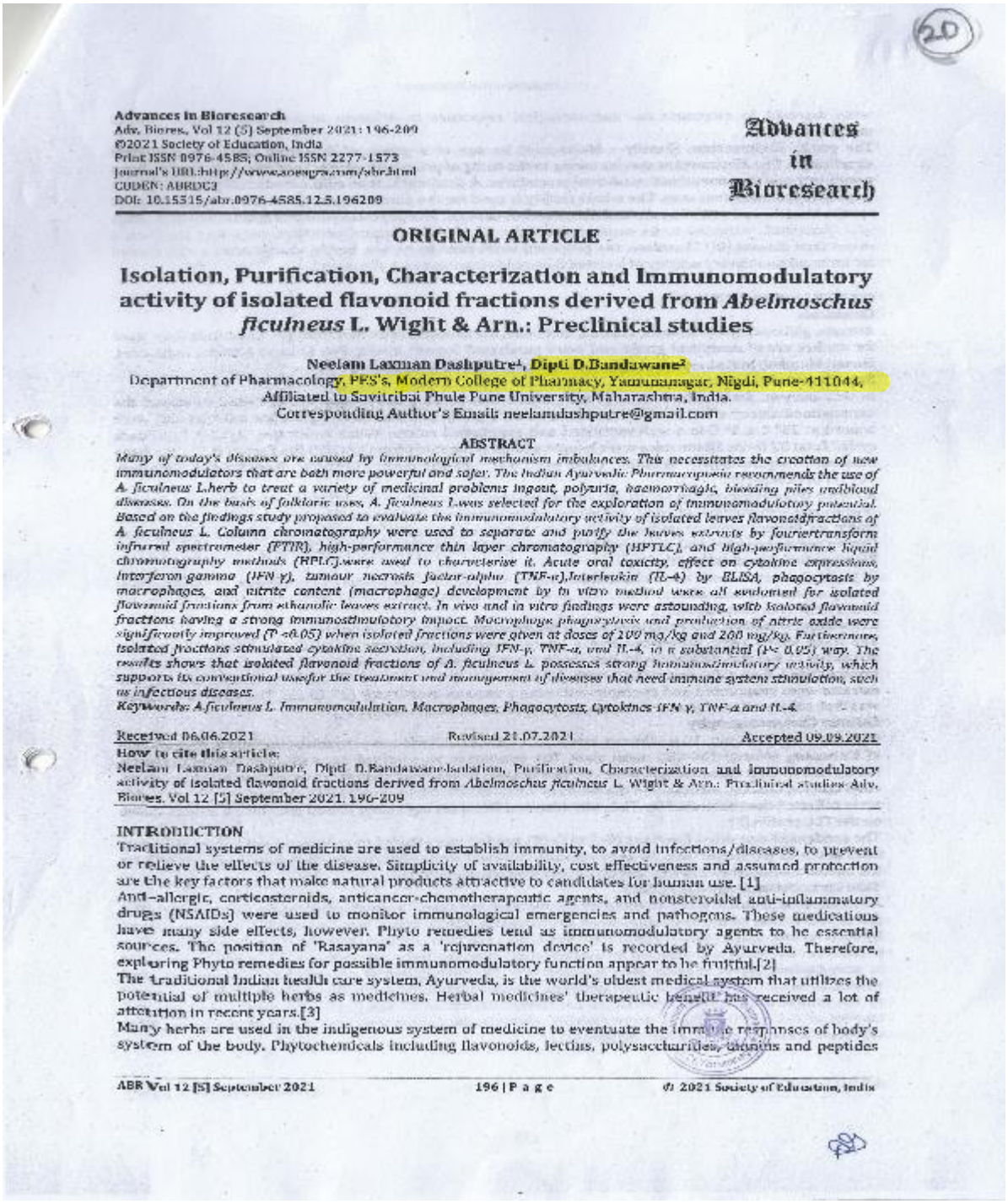
ABSTRACT

The Nanoemulgel drug delivery system is a formulation-related intervention aimed at improving lipophilic medication systemic distribution and therapeutic profile. Because of its greater penetration characteristics, enhanced pharmacokinetic profile, and therefore better therapeutic efficacy, nanoemulsion gel might be regarded a preferable alternative to traditional lipophilic drug formulations. At the same time, it can be directed more precisely to the site of action, avoiding first-pass metabolism and relieving the user of gastric/systemic incompatibilities. Nanoemulgel is made up of two distinct systems in which a drug-containing nanoemulsion is mixed with a gel basis. This formulation benefits from the combination of these two systems in a number of ways.

Keywords: Nanoemulgel, Nanoemulsion, Formulation

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Isolation, Purification, Characterization and Immunomodulatory activity of isolated flavonoid fractions derived from Abelmoschus



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ORIGINAL ARTICLE

Isolation, Purification, Characterization and Immunomodulatory activity of isolated flavonoid fractions derived from *Abelmoschus ficulneus* L. Wight & Arn.: Preclinical studies

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ABSTRACT

Many of today's diseases are caused by immunological mechanism imbalances. This necessitates the creation of new immunomodulators that are both more powerful and safer. The Indian Ayurvedic Pharmacopoeia recommends the use of A. ficulneus L.herb to treat a variety of medicinal problems ingoit, polyuria, haemorrhagic, bleeding piles medicinal diseases. On the basis of folkloric uses, A. ficulneus L.was selected for the exploration of immunomodulatory potential. Based on the findings study proposed to evaluate the immunomodulatory activity of isolated leaves flavonoidfractions of A. ficulneus L. Column chromatography were used to separate and purify the leaves extracts by fouriertransform infrared spectrometer (FTIR), high-performance thin layer chromatography (HPTLC), and high-performance liquid chromatography methods (RPLC).were used to characterize it. Acute oral toxicity, effect on cytokine expressions, Interferon gamma (IFN-γ), tumour necrosis factor-alpha (TNF-α),Interleukin (IL-4) by ELISA, phagocytosis by macrophages, and nitrite content (macrophage) development by in vitro method were all evaluated for isolated flavonoid fractions from ethanolic leaves extract. In vivo and in vitro findings were astounding, with isolated flavonoid fractions having a strong immunostimulatory impact. Macrophage phagocytosis and production of nitric oxide were significantly improved ($P<0.05$) when isolated fractions were given at doses of 100 mg/kg and 200 mg/kg. Furthermore, isolated fractions stimulated cytokine secretion, including IFN-γ, TNF-α, and IL-4, in a substantial ($P< 0.05$) way. The results shows that isolated flavonoid fractions of A. ficulneus L. possesses strong immunostimulatory activity, which supports its conventional useFor the treatment and management of diseases that need immune system stimulation, such as infectious diseases.

Keywords: *A.ficulneus L. Immunomodulation, Macrophages, Phagocytosis, Cytokines IFN γ, TNF-α and IL-4*

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INTRODUCTION

Traditional systems of medicine are used to establish immunity, to avoid infections/diseases, to prevent or relieve the effects of the disease. Simplicity of availability, cost effectiveness and assumed protection are the key factors that make natural products attractive to candidates for human use. [1]
Anti-allergic, corticosteroids, anticancer-chemotherapeutic agents, and nonsteroidal anti-inflammatory drugs (NSAIDs) were used to monitor immunological emergencies and pathogens. These medications have many side effects, however. Phyto remedies tend as immunomodulatory agents to be essential sources. The position of 'Rasayana' as a 'rejuvenation device' is recorded by Ayurveda. Therefore, exploring Phyto remedies for possible immunomodulatory function appear to be fruitful.[2]
The traditional Indian health care system, Ayurveda, is the world's oldest medical system that utilizes the potential of multiple herbs as medicines. Herbal medicines' therapeutic benefit has received a lot of attention in recent years.[3]
Many herbs are used in the indigenous system of medicine to eventuate the immune responses of body's system of the body. Phytochemicals including flavonoids, lectins, polysaccharides, tannins and peptides

Exploration of antidiabetic potential of arial parts of Abutilon indicum Linn in streptozotocin-nicotinamide induced diabetes in rats

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Exploration of Antidiabetic potential of aerial parts of *Abutilon indicum* Linn in streptozotocin- nicotinamide induced diabetes in rats

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Abstract

Present study was carried out to investigate Antidiabetic activity of ethyl acetate fraction of aerial parts of *Abutilon indicum* L. (EAAI) in streptozotocin induced early diabetic nephropathy in rats, to focus on its possible mode of action and identification of possible phytoconstituents responsible for the proposed activity. Experimental diabetes was induced in Wistar rats by single intraperitonial injection of streptozotocin (65 mg/kg). Animals were divided in six groups (n=6) and treated with variable doses of EAAI for 4 weeks. Fasting blood glucose was measured at 0, 7th, 14th, 21st, 28th day of the study. At the end of 4 weeks, oral glucose tolerance test (OGTT), lipid profile, glycosylated haemoglobin, was determined. Antioxidant enzymes of liver were evaluated. Pancreas of experimental animals was examined to determine structural changes. Further, EAAI was also analysed for its phytochemical composition using various qualitative and quantitative methods.

Daily oral administration of EAAI for 28 days to diabetic rats produced significant decrease in fasting blood glucose, lipid profile, and liver enzymes. Where as significant improvement in glycosylated haemoglobin, oxidative stress parameters of liver has been observed in EAAI treated diabetic rats. Histopathology of pancreas tissue showed structural improvement.

The results of our study demonstrate Antidiabetic potential of aerial parts of *Abutilon indicum* L. justifying its use in the indigenous system of medicine.

Keywords: Streptozotocin, *Abutilon Indicum*, Hyperglycaemia, Oxidative stress, Antioxidants, Quercetin

1. INTRODUCTION

Diabetes mellitus (DM) is an endocrine disorder marked by abnormalities in lipid, carbohydrates, and protein metabolism and it is characterized by hyperglycaemia and glycosuria. Decreased insulin secretion or absence of insulin in blood is mainly responsible for diabetes mellitus. Increased blood sugar it does not only cause hyperglycaemia but result in numerous complications which are grouped as acute, sub acute, or chronic; these include but are not limited to retinopathy, neuropathy, nephropathy, cardiovascular disorders, hypoglycaemia, diabetic ketoacidosis, hyperosmolar nonketotic syndrome, polydipsia, frequent urination, lack of vigour, ocular impairment, weight loss, and excessive eating (Fatai , 2016). The prevalence of type 2 diabetes mellitus (T2DM) is approaching epidemic proportions, and diabetes mellitus (DM) affects people of all ages. There has been a dramatic increase in the prevalence of DM over the past 30 years; while previously, far fewer adults (and rarely children) were affected by this condition, mostly because obesity and physical inactivity were not as pervasive (Nissa, 2012). Current research is focused on the development of newer drug leads from phytoconstituents of medicinal plants which have been used in traditional practices, so as to get more potential and effective agents with lesser side effects than existing hypoglycaemic agents.

Abutilon indicum (Linn.) sweet (Malvaceae) commonly called 'Country Mallow' is a perennial plant up to 3 m in height. *Abutilon Indicum* abundantly found as a weed thought out the tropical parts of India (Reyad, 2015). The plant is used in the traditional system of medicine for hypoglycemic, hepatoprotective, antimicrobial, male contraceptive, antidiarrheal activities, astringent, antibacterial, anthelmintic, carminative and diuretic. It is used locally for colds, high fever, mumps, tuberculosis, bronchitis, diabetes, carbuncle, haemorrhoids, hernia, diarrhoea and various types of

Challenges, Advances, and Opportunities of Herbal Medicines in Wound Healing: A Review

Int. J. Pharm. Sci. Rev. Res., 71(1), November - December 2021; Article No. 15, Pages: 125-136 ISSN 0976 – 044X

Review Article

Challenges, Advances and Opportunities of Herbal Medicines in Wound Healing: A Review

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ABSTRACT

A large portion of the world's population relies on herbs for medical purposes today. About 25-30% of modern drugs are chemical intermediates derived from plant constituents. Traditional medicinal plant preparations are frequently utilised for wound healing, encompassing a wide range of skin related disorders. In wound management, herbal medicine entails cleaning, debridement, and the creation of an environment that promotes natural healing. This review discusses wound, healing of the wound, allopathic treatment in wound healing, types of herbal medicines used in the treatment of wound healing and common excipients used in topical herbal formulations. In this article, we look at 15 plants that have been utilised as wound healers in traditional medicine around the world. This study is an attempt to search the difficulties and challenges of herbal formulations need for novel drug delivery system nanocarriers for herbal remedies with other nanotechnology strategies and techniques as a new drug delivery system and its future prospective. The purpose of this review is to examine the most common excipients used in herbal formulations, as well as various medicinal plants traditionally used in wound healing, wound healing difficulties and challenges, the use of nanotechnology in herbal formulation, the future scope of herbal medicines in wound healing, and a comparison of allopathy and herbal formulations.

Keywords: Herbal medicine; Traditional medicine; Skin; Wound; Wound healing; Herbal medicine in wound healing.

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INTRODUCTION

Skin is the largest organ of the body. Skin performs some major functions like protection from external harm or physical injury, regulation of body temperature and sensation to stimuli. It performs several roles, and any damage or injury increases the organism's sensitivity to additional biological and physical risks, resulting in the wound. The wound is an injury to the body that necessitates the cracking of the skin and thereby harms the underlying tissue[1].

HEALING OF WOUND

Healing is a complicated and time-consuming process of restoring cell structure and tissue layers that can take place in two ways:

a) Regeneration – It is a process of renewal of the extinct tissue by a like tissue.

b) Repair – It's the process of replacing the lost/damaged tissue with new granulation tissue. This granulation tissue fully develops to form the scar tissue. Healing of the wound includes the following phases: Haemostasis, Inflammatory Phase, Proliferation or Granulation, Remodelling and Scar Formation[2].

1) Haemostasis

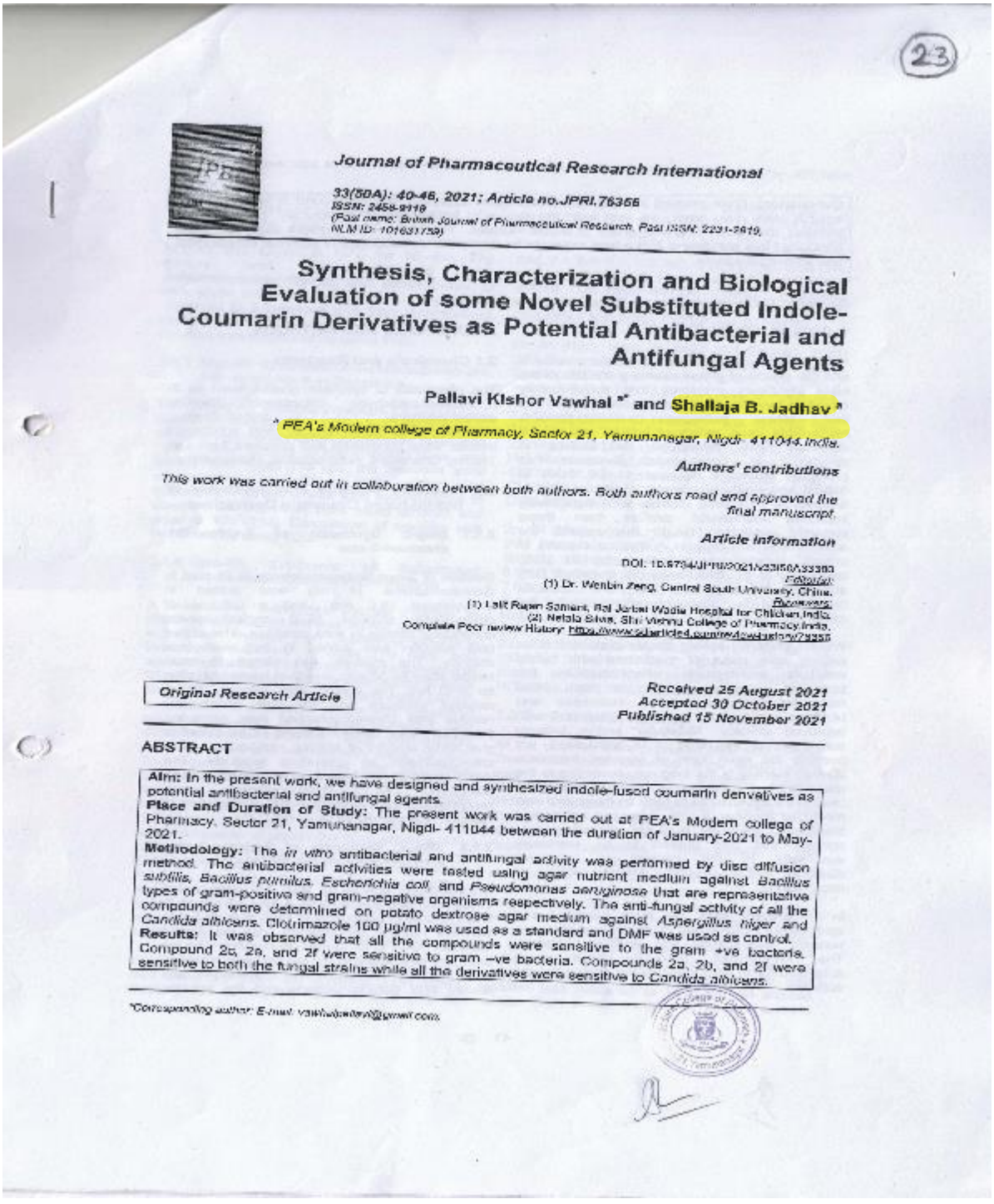
Haemostasis is the first phase of wound healing, which involves the sealing of ruptured blood vessels with the help of platelets to heal the wound. Platelets secrete vasoconstrictor chemicals to aid in the sealing process by producing a stable clot that seals off the injured blood vessels. In the presence of Adenosine Di Phosphate (ADP), platelets clump together and attach to the exposed collagen. Thrombin initiates the synthesis of fibrin from fibrinogen. Platelet-derived growth factor (PDGF), which is secreted by platelets, initiates the following steps. Except in the case of any clotting disorders, hemostasis occurs immediately after the initial injury.

2) Inflammation Phase

The inflammatory phase is the second phase in wound healing. It is the body's physiological response to prevent or stop the bleeding to heal a wound. Following the initial wounding, the blood vessel in the wound area contracts and a thick clot forms. After hemostasis, blood arteries dilate, allowing antibodies, growth factors, vital cells, and WBC to reach the damaged area thus, exudate levels rise. Hence the neighboring skin should be examined for the signs of softening and breaking down. During this phase, the typical signs of inflammation such as aberrant redness of the skin, heat, swelling, pain, and functional dysfunction might be visible. Neutrophils and Macrophages are two types of phagocytic cells that play an important part in necrotic tissue autolysis. The secretion of growth factors like FGF, EGF and IL-1 also occur during this stage.

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Synthesis, Characterization, and Biological Evaluation of some Novel Substituted Indole-Coumarin Derivatives as Potential Antibacterial and Antifungal Agents



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Synthesis, Characterization and Biological Evaluation of some Novel Substituted Indole-Coumarin Derivatives as Potential Antibacterial and Antifungal Agents

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aim: In the present work, we have designed and synthesized indole-fused coumarin derivatives as potential antibacterial and antifungal agents.

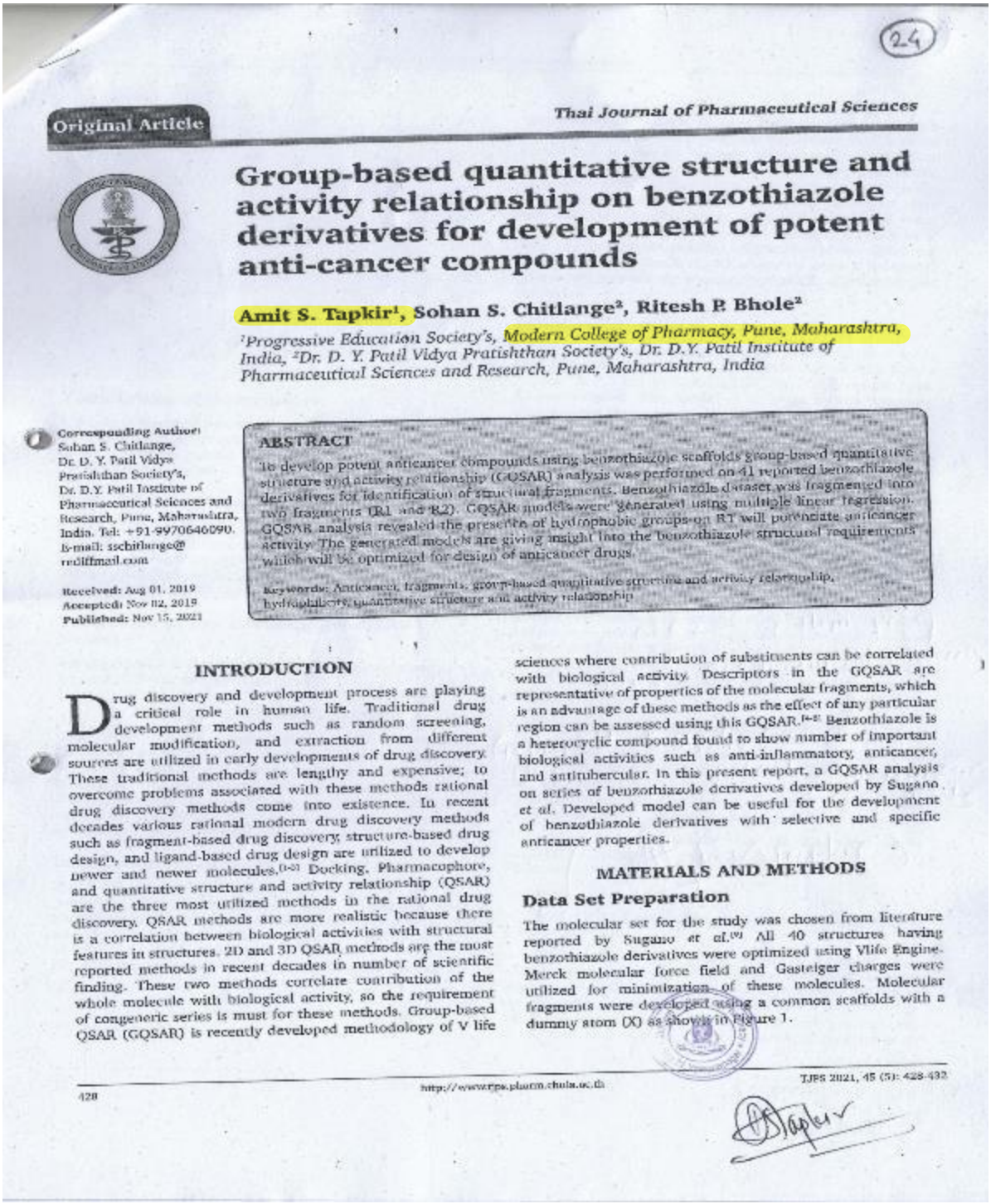
Place and Duration of Study: The present work was carried out at PEA's Modern college of Pharmacy, Sector 21, Yamunanagar, Nigdi- 411044 between the duration of January-2021 to May-2021.

Methodology: The *in vitro* antibacterial and antifungal activity was performed by disc diffusion method. The antibacterial activities were tested using agar nutrient medium against *Bacillus subtilis*, *Bacillus pumilus*, *Escherichia coli* and *Pseudomonas aeruginosa* that are representative types of gram-positive and gram-negative organisms respectively. The anti-fungal activity of all the compounds were determined on potato dextrose agar medium against *Aspergillus niger* and *Candida albicans*. Clotrimazole 100 µg/ml was used as a standard and DMF was used as control.

Results: It was observed that all the compounds were sensitive to the gram +ve bacteria. Compound 2b, 2e, and 2f were sensitive to gram –ve bacteria. Compounds 2a, 2b, and 2f were sensitive to both the fungal strains while all the derivatives were sensitive to *Candida albicans*.

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Group-based quantitative structure and activity relationship on benzothiazole derivatives for the development of potent anti- cancer compounds



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Original Article

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Group-based quantitative structure and activity relationship on benzothiazole derivatives for development of potent anti-cancer compounds

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ABSTRACT

To develop potent anticancer compounds using benzothiazole scaffolds group-based quantitative structure and activity relationship (GQSAR) analysis was performed on 41 reported benzothiazole derivatives for identification of structural fragments. Benzothiazole dataset was fragmented into two fragments (R1 and R2). GQSAR models were generated using multiple linear regression. GQSAR analysis revealed the presence of hydrophobic groups on R1 will potentiate anticancer activity. The generated models are giving insight into the benzothiazole structural requirements which will be optimized for design of anticancer drugs.

Keywords: Anticancer, fragments, group-based quantitative structure and activity relationship, hydrophobicity, quantitative structure and activity relationship

INTRODUCTION

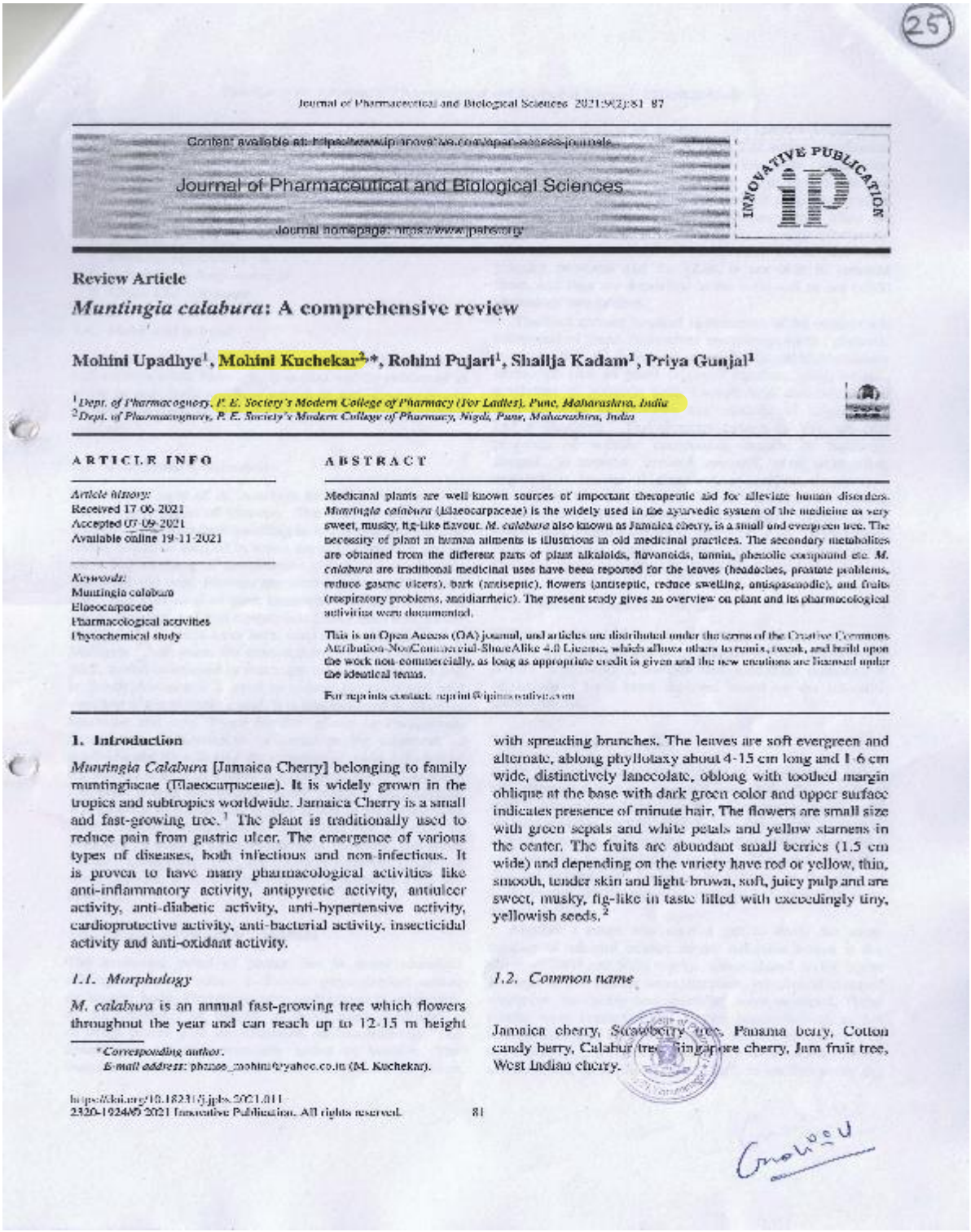
Drug discovery and development process are playing a critical role in human life. Traditional drug development methods such as random screening, molecular modification, and extraction from different sources are utilized in early developments of drug discovery. These traditional methods are lengthy and expensive; to overcome problems associated with these methods rational drug discovery methods come into existence. In recent decades various rational modern drug discovery methods such as fragment-based drug discovery, structure-based drug design, and ligand-based drug design are utilized to develop newer and newer molecules.[1-3] Docking, Pharmacophore, and quantitative structure and activity relationship (QSAR) are the three most utilized methods in the rational drug discovery. QSAR methods are more realistic because there is a correlation between biological activities with structural features in structures. 2D and 3D QSAR methods are the most reported methods in recent decades in number of scientific finding. These two methods correlate contribution of the whole molecule with biological activity, so the requirement of congeneric series is must for these methods. Group-based QSAR (GQSAR) is recently developed methodology of V life sciences where contribution of substituents can be correlated with biological activity. Descriptors in the GQSAR are representative of properties of the molecular fragments, which is an advantage of these methods as the effect of any particular region can be assessed using this GQSAR.[4-5] Benzothiazole is a heterocyclic compound found to show number of important biological activities such as anti-inflammatory, anticancer, and antituberculer. In this present report, a GQSAR analysis on series of benzothiazole derivatives developed by Sugano et al. Developed model can be useful for the development of benzothiazole derivatives with selective and specific anticancer properties.

MATERIALS AND METHODS

Data Set Preparation

The molecular set for the study was chosen from literature reported by Sugano et al.[6] All 40 structures having benzothiazole derivatives were optimized using Vlife Engine. Merck molecular force field and Gasteiger charges were utilized for minimization of these molecules. Molecular fragments were developed using a common scaffolds with a dummy atom (X) as shown in Figure 1.

Muntingia calabura: A comprehensive review



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Review Article

Muntingia calabura: A comprehensive review

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ABSTRACT

Medicinal plants are well known sources of important therapeutic aid for alleviate human disorders. *Muntingia calabura* (Elaeocarpaceae) is the widely used in the ayurvedic system of the medicine as very sweet, musky, fig-like flavour. *M. calabura* also known as Jamaica cherry, is a small and evergreen tree. The necessity of plant in human ailments is illustrious in old medicinal practices. The secondary metabolites are obtained from the different parts of plant alkaloids, flavonoids, tannin, phenolic compound etc. *M. calabura* are traditional medicinal uses have been reported for the leaves (headaches, prostate problems, reduce gastric ulcers), bark (antiseptic), flowers (antiseptic, reduce swelling, antispasmodic), and fruits (respiratory problems, antidiarrheic). The present study gives an overview on plant and its pharmacological activities were documented.

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1. Introduction

Muntingia Calabura [Jamaica Cherry] belonging to family muntingiaceae (Elaeocarpaceae). It is widely grown in the tropics and subtropics worldwide. Jamaica Cherry is a small and fast-growing tree.[1] The plant is traditionally used to reduce pain from gastric ulcer. The emergence of various types of diseases, both infectious and non-infectious. It is proven to have many pharmacological activities like anti-inflammatory activity, antipyretic activity, antiulcer activity, anti-diabetic activity, anti-hypertensive activity, cardioprotective activity, anti-bacterial activity, insecticidal activity and anti-oxidant activity.

1.1. Morphology

M. calabura is an annual fast-growing tree which flowers throughout the year and can reach up to 12-15 m height with spreading branches. The leaves are soft evergreen and alternate, oblong phyllotaxy about 4-15 cm long and 1-6 cm wide, distinctively lanceolate, oblong with toothed margin oblique at the base with dark green color and upper surface indicates presence of minute hair. The flowers are small size with green sepals and white petals and yellow stamens in the center. The fruits are abundant small berries (1.5 cm wide) and depending on the variety have red or yellow, thin, smooth, tender skin and light-brown, soft, juicy pulp and are sweet, musky, fig-like in taste filled with exceedingly tiny, yellowish seeds.[2]

1.2. Common name

Jamaica cherry, Strawberry tree, Panama berry, Cotton candy berry, Calabur tree, Singapore cherry, Jam fruit tree, West Indian cherry.

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Quality risk assessment and DoE- Practiced validated stability-indicating chromatographic method for quantification of rivaroxaban in bulk and tablet dosage form



AKADÉMIAI KIADÓ

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ORIGINAL RESEARCH PAPER

Quality risk assessment and DoE – Practiced validated stability-indicating chromatographic method for quantification of Rivaroxaban in bulk and tablet dosage form

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ABSTRACT

A systematic DoE and Analytical Quality by Design (AQbD) approach was utilized for the development and validation of a novel stability indicating high-performance thin-layer chromatographic (HPTLC) method for Rivaroxaban (RBN) estimation in bulk and marketed formulation. A D-optimal design was used to screen the effect of solvents, volume of solvents, time from spotting to development and time for development to scanning. ANOVA results and Pareto chart revealed that toluene, methanol, water and saturation time had an impact on retention time. The critical method and material attributes were further screened by Box-Behnken design (BBD) to achieve optimal chromatographic condition. A stress degradation study was carried out and structure of major alkaline degradant was elaborated. According to the design space, a control strategy was used with toluene: methanol: water (6:2:2) and the saturation time was 15 min. A retention factor (RF) of 0.59 ± 0.05 was achieved for RBN using chromatographic plate precoated with silica gel at detection wavelength 282 nm with optimized conditions. The linear calibration curve was achieved in the concentration range of 200–1,200 ng/band with $r^2 > 0.998$ suggesting good coordination between analyte concentration and peak areas. The quadratic model was demonstrated as the best fit model and no interaction was noted between CMAs. The optimized HPTLC method was validated critically as stated in International Conference on Harmonization (ICH) Q2 (R1) guideline and implemented successfully for stress degradation study of RBN. The developed HPTLC method obtained through AQbD application was potentially able to resolve all degradants of RBN achieved through forced degradation study. The obtained results demonstrate that a scientific AQbD approach implementation in HPTLC method development and stress degradation study drastically minimizes the number of trials in experiments, ultimately time and cost of analysis could be minimized.

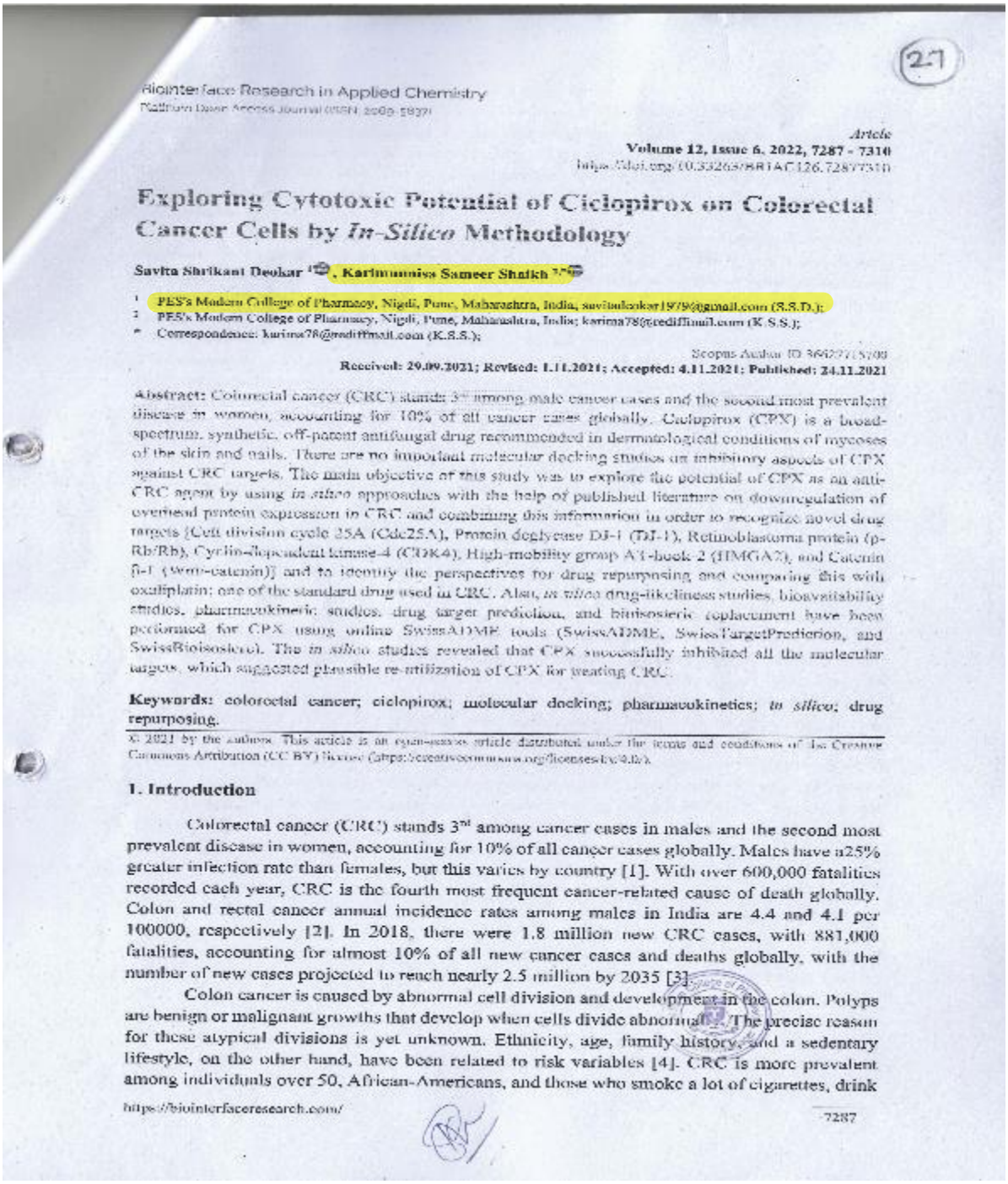
KEYWORDS

analytical quality by design (AQbD), stability study, Rivaroxaban, validation, high performance thin-layer chromatography (HPTLC)

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Exploring Cytotoxic Potential of Ciclopirox on Colorectal Cancer Cells by In-Silico Methodology



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Exploring Cytotoxic Potential of Ciclopirox on Colorectal Cancer Cells by *In-Silico* Methodology

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Abstract: Colorectal cancer (CRC) stands 3rd among male cancer cases and the second most prevalent disease in women, accounting for 10% of all cancer cases globally. Ciclopirox (CPX) is a broad-spectrum, synthetic, off-patent antifungal drug recommended in dermatological conditions of mycoses of the skin and nails. There are no important molecular docking studies on inhibitory aspects of CPX against CRC targets. The main objective of this study was to explore the potential of CPX as an anti-CRC agent by using *in silico* approaches with the help of published literature on downregulation of overhead protein expression in CRC and combining this information in order to recognize novel drug targets [Cell division cycle 25A (Cdc25A), Protein deglycase DJ-1 (DJ-1), Retinoblastoma protein (p-Rb/Rb), Cyclin-dependent kinase-4 (CDK4), High-mobility group AT-hook 2 (HMGA2), and Catenin β-1 (Wnt-catenin)] and to identify the perspectives for drug repurposing and comparing this with oxaliplatin; one of the standard drug used in CRC. Also, *in silico* drug-likeliness studies, bioavailability studies, pharmacokinetic studies, drug target prediction, and bioisosteric replacement have been performed for CPX using online SwissADME tools (SwissADME, SwissTargetPrediction, and SwissBioisosteric). The *in silico* studies revealed that CPX successfully inhibited all the molecular targets, which suggested plausible re-utilization of CPX for treating CRC.

Keywords: colorectal cancer; ciclopirox; molecular docking; pharmacokinetics; *in silico*; drug repurposing.

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1. Introduction

Colorectal cancer (CRC) stands 3rd among cancer cases in males and the second most prevalent disease in women, accounting for 10% of all cancer cases globally. Males have a25% greater infection rate than females, but this varies by country [1]. With over 600,000 fatalities recorded each year, CRC is the fourth most frequent cancer-related cause of death globally. Colon and rectal cancer annual incidence rates among males in India are 4.4 and 4.1 per 100000, respectively [2]. In 2018, there were 1.8 million new CRC cases, with 881,000 fatalities, accounting for almost 10% of all new cancer cases and deaths globally, with the number of new cases projected to reach nearly 2.5 million by 2035 [3].

Colon cancer is caused by abnormal cell division and development in the colon. Polyps are benign or malignant growths that develop when cells divide abnormally. The precise reason for these atypical divisions is yet unknown. Ethnicity, age, family history, and a sedentary lifestyle, on the other hand, have been related to risk variables [4]. CRC is more prevalent among individuals over 50, African-Americans, and those who smoke a lot of cigarettes, drink

Phytochemistry and Pharmacology of Pterocarpus Santalinus and Its Role in Dermatology

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Review Article

PHYTOCHEMISTRY AND PHARMACOLOGY OF *PTEROCARPUS SANTALINUS* AND ITS ROLE IN DERMATOLOGY

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ABSTRACT

The review provides an updated overview of the phytochemical and pharmacological studies on *Pterocarpus santalinus*. Phytochemical analysis suggests the presence of triterpenoids, steroids, flavonoids and phenolic acids. The phytoconstituents and related pharmacological activities of various parts of *P. santalinus* include antifungal, anticholinesterase, antioxidant, antibacterial, antipyretic, anti-inflammatory, anticancer and antiulcer. Literature survey highlights the dermatological applications of the phytoconstituents such as pterostilbene, santrin and hinokiflavone as potential leads for anti-aging, ultraviolet rays (UV-B) protective and wound healing effects. Undoubtedly, *P. santalinus* has wide therapeutic value. The dermatologically significant phytoconstituents, namely, pterostilbene, resveratrol, santrin, lupeol, betulin, β-sucoesterol and celabiaboic, if isolated and used in dermatological formulations, can show promising skin protective effect. The data were compiled using scientific databases, namely, Google Scholar and PubMed, the data made available specifically from 2010 to 2021.

Keywords: *Pterocarpus santalinus*, Pharmacology, Dermatology, Fabaceae.

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Highlights

- Brief data on the vernacular names, geographical distribution, traditional uses, collection and cultivation covered.
- Updated overview of the phytochemical and pharmacological studies on *P. santalinus*.
- Dermatological applications of the phytoconstituents of *P. santalinus*.
- Diverse applications of *P. santalinus* were discussed.

INTRODUCTION

Pterocarpus santalinus Linn. belongs to the family Fabaceae, popular as "Red Saunders." It is deciduous plant growing up to 10–11 m high. Geographical distribution of *P. santalinus* is cultivated in the southern parts of Eastern Ghats. Commercially important part is timber of *P. santalinus* which has historical and traditional value, used for the production of musical instruments, toys and carvings. Convention on International Trade in Endangered Species of Wild Fauna and Flora has listed *P. santalinus* as an endangered plant [1].

Santalin, a natural dye in the timber is used as a pharmaceutical colorant. Correlation of various phytoconstituents with the pharmacological and dermatological applications urges us to compile the data.

VERNACULAR NAMES

English: Red Sanders, Red sandalwood, Marathi: Raktachandan, Gujarati: Ratanjali, Tulukandana, Kannada: Rakatachandana, Telugu: Errachandanamu and Assamese: Sandale [2].

GEOGRAPHICAL DISTRIBUTION

P. santalinus is distributed in hilly regions with hot and dry climate. It grows well in the tropical regions of India, Sri Lanka, Taiwan, the Philippines and China. In India, it is predominantly found in the southern parts of the Eastern Ghats, Cuddapah and Chittoor districts of Andhra Pradesh and Pulikasam and Nellore in Tamil Nadu [3].

CULTIVATION AND COLLECTION

The seed and vegetative propagation is the traditional way of propagation of *P. santalinus*. In seed germination, it needs well-drained red loam soils which are suitable for the cultivation. It regenerates very well in dry hot climate. It requires rainfall ranging from 800 to 1000 mm annually for growth. The seeds are given treatment with GA3 (gibberellic acid) and benzyladenine (parts per million) which help in early germination or seeds can be soaked for 72 h in cold water or in cow dung slurry. The pits (size 45 × 45 × 45 cm are dug at spacing of 4 × 4 m) are filled with topsoil mixed carefully with 10–15 kg farm yard manure and 10 g of lindane dust. It protects the planting stock from attack of soil-borne fungi. March–May months are very much suitable for raising nursery buds from seeds. The best time for planting the crop in the field is end of May–June, that is, onset of rainy season. The irrigation to plants is done immediately after transplantation. Further, alternate days up to 15 days irrigation are done [4].

TRADITIONAL USES

Ethnobotanical uses of *P. santalinus* include its application in the treatment of boils, eczema and wounds in West Bengal [5]. Powder or decoction of heartwood or bark was used to treat pimples, diabetes and hypercholesterolemia in Kerala [6]. *P. santalinus* (tribes in Chittoor district of Andhra Pradesh) used to treat for ulcers. In Malamalasar tribes of Kerala used wood paste as a blood purifier and antidote to prevent the poison from functioning or reverse its effect. The tribes of Kandhas in Kandhamal, Odisha, administered decoction of *Celosia cristata* roots, stem bark of *Azadirachta indica* and *P. santalinus* used to treat treating piles [7].

PHYTOCHEMISTRY OF *P. SANTALINUS*

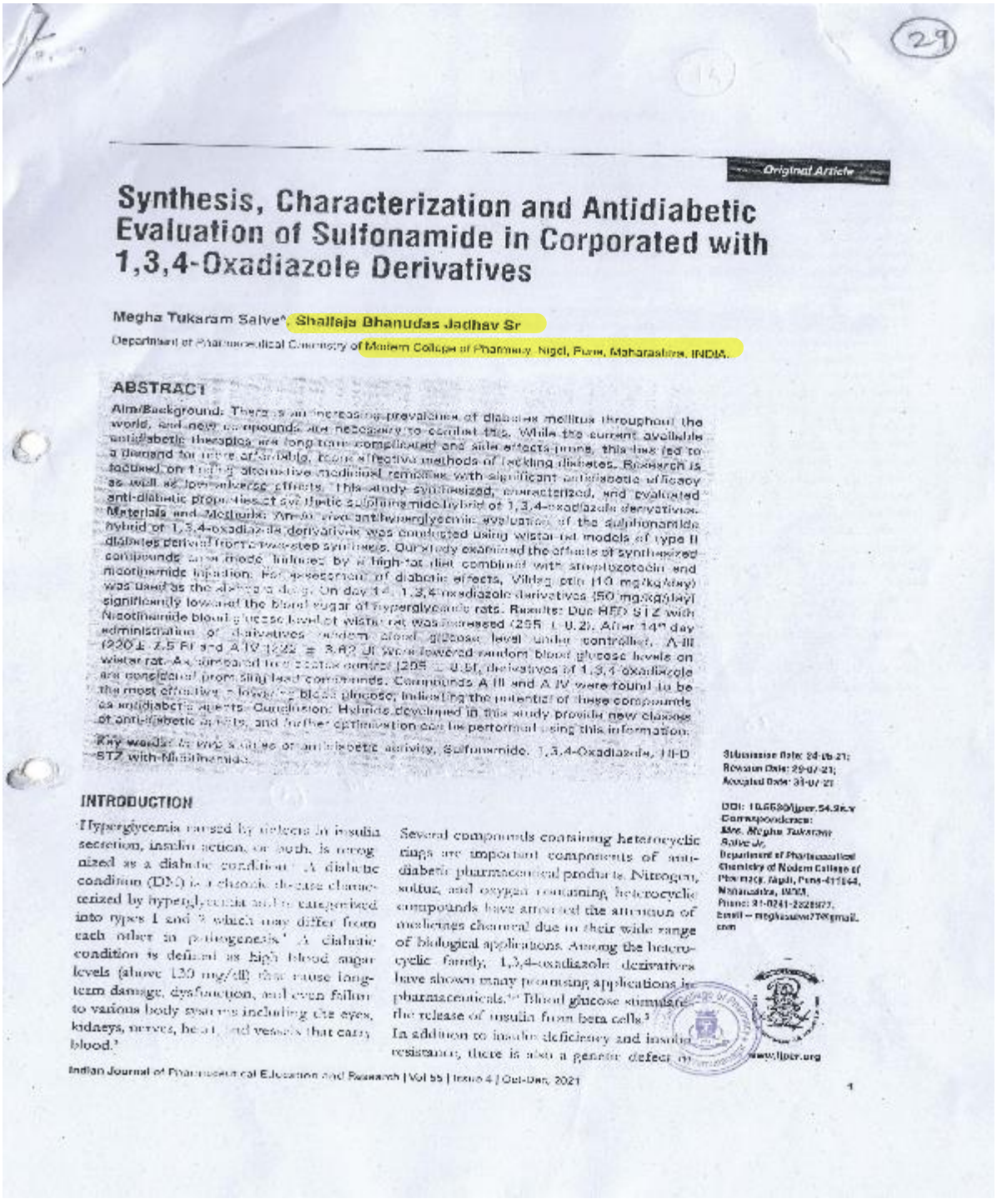
Table 1 classifies and enlists the phytoconstituents of *P. santalinus* [8-10]. Fig. 1 depicts the chemical structures of some of the phytoconstituents.

PHARMACOLOGICAL ACTIVITIES OF *P. SANTALINUS*

Anticholinesterase (AChE) activity

The methanol extract of [illegible] *P. santalinus* possessed in vitro and in vivo AChE activity. In vitro [illegible] assay of AChE by the extract was evaluated by IC50 value and galanthamine as a standard. In vivo activity was assessed in [illegible] induced amnesia in Swiss albino mice. It passes shuttle avoidance test, increasing concentrations of extract exhibited memory enhancement by increased latency time

Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated with 1,3,4-oxadiazole derivatives



Original Article

Synthesis, Characterization and Antidiabetic Evaluation of Sulfonamide in Corporated with 1,3,4-Oxadiazole Derivatives

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Department of Pharmaceutical Chemistry of Modern College of Pharmacy, Nigdi, Pune, Maharashtra, INDIA.

ABSTRACT

Aim/Background: There is an increasing prevalence of diabetes mellitus throughout the world, and new compounds are necessary to combat this. While the current available antidiabetic therapies are long term complicated and side effects prone, this has led to a demand for more affordable, more effective methods of tackling diabetes. Research is focused on finding alternative medicinal remedies with significant antidiabetic efficacy as well as low adverse effects. This study synthesized, characterized, and evaluated anti-diabetic properties of synthetic sulphonamide hybrid of 1,3,4-oxadiazole derivatives. Materials and Methods: An in vivo antihyperglycemic evaluation of the sulphonamide hybrid of 1,3,4-oxadiazole derivatives was conducted using wistar rat models of type II diabetes derived from a two-step synthesis. Our study examined the effects of synthesized compounds on mode induced by a high-fat diet combined with streptozotocin and nicotinamide injection. For assessment of diabetic effects, Vildag ptin (10 mg/kg/day) was used as the standard drug. On day 14, 1,3,4-oxadiazole derivatives (50 mg/kg/day) significantly lowered the blood sugar of hyperglycemic rats. Results: Due HFD STZ with Nicotinamide blood glucose level of wistar rat was increased (255 ± 0.2). After 14th day administration of derivatives, random blood glucose level under controlled. A-III (220± 2.5 FI and A IV 122 ± 3.82 UI were lowered random blood glucose levels on wistar rat. As compared to positive control (255 ± 0.5), derivatives of 1,3,4-oxadiazole are considered promising lead compounds. Compounds A III and A IV were found to be the most effective in lowering blood glucose, indicating the potential of these compounds as antidiabetic agents. Conclusion: Hybrids developed in this study provide new classes of anti-diabetic agents, and further optimization can be performed using this information.

Key words: In vivo studies of antidiabetic activity, Sulfonamide, 1,3,4-Oxadiazole, HFD STZ with-Nicotinamide.

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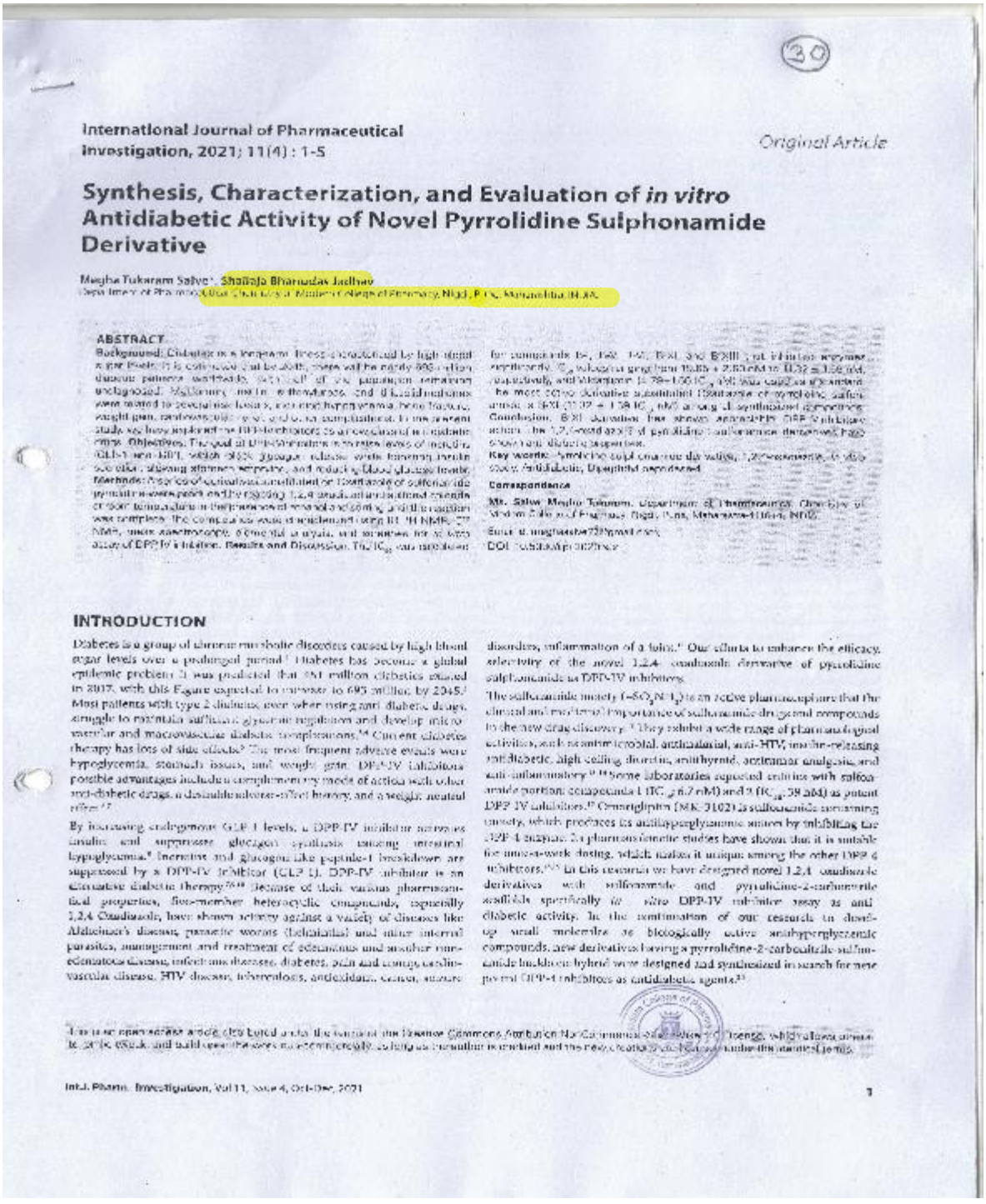
INTRODUCTION

Hyperglycemia caused by defects in insulin secretion, insulin action, or both, is recognized as a diabetic condition. A diabetic condition (DM) is a chronic disease characterized by hyperglycemia and is categorized into types I and 2 which may differ from each other in pathogenesis.[1] A diabetic condition is defined as high blood sugar levels (above 120 mg/dl) that cause long-term damage, dysfunction, and even failure to various body systems including the eyes, kidneys, nerves, heart, and vessels that carry blood.[2]

Several compounds containing heterocyclic rings are important components of antidiabetic pharmaceutical products. Nitrogen, sulfur, and oxygen containing heterocyclic compounds have attracted the attention of medicinal chemist due to their wide range of biological applications. Among the heterocyclic family, 1,3,4-oxadiazole derivatives have shown many promising applications in pharmaceuticals.[3-5] Blood glucose stimulates the release of insulin from beta cells.[6] In addition to insulin deficiency and insulin resistance, there is also a genetic defect in

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Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel pyrrolidine sulphonamide derivative



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Original Article

Synthesis, Characterization, and Evaluation of *in vitro* Antidiabetic Activity of Novel Pyrrolidine Sulphonamide Derivative

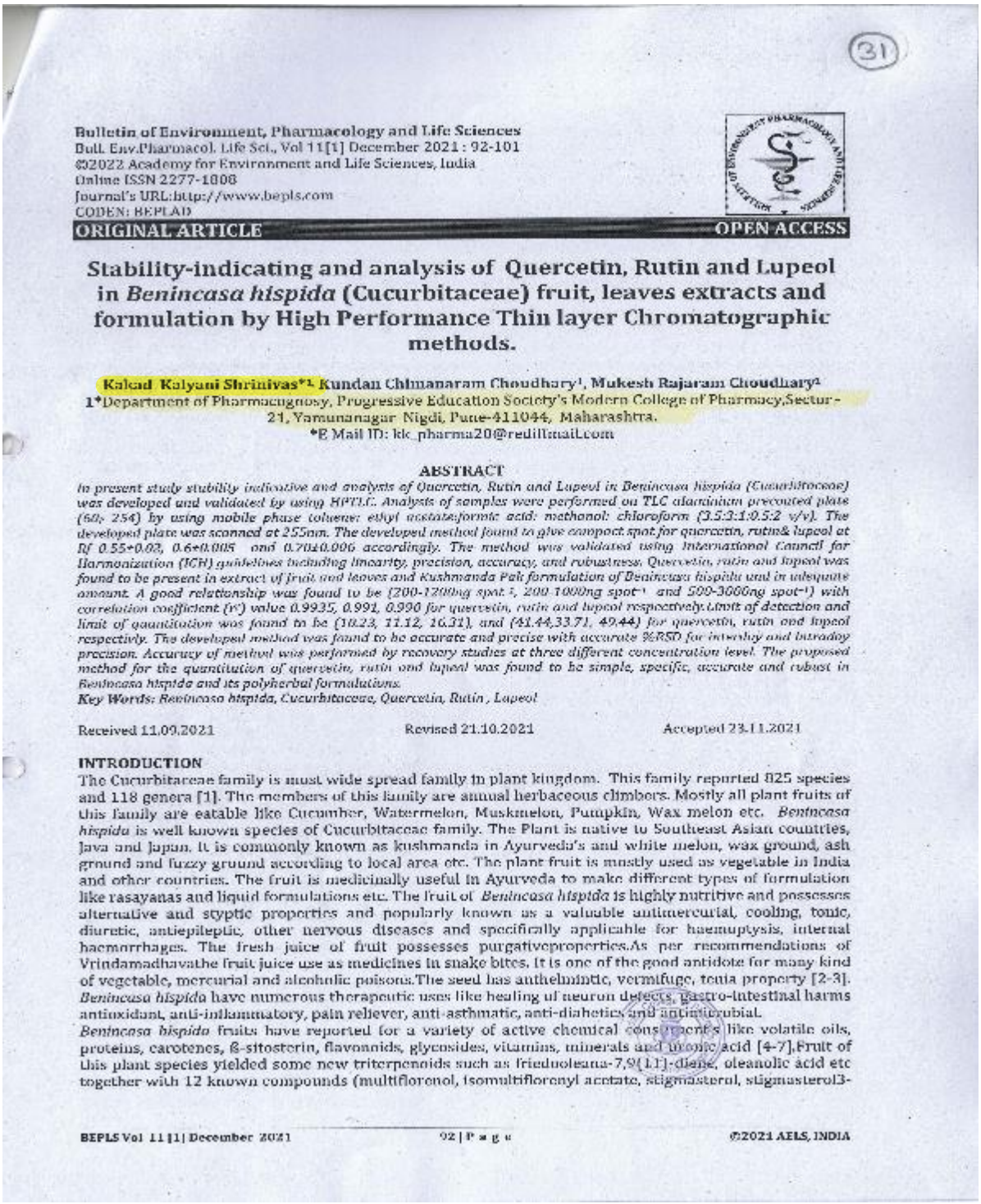
Megha Tukaram Salve*, Shailaja Bhanudas Jadhav

ABSTRACT

INTRODUCTION

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Stability-indicating and analysis of Quercetin, Rutin, and Lupeol in Benincasa hispida (Cucurbitaceae) fruit, leaves extracts, and formulation by High-Performance Thin layer Chromatographic methods.



(31)

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ORIGINAL ARTICLE OPEN ACCESS

Stability-indicating and analysis of Quercetin, Rutin and Lupeol in *Benincasa hispida* (Cucurbitaceae) fruit, leaves extracts and formulation by High Performance Thin layer Chromatographic methods.

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ABSTRACT

In present study stability indicative and analysis of Quercetin, Rutin and Lupeol in Benincasa hispida (Cucurbitaceae) was developed and validated by using HPTLC. Analysis of samples were performed on TLC aluminium precoated plate (60F 254) by using mobile phase toluene: ethyl acetate:formic acid: methanol: chloroform (3.5:3:1:0.5:2 v/v). The developed plate was scanned at 255nm. The developed method found to give compact spot for quercetin, rutin& lupeol at Rf 0.55±0.03, 0.6±0.005 and 0.70±0.006 accordingly. The method was validated using International Council for Harmonization (ICH) guidelines including linearity, precision, accuracy, and robustness. Quercetin, rutin and lupeol was found to be present in extract of fruit and leaves and Kushmanda Pak formulation of Benincasa hispida and in adequate amount. A good relationship was found to be (200-1200ng spot-1, 200-1000ng spot-1 and 500-3000ng spot-1) with correlation coefficient (r²) value 0.9935, 0.991, 0.990 for quercetin, rutin and lupeol respectively. Limit of detection and limit of quantitation was found to be (10.23, 11.12, 16.31), and (41.44,33.71, 49.44) for quercetin, rutin and lupeol respectively. The developed method was found to be accurate and precise with accurate %RSD for interday and intraday precision. Accuracy of method was performed by recovery studies at three different concentration level. The proposed method for the quantitation of quercetin, rutin and lupeol was found to be simple, specific, accurate and robust in Benincasa hispida and its polyherbal formulations.

Key Words: *Benincasa hispida, Cucurbitaceae, Quercetin, Rutin , Lupeol*

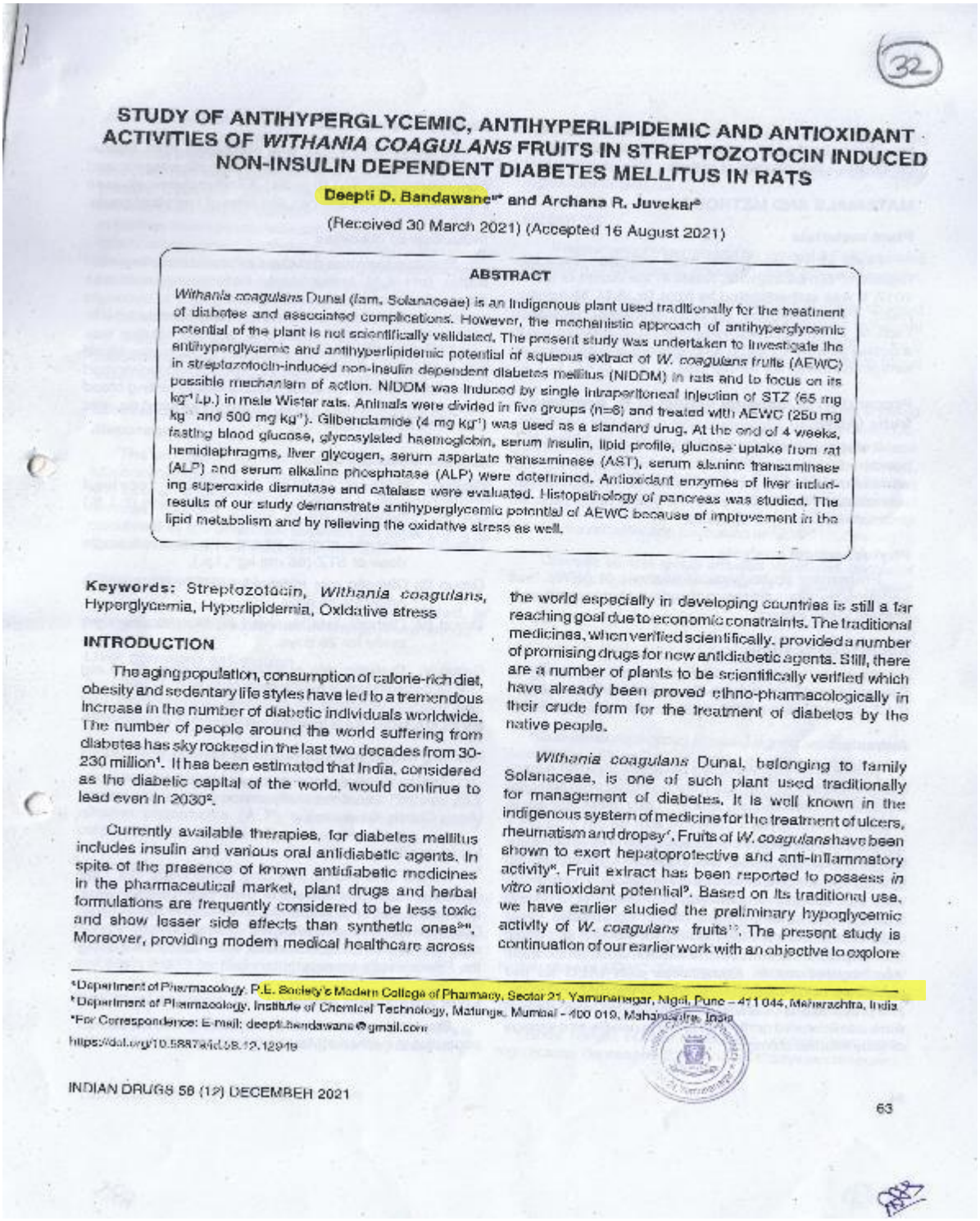
Received 11.09.2021 Revised 21.10.2021 Accepted 23.11.2021

INTRODUCTION

The Cucurbitaceae family is most wide spread family in plant kingdom. This family reported 825 species and 118 genera [1]. The members of this family are annual herbaceous climbers. Mostly all plant fruits of this family are eatable like Cucumber, Watermelon, Muskmelon, Pumpkin, Wax melon etc. *Benincasa hispida* is well known species of Cucurbitaceae family. The Plant is native to Southeast Asian countries, Java and Japan. It is commonly known as kushmanda in Ayurveda's and white melon, wax ground, ash ground and fuzzy gruund according to local area etc. The plant fruit is mostly used as vegetable in India and other countries. The fruit is medicinally useful in Ayurveda to make different types of formulation like rasayanas and liquid formulations etc. The fruit of *Benincasa hispida* is highly nutritive and possesses alternative and styptic properties and popularly known as a valuable antimercurial, cooling, tonic, diuretic, antiepileptic, other nervous diseases and specifically applicable for haemuptysis, internal haemorrhages. The fresh juice of fruit possesses purgativeproperties.As per recommendations of Vrindamadhavathe fruit juice use as medicines in snake bites. It is one of the good antidote for many kind of vegetable, mercurial and alcoholic poisons.The seed has anthelmintic, vermifuge, tenia property [2-3]. *Benincasa hispida* have numerous therapeutic uses like healing of neuron defects, gastro-intestinal harms antioxidant, anti-inflammatory, pain reliever, anti-asthmatic, anti-diabetics and antimicrobial.

Benincasa hispida fruits have reported for a variety of active chemical constituents like volatile oils, proteins, carotenes, ß-sitosterin, flavonoids, glycosides, vitamins, minerals and uronic acid [4-7].Fruit of this plant species yielded some new triterpenoids such as friedooleana-7,9(11)-diene, oleanolic acid etc together with 12 known compounds (multifloreno1, isomultiflorenyl acetate, stigmasterol, stigmasterol3-

Study of antihyperglycemic, antihyperlipidemic and antioxidant activities of Withania coagulans fruits in streptozotocin-induced non- insulin dependent diabetes mellitus in ratsv



32

STUDY OF ANTIHYPERGLYCEMIC, ANTIHYPERLIPIDEMIC AND ANTIOXIDANT ACTIVITIES OF *WITHANIA COAGULANS* FRUITS IN STREPTOZOTOCIN INDUCED NON-INSULIN DEPENDENT DIABETES MELLITUS IN RATS

Deepti D. Bandawane[a]* and Archana R. Juvekar[b]

(Received 30 March 2021) (Accepted 16 August 2021)

ABSTRACT

Withania coagulans Dunal (fam. Solanaceae) is an indigenous plant used traditionally for the treatment of diabetes and associated complications. However, the mechanistic approach of antihyperglycemic potential of the plant is not scientifically validated. The present study was undertaken to investigate the antihyperglycemic and antihyperlipidemic potential of aqueous extract of *W. coagulans* fruits (AEWC) in streptozotocin-induced non-insulin dependent diabetes mellitus (NIDDM) in rats and to focus on its possible mechanism of action. NIDDM was induced by single intraperitoneal injection of STZ (65 mg kg^{-1} i.p.) in male Wistar rats. Animals were divided in five groups (n=6) and treated with AEWC (250 mg kg^{-1} and 500 mg kg^{-1}). Glibenclamide (4 mg kg^{-1}) was used as a standard drug. At the end of 4 weeks, fasting blood glucose, glycosylated haemoglobin, serum insulin, lipid profile, glucose uptake from rat hemidiaphragms, liver glycogen, serum aspartate transaminase (AST), serum alanine transaminase (ALP) and serum alkaline phosphatase (ALP) were determined. Antioxidant enzymes of liver including superoxide dismutase and catalase were evaluated. Histopathology of pancreas was studied. The results of our study demonstrate antihyperglycemic potential of AEWC because of improvement in the lipid metabolism and by relieving the oxidative stress as well.

Keywords: Streptozotocin, *Withania coagulans*, Hyperglycemia, Hyperlipidemia, Oxidative stress

INTRODUCTION

The aging population, consumption of calorie-rich diet, obesity and sedentary life styles have led to a tremendous increase in the number of diabetic individuals worldwide. The number of people around the world suffering from diabetes has sky rocked in the last two decades from 30-230 million[1]. It has been estimated that India, considered as the diabetic capital of the world, would continue to lead even in 2030[2].

Currently available therapies, for diabetes mellitus includes insulin and various oral antidiabetic agents. In spite of the presence of known antidiabetic medicines in the pharmaceutical market, plant drugs and herbal formulations are frequently considered to be less toxic and show lesser side effects than synthetic ones[3-5]. Moreover, providing modern medical healthcare across the world especially in developing countries is still a far reaching goal due to economic constraints. The traditional medicines, when verified scientifically, provided a number of promising drugs for new antidiabetic agents. Still, there are a number of plants to be scientifically verified which have already been proved ethno-pharmacologically in their crude form for the treatment of diabetes by the native people.

Withania coagulans Dunal, belonging to family Solanaceae, is one of such plant used traditionally for management of diabetes. It is well known in the indigenous system of medicine for the treatment of ulcers, rheumatism and dropsy[6]. Fruits of *W. coagulans* have been shown to exert hepatoprotective and anti-inflammatory activity[4]. Fruit extract has been reported to possess *in vitro* antioxidant potential[3]. Based on its traditional use, we have earlier studied the preliminary hypoglycemic activity of *W. coagulans* fruits[7]. The present study is continuation of our earlier work with an objective to explore

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Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis

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Evaluation of *In-vitro* anthelmintic potential of various extracts of emblica officinalis

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Abstract
Objective: The present study was aimed to evaluate the in-vitro anthelmintic potential of *Emblica officinalis* (Indian gooseberry) against *Pheretima Posthuma* (Indian earthworm).
Methods: Different extracts of *Emblica officinalis* as methanolic, ethanolic and hydroalcoholic were prepared and used in different concentrations such as10, 20 and 30 mg/ml with normal saline were used in the study. The worms were randomized in to 11 groups of six worms each (of similar type). *Piperazine citrate* (10 mg/ml) was used as a reference standard. For each worm paralysis time and death time was observed. When there was no movement observed except for when the worm was shaken vigorously, paralysis (P) in min was noted and with confirmation of lack of movement even when the worm was shaken vigorously as well as when dipped in warm water (50° C), death time (D) in min was recorded.
Results: In all the extracts, worms were paralyzed and death occurred in a dose dependent manner. The hydroalcoholic extract was proven as most potent amongst all the extracts.
Conclusion: *Emblica officinalis* can be used as a potential herbal remedy for the treatment of helminths infection.

Keywords: helminthiasis, earthworm, paralysis time

Introduction

Helminthiasis which is also called as worm infection, is a macroparasite disease caused in both humans as well as animals. In this condition parasite worms affect a part of the body and these worms are called as helminths. Severalcases with helminthiasis are found usually in developing countries. Moreover, the rural areas with poor sanitation and hygiene protocols contribute in the causing factors of helminthinsis. It is observed that there is an increase in morbidity and even mortality to some extent. This may lead to significant health issues in an individual [1, 2, 3] Thereis a group of antiparasitic drugs that expel parasitic worms and other intestinal parasites from the body by means of stunning or killing the parasites without harming the host which are known as anthelmintics or anti-helminthics.

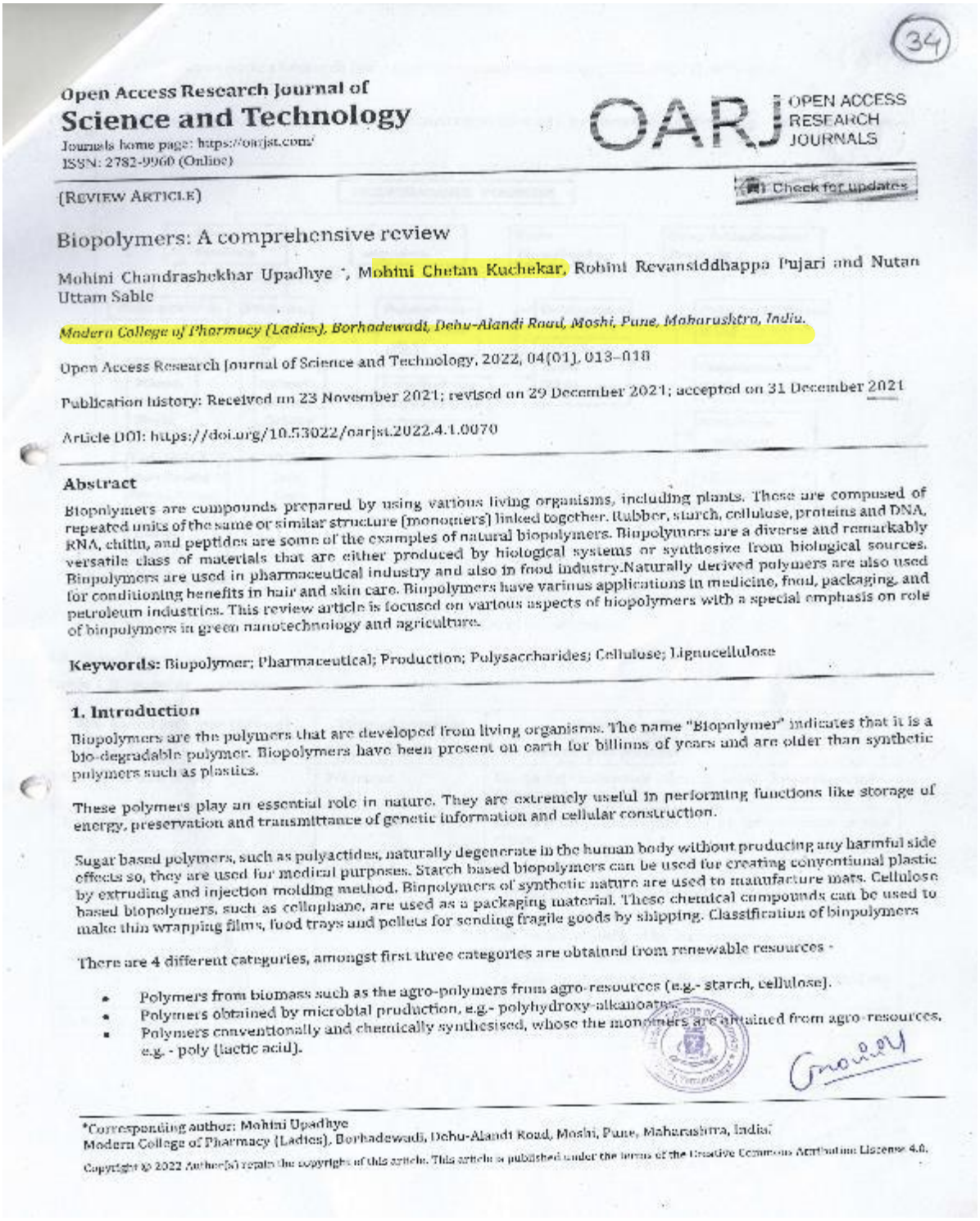
Anthelmintics are classified as vermicides are the agents that kill or vermifuges are the agents that stun. These anthelmintic agents are used for the treatment of helminthiasis in humans as well as infected animals [4] Resistance to these drugs has become amajor problem with the usage of this class of chemotherapeutic agents and hence, this is a gigantic problem in the treatment of helminthiasis.

Furthermore, helminth infection can also be treated by several polyherbal formulations [5] These categories of drugs are not cost-effective. Hence the patient acceptability of these drugshecome an issue. Herbal remedies can be used as safe as well as effective alternative remedies due to the limitations discussed above. The polyphenolic compounds consist flavonoids which are widely distributed throughout the plant kingdom. Flavonoids exhibit several biological effects such as anti-hepatotoxic, anti-inflammatory, antiulcer activity, antiatherosclerotic, antitumor, antithrombogenic, antiosteoporosis, antiviral, antibacterial and antifungal activities [6-9] A few earlier studies have shown that the aqueous and ethanolic extracts of Barleria buxifolia have a good anthelmintic activity due to presence of alkaloids, flavonoids, tannins and steroids which have been associated with anthelmintic activity [10] In the view of this, an attempt has been made to evaluate the anthelmintic potential of *Emblica officinalis* in this study.

After a literature survey it was observed that many diverse biological activities are shown by polyphenols in *Emblica officinalis*. A study shows that Indian gooseberry has potent anti-oxidant activity [11, 12] It also exhibits anti-inflammatory, analgesic, antipyretic, antibacterial, antiviral, anti-cancer properties and is found to be effective in treatment of acquired immune deficiency syndrome (AIDS) [13]. The fruits of *Emblica officinalis* are reported to contain high amounts of ascorbic acid that is vitamin C, ellagitannins, such as emblicanin A (37%), emblicanin B (33%), punigluconin (12%), and pedunculagin (14%). It also contains other polyphenols, such as flavonoids, kaempferol, tannins, ellagic acid, and gallic acid [14, 15, 16, 17].

Piperazine citrate is used as a reference standard in this assay. The mechanism of piperazine citrate is that it causes muscle hyperpolarization due to its GABA mimetic action. Which results in the opening of Cl- channels followed by relaxation and depresses the contractile effect of acetylcholine, thereby causing flaccid paralysis of worms. However, the worms can recover if they are placed in a medium isolated from piperazine [18].

Biopolymers: A comprehensive review.



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(REVIEW ARTICLE)

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Biopolymers: A comprehensive review

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Abstract

Biopolymers are compounds prepared by using various living organisms, including plants. These are composed of repeated units of the same or similar structure (monomers) linked together. Rubber, starch, cellulose, proteins and DNA, RNA, chitin, and peptides are some of the examples of natural biopolymers. Biopolymers are a diverse and remarkably versatile class of materials that are either produced by biological systems or synthesize from biological sources. Biopolymers are used in pharmaceutical industry and also in food industry.Naturally derived polymers are also used for conditioning benefits in hair and skin care. Biopolymers have various applications in medicine, food, packaging, and petroleum industries. This review article is focused on various aspects of biopolymers with a special emphasis on role of biopolymers in green nanotechnology and agriculture.

Keywords: Biopolymer; Pharmaceutical; Production; Polysaccharides; Cellulose; Lignocellulose

1. Introduction

Biopolymers are the polymers that are developed from living organisms. The name "Biopolymer" indicates that it is a bio-degradable polymer. Biopolymers have been present on earth for billions of years and are older than synthetic polymers such as plastics.

These polymers play an essential role in nature. They are extremely useful in performing functions like storage of energy, preservation and transmittance of genetic information and cellular construction.

Sugar based polymers, such as polyactides, naturally degenerate in the human body without producing any harmful side effects so, they are used for medical purposes. Starch based biopolymers can be used for creating conventional plastic by extruding and injection molding method. Biopolymers of synthetic nature are used to manufacture mats. Cellulose based biopolymers, such as cellophane, are used as a packaging material. These chemical compounds can be used to make thin wrapping films, food trays and pellets for sending fragile goods by shipping. Classification of biopolymers

There are 4 different categories, amongst first three categories are obtained from renewable resources -

- Polymers from biomass such as the agro-polymers from agro-resources (e.g.- starch, cellulose).
- Polymers obtained by microbial production, e.g.- polyhydroxy-alkanoates.
- Polymers conventionally and chemically synthesised, whose the monomers are obtained from agro-resources, e.g. - poly (lactic acid).

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Exploration of anti- hyperglycemic potential of herbal mixture in streptozotocin- induced type-II diabetes in rats

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EXPLORATION OF ANTI-HYPERGLYCEMIC POTENTIAL OF HERBAL MIXTURE IN STREPTOZOTOCIN-INDUCED TYPE-II DIABETES IN RATS

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Keywords:

Herbal mixture, Streptozotocin, *Withania coagulans*, *Alstonia scholaris*, *Aegle marmelose*

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ABSTRACT: Indigenous plants like *Withania coagulans* fruits, *Alstonia scholaris* bark and *Aegle marmelose* leaves have been used for diabetes management by traditional Indian people for a long time. The present study was carried out to investigate anti-hyperglycemic potential of an herbal mixture comprising of extracts of these three plants in streptozotocin-induced diabetes in Wistar rats and to focus on its possible mechanism of action. Experimental diabetes was induced in Wistar rats by a single intraperitoneal injection of streptozotocin (65 mg/kg). Animals were divided in five groups (n=6) and treated with herbal mixture (100 & 200 mg/kg) for 4 weeks. At the end of the study period, fasting blood glucose, oral glucose tolerance, glycosylated hemoglobin, serum insulin, glucose uptake from rat hemidiaphragms, and liver glycogen were determined. Antioxidant enzymes of the liver, including superoxide dismutase and catalase, were evaluated. Histopathology of the pancreas was studied. The results of our study demonstrate anti-hyperglycemic and antioxidant potential of the herbal mixture, justifying its use in the indigenous system of medicine.

INTRODUCTION: Diabetes mellitus is a clinical syndrome characterized by hyperglycemia due to absolute or relative deficiency of insulin. Lack of insulin affects the metabolism of carbohydrates, protein, and fat, leading to significant water and electrolyte homeostasis disturbance. The long-standing metabolic derangement is frequently associated with permanent and irreversible functional and structural changes in the cells of the body, with those of the vascular system being particularly susceptible.

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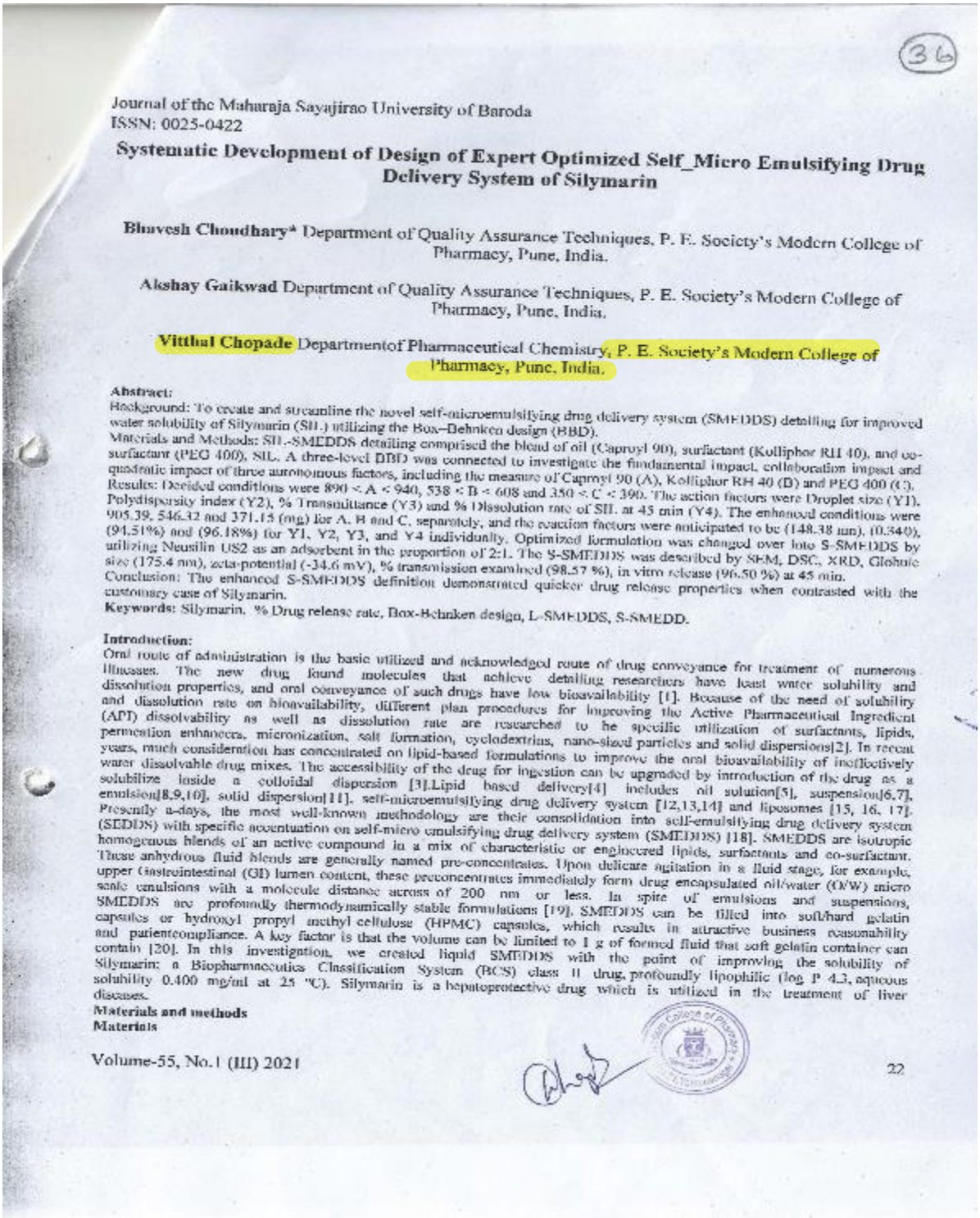
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These changes lead to the development of well-defined clinical entities, the so-called 'complications of diabetes' which characteristically affect the eye, kidney and nervous system [1-2]. The aging population, consumption of caloric-rich diet, obesity, and sedentary lifestyle has led to a tremendous increase in the number of diabetic individuals worldwide.

It has been estimated that India, considered the diabetic capital of the world with more than 32 million diabetic patients, would continue to lead even in 2030 with a whopping 80 million diabetics [3-4]. The enormous cost of modern treatment stressed to the evolution of alternative strategies for the prevention and treatment of diabetes. Although insulin has become one of the most important therapeutic agents known to medicine, there is continuing effort to find insulin substitutes,

Systematic Development of Design of Expert Optimized Self Micro Emulsifying Drug Delivery System of Silymarin



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Systematic Development of Design of Expert Optimized Self_Micro Emulsifying Drug Delivery System of Silymarin

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Abstract:
Background: To create and streamline the novel self-microemulsifying drug delivery system (SMEDDS) detailing for improved water solubility of Silymarin (SIL) utilizing the Box–Behnken design (BBD).
Materials and Methods: SIL-SMEDDS detailing comprised the blend of oil (Caproyl 90), surfactant (Kolliphor RH 40), and co-surfactant (PEG 400), SIL. A three-level BBD was connected to investigate the fundamental impact, collaboration impact and quadratic impact of three autonomous factors, including the measure of Caproyl 90 (A), Kolliphor RH 40 (B) and PEG 400 (C). Results: Decided conditions were 890 < A < 940, 538 < B < 608 and 350 < C < 390. The action factors were Droplet size (Y1), Polydispersity index (Y2), % Transmittance (Y3) and % Dissolution rate of SIL at 45 min (Y4). The enhanced conditions were 905.39, 546.32 and 371.15 (mg) for A, B and C, separately, and the reaction factors were anticipated to be (148.38 nm), (0.340), (94.51%) and (96.18%) for Y1, Y2, Y3, and Y4 individually. Optimized formulation was changed over into S-SMEDDS by utilizing Neusilin US2 as an adsorbent in the proportion of 2:1. The S-SMEDDS was described by SEM, DSC, XRD, Globule size (175.4 nm), zeta-potential (-34.6 mV), % transmission examined (98.57 %), in vitro release (96.50 %) at 45 min.
Conclusion: The enhanced S-SMEDDS definition demonstrated quicker drug release properties when contrasted with the customary case of Silymarin.
Keywords: Silymarin, % Drug release rate, Box-Behnken design, L-SMEDDS, S-SMEDD.

Introduction:
Oral route of administration is the basic utilized and acknowledged route of drug conveyance for treatment of numerous illnesses. The new drug found molecules that achieve detailing researchers have least water solubility and dissolution properties, and oral conveyance of such drugs have low bioavailability [1]. Because of the need of solubility and dissolution rate on bioavailability, different plan procedures for improving the Active Pharmaceutical Ingredient (API) dissolvability as well as dissolution rate are researched to be specific utilization of surfactants, lipids, permeation enhancers, micronization, salt formation, cyclodextrins, nano-sized particles and solid dispersions[2]. In recent years, much consideration has concentrated on lipid-based formulations to improve the oral bioavailability of ineffectively water dissolvable drug mixes. The accessibility of the drug for ingestion can be upgraded by introduction of the drug as a solubilize inside a colloidal dispersion [3].Lipid based delivery[4] includes oil solution[5], suspension[6,7], emulsion[8,9,10], solid dispersion[11], self-microemulsifying drug delivery system [12,13,14] and liposomes [15, 16, 17]. Presently a-days, the most well-known methodology are their consolidation into self-emulsifying drug delivery system (SEDDS) with specific accentuation on self-micro emulsifying drug delivery system (SMEDDS) [18]. SMEDDS are isotropic homogenous blends of an active compound in a mix of characteristic or engineered lipids, surfactants and co-surfactant. These anhydrous fluid blends are generally named pre-concentrates. Upon delicate agitation in a fluid stage, for example, upper Gastrointestinal (GI) lumen content, these preconcentrates immediately form drug encapsulated oil/water (O/W) micro scale emulsions with a molecule distance across of 200 nm or less. In spite of emulsions and suspensions, SMEDDS are profoundly thermodynamically stable formulations [19]. SMEDDS can be filled into soft/hard gelatin capsules or hydroxyl propyl methyl cellulose (HPMC) capsules, which results in attractive business reasonability and patientcompliance. A key factor is that the volume can be limited to 1 g of formed fluid that soft gelatin container can contain [20]. In this investigation, we created liquid SMEDDS with the point of improving the solubility of Silymarin; a Biopharmaceutics Classification System (BCS) class II drug, profoundly lipophilic (log P 4.3, aqueous solubility 0.400 mg/ml at 25 °C). Silymarin is a hepatoprotective drug which is utilized in the treatment of liver diseases.

Materials and methods
Materials

Comparative Study of Aragvadha Phalamajja (Cassia fistula Linn.) w.s.r. to its Sangrahana Vidhi.

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Comparative Study of *Aragvadha Phalamajja* (*Cassia fistula* Linn.) w.s.r. to its *Sangrahana Vidhi*

Research Article

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Abstract

Ayurved advocates that drug should be collected with proper classical methods. In Ayurvedic texts, specific time, season and procedures or methods have been highlighted for getting better potency, efficacy and therapeutic properties of drug by describing the standard methods of drug collection and preservation in details. Now a day, due to lack of proper traditional knowledge and time very few people bother to follow all these methods of collection given by *Acharya*. Hence, the potency of medicines is of question. *Aragvadha* (*Cassia fistula* Linn.) has been popular as a common drug of choice treatment since ancient time. Classic text like *Charaka Samhita* has quoted the classical and particular method for the collection and preservation of *Aragvadha Phalamajja* (*Cassia fistula* Linn.). *Acharya Charaka* has quoted this collection method of *Aragvadha Phalamajja*(*Cassia fistula* Linn.)as follows- The good qualities of collected pods should be kept covered in river bed sand for seven days. After seven days these pods should be removed and kept in sunlight for some time. And thereafter, fruit pulp (*phalamajja*) should be extracted and stored in a clean vessel. Therefore, study of classically collected *Aragvadha Phalamajja* (*Cassia fistula* Linn.) and Market sample of *Aragvadha Phalamajja* (*Cassia fistula* Linn.) was carried out.

Key Words: *Cassia fistula Linn, Collection method, Aragvadha, Standardization, Sangrahana Vidhi.*

Introduction

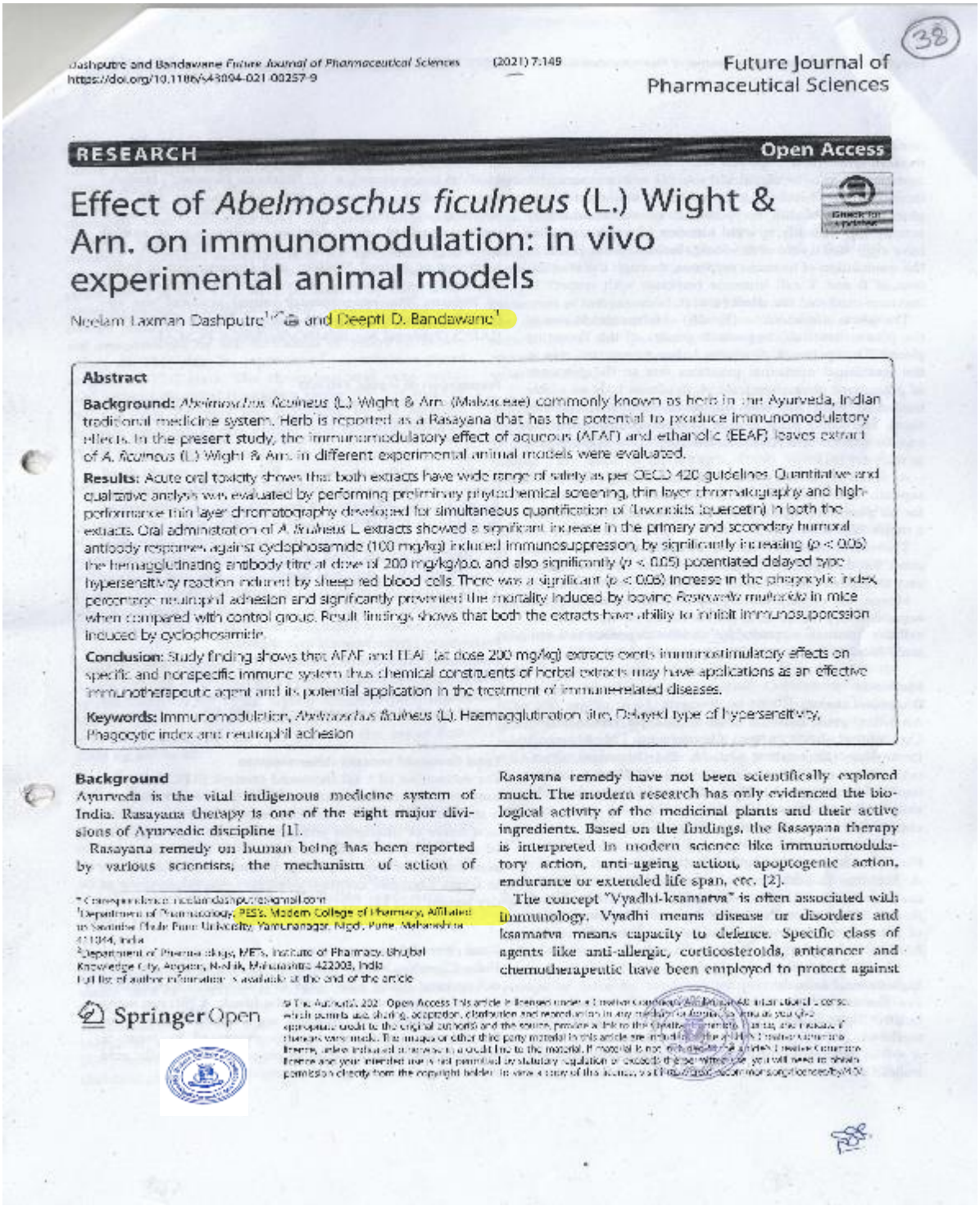
In Ayurved quality of drug is quoted as *Bahukalpa* (useful in many forms), *Bahuguna* (having many qualities), *Sampanna* (rich in active ingredients) and *Yogya* (suitable for preparation of medicine).(1) As per *Charakacharya*, standard drug should be examined on the basis of nature (natural composition), properties, action, habitat, time and mode of collection, storage, processing, dosage etc.; any other drug of this type should fulfil the same characters.(2) If drug is not collected with its proper collection methods, there will be increased chances of reduction in its potency and efficacy. Ayurved has described the standard methods of drug collection and preservation in details to enhance their potency, efficacy and therapeutic properties. These methods may also improve shelf-life of that particular dravya or may reduce any harmful properties of that dravya. Moreover, by these means, prevention from mold, other microorganisms and insects; detoxification of toxic ingredients and enhancement in therapeutic actions can be achieved.

Now a day, due to lack of proper traditional knowledge and time very few people bother to follow all these methods of collection given by *Acharya*. Hence, the potency of medicines is of question. *Aragvadha* (*Cassia fistula*Linn.) has been popular as a common drug of choice since ancient time due to its therapeutic properties like laxative, antipyretic etc. useful in the management of diseases like *Hridroga*(cardiac problems), *Kushtha* (skin problems), *Prameha* and many more. As per available sources *Aragvadha* has been screened for its antioxidant activity (3), anti-tumour activity (4), hepatoprotective activity (5), antibacterial activity and antifungal activity (6). *Acharya Charaka* has quoted this collection method of *Aragvadha Phalamajja* as follows-

"Pods of *Aragvadha* should be collected in its proper period of ripening. These good qualities of collected pods should be kept covered in riverbed sand for seven days. After seven days these pods should be removed and kept in sunlight for some time. And thereafter, fruit pulp (*phalamajja*) should be extracted and stored in a clean vessel (7)."

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Effect of Abelmoschus ficulneus (L.) Wight & Arn. on immunomodulation: in vivo experimental animal models



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Future Journal of Pharmaceutical Sciences

RESEARCH Open Access

Effect of *Abelmoschus ficulneus* (L.) Wight & Arn. on immunomodulation: in vivo experimental animal models

Neelam Laxman Dashputre[1]* and Deepti D. Bandawane[1]

Abstract

Background: *Abelmoschus ficulneus* (L.) Wight & Arn. (Malvaceae) commonly known as herb in the Ayurveda, Indian traditional medicine system. Herb is reported as a Rasayana that has the potential to produce immunomodulatory effects. In the present study, the immunomodulatory effect of aqueous (AFAF) and ethanolic (EEAF) leaves extract of *A. ficulneus* (L.) Wight & Arn. in different experimental animal models were evaluated.

Results: Acute oral toxicity shows that both extracts have wide range of safety as per OECD 420 guidelines. Quantitative and qualitative analysis was evaluated by performing preliminary phytochemical screening, thin layer chromatography and high-performance thin layer chromatography developed for simultaneous quantification of flavonoids (quercetin) in both the extracts. Oral administration of *A. ficulneus* L. extracts showed a significant increase in the primary and secondary humoral antibody responses against cyclophosamide (100 mg/kg) induced immunosuppression, by significantly increasing ($p < 0.05$) the hemagglutinating antibody titre at dose of 200 mg/kg/p.o. and also significantly ($p < 0.05$) potentiated delayed type hypersensitivity reaction induced by sheep red blood cells. There was a significant ($p < 0.05$) increase in the phagocytic index, percentage neutrophil adhesion and significantly prevented the mortality induced by bovine *Rasevenin multiceps* in mice when compared with control group. Result findings shows that both the extracts have ability to inhibit immunosuppression induced by cyclophosamide.

Conclusion: Study finding shows that AFAF and EEAF (at dose 200 mg/kg) extracts exerts immunostimulatory effects on specific and nonspecific immune system thus chemical constituents of herbal extracts may have applications as an effective immunotherapeutic agent and its potential application in the treatment of immune-related diseases.

Keywords: Immunomodulation, *Abelmoschus ficulneus* (L.), Haemagglutination titre, Delayed type of hypersensitivity, Phagocytic index and neutrophil adhesion

Background

Ayurveda is the vital indigenous medicine system of India. Rasayana therapy is one of the eight major divisions of Ayurvedic discipline [1].

Rasayana remedy on human being has been reported by various scientists, the mechanism of action of Rasayana remedy have not been scientifically explored much. The modern research has only evidenced the biological activity of the medicinal plants and their active ingredients. Based on the findings, the Rasayana therapy is interpreted in modern science like immunomodulatory action, anti-ageing action, apoptogenic action, endurance or extended life span, etc. [2].

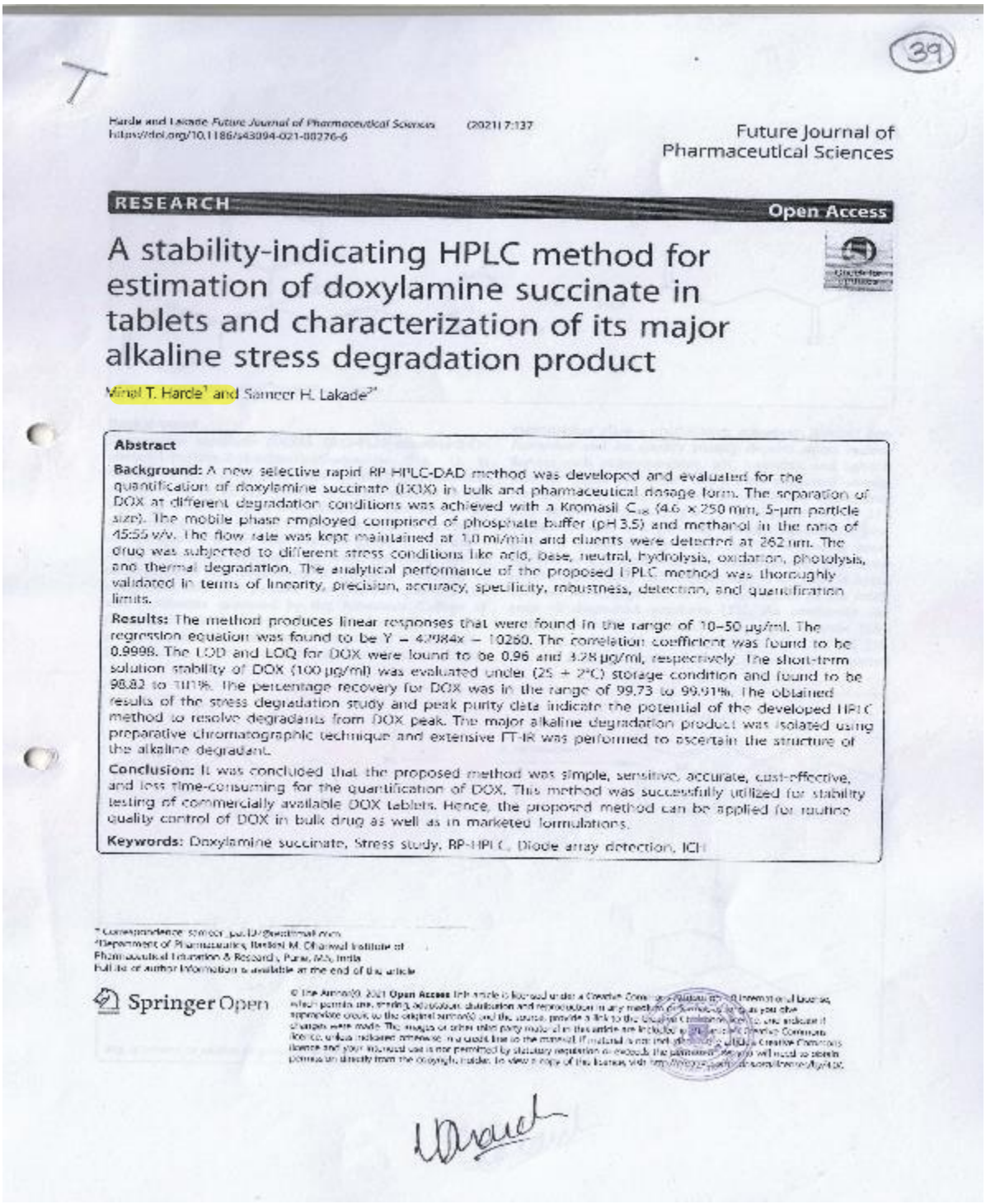
The concept "Vyadhi-ksamatva" is often associated with immunology. Vyadhi means disease or disorders and ksamatva means capacity to defence. Specific class of agents like anti-allergic, corticosteroids, anticancer and chemotherapeutic have been employed to protect against

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A stability-indicating HPLC method for estimation of doxylamine succinate in tablets and characterization of its major alkaline stress degradation product



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Future Journal of Pharmaceutical Sciences

RESEARCH Open Access

A stability-indicating HPLC method for estimation of doxylamine succinate in tablets and characterization of its major alkaline stress degradation product

Vimal T. Harde[1] and Sameer H. Lakade[2*]

Abstract

Background: A new selective rapid RP-HPLC-DAD method was developed and evaluated for the quantification of doxylamine succinate (DOX) in bulk and pharmaceutical dosage form. The separation of DOX at different degradation conditions was achieved with a Kromasil C_{18} (4.6 × 250 mm, 5-μm particle size). The mobile phase employed comprised of phosphate buffer (pH 3.5) and methanol in the ratio of 45:55 v/v. The flow rate was kept maintained at 1.0 ml/min and eluents were detected at 262 nm. The drug was subjected to different stress conditions like acid, base, neutral, hydrolysis, oxidation, photolysis, and thermal degradation. The analytical performance of the proposed HPLC method was thoroughly validated in terms of linearity, precision, accuracy, specificity, robustness, detection, and quantification limits.

Results: The method produces linear responses that were found in the range of 10–50 μg/ml. The regression equation was found to be Y = 42984x − 10260. The correlation coefficient was found to be 0.9998. The LOD and LOQ for DOX were found to be 0.96 and 3.28 μg/ml, respectively. The short-term solution stability of DOX (100 μg/ml) was evaluated under (25 ± 2°C) storage condition and found to be 98.82 to 101%. The percentage recovery for DOX was in the range of 99.73 to 99.91%. The obtained results of the stress degradation study and peak purity data indicate the potential of the developed HPLC method to resolve degradants from DOX peak. The major alkaline degradation product was isolated using preparative chromatographic technique and extensive FT-IR was performed to ascertain the structure of the alkaline degradant.

Conclusion: It was concluded that the proposed method was simple, sensitive, accurate, cost-effective, and less time-consuming for the quantification of DOX. This method was successfully utilized for stability testing of commercially available DOX tablets. Hence, the proposed method can be applied for routine quality control of DOX in bulk drug as well as in marketed formulations.

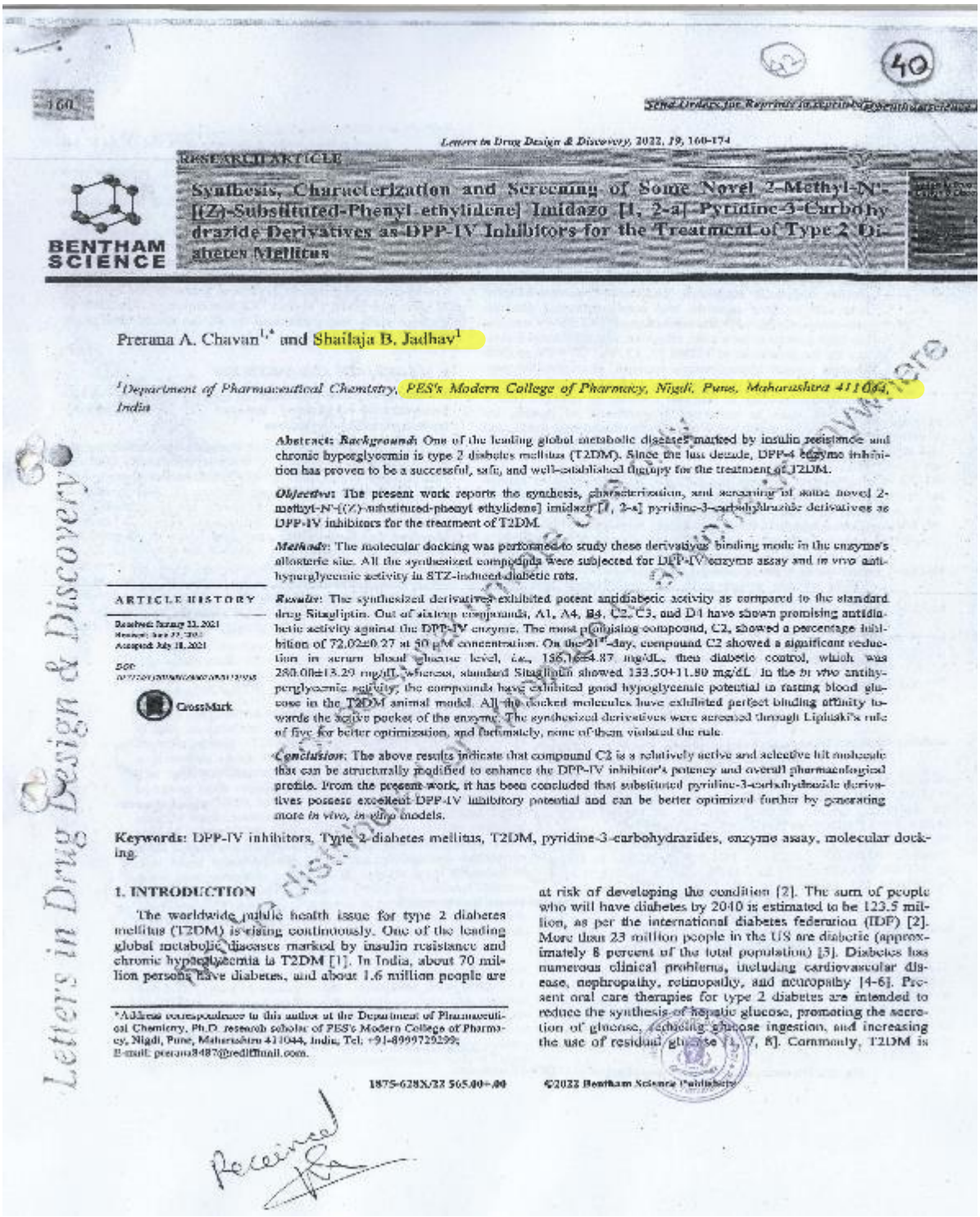
Keywords: Doxylamine succinate, Stress study, RP-HPLC, Diode array detection, ICH

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Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'-[(Z)-substituted – Phenyl ethylidene] Imidazole[1,2-A] Pyridene-3- Carbohydrazide Derivatives as DPP-IV inhibitors for the Treatment of Type 2 Diabetes Mellitus



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Letters in Drug Design & Discovery, 2022, 19, 160-174

RESEARCH ARTICLE

BENTHAM SCIENCE

Synthesis, Characterization and Screening of Some Novel 2-Methyl-N'-[(Z)-Substituted-Phenyl ethylidene] Imidazo [1, 2-a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus

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Abstract: ***Background:*** One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is type 2 diabetes mellitus (T2DM). Since the last decade, DPP-4 enzyme inhibition has proven to be a successful, safe, and well-established therapy for the treatment of T2DM.

Objective: The present work reports the synthesis, characterization, and screening of some novel 2-methyl-N'-[(Z)-substituted-phenyl ethylidene] imidazo [1, 2-a] pyridine-3-carbohydrazide derivatives as DPP-IV inhibitors for the treatment of T2DM.

Methods: The molecular docking was performed to study these derivatives' binding mode in the enzyme's allosteric site. All the synthesized compounds were subjected for DPP-IV enzyme assay and *in vivo* anti-hyperglycemic activity in STZ-induced diabetic rats.

Results: The synthesized derivatives exhibited potent antidiabetic activity as compared to the standard drug Sitagliptin. Out of sixteen compounds, A1, A4, B4, C2, C3, and D1 have shown promising antidiabetic activity against the DPP-IV enzyme. The most promising compound, C2, showed a percentage inhibition of 72.02±0.27 at 50 µM concentration. On the 21st-day, compound C2 showed a significant reduction in serum blood glucose level, *i.e.*, 136.16±4.87 mg/dL, then diabetic control, which was 280.08±13.29 mg/dL, whereas, standard Sitagliptin showed 133.50±11.80 mg/dL. In the *in vivo* antihyperglycemic activity, the compounds have exhibited good hypoglycemic potential in raising blood glucose in the T2DM animal model. All the docked molecules have exhibited perfect binding affinity towards the active pocket of the enzyme. The synthesized derivatives were screened through Lipinski's rule of five for better optimization, and fortunately, none of them violated the rule.

Conclusion: The above results indicate that compound C2 is a relatively active and selective hit molecule that can be structurally modified to enhance the DPP-IV inhibitor's potency and overall pharmacological profile. From the present work, it has been concluded that substituted pyridine-3-carbohydrazide derivatives possess excellent DPP-IV inhibitory potential and can be better optimized further by generating more *in vivo*, *in silico* models.

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Keywords: DPP-IV inhibitors, Type 2 diabetes mellitus, T2DM, pyridine-3-carbohydrazides, enzyme assay, molecular docking.

1. INTRODUCTION

The worldwide public health issue for type 2 diabetes mellitus (T2DM) is rising continuously. One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is T2DM [1]. In India, about 70 million persons have diabetes, and about 1.6 million people are at risk of developing the condition [2]. The sum of people who will have diabetes by 2040 is estimated to be 123.5 million, as per the international diabetes federation (IDP) [2]. More than 23 million people in the US are diabetic (approximately 8 percent of the total population) [3]. Diabetes has numerous clinical problems, including cardiovascular disease, nephropathy, retinopathy, and neuropathy [4-6]. Present oral care therapies for type 2 diabetes are intended to reduce the synthesis of hepatic glucose, promoting the secretion of glucose, reducing glucose ingestion, and increasing the use of residual glucose [1, 7, 8]. Commonly, T2DM is

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Letters in Drug Design & Discovery

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Formulation And Evaluation of Polyherbal Shampoo as Hair Care Product

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FORMULATION AND EVALUATION OF POLYHERBAL SHAMPOO AS HAIR CARE PRODUCT

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ABSTRACT

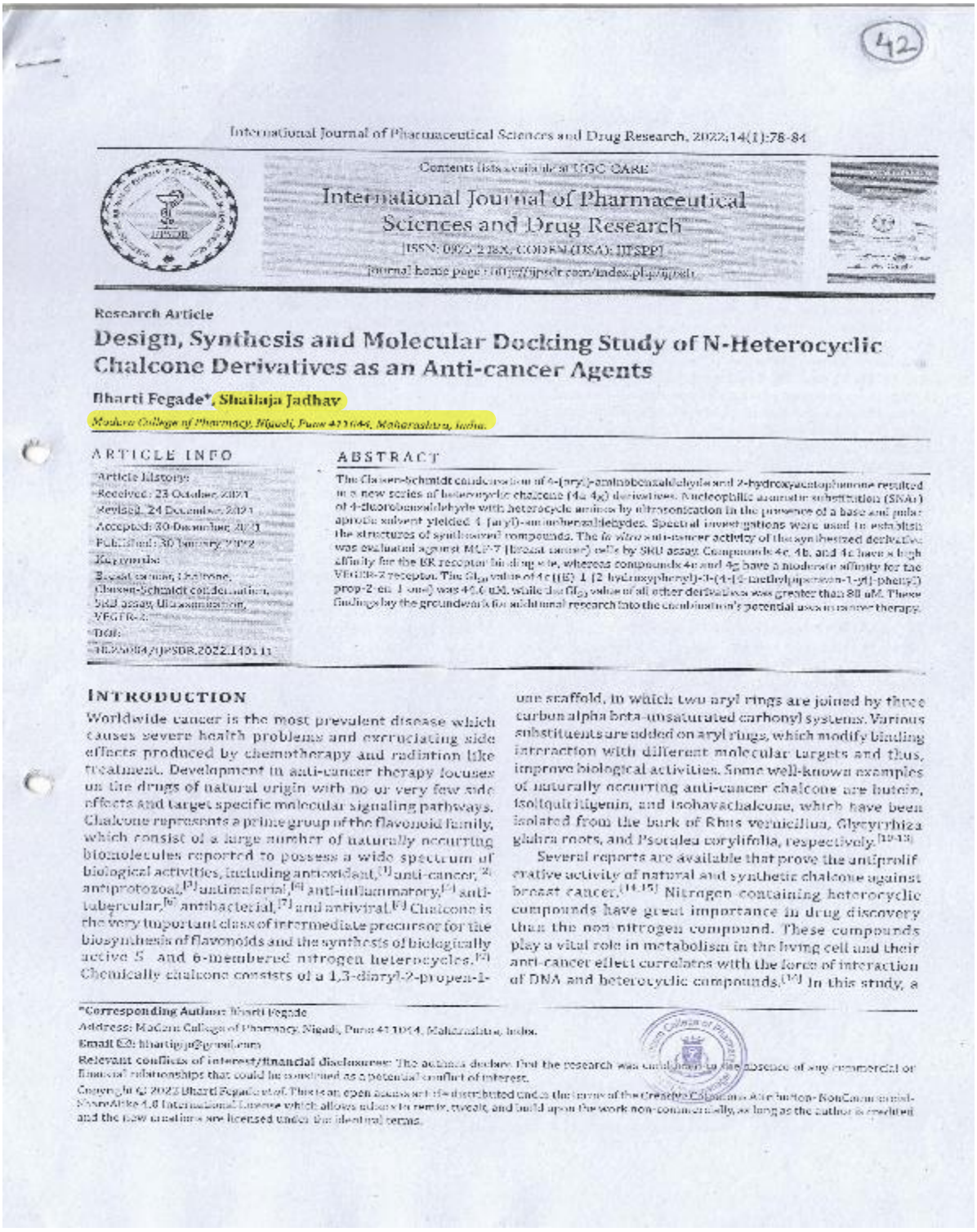
Introduction: Ayurvedic herbal formulations are always considered as centre of magnetism in high-speed growing society. The objective of current study is to formulate and evaluate polyherbal shampoo powder as hair care product. **Material and Methods:** In the present study, plants parts were collected dried, grinned, sieved and mixed well. Formulation of herbal shampoo powder was prepared, which contains several known herbal crude drugs. The formulation was developed and further evaluated for various parameters like organoleptic characters, common powder characteristics for example angle of repose, bulk density, tapped density, hausner's ratio, cars index and physiochemical properties of powder such as pH, ash value, washability, solubility, wetting time, skin irritation test, loss on drying, foaming index, foam stability, dirt dispersion test, nature of hair after washing and cleansing test. **Result and conclusion:** The results obtained after evaluation were satisfactory and presented in detail. It was concluded that polyherbal shampoo formulated was showing good qualities of shampoo and hence can be used as an herbal shampoo.

KEYWORDS: Hair care, Polyherbal shampoo, Formulation, Evaluation, Cleansing agent.

INTRODUCTION

Hair is a very imperative part of the overall appearance and elegance of the human body, which reflects social distinction and beauty. There are different types of hairs like dry hair, normal hair and oily hair vary from person to person.[1] There are lots of hair problems experience in the social order that differ from one person to others, as hair fall, thinning of hair, dandruff, dry freeze hair, lack of hair volume, greying of hair, dullness, immature

Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti- cancer agent



(42)

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Research Article

Design, Synthesis and Molecular Docking Study of N-Heterocyclic Chalcone Derivatives as an Anti-cancer Agents

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Breast cancer, Chalcone, Claisen-Schmidt condensation, SRB assay, UI examination, VEGFR-2.

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ABSTRACT

The Claisen-Schmidt condensation of 4-(aryl)-aminobenzaldehyde and 2-hydroxyacetophenone resulted in a new series of heterocyclic chalcone (4a-4k) derivatives. Nucleophilic aromatic substitution (SNAr) of 4-fluorobenzaldehyde with heterocycle amines by ultrasonication in the presence of a base and polar aprotic solvent yielded 4-(aryl)-aminobenzaldehydes. Spectral investigations were used to establish the structures of synthesized compounds. The *in vitro* anti-cancer activity of the synthesized derivatives was evaluated against MCF-7 (breast cancer) cells by SRB assay. Compounds 4c, 4h, and 4i have a high affinity for the BR receptor binding site, whereas compounds 4e and 4g have a moderate affinity for the VEGFR-2 receptor. The GI_{50} value of 4c ((E)-1-(2-hydroxyphenyl)-3-(4-(4-methylpiperazin-1-yl)-phenyl) prop-2-en-1-one) was 42.6 uM, while the GI_{50} value of all other derivatives was greater than 88 uM. These findings by the groundwork for additional research into the combination's potential use in cancer therapy.

INTRODUCTION

Worldwide cancer is the most prevalent disease which causes severe health problems and excruciating side effects produced by chemotherapy and radiation like treatment. Development in anti-cancer therapy focuses on the drugs of natural origin with no or very few side effects and target specific molecular signaling pathways. Chalcone represents a prime group of the flavonoid family, which consist of a large number of naturally occurring biomolecules reported to possess a wide spectrum of biological activities, including antioxidant,[1] anti-cancer,[2] antiprotozoal,[3] antimalarial,[4] anti-inflammatory,[5] anti-tubercular,[6] antibacterial,[7] and antiviral.[8] Chalcone is the very important class of intermediate precursor for the biosynthesis of flavonoids and the synthesis of biologically active 5- and 6-membered nitrogen heterocycles.[9] Chemically chalcone consists of a 1,3-diaryl-2-propen-1-one scaffold, in which two aryl rings are joined by three carbon alpha beta-unsaturated carbonyl systems. Various substituents are added on aryl rings, which modify binding interaction with different molecular targets and thus, improve biological activities. Some well-known examples of naturally occurring anti-cancer chalcone are butein, isoliquiritigenin, and isobavachalcone, which have been isolated from the bark of Rhus vernicillia, Glycyrrhiza glabra roots, and Psoralea corylifolia, respectively.[10-13]

Several reports are available that prove the antiproliferative activity of natural and synthetic chalcone against breast cancer.[14,15] Nitrogen-containing heterocyclic compounds have great importance in drug discovery than the non-nitrogen compound. These compounds play a vital role in metabolism in the living cell and their anti-cancer effect correlates with the force of interaction of DNA and heterocyclic compounds.[16] In this study, a

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A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of The H1N1 Influenza Target Protein

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International Journal of Pharma and Bio Sciences

Original Research Article

Analytical chemistry for better drug analysis

A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of the H1N1 Influenza Target Protein

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Abstract: The global prevalence of the H1N1 infection in 2009 had made the World Health Organization to declare it a pandemic. Even though the occurrence is still continuing, it is not that severe as it was earlier. Similar to the seasonal flu, it has the potential to cause more significant health issues in certain group of people. The best strategy to avoid such flues is to get vaccinated every year. Molecular docking plays a vital role among the various drug designing strategies that are being used in computer-assisted drug designing. In this research, we have tested the molecular docking of Peramivir and Zanamivir on the Receptor Binding proteins of H1N1 Influenza Virus. The objective of the study was to review the efficacy of these neuraminidase inhibitors which are recently granted an Emergency Use Food and Drug Administration (FDA) for the treatment of H1N1 influenza in selected patients. Molecular docking is one of the foremost applied methods in structure-based drug design (SBDD) owing to its large level of accuracy and ability to confirm the small-molecule ligands within the acceptable target binding site. Molecular docking has evolved as an important tool for new drugs today. Molecular docking methods produce quantitative indications of binding energies, as well as ranges of docked molecules that support the binding affinity of ligand-receptor complexes with pharmacokinetic features. The reported binding energies are the sum of the total intermolecular energy, total internal energy, and torsional free energy excluding the energy of the unbound system. This method was used to determine the potential interactions between the receptor and the ligand, as well as the length of the bond. Docked orientations were recorded at the completion of each run, and the resulting molecules were analyzed for geometry and the number of hydrogen bonds. Thus, docking study of two compounds was performed, and both compounds demonstrated higher binding energy. Peramivir has a binding energy of -5.03, whereas zanamivir has a binding energy of -3.88. The results presented in the current study provide data that are useful for the future treatment of H1N1 infection.

Keywords: H1N1 influenza inhibitors, Influenza H1N1, swine influenza, Molecular docking, Anti-influenza drugs and neuraminidase inhibitors.

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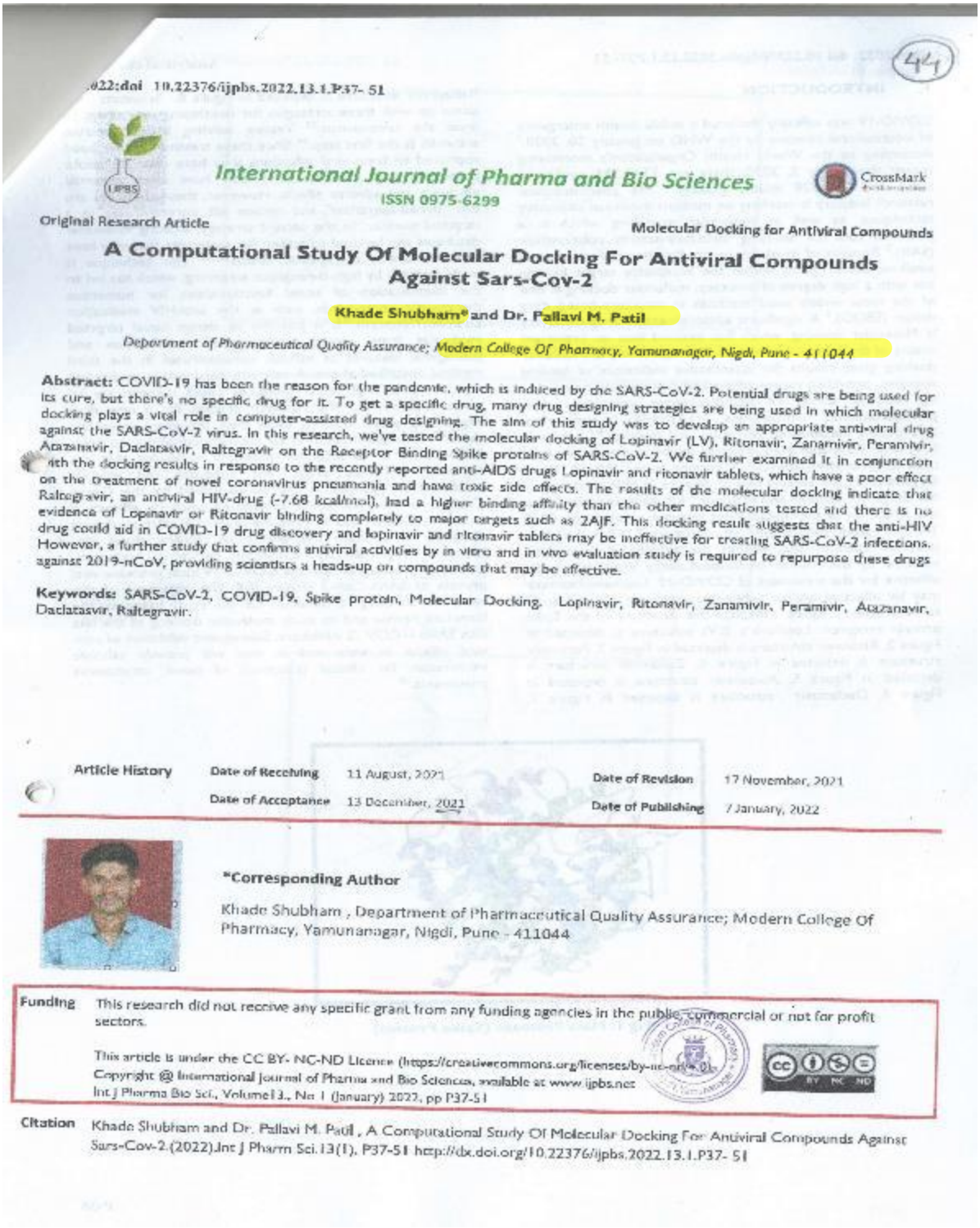
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P-73

A Computational Study of Molecular Docking for Antiviral Compounds Against Sars-Cov-2



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Original Research Article

Molecular Docking for Antiviral Compounds

A Computational Study Of Molecular Docking For Antiviral Compounds Against Sars-Cov-2

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Abstract: COVID-19 has been the reason for the pandemic, which is induced by the SARS-CoV-2. Potential drugs are being used for its cure, but there's no specific drug for it. To get a specific drug, many drug designing strategies are being used in which molecular docking plays a vital role in computer-assisted drug designing. The aim of this study was to develop an appropriate anti-viral drug against the SARS-CoV-2 virus. In this research, we've tested the molecular docking of Lopinavir (LV), Ritonavir, Zanamivir, Peramivir, Atazanavir, Daclatasvir, Raltegravir on the Receptor Binding Spike proteins of SARS-CoV-2. We further examined it in conjunction with the docking results in response to the recently reported anti-AIDS drugs Lopinavir and ritonavir tablets, which have a poor effect on the treatment of novel coronavirus pneumonia and have toxic side effects. The results of the molecular docking indicate that Raltegravir, an antiviral HIV-drug (-7.68 kcal/mol), had a higher binding affinity than the other medications tested and there is no evidence of Lopinavir or Ritonavir binding completely to major targets such as 2AJF. This docking result suggests that the anti-HIV drug could aid in COVID-19 drug discovery and lopinavir and ritonavir tablets may be ineffective for treating SARS-CoV-2 infections. However, a further study that confirms antiviral activities by in vitro and in vivo evaluation study is required to repurpose these drugs against 2019-nCoV, providing scientists a heads-up on compounds that may be effective.

Keywords: SARS-CoV-2, COVID-19, Spike protein, Molecular Docking. Lopinavir, Ritonavir, Zanamivir, Peramivir, Atazanavir, Daclatasvir, Raltegravir.

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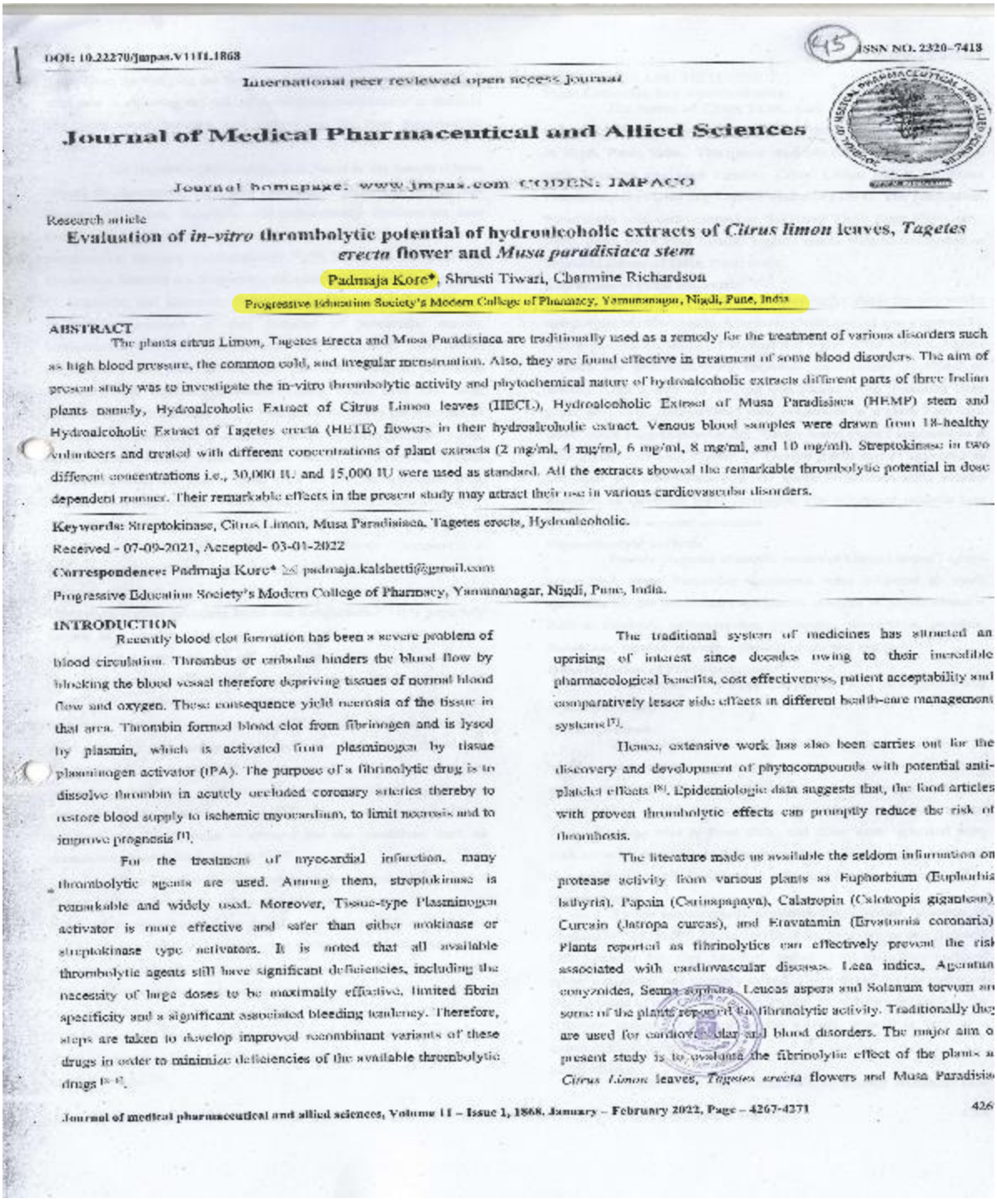
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Evaluation of In-vitro thrombolytic potential of hydroalcoholic extracts of Citrus Limon Leaves, Tagetes Erecta flower and Musa Paradasiaca Stem



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Research article

Evaluation of *in-vitro* thrombolytic potential of hydroalcoholic extracts of *Citrus limon* leaves, *Tagetes erecta* flower and *Musa paradisiaca stem*

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ABSTRACT

The plants citrus Limon, Tagetes Erecta and Musa Paradisiaca are traditionally used as a remedy for the treatment of various disorders such as high blood pressure, the common cold, and irregular menstruation. Also, they are found effective in treatment of some blood disorders. The aim of present study was to investigate the in-vitro thrombolytic activity and phytochemical nature of hydroalcoholic extracts different parts of three Indian plants namely, Hydroalcoholic Extract of Citrus Limon leaves (HECL), Hydroalcoholic Extract of Musa Paradisiaca (HEMP) stem and Hydroalcoholic Extract of Tagetes erecta (HETE) flowers in their hydroalcoholic extract. Venous blood samples were drawn from 18-healthy volunteers and treated with different concentrations of plant extracts (2 mg/ml, 4 mg/ml, 6 mg/ml, 8 mg/ml, and 10 mg/ml). Streptokinase in two different concentrations i.e., 30,000 IU and 15,000 IU were used as standard. All the extracts showed the remarkable thrombolytic potential in dose dependent manner. Their remarkable effects in the present study may attract their use in various cardiovascular disorders.

Keywords: Streptokinase, Citrus Limon, Musa Paradisiaca, Tagetes erecta, Hydroalcoholic.

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INTRODUCTION

Recently blood clot formation has been a severe problem of blood circulation. Thrombus or embolus hinders the blood flow by blocking the blood vessel therefore depriving tissues of normal blood flow and oxygen. These consequence yield necrosis of the tissue in that area. Thrombin formed blood clot from fibrinogen and is lysed by plasmin, which is activated from plasminogen by tissue plasminogen activator (tPA). The purpose of a fibrinolytic drug is to dissolve thrombin in acutely occluded coronary arteries thereby to restore blood supply to ischemic myocardium, to limit necrosis and to improve prognosis [1].

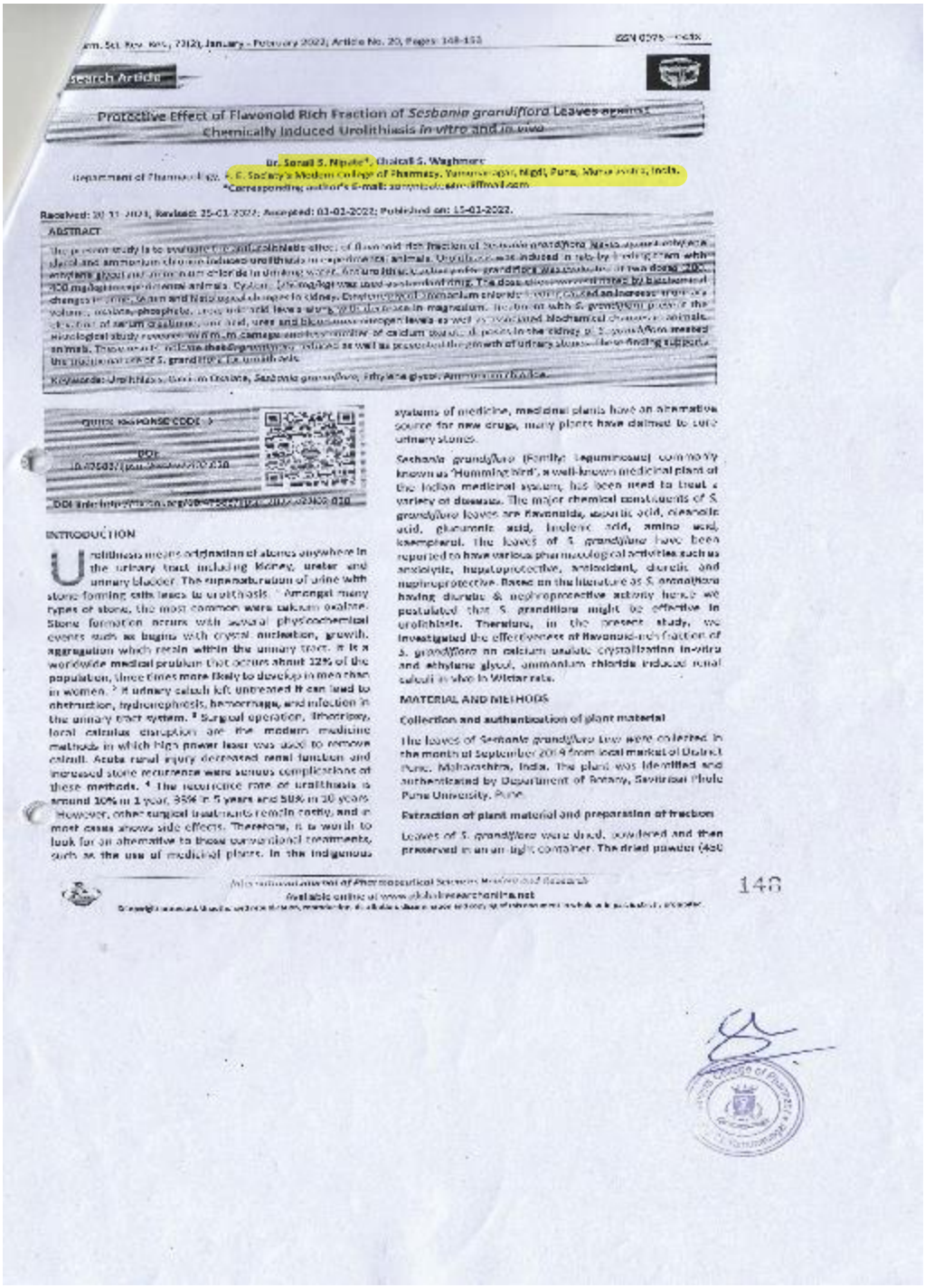
For the treatment of myocardial infarction, many thrombolytic agents are used. Among them, streptokinase is remarkable and widely used. Moreover, Tissue-type Plasminogen activator is more effective and safer than either urokinase or streptokinase type activators. It is noted that all available thrombolytic agents still have significant deficiencies, including the necessity of large doses to be maximally effective, limited fibrin specificity and a significant associated bleeding tendency. Therefore, steps are taken to develop improved recombinant variants of these drugs in order to minimize deficiencies of the available thrombolytic drugs [2-4].

The traditional system of medicines has attracted an uprising of interest since decades owing to their incredible pharmacological benefits, cost effectiveness, patient acceptability and comparatively lesser side effects in different health-care management systems [5].

Hence, extensive work has also been carries out for the discovery and development of phytocompounds with potential anti-platelet effects [6]. Epidemiologic data suggests that, the food articles with proven thrombolytic effects can promptly reduce the risk of thrombosis.

The literature made us available the seldom information on protease activity from various plants as Euphorbium (Euphorbia lathyris), Papain (Carinapapaya), Calatropin (Calotropis gigantean), Curcain (Jatropa curcas), and Eravatamin (Ervatamia coronaria). Plants reported as fibrinolytics can effectively prevent the risk associated with cardiovascular diseases. Leea indica, Agaratum conyzoides, Senna sophera, Leucas aspera and Solanum torvum are some of the plants reported for fibrinolytic activity. Traditionally they are used for cardiovascular and blood disorders. The major aim of present study is to evaluate the fibrinolytic effect of the plants *Citrus Limon* leaves, *Tagetes erecta* flowers and Musa Paradisia

Protective Effect of Flavonoid Rich Fraction of Sesbania grandiflora leaves against chemically induced Urolithiasis in vitro and in vivo



Research Article

Protective Effect of Flavonoid Rich Fraction of *Sesbania grandiflora* Leaves against Chemically Induced Urolithiasis *in vitro* and *in vivo*

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ABSTRACT

Keywords: Urolithiasis, Calcium Oxalate, Sesbania grandiflora, Ethylene glycol, Ammonium chloride

INTRODUCTION

Urolithiasis means crystallization of stones anywhere in the urinary tract including kidney, ureter and urinary bladder. The supersaturation of urine with stone-forming salts leads to urolithiasis. [1] Amongst many types of stone, the most common were calcium oxalate. Stone formation occurs with several physicochemical events such as begins with crystal nucleation, growth, aggregation which remain within the urinary tract. It is a worldwide medical problem that occurs about 12% of the population, three times more likely to develop in men than in women. [2] If urinary calculi left untreated it can lead to obstruction, hydronephrosis, hemorrhage, and infection in the urinary tract system. [3] Surgical operation, lithotripsy, local calculus disruption are the modern medicine methods in which high power laser was used to remove calculi. Acute renal injury decreased renal function and increased stone recurrence were serious complications of these methods. [4] The recurrence rate of urolithiasis is around 10% in 1 year, 35% in 5 years and 50% in 20 years. However, other surgical treatments remain costly, and in most cases shows side effects. Therefore, it is worth to look for an alternative to these conventional treatments, such as the use of medicinal plants. In the indigenous systems of medicine, medicinal plants have an alternative source for new drugs, many plants have claimed to cure urinary stones.

Sesbania grandiflora (Family: Leguminosae) commonly known as 'Hummingbird', a well-known medicinal plant of the Indian medicinal system, has been used to treat a variety of diseases. The major chemical constituents of *S. grandiflora* leaves are flavonoids, ascorbic acid, oleanolic acid, glauconic acid, linoleic acid, amino acid, kaempferol. The leaves of *S. grandiflora* have been reported to have various pharmacological activities such as anxiolytic, hepatoprotective, antioxidant, diuretic and nephroprotective. Based on the literature as *S. grandiflora* having diuretic & nephroprotective activity hence we postulated that *S. grandiflora* might be effective in urolithiasis. Therefore, in the present study, we investigated the effectiveness of flavonoid-rich fraction of *S. grandiflora* on calcium oxalate crystallization in-vitro and ethylene glycol, ammonium chloride induced renal calculi in vivo in Wistar rats.

MATERIAL AND METHODS

Collection and authentication of plant material

The leaves of *Sesbania grandiflora* tree were collected in the month of September 2019 from local market of District Pune, Maharashtra, India. The plant was identified and authenticated by Department of Botany, Savitribai Phule Pune University, Pune.

Extraction of plant material and preparation of fraction

Leaves of *S. grandiflora* were dried, powdered and then preserved in an air tight container. The dried powder (450

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Evaluation of Anti-Urolithiatic Activity of Ethanolic Extract of Delonix Regia Leaves in Experimental Animal

— Scopus

Dr. Sonali S. Nipate

(41)

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Research Article

Evaluation of Anti-Urolithiatic Activity of Ethanolic Extract of *Delonix regia* Leaves in Experimental Animal

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ABSTRACT

The aim of the present study was to investigate the anti-urolithiatic effect of *Delonix regia* leaves in ethylene glycol and ammonium chloride induced urolithiasis in wistar rats. Renal stone was induced in animals by 0.75% ethylene glycol and 1% ammonium chloride in drinking water for 28 days. In this study the test groups animals were administered with ethanolic extract of *D.Regia* at doses 200mg/kg and 400mg/kg once in day from 15th day to 28th day. Cystone (75mg/kg) was used as standard drug. In this study in vitro crystallization is done by using nucleation assay and aggregation assay by using calcium chloride and sodium oxalate. The effect of *Delonix regia* on various physical and biochemical parameters in urine as well as serum was evaluated. The present study, results reveals that the administration of 400mg/kg dose of *Delonix regia* reduced the biochemical parameter than 200mg/kg and states that higher dose is an effective dose for treatment of urolithiasis.

Keywords: Anti-urolithiasis, *Delonix regia*, Ethylene glycol, Ammonium chloride.

QUICK RESPONSE CODE →

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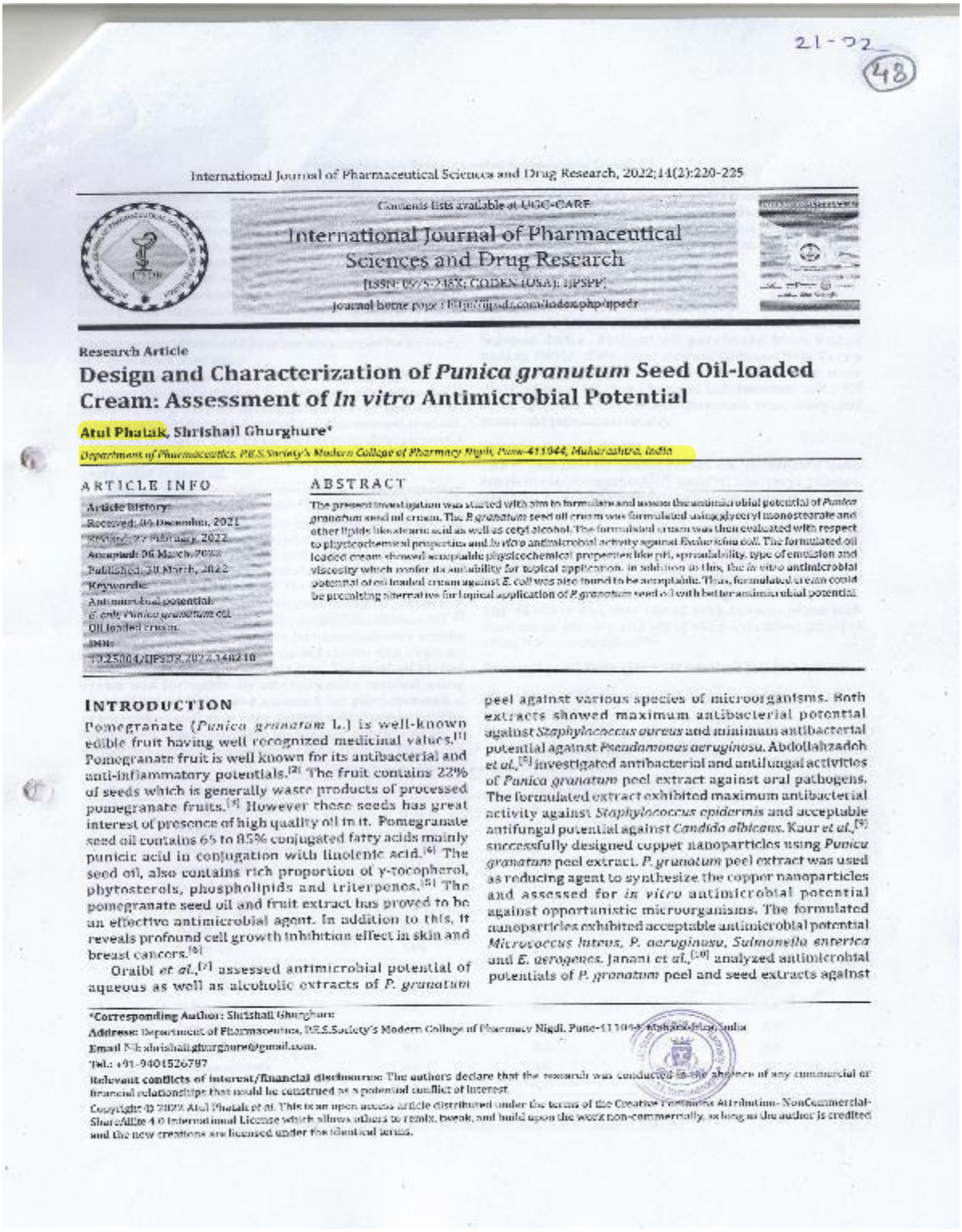
INTRODUCTION

Urolithiasis refers to the formation of stones in the urinary tract, including the kidney, ureter, and bladder. Urolithiasis is caused by the oversaturation of urine with stone-forming salts [1]. Nephrolithiasis, or kidney stone disease, is sometimes known as urolithiasis. A stone that grows to a diameter of more than 5 millimetres (0.2 inch) might clog the ureter, causing significant pain in the lower back or belly. The majority of stones develop as a result of a mix of hereditary and environmental factors. High urine calcium levels, obesity, some diets, some drugs, and calcium supplementation are all risk factors. Symptoms, urine testing, and medical imaging are commonly used to make the diagnosis. Blood testing may be beneficial as well. Nephrolithiasis (stones in the kidney), ureterolithiasis (stones in the ureter), and cystolithiasis (stones in the bladder) are the most common classifications (calcium oxalate, uric acid, struvite, cystine) is what they are formed of[2]. Amongst there were many different sorts of stones, but the most prevalent were calcium oxalate stones. Several factors contribute to the formation of stones. Crystallization is the first step in a series of physicochemical events nucleation, growth, and aggregation are all processes that occur within the body. Urogenital tract it's a major medical issue that affects people all around the world. About 12% of the population is affected, which is three times more than the national average. Men are more likely than women to have this condition [3]. Urolithiasis recurrence rates are roughly 10% after one year, 33% after five years, and 50% after ten years [4]. The mechanisms involved in the production of stone calcification are not completely understood. Anatomic, environmental, genetic, metabolic, dietary, and socioeconomic factors all play a role in its etiopathogenesis[5]. Citrate is an inhibitor, and low urine volume, calcium, oxalate, uric acid, phosphate, and other promoters are promoters, and the imbalance between them could be a cause in lithogenesis. Urinary calculi can induce obstruction, hydronephrosis, infection, urinary tract bleeding, hypertension, tubular necrosis, and subsequent kidney fibrosis, resulting in cell injury and renal stone reformation [6]. Combinations of medicinal and surgical procedures are frequently used to treat urolithiasis. Stone removal techniques include endoscopic stone removal and extracorporeal shock wave lithotripsy. These treatments are both expensive and painful, and they have a number of negative side effects, including haemorrhage, hypertension, tubular necrosis, and eventual fibrosis of the kidney, which leads to cell injury. Stone recurrence is also fairly prevalent [7]. To prevent the recurrence of hypercalciuria and hyperoxaluria-induced calculi, thiazide diuretics and alkali-citrate are employed, however scientific proof for their usefulness is lacking. As a result, novel pharmacological therapy is needed that is cost-effective, targets several etiological risk factors in urolithiasis, and reduces the rate of recurrence [8].

Since ancient times, medicinal plants have played a significant role in the treatment of numerous diseases in India's traditional medicine. For the bulk of the world's population, the plants provide a low-cost supply of pharmaceuticals. Phytotherapeutic drugs could be

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Design and characterization of punica granutum seed oil- loaded cream: assessment of in vitro antimicrobial potential



21-22
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Research Article

Design and Characterization of *Punica granutum* Seed Oil-loaded Cream: Assessment of *In vitro* Antimicrobial Potential

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ABSTRACT

The present investigation was started with aim to formulate and assess the antimicrobial potential of *Punica granutum* seed oil cream. The *P. granutum* seed oil cream was formulated using glyceryl monostearate and other lipids like stearic acid as well as cetyl alcohol. The formulated cream was then evaluated with respect to physicochemical properties and *in vitro* antimicrobial activity against *Escherichia coli*. The formulated oil loaded cream showed acceptable physicochemical properties like pH, spreadability, type of emulsion and viscosity which confer its suitability for topical application. In addition to this, the *in vitro* antimicrobial potential of oil loaded cream against *E. coli* was also found to be acceptable. Thus, formulated cream could be promising alternative for topical application of *P. granutum* seed oil with better antimicrobial potential.

INTRODUCTION

Pomegranate (*Punica granatum* L.) is well-known edible fruit having well recognized medicinal values.[1] Pomegranate fruit is well known for its antibacterial and anti-inflammatory potentials.[2] The fruit contains 22% of seeds which is generally waste products of processed pomegranate fruits.[3] However these seeds has great interest of presence of high quality oil in it. Pomegranate seed oil contains 65 to 85% conjugated fatty acids mainly punicic acid in conjugation with linolenic acid.[4] The seed oil, also contains rich proportion of γ-tocopherol, phytosterols, phospholipids and triterpenes.[5] The pomegranate seed oil and fruit extract has proved to be an effective antimicrobial agent. In addition to this, it reveals profound cell growth inhibition effect in skin and breast cancers.[6]

Oraibi *et al.*,[7] assessed antimicrobial potential of aqueous as well as alcoholic extracts of *P. granatum* peel against various species of microorganisms. Both extracts showed maximum antibacterial potential against *Staphylococcus aureus* and minimum antibacterial potential against *Pseudomonas aeruginosa*. Abdollahzadeh *et al.*,[8] investigated antibacterial and antifungal activities of *Punica granatum* peel extract against oral pathogens. The formulated extract exhibited maximum antibacterial activity against *Staphylococcus epidermis* and acceptable antifungal potential against *Candida albicans*. Kaur *et al.*,[9] successfully designed copper nanoparticles using *Punica granatum* peel extract. *P. granatum* peel extract was used as reducing agent to synthesize the copper nanoparticles and assessed for *in vitro* antimicrobial potential against opportunistic microorganisms. The formulated nanoparticles exhibited acceptable antimicrobial potential *Micrococcus luteus*, *P. aeruginosa*, *Salmonella enterica* and *E. aerogenes*. Janani *et al.*,[10] analyzed antimicrobial potentials of *P. granatum* peel and seed extracts against

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Design, synthesis, and biological evaluation of 3-chloro-2-oxo-N-(aryl carbamoyl)-2H-1-benzopyran-6-sulfonamide derivatives as potential DPP-IV inhibitors

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Design, Synthesis, and Biological Evaluation of 3-Chloro-2-Oxo-N-(Arylcarbamoyl)-2H-1-Benzopyran-6-Sulfonamide Derivatives as Potential DPP-IV Inhibitors

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Abstract**—**In present work, we aimed at preparing coumarin and sulfonamide containing moieties into a single candidate template i.e. 3-chloro-2-oxo-N-(arylcarbamoyl)-2H-1-benzopyran-6-sulfonamides for the purpose of synergistic activity as potent DPP-IV inhibitors. The designed derivatives were subjected for the calculations of Lipinski rule, Veber's rule, ADME analysis, drug-likeness properties and molecular docking. The derivatives which successfully passed all the criteria were proceeded for wet lab synthesis and biological evaluation. From the initial screening through Lipinski rule, Veber's rule, ADME calculations, and drug-likeness properties, molecules **1a**, 1f, 1g, 1h, 1i, 1j, 1k, 1o, 1p, 1q, 1r, 1v, 1w, and 1x successfully passed all the filters and displayed most drug-likeness nature. Therefore only these molecules were subjected for molecular docking studies. From molecular docking results, we have selected 1f, 1g, 1i, 1j, and 1v for the wet lab synthesis and biological evaluation. The structures of all the synthesized compounds were confirmed by spectral analysis and were subjected for in vitro DPP-IV enzyme assay. Sitagliptin was used as standard for the assay and it displayed 0.018 µM IC50 value. Compound 1f, 1g, 1i, 1j, and 1v exhibited 15.55, 15.85, 13.95, 14.48, and 13.45 µM IC50 values respectively. We concluded that compound 1f, 1g, 1i, 1j, and 1v are potential lead compounds to be developed as potent DPP-IV inhibitors for the treatment of diabetes.

Keywords**—**DPP-IV inhibitors, coumarin derivatives, molecular docking, ADME, vitro.

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Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches

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Review Article

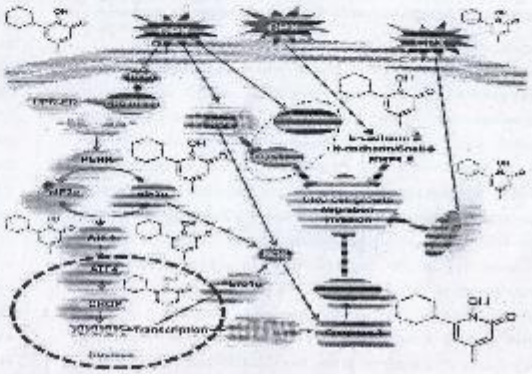
Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches

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ABSTRACT

Ciclopirox is an anti-mycotic drug, used topically, that belongs to the hydroxypyridone molecular class and is not linked to azole drugs or other anti-fungal medication. Ciclopirox was first designed to treat vaginal candidiasis and fungal skin infections, and it is now widely used for these conditions. Drug repurposing is a method for discovering new applications for authorized or experimental medicines that go beyond the original medical indication. Ciclopirox received acknowledgement as repurposed anti-cancer agent (anti-bladder cancer, anti-Ewing sarcoma, anti-pancreatic cancer, hematologic malignancy inhibitor, proliferating cell lines inhibitor, etc.) owing to multiple therapeutic excellencies, where numerous signaling pathways plays role in treating diverse cancer forms. This review article paved a new way by eventually opening newer possibilities for the enthusiastic (medicinal)-chemists, pharmacologists, and researchers of allied branches to design better drugs, repurpose this drug further, and finally use it clinically against various forms of proliferating diseases like cancer.



Keywords: Ciclopirox, Repurpose, Anti-cancer, Inhibitors, Pathways, Cancer.

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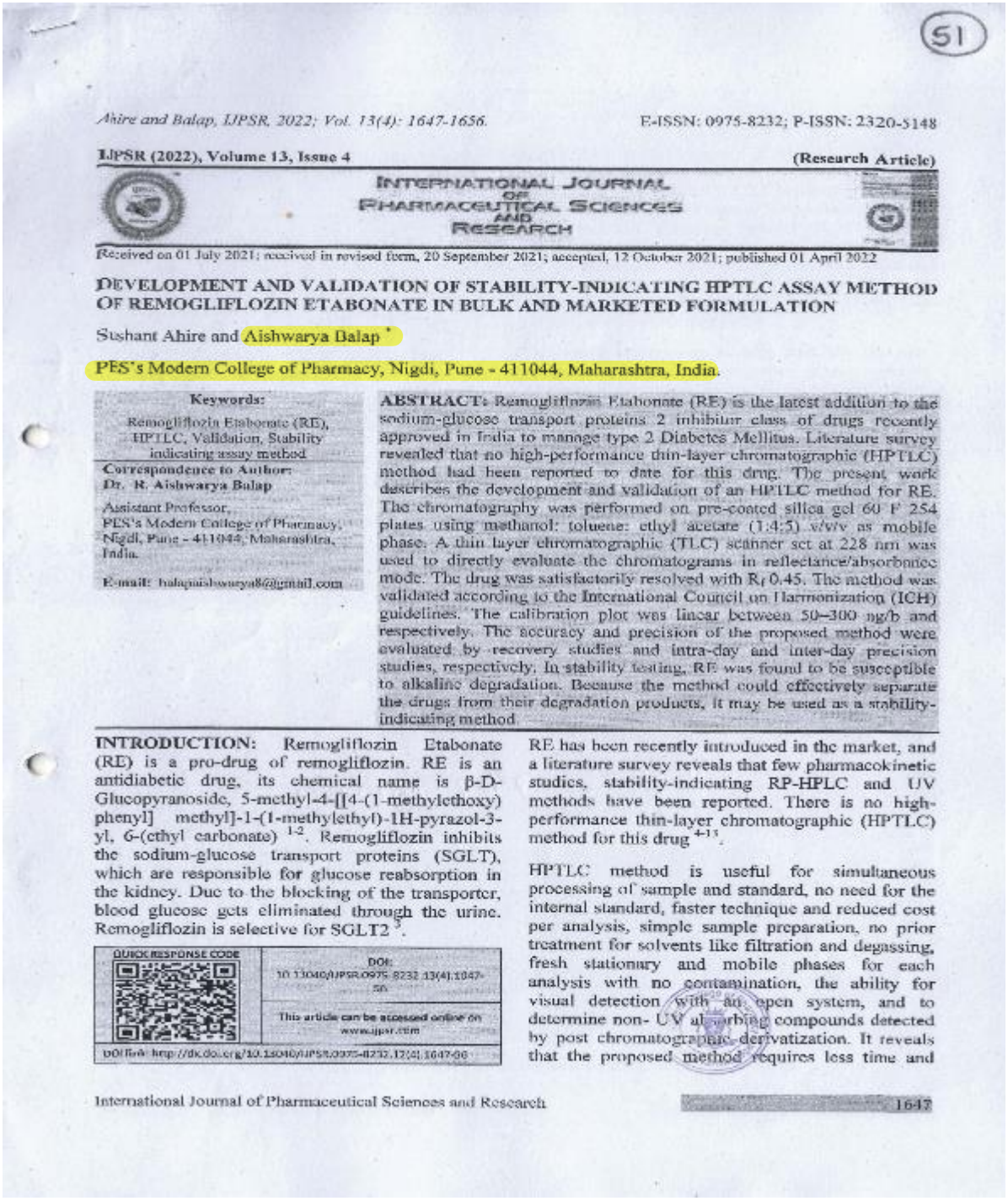
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INTRODUCTION

Ciclopirox (CPX) is an anti-mycotic drug, used topically, that belongs to the hydroxypyridone molecular class and is not linked to azole drugs or other anti-fungal medication (Figure 1). Its antimicrobial spectrum is far wider than the majority further anti-mycotic, since it covers virtually all clinically significant yeasts, moulds, and dermatophytes [1]. It's also effective against certain bacteria and *Candida* species that are resistant to azoles. CPX's method of action differs from that of certain other antifungal topical medications, which all work by inhibiting ergosterol [2]. The strong affinity of CPX for trivalent metal cations seems to be the main indicator of its antimicrobial action, since it inhibits metal-dependent enzymes involved for peroxide breakdown inside the fungal cell. Resilience in pathogenic fungi has a very low chance of developing due to this distinct and multilayer mode of action, with instances of resistance being very uncommon [3].

In pharmacological models and biochemical models, CPX has modest anti-inflammatory effects, which have also been shown in limited clinical trials. These anti-inflammatory effects are presumably due to the reactive oxygen species (ROS) produced by inflammatory cells [4]. CPX and its olamine salt come in a multitude of topical formulations that may be applied to the nails, vaginal area, and skin. The prescription versions, ciclopirox cream (1%) and nail lacquer (8%) have been studied the most, although spray, lotion, pessary, shampoo, gel, douche, and solution were utilized. CPX goes deep into the mucosal membranes, nail keratin, skin's deep layers, and ultimately attaining the concentrations that are higher than the

Development and Validation of Stability-Indicating HPTLC Assay Method of Remogliflozin Etabonate in Bulk and Marketed Formulation



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DEVELOPMENT AND VALIDATION OF STABILITY-INDICATING HPTLC ASSAY METHOD OF REMOGLIFLOZIN ETABONATE IN BULK AND MARKETED FORMULATION

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Keywords:

Remogliflozin Etabonate (RE), HPTLC, Validation, Stability indicating assay method

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ABSTRACT: Remogliflozin Etabonate (RE) is the latest addition to the sodium-glucose transport proteins 2 inhibitor class of drugs recently approved in India to manage type 2 Diabetes Mellitus. Literature survey revealed that no high-performance thin-layer chromatographic (HPTLC) method had been reported to date for this drug. The present work describes the development and validation of an HPTLC method for RE. The chromatography was performed on pre-coated silica gel 60 F 254 plates using methanol: toluene: ethyl acetate (1:4:5) *v/v/v* as mobile phase. A thin layer chromatographic (TLC) scanner set at 228 nm was used to directly evaluate the chromatograms in reflectance/absorbance mode. The drug was satisfactorily resolved with R_f 0.45. The method was validated according to the International Council on Harmonization (ICH) guidelines. The calibration plot was linear between 50–300 ng/b and respectively. The accuracy and precision of the proposed method were evaluated by recovery studies and intra-day and inter-day precision studies, respectively. In stability testing, RE was found to be susceptible to alkaline degradation. Because the method could effectively separate the drugs from their degradation products, it may be used as a stability-indicating method.

INTRODUCTION: Remogliflozin Etabonate (RE) is a pro-drug of remogliflozin. RE is an antidiabetic drug, its chemical name is β-D-Glucopyranoside, 5-methyl-4-[[4-(1-methylethoxy) phenyl] methyl]-1-(1-methylethyl)-1H-pyrazol-3-yl, 6-(ethyl carbonate) [1-2]. Remogliflozin inhibits the sodium-glucose transport proteins (SGLT), which are responsible for glucose reabsorption in the kidney. Due to the blocking of the transporter, blood glucose gets eliminated through the urine. Remogliflozin is selective for SGLT2 [3].

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RE has been recently introduced in the market, and a literature survey reveals that few pharmacokinetic studies, stability-indicating RP-HPLC and UV methods have been reported. There is no high-performance thin-layer chromatographic (HPTLC) method for this drug [4-15].

HPTLC method is useful for simultaneous processing of sample and standard, no need for the internal standard, faster technique and reduced cost per analysis, simple sample preparation, no prior treatment for solvents like filtration and degassing, fresh stationary and mobile phases for each analysis with no contamination, the ability for visual detection with an open system, and to determine non- UV absorbing compounds detected by post chromatographic derivatization. It reveals that the proposed method requires less time and

Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach

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Research Article

Pharmaceutics for effective drug dosage

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Preparation and Characterization of Advanced Nano medicine For Malaria: Box Behnken Design Approach

Anuradha G. More[1*], Parag R. Potbhare[1], Padmaja S. Kore[1], Praveen D. Chaudhari[1], Pratiksha U. Kshirsagar[1], Radhika R. Baheti[1] and Surbhi C. Gupta[1]

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Abstract: In tropical countries, malaria is a larger cause of sickness and death in adults and children. Drug resistance with antimalarial therapy has now become a serious problem worldwide and it is the basic reason for the need of combination therapy. Artemisinin-based combination therapy (ACT) is widely used nowadays. The drugs selected for the study from ACT were an Artesunate (AST) and Lumefantrine (LUM). In this study, the optimized Solid-Self nanoemulsifying drug delivery system (S-SNEDDS) formulation of AST and LUM was developed using Box Behnken design (BBD) which showed greater *in-vitro* drug release when compared to marketed formulation. Both the drugs AST and LUM show high solubility in Anise oil, Tween 80 (surfactant), and PEG 400 (co-surfactant). Ternary phase diagrams were used to select nanoemulsifying regions. It was found to have a maximum nanoemulsion region with a 2:1 surfactant to co-surfactant ratio. The effect of formulation variables was studied by BBD. Thirteen formulations were prepared and were further characterized based on globule size, PDI, zeta potential, self-emulsification time, cloud point, % transmittance and in vitro dissolution profiles. The optimized Liquid-SNEDDS (L-SNEDDS) with RHLB 13.76 gives globule size (82.8 nm), % T (96.7 %), *in vitro* release of AST (98.4 %) and LUM (97.07%) at 45 min. was converted into S-SNEDDS by using neusilin US2 as an adsorbent. The S-SNEDDS was characterized by SEM, globule size (98.24 nm), % T (95.02 %), in vitro release of ART (95.18 %) and LUM (96.4%) at 45 min. DSC and FTIR study for S-SNEDDS assure that there was an absence of any chemical interaction within the drug and carrier. SEM, X-ray diffraction studies confirmed that drugs exist in amorphous nature. The present research successfully developed S-SNEDDS for bioavailability enhancement of AST and LUM in fix dose combination

Keywords: Artesunate and Lumefantrine, Solid self-emulsifying drug delivery system, Box-Behnken design, Antimalarial formulation

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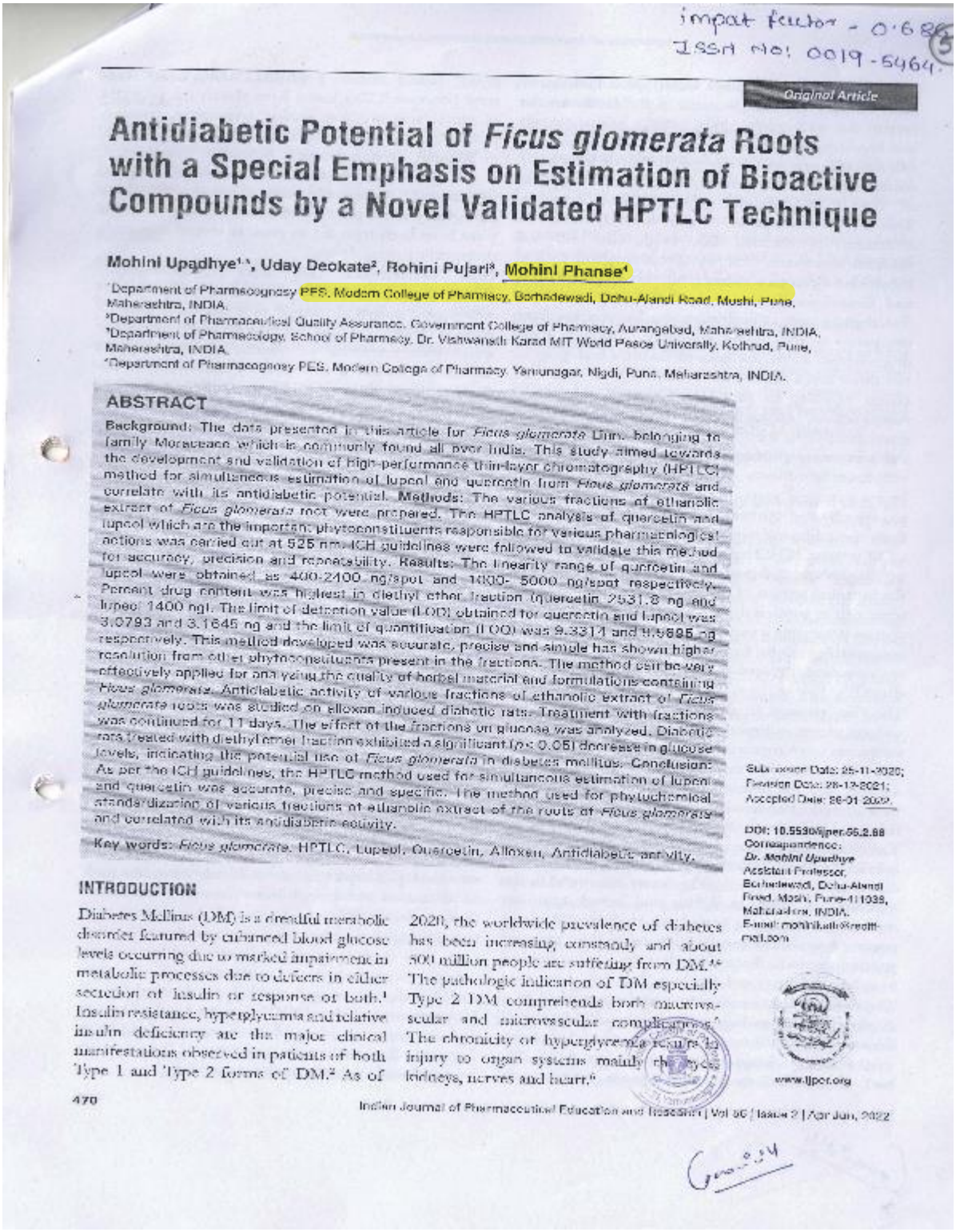
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Antidiabetic Potential of Ficus glomerata Roots with a Special Emphasis on Estimation of Bioactive Compounds by a Novel Validated HPTLC



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Original Article

Antidiabetic Potential of *Ficus glomerata* Roots with a Special Emphasis on Estimation of Bioactive Compounds by a Novel Validated HPTLC Technique

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ABSTRACT

Background: The data presented in this article for *Ficus glomerata* Linn. belonging to family Moraceae which is commonly found all over India. This study aimed towards the development and validation of high-performance thin-layer chromatography (HPTLC) method for simultaneous estimation of lupeol and quercetin from *Ficus glomerata* and correlate with its antidiabetic potential. **Methods:** The various fractions of ethanolic extract of *Ficus glomerata* root were prepared. The HPTLC analysis of quercetin and lupeol which are the important phytoconstituents responsible for various pharmacological actions was carried out at 525 nm. ICH guidelines were followed to validate this method for accuracy, precision and repeatability. **Results:** The linearity range of quercetin and lupeol were obtained as 400-2400 ng/spot and 1400- 5000 ng/spot respectively. Percent drug content was highest in diethyl ether fraction (quercetin 2531.8 ng and lupeol 1400 ng). The limit of detection value (LOD) obtained for quercetin and lupeol was 3.0793 and 3.1645 ng and the limit of quantification (LOQ) was 9.3314 and 9.5895 ng respectively. This method developed was accurate, precise and simple has shown higher resolution from other phytoconstituents present in the fractions. The method can be very effectively applied for and value the quality of herbal material and formulations containing *Ficus glomerata*. Antidiabetic activity of various fractions of ethanolic extract of *Ficus glomerata* roots was studied on alloxan induced diabetic rats. Treatment with fractions was continued for 11 days. The effect of the fractions on glucose was analyzed. Diabetic rats treated with diethyl ether fraction exhibited a significant ($p < 0.05$) decrease in glucose levels, indicating the potential use of *Ficus glomerata* in diabetes mellitus. **Conclusion:** As per the ICH guidelines, the HPTLC method used for simultaneous estimation of lupeol and quercetin was accurate, precise and specific. The method used for phytochemical standardization of various fractions of ethanolic extract of the roots of *Ficus glomerata* and correlated with its antidiabetic activity.

Key words: *Ficus glomerata*, HPTLC, Lupeol, Quercetin, Alloxan, Antidiabetic activity.

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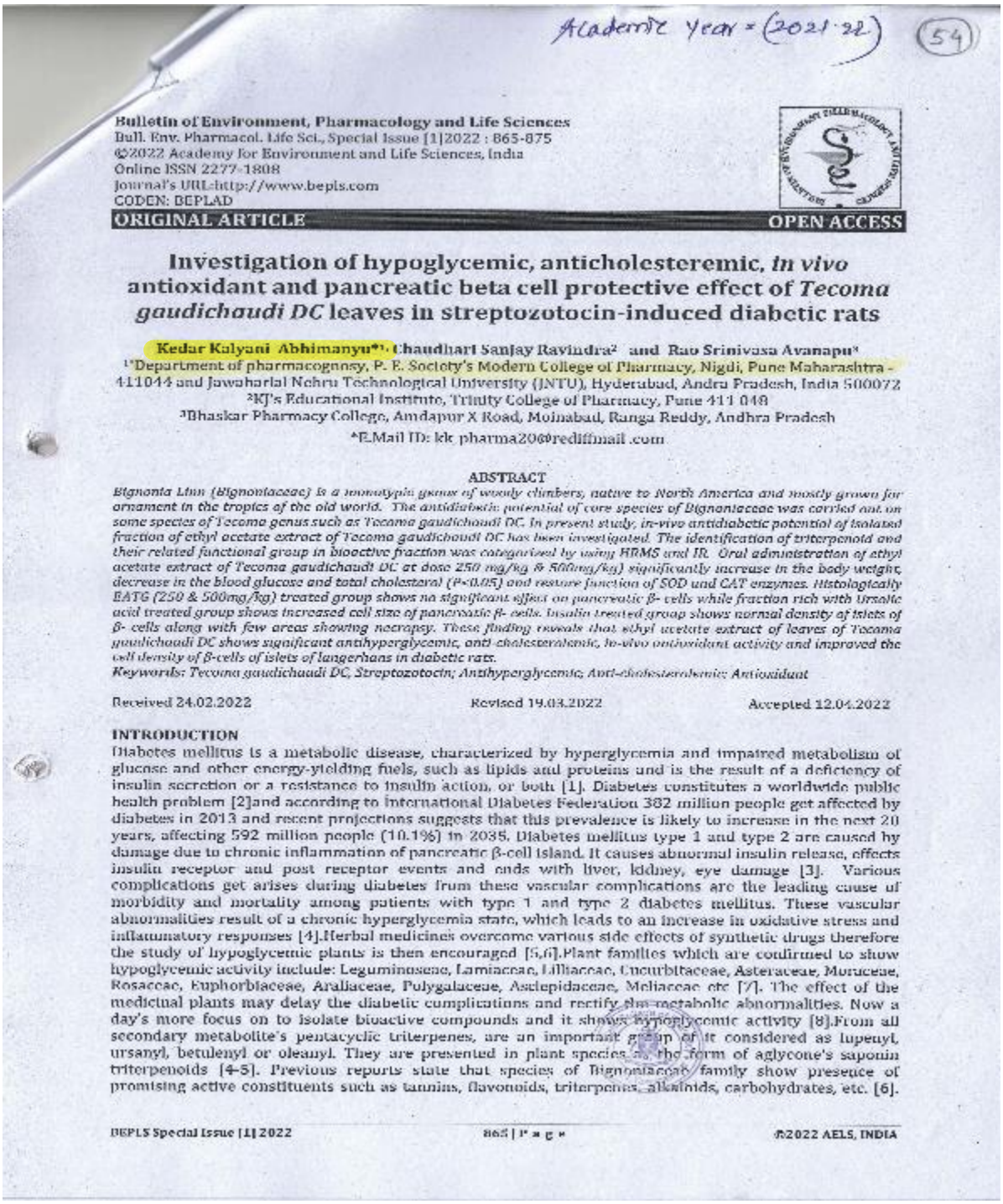
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INTRODUCTION

Diabetes Mellitus (DM) is a dreadful metabolic disorder featured by enhanced blood glucose levels occurring due to marked impairment in metabolic processes due to defects in either secretion of insulin or response or both.[1] Insulin resistance, hyperglycemia and relative insulin deficiency are the major clinical manifestations observed in patients of both Type 1 and Type 2 forms of DM.[2] As of 2020, the worldwide prevalence of diabetes has been increasing, constantly and about 500 million people are suffering from DM.[3,4] The pathologic indication of DM especially Type 2 DM comprehends both macrovascular and microvascular complications.[5] The chronicity of hyperglycemia results in injury to organ systems mainly the eyes, kidneys, nerves and heart.[6]

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Investigation of hypoglycemic, anticholesteremic, in vivo antioxidant and pancreatic beta cell protective effect of Tecoma gaudichaudi DC leaves in streptozotocin-induced diabetic rats



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Investigation of hypoglycemic, anticholesteremic, *In vivo* antioxidant and pancreatic beta cell protective effect of *Tecoma gaudichaudi DC* leaves in streptozotocin-induced diabetic rats

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ABSTRACT

Bignonia Linn (Bignoniaceae) is a monotypic genus of woody climbers, native to North America and mostly grown for ornament in the tropics of the old world. The antidiabetic potential of core species of Bignoniaceae was carried out on some species of Tecoma genus such as Tecoma gaudichaudi DC. In present study, in-vivo antidiabetic potential of isolated fraction of ethyl acetate extract of Tecoma gaudichaudi DC has been investigated. The identification of triterpenoid and their related functional group in bioactive fraction was categorized by using HRMS and IR. Oral administration of ethyl acetate extract of Tecoma gaudichaudi DC at dose 250 mg/kg & 500mg/kg) significantly increase in the body weight, decrease in the blood glucose and total cholesterol ($P<0.05$) and restore function of SOD and CAT enzymes. Histologically EATG (250 & 500mg/kg) treated group shows no significant effect on pancreatic β- cells while fraction rich with Ursolic acid treated group shows increased cell size of pancreatic β- cells. Insulin treated group shows normal density of islets of β- cells along with few areas showing necrapsy. These finding reveals that ethyl acetate extract of leaves of Tecoma gaudichaudi DC shows significant antihyperglycemic, and cholesteralemic, In-vivo antioxidant activity and improved the cell density of β-cells of islets of langerhans in diabetic rats.

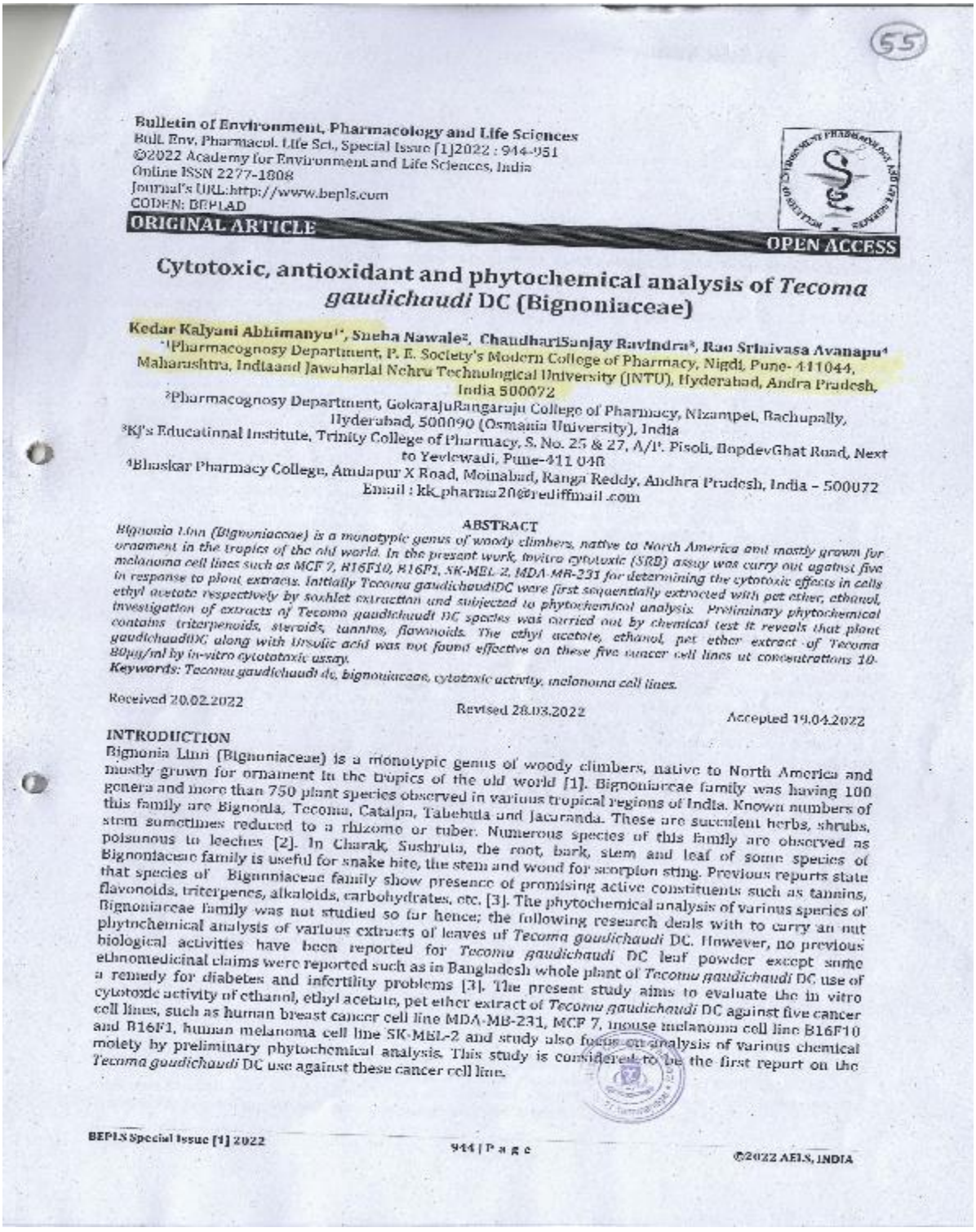
Keywords: Tecoma gaudichaudi DC, Streptozotocin; Antihyperglycemic, Anti-cholesterolemic, Antioxidant

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INTRODUCTION

Diabetes mellitus is a metabolic disease, characterized by hyperglycemia and impaired metabolism of glucose and other energy-yielding fuels, such as lipids and proteins and is the result of a deficiency of insulin secretion or a resistance to insulin action, or both [1]. Diabetes constitutes a worldwide public health problem [2]and according to International Diabetes Federation 382 million people get affected by diabetes in 2013 and recent projections suggests that this prevalence is likely to increase in the next 20 years, affecting 592 million people (10.1%) in 2035. Diabetes mellitus type 1 and type 2 are caused by damage due to chronic inflammation of pancreatic β-cell island. It causes abnormal insulin release, effects insulin receptor and post receptor events and ends with liver, kidney, eye damage [3]. Various complications get arises during diabetes from these vascular complications are the leading cause of morbidity and mortality among patients with type 1 and type 2 diabetes mellitus. These vascular abnormalities result of a chronic hyperglycemia state, which leads to an increase in oxidative stress and inflammatory responses [4].Herbal medicines overcome various side effects of synthetic drugs therefore the study of hypoglycemic plants is then encouraged [5,6].Plant families which are confirmed to show hypoglycemic activity include: Leguminosae, Lamiaceae, Liliaceae, Cucurbitaceae, Asteraceae, Moraceae, Rosaceae, Euphorbiaceae, Araliaceae, Polygalaceae, Asclepidaceae, Meliaceae etc [7]. The effect of the medicinal plants may delay the diabetic complications and rectify the metabolic abnormalities. Now a day's more focus on to isolate bioactive compounds and it shows hypoglycemic activity [8].From all secondary metabolite's pentacyclic triterpenes, are an important group of it considered as lupenyl, ursanyl, betulenyl or oleanyl. They are presented in plant species as the form of aglycone's saponin triterpenoids [4-5]. Previous reports state that species of Bignoniaceae family show presence of promising active constituents such as tannins, flavonoids, triterpenes, alkaloids, carbohydrates, etc. [6].

Cytotoxic, antioxidant and phytochemical analysis of Tecoma gaudichi DC (Bignoniaceae)



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Cytotoxic, antioxidant and phytochemical analysis of *Tecoma gaudichaudi* DC (Bignoniaceae)

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ABSTRACT

Bignonia Linn (Bignoniaceae) is a monotypic genus of woody climbers, native to North America and mostly grown for ornament in the tropics of the old world. In the present work, invitro cytotoxic (SRB) assay was carry out against five melanoma cell lines such as MCF 7, B16F10, B16F1, SK-MEL 2, MDA-MB-231 for determining the cytotoxic effects in cells in response to plant extracts. Initially Tecoma gaudichaudiDC were first sequentially extracted with pet ether, ethanol, ethyl acetate respectively by soxhlet extraction and subjected to phytochemical analysis. Preliminary phytochemical investigation of extracts of Tecoma gaudichaudi DC species was carried out by chemical test it reveals that plant contains triterpenoids, steroids, tannins, flavonoids. The ethyl acetate, ethanol, pet ether extract of Tecoma gaudichaudiDC along with Ursulic acid was not found effective on these five cancer cell lines at concentrations 10-80µg/ml by in-vitro cytotoxic assay.

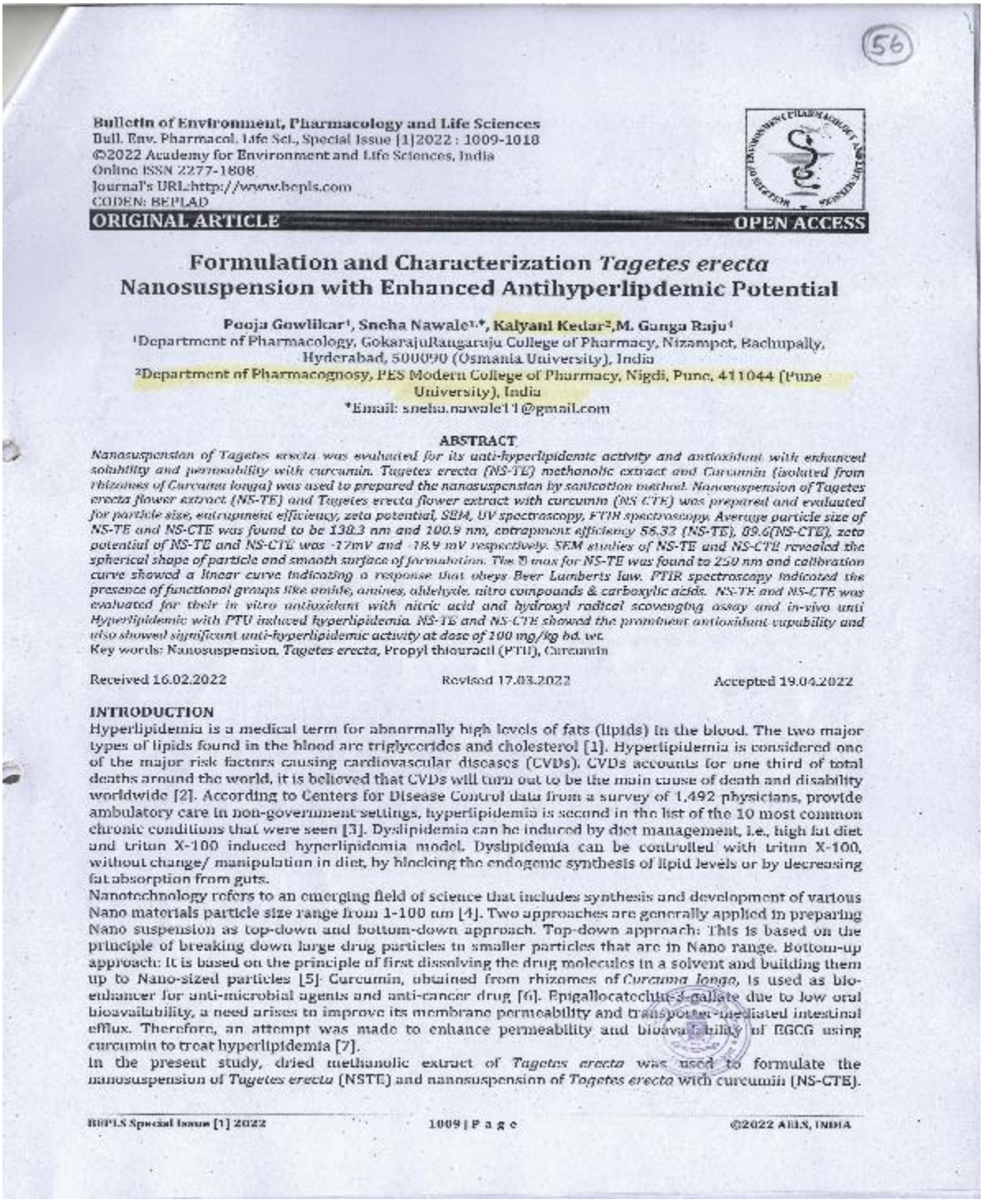
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INTRODUCTION

Bignonia Linn (Bignoniaceae) is a monotypic genus of woody climbers, native to North America and mostly grown for ornament in the tropics of the old world [1]. Bignoniaceae family was having 100 genera and more than 750 plant species observed in various tropical regions of India. Known numbers of this family are Bignonia, Tecoma, Catalpa, Tabebuia and Jacaranda. These are succulent herbs, shrubs, stem sometimes reduced to a rhizome or tuber. Numerous species of this family are observed as poisonous to leeches [2]. In Charak, Sushruta, the root, bark, stem and leaf of some species of Bignoniaceae family is useful for snake bite, the stem and wood for scorpion sting. Previous reports state that species of Bignoniaceae family show presence of promising active constituents such as tannins, flavonoids, triterpenes, alkaloids, carbohydrates, etc. [3]. The phytochemical analysis of various species of Bignoniaceae family was not studied so far hence; the following research deals with to carry an out phytochemical analysis of various extracts of leaves of *Tecoma gaudichaudi* DC. However, no previous biological activities have been reported for *Tecoma gaudichaudi* DC leaf powder except some ethnomedicinal claims were reported such as in Bangladesh whole plant of *Tecoma gaudichaudi* DC use of a remedy for diabetes and infertility problems [3]. The present study aims to evaluate the in vitro cytotoxic activity of ethanol, ethyl acetate, pet ether extract of *Tecoma gaudichaudi* DC against five cancer cell lines, such as human breast cancer cell line MDA-MB-231, MCF 7, mouse melanoma cell line B16F10 and B16F1, human melanoma cell line SK-MEL-2 and study also focus on analysis of various chemical molety by preliminary phytochemical analysis. This study is considered to be the first report on the *Tecoma gaudichaudi* DC use against these cancer cell line.

Formulation and characterization targets Etecta Nanosuspension with enhanced antihyperlipidemic potential



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ORIGINAL ARTICLE OPEN ACCESS

Formulation and Characterization *Tagetes erecta* Nanosuspension with Enhanced Antihyperlipdemic Potential

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ABSTRACT

Nanosuspension of Tagetes erecta was evaluated for its anti-hyperlipidemic activity and antioxidant with enhanced solubility and permeability with curcumin. Tagetes erecta (NS-TE) methanolic extract and Curcumin (isolated from rhizomes of Curcuma longa) was used to prepared the nanasuspension by sanication method. Nanosuspension of Tagetes erecta flower extract (NS-TE) and Tagetes erecta flower extract with curcumin (NS CTE) was prepared and evaluated for particle size, entrapment efficiency, zeta potential, SEM, UV spectroscopy, FTIR spectroscopy. Average particle size of NS-TE and NS-CTE was found to be 138.3 nm and 100.9 nm, entrapment efficiency 56.32 (NS-TE), 89.6(NS-CTE), zeta potential of NS-TE and NS-CTE was -17mV and -18.9 mV respectively. SEM studies of NS-TE and NS-CTE revealed the spherical shape of particle and smooth surface of formulation. The λ max for NS-TE was found to 250 nm and calibration curve showed a linear curve indicating a response that obeys Beer Lamberts law. FTIR spectroscopy indicated the presence of functional groups like amide, amines, aldehyde, nitro compounds & carboxylic acids. NS-TE and NS-CTE was evaluated for their in vitro antioxidant with nitric acid and hydroxyl radical scavenging assay and in-vivo anti Hyperlipidemic with PTU induced hyperlipidemia. NS-TE and NS-CTE showed the prominent antioxidant capability and also showed significant anti-hyperlipidemic activity at dose of 100 mg/kg bd. wt.

Key words: Nanosuspension, *Tagetes erecta*, Propyl thiouracil (PTU), Curcumin

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INTRODUCTION

Hyperlipidemia is a medical term for abnormally high levels of fats (lipids) in the blood. The two major types of lipids found in the blood are triglycerides and cholesterol [1]. Hyperlipidemia is considered one of the major risk factors causing cardiovascular diseases (CVDs). CVDs accounts for one third of total deaths around the world, it is believed that CVDs will turn out to be the main cause of death and disability worldwide [2]. According to Centers for Disease Control data from a survey of 1,492 physicians, provide ambulatory care in non-government settings, hyperlipidemia is second in the list of the 10 most common chronic conditions that were seen [3]. Dyslipidemia can be induced by diet management, i.e., high fat diet and triton X-100 induced hyperlipidemia model. Dyslipidemia can be controlled with triton X-100, without change/ manipulation in diet, by blocking the endogenic synthesis of lipid levels or by decreasing fat absorption from guts.

Nanotechnology refers to an emerging field of science that includes synthesis and development of various Nano materials particle size range from 1-100 nm [4]. Two approaches are generally applied in preparing Nano suspension as top-down and bottom-down approach. Top-down approach: This is based on the principle of breaking down large drug particles to smaller particles that are in Nano range. Bottom-up approach: It is based on the principle of first dissolving the drug molecules in a solvent and building them up to Nano-sized particles [5]. Curcumin, obtained from rhizomes of *Curcuma longa*, is used as bio-enhancer for anti-microbial agents and anti-cancer drug [6]. Epigallocatechin-3-gallate due to low oral bioavailability, a need arises to improve its membrane permeability and transporter-mediated intestinal efflux. Therefore, an attempt was made to enhance permeability and bioavailability of EGCG using curcumin to treat hyperlipidemia [7].

In the present study, dried methanolic extract of *Tagetes erecta* was used to formulate the nanosuspension of *Tagetes erecta* (NSTE) and nanosuspension of *Tagetes erecta* with curcumin (NS-CTE).

Cytotoxic, antioxidant and phytochemical analysis of Ethyl acetate extract of Putranjiva roxburghii Wall

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ORIGINAL ARTICLE

Cytotoxic, antioxidant and phytochemical analysis of Ethyl acetate extract of *Putranjiva roxburghii* wall"

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ABSTRACT

The cytotoxic activity of ethyl acetate extract of bark of Putranjiva roxburghii wall (Euphorbiaceae family) was carried outon five cancer cell lines by using sulforhodamine-B (SRB) assay and antioxidant activity by using 1, 1-diphenyl -2-picryl-hydrazyl radical. Phytochemical analysis of ethyl acetate extract of this plant shows presence of different groups of chemical moieties and it may be responsible for in vitro cytotoxic activity. In vitro activity was investigated against cancer cell lines human breast cancer cell line MDA-MB-231, MCF 7, mouse melanoma cell line B16F10 and B16F1, human melanoma cell line SK MEL-2.The ethyl acetate extract of bark of Putranjiva roxburghii shows significant in vitro cytotoxic activity withIC50 38.5, 31.2, 37.9 against MDA-MB-231, B16F10, B16F1 and less antiproliferation on the MCF 7, SK-MEL-2. Ethyl acetate extract of bark of Putranjiva roxburghii shows potent antioxidant activity support to treat cancer. The present study is considered to be the first report on cytotoxic activities against cancer cell lines of this plant.

Key Words: Putranjiva roxburghii Wall; Euphorbiaceae; Gas chromatography and mass spectrometry; cytotoxic activity, Antioxidant activity

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INTRODUCTION

Euphorbiaceae family having 220 genera and 4,000 plant species found in various tropical regions of India. In India, following genera of Euphorbiaceae are reported as medicinal plants: Acalypha, Aleurites, Bridelia, Jatropha, phyllanthus, Putranjiva, Ricinus [1-3]. Species of Euphorbiaceae have been used by the local population of many countries in folk medicine as remedies against several diseases complains such as cancer, diabetes, diarrhea, heart diseases, hemorrhages, hepatitis, jaundice, malaria, ophthalmic diseases, rheumatism and scabies etc.

Various parts of *the Putranjiva roxburghii Wall* such as leaf, bark, seed are medicinally useful. The leaves, fruits and the stones of fruits are given in decoction, cold and fevers. The bark and the seeds are useful in the antidotal treatment of snakebite, its leaves and fruits have been traditionally used for the treatment of fever, muscle twisting, arthralgia and rheumatism [6].This plant was effectively used as antinociceptive, antipyretic, anti-inflammatory, antioxidant and to cure hemorrhoids [7].

Putranjiva roxburghii Wall was reported pharmacologically important compounds such triterpenoids, Friedelin, Putranjivanonol and Putranjic acid, Friedelin, Putranjivadione, Friedelanol and Roxburgholonewere isolated from the trunk bark of *Putranjiva roxburghii* [8-10].Roxburghonic acid, a triterpene acid and putraflavone, a biflavonoid, were isolated from the alcoholic extract of the leaves of this plant [11]. Amentoflavone, β-amyrin and stigmasterol determined from *Putranjiva roxburghii* by HPTLC method [12-13]. All published reports mentioned phytochemical, pharmacological studies of this plant effectively use against various diseases.

The present study aims to evaluate the in vitro cytotoxic activity of ethyl acetate extract of bark of *Putranjiva roxburghii* Wall against five cancer cell lines, such as human breast cancer cell line MDA-MB-

Risk Management of Uncontrolled Migraine Attacks

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RISK MANAGEMENT OF UNCONTROLLED MIGRAINE ATTACKS

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ABSTRACT

Migraine is one of the commonest and misunderstood diseases encountered in healthcare practice. It is a condition that heavily affects a person's personal as well as social life. Proper management of this condition is necessary to avoid discomforts and progress towards a healthy life. The present case study aims to highlight the importance of avoiding trigger factors of migraine and also convey the importance of proper lifestyle and medication adherence for minimizing the frequency of migraine headaches.

KEYWORDS: Migraine, trigger factors, medication adherence.

INTRODUCTION

Migraine may be a throbbing pain or pulsing sensation on either side of the head and is amid nausea, vomiting, and photophobia. It is one of the most primary and commonest headache disorders. An attack usually lasts for 4 to 72 hours until properly managed. Migraine attacks commonly occur when the patient (migraineur) is awake. Mostly migraine is a type of disorder for which more than one trigger factors like stress, sunlight exposure, loud noise, and many more contribute to intensifying the headaches. There are no specific treatment options available but symptomatic relief is provided with Non-Steroidal Anti –Inflammatory Drugs (NSAIDs), Anti-depressants, and Anti-emetics. Some practitioners also propose Beta-blockers for prophylactic management of migraine.[1,2]

Molecular Docking and in vitro studies of some new oxadiazole derivatives as antidiabetic agents

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Research Article

Molecular Docking and In-Vitro Studies of Some New Oxadiazole Derivatives As Antidiabetic Agent .

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ABSTRACT
In this research, series of 1,3,4-oxadiazole derivative (A-I to A-XIV) were synthesized in search of an anti-diabetic agents. Molecular docking study was conducted with a binding pocket of Dpp-4 enzyme (PDB ID: 3W2T) to elucidate the binding interactions of newly synthesized targets. Five selected compounds with best docking scores and highest Dpp-4 inhibitory activity were further screened for IC_{50} nM in vitro anti-hyperglycemic study. Three of the compounds (A-III,A-II and A-I) were showed better inhibition of Dpp-4 IC_{50} nM than the standard drug Vildagliptin (4.79±1.66) and A-III (12.05±1.64) . A-III has the highest inhibitory effect among the 14 Synthesized derivatives as a comparison to standard Vildagliptin as a Dpp-4 inhibitor.

Keywords: Type 2 diabetes (T2D), sulfonamide derivatives of 2-cyanopyrrolidine, molecular docking.

INTRODUCTION

Diabetes may be a chronic disease that happens when the pancreas doesn't produce enough insulin to regulates blood sugar or alternatively, when the body cannot effectively use the insulin it produces Dpp-4 is an enzyme which destroys a gastrointestinal hormones called Incretins .Incretins help stimulate insulin when its needed (e.g. after eating) and reduce conversion of glycogen to glucose by the liver. Dpp-4 inhibitors are a family of oral antidiabetic drugs that block the Dpp-4 enzyme [1]. Dpp-4 could be a widespread enzyme present that inactivates a variety of many other bioactive compounds, except carbohydrate insulinotropic polypeptide , (GIP) and GLP-1 thus inhibition could theoretically influence glucose control with different pathways.

2-Cyanopyrrolidine derivatives belongs to Glycine-based Inhibitors , of main class Peptidomimetic Inhibitors. 2-Cyanopyrrolidine derivatives contain existence of Nitrile on the five membered pyrrolidine ring that provides reversible nanomolar inhibition of DPP-4 enzyme [2,3]. The cyanopyrrolidine isoform fills the S1 pocket, forming a covalent bond between the cyano group and the side chain Ser630 [4] . The Nitrile group is increasingly forming a coordination complex with the Dpp-4 catalytic site.It improves the glycated hemoglobin (HbA1c) because it reversibly inhibits the DPP-4 enzyme, which prolongs circulating half- life glucagon like peptide-1 (GLP-1) increasing insulin secretion .Omarigliptin (MK-3102), a sulfonamide based DPP-4 inhibitor developed by Merc and proved that as a potent antidiabetic activity. The pharmacokinetic studies showed that ,Omarigliptin is suitable for once weekly dose , which makes it unique and suitable for the DPP-4 inhibitors [5].The 1,3,4-oxadiazole derivatives are reported as a various biological activites like antiviral, antitubercular, anticancer, antimicrobial , antidiabetic , anticonvulsant and analgesic[7]. Similarly, according to literature it reveals that Vildagliptin , Saxagliptin , Anagliptin has better action dues to 2-cyanopyrrolidine group .These derivatives exhibit significant biological activities based on the distinct and specific pharmacological advantages of sulfonamides group present in it .Oxadiazole and sulphonmide Cyanopyrrolidine scaffolds were intend to develop a hybrid skeleton of sulphonamide pyrrolidine scaffolds during search of naval and potent Dpp-4 inhibitor as an antidiabetic agent [6]. AutoDock 4.2 software used for molecular modeling study . Oxadiazole derivatives containing 2-cyano pyrrolidine sulfonamide substituent which is synthesis by eco friendly method. The completion of the reaction was tested by thin-layer chromatography (TLC) of the silica gel coated aluminium sheets (silica gel 60 F254) obtained from Merck. Industrial quality solvents and reagents have been used without further purification.The open capillary procedure was used to calculate the melting points and was not corrected. The IR spectra (in KBr pellets) was recorded on the IASCO FT/IR-4100 spectrophotometer. ^{1}H NMR and ^{13}C NMR spectra (DMSO-d6) were registered on Bruker (400 MHz) using TMS as an internal standard. Chemical change values are displayed in (ppm) units. The

Spray drying approach in preparation and characterization of solid Dispersion of Eprosartan Mesylate

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RESEARCH ARTICLE

SPRAY DRYING APPROACH IN PREPARATION AND CHARACTERIZATION OF SOLID DISPERSION OF EPROSARTAN MESYLATE

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ABSTRACT

Spray drying methods were used to make solid dispersions of the medication Eprosartan Mesylate, which is poorly water-soluble. X-ray Powder diffraction, Fourier transform infrared spectroscopy, and differential scanning calorimetry were used to characterize the products' physicochemical features as well as drug-polymer interactions. Eprosartan Mesylate was shown to be dispersed amorphously in both solid dispersion systems, with a drug to polymer weight ratio of 1:4 The drug and polymer created hydrogen bonds, according to the spectrum data. Both techniques utilized in this investigation enhanced Eprosartan Mesylate solubility. Solid dispersions, on the other hand, performed significantly better, dissolving completely in 5 minutes and at a rate that was about 20 times faster than API within the first 15 minutes. Spray drying is a good way to boost the bioavailability of drugs that are poor water solubility.

KEYWORDS: Eprosartan mesylate, Solid dispersion, Spray drying, Poorly water soluble drug, Bioavailability.

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INTRODUCTION

Eprosartan mesylate is a non-biphenyl, non-tetrazole, nonpeptide angiotensin II antagonist with antihypertensive properties. Eprosartan methane sulfonate is a sodium salt of methane sulfonate, has eprosartan in it and crystalline powder with less water solubility. Eprosartan mesylate is given in a dose of 400 to 800 mg once or twice in a day for 13 weeks to mild to severe hypertensive patient. By reducing angiotensin II-induced vasoconstriction and angiotensin II mediated stimulation of aldosterone secretion by the adrenal cortex, this lowers salt and water excretion while increasing potassium excretion.[1]

Eprosartan mesylate is classed as a class 2 drug by the Biopharmaceutics Classification System because of its low water solubility (1 mg/mL at 25°C) (BCS). A BCS class 2 medicine's oral bioavailability can be improved by using a method like solid dispersion to increase its water solubility. Eprosartan mesylate is administered in large dosage, because of limited efficacy. Eprosartan Mesylate Drug Dissolution Enhancement could increase its oral efficacy and reduce the requirement for high doses.

Eprosartan Mesylate water solubility and lipophilicity is pH dependant, which could lead to varied absorption as the molecule moves through the gastrointestinal tract. The consequent bioavailability is around 13% due to substantial hepatic first pass metabolism in the liver and relatively low solubility. As a result, a high dose of 800 mg is frequently prescribed for the treatment of hypertension and other heart issues, which frequently results in negative undesirable side effects.[2]

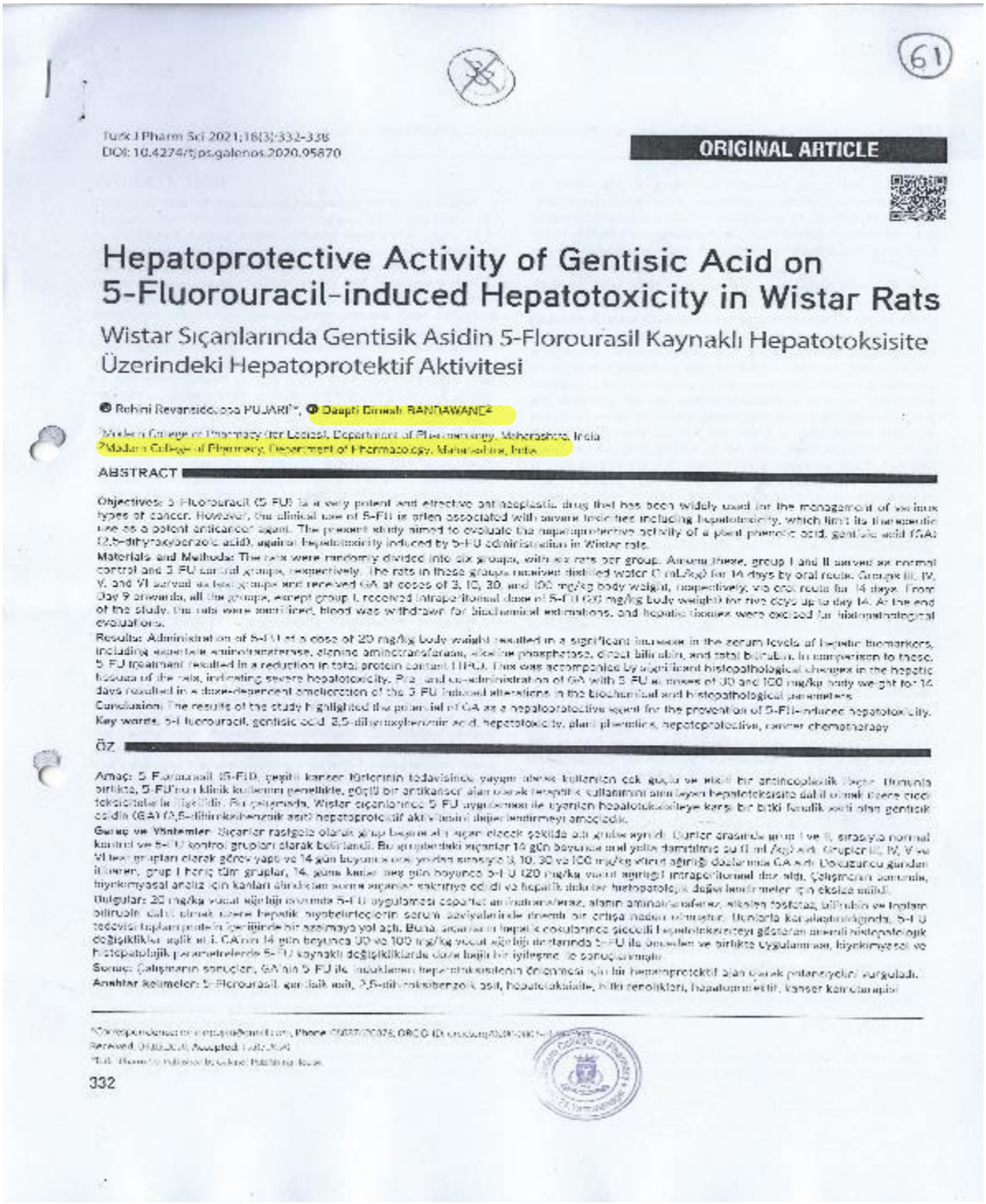
Eprosartan Mesylate binds significantly to plasma proteins (98%) and has a mean terminal elimination half-life of 20 hours at 600 mg oral dosing. Eprosartan Mesylate has a low oxidative and hydrolytic metabolism, with approximately 90% of the unaltered drug eliminated in the stool.[3]

Procedures that have been shown to increase the solubility and solubilisation of poorly water-soluble API's usually involve micronization, nanoparticle formation, surfactant Solubilization, micro emulsions, cyclodextrin Complexation, hydrophilic polymeric wall materials encapsulating, self-emulsifying drug delivery systems, and hydrophobic medicines dispersed in hydrophilic polymer matrix. This technique, that includes dispersing a hydrophobic drug in a hydrophilic polymer, such as a polymer such as polyvinyl Pyrrolidone (PVP), along with the inclusion of a surfactant, has been shown to be rather effective in improving the Water-insoluble medication dispersion and dissolution.[4]

A ternary solid dispersion is better at improving the dispersion and dissolution of BCS class 2 drugs than a binary solid dispersion (a binary solid dispersion). The kneading method, the solvent evaporation method, and the lyophilization technique are useful for solid dispersions. Solid dispersions generated by the solvent evaporation technique may be useful for increasing the dispersion and dissolution rates of water-insoluble compounds. Wetting rises because the drug is adjacent to the hydrophilic carriers, and amorphization is helped by the crystalline components becoming amorphous.[5]

In this investigation, we employed the solvent evaporation methodology to synthesise a range of eprosartan mesylate-

Hepato-protective activity of of gentisic acid on 5- fluorouracil- induced hepatotoxicity in wistar rats



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ORIGINAL ARTICLE

Hepatoprotective Activity of Gentisic Acid on 5-Fluorouracil-induced Hepatotoxicity in Wistar Rats

Wistar Sıçanlarında Gentisik Asidin 5-Florourasil Kaynaklı Hepatotoksisite Üzerindeki Hepatoprotektif Aktivitesi

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ABSTRACT

Objectives: 5-Fluorouracil (5-FU) is a very potent and effective antineoplastic drug that has been widely used for the management of various types of cancer. However, the clinical use of 5-FU is often associated with severe toxicities including hepatotoxicity, which limit its therapeutic use as a potent anticancer agent. The present study aimed to evaluate the hepatoprotective activity of a plant phenolic acid, gentisic acid (GA) (2,5-dihydroxybenzoic acid), against hepatotoxicity induced by 5-FU administration in Wistar rats.

Materials and Methods: The rats were randomly divided into six groups, with six rats per group. Among these, group I and II served as normal control and 5-FU control groups, respectively. The rats in these groups received distilled water (1 mL/kg) for 14 days by oral route. Groups III, IV, V, and VI served as test groups and received GA at doses of 3, 10, 30, and 100 mg/kg body weight, respectively, via oral route for 14 days. From Day 9 onwards, all the groups, except group I, received intraperitoneal dose of 5-FU (20 mg/kg body weight) for five days up to day 14. At the end of the study, the rats were sacrificed, blood was withdrawn for biochemical estimations, and hepatic tissues were excised for histopathological evaluations.

Results: Administration of 5-FU at a dose of 20 mg/kg body weight resulted in a significant increase in the serum levels of hepatic biomarkers, including aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, direct bilirubin, and total bilirubin. In comparison to these, 5-FU treatment resulted in a reduction in total protein content (TPC). This was accompanied by significant histopathological changes in the hepatic tissues of the rats, indicating severe hepatotoxicity. Pre- and co-administration of GA with 5-FU at doses of 30 and 100 mg/kg body weight for 14 days resulted in a dose-dependent amelioration of the 5-FU induced alterations in the biochemical and histopathological parameters.

Conclusion: The results of the study highlighted the potential of GA as a hepatoprotective agent for the prevention of 5-FU-induced hepatotoxicity.

Key words: 5-fluorouracil, gentisic acid, 2,5-dihydroxybenzoic acid, hepatotoxicity, plant phenolics, hepatoprotective, cancer chemotherapy

Öz

Amaç: 5-Florourasil (5-FU), çeşitli kanser türlerinin tedavisinde yaygın olarak kullanılan çok güçlü ve etkili bir antineoplastik ilaçtır. Ancak 5-FU'nun klinik kullanımı genellikle, güçlü bir antikanser ajan olarak terapötik kullanımını sınırlayan hepatotoksisite dahil olmak üzere çeşitli toksisitelerle ilişkilidir. Bu çalışmada, Wistar sıçanlarında 5-FU uygulanması ile oluşan hepatotoksisiteye karşı bir bitki fenolik asidi olan gentisik asidin (GA) (2,5-dihidroksibenzoik asit) hepatoprotektif aktivitesini değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Sıçanlar rastgele olarak grup başına altı sıçan olacak şekilde altı gruba ayrıldı. Bunlar arasında grup I ve II sırasıyla normal kontrol ve 5-FU kontrol grupları olarak belirlendi. Bu gruplardaki sıçanlar 14 gün boyunca oral yolla damıtılmış su (1 mL/kg) aldı. Grup III, IV, V ve VI test grupları olarak görev yaptı ve 14 gün boyunca oral yoldan sırasıyla 3, 10, 30 ve 100 mg/kg vücut ağırlığı dozlarında GA aldı. Dokuzuncu günden itibaren, grup I hariç tüm gruplar, 14. güne kadar beş gün boyunca 5-FU (20 mg/kg vücut ağırlığı) intraperitoneal dozunu aldı. Çalışmanın sonunda, biyokimyasal analiz için kanları alındıktan sonra sıçanlar ötanazi edildi ve hepatik dokular histopatolojik değerlendirmeler için çıkarıldı.

Bulgular: 20 mg/kg vücut ağırlığı dozunda 5-FU uygulaması aspartat aminotransferaz, alanin aminotransferaz, alkalen fosfataz, bilirubin ve toplam bilirubin gibi klinik olarak hepatik biyobelirteçlerin serum düzeylerinde önemli bir artışa neden olmuştur. Bunlarla karşılaştırıldığında, 5-FU tedavisi toplam protein içeriğinde bir azalmaya yol açtı. Buna, sıçanların hepatik dokularında şiddetli hepatotoksisiteyi gösteren önemli histopatolojik değişiklikler eşlik etti. GA'nın 14 gün boyunca 30 ve 100 mg/kg vücut ağırlığı dozlarında 5-FU ile önceden ve birlikte uygulanması, biyokimyasal ve histopatolojik parametrelerde 5-FU kaynaklı değişikliklerde doza bağlı bir iyileşme ile sonuçlanmıştır.

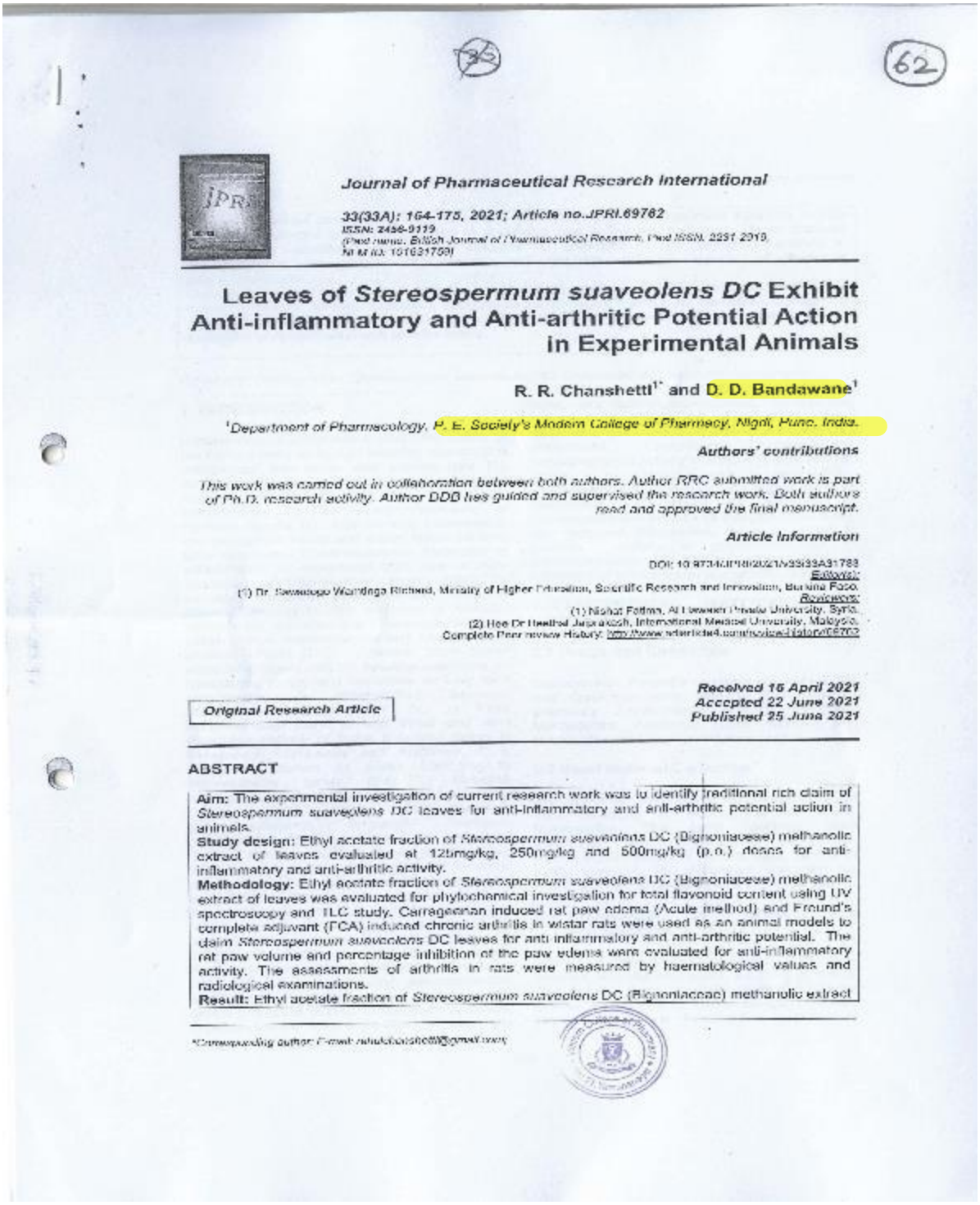
Sonuç: Çalışmanın sonuçları, GA'nın 5-FU ile indüklenen hepatotoksisitenin önlenmesi için bir hepatoprotektif ajan olarak potansiyelini vurguladı.

Anahtar kelimeler: 5-florourasil, gentisik asit, 2,5-dihidroksibenzoik asit, hepatotoksisite, bitki fenolikleri, hepatoprotektif, kanser kemoterapisi

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Leaves of Stereospermum suaveolens DC exhibit anti inflammatory and anti arthritic potential action in experimental animals



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Leaves of *Stereospermum suaveolens DC* Exhibit Anti-inflammatory and Anti-arthritic Potential Action in Experimental Animals

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Authors' contributions

This work was carried out in collaboration between both authors. Author RRC submitted work is part of Ph.D. research activity. Author DDB has guided and supervised the research work. Both authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Aim: The experimental investigation of current research work was to identify traditional rich claim of *Stereospermum suaveolens DC* leaves for anti-inflammatory and anti-arthritic potential action in animals.
Study design: Ethyl acetate fraction of *Stereospermum suaveolens* DC (Bignoniaceae) methanolic extract of leaves evaluated at 125mg/kg, 250mg/kg and 500mg/kg (p.o.) doses for anti-inflammatory and anti-arthritic activity.
Methodology: Ethyl acetate fraction of *Stereospermum suaveolens* DC (Bignoniaceae) methanolic extract of leaves was evaluated for phytochemical investigation for total flavonoid content using UV spectroscopy and TLC study. Carrageenan induced rat paw edema (Acute method) and Freund's complete adjuvant (FCA) induced chronic arthritis in wistar rats were used as an animal models to claim *Stereospermum suaveolens* DC leaves for anti inflammatory and anti-arthritic potential. The rat paw volume and percentage inhibition of the paw edema were evaluated for anti-inflammatory activity. The assessments of arthritis in rats were measured by haematological values and radiological examinations.
Result: Ethyl acetate fraction of *Stereospermum suaveolens* DC (Bignoniaceae) methanolic extract

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Development of biodegradable porous starch form for improving oral delivery of a process Eprosartan Mesylate

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Research Article

DEVELOPMENT OF BIODEGRADABLE POROUS STARCH FOAM FOR IMPROVING ORAL DELIVERY OF EPROSARTAN MESYLATE

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ABSTRACT

Compared to inorganic carriers, Biodegradable Porous Starch Foam has shown strong properties and has a nano porous structure, low density and large specific surface area and pore volume of Biodegradable Porous Starch Foam to improve the solubility and enhance absorption of poorly water soluble drugs. The study aimed to prepare Biodegradable Porous Starch Foam used to improve bioavailability of poorly water-soluble drug Eprosartan Mesylate. The solid-state properties of the loaded BPSF samples have been characterised by SEM, FTIR, XRPD, and DSC for the analysis of the state of dispersion of loaded eprosartan mesylate compared with the pure eprosartan mesylate. By solvent immersion/ evaporation, the eprosartan mesylate is absorbed by a porous structure. The SEM shows the drug is loaded with crystals and rod-shaped pores. In XRPD, crystallinity of BPSF and unprocessed starch is measured as 26.76 percent and 28.6 percent, respectively. Eprosartan mesylate is thus identified on the surface of BPSF only by FTIR. From the *in vitro* drug release studies, it was confirmed that BPSF can be used to enhance the water solubility of poorly water soluble drugs. This study demonstrates the great significance of using BPSF as a new delivery mechanism for medicines that are poorly water-soluble based on these results. This method can be used as a replacement for another currently used technique to enhance the stability of poorly soluble drugs.

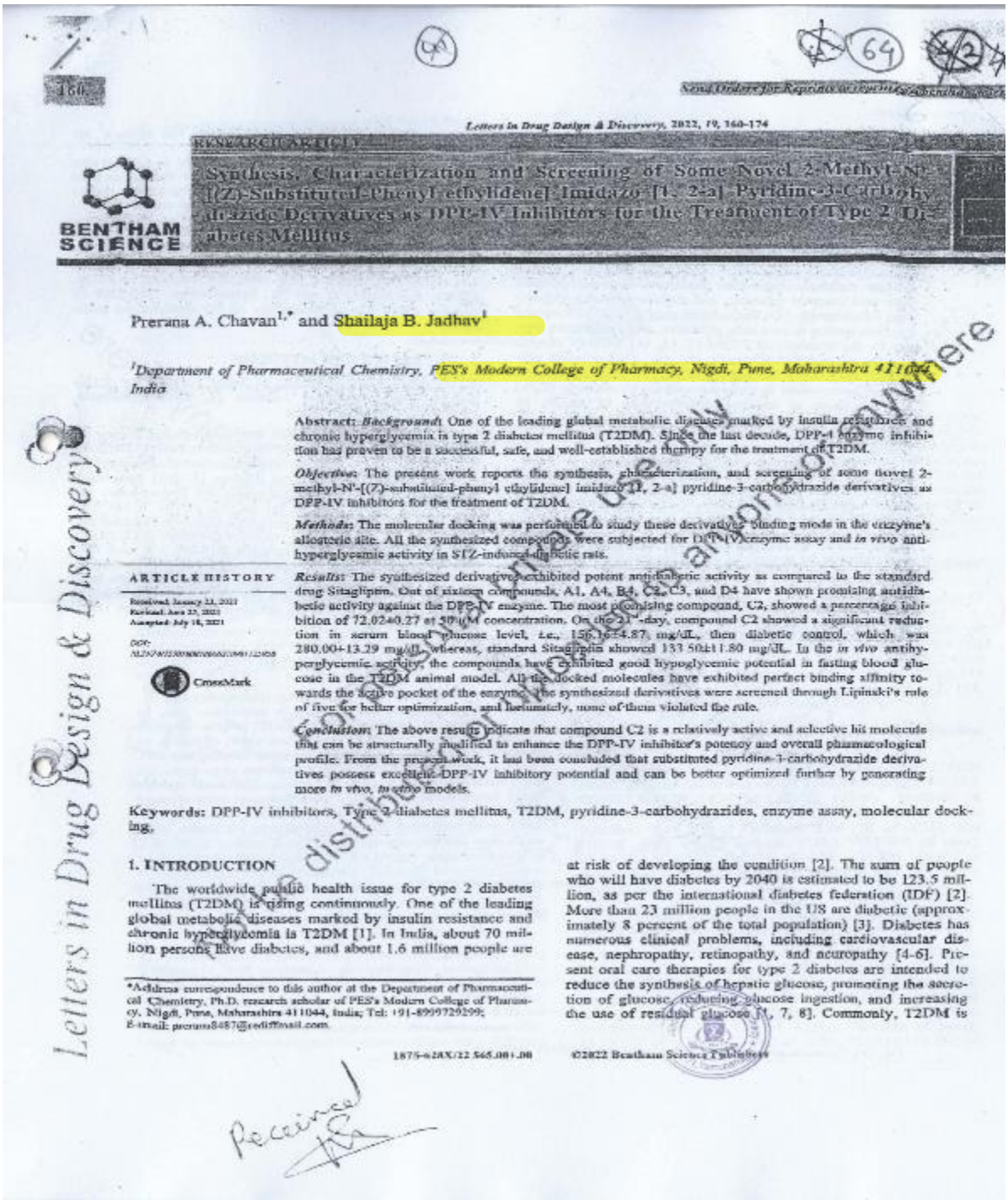
Keywords: Biodegradable Porous Starch Foam (BPSF), Poor water solubility, Eprosartan Mesylate, Bioavailability.

1. INTRODUCTION

As a degradable porous biocompatible material based on starch, Biodegradable Porous Starch Foam has huge potential for poorly water soluble oral dosage forms that have not been investigated to date as a solid dispersion vehicle. Compared to inorganic carriers, Biodegradable Porous Starch Foam has shown strong properties and has a nano porous structure, low density and large specific surface area and pore volume of Biodegradable Porous Starch Foam to improve the solubility and enhance absorption of poorly water-soluble drugs. These are especially desirable properties for vehicle design for systems of oral drug delivery that are poorly water soluble [1]. Starch-based polymers have been widely researched for many applications as drug delivery systems, ranging from scaffolds for tissue engineering to bone cement, microparticle drug delivery systems, and hydrogels [2]. The most reliable distribution factor is Starch. General starch foam is formulated using extrusion or microwave strategy by swelling. Perhaps the product of swelling using extrusion or microwave methodologies is a large pore size of around 1 m [3]. A new method is used for the preparation of Biodegradable Porous Starch via gelatinization associated with the solvent exchange approach. The products obtained have many advantages using this technique, such as a smaller pore size of about 200 nm, generally high throughput, high batch to batch repeatability, and simple scaling. Researchers have also produced countless foam products successfully in the last century, including microcellular starch foams (SMCFs) for volatile compound encapsulation and porous injection molded starch-based blends for tissue engineering scaffolds. However, the use of Biodegradable Porous Starch Foam as an additive to enhance the aqueous solubility of poorly water-soluble drugs still hasn't been studied in detail.

Eprosartan has indeed been approved for the treatment of hypertensive patients in even more than 20 countries as a non-peptide angiotensin II receptor antagonist (e.g., USA, UK, Germany). The drug is orally active and has a chemical structure that is different from biphenyl and tetrazole [4]. In healthy volunteers, patients with

Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted-Phenyl ethylidene] Imidazo [1, 2- a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus



Letters in Drug Design & Discovery, 2022, 19, 160-174

RESEARCH ARTICLE

BENTHAM SCIENCE

Synthesis, Characterization and Screening of Some Novel 2-Methyl-N'-[(Z)-Substituted-Phenyl ethylidene] Imidazo [1, 2-a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus

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Abstract: ***Background:*** One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is type 2 diabetes mellitus (T2DM). Since the last decade, DPP-4 enzyme inhibition has proven to be a successful, safe, and well-established therapy for the treatment of T2DM.

Objective: The present work reports the synthesis, characterization, and screening of some novel 2-methyl-N'-[(Z)-substituted-phenyl ethylidene] imidazo [1, 2-a] pyridine-3-carbohydrazide derivatives as DPP-IV inhibitors for the treatment of T2DM.

Methods: The molecular docking was performed to study these derivatives' binding mode in the enzyme's allosteric site. All the synthesized compounds were subjected for DPP-IV enzyme assay and *in vivo* anti-hyperglycemic activity in STZ-induced diabetic rats.

Results: The synthesized derivatives exhibited potent antidiabetic activity as compared to the standard drug Sitagliptin. Out of sixteen compounds, A1, A4, B4, C2, C3, and D4 have shown promising antidiabetic activity against the DPP-IV enzyme. The most promising compound, C2, showed a percentage inhibition of 72.02±0.27 at 50 µM concentration. On the 21st day, compound C2 showed a significant reduction in serum blood glucose level, i.e., 156.16±4.87 mg/dL, then diabetic control, which was 280.00±13.29 mg/dL, whereas, standard Sitagliptin showed 133.50±1.80 mg/dL. In the *in vivo* antihyperglycemic activity, the compounds have exhibited good hypoglycemic potential in fasting blood glucose in the T2DM animal model. All the docked molecules have exhibited perfect binding affinity towards the active pocket of the enzyme. The synthesized derivatives were screened through Lipinski's rule of five for better optimization, and fortunately, none of them violated the rule.

Conclusion: The above results indicate that compound C2 is a relatively active and selective hit molecule that can be structurally modified to enhance the DPP-IV inhibitor's potency and overall pharmacological profile. From the present work, it has been concluded that substituted pyridine-3-carbohydrazide derivatives possess excellent DPP-IV inhibitory potential and can be better optimized further by generating more *in vivo*, *in silico* models.

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Keywords: DPP-IV inhibitors, Type 2 diabetes mellitus, T2DM, pyridine-3-carbohydrazides, enzyme assay, molecular docking.

1. INTRODUCTION

The worldwide public health issue for type 2 diabetes mellitus (T2DM) is rising continuously. One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is T2DM [1]. In India, about 70 million persons have diabetes, and about 1.6 million people are at risk of developing the condition [2]. The sum of people who will have diabetes by 2040 is estimated to be 123.5 million, as per the international diabetes federation (IDF) [2]. More than 23 million people in the US are diabetic (approximately 8 percent of the total population) [3]. Diabetes has numerous clinical problems, including cardiovascular disease, nephropathy, retinopathy, and neuropathy [4-6]. Present oral care therapies for type 2 diabetes are intended to reduce the synthesis of hepatic glucose, promoting the secretion of glucose, reducing glucose ingestion, and increasing the use of residual glucose [1, 7, 8]. Commonly, T2DM is

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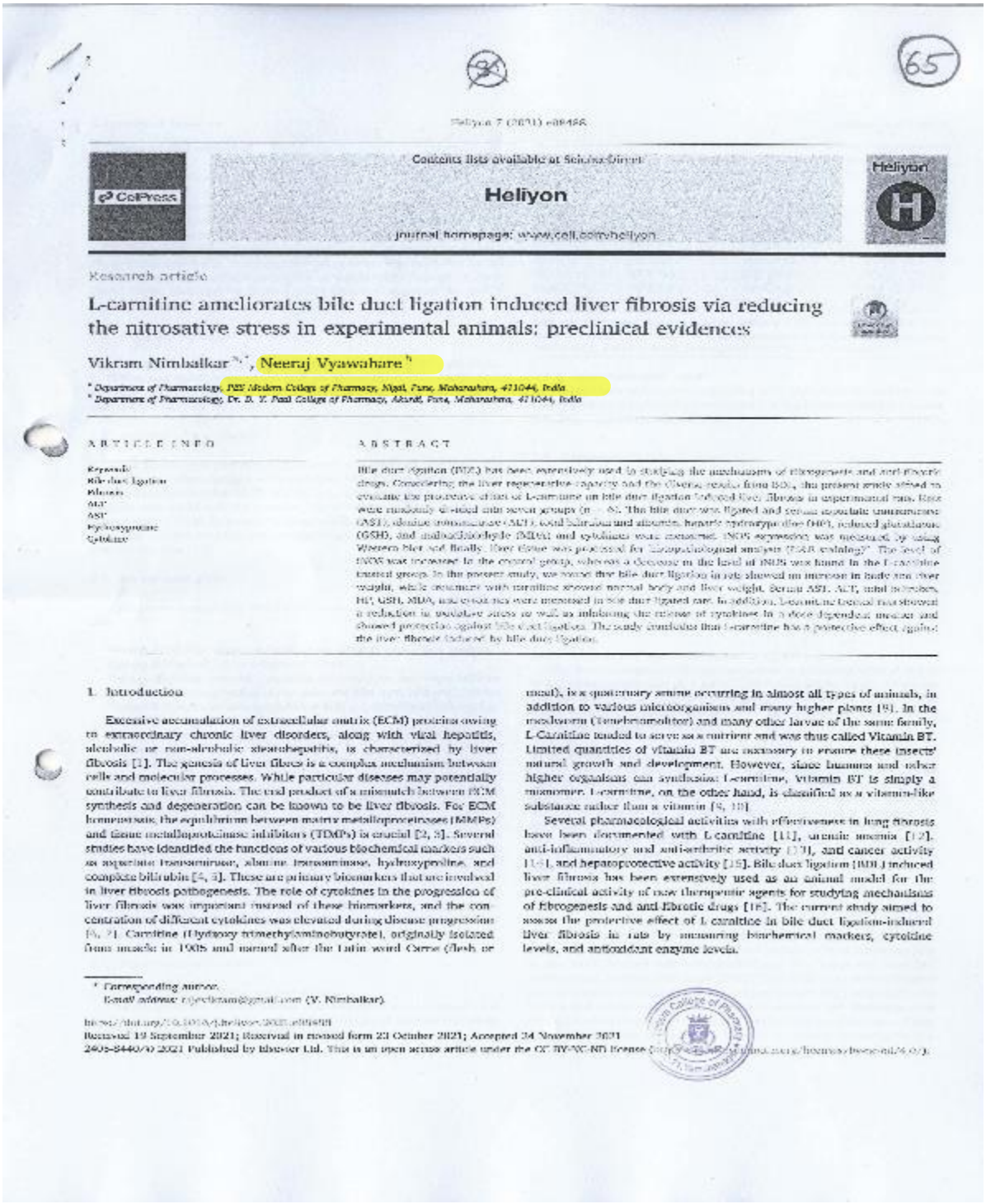
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L-carnitine ameliorates bile duct ligation induced liver Fibrosis by reducing the nitrosative stress in experimental animals: preclinical evidence



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Research article

L-carnitine ameliorates bile duct ligation induced liver fibrosis via reducing the nitrosative stress in experimental animals: preclinical evidences

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Bile duct ligation
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ABSTRACT

Bile duct ligation (BDL) has been extensively used to study the mechanisms of fibrogenesis and anti-fibrotic drugs. Considering the liver regenerative capacity and the clinical results from BDL, the present study aimed to evaluate the protective effect of L-carnitine on bile duct ligation induced liver fibrosis in experimental rats. Rats were randomly divided into seven groups (n = 6). The bile duct was ligated and serum aspartate transaminase (AST), alanine transaminase (ALT), total bilirubin and albumin, hepatic hydroxyproline (HP), reduced glutathione (GSH), and malondialdehyde (MDA) and cytokines were measured. iNOS expression was measured by using Western blot and finally, liver tissue was processed for histopathological analysis (H&E staining). The level of iNOS was increased in the control group, whereas a decrease in the level of iNOS was found in the L-carnitine treated groups. In the present study, we noted that bile duct ligation in rats showed an increase in bile and liver weight, while treatment with carnitine showed normal body and liver weight. Serum AST, ALT, total bilirubin, HP, GSH, MDA, and cytokines were measured in bile duct ligated rats. In addition, L-carnitine treated rats showed a reduction in oxidative stress as well as inhibiting the release of cytokines in a dose dependent manner and showed protection against bile duct ligation. The study concludes that L-carnitine has a protective effect against the liver fibrosis induced by bile duct ligation.

1. Introduction

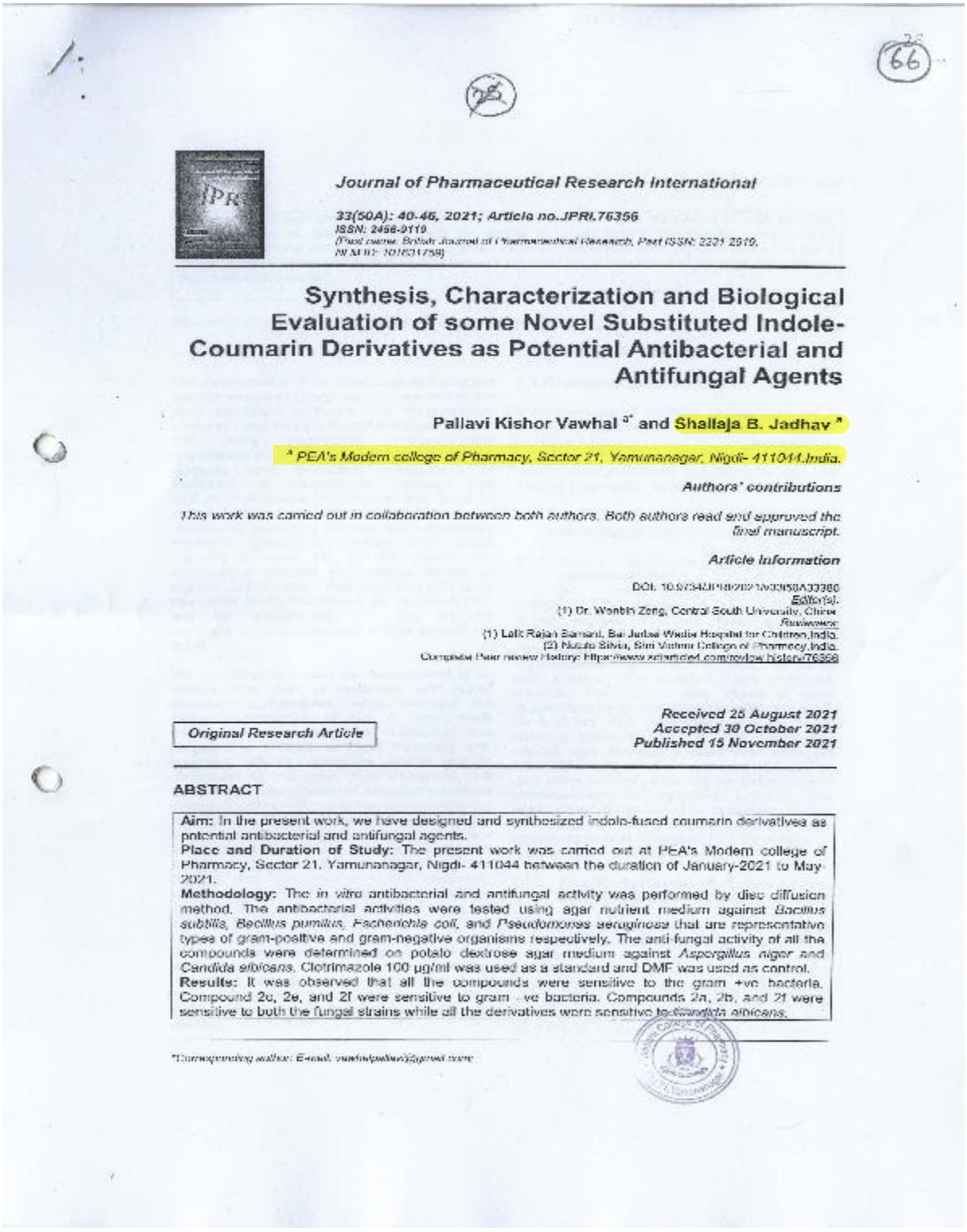
Excessive accumulation of extracellular matrix (ECM) proteins owing to extraordinary chronic liver disorders, along with viral hepatitis, alcoholic or non-alcoholic steatohepatitis, is characterized by liver fibrosis [1]. The genesis of liver fibrosis is a complex mechanism between cells and molecular processes. While particular diseases may potentially contribute to liver fibrosis. The end product of a mismatch between ECM synthesis and degeneration can be known to be liver fibrosis. For ECM homeostasis, the equilibrium between matrix metalloproteinases (MMPs) and tissue metalloproteinase inhibitors (TIMPs) is crucial [2, 3]. Several studies have identified the functions of various biochemical markers such as aspartate transaminase, alanine transaminase, hydroxyproline, and complete bilirubin [4, 5]. These are primary biomarkers that are involved in liver fibrosis pathogenesis. The role of cytokines in the progression of liver fibrosis was important instead of these biomarkers, and the concentration of different cytokines was elevated during disease progression [6, 7]. Carnitine (Hydroxy trimethylaminobutyrate), originally isolated from muscle in 1905 and named after the Latin word Carne (flesh or meat), is a quaternary amine occurring in almost all types of animals, in addition to various microorganisms and many higher plants [9]. In the mealworm (Tenebrio molitor) and many other larvae of the same family, L-Carnitine tended to serve as a nutrient and was thus called Vitamin BT. Limited quantities of vitamin BT are necessary to ensure these insects' natural growth and development. However, since humans and other higher organisms can synthesize L-carnitine, Vitamin BT is simply a misnomer. L-carnitine, on the other hand, is classified as a vitamin-like substance rather than a vitamin [8, 10].

Several pharmacological activities with effectiveness in lung fibrosis have been documented with L-carnitine [11], uremic anemia [12], anti-inflammatory and anti-arthritic activity [13], and cancer activity [14], and hepatoprotective activity [15]. Bile duct ligation (BDL) induced liver fibrosis has been extensively used as an animal model for the pre-clinical activity of new therapeutic agents for studying mechanisms of fibrogenesis and anti-fibrotic drugs [16]. The current study aimed to assess the protective effect of L-carnitine in bile duct ligation-induced liver fibrosis in rats by measuring biochemical markers, cytokine levels, and antioxidant enzyme levels.

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Synthesis characterization and biological evaluation of some novel substituted indole derivatives as potential antibacterial and antifungal Agents



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Synthesis, Characterization and Biological Evaluation of some Novel Substituted Indole-Coumarin Derivatives as Potential Antibacterial and Antifungal Agents

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Original Research Article

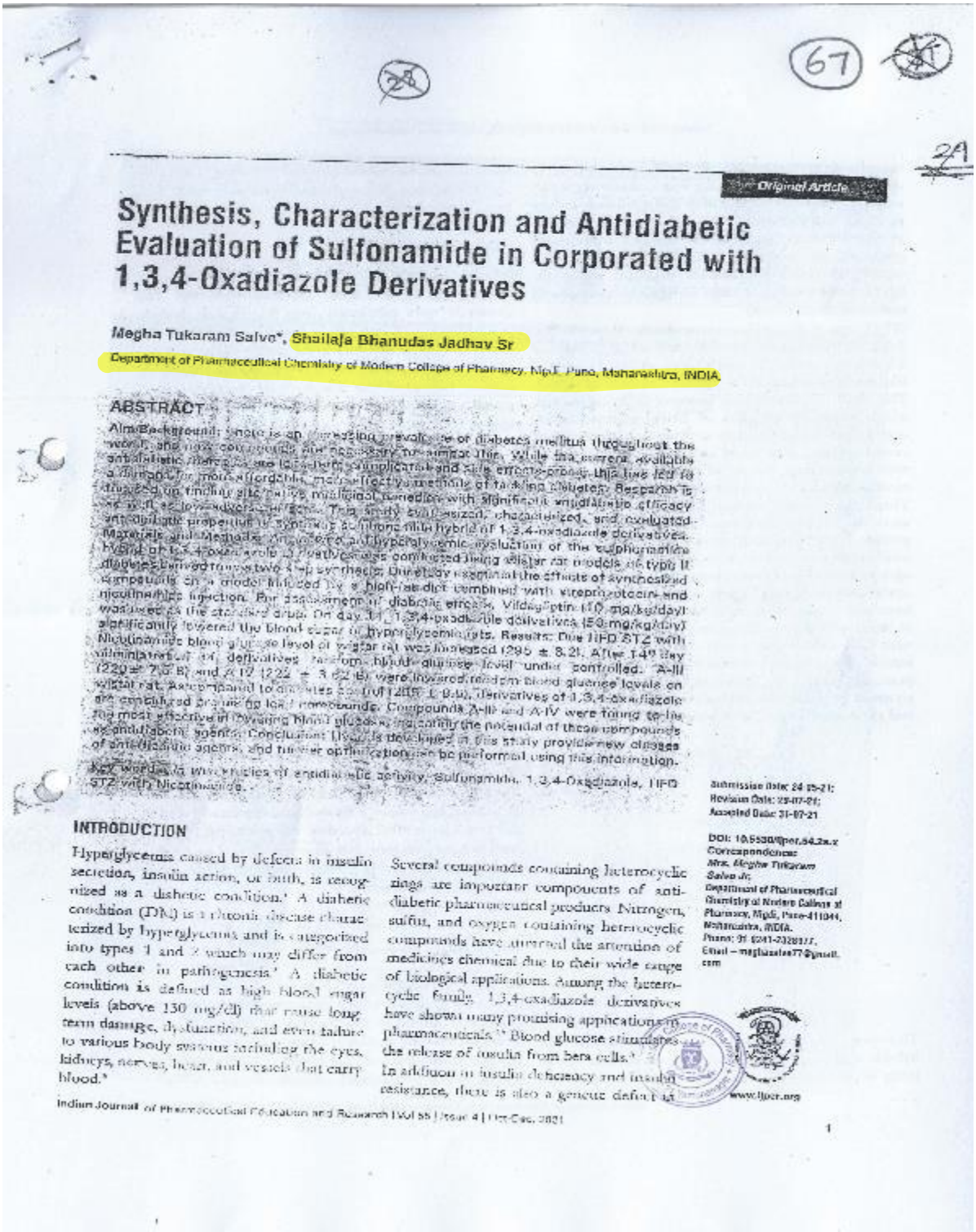
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ABSTRACT

Aim: In the present work, we have designed and synthesized indole-fused coumarin derivatives as potential antibacterial and antifungal agents.
Place and Duration of Study: The present work was carried out at PEA's Modern college of Pharmacy, Sector 21, Yamunanagar, Nigdi- 411044 between the duration of January-2021 to May-2021.
Methodology: The *in vitro* antibacterial and antifungal activity was performed by disc diffusion method. The antibacterial activities were tested using agar nutrient medium against *Bacillus subtilis*, *Bacillus pumilus*, *Escherichia coli*, and *Pseudomonas aeruginosa* that are representative types of gram-positive and gram-negative organisms respectively. The anti-fungal activity of all the compounds were determined on potato dextrose agar medium against *Aspergillus niger* and *Candida albicans*. Clotrimazole 100 µg/ml was used as a standard and DMF was used as control.
Results: It was observed that all the compounds were sensitive to the gram +ve bacteria. Compound 2c, 2e, and 2f were sensitive to gram -ve bacteria. Compounds 2a, 2b, and 2f were sensitive to both the fungal strains while all the derivatives were sensitive to *Candida albicans*.

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Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated with 1,3,4-oxadiazole derivatives



Original Article

Synthesis, Characterization and Antidiabetic Evaluation of Sulfonamide in Corporated with 1,3,4-Oxadiazole Derivatives

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ABSTRACT

Aim/Background: Diabetes is an increasing prevalence of diabetes mellitus throughout the world, and new compounds are necessary to combat this. While the current available antidiabetic therapies are long-term complications and side effects-prone, this has led to a demand for more affordable, more effective methods of tackling diabetes. Research is focused on finding effective multimodal remedies with significant antidiabetic efficacy as well as low adverse effects. This study synthesized, characterized, and evaluated antidiabetic properties of synthesized sulfonamide-based hybrid of 1,3,4-oxadiazole derivatives. Materials and Methods: An in vivo antihyperglycemic evaluation of the sulphonamide hybrid of 1,3,4-oxadiazole derivatives compared using wister rat models of type II diabetes derived from two-step synthesis. One study examined the effects of synthesized compounds on a model induced by a high-fat diet combined with streptozotocin and nicotinamide injection. For assessment of diabetic effects, Vildagliptin (10 mg/kg/day) was used as the standard drug. On day 3 1, 3,4-oxadiazole derivatives (50 mg/kg/day) significantly lowered the blood sugar of hyperglycemic rats. Results: The HFD-STZ with Nicotinamide blood glucose level of wistar rat was increased (295 ± 8.21). After 14th day administration of derivatives, serum blood glucose level under controlled. A-III (220 ± 7.58) and A-IV (222 ± 3.62) were lowered random blood glucose levels on wistar rat. Administration of derivatives (50 mg/kg, p.o.) derivatives of 1,3,4-oxadiazole are established promising lead compounds. Compounds A-III and A-IV were found to be the most effective in lowering blood glucose, indicating the potential of these compounds as antidiabetic agents. Conclusion: Overall, the findings in this study provide new classes of antidiabetic agents, and further optimization can be performed using this information.

Key words: In vivo studies of antidiabetic activity, Sulfonamide, 1,3,4-Oxadiazole, HFD-STZ with Nicotinamide.

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INTRODUCTION

Hyperglycemia caused by defects in insulin secretion, insulin action, or both, is recognized as a diabetic condition.[1] A diabetic condition (DM) is a chronic disease characterized by hyperglycemia and is categorized into types 1 and 2 which may differ from each other in pathogenesis.[2] A diabetic condition is defined as high blood sugar levels (above 130 mg/dl) that cause long-term damage, dysfunction, and even failure to various body systems including the eyes, kidneys, nerves, heart, and vessels that carry blood.[3]

Several compounds containing heterocyclic rings are important components of antidiabetic pharmaceutical products. Nitrogen, sulfur, and oxygen containing heterocyclic compounds have attracted the attention of medicines chemical due to their wide range of biological applications. Among the heterocyclic family, 1,3,4-oxadiazole derivatives have shown many promising applications in pharmaceuticals.[4] Blood glucose stimulates the release of insulin from beta cells.[5] In addition to insulin deficiency and insulin resistance, there is also a genetic defect in

Exploring cytotoxic potential of ciclopirox on colorectal cancer cells by in silico methodology

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Exploring Cytotoxic Potential of Ciclopirox on Colorectal Cancer Cells by *In-Silico* Methodology

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Abstract: Colorectal cancer (CRC) stands 3rd among male cancer cases and the second most prevalent disease in women, accounting for 10% of all cancer cases globally. Ciclopirox (CPX) is a broad-spectrum, synthetic, off-patent antifungal drug recommended in dermatological conditions of mycoses of the skin and nails. There are no important molecular docking studies on inhibitory aspects of CPX against CRC targets. The main objective of this study was to explore the potential of CPX as an anti-CRC agent by using *in silico* approaches with the help of published literature on downregulation of overhead protein expression in CRC and combining this information in order to recognize novel drug targets [Cell division cycle 25A (Cdc25A), Protein deglycase DJ-1 (DJ-1), Retinoblastoma protein (p-Rb/Rb), Cyclin-dependent kinase-4 (CDK4), High-mobility group A1-hook 2 (HMGA2), and Catenin β-1 (Wnt/-catenin)] and to identify the perspectives for drug repurposing and comparing this with oxaliplatin; one of the standard drug used in CRC. Also, *in silico* drug-likeliness studies, bioavailability studies, pharmacokinetic studies, drug target prediction, and biolsosteric replacement have been performed for CPX using online SwissADME tools (SwissADME, SwissTargetPrediction, and SwissBiosostere). The *in silico* studies revealed that CPX successfully inhibited all the molecular targets, which suggested plausible re-utilization of CPX for treating CRC.

Keywords: colorectal cancer; ciclopirox; molecular docking; pharmacokinetics; *in silico*; drug repurposing.

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1. Introduction

Colorectal cancer (CRC) stands 3rd among cancer cases in males and the second most prevalent disease in women, accounting for 10% of all cancer cases globally. Males have a25% greater infection rate than females, but this varies by country [1]. With over 600,000 fatalities recorded each year, CRC is the fourth most frequent cancer-related cause of death globally. Colon and rectal cancer annual incidence rates among males in India are 4.4 and 4.1 per 100000, respectively [2]. In 2018, there were 1.8 million new CRC cases, with 881,000 fatalities, accounting for almost 10% of all new cancer cases and deaths globally, with the number of new cases projected to reach nearly 2.5 million by 2035 [3].

Colon cancer is caused by abnormal cell division and development in the colon. Polyps are benign or malignant growths that develop when cells divide abnormally. The precise reason for these atypical divisions is yet unknown. Ethnicity, age, family history, and a sedentary lifestyle, on the other hand, have been related to risk variables [4]. CRC is more prevalent among individuals over 50, African-Americans, and those who smoke a lot of cigarettes, drink

Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel pyrrolidine sulphonamide derivative



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Original Article

Synthesis, Characterization, and Evaluation of *in vitro* Antidiabetic Activity of Novel Pyrrolidine Sulphonamide Derivative

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ABSTRACT

Background: Diabetes is a long-term illness characterized by high blood sugar levels. It is estimated that by 2045, there will be nearly 693 million diabetic patients worldwide, with half of the population remaining undiagnosed. Metformin, glycine, sulfonylureas, and thiazolidinediones were related to several risk factors, including hypoglycaemia, bone fractures, weight gain, cardiovascular, renal, and other complications. In the present study we have explored the DPP-IV inhibitors as a new class of antidiabetic drugs. **Objectives:** The goal of DPP-IV inhibitors is to raise levels of incretin hormones, such as GLP-1, which block glucagon release while boosting insulin secretion, slowing stomach emptying, and reducing blood glucose levels. **Methods:** A series of derivatives substituted on Oxadiazole of sulfonamide pyrrolidine were produced by reacting 1,2,4-oxadiazol and sulfonyl chloride at room temperature in the presence of ethanol and silica gel. The reaction was complete. The compounds were characterized using IR, ^{1}H NMR, ^{13}C NMR, mass spectroscopy, elemental analysis, and screened for *in vitro* assay of DPP-IV inhibition. **Results and Discussion:** The IC_{50} was calculated for compounds B-I, B-V, B-VI, B-X, and B-XII that inhibited enzymes significantly. IC_{50} values ranging from 19.65 ± 2.60 nM to 11.32 ± 1.58 nM, respectively, and Vildagliptin (11.78±1.86 IC_{50} nM) was used as a standard. The most active derivative substituted Oxadiazole of pyrrolidine sulfonamide is B-XI (11.32 ± 1.58 IC_{50} nM) among all synthesized compounds. **Conclusion:** B-XI derivative has shown appreciable DPP-IV inhibitory action; the 1,2,4 oxadiazole-bearing pyrrolidine-based sulfonamide derivatives have shown antidiabetic properties.

Key words: Pyrrolidine sulfonamide derivative, 1,2,4-oxadiazole, *in vitro* assay, Antidiabetic, Dipeptidyl peptidase-4.

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INTRODUCTION

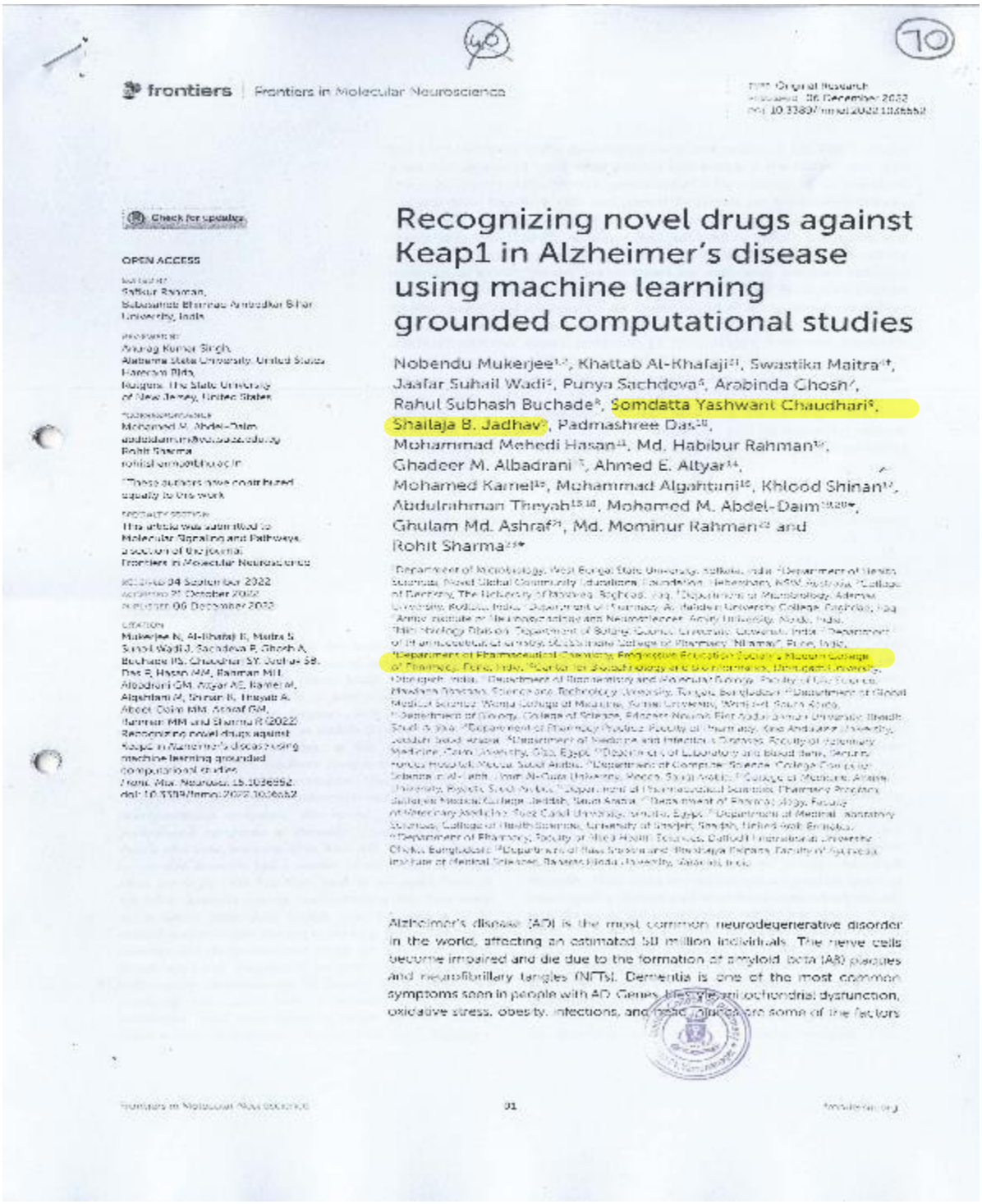
Diabetes is a group of chronic metabolic disorders caused by high blood sugar levels over a prolonged period.[1] Diabetes has become a global epidemic problem. It was predicted that 451 million diabetics existed in 2017, with this Figure expected to increase to 693 million by 2045.[2] Most patients with type 2 diabetes, even when using anti-diabetic drugs, struggle to maintain sufficient glycemic regulation and develop microvascular and macrovascular diabetic complications.[3-5] Current diabetes therapy has lots of side effects.[6] The most frequent adverse events were hypoglycemia, stomach issues, and weight gain. DPP-IV inhibitors' possible advantages include a complementary mode of action with other anti-diabetic drugs, a desirable adverse-effect history, and a weight-neutral effect.[7]

By increasing endogenous GLP-1 levels, a DPP-IV inhibitor activates insulin and suppresses glucagon synthesis causing intestinal hypoglycemia.[8] Incretins and glucagon-like peptide 1 breakdown are suppressed by a DPP IV inhibitor (GLP 1). DPP-IV inhibitor is an alternative diabetic therapy.[9,10] Because of their various pharmaceutical properties, five member heterocyclic compounds, especially 1,2,4-Oxadiazole, have shown activity against a variety of diseases like Alzheimer's disease, parasitic worms (helminths) and other internal parasites, management and treatment of edematous and another non-edematous disease, infectious diseases, diabetes, pain and cramp, cardiovascular disease, HIV disease, tuberculosis, antioxidant, cancer, seizure disorders, inflammation of a joint.[11] Our efforts to enhance the efficacy, selectivity of the novel 1,2,4- oxadiazole derivative of pyrrolidine sulphonamide as DPP-IV inhibitors.

The sulfonamide moiety ($-SO_2NH_2$) is an active pharmacophore that the clinical and medicinal importance of sulfonamide drugs and compounds in the new drug discovery.[12] They exhibit a wide range of pharmacological activities, such as antimicrobial, antimalarial, anti-HIV, insulin releasing antidiabetic, high ceiling diuretic, antithyroid, antitumor analgesic, and anti-inflammatory.[13-15] Some laboratories reported entities with sulfonamide portion; compounds 1 (IC_{50} 8.7 nM) and 2 (IC_{50} 59 nM) as potent DPP-IV inhibitors.[17] Omarigliptin (MK-3102) is sulfonamide containing moiety, which produces its antihyperglycaemic action by inhibiting the DPP-4 enzyme. Its pharmacokinetic studies have shown that it is suitable for once-a-week dosing, which makes it unique among the other DPP-4 inhibitors.[16,17] In this research we have designed novel 1,2,4- oxadiazole derivatives with sulfonamide and pyrrolidine-2-carbonitrile scaffolds specifically *in vitro* DPP-IV inhibitor assay as anti diabetic activity. In the continuation of our research to develop small molecules as biologically active antihyperglycemic compounds, new derivatives having a pyrrolidine-2-carbonitrile sulfonamide backbone hybrid were designed and synthesized in search for new potent DPP-4 inhibitors as antidiabetic agents.[18]

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Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies



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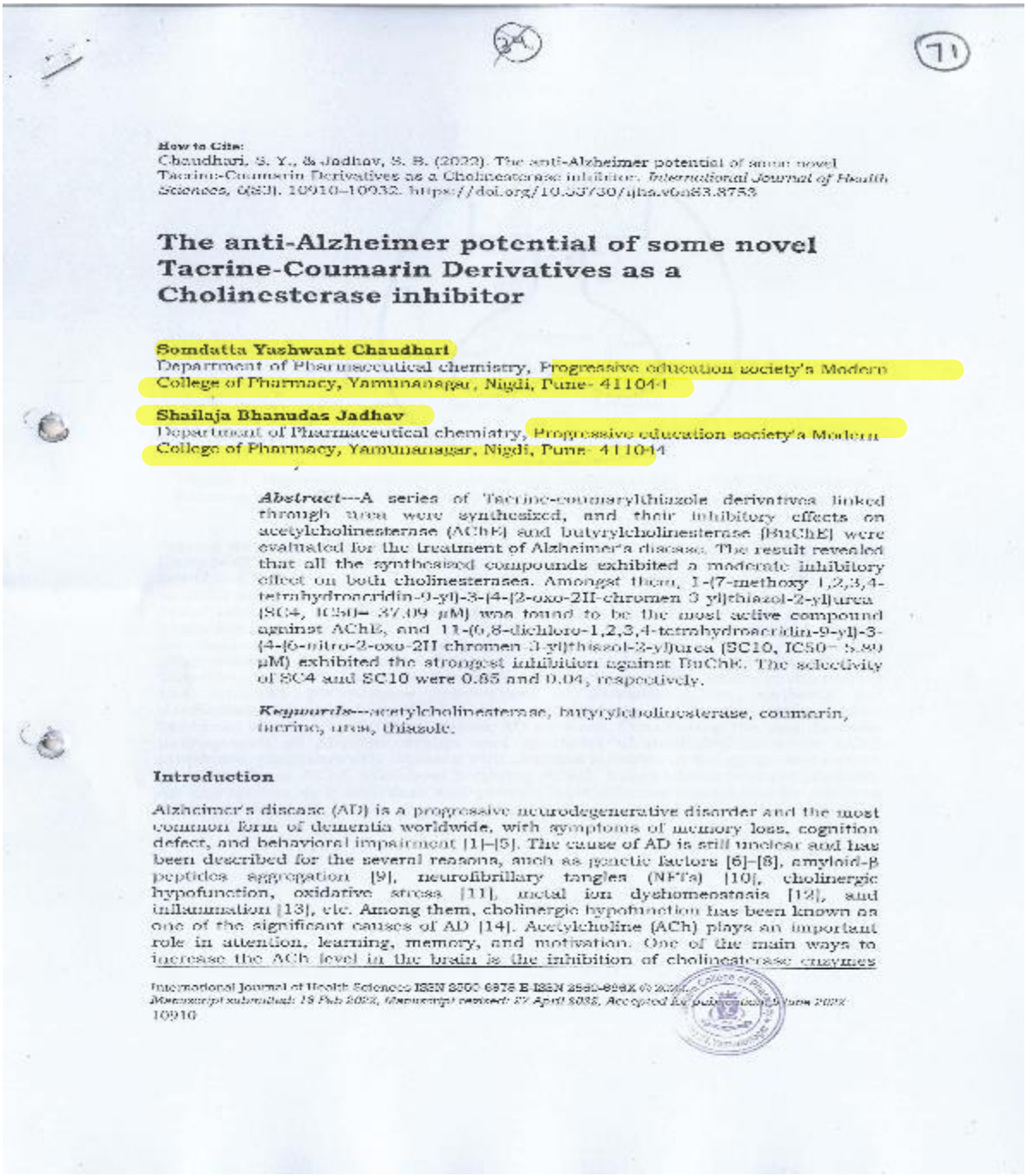
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Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning grounded computational studies

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Alzheimer's disease (AD) is the most common neurodegenerative disorder in the world, affecting an estimated 50 million individuals. The nerve cells become impaired and die due to the formation of amyloid beta (Aβ) plaques and neurofibrillary tangles (NFTs). Dementia is one of the most common symptoms seen in people with AD. Genes, [illegible] mitochondrial dysfunction, oxidative stress, obesity, infections, and [illegible] are some of the factors

The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor



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The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor

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***Abstract*---**A series of Tacrine-coumarylthiazole derivatives linked through urea were synthesized, and their inhibitory effects on acetylcholinesterase (AChE) and butyrylcholinesterase (BuChE) were evaluated for the treatment of Alzheimer's disease. The result revealed that all the synthesized compounds exhibited a moderate inhibitory effect on both cholinesterases. Amongst them, 1-(7-methoxy 1,2,3,4-tetrahydroacridin-9-yl)-3-(4-(2-oxo-2H-chromen 3 yl)thiazol-2-yl)urea (SC4, IC50= 37.09 µM) was found to be the most active compound against AChE, and 11-(6,8-dichloro-1,2,3,4-tetrahydroacridin-9-yl)-3-(4-(6-nitro-2-oxo-2H chromen-3-yl)thiazol-3-yl)urea (SC10, IC50= 5.89 µM) exhibited the strongest inhibition against BuChE. The selectivity of SC4 and SC10 were 0.65 and 0.04, respectively.

***Keywords*---**acetylcholinesterase, butyrylcholinesterase, coumarin, tacrine, urea, thiazole.

Introduction

Alzheimer's disease (AD) is a progressive neurodegenerative disorder and the most common form of dementia worldwide, with symptoms of memory loss, cognition defect, and behavioral impairment [1]–[5]. The cause of AD is still unclear and has been described for the several reasons, such as genetic factors [6]–[8], amyloid-β peptides aggregation [9], neurofibrillary tangles (NFTs) [10], cholinergic hypofunction, oxidative stress [11], metal ion dyshomeostasis [12], and inflammation [13], etc. Among them, cholinergic hypofunction has been known as one of the significant causes of AD [14]. Acetylcholine (ACh) plays an important role in attention, learning, memory, and motivation. One of the main ways to increase the ACh level in the brain is the inhibition of cholinesterase enzymes

Design synthesis and biological evaluation of 3 chloro 2 oxo N (arylcarbomyl) 2H-1 benzopyran six sulfonamide derivatives as potential DPP-IV inhibitors

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Design, Synthesis, and Biological Evaluation of 3-Chloro-2-Oxo-N-(Arylcarbamoyl)-2H-1-Benzopyran-6-Sulfonamide Derivatives as Potential DPP-IV Inhibitors

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***Abstract*---**In present work, we aimed at preparing coumarin and sulfonamide containing moieties into a single candidate template i.e. 3-chloro-2-oxo-N (arylcarbamoyl)-2H-1-benzopyran-6-sulfonamides for the purpose of synergistic activity as potent DPP-IV inhibitors. The designed derivatives were subjected for the calculations of Lipinski rule, Veber's rule, ADME analysis, drug-likeness properties and molecular docking. The derivatives which successfully passed all the criteria were proceeded for wet lab synthesis and biological evaluation. From the initial screening through Lipinski rule, Veber's rule, ADME calculations, and drug-likeness properties, molecules 1a, 1f, 1g, 1h, 1i, 1j, 1k, 1o, 1p, 1q, 1r, 1v, 1w, and 1x successfully passed all the filters and displayed most drug-likeness nature. Therefore only these molecules were subjected for molecular docking studies. From molecular docking results, we have selected 1f, 1g, 1i, 1j, and 1v for the wet lab synthesis and biological evaluation. The structures of all the synthesized compounds were confirmed by spectral analysis and were subjected for in vitro DPP-IV enzyme assay. Sitagliptin was used as standard for the assay and it displayed 0.018 µM IC50 value. Compound 1f, 1g, 1i, 1j, and 1v exhibited 15.55, 15.85, 13.93, 14.48, and 13.43 µM IC50 values respectively. We concluded that compound 1f, 1g, 1i, 1j, and 1v are potential lead compounds to be developed as potent DPP-IV inhibitors for the treatment of diabetes.

***Keywords*---**DPP-IV Inhibitors, coumarin derivatives, molecular docking, ADME, vitro.

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Validated UV Visible spectrophotometric method for the estimation of sorafenib tosylate in bulk and nanoparticles

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Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles

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***Abstract*---**It was noticed from the standard databases such as Scopus, PubMed, ScienceDirect, etc. that a limited UV-Vis spectrophotometric method has been reported for estimating Sorafenib (SOR), but no sophisticated analytical methods have been ever reported in any database for estimating SOR in nanoparticles. The present research involved the establishment of an economic, accurate, robust, and precise analytical method for the quantitative determination of SOR in bulk and nanoparticles utilizing a new validated spectrophotometric method. The spectrophotometric analysis was carried out using double-beam ultraviolet-visible spectrophotometer was employed in developing a new method using methanol and water at a ratio of 80:20 v/v and λmax of 265 nm. The technique was verified using the Q2A and Q2B guidelines of ICH. The newly developed UV-Vis method had desired linearity over the range of 2-12 µg/mL; along with excellent precision, accuracy, ruggedness, and robustness characteristics as observed from % RSD values of less than 2. The present study concluded that the developed UV-Vis method has desired linearity, precision, accuracy, ruggedness, and robustness, and will serve as an excellent technique for the determination of sorafenib in both bulk and nanoparticles without the interference of commonly used chemicals or solvents.

***Keywords*---**sorafenib, ultraviolet visible, bulk, nanoparticles.

Introduction

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Gradient happy HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole

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Gradient RP-HPLC method development and validation for simultaneous estimation of paclitaxel and albendazole

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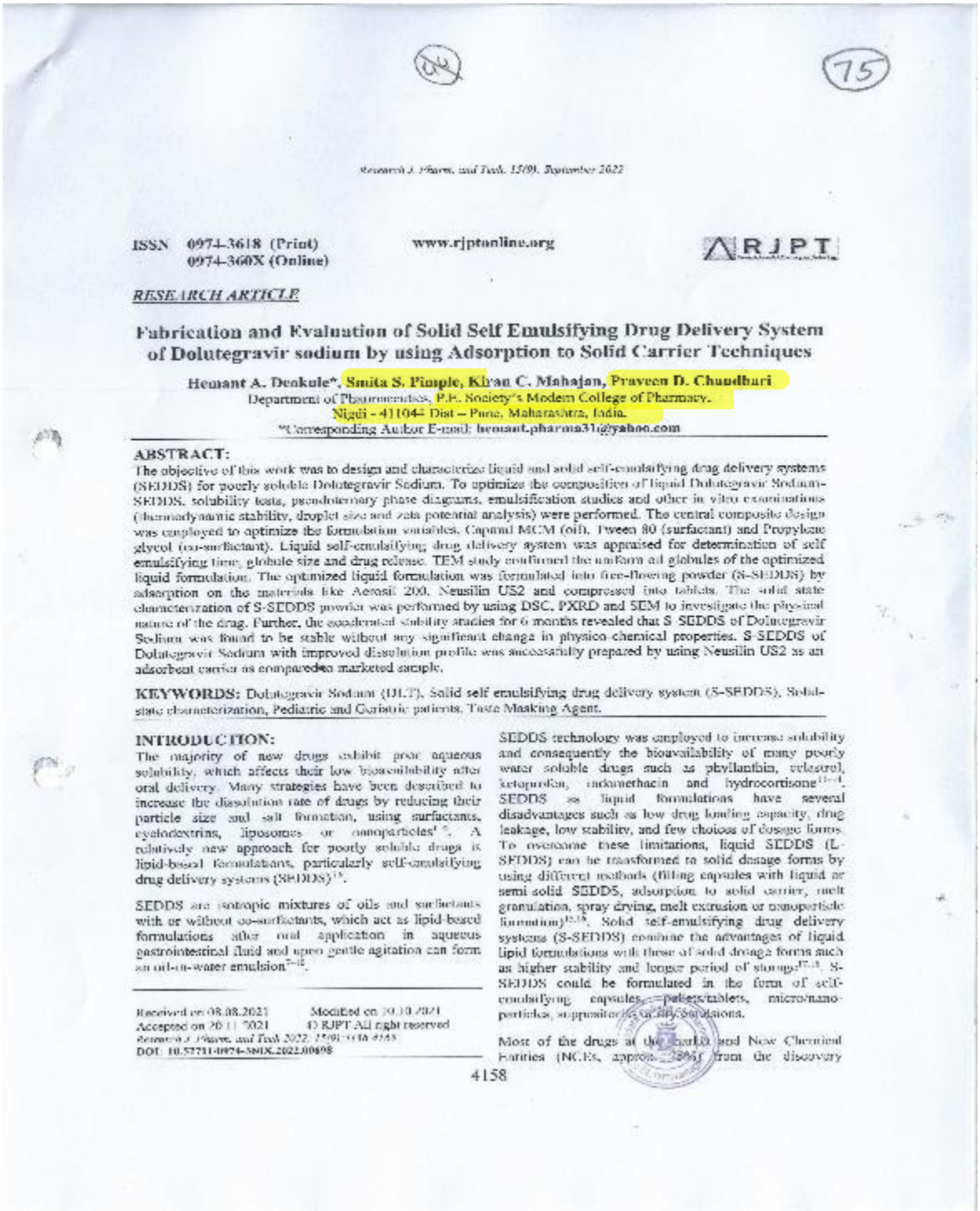
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***Abstract*---**The goal of this research is to provide an accurate and exact technique for estimating Albendazole and Paclitaxel simultaneously utilizing gradient RP-HPLC (high performance liquid chromatography). A UV detector fixed at 230 nm was used to estimate albendazole and paclitaxel simultaneously. As the solvent system, acetonitrile and water in the ratio of 50:50 was used in the presence of 0.1 % trifluoroacetic acid. Mobile phase was run on a Inertsil ODS 3V 150 4.6 mm or equivalent column in Gradient mode at a flow rate of 1.0 mL/min. By this method albendazole and paclitaxel showed 6.199 and 9.684 retention time (Rt) respectively with continuous run upto 25 min. In the prescribed concentration range, the calibration curves for each analyte were determined to be linear (r2 > 0.994). The percentage of recovery was found to be within the limit at each level (98.0 %to 102.0 %). All validation parameters were determined to be acceptable, including system precision, method precision, linearity, range, accuracy, ruggedness, robustness, solution, and mobile phase stability findings. This suggests that the HPLC simultaneous approach for determining albendazole and paclitaxel assays is accurate. Several analytical parameters, including linearity, accuracy, precision, specificity, limit of quantification, limit of detection, robustness, ruggedness, solution stability, and mobile phase stability, were assessed using the ICH criteria, and all results were within the range.

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Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques



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RESEARCH ARTICLE

Fabrication and Evaluation of Solid Self Emulsifying Drug Delivery System of Dolutegravir sodium by using Adsorption to Solid Carrier Techniques

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ABSTRACT:
The objective of this work was to design and characterize liquid and solid self-emulsifying drug delivery systems (SEDDS) for poorly soluble Dolutegravir Sodium. To optimize the composition of liquid Dolutegravir Sodium-SEDDS, solubility tests, pseudoternary phase diagrams, emulsification studies and other in vitro examinations (thermodynamic stability, droplet size and zeta potential analysis) were performed. The central composite design was employed to optimize the formulation variables. Capmul MCM (oil), Tween 80 (surfactant) and Propylene glycol (co-surfactant). Liquid self-emulsifying drug delivery system was appraised for determination of self emulsifying time, globule size and drug release. TEM study confirmed the uniform oil globules of the optimized liquid formulation. The optimized liquid formulation was formulated into free-flowing powder (S-SEDDS) by adsorption on the materials like Aerosil 200, Neusilin US2 and compressed into tablets. The solid state characterization of S-SEDDS powder was performed by using DSC, PXRD and SEM to investigate the physical nature of the drug. Further, the accelerated stability studies for 6 months revealed that S-SEDDS of Dolutegravir Sodium was found to be stable without any significant change in physico-chemical properties. S-SEDDS of Dolutegravir Sodium with improved dissolution profile was successfully prepared by using Neusilin US2 as an adsorbent carrier as compared to marketed sample.

KEYWORDS: Dolutegravir Sodium (DLT), Solid self emulsifying drug delivery system (S-SEDDS), Solid-state characterization, Pediatric and Geriatric patients, Taste Masking Agent.

INTRODUCTION:

The majority of new drugs exhibit poor aqueous solubility, which affects their low bioavailability after oral delivery. Many strategies have been described to increase the dissolution rate of drugs by reducing their particle size and salt formation, using surfactants, cyclodextrins, liposomes or nanoparticles[1-5]. A relatively new approach for poorly soluble drugs is lipid-based formulations, particularly self-emulsifying drug delivery systems (SEDDS)[1,6].

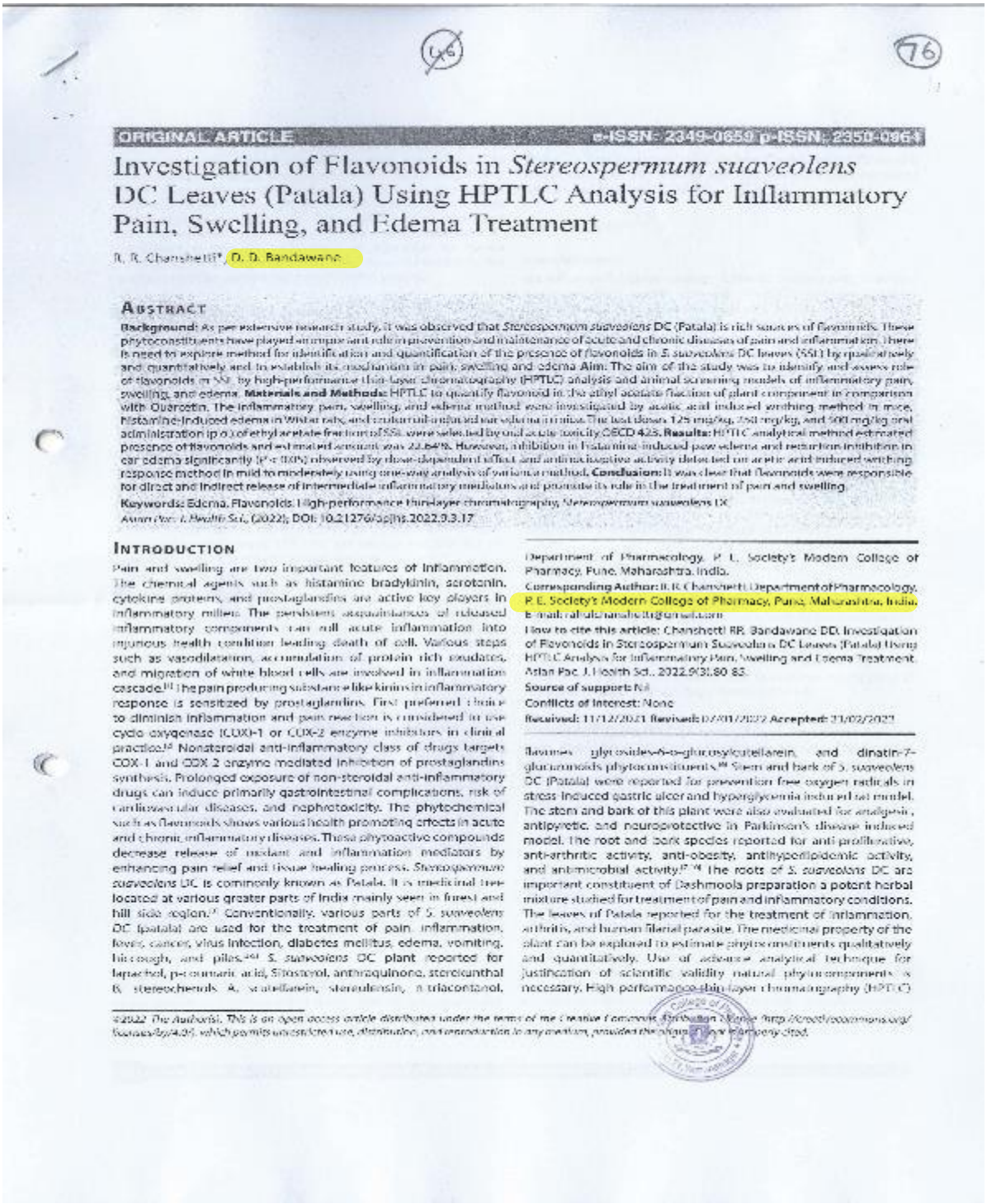
SEDDS are isotropic mixtures of oils and surfactants with or without co-surfactants, which act as lipid-based formulations after oral application in aqueous gastrointestinal fluid and upon gentle agitation can form an oil-in-water emulsion[7-12].

SEDDS technology was employed to increase solubility and consequently the bioavailability of many poorly water soluble drugs such as phyllanthin, celastrol, ketoprofen, indomethacin and hydrocortisone[13-16]. SEDDS as liquid formulations have several disadvantages such as low drug loading capacity, drug leakage, low stability, and few choices of dosage forms. To overcome these limitations, liquid SEDDS (L-SEDDS) can be transformed to solid dosage forms by using different methods (filling capsules with liquid or semi solid SEDDS, adsorption to solid carrier, melt granulation, spray drying, melt extrusion or nanoparticle formation)[17,18]. Solid self-emulsifying drug delivery systems (S-SEDDS) combine the advantages of liquid lipid formulations with those of solid dosage forms such as higher stability and longer period of storage[17,18]. S-SEDDS could be formulated in the form of self-emulsifying capsules, pellets/tablets, micro/nano-particles, suppositories or dry formulations.

Most of the drugs at the early and New Chemical Entities (NCEs, approx. 40%) from the discovery

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Investigation of Flavonoids in stereospermum suaveolens using HPLC analysis for inflammatory pain swelling and edema treatment



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Investigation of Flavonoids in *Stereospermum suaveolens* DC Leaves (Patala) Using HPTLC Analysis for Inflammatory Pain, Swelling, and Edema Treatment

R. R. Chanshetti*, D. D. Bandawane

Abstract

Background: As per extensive research study, it was observed that *Stereospermum suaveolens* DC (Patala) is rich sources of flavonoids. These phytoconstituents have played an important role in prevention and maintenance of acute and chronic diseases of pain and inflammation. There is need to explore method for identification and quantification of the presence of flavonoids in *S. suaveolens* DC leaves (SSL) by qualitatively and quantitatively and to establish its mechanism in pain, swelling and edema **Aim:** The aim of the study was to identify and assess role of flavonoids in SSL by high-performance thin-layer chromatography (HPTLC) analysis and animal screening models of inflammatory pain, swelling, and edema. **Materials and Methods:** HPTLC to quantify flavonoid in the ethyl acetate fraction of plant component in comparison with Quercetin. The inflammatory pain, swelling, and edema method were investigated by acetic acid induced writhing method in mice, histamine-induced edema in Wistar rats, and croton oil-induced ear edema in mice. The test doses 125 mg/kg, 250 mg/kg, and 500 mg/kg oral administration (p.o.) of ethyl acetate fraction of SSL were selected by oral acute toxicity OECD 425. **Results:** HPTLC analytical method estimated presence of flavonoids and estimated amount was 22.64%. However, inhibition in histamine-induced paw edema and reduction inhibition in ear edema significantly ($P < 0.05$) observed by dose-dependent effect and anti-nociceptive activity detected on acetic acid induced writhing response method in mild to moderately using one-way analysis of variance method. **Conclusion:** It was clear that flavonoids were responsible for direct and indirect release of intermediate inflammatory mediators and promote its role in the treatment of pain and swelling.

Keywords: Edema, Flavonoids, High-performance thin-layer chromatography, *Stereospermum suaveolens* DC

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Introduction

Pain and swelling are two important features of inflammation. The chemical agents such as histamine bradykinin, serotonin, cytokine proteins, and prostaglandins are active key players in inflammatory milieu. The persistent extravasations of released inflammatory components can roll acute inflammation into injurious health condition leading death of cell. Various steps such as vasodilatation, accumulation of protein rich exudates, and migration of white blood cells are involved in inflammation cascade.[1] The pain producing substance like kinins in inflammatory response is sensitized by prostaglandins. First preferred choice to diminish inflammation and pain reaction is considered to use cyclo oxygenase (COX)-1 or COX-2 enzyme inhibitors in clinical practice.[2] Nonsteroidal anti-inflammatory class of drugs targets COX-1 and COX-2 enzyme mediated inhibition of prostaglandins synthesis. Prolonged exposure of non-steroidal anti-inflammatory drugs can induce primarily gastrointestinal complications, risk of cardiovascular diseases, and nephrotoxicity. The phytochemical such as flavonoids shows various health promoting effects in acute and chronic inflammatory diseases. These phytoactive compounds decrease release of oxidant and inflammation mediators by enhancing pain relief and tissue healing process. *Stereospermum suaveolens* DC is commonly known as Patala. It is medicinal tree located at various greater parts of India mainly seen in forest and hill side region.[3] Conventionally, various parts of *S. suaveolens* DC (patala) are used for the treatment of pain, inflammation, fever, cancer, virus infection, diabetes mellitus, edema, vomiting, hiccough, and piles.[4-6] *S. suaveolens* DC plant reported for lupeol, p-coumaric acid, Sitosterol, anthraquinone, stereulanthal B, stereochenols A, scutellarein, stereulensin, n-triacontanol, flavones glycosides-6-o-glucosylcutellarein, and dinatin-7-glucuronoids phytoconstituents.[7] Stem and bark of *S. suaveolens* DC (Patala) were reported for prevention free oxygen radicals in stress induced gastric ulcer and hyperglycemia induced rat model. The stem and bark of this plant were also evaluated for analgesic, antipyretic, and neuroprotective in Parkinson's disease induced model. The root and bark species reported for anti-proliferative, anti-arthritic activity, anti-obesity, antihyperlipidemic activity, and antimicrobial activity.[8,9] The roots of *S. suaveolens* DC are important constituent of Dashmoola preparation a potent herbal mixture studied for treatment of pain and inflammatory conditions. The leaves of Patala reported for the treatment of inflammation, arthritis, and human filarial parasite. The medicinal property of the plant can be explored to estimate phytoconstituents qualitatively and quantitatively. Use of advance analytical technique for justification of scientific validity natural phytoconstituents is necessary. High performance thin-layer chromatography (HPTLC)

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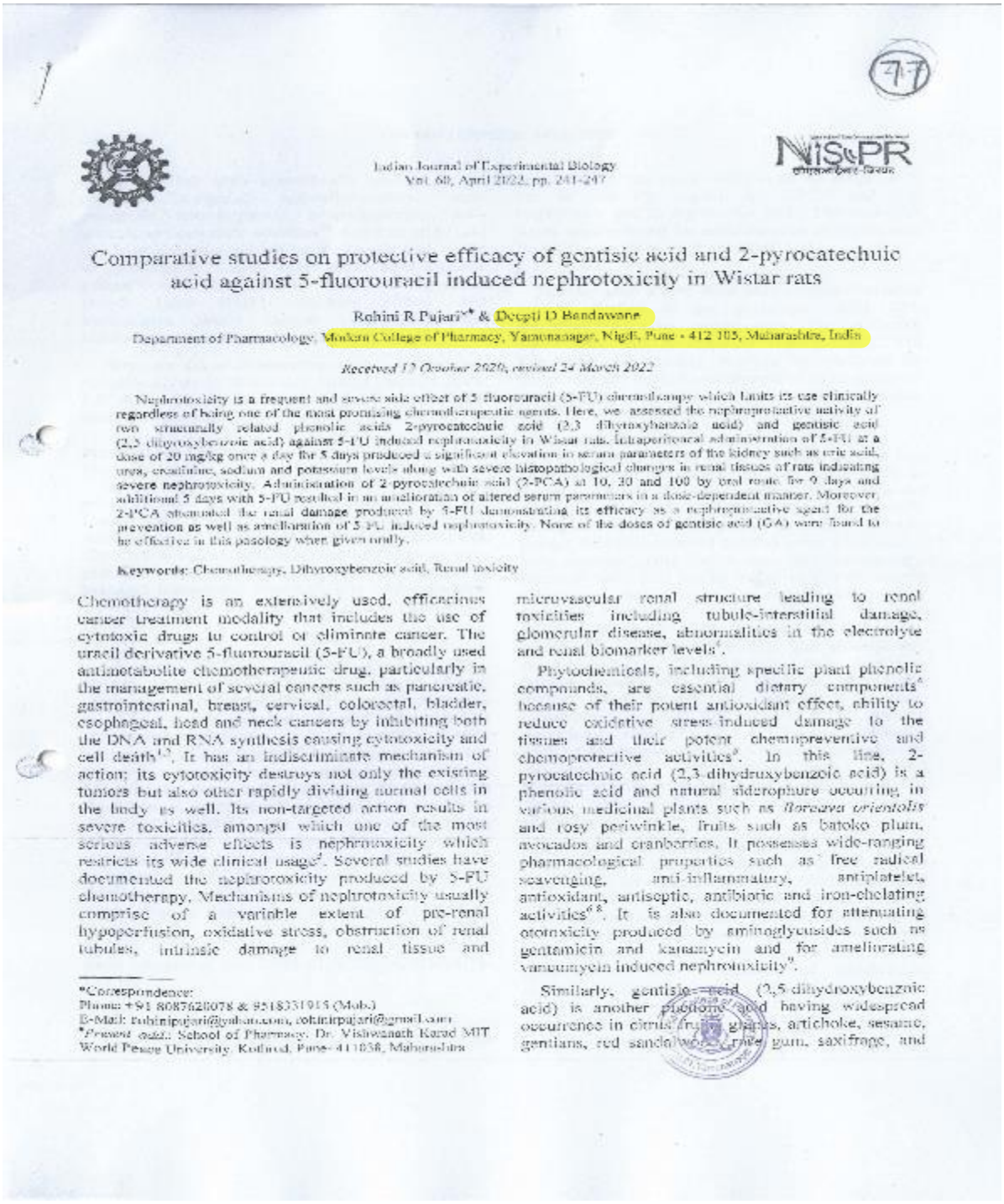
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Comparative studies on protective efficacy of gentisic acid and 2- pyrocatechuicacid against 5 fluorouracil induced toxicity in wistar rats



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NISCPR

Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuic acid against 5-fluorouracil induced nephrotoxicity in Wistar rats

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Nephrotoxicity is a frequent and severe side effect of 5 fluorouracil (5-FU) chemotherapy which limits its use clinically regardless of being one of the most promising chemotherapeutic agents. Here, we assessed the nephroprotective activity of two structurally related phenolic acids 2-pyrocatechuic acid (2,3 dihydroxybenzoic acid) and gentisic acid (2,5 dihydroxybenzoic acid) against 5-FU induced nephrotoxicity in Wistar rats. Intraperitoneal administration of 5-FU at a dose of 20 mg/kg once a day for 5 days produced a significant elevation in serum parameters of the kidney such as uric acid, urea, creatinine, sodium and potassium levels along with severe histopathological changes in renal tissues of rats indicating severe nephrotoxicity. Administration of 2-pyrocatechuic acid (2-PCA) at 10, 30 and 100 by oral route for 9 days and additional 5 days with 5-FU resulted in an amelioration of altered serum parameters in a dose-dependent manner. Moreover, 2-PCA attenuated the renal damage produced by 5-FU demonstrating its efficacy as a nephroprotective agent for the prevention as well as amelioration of 5-FU induced nephrotoxicity. None of the doses of gentisic acid (GA) were found to be effective in this pasology when given orally.

Keywords: Chemotherapy, Dihydroxybenzoic acid, Renal toxicity

Chemotherapy is an extensively used, efficacious cancer treatment modality that includes the use of cytotoxic drugs to control or eliminate cancer. The uracil derivative 5-fluorouracil (5-FU), a broadly used antimetabolite chemotherapeutic drug, particularly in the management of several cancers such as pancreatic, gastrointestinal, breast, cervical, colorectal, bladder, esophageal, head and neck cancers by inhibiting both the DNA and RNA synthesis causing cytotoxicity and cell death[1,2]. It has an indiscriminate mechanism of action; its cytotoxicity destroys not only the existing tumors but also other rapidly dividing normal cells in the body as well. Its non-targeted action results in severe toxicities, amongst which one of the most serious adverse effects is nephrotoxicity which restricts its wide clinical usage[3]. Several studies have documented the nephrotoxicity produced by 5-FU chemotherapy. Mechanisms of nephrotoxicity usually comprise of a variable extent of pre-renal hypoperfusion, oxidative stress, obstruction of renal tubules, intrinsic damage to renal tissue and microvascular renal structure leading to renal toxicities including tubule-interstitial damage, glomerular disease, abnormalities in the electrolyte and renal biomarker levels[4].

Phytochemicals, including specific plant phenolic compounds, are essential dietary components[5] because of their potent antioxidant effect, ability to reduce oxidative stress-induced damage to the tissues and their potent chemopreventive and chemoprotective activities[6]. In this line, 2-pyrocatechuic acid (2,3-dihydroxybenzoic acid) is a phenolic acid and natural siderophore occurring in various medicinal plants such as *Boreava orientalis* and rosy periwinkle, fruits such as batoko plum, avocados and cranberries. It possesses wide-ranging pharmacological properties such as free radical scavenging, anti-inflammatory, antiplatelet, antioxidant, antiseptic, antibiotic and iron-chelating activities[6-8]. It is also documented for attenuating ototoxicity produced by aminoglycosides such as gentamicin and kanamycin and for ameliorating vancomycin induced nephrotoxicity[9].

Similarly, gentisic acid (2,5 dihydroxybenzoic acid) is another phenolic acid having widespread occurrence in citrus fruits, grapes, artichoke, sesame, gentians, red sandal wood, tree gum, saxifrage, and

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Design, molecular docking studies and ADMET prediction of Chalcones of Indole benzenesulfonyl derivatives as Thioredoxin inhibitor for anticancer activity

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Design, Molecular Docking Studies and ADMET Prediction of Chalcones of Indole-Benzenesulfonyl Derivatives as Thioredoxin Inhibitor for Anticancer Activity

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ABSTRACT: The indole nucleus offers a wide range of applications in medicinal chemistry, including anticancer activity. A series of novel indole chalcone derivatives containing benzyl-sulphonyl group were designed and *in silico* study was carried out against the thioredoxin system as an anticancer target. The drug-likeness properties of synthesized compounds were predicted. A study on the Passonline server predicts the compounds to have the least adverse reaction with thioredoxin inhibitor activity. As the designed compounds break not more than one 'rule of five', it can be concluded that these derivatives could be orally active. As per the ADMET analysis, except for **C2** which contains para-substituted bromo, all the proposed compounds can be considered as safer lead molecules. According to the docking analysis, the derivatives showed a good binding affinity with the lowest minimum binding energy to the protein. According to the docking results, **C3**, **C7**, and **C8** containing para chloro, para hydroxyl, and meta chloro groups, respectively, could be the powerful inhibitors among the derivatives. The molecules form hydrophobic and hydrogen bond interactions. **C9** consisting of meta fluorine group may be a more potent thioredoxin inhibitor in comparison with Daucostero. Overall, the findings suggest that **C3**, **C7**, **C8**, and **C9** compounds could be effective anticancer inhibitors of thioredoxin. The designed indole chalcones containing benzyl-sulfonyl group analogs could be safer and more or equivalent effective anticancer agents.

KEYWORDS: Cancer therapy; thioredoxin inhibitor; *in silico* ADMET; molecular docking.

1. INTRODUCTION

Cancer is a widespread disease characterized by uncontrollable cell growth, influx, and metastasis. It is the second most common cause of death after cardiovascular disease worldwide.[1] Even though chemotherapy is one of the most widely used cancer treatment choices, the utilization of existing chemotherapeutics is limited due to unwanted side effects and multi-drug resistance.[2] Hence the design and discovery of newer and safer as well as more effective anticancer drugs are receiving great attention recently.[3] Indole derivatives are widely reported for cancer therapy development because they have the potential to function as many targets in cancer cells with promising anticancer action.[4] It is a heterocyclic scaffold containing a variety of biological functions including anticancer,[5] anti-inflammatory,[6] antiviral,[7] antidepressant,[8] antihypertensive, antidiabetic, anti-HIV, etc.[9] Many indole-containing drugs are available in the market for various pharmacological activities. Indole, which is responsible for cell death through multiple pathways in distinct cell lines, has recently become an important source of anticancer drug development.

The thioredoxin (Trx) system is found in all organisms and is a major system that regulates the intracellular redox state. It is an important regulator of cellular redox homeostasis and a possible molecular target candidate in the response to oxidative stress-inducing substances.[10] This system consists of Trx, Trx

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Detoxification of Gunja Seeds with Ex Vivo Study

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Original Article

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Detoxification of Gunja Seeds with Ex Vivo Study

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ABSTRACT

Seeds of Abrus precatorius linn. (fabaceae) are used in different Ayurvedic therapeutics. Since they are poisonous, they are processed with various media like Godugdha (cow's milk), Kanji (sour gruel), Nimbu Swarasa (Lemon Juice), etc. before being incorporated into the Ayurvedic formulations. This study investigates the use of Gomutra (Cow Urine), normal saline (NaCl), and water as detoxification media. A stainless-steel vessel with a dolayantra was used to immerse the seeds for 3 hours of boiling during the detoxification process. Detoxification using Gomutra gave a reddish tinge to the seeds compared to the light brown color seen with NaCl medium. The physicochemical changes in detoxification that occurred in the gomutra treated gunja seeds were validated by TLC and Ex Vivo investigations (agglutination assay). To characterize the extract using TLC, the mobile phase was Toulene: ethyl acetate: glacial acetic acid (6.5: 3.3: 0.2). The removal of distinctive bands in the TLC profile of processed gunja seeds suggested that the gunja seed extract's composition had changed.

Key words: *Abrus precatorius, Gunja seeds, Abrin, Gomutra, Dolayantra*

INTRODUCTION

Gunja (*Abrus precatorius Linn.*), known as Indian liquorice, is reputed as one of the world's most deadly but most beautiful seeds belonging to the family Fabaceae, classified as Upavisha (semi-poisonous medications) and widely employed in various Ayurvedic formulations with significant therapeutic value [1]. Due to the poisonous content present in gunja, it comes under the term "poisonous drug." In Ayurveda, it's stated that gunja can be used for therapeutic effect after proper detoxification [2]. Cow's milk, sour gruel, lemon juice, water, and other substances have previously been used to detoxify gunja [3]. In this study, we used *gomutra* and normal saline water for detoxification of gunja, and the confirmatory test known as the agglutination assay was carried out to confirm the agglutination factor present in gunja, which is Abrin, removed after the detoxification process using the new detoxification media, which is Cow's Urine [4]. This review paper shows the detoxification of gunja seed by using the TLC method and agglutination assay [5].

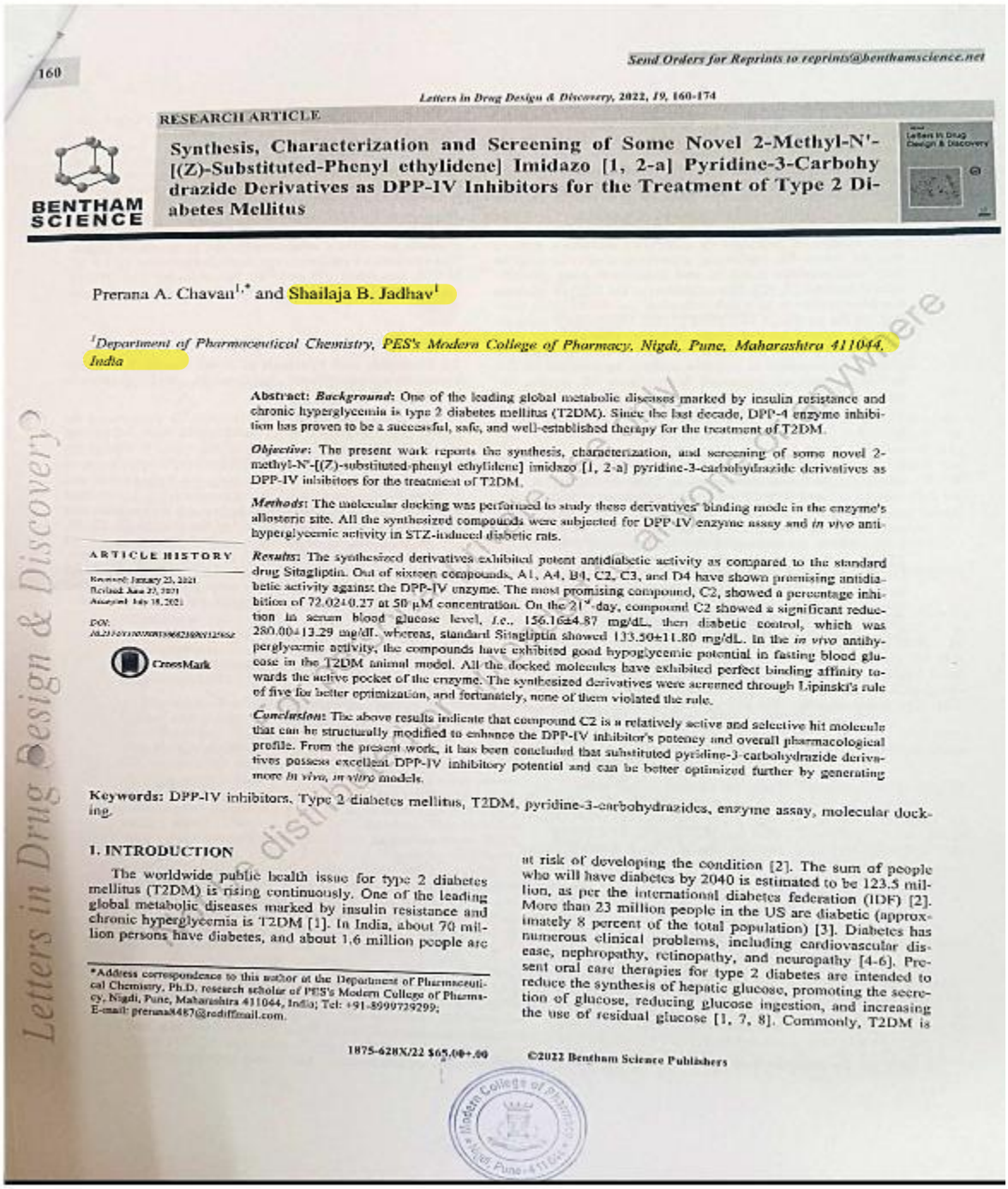
MATERIALS AND METHODS

Drug procurement

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Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted-Phenyl ethylidene] Imidazo [1, 2- a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus



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RESEARCH ARTICLE

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Synthesis, Characterization and Screening of Some Novel 2-Methyl-N'-[(Z)-Substituted-Phenyl ethylidene] Imidazo [1, 2-a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus

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Abstract: ***Background:*** One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is type 2 diabetes mellitus (T2DM). Since the last decade, DPP-4 enzyme inhibition has proven to be a successful, safe, and well-established therapy for the treatment of T2DM.

Objective: The present work reports the synthesis, characterization, and screening of some novel 2-methyl-N'-[(Z)-substituted-phenyl ethylidene] imidazo [1, 2-a] pyridine-3-carbohydrazide derivatives as DPP-IV inhibitors for the treatment of T2DM.

Methods: The molecular docking was performed to study these derivatives' binding mode in the enzyme's allosteric site. All the synthesized compounds were subjected for DPP-IV enzyme assay *and in vivo* antihyperglycemic activity in STZ-induced diabetic rats.

Results: The synthesized derivatives exhibited potent antidiabetic activity as compared to the standard drug Sitagliptin. Out of sixteen compounds, A1, A4, B4, C2, C3, and D4 have shown promising antidiabetic activity against the DPP-IV enzyme. The most promising compound, C2, showed a percentage inhibition of 72.02±0.27 at 50 µM concentration. On the 21st day, compound C2 showed a significant reduction in serum blood glucose level, *i.e.*, 156.16±4.87 mg/dL, then diabetic control, which was 280.00±13.29 mg/dl, whereas, standard Sitagliptin showed 133.50±11.80 mg/dL. In the *in vivo* antihyperglycemic activity, the compounds have exhibited good hypoglycemic potential in fasting blood glucose in the T2DM animal model. All the docked molecules have exhibited perfect binding affinity towards the active pocket of the enzyme. The synthesized derivatives were screened through Lipinski's rule of five for better optimization, and fortunately, none of them violated the rule.

Conclusion: The above results indicate that compound C2 is a relatively active and selective hit molecule that can be structurally modified to enhance the DPP-IV inhibitor's potency and overall pharmacological profile. From the present work, it has been concluded that substituted pyridine-3-carbohydrazide derivatives possess excellent DPP-IV inhibitory potential and can be better optimized further by generating more *in vivo, in vitro* models.

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Keywords: DPP-IV inhibitors, Type 2 diabetes mellitus, T2DM, pyridine-3-carbohydrazides, enzyme assay, molecular docking.

1. INTRODUCTION

The worldwide public health issue for type 2 diabetes mellitus (T2DM) is rising continuously. One of the leading global metabolic diseases marked by insulin resistance and chronic hyperglycemia is T2DM [1]. In India, about 70 million persons have diabetes, and about 1.6 million people are at risk of developing the condition [2]. The sum of people who will have diabetes by 2040 is estimated to be 123.5 million, as per the international diabetes federation (IDF) [2]. More than 23 million people in the US are diabetic (approximately 8 percent of the total population) [3]. Diabetes has numerous clinical problems, including cardiovascular disease, nephropathy, retinopathy, and neuropathy [4-6]. Present oral care therapies for type 2 diabetes are intended to reduce the synthesis of hepatic glucose, promoting the secretion of glucose, reducing glucose ingestion, and increasing the use of residual glucose [1, 7, 8]. Commonly, T2DM is

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Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti- cancer agent

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Research Article

Design, Synthesis and Molecular Docking Study of N-Heterocyclic Chalcone Derivatives as an Anti-cancer Agents

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ABSTRACT

The Claisen-Schmidt condensation of 4-(aryl)-aminobenzaldehyde and 2-hydroxyacetopherone resulted in a new series of heterocyclic chalcone (4a-4g) derivatives. Nucleophilic aromatic substitution (SNAr) of 4-fluorobenzaldehyde with heterocycle amines by ultrasonication in the presence of a base and polar aprotic solvent yielded 4-(aryl)-aminobenzaldehydes. Spectral investigations were used to establish the structures of synthesized compounds. The *in vitro* anti-cancer activity of the synthesized derivative was evaluated against MCF-7 (breast cancer) cells by SRB assay. Compounds 4c, 4h, and 4e have a high affinity for the ER receptor binding site, whereas compounds 4c and 4g have a moderate affinity for the VEGER-2 receptor. The GI_{50} value of 4c ((E)-1-[2-hydroxyphenyl]-3-[4-[4-methylpiperazin-1-yl]-phenyl] prop-2-en-1-one) was 44.6 uM, while the GI_{50} value of all other derivatives was greater than 80 uM. These findings lay the groundwork for additional research into the combination's potential uses in cancer therapy.

INTRODUCTION

Worldwide cancer is the most prevalent disease which causes severe health problems and excruciating side effects produced by chemotherapy and radiation-like treatment. Development in anti-cancer therapy focuses on the drugs of natural origin with no or very few side effects and target specific molecular signaling pathways. Chalcone represents a prime group of the flavonoid family, which consist of a large number of naturally occurring biomolecules reported to possess a wide spectrum of biological activities, including antioxidant,[1] anti-cancer,[2] antiprotozoal,[3] antimalarial,[4] anti-inflammatory,[5] anti-tubercular,[6] antibacterial,[7] and antiviral.[8] Chalcone is the very important class of intermediate precursor for the biosynthesis of flavonoids and the synthesis of biologically active 5- and 6-membered nitrogen heterocycles.[9] Chemically chalcone consists of a 1,3-diaryl-2-propen-1-one scaffold, in which two aryl rings are joined by three carbon alpha beta-unsaturated carbonyl systems. Various substituents are added on aryl rings, which modify binding interaction with different molecular targets and thus, improve biological activities. Some well-known examples of naturally occurring anti-cancer chalcone are butein, isoliquiritigenin, and isobavachalcone, which have been isolated from the bark of Rhus verniciflua, Glycyrrhiza glabra roots, and Psoralea corylifolia, respectively.[10-13]

Several reports are available that prove the antiproliferative activity of natural and synthetic chalcone against breast cancer.[14,15] Nitrogen-containing heterocyclic compounds have great importance in drug discovery than the non-nitrogen compound. These compounds play a vital role in metabolism in the living cell and their anti-cancer effect correlates with the force of interaction of DNA and heterocyclic compounds.[16] In this study, a

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Extraction, Isolation, Characterization of Curcumin-I From Curcuminoids

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Extraction, Isolation, Characterization of Curcumin-I From Curcuminoids

Priyanka T. Kare[1],*, Sarika S. Malode[1], Kalyani S. Kakad[2], Khanderao R. Jadhav[4]

Abstract

The major goal of this study is to extract, isolate, and characterize curcumin-I, a component of curcuminoids. Turmeric, or Curcuma longa Linn., plays a significant role in Ayurvedic medicine. Turmeric, or Curcuma longa Linn, is the popular name for this plant. An array of chemicals with biological activity may be more easily extracted with the help of this seasoning. Some of the compounds at play include curcuminoids and turmerone, although this is by no means a full list. When curcumin I, II, and III are combined, a process takes place that creates curcuminoids. Curcumin is a powerful anti-inflammatory, anti-HIV, anti-tumor, anti-viral, anti-cancer, anti-fungal, and anti-parasitic chemical. Some more uses are: It has also been hypothesised that this molecule has anti-parasitic and anti-fungal effects. The fact that it could potentially prevent tumour, viral, and parasite development is just frosting on the cake in terms of its therapeutic potential. In order to collect the data necessary for this study, an extraction of ground turmeric using the Soxhlet technique was performed. Separating curcumin-I from the other synthetic curcuminoids was crucial to achieving this aim. Scientists were able to effectively isolate and purify the molecule using crystallisation and chromatography. The best strategy was crystallisation.

Keywords: *Curcuma longa*, Curcuminoids, TLC, U.V., Mass, NMR

INTRODUCTION

Zingiberaceae family contains the important medicinal plant known as turmeric (Curcuma Longa Linn). Turmeric is native to India. Turmeric is regarded as a functional food due to the positive benefits it has on one's health [1]. In addition, turmeric has the ability to provide a distinct flavour to whatever it is combined with and maintain that flavour for an extended amount of time after the dish has been cooked. Phenolic compounds known as curcuminoids are obtained from the dark yellow spice known as Curcuma Longa [2]. The three primary diarylheptanoids that may be discovered in curcuminoids are referred to as curcumin (diferuloylmethane), demethoxycurcumin (phydro xycinnamoylferuloymethane), and bisdemethox ycurcumin (di-phydroxycinnamoylmethane). It has been shown that the natural antioxidant curcumin lowers cytotoxicity and the risk of developing cancer [3]. In addition to its efficacy against the human immunodeficiency virus, curcumin has properties that make it beneficial as an antimicrobial agent, an anti-inflammatory agent, an antibacterial agent, and astringent [4]. In this study, an attempt is made to isolate and identify the many types of curcuminoids that are found in turmeric.

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Protective Effect of Berberine in Amelioratimg Diabetic Complications in Streptozotocin high fat diet model in Experimental Animals

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Original Article

PROTECTIVE ROLE OF BERBERINE IN AMELIORATING DIABETIC COMPLICATIONS IN STREPTOZOTOCIN-HIGH FAT DIET MODEL IN EXPERIMENTAL ANIMALS

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ABSTRACT

Objective: Diabetes mellitus is a serious, complex metabolic disorder and growing health threat disease in the world. Berberine, one of the main constituent in *Rhizoma coptidis* is widely used in the treatment of diabetes. Potential of berberine in the management of diabetic complications, namely diabetic nephropathy and cardiomyopathy, is however, not yet explored. The present study was, therefore, undertaken to explore the potential of berberine for the management of diabetic nephropathy and diabetic cardiomyopathy in high-fat diet (HFD) and low dose streptozotocin (STZ) induced diabetes in rats.

Methods: Rats were fed a high-fat diet for 4 w followed by a single intraperitoneal dose of streptozotocin (35 mg/kg). Animals were divided in five groups. Berberine was given orally in two different dose levels (75 mg/kg and 150 mg/kg) for 28 d. Metformin (100 mg/kg) was used as a standard antidiabetic drug. At the end of the study, parameters evaluated includes glycemic profile, lipid profile, left ventricular indices, urinary protein, serum creatinine, blood urea nitrogen and cardiac antioxidants. Histopathology of kidney and pancreas was carried out.

Results: Berberine treated groups showed a significant decrease in fasting blood glucose, glycosylated Hb, creatinine, blood urea nitrogen and urinary total proteins, whereas there was a significant improvement in serum insulin, liver glycogen, skeletal muscle glycogen and cardiac antioxidant enzymes.

Conclusion: Present study indicated that berberine shows a protective role in diabetes-associated renal and cardiovascular complications.

Keywords: Diabetic nephropathy, Diabetic cardiomyopathy, High fat diet, Streptozotocin, Berberine

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INTRODUCTION

Diabetes mellitus is one of the metabolic disorders characterized by abnormally high levels of blood glucose. It has been recognized as a growing worldwide epidemic by the World Health Organization (WHO). Diabetes has become the disease of concern, particularly for Indians as India is now considered as the capital of diabetes patients, with 62.4 million Indians having type II diabetes mellitus [1].

In type II diabetes mellitus, progressive decline in insulin action referred as insulin resistance and pancreatic β-cell dysfunction leads to increased levels of blood glucose [2]. A major risk factor for insulin resistance is obesity, which is generally caused by a western-style high fatty diet and physical inactivity [3]. The development of insulin resistance in obesity exhibits accelerated lipolytic activity with increased release of free fatty acids (FFA) into the portal circulation. The FFA may be cytotoxic by inducing lipid peroxidation and hepatocyte apoptosis resulting in fatty liver disease. Further, studies have shown that both obesity and type II diabetes impair insulin-induced suppression of glycogenolysis and gluconeogenesis. The current treatment for type II diabetes includes insulin and oral hypoglycemic drugs such as biguanides, sulfonylurea derivatives, thiazolidinediones and α-glucosidase inhibitors. These medications have side effects, e. g. thiazolidinediones induce obesity, osteoporosis and sodium retention; sulfonylurea derivatives can lead to incidences of severe hypoglycemia, whereas biguanides like metformin put patients at risk of developing lactic acidosis [4]. Further, the oral monotherapy with lifestyle changes is not sufficient for most of the diabetic patients and requires various oral combinations or addition of insulin [5]. Thus, there is an increasing need to search for effective antidiabetic agents exhibiting fewer side effects. As an alternative, large number of population is trying to rely on plant-based remedies for management of this metabolic disorder.

aquifolium (Oregon grape), *Coptis chinensis* (Coptis or golden thread) and *Berberis aristata* (tree turmeric). Berberine is reported to be useful in the Indian traditional system since a long time for various ailments, including diabetes, hyperlipidemia, oxidative stress, cancer and inflammation [6-9]. Berberine is reported to exhibit antidiabetic activity through promoting regeneration and functional recovery of β-cells as well as by improvement of insulin sensitivity [10, 11]. Considering the role of berberine as an insulin sensitizer, we have undertaken the present study with an objective to evaluate the effect of berberine on diabetic nephropathy and cardiomyopathy in HFD-low dose STZ induced type II diabetes in rats.

MATERIALS AND METHODS

Drugs and chemicals

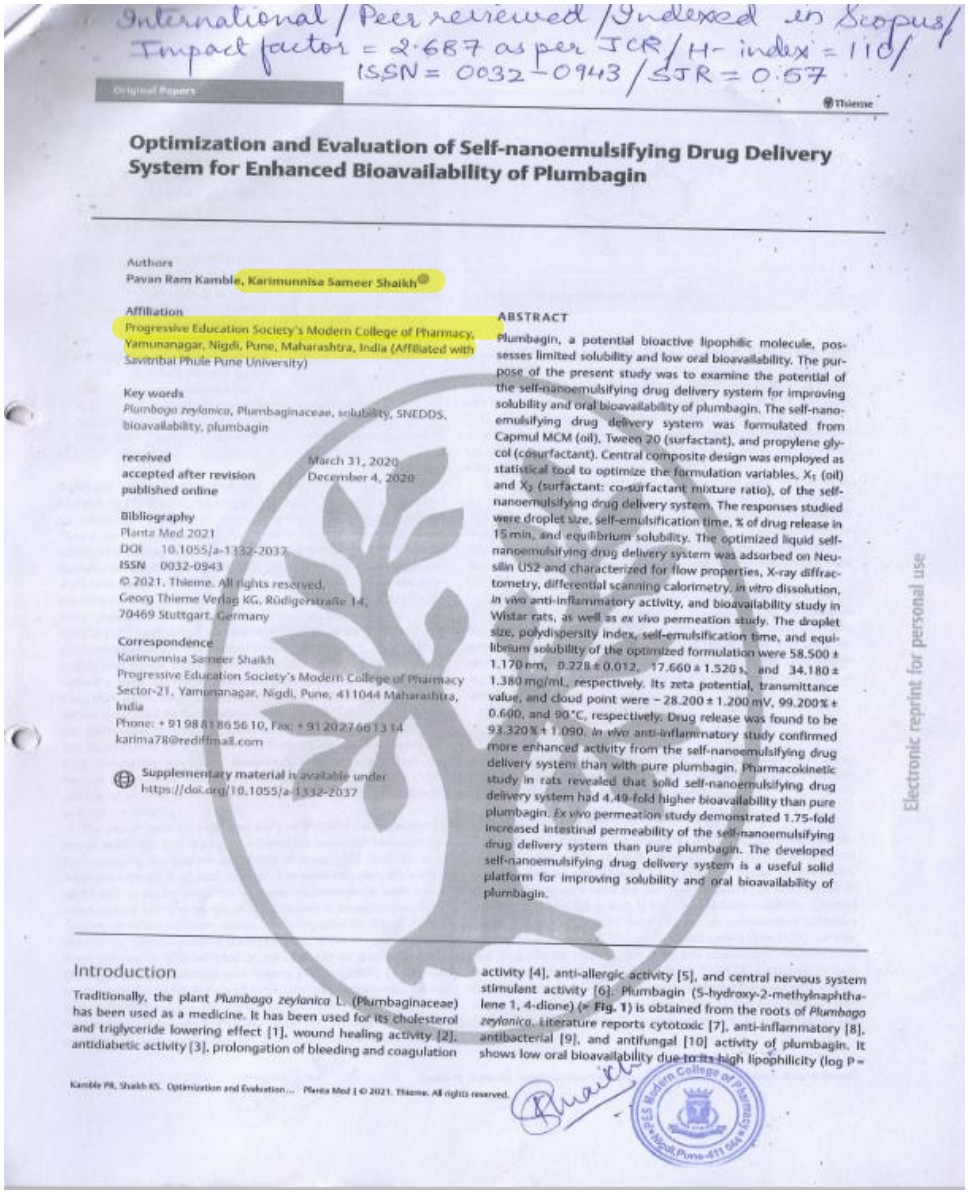
Berberine was purchased from TCI Chemicals (India) Pvt Ltd. Streptozotocin (STZ) was purchased from Sigma chemicals, Germany. Kits for estimation of total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL), creatinine, blood urea nitrogen (BUN), total proteins, SGOT, SGPT and ALP were purchased from Erba diagnostics. All other chemicals used in study were of high-quality analytical grade.

Experimental animals

Healthy male Sprague Dawley rats (150-180 g) were procured from National Institute of Bioscience, Chaturshrungi, Pune. Animals were housed in a group of 6 per cage in standard polypropylene cages lined with raw husk. The animal house was maintained on 12 h light/dark cycle at approximately 22±2 °C, relative humidity 60-70%. After randomization into various groups and before initiation of the experiment, the rats were acclimatized for a period of 7 d. Before and during the experiment rats were fed with standard laboratory diet (Nutrivet Lifescience, Pune, Maharashtra) and water

Modern College of Pharmacy Yamunanagar

Optimization and evaluation of self-nanoemulsifying drug delivery system for enhanced bioavailability of plumbagin



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Original Papers

Thieme

Optimization and Evaluation of Self-nanoemulsifying Drug Delivery System for Enhanced Bioavailability of Plumbagin

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ABSTRACT

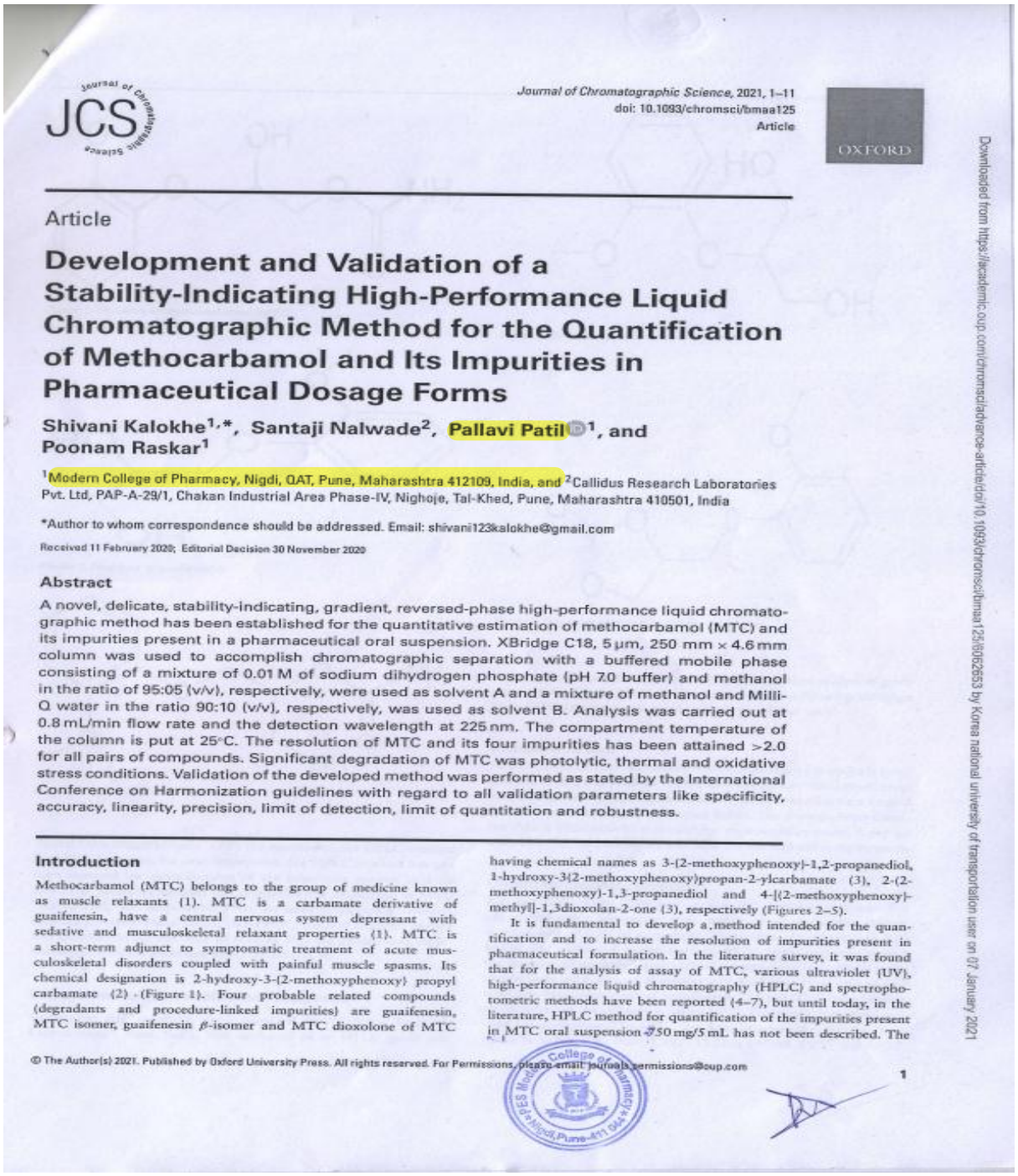
Plumbagin, a potential bioactive lipophilic molecule, possesses limited solubility and low oral bioavailability. The purpose of the present study was to examine the potential of the self-nanoemulsifying drug delivery system for improving solubility and oral bioavailability of plumbagin. The self-nanoemulsifying drug delivery system was formulated from Capmul MCM (oil), Tween 20 (surfactant), and propylene glycol (cosurfactant). Central composite design was employed as statistical tool to optimize the formulation variables, X_1 (oil) and X_2 (surfactant: co-surfactant mixture ratio), of the self-nanoemulsifying drug delivery system. The responses studied were droplet size, self-emulsification time, % of drug release in 15 min, and equilibrium solubility. The optimized liquid self-nanoemulsifying drug delivery system was adsorbed on Neusilin US2 and characterized for flow properties, X-ray diffractometry, differential scanning calorimetry, *in vitro* dissolution, *in vivo* anti-inflammatory activity, and bioavailability study in Wistar rats, as well as *ex vivo* permeation study. The droplet size, polydispersity index, self-emulsification time, and equilibrium solubility of the optimized formulation were 58.500 ± 1.170 nm, 0.228 ± 0.012, 17.660 ± 1.520 s, and 34.180 ± 1.380 mg/mL, respectively. Its zeta potential, transmittance value, and cloud point were − 28.200 ± 1.200 mV, 99.200% ± 0.600, and 90 °C, respectively. Drug release was found to be 93.320% ± 1.090. *In vivo* anti-inflammatory study confirmed more enhanced activity from the self-nanoemulsifying drug delivery system than with pure plumbagin. Pharmacokinetic study in rats revealed that solid self-nanoemulsifying drug delivery system had 4.49-fold higher bioavailability than pure plumbagin. *Ex vivo* permeation study demonstrated 1.75-fold increased intestinal permeability of the self-nanoemulsifying drug delivery system than pure plumbagin. The developed self-nanoemulsifying drug delivery system is a useful solid platform for improving solubility and oral bioavailability of plumbagin.

Introduction

Traditionally, the plant *Plumbago zeylanica* L. (Plumbaginaceae) has been used as a medicine. It has been used for its cholesterol and triglyceride lowering effect [1], wound healing activity [2], antidiabetic activity [3], prolongation of bleeding and coagulation activity [4], anti-allergic activity [5], and central nervous system stimulant activity [6]. Plumbagin (5-hydroxy-2-methylnaphthalene 1, 4-dione) (► **Fig. 1**) is obtained from the roots of *Plumbago zeylanica*. Literature reports cytotoxic [7], anti-inflammatory [8], antibacterial [9], and antifungal [10] activity of plumbagin. It shows low oral bioavailability due to its high lipophilicity (log P =

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Development and Validation of a Stability-Indicating High-Performance Liquid Chromatographic Method for the Quantification of Methocarbamol and Its Impurities in Pharmaceutical Dosage Forms



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Article

Development and Validation of a Stability-Indicating High-Performance Liquid Chromatographic Method for the Quantification of Methocarbamol and Its Impurities in Pharmaceutical Dosage Forms

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Abstract

A novel, delicate, stability-indicating, gradient, reversed-phase high-performance liquid chromatographic method has been established for the quantitative estimation of methocarbamol (MTC) and its impurities present in a pharmaceutical oral suspension. XBridge C18, 5 µm, 250 mm × 4.6 mm column was used to accomplish chromatographic separation with a buffered mobile phase consisting of a mixture of 0.01 M of sodium dihydrogen phosphate (pH 7.0 buffer) and methanol in the ratio of 95:05 (v/v), respectively, were used as solvent A and a mixture of methanol and Milli-Q water in the ratio 90:10 (v/v), respectively, was used as solvent B. Analysis was carried out at 0.8 mL/min flow rate and the detection wavelength at 225 nm. The compartment temperature of the column is put at 25°C. The resolution of MTC and its four impurities has been attained >2.0 for all pairs of compounds. Significant degradation of MTC was photolytic, thermal and oxidative stress conditions. Validation of the developed method was performed as stated by the International Conference on Harmonization guidelines with regard to all validation parameters like specificity, accuracy, linearity, precision, limit of detection, limit of quantitation and robustness.

Introduction

Methocarbamol (MTC) belongs to the group of medicine known as muscle relaxants (1). MTC is a carbamate derivative of guaifenesin, have a central nervous system depressant with sedative and musculoskeletal relaxant properties (1). MTC is a short-term adjunct to symptomatic treatment of acute musculoskeletal disorders coupled with painful muscle spasms. Its chemical designation is 2-hydroxy-3-(2-methoxyphenoxy) propyl carbamate (2) (Figure 1). Four probable related compounds (degradants and procedure-linked impurities) are guaifenesin, MTC isomer, guaifenesin β-isomer and MTC dioxolone of MTC having chemical names as 3-(2-methoxyphenoxy)-1,2-propanediol, 1-hydroxy-3(2-methoxyphenoxy)propan-2-ylcarbamate (3), 2-(2-methoxyphenoxy)-1,3-propanediol and 4-[(2-methoxyphenoxy)-methyl]-1,3dioxolan-2-one (3), respectively (Figures 2–5).

It is fundamental to develop a method intended for the quantification and to increase the resolution of impurities present in pharmaceutical formulation. In the literature survey, it was found that for the analysis of assay of MTC, various ultraviolet (UV), high-performance liquid chromatography (HPLC) and spectrophotometric methods have been reported (4–7), but until today, in the literature, HPLC method for quantification of the impurities present in MTC oral suspension (750 mg/5 mL has not been described. The

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Case report on Bullous Pemphigoid: A fatal skin condition

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CASE REPORT

Case report on Bullous Pemphigoid: A Fatal Skin Condition

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Abstract

Bullous pemphigoid (BP) is a fatal skin condition which is manifested as diffuse eczematous, pruritic lesions which is afterwards; appear as tense blistering lesions filled with clear fluid which is commonly observed in elderly. Direct immunofluorescence is used as the definitive standard for the diagnosis of BP. Line of treatment for BP includes drugs which are anti-inflammatory such as topical steroids and sulfonamides; second line of treatment includes the immune-suppressant agents such as azathioprine, systemic steroids and last line of therapy includes the agent which increases the elimination of abnormal antibodies from plasma. These may include the treatment options such as plasmapheresis and intravenous immunoglobulin.

Keywords: Bullous Pemphigoid, Autoimmune disease, Skin conditions

1 | INTRODUCTION

Bullous pemphigoid is the autoimmune skin condition which is rare and one of the fatal skin condition.[1] It is manifested as diffuse eczematous, pruritic lesions which look like a blistering lesions filled with clear fluid giving it tensed appearance. Lesions are mainly located in the trunk and extremities. BP is diagnose by histological and immunopathological investigations.[2] In UK the incidence rate is one in 10,000 people affected by this condition which is comparatively low in India.[3] The purpose of current case report is to increase awareness about the skin condition and prevent physician from misdiagnosis.

2 | CASE REPORT

A 60 year old female patient presented at the General Medicine department of District General Hospital, Amravati with the chief complaints of painful diffused, bullous eruption mainly on chest, back, abdomen and upper extremities from 15 days. After an initial assessment and physical examination, the patient was advised certain investigations such as Complete Blood Count and HIV. Laboratory investi-

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Case Of Hiatus Hernia: An Aggravating Factor For Iron Deficiency Anemia

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CASE REPORT

CASE OF HIATUS HERNIA: AN AGGRAVATING FACTOR FOR IRON DEFICIENCY ANEMIA

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Abstract

Hiatus hernia (HH) is the herniation of stomach into the chest cavity through diaphragm. HH is idiopathic and hence its exact cause is not known; possible causes are age related changes in diaphragm and inborn large hiatus. [1] Cameron lesions are yet another indicative for hiatus hernia. The purpose of this case report is highlighting various sources of the above condition which lead to worsened patient condition leading to hospitalization.

Current case is a presentation of heme fibroid, duodenal Cameron lesion and type 1 hiatus hernia leading to worsened iron deficiency anaemia. For the efficient management of patient a proton pump inhibitor and vitamin B complex was advised.

Keywords: Hiatus Hernia, Iron deficiency Anemia, Proton Pump Inhibitor, Heme Fibroid

1 | INTRODUCTION

Anaemia induction with a hiatus hernia is generally an uncommon presentation. The prevalence of both the conditions co-existing is very low (6 to 7%).[1] But, HH might contribute the iron deficiency anaemia due to excessive bleeding from the Cameron lesions and peptic ulcers.[2] In present case, type I HH is present hence completely harmless thus chances of GI bleeding are almost diminished. The condition was brought in light by an upper endoscopy. There is no documented data available for treatment of anemic patients with a hiatus hernia with proton pump inhibitors but the same are found to be effective at some extents.[1] This case report focuses upon depletion of patient's anemic condition due to the mentioned underlying causes.

Supplementary information The online version of this article (https://doi.org/10.15520/ijmhs.v10i09.3083) contains supplementary material, which is available to authorized users.

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Evaluation of the Immunomodulatory activity of AbelmoschusManihot Linn In various experimental animal models

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EVALUATION OF THE IMMUNOMODULATORY ACTIVITY OF ABELMOSCHUS MANIHOT LINN IN VARIOUS EXPERIMENTAL ANIMAL MODELS

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ABSTRACT

Purpose: The aim of the study was to evaluate the immunomodulatory activity of leaves extracts of *Abelmoschus manihot* (L.) Linn. (Family: Malvaceae) using various experimental animal models.

Methods: Aqueous and ethanolic leaves extract of *Abelmoschus manihot* L. was administered orally at the dosage levels of 200 mg/kg/day body weight in mice. Immunomodulatory activity was evaluated by heamagglutination antibody (HA) titre; delayed type hypersensitivity (DTH), neutrophil adhesion test, carbon clearance test and *E- coli* induced abdominal peritonitis on specific and non-specific immune response. Cyclophosphamide (100 mg/kg/day, p.o.) is used to induced immunosuppresion in mice and levamisole (50 mg/kg/day, p.o.) used as immunostimulating agents.

Results: Oral administration of aqueous and ethanolic leaves extract of *A. manihot* showed a significant increase in the production of circulating antibody titre in response to sheep red blood cells (SRBCs). A significant ($p<0.05$) increase in both primary and secondary HA titre was observed when compared to control group, whereas in cyclophosphamide treated group *A. manihot* showed significant ($p<0.05$) increase in HA titre and DTH reaction by facilitating the footpad thickness response to SRBCs in sensitized mice. Also showed a significant ($p<0.05$) increase in percentage neutrophil adhesion to nylon fibers, increased phagocytic index significantly and decreased percent mortality by *E- coli* induced abdominal peritonitis.

Conclusion: From the above findings, aqueous and ethanolic leaves extract of *A. manihot* (200 mg/kg). showed potential for augmenting immune response of both specific and non-specific immunity. It is concluded that, immunostimulatory effect of *A. manihot* could be attributed to its various phytoconstituents present in aqueous and ethanolic leaves extract.

Keywords: *Abelmoschus manihot*, Immunomodulation, antibody titre, delayed type hypersensitivity, phagocytic index.

I. INTRODUCTION

The immune system is exposed to a myriad of substances intentionally and unintentionally. Immune activation is an effective as well as protective approach against emerging infectious diseases. Immunostimulation is also indicated to counteract immunosuppression or an ineffectively working immune system.[1]

One of the main strategies in ayurvedic medicine is to increase body's natural resistance to disease or stress causing agent rather than directly neutralizing the agent itself in practice. Ayurveda exploits the potential of various herbs as drugs and play important role in modern health care, particularly where satisfactory treatment is not available. The traditional medicine all over the world is nowadays reviewed by an extensive research on different plant species and their therapeutic principles.[2]

The *Malvaceae* species has been used for thousands of years as culinary and medicinal properties in ayurveda, the traditional medicinal system of India. A large annual erect hairy herb or undershrub, represented by *Abelmoschus manihot (A. manihot)* (L.) Medik (Malvaceae) Synonym: *Hibiscus manihot* Linn is medicinally important plant of the Malvaceae family commonly known as 'Jangali bhendi' is a 1.2-1.8 m. high, commonly found on the Kokan, Western Ghats and Western coasts of India.[3]

They are beneficial in treating gout, tuberculosis and bleeding disorders. The *A. manihot L.* are used in Rakttapitta dosha, blood purifier, stomach pain, colic pain, hepatoprotective and also used in blood diseases.[3, 4] Root paste and leaves useful for boils, sores, sprains, inflammations, tuberculosis and leucoderma.[6, 7, 8]

The reported pharmacological studies on some Malvaceae species include Analgesic and anti-inflammatory activity: (*Sutradhar RK, et al*, 2006) Hepatoprotective activity: (*Porchezhian E. et al*, 2005), Flavonoid isolation: (*Matlawska I. et al*, 2002), Hypoglycemic activity: (*Seetharam YN. et al*, 2002), phytochemical investigation: (*Gaind KN. et al*, 1976).

Further no scientific study has been carried out on *Ablemoschus Manihot* L. Hence the present investigation has been undertaken to evaluate the Immunomodulatory activity of a leaf extracts of *Abelmoschus manihot* L. with special emphasis to its immunomodulatory effect which has not been carried out yet.

II. MATERIALS AND METHODS

2.1 Plant collection and authentication

Fresh leaves of *A. manihot* L. was collected from local areas of Trimbakeshwar and Igatpuri, Nashik. The plant was authenticated by botanical survey of India, Pune. A sample voucher specimen of the plant was deposited for further future reference.

Case of uncontrolled seizures due to poor medication adherence

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ORIGINAL RESEARCH PAPER

General Medicine

CASE OF UNCONTROLLED SEIZURES DUE TO POOR MEDICATION ADHERENCE

KEY WORDS: seizure, periventricular heterotopia, anticonvulsants, medication adherence

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ABSTRACT

Periventricular heterotopia is a rare and chronic disease which cannot be cured completely but well defined treatment with proper history taking and patient counseling can improve patient's quality of life. It occurs due to malfunctioning of cortical development caused when a cluster of neuron fails to migrate from the ventricular zone to cerebral cortex resulting in seizures. Current case report is of a 42 year old female patient presented with repetitive seizures, weakness, muscle pain and unreasonable mood swings. Poor medication adherence caused worsening of patient's condition. The patient was successfully recovered by proper medication and patient counseling.

INTRODUCTION

Approximately 8%to 10% of the population experience a seizure during their lifetime amongst which only 2%to 3% of them go on to develop epilepsy. [2] Periventricular/ sub ependymal heterotopia is a rare disease in which malfunctioning of cortical development is resulted when a cluster of neuron fails to migrate from the ventricular zone to cerebral cortex resulting in seizures. [4]Hence, understanding the underlying cause leads to an accurate diagnosis to ensure appropriate treatment for patients with low risk for recurrence are not treated unnecessarily.[2] PH mainly occurs due to mutation in x-linked FLNA gene or mutation in autosomal genes (ARFGEF 2). The main symptom is recurrent seizures but less likely commonly people with PH may have more severe brain malfunctioning, small head size, recurrent infection, blood vessel abnormalities etc. The x-linked form of PH usually affects females because in male severity may cause death before birth. It is not cured completely but symptoms can be minimized.[2,3,4]

CASE REPORT

A 42 year old female came up with complaints of repetitive seizures, weakness, muscle pain, discomfort and some unreasonable mood swings. After seizure attack patient showed symptoms of claustrophobia, confusion, and uncontrolled movements accompanied by violent behavior. The patient had a history of generalized tonic clonic seizure from last 23 years (1996). Treatment was initiated in 1997 with Eptoin 100 OD but the symptoms were not relieved. History also briefed of trying to commit suicide due to depression and late pregnancy. Patient had seizure free period in pregnancy and after pregnancy for 1 year. CT scan and MRI were done in 2006 which implied:

MRI Report- Irregularity along the wall of left lateral ventricle due to multiple nodular lesions similar to sub- ependymal grey matter heterotopia.

CT scan Report- Nodularity along the wall of left lateral ventricle which appears lined by grey matter suggestive of grey matter heterotopia.

Patient was prescribed with:

1. TAB Oxetol 300 BD for 7 days (Oxcarbazepine)
2. TAB cloba 5 BD for 1 month (Clobazam)
3. Tab Eptoin 100 mg OD for 1 month (Phenytoin)

Anticonvulsant Eptoin 100 was continued for next 9 years but the medication did not relieve patient's symptoms. So on this basis medication was stopped by physician (for 4 years). But after cessation of the medication seizure frequency increased with violent behavior and unreasonable mood swings. In the year 2019 patient was diagnosed with hypertension and started on amlodipine 5 mg OD.

After 2 months from the Hypertension diagnosis and re-consultation with the physician the anticonvulsant Eptoin 100 was started again with proper patient counselling and the symptoms had been minimal since then.

The symptoms of the patient can be divided technically into three phases.

1. When the patient was primarily diagnosed with periventricular heterotopia, Eptoin 100 mg OD (Phenytoin) was initiated but without a proper patient counseling for the same. Hence the symptoms of repetitive seizures, depression with weakness and suicidal tendencies did show a very slight improvement.
2. 2nd phase of symptoms was of a considered time as during this time span, the medication was stopped by the physician, and hence there was a notable change in the symptoms.
   The symptoms were repetitive seizures with violent behavior, unreasonable mood swings and myalgia.
3. The 3rd or most exponential phase of the patient symptom is the ongoing phase where patient has only 1 to 2 seizure episodes in a month; the unreasonable mood swings are diminished, the muscle pain is reduced and no violent behavior was observed. This phase is significant as the previous medication (Eptoin 100 mg OD) was restarted with proper patient counseling and as a result of positive feedback the symptoms are relieved.

DISCUSSION

Adult onset seizures are most prevalent in the young and middle-aged adults than the elderly; generalized seizures are more prominent than focal seizures. [1,2] Some studies had shown that maximum patients suffer from adult onset seizure due to stroke followed by a CNS infection and brain tumor but in this case the etiological factor is periventricular heterotopia which cannot be cured but the symptoms (epilepsy) can be minimized by anticonvulsants.[5,6] In this case medicine was prescribed according to the guideline but

Analytical Method Development And Validation For Stability Indicating Hptlc Method For Assay Of Luliconazole In Bulk And Dosage Form

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ANALYTICAL METHOD DEVELOPMENT AND VALIDATION FOR STABILITY INDICATING HPTLC METHOD FOR ASSAY OF LULICONAZOLE IN BULK AND DOSAGE FORM

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ABSTRACT

A quick, precise and accurate method based on HPTLC has been developed for analysis of Luliconazole. The method was developed and validated for the determination of Luliconazole on pre coated silica gel HPTLC plates using Toluene: methanol: GAA Solution (8:2:0.2V/V/V) as a mobile phase with Densitometric detection at 294nm. The method was validated for linearity, precision, accuracy and robustness. Linearity range for LUL was found 100-500ng/band Correlation coefficient was 0.990. The developed method was precise and robust, % RSD was found less than 2%. % recovery was found to be in range of 101.67-103.61%. LOD and LOQ were 15.48ng/b and 46.92ng/b. Stress degradation studies were performed to evaluate the stability indicating properties and specificity of the method. Degradation study was carried out by exposing of working standard solution of LUL with acid (0.1N HCL at 80°C), base (0.1 N NaOH at 80°C), hydrogen peroxide (3% H2O2), Distilled water (H2O) for 2 hours while one volumetric flask was exposed to UV light (294 nm) and one volumetric flask was exposed to (800 C) for 24 hours and thermal LUL sample at (80°C for 1hr) The degradation was found to be resp. (5.17%, 7.20%, 8.18%, 7.82%, 7.58%, 5.72%)

KEYWORDS

Analytical method validation, High-performance thin-layer chromatography, Luliconazole and Stability-indicating assay method.

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INTRODUCTION

The drug Luliconaozole (LCZ) was selected for this study. The (2E)-2-[(4R)-4-(2, 4-dichlorophenyl)-1, 3-dithiolan-2-ylidene]-2-imidazol-1-ylacetonitrile, a completely unique antifungal drug launched in India by Ranbaxy Laboratories Ltd. The products were screened from active compounds associated with the drug luliconazole, a potent antidermatophytic

Fetal termination in prenatally diagnosed ventricular septum defect, and hypoplastic left heart syndrom case

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FETAL TERMINATION IN PRENATALLY DIAGNOSED VENTRICULAR SEPTUM DEFECT AND HYPOPLASTIC LEFT HEART SYNDROME CASE

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ABSTRACT

A ventricular septal defect (VSD) is a hole or a defect in the septum that separates the two lower chambers of the heart, resulting in contact between the ventricular cavities. Hypoplastic left heart syndrome refers to the abnormal development of the left-sided cardiac structures, resulting in obstruction to blood flow from the left ventricular outflow tract. Current case is of a 23 year old female whose fetus was diagnosed with ventricular septal defect along with hypoplastic left heart syndrome. Heart appeared in the middle position, four chambered view shows hypoplastic left heart chambers and dilated right heart chambers, muscular ventricular septal defect seen and outflow tracts appeared abnormal. After examining all the parameters the doctor suggested to abort the fetus. Delivering a baby with this defect was risk for the baby as well as the mother and may even end up with death of the baby. This case report concludes that, prenatal diagnosis and proper counselling helps to prevent long term neurologic condition and reduces rate of morbity after birth.

KEYWORDS: Ventricular septal defect, hypoplastic left heart syndrome, pregnancy termination.

INTRODUCTION

A ventricular septal defect (VSD) is a hole or a defect in the septum that splits the two lower chambers of the heart, resulting in contact between the ventricular cavities. It may occur as a primary anomaly, with or without considerable heart related defects. It was first clinically

Analytical Method Development and Validation for Stability Indicating HPTLC Method for Assay of Stiripentol In Bulk and Dosage Form

RESEARCH ARTICLE

Analytical Method Development and Validation for Stability Indicating HPTLC Method for Assay of Stiripentol In Bulk and Dosage Form

Santosh Kumar Kashid*, Amit Tapkir, Pravin Choudhari

Abstract

This work is concerned with the stability-indicating method development and validation of Stiripentol in a bulk drug and formulation by high-performance thin-layer chromatographic method (HPTLC). The pre-coated silica gel 60 F_{254} aluminum plate was selected as the stationary phase, and the solvent system consisted of Ethyl acetate: Dichloromethane: Toluene (2:2:6 v/v) used as developing solvents. Analysis of Stiripentol was carried out at 301 nm with Stiripentol being detected at an R(f) of 0.63. The developed method was validated for linearity, accuracy, precision, limit of detection (LoD), limit of quantitation (LoQ), robustness parameters, and stability are determined by force degradation study. The correlation coefficient of Stiripentol was 0.994 observed. The calibration plot was linear between 50–300 ng/band, respectively. The average percentage recovery of Stiripentol was found to be 100.25 %. Intra and inter-day precision measured as %RSD was less than 2%. Hence stability study of Stiripentol, it was found to degrade in acidic condition(8.52% - 0.1N HCL for 30 minutes at room temperature), alkali condition(7.47%- 0.1 N NaOH for 30min at room temperature), Hydrolytic condition(4.73%– dist. Water for 30min at room temperature), thermal condition(7.69%-40°C for 30min), oxidative condition(7.55% - 3% H_2O_2 for 30min at room temperature) and photolytic UV condition(7.54% -24hr UV radiation) respectively. Stiripentol was unstable in acidic condition and stable in normal dist. Water hydrolytic condition. The proposed method was found to be very sensitive and accurate for the determination of Stiripentol in bulk and formulation.

Keywords: High-Performance Thin Layer Chromatography, Stiripentol, Stress degradation, Validation.

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Introduction

Stiripentol is a newly approved antiepileptic drug[1,2] (Figure 1). The racemic mixture of Stiripentol has two enantiomers R (+) Stiripentol and S (-).[3] Stiripentol of which R (+) has 2.4-fold greater anticonvulsant potency and 3-fold faster elimination rate then S (-) Stiripentol.[4] Its clinical development was delayed due to its inhibitory effect on hepatic cytochrome P450 (CYP).[5] By suppressing GABA uptake, Stiripentol increases γ- GABA concentration in brain tissues and reduces GABA transaminase activity.[6] Stiripentol has no affinity for $GABA_A$ and $GABA_B$ receptors.[7] The European marketing authorization has approved Stiripentol for the treatment of Dravet syndrome or severe myoclonic epilepsy in infancy SMEI in combination with sodium valproate and clobazam.[8,9]

Pharmaceutical dosage form of Stiripentol is imperative for the optimum and efficient delivery of its therapeutic activity to the patients by stability testing. The motive of stability testing is to look into changes in the quality of a drug substance or a drug product with time due to environmental factors, such as temperature, humidity, and light. Furthermore, stability testing includes storage conditions and shelf life for the drug product.[10,11] In certain, pharmaceuticals are fundamentally sensitive to environmental conditions, which are usually varied during the different stages (i.e., manufacturing, transportation and storage) of the finished products. Based on the earlier mentioned importance of stability testing, it is essential to investigate degradation pathways and stability of the drug. Recently, the need to establish a stability-indicating assay method for stability testing has become more clearly mandated in the official guidelines at the International Conference on Harmonization (ICH)[11] and United States Pharmacopeia (USP). A detailed literature survey disclosed that only few high-performance liquid chromatography (HPLC) methods were reported to determine STP to study its

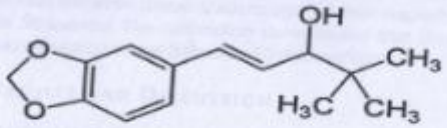


Figure 1: Structure of Stiripentol

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Formulation and invitro characterization of oseltamivir fast dissolving tablets using superdisintergrants

RESEARCH ARTICLE

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Formulation and *In-Vitro* Characterization of Oseltamivir Fast Dissolving Tablets Using Superdisintegrants

R Y Patil[1], Atul A Phatak[2], Shrishail M Ghurghure[1*], Sachin Yanjane[1]

Abstract: The aim of the present study was to formulate fast dissolving tablet of oseltamivir using superdisintegrants with the help of solid dispersion technique to improve the aqueous solubility, dissolution rate and to facilitate faster onset of action. Solid dispersion of oseltamivir was prepared with PVP K30 in different drug: carrier ratio using solvent evaporation method. The optimized solid dispersion (drug: PVP K30, 1:0.5 ratio) were further used to prepare fast dissolving tablet by direct compression method using superdisintegrants such as crospovidone and xanthan gum. Infrared spectroscopy, differential scanning calorimetry and x-ray diffraction were performed to identify the physicochemical interaction between drug and optimized formulation. The pre-compression parameter of prepared powder blends all formulation suggested good flowability and compressibility. The prepared tablets were evaluated for thickness, hardness, friability and weight variation, drug content, wetting time, disintegration time and *in-vitro* dissolution studies. The batch F12- shows highest release of 99.84 % in 25 min.

INTRODUCTION

Tablet is defined as compressed solid dosage form containing medicament with or without excipients. In recent decades, a diffusion of pharmaceutical analysis has been conducted to develop new indefinite quantity forms. The novel drug delivery systems are to increase safety and efficacy of drug by formulating convenient dosage form and to achieve better patient compliance. [1] The matter of swallowing is also a standard development throughout a geriatric patient because of worry of choking, hand tremors, dysphasia and in young people because of underdeveloped muscular and nervous systems this results in a poor patient compliance which may be improved by the fast dissolving tablets. [2] The ideal drug delivery systems have two things would be needed first it might be one dose the period of treatment whether or not it's for days or week, like infection, or for the life time of the patient, as in high blood pressure or diabetes. Fast dissolving tablets are also called as mouth-dissolving tablets, melt-in mouth tablets, oral dispersible tablets, rap melts, porous tablets, quick dissolving tablet. Fast dissolving tablets dissolve in the oral cavity without water. Most fast dissolving tablets have substances to mask the bitter taste of the active ingredient. [3]

Oseltamivir is administered orally, it is an antiviral drug for the management of influenza A and B infections in children >1 year and adults of all ages. [4] Standard dose of oseltamivir in adult's is 75 mg, while children have unit doses that are selected on the basis of body weight. Oral capsule (35, 40 and 75 mg) and suspension formulations are currently promptly on the market. As fast dissolving tablets can hold the dose up to the 500 mg we can suitably administer 75 mg of dose. The mouth disintegrating tablet of oseltamivir will disintegrate rapidly in the patient mouth without need of water or chewing and released its drug contents instantaneously. So this dosage form is more comfortable for paediatric, geriatric patient. [4-5]

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Solid dispersion of oseltamivir was prepared with PVP K30 in different drug: carrier ratio using solvent evaporation methods. The optimized solid dispersion (drug: PVP K30, 1:0.5 ratio) were further used to prepare fast dissolving tablet by direct compression method using superdisintegrants such as crospovidone and xanthan gum. Infrared spectroscopy and differential scanning calorimetry were performed to identify the physicochemical interaction between drug and optimized formulation. [6-7]

Advantages of Fast Dissolving Tablet: [3]

1. Improved compliance/added convenience
2. No water needed
3. No chewing needed
4. Better taste
5. Suitable for controlled as well as fast release actives
6. Ability to produce benefits of liquid medication within the style of solid preparation.
7. Allows high drug loading.
8. Adaptable and amenable to existing processing and packaging machinery
9. Cost-effective.

MATERIALS AND METHODS

Oseltamivir were received from Zydus Cadila Ltd, Ahmedabad. PVP k-30, Crospovidone, Manitol, Magnesium stearate, Talc was received from Shri Sai Chemical, Solapur.

Calibration Curve of Oseltamivir

Accurately weighed 10 mg of drug was transferred to 10 ml volumetric flask and dissolved in methanol, this was considered as stock solution. From stock solution 0.1 ml, 0.2 ml, 0.3 ml, 0.4 ml, 0.5 ml, were taken and was make up the volume to 10ml with methanol to get respective concentrations of (10, 20, 30, 40 and 50) µg/ml. Prepared samples were analyzed by using ultraviolet double beam spectrophotometer at λmax 218 nm.

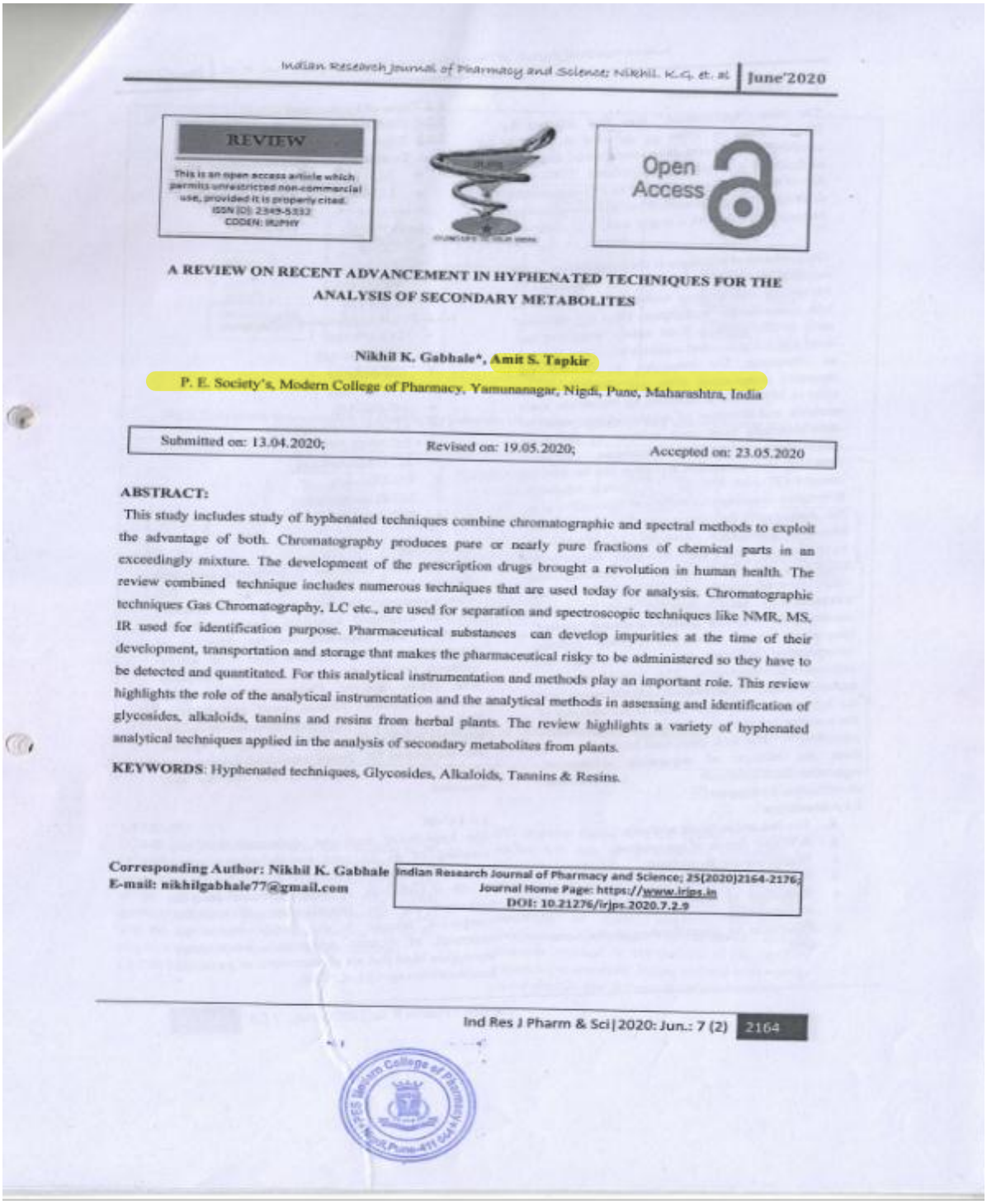
Preparation of Oseltamivir Fast Dissolving Tablet

1. Step-1: Solid Dispersion Technique-Solvent Evaporation Method

The solid dispersions of oseltamivir were prepared by dissolving the mixture of oseltamivir and the PVP K 30 at

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A Review on Recent Advancement In Hyphenated Techniques For The Analysis Of Secondary Metabolites



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REVIEW

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A REVIEW ON RECENT ADVANCEMENT IN HYPHENATED TECHNIQUES FOR THE ANALYSIS OF SECONDARY METABOLITES

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ABSTRACT:

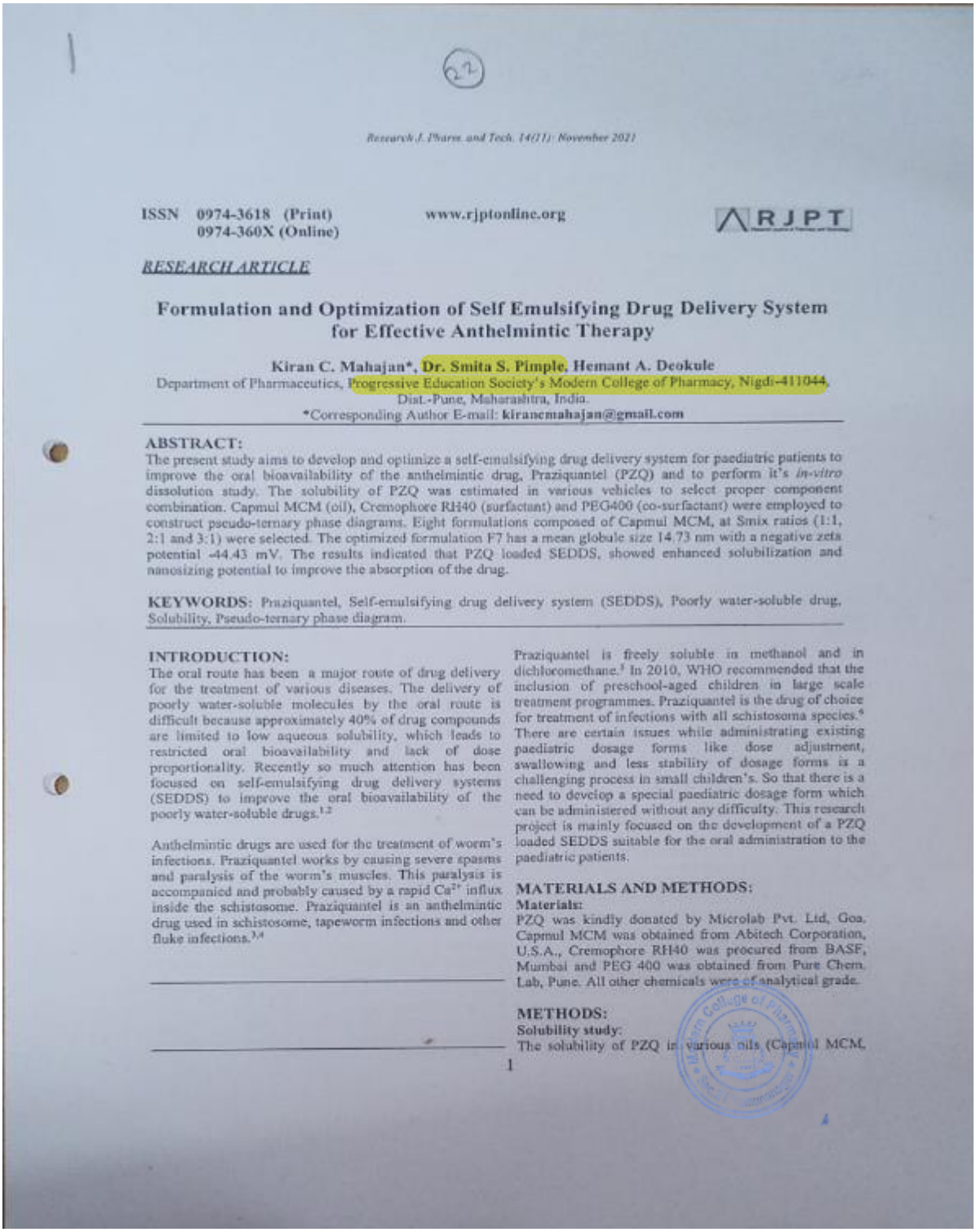
This study includes study of hyphenated techniques combine chromatographic and spectral methods to exploit the advantage of both. Chromatography produces pure or nearly pure fractions of chemical parts in an exceedingly mixture. The development of the prescription drugs brought a revolution in human health. The review combined technique includes numerous techniques that are used today for analysis. Chromatographic techniques Gas Chromatography, LC etc., are used for separation and spectroscopic techniques like NMR, MS, IR used for identification purpose. Pharmaceutical substances can develop impurities at the time of their development, transportation and storage that makes the pharmaceutical risky to be administered so they have to be detected and quantitated. For this analytical instrumentation and methods play an important role. This review highlights the role of the analytical instrumentation and the analytical methods in assessing and identification of glycosides, alkaloids, tannins and resins from herbal plants. The review highlights a variety of hyphenated analytical techniques applied in the analysis of secondary metabolites from plants.

KEYWORDS: Hyphenated techniques, Glycosides, Alkaloids, Tannins & Resins.

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Formulation and Optimization of Self Emulsifying Drug Delivery System For Effective Anthelmintic Therapy



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RESEARCH ARTICLE

Formulation and Optimization of Self Emulsifying Drug Delivery System for Effective Anthelmintic Therapy

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ABSTRACT:
The present study aims to develop and optimize a self-emulsifying drug delivery system for paediatric patients to improve the oral bioavailability of the anthelmintic drug, Praziquantel (PZQ) and to perform it's *in-vitro* dissolution study. The solubility of PZQ was estimated in various vehicles to select proper component combination. Capmul MCM (oil), Cremophore RH40 (surfactant) and PEG400 (co-surfactant) were employed to construct pseudo-ternary phase diagrams. Eight formulations composed of Capmul MCM, at Smix ratios (1:1, 2:1 and 3:1) were selected. The optimized formulation F7 has a mean globule size 14.73 nm with a negative zeta potential -44.43 mV. The results indicated that PZQ loaded SEDDS, showed enhanced solubilization and nanosizing potential to improve the absorption of the drug.

KEYWORDS: Praziquantel, Self-emulsifying drug delivery system (SEDDS), Poorly water-soluble drug, Solubility, Pseudo-ternary phase diagram.

INTRODUCTION:

The oral route has been a major route of drug delivery for the treatment of various diseases. The delivery of poorly water-soluble molecules by the oral route is difficult because approximately 40% of drug compounds are limited to low aqueous solubility, which leads to restricted oral bioavailability and lack of dose proportionality. Recently so much attention has been focused on self-emulsifying drug delivery systems (SEDDS) to improve the oral bioavailability of the poorly water-soluble drugs.[1,2]

Anthelmintic drugs are used for the treatment of worm's infections. Praziquantel works by causing severe spasms and paralysis of the worm's muscles. This paralysis is accompanied and probably caused by a rapid Ca^{2+} influx inside the schistosome. Praziquantel is an anthelmintic drug used in schistosome, tapeworm infections and other fluke infections.[3,4]

Praziquantel is freely soluble in methanol and in dichloromethane.[5] In 2010, WHO recommended that the inclusion of preschool-aged children in large scale treatment programmes. Praziquantel is the drug of choice for treatment of infections with all schistosoma species.[6] There are certain issues while administrating existing paediatric dosage forms like dose adjustment, swallowing and less stability of dosage forms is a challenging process in small children's. So that there is a need to develop a special paediatric dosage form which can be administered without any difficulty. This research project is mainly focused on the development of a PZQ loaded SEDDS suitable for the oral administration to the paediatric patients.

MATERIALS AND METHODS:

Materials:
PZQ was kindly donated by Microlab Pvt. Ltd, Goa. Capmul MCM was obtained from Abitech Corporation, U.S.A., Cremophore RH40 was procured from BASF, Mumbai and PEG 400 was obtained from Pure Chem. Lab, Pune. All other chemicals were of analytical grade.

METHODS:
Solubility study:
The solubility of PZQ in various oils (Capmul MCM,

Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients

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Research Article

Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients

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Received: 12.01.21, Revised: 11.02.21, Accepted: 10.03.21

ABSTRACT
The objective of the present study was to prepare and evaluate solid self-emulsifying drug delivery system (S-SEDDS) containing Praziquantel, a poor water-soluble drug. The central composite design was employed to optimize the formulation variables, Capmul MCM (oil), Cremophore RH40 (surfactant) and PEG400 (co-surfactant). Liquid self-emulsifying drug delivery system was appraised for determination of self emulsifying time, globule size and drug release. TEM study confirmed the uniform oil globules of the optimized liquid formulation. The optimized liquid formulation was formulated into free-flowing powder (S-SEDDS) by adsorption on the materials like Aerosil 200, Neusilin US2 and compressed into tablets. The solid state characterization of S-SEDDS powder was performed by using DSC, PXRD and SEM to investigate the physical nature of the drug. Further, the accelerated stability studies for 6 months revealed that S-SEDDS of Praziquantel was found to be stable without any significant change in physico-chemical properties. S-SEDDS of Praziquantel with improved dissolution profile was successfully prepared by using Neusilin US2 as an adsorbent carrier.

Keywords: Praziquantel (PZQ), Solid-self emulsifying drug delivery system (S-SEDDS), Solid-state characterization, Paediatric patients, Stability.

INTRODUCTION

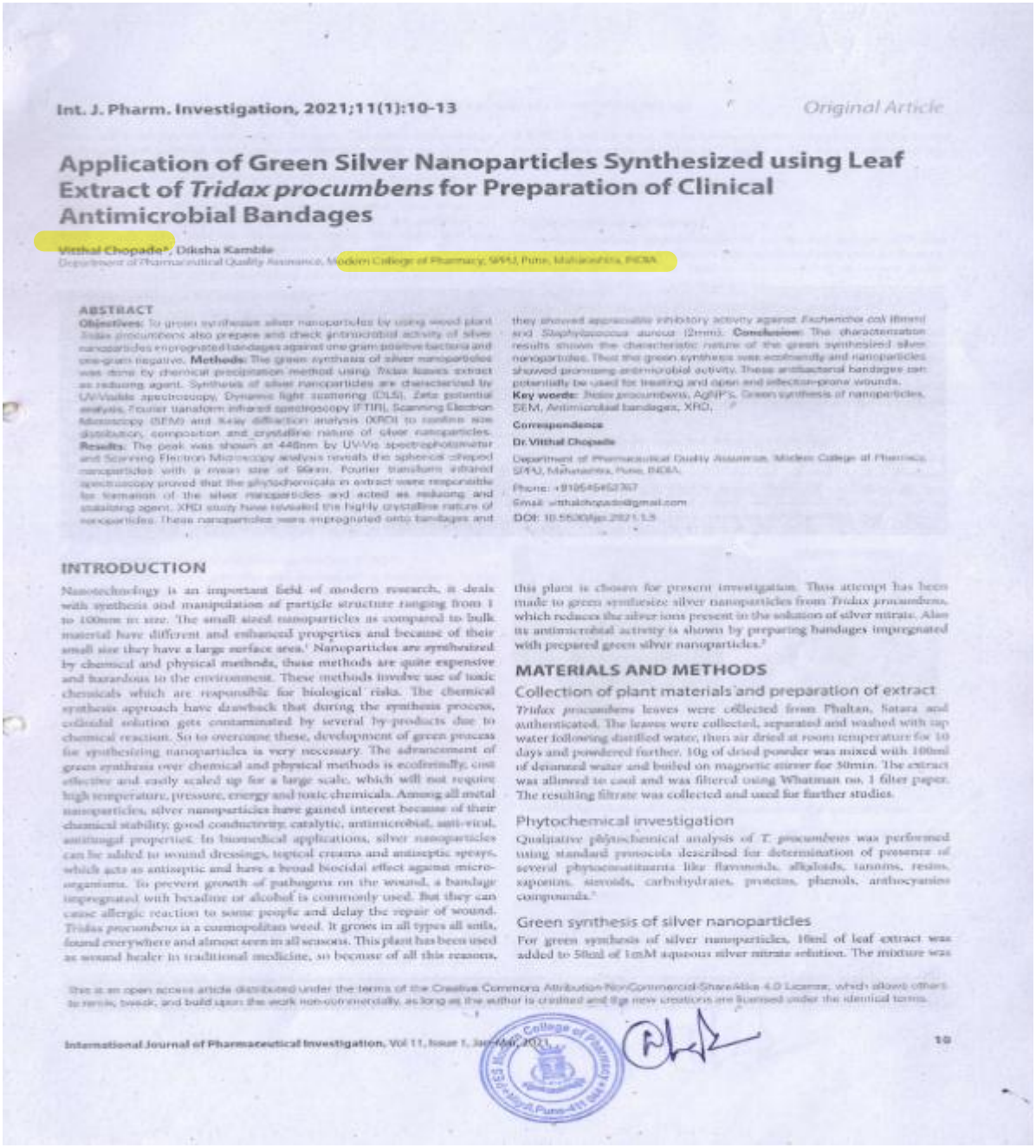
Most of the drugs at the market and New Chemical Entities (NCEs, approx. 75%) from the discovery pipeline are poorly water-soluble, it has never been so important for formulation scientists from academia and pharmaceutical industries to work on improving solubility. Nowadays, there are many challenges associated with formulating paediatric medicines for developing countries and the demand of paediatric medicine still remains at large. Praziquantel (PZQ), an anthelmintic drug used in various countries for the treatment of schistosome and liver fluke infection. It prevents newly hatched insect larvae (worms) from growing or multiplying in your body. Paediatric patients need different oral dosage forms than adults due to differences in swallowing capabilities, taste likings, and dosage requirement. Paediatric patients need new modified dosage forms to fulfill recommended dosing treatments due to age differences when compared to another age group. However, adsorption onto solid carriers such as using MCC grade material is a very recent approach and a limited number of works has been done till now. After the conversion of liquid SEDDS into solids, free flowing powders have flexibility (ease of processing) in designing and developing solid dosage forms (easy to encapsulate the powder) as well as the reduction of intra- and inter-subject variability of drug dissolution profiles, thus lead to improvements in drug safety and efficacy. Bitter drugs are really very difficult for patient to take in oral dosage form, especially by paediatric patients. So, new Doshion Pharma grade polymer, designed specifically mask the taste of drug was used in the formulation of tablet. This research project is mainly focused on the development of a flexible dosage form suitable for oral administration of PZQ to children.[1,2,3]

MATERIALS AND METHODS

Materials: Praziquantel was kindly donated by Microlab Pvt. Ltd, Goa. Capmul MCM was obtained from Abitech Corporation, U.S.A., Cremophore RH40 was procured from BASF, Mumbai, PEG 400 was obtained from Pure Chem. Lab, Pune, Aerosil 200 was obtained from Oxford Laboratory Reagent, Mumbai and Neusilin US2 was obtained from Fuji Chemical Industry Co. Ltd., Japan. All other chemicals were of analytical grade.

Methods: Solubility study: The solubility of PZQ in various oils (Capmul MCM, Capryol 90, Oleic

Application of Green Silver Nanoparticles Synthesized using Leaf Extract of Tridax procumbens for Preparation of Clinical Antimicrobial Bandages



Int. J. Pharm. Investigation, 2021;11(1):10-13

Original Article

Application of Green Silver Nanoparticles Synthesized using Leaf Extract of *Tridax procumbens* for Preparation of Clinical Antimicrobial Bandages

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ABSTRACT

Objectives: To green synthesize silver nanoparticles by using weed plant *Tridax procumbens* also prepare and check antimicrobial activity of silver nanoparticles impregnated bandages against one gram positive bacteria and one gram negative. **Methods:** The green synthesis of silver nanoparticles was done by chemical precipitation method using *Tridax* leaves extract as reducing agent. Synthesis of silver nanoparticles are characterized by UV-Visible spectroscopy, Dynamic light scattering (DLS), Zeta potential analysis, Fourier transform infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM) and X-ray diffraction analysis (XRD) to confirm size distribution, composition and crystalline nature of silver nanoparticles. **Results:** The peak was shown at 448nm by UV-Vis spectrophotometer and Scanning Electron Microscopy analysis reveals the spherical shaped nanoparticles with a mean size of 56nm. Fourier transform infrared spectroscopy proved that the phytochemicals in extract were responsible for formation of the silver nanoparticles and acted as reducing and stabilizing agent. XRD study have revealed the highly crystalline nature of nanoparticles. These nanoparticles were impregnated onto bandages and they showed appreciable inhibitory activity against *Escherichia coli* (8mm) and *Staphylococcus aureus* (12mm). **Conclusion:** The characterization results shown the characteristic nature of the green synthesized silver nanoparticles. Thus the green synthesis was ecofriendly and nanoparticles showed promising antimicrobial activity. These antibacterial bandages can potentially be used for treating and open and infection-prone wounds.

Key words: *Tridax procumbens*, AgNP's, Green synthesis of nanoparticles, SEM, Antimicrobial bandages, XRD.

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INTRODUCTION

Nanotechnology is an important field of modern research, it deals with synthesis and manipulation of particle structure ranging from 1 to 100nm in size. The small sized nanoparticles as compared to bulk material have different and enhanced properties and because of their small size they have a large surface area.[1] Nanoparticles are synthesized by chemical and physical methods, these methods are quite expensive and hazardous to the environment. These methods involve use of toxic chemicals which are responsible for biological risks. The chemical synthesis approach have drawback that during the synthesis process, colloidal solution gets contaminated by several by-products due to chemical reaction. So to overcome these, development of green process for synthesizing nanoparticles is very necessary. The advancement of green synthesis over chemical and physical methods is ecofriendly, cost effective and easily scaled up for a large scale, which will not require high temperature, pressure, energy and toxic chemicals. Among all metal nanoparticles, silver nanoparticles have gained interest because of their chemical stability, good conductivity, catalytic, antimicrobial, anti-viral, antifungal properties. In biomedical applications, silver nanoparticles can be added to wound dressings, topical creams and antiseptic sprays, which acts as antiseptic and have a broad biocidal effect against micro-organisms. To prevent growth of pathogens on the wound, a bandage impregnated with betadine or alcohol is commonly used. But they can cause allergic reaction to some people and delay the repair of wound. *Tridax procumbens* is a cosmopolitan weed. It grows in all types all soils, found everywhere and almost seen in all seasons. This plant has been used as wound healer in traditional medicine, so because of all this reasons, this plant is chosen for present investigation. This attempt has been made to green synthesize silver nanoparticles from *Tridax procumbens*, which reduces the silver ions present in the solution of silver nitrate. Also its antimicrobial activity is shown by preparing bandages impregnated with prepared green silver nanoparticles.[2]

MATERIALS AND METHODS

Collection of plant materials and preparation of extract

Tridax procumbens leaves were collected from Phaltan, Satara and authenticated. The leaves were collected, separated and washed with tap water following distilled water, then air dried at room temperature for 10 days and powdered further. 10g of dried powder was mixed with 100ml of deionized water and boiled on magnetic stirrer for 30min. The extract was allowed to cool and was filtered using Whatman no. 1 filter paper. The resulting filtrate was collected and used for further studies.

Phytochemical investigation

Qualitative phytochemical analysis of *T. procumbens* was performed using standard protocols described for determination of presence of several phytoconstituents like flavonoids, alkaloids, tannins, resins, saponins, steroids, carbohydrates, proteins, phenols, anthocyanins compounds.[3]

Green synthesis of silver nanoparticles

For green synthesis of silver nanoparticles, 10ml of leaf extract was added to 50ml of 1mM aqueous silver nitrate solution. The mixture was

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Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques

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RESEARCH ARTICLE

Fabrication and Evaluation of Solid Self Emulsifying Drug Delivery System of Dolutegravir sodium by using Adsorption to Solid Carrier Techniques

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ABSTRACT:
The objective of this work was to design and characterize liquid and solid self-emulsifying drug delivery systems (SEDDS) for poorly soluble Dolutegravir Sodium. To optimize the composition of liquid Dolutegravir Sodium-SEDDS, solubility tests, pseudoternary phase diagrams, emulsification studies and other in vitro examinations (thermodynamic stability, droplet size and zeta potential analysis) were performed. The central composite design was employed to optimize the formulation variables, Capmul MCM (oil), Tween 80 (surfactant) and Propylene glycol (co-surfactant). Liquid self-emulsifying drug delivery system was appraised for determination of self emulsifying time, globule size and drug release. TEM study confirmed the uniform oil globules of the optimized liquid formulation. The optimized liquid formulation was formulated into free-flowing powder (S-SEDDS) by adsorption on the materials like Aerosil 200, Neusilin US2 and compressed into tablets. The solid state characterization of S-SEDDS powder was performed by using DSC, PXRD and SEM to investigate the physical nature of the drug. Further, the accelerated stability studies for 6 months revealed that S-SEDDS of Dolutegravir Sodium was found to be stable without any significant change in physico-chemical properties. S-SEDDS of Dolutegravir Sodium with improved dissolution profile was successfully prepared by using Neusilin US2 as an adsorbent carrier as compared to marketed sample.

KEYWORDS: Dolutegravir Sodium (DLT), Solid-self emulsifying drug delivery system (S-SEDDS), Solid-state characterization, Pediatric and Geriatric patients, Taste Masking Agent.

INTRODUCTION:

The majority of new drugs exhibit poor aqueous solubility, which affects their low bioavailability after oral delivery. Many strategies have been described to increase the dissolution rate of drugs by reducing their particle size and salt formation, using surfactants, cyclodextrins, liposomes or nanoparticles[1-4]. A relatively new approach for poorly soluble drugs is lipid-based formulations, particularly self-emulsifying drug delivery systems (SEDDS)[5,6].

SEDDS are isotropic mixtures of oils and surfactants with or without co-surfactants, which act as lipid-based formulations after oral application in aqueous gastrointestinal fluid and upon gentle agitation can form an oil-in-water emulsion[7-10].

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SEDDS technology was employed to increase solubility and consequently the bioavailability of many poorly water soluble drugs such as phyllanthin, celastrol, ketoprofen, indomethacin and hydrocortisone[11-14]. SEDDS as liquid formulations have several disadvantages such as low drug loading capacity, drug leakage, low stability, and few choices of dosage forms. To overcome these limitations, liquid SEDDS (L-SEDDS) can be transformed to solid dosage forms by using different methods (filling capsules with liquid or semi-solid SEDDS, adsorption to solid carrier, melt granulation, spray drying, melt extrusion or nanoparticle formation)[15,16]. Solid self-emulsifying drug delivery systems (S-SEDDS) combine the advantages of liquid lipid formulations with those of solid dosage forms such as higher stability and longer period of storage[17,18]. S-SEDDS could be formulated in the form of self-emulsifying capsules, pellets/tablets, micro/nano-particles, suppositories or dry emulsions.

Most of the drugs at the market and New Chemical Entities (NCEs, approx. 75%) from the discovery

Systematic Development of Design of Expert Optimized Self_Micro Emulsifying Drug Delivery System of Silymarin

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Systematic Development of Design of Expert Optimized Self_Micro Emulsifying Drug Delivery System of Silymarin

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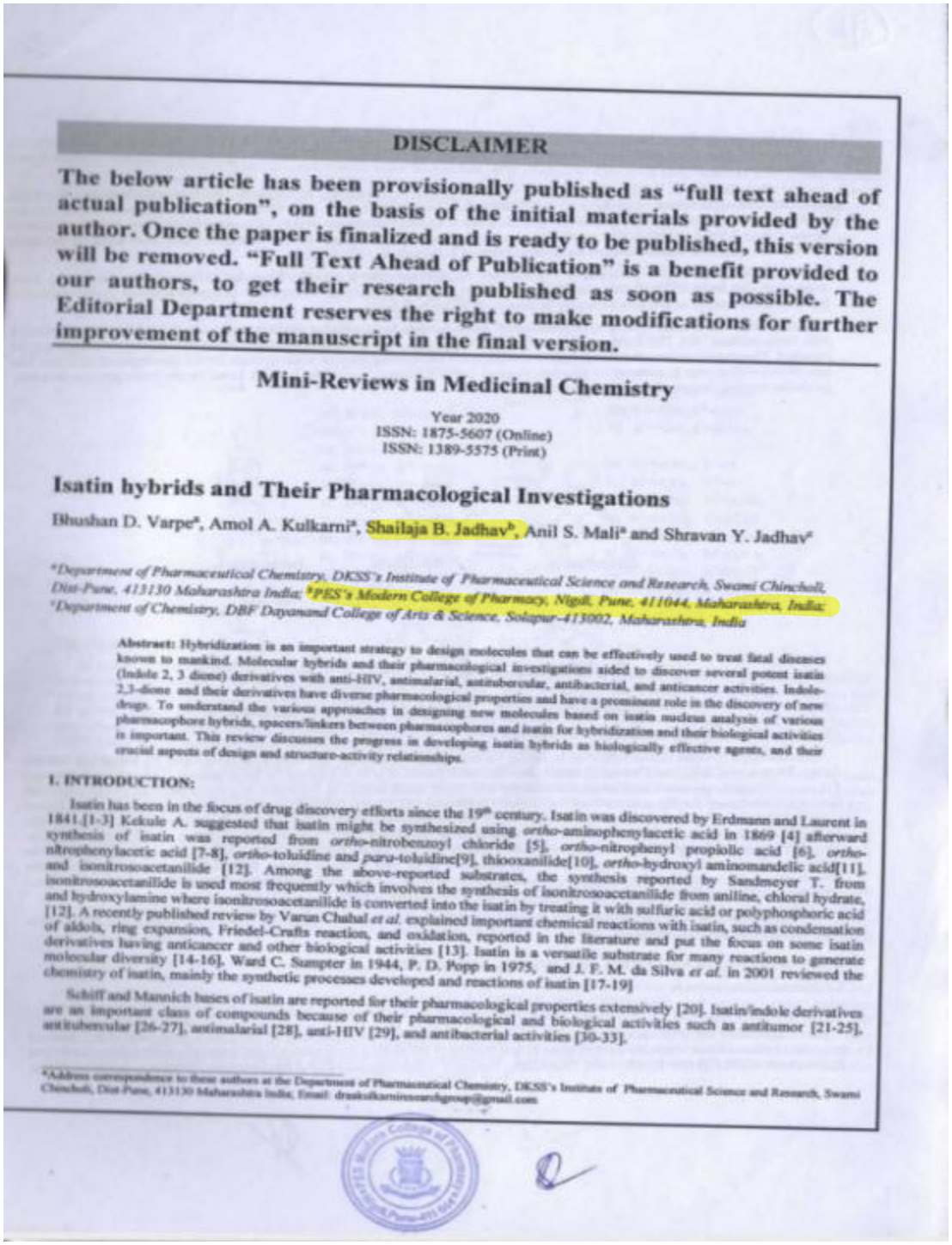
Vitthal Chopade Departmentof Pharmaceutical Chemistry, P. E. Society's Modern College of Pharmacy, Pune, India.

Abstract:
Background: To create and streamline the novel self-microemulsifying drug delivery system (SMEDDS) detailing for improved water solubility of Silymarin (SIL) utilizing the Box–Behnken design (BBD).
Materials and Methods: SIL-SMEDDS detailing comprised the blend of oil (Caproyl 90), surfactant (Kolliphor RH 40), and co-surfactant (PEG 400), SIL. A three-level BBD was connected to investigate the fundamental impact, collaboration impact and quadratic impact of three autonomous factors, including the measure of Caproyl 90 (A), Kolliphor RH 40 (B) and PEG 400 (C).
Results: Decided conditions were 890 < A < 940, 538 < B < 608 and 350 < C < 390. The action factors were Droplet size (Y1), Polydispersity index (Y2), % Transmittance (Y3) and % Dissolution rate of SIL at 45 min (Y4). The enhanced conditions were 905.39, 546.32 and 371.15 (mg) for A, B and C, separately, and the reaction factors were anticipated to be (148.38 nm), (0.340), (94.51%) and (96.18%) for Y1, Y2, Y3, and Y4 individually. Optimized formulation was changed over into S-SMEDDS by utilizing Neusilin US2 as an adsorbent in the proportion of 2:1. The S-SMEDDS was described by SEM, DSC, XRD, Globule size (175.4 nm), zeta-potential (-34.6 mV), % transmission examined (98.57 %), in vitro release (96.50 %) at 45 min.
Conclusion: The enhanced S-SMEDDS definition demonstrated quicker drug release properties when contrasted with the customary case of Silymarin.
Keywords: Silymarin, % Drug release rate, Box-Behnken design, L-SMEDDS, S-SMEDD.

Introduction:
Oral route of administration is the basic utilized and acknowledged route of drug conveyance for treatment of numerous illnesses. The new drug found molecules that achieve detailing researchers have least water solubility and dissolution properties, and oral conveyance of such drugs have low bioavailability [1]. Because of the need of solubility and dissolution rate on bioavailability, different plan procedures for improving the Active Pharmaceutical Ingredient (API) dissolvability as well as dissolution rate are researched to be specific utilization of surfactants, lipids, permeation enhancers, micronization, salt formation, cyclodextrins, nano-sized particles and solid dispersions[2]. In recent years, much consideration has concentrated on lipid-based formulations to improve the oral bioavailability of ineffectively water dissolvable drug mixes. The accessibility of the drug for ingestion can be upgraded by introduction of the drug as a solubilize inside a colloidal dispersion [3].Lipid based delivery[4] includes oil solution[5], suspension[6,7], emulsion[8,9,10], solid dispersion[11], self-microemulsifying drug delivery system [12,13,14] and liposomes [15, 16, 17]. Presently a-days, the most well-known methodology are their consolidation into self-emulsifying drug delivery system (SEDDS) with specific accentuation on self-micro emulsifying drug delivery system (SMEDDS) [18]. SMEDDS are isotropic homogenous blends of an active compound in a mix of characteristic or engineered lipids, surfactants and co-surfactant. These anhydrous fluid blends are generally named pre-concentrates. Upon delicate agitation in a fluid stage, for example, upper Gastrointestinal (GI) lumen content, these preconcentrates immediately form drug encapsulated oil/water (O/W) micro scale emulsions with a molecule distance across of 200 nm or less. In spite of emulsions and suspensions, SMEDDS are profoundly thermodynamically stable formulations [19]. SMEDDS can be filled into soft/hard gelatin capsules or hydroxyl propyl methyl cellulose (HPMC) capsules, which results in attractive business reasonability and patientcompliance. A key factor is that the volume can be limited to 1 g of formed fluid that soft gelatin container can contain [20]. In this investigation, we created liquid SMEDDS with the point of improving the solubility of Silymarin; a Biopharmaceutics Classification System (BCS) class II drug, profoundly lipophilic (log P 4.3, aqueous solubility 0.400 mg/ml at 25 °C). Silymarin is a hepatoprotective drug which is utilized in the treatment of liver diseases.

Materials and methods
Materials

Isatin hybrids and their pharmacological investigations



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Isatin hybrids and Their Pharmacological Investigations

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Abstract: Hybridization is an important strategy to design molecules that can be effectively used to treat fatal diseases known to mankind. Molecular hybrids and their pharmacological investigations aided to discover several potent isatin (Indole 2, 3 dione) derivatives with anti-HIV, antimalarial, antituberculer, antibacterial, and anticancer activities. Indole-2,3-dione and their derivatives have diverse pharmacological properties and have a prominent role in the discovery of new drugs. To understand the various approaches in designing new molecules based on isatin nucleus analysis of various pharmacophore hybrids, spacers/linkers between pharmacophores and isatin for hybridization and their biological activities is important. This review discusses the progress in developing isatin hybrids as biologically effective agents, and their crucial aspects of design and structure-activity relationships.

1. INTRODUCTION:

Isatin has been in the focus of drug discovery efforts since the 19th century. Isatin was discovered by Erdmann and Laurent in 1841.[1-3] Kekule A. suggested that isatin might be synthesized using *ortho*-aminophenylacetic acid in 1869 [4] afterward synthesis of isatin was reported from *ortho*-nitrobenzoyl chloride [5], *ortho*-nitrophenyl propiolic acid [6], *ortho*-nitrophenylacetic acid [7-8], *ortho*-toluidine and *para*-toluidine[9], thiooxanilide[10], *ortho*-hydroxyl aminomandelic acid[11], and isonitrosoacetanilide [12]. Among the above-reported substrates, the synthesis reported by Sandmeyer T. from isonitrosoacetanilide is used most frequently which involves the synthesis of isonitrosoacetanilide from aniline, chloral hydrate, and hydroxylamine where isonitrosoacetanilide is converted into the isatin by treating it with sulfuric acid or polyphosphoric acid [12]. A recently published review by Varun Chahal *et al.* explained important chemical reactions with isatin, such as condensation of aldols, ring expansion, Friedel-Crafts reaction, and oxidation, reported in the literature and put the focus on some isatin derivatives having anticancer and other biological activities [13]. Isatin is a versatile substrate for many reactions to generate molecular diversity [14-16]. Ward C. Sumpter in 1944, P. D. Popp in 1975, and J. F. M. da Silva *et al.* in 2001 reviewed the chemistry of isatin, mainly the synthetic processes developed and reactions of isatin [17-19]

Schiff and Mannich bases of isatin are reported for their pharmacological properties extensively [20]. Isatin/indole derivatives are an important class of compounds because of their pharmacological and biological activities such as antitumor [21-25], antituberculer [26-27], antimalarial [28], anti-HIV [29], and antibacterial activities [30-33].

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Evaluation of In-Vitro Anthelmintic Potential of Umbelliferone Against Pheretima Posthuma

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EVALUATION OF IN-*VITRO* ANTHELMINTIC POTENTIAL OF UMBELLIFERONE AGAINST *PHERETIMA POSTHUMA*

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Keywords:

Anthelmintic activity, *Pheretima Posthuma*, Umbelliferone

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ABSTRACT: Objective: The present study was aimed to evaluate the *in-vitro* anthelmintic potential of isolated phytoconstituent umbelliferone against *Pheretima Posthuma* (Indian earthworm). **Methods:** Three different concentrations (10, 20, 30 mg/ml in Dimethyl sulfoxide (DMSO) of umbelliferone were prepared, and six worms of similar type were placed in it. Observations were made for the time taken for paralysis and death of the individual worm. Meantime required for the paralysis (P) in min was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; death time (D) in min was recorded after confirmation with lack of movement when shaken vigorously/ dipped in warm water (50 °C). Piperazine citrate (10 mg/ml) was used as a reference standard. **Results:** Umbelliferone demonstrated paralysis as well as the death of worms, especially at a higher concentration of 30 mg/ml in a shorter time as compared to reference drug Piperazine citrate. **Conclusion:** In the present study, Umbelliferone was tested for its anthelmintic activity against *Pheretima posthuma*. Various concentrations were used in the bioassay, which involved paralysis and death time of the worms. The phytoconstituent showed significant anthelmintic activity.

INTRODUCTION: Helminthiasis, also regarded as a worm infection, is a macro-parasitic disease infecting humans as well as other animals. Helminthiasis is one of the most prevalent diseases in the world, particularly in the areas of poor sanitary control as well as in tropical countries. Also, the main cause of the infection in the developing countries is the lack of adequate sanitary facilities [1]. Anthelmintics or anti-helminthics are regarded as a group of antiparasitic drugs that basically have a mechanism of expelling parasitic worms and other internal parasites from the body by either stunning or killing them without the involvement of the host. They can also be regarded as vermicides (those that kill) or vermifuges (those that stun). Anthelmintics are used for the treatment of helminthiasis as well as infected animals [2]. Resistance development became the most prevalent problem with the use of these categories of chemotherapeutic agents; therefore, there is a major problem in the treatment of helminthiasis.

There are several polyherbal formulations in the treatment of helminth infection [3]. Moreover, these categories of drugs are not cost-effective. So, patient acceptability becomes another issue in the consumption of these drugs as a remedy. Taking into consideration the above-mentioned limitations, herbal remedies can be used as safe and effective alternative remedies. Coumarin (1, 2-Benzopyrone or 2H-1-benzopyran-2-one, or phenylpropanoids) and its derivatives are proven to exhibit useful and diverse biological activities [4, 5]. The compound coumarin occurs as secondary metabolites in the various parts of plants as seeds, roots, and leaves of

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Development and evaluation of Cinnarizine loaded nanosponges: pharmacodynamic and pharmacokinetic study on wistar rats

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Research Article

Development and Evaluation of Cinnarizine Loaded Nanosponges: Pharmacodynamic and Pharmacokinetic Study on Wistar Rats

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ABSTRACT

The purpose of this study research was to improve bioavailability of Cinnarizine, a poorly water-soluble drug. The objective of this study is to formulate and evaluate Cinnarizine loaded nanosponges to increases the bioavailability of cinnarizine. Cinnarizine loaded nanosponges were prepared by quasi emulsion solvent diffusion method. The drug loaded nanosponge was characterized by FTIR, DSC, PXRD and SEM. Cinnarizine was loaded by using Eudragit RS 100, cold polyvinyl alcohol, dichloromethane, and distilled water. The prepared nanosponges were formulated and evaluated for powder properties, Pharmacodynamic and pharmacokinetic studies. Cinnarizine loaded nanosponges were white in color and odorless. FTIR study of formulation has shown that there were no interactions between drug and other excipients. X-ray diffraction (XRD) study of formulation confirmed amorphous nature of cinnarizine. For optimized batch (F5), percent yield (60.89±0.18%), entrapment efficiency (70.85±0.41%), particle size (492.33nm), Polydispersity index (0.08103±0.04), zeta potential (5.67mV), drug content (82.88 ±0.88%). Stability study of nanosponge was carried out as per ICH guidelines. The results of in vivo studies showed 1.4 times increases in bioavailability of Cinnarizine by nanosponges as compared to pure Cinnarizine powder. It was possible to prepare nanosponges of Cinnarizine by using quasi emulsion solvent diffusion method to obtain the best possible formulation.

Keywords: Eudragit RS 100, polyvinyl alcohol, Cinnarizine, nanosponges, Quassi emulsion solvent diffusion.

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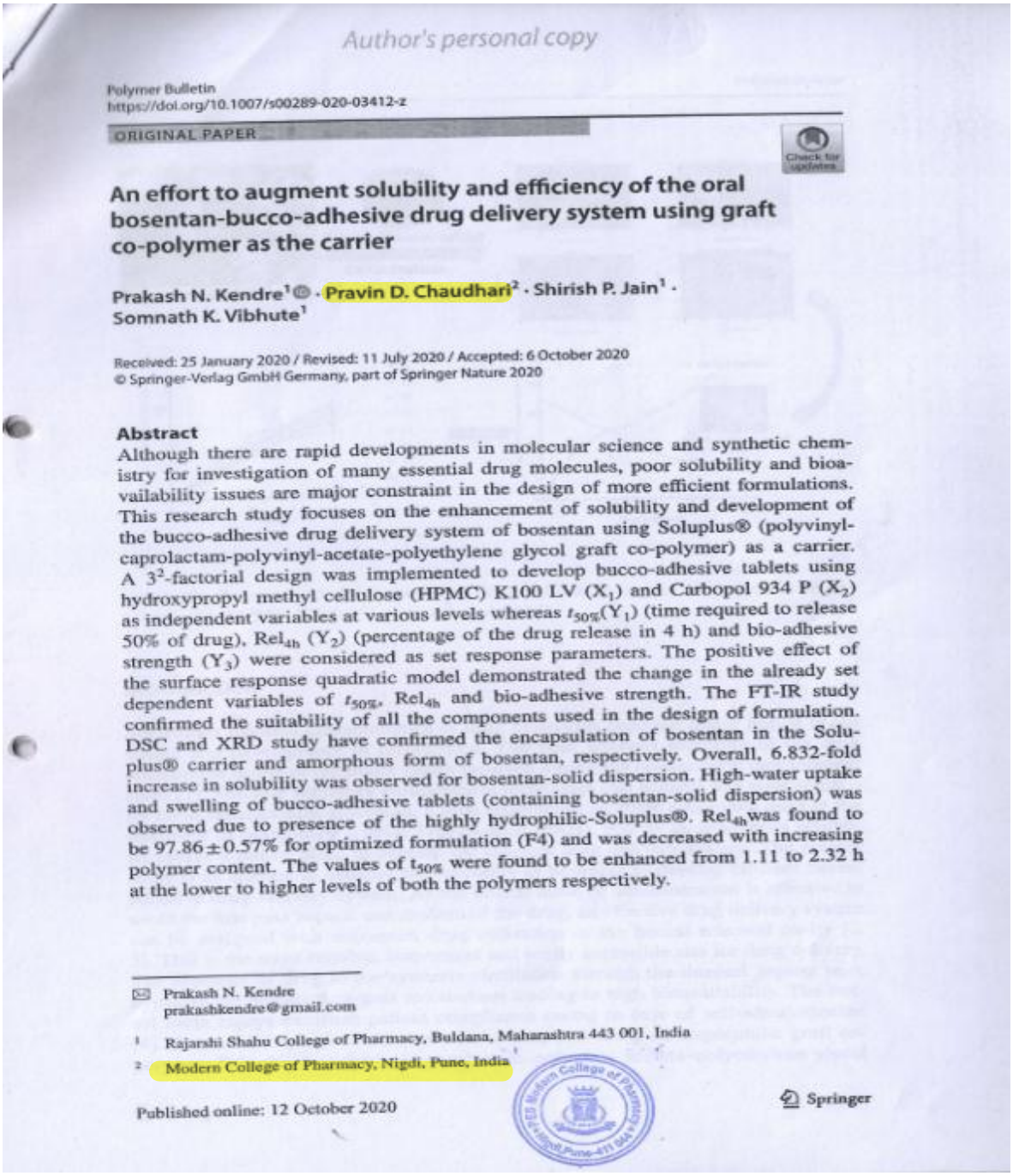
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INTRODUCTION

Low aqueous solubility of drug has always presented major obstacle towards the development of drug delivery systems which often compromises patient compliance. Oral route is thought to be common and easy for drug administration. On oral administration of drug in its dosage form, it is expected to dissolve and release the drug into the gastrointestinal fluid before the absorption. Poor solubility may limit the dissolution of drug in gastrointestinal tract resulting to low bioavailability that can pharmacologically affect the therapeutic efficacy of drug. [1] The drugs belonging to BCS class II particularly fall in this category and have been extensively researched molecular optimization and development of novel efficacious dosage forms. Cinnarizine, (E)-1-(diphenylmethyl)-4-(3-phenylprop-2-enyl) piperazine, having molecular formula $C_{26}H_{28}N_2$ and molecular weight 368.51 g/mol, is white or almost white powder. It is originally obtained from wood-reed roots (*Cinna*). It is a weak base with poor aqueous solubility. [2] Nanosponges are porous polymeric delivery systems that are small spherical particles with large porous surface. A sponge that has nano size holes, especially one used for bio-mimetic detoxification. The sponge acts as a three-dimensional network or scaffold, which consist of the backbone known as long-length polyester. [3] Oral drug delivery has long been a problem for medical researchers how to get them to the right place in the body and how to control the release of the drug to prevent overdose. The development of new and complex molecules called nanosponges has the potential to solve these problems. Nanosponge is a novel and emerging technology which play a vital role in targeting drug delivery in a controlled manner. A wide variety of drugs can be loaded into nanosponge for oral drug delivery. These particles are capable of carrying both lipophilic and hydrophilic substances and of improving the solubility of poor water soluble molecule like cinnarizine. Nanosponges are small size and porous nature they can bind poorly soluble drugs within their matrix and improve their bioavailability. Cinnarizine is more commonly prescribed for nausea and vomiting due to motion sickness. Cinnarizine used in chemotherapy, vertigo or Meniere's disease. It is given in lower dose 25 mg & 75 mg higher doses of Cinnarizine. It can be taken by adults and by children over 5 years of age. Cinnarizine is used to treat problems affecting the inner ear and balance such as dizziness and sickness. It is also helpful in preventing travel sickness. There is a need to minimize the dose, avoid repetition of dosing frequency and minimize the side effects. Thus, there is a need to increase the efficacy of Cinnarizine. Formulating vesicular carriers like

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An effort to augment solubility and efficiency of the oral bosentan-buccoadhesive drug delivery system using graft co-polymer as the carrier



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ORIGINAL PAPER

An effort to augment solubility and efficiency of the oral bosentan-bucco-adhesive drug delivery system using graft co-polymer as the carrier

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Abstract
Although there are rapid developments in molecular science and synthetic chemistry for investigation of many essential drug molecules, poor solubility and bioavailability issues are major constraint in the design of more efficient formulations. This research study focuses on the enhancement of solubility and development of the bucco-adhesive drug delivery system of bosentan using Soluplus® (polyvinyl-caprolactam-polyvinyl-acetate-polyethylene glycol graft co-polymer) as a carrier. A 3^2-factorial design was implemented to develop bucco-adhesive tablets using hydroxypropyl methyl cellulose (HPMC) K100 LV (X_1) and Carbopol 934 P (X_2) as independent variables at various levels whereas $t_{50\%}$(Y_1) (time required to release 50% of drug), Rel_{4h} (Y_2) (percentage of the drug release in 4 h) and bio-adhesive strength (Y_3) were considered as set response parameters. The positive effect of the surface response quadratic model demonstrated the change in the already set dependent variables of $t_{50\%}$, Rel_{4h} and bio-adhesive strength. The FT-IR study confirmed the suitability of all the components used in the design of formulation. DSC and XRD study have confirmed the encapsulation of bosentan in the Soluplus® carrier and amorphous form of bosentan, respectively. Overall, 6.832-fold increase in solubility was observed for bosentan-solid dispersion. High-water uptake and swelling of bucco-adhesive tablets (containing bosentan-solid dispersion) was observed due to presence of the highly hydrophilic-Soluplus®. $Rel_{4h}$was found to be 97.86 ± 0.57% for optimized formulation (F4) and was decreased with increasing polymer content. The values of $t_{50\%}$ were found to be enhanced from 1.11 to 2.32 h at the lower to higher levels of both the polymers respectively.

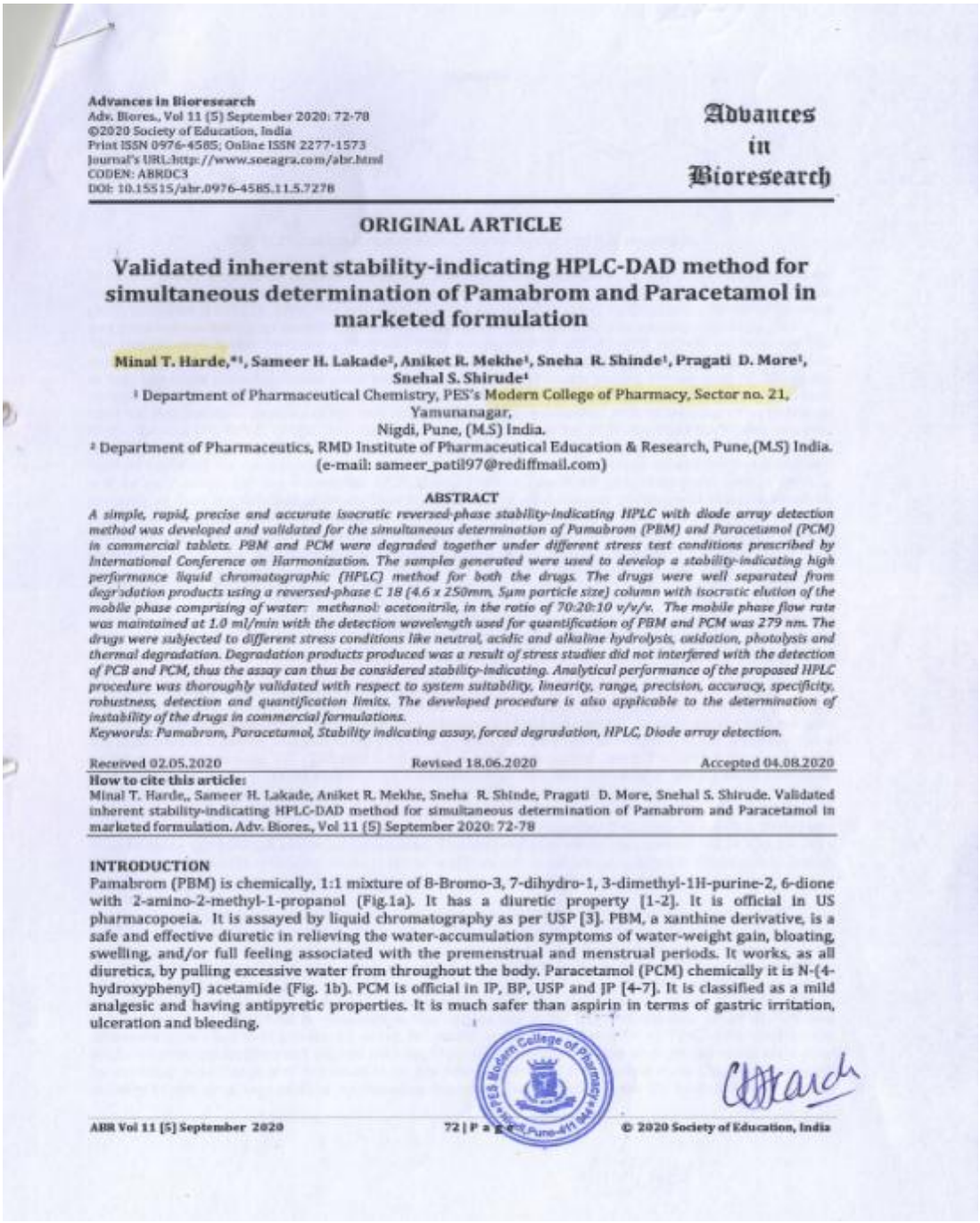
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Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Pamabrom and Paracetamol in marketed formulation



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Advances in Bioresearch

ORIGINAL ARTICLE

Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Pamabrom and Paracetamol in marketed formulation

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ABSTRACT

A simple, rapid, precise and accurate isocratic reversed-phase stability-indicating HPLC with diode array detection method was developed and validated for the simultaneous determination of Pamabrom (PBM) and Paracetamol (PCM) in commercial tablets. PBM and PCM were degraded together under different stress test conditions prescribed by International Conference on Harmonization. The samples generated were used to develop a stability-indicating high performance liquid chromatographic (HPLC) method for both the drugs. The drugs were well separated from degradation products using a reversed-phase C 18 (4.6 x 250mm, 5µm particle size) column with isocratic elution of the mobile phase comprising of water: methanol: acetonitrile, in the ratio of 70:20:10 v/v/v. The mobile phase flow rate was maintained at 1.0 ml/min with the detection wavelength used for quantification of PBM and PCM was 279 nm. The drugs were subjected to different stress conditions like neutral, acidic and alkaline hydrolysis, oxidation, photolysis and thermal degradation. Degradation products produced was a result of stress studies did not interfered with the detection of PCB and PCM, thus the assay can thus be considered stability-indicating. Analytical performance of the proposed HPLC procedure was thoroughly validated with respect to system suitability, linearity, range, precision, accuracy, specificity, robustness, detection and quantification limits. The developed procedure is also applicable to the determination of instability of the drugs in commercial formulations.

Keywords: Pamabrom, Paracetamol, Stability indicating assay, forced degradation, HPLC, Diode array detection.

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INTRODUCTION

Pamabrom (PBM) is chemically, 1:1 mixture of 8-Bromo-3, 7-dihydro-1, 3-dimethyl-1H-purine-2, 6-dione with 2-amino-2-methyl-1-propanol (Fig.1a). It has a diuretic property [1-2]. It is official in US pharmacopoeia. It is assayed by liquid chromatography as per USP [3]. PBM, a xanthine derivative, is a safe and effective diuretic in relieving the water-accumulation symptoms of water-weight gain, bloating, swelling, and/or full feeling associated with the premenstrual and menstrual periods. It works, as all diuretics, by pulling excessive water from throughout the body. Paracetamol (PCM) chemically it is N-(4-hydroxyphenyl) acetamide (Fig. 1b). PCM is official in IP, BP, USP and JP [4-7]. It is classified as a mild analgesic and having antipyretic properties. It is much safer than aspirin in terms of gastric irritation, ulceration and bleeding.

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Design and Development of Novel Controlled-Release Azilsartan Medoxomil Loaded Provesicular Powder

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ORIGINAL ARTICLE **OPEN ACCESS**

Design and Development of Novel Controlled-Release Azilsartan Medoxomil Loaded Provesicular Powder

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ABSTRACT

The present study involved Design and Development of novel controlled-release Azilsartan medoxomil loaded provesicular powder (Azil). The provesicular powder of Azilsartan Medoxomil was prepared with a carrier, Cholesterol, span 60 by rotary flask evaporation technique &was evaluated for various physicochemical properties such as solubility, drug entrapment efficiency, surface morphology and analysis were carried out using Fourier transform infrared spectroscopy, Differential scanning calorimetry and powder X-ray diffraction. Theoptimized Formulation batch F6 was selected based on 100% cumulative drug release in 9 hours& showed99.95% CDR in 9 hours while drug entrapment efficiency was 93.00%. The mechanism of the drug release rate kinetics of the Batch F6 followed the Korsmeyer-Peppas. Thus, it can be concluded that Span 60 based provesicular powder, enhanced the solubility 20 folds while Cholesterol and Maltodextrin proved an effective carrier for developing controlled release provesicular powder.

Keywords: *Azilsartan medoxomil, Span 60, Provesicular powder, Solubility.*

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INTRODUCTION

A number of novel drug delivery systems using colloidal particulate carriers had emerged, encompassing various routes of administration, to achieve controlled and targeted drug delivery. Colloidal particulate carriers such as liposomes [1] or niosomes [2] have distinct advantages over conventional dosage forms. Liposomes consist mainly of phospholipids, prepared from double-chain phospholipids (neutral or charged) [3]. Niosomes are analogous to liposomes and also serve as promising drug carriers [4]. Niosomes offer an alternative to phospholipid vesicles. The hydrated mixtures of cholesterol and non-ionic surfactants give rise to these lipid vesicles [5]. These carriers can act as drug reservoirs, and modification of their composition or surface can adjust the drug release rate and/or the affinity for the target site. As a drug carrier, encapsulating a sufficient amount of the drug is one of the most desirable properties for niosomes usage [6-7]. The uniqueness of these lipid vesicles relies on their ability to carry hydrophilic drugs by encapsulation and hydrophobic drugs by partitioning within their lipid domains [8]. Niosomes behave like liposomes in vivo as they are able to prolong the circulation of encapsulated drug altering its organ distribution and metabolic stability [9] or to increase the contact time of drug with the applied tissue in topical preparations [10]. Niosomes proved to be an alternate to liposomes because they pose less problems related to chemical stability and are low cost substitutes. However, niosome dispersions may exhibit physical instability problems during storage like vesicle aggregation, fusion, leaking, or hydrolysis of encapsulated drugs, which could affect the shelf life of the dispersion [11]. Pro-niosomes are liquid crystalline compact niosomal hybrid which could be converted into niosomes upon hydration with water. Niosomes are water-soluble carrier particles, and these are dried to form niosomal dispersion on brief agitation in hot aqueous media. This dehydrated product is pro-niosome. The

Prepartion and Evaluation of Sustained Release Herbal Matrix Tablet

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CHAPTER 1

Preparation and Evaluation of Sustained Release Herbal Matrix Tablet

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ABSTRACT

In the recent years focus on the development of the oral controlled release drug delivery system has been increasing. Oral administration is considered as the most comfortable, commonly used route of drug delivery. As far as sustained release systems are concerned, oral route of administration has received importance in concern with the research related to physiology along with its drug constraints. Sustained release formulations are developed to release drug at predetermined rate so that constant drug level for specific period of time is maintained and with less side effect. The *Cinnamomum tamala* leaves has been proved for its diuretic activity in the previous literature, hence this study has been carried out to formulate sustained release matrix tablet to prolong its action.

An influence of lyophilization on Praziquantel loaded nanosponge by using food protein as a stabillizer with effect of statistical optimization.

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RESEARCH ARTICLE

An Influence of Lyophilization on Praziquantel Loaded Nanosponge's by using food protein as a stabilizer with effect of Statistical Optimization

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ABSTRACT:

Nanosponges are tiny sponges with a size of a small virus, which can be filled with a wide variety of drugs and can circulate around the body until they stumble upon the specific target site and attach on the surface and begin to release the drug in a controlled and expected manner. Praziquantel is anthelmintic drug which is belong to biopharmaceutical class II drug. There was no interaction found between drug and excipients as revealed by an IR spectra and standard curve of the pure drug and placebo formulation. Nanosponge of different ratios were prepared by emulsion solvent diffusion method by using ethyl cellulose (X1) and PVA / whey protein was used as polymers, dichloromethane (DCM) (X2) as a solvent and Stirring speed (X3) maintained for different batches. These factors were selected as independent variables, while Drug loading, Particle size and cumulative drug release were selected as dependent variables. The whey protein is used as stabilizers. Furthermore, an optimal batch was selected from eight formulations by using 2^3factorial design and evaluated for bulk density, tapped density, angle of repose, compressibility Index, Carr's index, dissolution studies, Entrapment efficiency, production yield, compatibility studies, powder x-ray diffraction (P-XRD), Differential scanning colorimetric (DSC), particle size analysis etc. Hence, nanosponge formulation using a variety of polymers was found to be a good alternative approach for increasing the dissolution rate of Praziquantel.

KEYWORDS: Particle size, Micromeritics, Nuclear Magnetic Resonance, cumulative drug release, factorial design, anthalmintic.

INTRODUCTION:

Targeted drug delivery to definite sites is the major problem which is being faced by the researchers. The development of new colloidal carrier nanosponges has the prospective to solve these problems. Nanosponge is innovative and emerging technology which offers controlled drug delivery for topical use. Nanosponges play an important role in targeting drug delivery in a controlled manner. A wide variety of drugs can be loaded into nanosponge for targeting drug delivery. Both water soluble and insoluble that is lipophilic as well as hydrophilic drugs can be loaded into nanosponges [1-3].

Nanosponge drug delivery system has emerged as one of the most promising fields in life science. The development of nanosponges has become an important step toward overcoming these problems. These tiny sponges can circulate around the body till they meet the target site, stick on the surface and begins to release the drug in a controlled and anticipated way which is more efficient for given dosage. Nanosponges are smaller in size due to their small size and spongy nature they can bind poorly-soluble drugs inside their matrix and develop their bioavailability. They can be formulated for targeting drugs to specific site and prevent drug and protein degradation and prolong the drug release in a controlled manner[3].These nano-sized colloidal carriers have been recently proposed for drug delivery, since their application can solubilize poorly water-soluble drugs and endow with prolonged release, as well as

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A corollary of nanoporous carrier drug delivery system an updated prospective

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A Corollary of Nanoporous Carrier Drug Delivery System: An Updated Perspective

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ABSTRACT

Nanosponges have come into sight as one of the most promising fields of science because of their perceived applications in controlled drug delivery. It has been increasingly investigated to achieve targeted and sustained release of drugs. Nanosponges are one of the novel drug delivery system, which is gaining popularity now-a-days because of their perceived application in controlled and site-specific drug delivery. The fundamental appeal of the nanosponge technology arises from the difficulty experienced with conventional formulations in releasing active ingredients over an extended period of time, unpleasant odor, greasiness and skin irritation. They are tiny sponge-like spherical particles with a large porous surface and are believed to contribute towards reduced side effects, improved stability, increased elegance and enhanced formulation flexibility. The present investigation in the appraisal describes nanosponge technology embracing its method of preparation, characterization, *in-vitro* and *in-vivo* evaluation methods along with recent research and future potential.

KEYWORDS: Nanosponge; Controlled drug delivery; Polymers; Porosity; Cross linkers.

Introduction

Targeted drug delivery to explicit sites is the noteworthy setback that is being faced by the researchers. The development of new colloidal carrier nanosponges has the potential to solve these problems. Nanosponge is a novel and emerging technology, which offers controlled drug delivery for topical use. Nanosponges take part in a vital role in targeting drug delivery in a controlled mode. A wide variety of drugs can be loaded into nanosponge for targeting drug delivery. Both hydrophilic as well as lipophilic drugs can be encumbered into nanosponges (Patel et al., 2014; Mathew et al., 2014 and Subramanian et al., 2012). Nanosponges are integrated in specific dosage form, circulate around the body until they stumble upon the specific target site, unite to the surface, and start to discharge the drug in controllable and predictable manner (Tamkhane et al., 2014). Nanosponges are capable to encapsulate both hydrophilic and lipophilic drug substance (Ali et al., 2014). It is feasible to manage the size of nanosponges by varying the concentration of polymer to cross linkers. The particle size was examined 285nm using polymethylmethacrylate polymer, 370 nm by means of ethyl cellulose as polymer and 310nm using pluronic F-68 as polymer (Srinivas et al., 2013). Nanosponges are solid in character and can be prepared as oral, topical, parenteral dosage form (Patel et al., 2014). Complexing nanoparticles are nanoparticle that attracts the molecule by electrostatic charges and conjugating nanoparticles are the nanoparticles that link the drug through covalent bond (Bolmal et al., 2013; Subramanian et al., 2012). The innovation of nanosponges has turn out to be a significant pace toward overcoming these problems. Another important nature of these sponges is their aqueous solubility; this allows the use of these systems in point of fact for drugs with poor solubility. These petite sponges can circulate around the body until they stumble upon the target location and fuse on the surface and began to release the drug in a controlled and predictable manner, which is more

ABBREVIATIONS: β-CD: β Cyclodextrin; 3D: 3 Dimensional; DMF: Dimethyl Formamide; DMSO: Dimethyl Sulfoxide; PY: Production Yield; CDs: Cyclodextrins; CGT: Cyclodextrin-Glycosyltrans-Ferase; AGU: Anhydrous A-D-Glucopyranoside Units; α-CD: α-Cyclodextrin; γ-CD: γ-Cyclodextrin; HDI: Hexamethylene Diisocyanate; TDI: Toluene-2,4-Diisocyanate; DOC: Dissolved Organic Carbon; AAA: Aromatic Amino Acids; SDS: Sodium Dodecyl Sulphate; XRD: x-Ray Diffraction Pattern; UV: Ultra Violet; HPLC: High Performance Liquid Chromatography; SEM: Scanning Electron Microscopy; TEM: Transmission Electron Microscopy; AFM: Atomic Force Microscopy; DSC: Differential Scanning Calorimetry; TOC: Total Organic Carbon; CP: Carpodaxime Proxetil; EVA: Ethylene Vinyl Acetate; si RNA: Small Interfering Ribo Nucleic Acid; FNS: Functionalized Nanosponges; PVA: Poly Vinyl Alcohol; IV: Intra Venous.

PES's Modern College of Pharmacy (for Ladies) Nigdi, Pune-411 044

Anti inflammatory potential effect of flavonoid rich ethyl acetate fraction of methanolic extrcat of Stereospurmum sasuaveolens DC (Bignoniaceae)leaves in experimental animals

Anti-inflammatory potential effect of flavonoid rich ethyl acetate fraction of methanolic extracts of *Stereospermum suaveolens DC* (Bignoniaceae) leaves in experimental animals.

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ABSTRACT

Objective: To assess anti-inflammatory potential effect of flavonoid rich ethyl acetate fraction of methanolic extract of Stereospermum suaveolens DC (Bignoniaceae) leaves.

Method: The phytochemical investigation and TLC analysis was studied as per standard phytochemical method. The inflammation was induced in wistar rats by sub-plantar injection of 0.1 ml of 1 % solution of carrageenan. The flavonoid rich ethyl acetate fraction of methanolic extract of *Stereospermum suaveolens DC* (Bignoniaceae) leaves was treated at different doses of 125mg/kg, 250mg/kg and 500mg/kg (p.o.). The rat paw volume was measured at 1h, 2h, 3h, 4h, 5h using Digital plethysmometer (VJ instruments - VJDP-01). The percentage inhibition of paw edema was calculated.

Result: The phytochemical investigation revealed presence of flavonoid, saponins, alkaloids, carbohydrates and phenolic components.The TLC study shown confirmation of presence of flavonoid. The significant paw edema inhibition and percentage of inhibition obtained in a dose of 250mg/kg is high as compared to 125mg/kg and 500mg/kg dose fraction in experimental model of inflammation. **Conclusion:** From the present obtained study it was concluded that flavonoid rich ethyl acetate fraction of methanolic extract of *Sterospermum suaveolens DC* leaves has potential anti-inflammatory activity.

Key words: Anti-inflammatory activity, Ethyl acetate fraction, Carageenan induced paw edema, *Sterospermum suaveolens* DC

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Evaluation of Immunomodulatory activity of Abelmoschus manihiot Linn in various experimental animal model

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EVALUATION OF THE IMMUNOMODULATORY ACTIVITY OF ABELMOSCHUS MANIHOT LINN IN VARIOUS EXPERIMENTAL ANIMAL MODELS

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ABSTRACT

Purpose: The aim of the study was to evaluate the immunomodulatory activity of leaves extracts of *Abelmoschus manihot* (L.) Linn. (Family: Malvaceae) using various experimental animal models.

Methods: Aqueous and ethanolic leaves extract of *Abelmoschus manihot* L. was administered orally at the dosage levels of 200 mg/kg/day body weight in mice. Immunomodulatory activity was evaluated by heamagglutination antibody (HA) titre; delayed type hypersensitivity (DTH), neutrophil adhesion test, carbon clearance test and *E- coli* induced abdominal peritonitis on specific and non-specific immune response. Cyclophosphamide (100 mg/kg/day, p.o.) is used to induced immunosuppresion in mice and levamisole (50 mg/kg/day, p.o.) used as immunostimulating agents.

Results: Oral administration of aqueous and ethanolic leaves extract of *A. manihot* showed a significant increase in the production of circulating antibody titre in response to sheep red blood cells (SRBCs). A significant ($p<0.05$) increase in both primary and secondary HA titre was observed when compared to control group, whereas in cyclophosphamide treated group *A. manihot* showed significant ($p<0.05$) increase in HA titre and DTH reaction by facilitating the footpad thickness response to SRBCs in sensitized mice. Also showed a significant ($p<0.05$) increase in percentage neutrophil adhesion to nylon fibers, increased phagocytic index significantly and decreased percent mortality by *E- coli* induced abdominal peritonitis.

Conclusion: From the above findings, aqueous and ethanolic leaves extract of *A. manihot* (200 mg/kg). showed potential for augmenting immune response of both specific and non-specific immunity. It is concluded that, immunostimulatory effect of *A. manihot* could be attributed to its various phytoconstituents present in aqueous and ethanolic leaves extract.

Keywords: *Abelmoschus manihot*, Immunomodulation, antibody titre, delayed type hypersensitivity, phagocytic index.

I. INTRODUCTION

The immune system is exposed to a myriad of substances intentionally and unintentionally. Immune activation is an effective as well as protective approach against emerging infectious diseases. Immunostimulation is also indicated to counteract immunosuppression or an ineffectively working immune system.[1]

One of the main strategies in ayurvedic medicine is to increase body's natural resistance to disease or stress causing agent rather than directly neutralizing the agent itself in practice. Ayurveda exploits the potential of various herbs as drugs and play important role in modern health care, particularly where satisfactory treatment is not available. The traditional medicine all over the world is nowadays reviewed by an extensive research on different plant species and their therapeutic principles.[2]

The *Malvaceae* species has been used for thousands of years as culinary and medicinal properties in ayurveda, the traditional medicinal system of India. A large annual erect hairy herb or undershrub, represented by *Abelmoschus manihot* (*A. manihot*) (L.) Medik (Malvaceae) Synonym: *Hibiscus manihot* Linn is medicinally important plant of the Malvaceae family commonly known as 'Jangali bhendi' is a 1.2-1.8 m. high, commonly found on the Kokan, Western Ghats and Western coasts of India.[3]

They are beneficial in treating gout, tuberculosis and bleeding disorders. The *A. manihot L.* are used in Rakttapitta dosha, blood purifier, stomach pain, colic pain, hepatoprotective and also used in blood diseases.[3, 4] Root paste and leaves useful for boils, sores, sprains, inflammations, tuberculosis and leucoderma.[6, 7, 8]

The reported pharmacological studies on some Malvaceae species include Analgesic and anti-inflammatory activity: (*Sutradhar RK, et al*, 2006) Hepatoprotective activity: (*Porchezhian E, et al*, 2005), Flavonoid isolation: (*Matlaweska I, et al*, 2002), Hypoglycemic activity: (*Seetharam YN, et al*, 2002), phytochemical investigation: (*Gaind KN, et al*, 1976).

Further no scientific study has been carried out on *Ablemoschus Manihot* L. Hence the present investigation has been undertaken to evaluate the Immunomodulatory activity of a leaf extracts of *Abelmoschus manihot* L. with special emphasis to its immunomodulatory effect which has not been carried out yet.

II. MATERIALS AND METHODS

2.1 Plant collection and authentication

Fresh leaves of *A. manihot* L. was collected from local areas of Trimbakeshwar and Igatpuri, Nashik. The plant was authenticated by botanical survey of India, Pune. A sample voucher specimen of the plant was deposited for further future reference.

Evaluation of prescription errors and polypharmacy practices in rural area at community pharmacy

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Original Research Article

Evaluation of prescription errors and polypharmacy practices in rural area at community pharmacy

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ABSTRACT

Background: Prescription refers to a written request from physician to patient for compounding and dispensing of medicines. The prescription comprises detail information of patient, physician, and drugs, absence of these prescription parameters may harm the patient's safety. Inappropriate practices like polypharmacy prescriptions must be avoided as this may lead to non-compliance.
Methods: A cross section observational study was conducted at a community pharmacy from September to November 2019. Permission was taken from the registered pharmacist. Prescriptions were collected from the subjects who visited the pharmacy in rural area. A checklist was prepared including all the parameters and the prescriptions were analyzed through Microsoft excel.
Results: Out of 2227 prescriptions collected, patient's name, age and weight were not written in 10.57%, 78.41%, and 12.33% of prescriptions respectively. Physician's name, designation and registration number were not mentioned in 18.50%, 21.14%, 29.51% prescriptions respectively. Date of issue was lacking in 12.33% prescriptions. It was found that 44.49% prescriptions were illegible. It was observed that 82.81% prescriptions possessed dosage form of drug and 32.15% dose in it. The study showed that 19.2% prescriptions were polypharmacy prescriptions.
Conclusions: Prescription is an authoritative document between doctor and pharmacist therefore it needs to be precise, fastidious, and scrupulous, monitoring to identify causes, analyze errors and blemishes in the prescription. One or other parameters were lacking in every prescription. 'Educate to medicate' this indicates that sound knowledge is requiring to prescribe therapeutically efficacious and accurate medicines in prescription.

Keywords: Prescription, Prescription parameters, Polypharmacy, Non-compliance, Prescription errors

INTRODUCTION

Prescription refers to a written request from physician to patient for compounding and dispensing of medicines for treatment. It is an element that ties up relationship of physician and pharmacist. It is an art in which special care regarding the appropriateness, efficacy, safety, adverse effects, contraindications, and cost effectiveness must be taken while prescribing any medicine. Once a physician diagnoses a patient, he or she decides drug therapy and writes a prescription in three parts superscription, inscription, and subscription then patient runs to pharmacist and he or she analyses prescription and dispenses it. This process is not very lenient, as it requires years of practice, sturdy knowledge and tons of hard work. The most carefully conceived prescription may become therapeutically useless, unless it communicates clearly with the pharmacist and adequately instructs the patient on how to take prescribed medication.[1]

The prescription comprises detailed information of the patient, physician, and drugs. As per World Health Organization practical manual on 'Guide to good prescribing', following are the parameters which must be

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Ultraviolet-Spectrophotometric Method for Simultaneous Estimation Of Dapagliflozin Propanediol And Metformin Hydrochloride

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Research Article

ULTRAVIOLET-SPECTROPHOTOMETRIC METHOD FOR SIMULTANEOUS ESTIMATION OF DAPAGLIFLOZIN PROPANEDIOL AND METFORMIN HYDROCHLORIDE

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ABSTRACT

Two simple, precise and economical UV spectrophotometric methods have been developed for the simultaneous estimation of Dapagliflozin and Metformin in bulk drug and marketed formulation. In simultaneous equation method, 223 nm (λ_{max} of DAPA) and 233 nm (λ_{max} of MET) analytical wavelengths were selected and analysis were carried out. In area under curve method, 220-229 nm (λ_{max} of DAPA) and 229-236 nm (λ_{max} of MET) wavelengths were selected and analysis were carried out. The method was validated using various parameters according to ICH guidelines. The low relative standard deviation values indicate good precision and high recovery values indicate accuracy of the proposed method. Assay results were in good agreement with label claim.

Keywords: Metformin HCl, Dapagliflozin Propanediol, Simultaneous estimation, Area under curve, Validation.

INTRODUCTION

Metformin Hydrochloride (MET) is a chemically 1, 1 dimethyl biguanide hydrochloride[1] (Fig 1) member of the biguanide class of oral antidiabetic drug, improves glucose tolerance in type 2 diabetic patients, lowering both basal and postprandial plasma glucose. MET minimize hepatic glucose production, reduces intestinal absorption of glucose and improves Insulin sensitivity by enhancing peripheral glucose uptake and utilization[2]. It has a molecular formula $C_4H_{12}CLN_5$ with molecular weight 165.625 g/mol and it is a white crystalline powder and freely soluble in water, ethanol, and methanol. I.P. recommends non-aqueous titration method for raw material and UV spectrometric method for tablets[3-5].

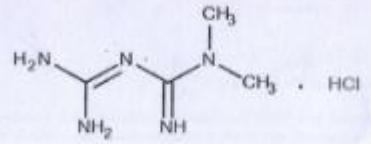


Figure 1: Metformin Hydrochloride

Dapagliflozin Propanediol (DAPA) is a chemically (1s)-1, 5-anhydro-1-C-[4-chloro-3-[(4-ethoxyphenyl) methyl] phenyl]-D-glucitol[6,7] (Fig 2). Dapagliflozin propanediol blockingSGLT$_2$ transporter mechanism causes blood glucose to be eliminated through the urine and maintained the insulin concentration in blood, at least 90% of the glucose to be eliminated through urine [8]. It has a molecular formula $C_{24}H_{33}ClO_8$ with molecular weight 408.873 g/mol. Dapagliflozinpropanediol is a white to off white crystalline powder which is soluble in water, ethanol,methanol and dimethyl formamide [9,10].

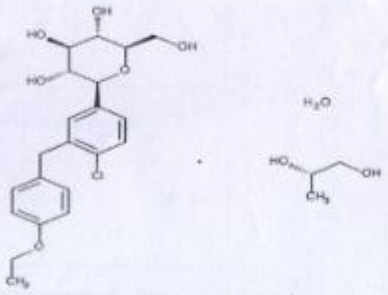


Figure 2: Dapagliflozin Propanediol

Literature survey reveals various methods for estimation of MET and DAPA in formulations, either alone or in combination with other drugs. Literature survey also revealed single RP-HPLC method for the binary mixture in API and tablet dosage form[11]. Three methods have been reported for estimation of the studied drugs in combine formulation by simultaneous equation method [12], Q-Absorbance ratio method [12] and first derivative spectrophotometric method [13]. In present study, an effort has been successfully made to determine MET And DAPA in bulk and tablet dosage form by simultaneous equation method and area under curve method. The proposed method has been optimized as

Synthesis and antidiabetic evaluation of some novel compounds

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Synthesis and antidiabetic evaluation of some novel compounds

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Aryloxypropanolmines have been reported to have β_3-agonist activity. Agonists of β_3-adrenergic receptors have been observed to simultaneously increase lipolysis, fat oxidation, energy expenditure and insulin action leading to the belief that this receptor might serve as an attractive target for the treatment of diabetes and obesity. Various aryloxypropanolamine derivatives have been synthesized starting with the substituted imines derived from 4-hydroxy benzaldehyde and substituted anilines. These imines have been converted to benzamide intermediates. The benzamide epoxide intermediates have been synthesized using epichlorhydrin. The title compounds **6a-j** have been synthesized *via* ring opening of the epoxides. The synthesized compounds have been characterized using infrared (IR), nuclear magnetic resonance (NMR) and mass spectrometry. The synthesized compounds have been evaluated for antidiabetic activity on streptozotocin induced diabetic male Wistar rats. The synthesized aryloxypropanolamine derivative consisting of $-OCH_3$ and *t*-butyl amine substituents show good activity as compared to the other synthesized compounds in the series. Glibenclamide has been taken as standard for measuring the antidiabetic activity.

Keywords: Aryloxypropanolamines, antidiabetic activity, lipolysis, streptozotocin, glibenclamide

The term diabetes mellitus describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both[1-4].

Currently anti-diabetic drugs used in long term therapy are found to be associated with various toxicities owing to which the development process in the anti-diabetic drug discovery has shifted its focus to newer anti-diabetic agents[5,6]. Current therapies for type II diabetes have inherent problems including non compliance, ineffectiveness and hypoglycemic episodes with insulin and sulphonyl ureas[7].

The β_3-adrenergic receptor (β_3 AR) is a G-protein coupled seven trans-membrane domain receptor that is expressed mainly in the adipose tissues where the excess fats are stored[8-10]. The stimulation of β_3 AR agonist has also been found to cause insulin sensitization[11].

Aryloxypropanolamine such as Pindolol **1** and Propranolol **2** (Figure 1) are well known for their ability to antagonize β-adrenoreceptor antagonist activity[12].

Aryloxypropanolamine, aryl group with oxirane side chain attached with primary or secondary amine have diverse pharmacological activities like anti-convulsant, anti-hypertensive, anti-obesity, and cardiovascular diseases[13-15]. Hence it was decided to take up the synthesis of newer derivatives of aryloxypropanolamines and screening of the same for anti-diabetic activity.

Result and Discussion

The formation of imine **3** using 4-hydroxybenzaldehyde **1** and substituted aniline **2** reaction by the removal of water molecule. The imine intermediate **3** with benzoyl chloride which contains chloride group which withdraws the electron density towards itself and also the oxygen atom present on it pulls the electron towards itself creating the positively charged carbon nuclei. There is the formation of benzamide intermediate **4**. Further the benzamide intermediate **4** with the epichlorhydrin molecule the oxirane intermediate **5** was formed. The intermediate then reacts with the amine like isopropylamine, butylamine, diethylamine or piperidine to form hydroxyl group on secondary carbon atom with the nitrogen attached to the terminal

Effect of Surfactants and Co-surfactants on Phase Behaviour and Physicochemical Properties of Self-nano emulsifying Drug Delivery System Loaded with Plumbagin

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Effect of Surfactants and Co-surfactants on Phase Behaviour and Physicochemical Properties of Self-nanoemulsifying Drug Delivery System Loaded with Plumbagin

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Keywords
Plumbagin; Surfactants; Solubility; Ternary.

ABSTRACT: Purpose: Plumbagin has wide pharmacological actions but limited solubility and low oral bioavailability. Self-nanoemulsifying drug delivery system (SNEDDS) has potential to improve solubility and dissolution rate. Selection of surfactant and co-surfactant is critical for a successful SNEDDS. Aim of present work was to investigate effect of different surfactants and co-surfactants on phase behaviour and physicochemical properties of SNEDDS loaded with plumbagin. Methods: Solubility of plumbagin in various oils, surfactants and co-surfactants was estimated. Out of those, Capmul®MCM (oil), Tween®20 and Tween® 80 (surfactants), polyethylene glycol 400 and propylene glycol (co-surfactants) in varying concentrations and combinations of surfactant: co-surfactant (Smix) were employed to construct pseudo-ternary phase diagrams. Thermodynamic stability, dispersibility, robustness to dilution, self-emulsification time, % transmittance and globule size tested. Results: Capmul®MCM, Tween®20, Tween® 80, polyethylene glycol (PEG) 400 and propylene glycol (PG) demonstrated the highest solubilisation and emulsification ability and studied further using ternary phase diagrams. Tween®20 showed larger self-emulsification region compared to Tween® 80 in combination with all co-surfactants studied. Tween® 80 could not form any nano-emulsion with PEG 400. Propylene glycol gave clear isotropic regions with 30% of oil. With Tween 20, it could emulsify up to 40% of oil. SNEDDSs prepared using Tween®20 with each of the co-surfactants passed dispersibility test. SNEDDSs containing Tween®20 and propylene glycol displayed smaller globule size, less self-emulsification time, high transmittance and than those prepared with Tween®20 and PEG 400. Conclusion: Tween®20 and propylene glycol are suitable surfactant and co-surfactant for plumbagin loaded SNEDDS. © 2019 iGlobal Research and Publishing Foundation. All rights reserved.

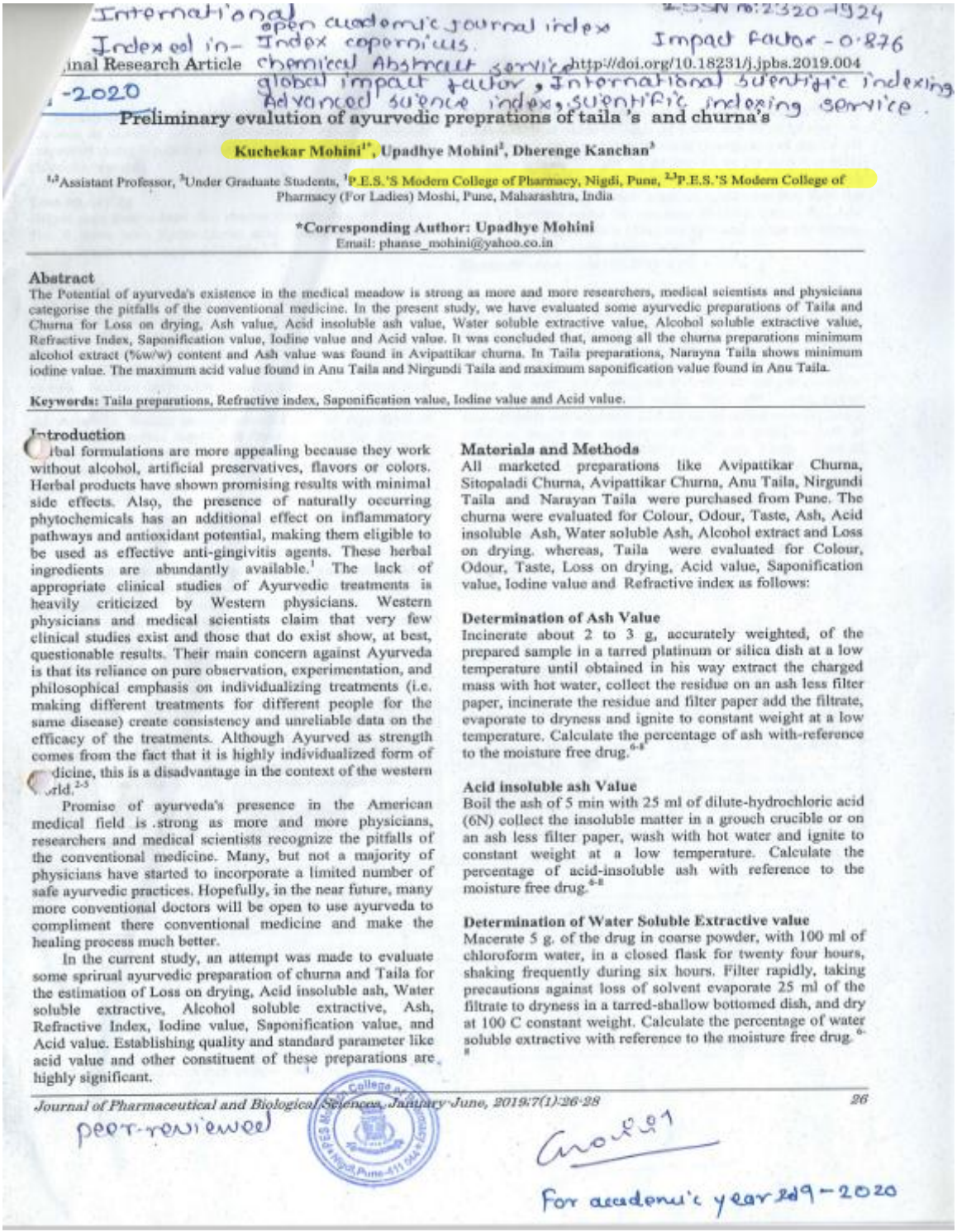
Cite this article as: Kamble, P.R.; Shaikh, K.S. Effect of surfactants and co-surfactants on phase behaviour and physicochemical properties of self-nanoemulsifying drug delivery system loaded with plumbagin. Indo Global J. Pharm. Sci., 2020; 10(1): 1-11. **DOI:** http://doi.org/10.35652/IGJPS.2020.10101 .

INTRODUCTION

Most of the new drug candidates and many existing drug molecules show poor aqueous solubility, which leads to poor oral bioavailability, high intra-and inter-subject variability and lack of dose proportionality [1]. The greatest challenge is to present the poorly water-soluble drugs into orally administered medications with sufficient bioavailability. To increase the oral bioavailability of poorly water soluble drugs, various formulation strategies have been adopted including the use of cyclodextrins, nanoparticles, solid dispersions, permeation enhancers and lipid-based formulations [2]. In recent years, considerable attention has been focused on lipid based formulations to improve the oral bioavailability of poorly water-soluble and lipophilic drugs. In fact, the most popular strategy is the incorporation of the drug molecule into inert lipid vehicles such as oils and surfactant dispersions, self-emulsifying formulations, emulsions, and liposomes with particular emphasis on self-nanoemulsifying drug delivery systems (SNEDDS) [3]. Self nanoemulsifying drug delivery systems (SNEDDS) are isotropic and thermodynamically stable mixtures of oil, surfactant, co-surfactant and drug that

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Preliminary evalution of ayurvedic preprations of taila 's and churna's.



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Preliminary evalution of ayurvedic preprations of taila 's and churna's

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Abstract
The Potential of ayurveda's existence in the medical meadow is strong as more and more researchers, medical scientists and physicians categorise the pitfalls of the conventional medicine. In the present study, we have evaluated some ayurvedic preparations of Taila and Churna for Loss on drying, Ash value, Acid insoluble ash value, Water soluble extractive value, Alcohol soluble extractive value, Refractive Index, Saponification value, Iodine value and Acid value. It was concluded that, among all the churna preparations minimum alcohol extract (%w/w) content and Ash value was found in Avipattikar churna. In Taila preparations, Narayna Taila shows minimum iodine value. The maximum acid value found in Anu Taila and Nirgundi Taila and maximum saponification value found in Anu Taila.

Keywords: Taila preparations, Refractive index, Saponification value, Iodine value and Acid value.

Introduction
Herbal formulations are more appealing because they work without alcohol, artificial preservatives, flavors or colors. Herbal products have shown promising results with minimal side effects. Also, the presence of naturally occurring phytochemicals has an additional effect on inflammatory pathways and antioxidant potential, making them eligible to be used as effective anti-gingivitis agents. These herbal ingredients are abundantly available.[1] The lack of appropriate clinical studies of Ayurvedic treatments is heavily criticized by Western physicians. Western physicians and medical scientists claim that very few clinical studies exist and those that do exist show, at best, questionable results. Their main concern against Ayurveda is that its reliance on pure observation, experimentation, and philosophical emphasis on individualizing treatments (i.e. making different treatments for different people for the same disease) create consistency and unreliable data on the efficacy of the treatments. Although Ayurved as strength comes from the fact that it is highly individualized form of medicine, this is a disadvantage in the context of the western world.[2-5]

Promise of ayurveda's presence in the American medical field is strong as more and more physicians, researchers and medical scientists recognize the pitfalls of the conventional medicine. Many, but not a majority of physicians have started to incorporate a limited number of safe ayurvedic practices. Hopefully, in the near future, many more conventional doctors will be open to use ayurveda to compliment there conventional medicine and make the healing process much better.

In the current study, an attempt was made to evaluate some sprirual ayurvedic preparation of churna and Taila for the estimation of Loss on drying, Acid insoluble ash, Water soluble extractive, Alcohol soluble extractive, Ash, Refractive Index, Iodine value, Saponification value, and Acid value. Establishing quality and standard parameter like acid value and other constituent of these preparations are highly significant.

Materials and Methods
All marketed preparations like Avipattikar Churna, Sitopaladi Churna, Avipattikar Churna, Anu Taila, Nirgundi Taila and Narayan Taila were purchased from Pune. The churna were evaluated for Colour, Odour, Taste, Ash, Acid insoluble Ash, Water soluble Ash, Alcohol extract and Loss on drying. whereas, Taila were evaluated for Colour, Odour, Taste, Loss on drying, Acid value, Saponification value, Iodine value and Refractive index as follows:

Determination of Ash Value
Incinerate about 2 to 3 g, accurately weighted, of the prepared sample in a tarred platinum or silica dish at a low temperature until obtained in his way extract the charged mass with hot water, collect the residue on an ash less filter paper, incinerate the residue and filter paper add the filtrate, evaporate to dryness and ignite to constant weight at a low temperature. Calculate the percentage of ash with-reference to the moisture free drug.[6-8]

Acid insoluble ash Value
Boil the ash of 5 min with 25 ml of dilute-hydrochloric acid (6N) collect the insoluble matter in a grouch crucible or on an ash less filter paper, wash with hot water and ignite to constant weight at a low temperature. Calculate the percentage of acid-insoluble ash with reference to the moisture free drug.[6-8]

Determination of Water Soluble Extractive value
Macerate 5 g. of the drug in coarse powder, with 100 ml of chloroform water, in a closed flask for twenty four hours, shaking frequently during six hours. Filter rapidly, taking precautions against loss of solvent evaporate 25 ml of the filtrate to dryness in a tarred-shallow bottomed dish, and dry at 100 C constant weight. Calculate the percentage of water soluble extractive with reference to the moisture free drug.[6-8]

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Exploration of protective effect of hydroalcoholic extract of Alstonia scholaris bark in STZ-induced early diabetic nephropathy model in rats

EXPLORATION OF PROTECTIVE EFFECT OF HYDROALCOHOLIC EXTRACT OF *ALSTONIA SCHOLARIS* BARK IN STZ-INDUCED EARLY DIABETIC NEPHROPATHY MODEL IN RATS

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ABSTRACT

Alstonia scholaris (fam. Apocynaceae) is an indigenous plant used traditionally for the treatment of diabetes and associated complications. However the nephroprotective potential of the plant is not scientifically evaluated. Objective of the present study was to investigate renal protective activity of hydroalcoholic extract of *Alstonia scholaris* bark (HEAS) in streptozotocin (STZ)-induced early diabetic nephropathy in rats and to focus on its possible mechanism of action. Experimental diabetes was induced in wistar rats using single intraperitoneal injection of streptozotocin (65 mg/kg). Animals were divided in five groups (n=6) and treated with 150 mg/kg and 300 mg/kg HEAS for 4 weeks. At the end of study period, fasting blood glucose, blood urea nitrogen (BUN), serum creatinine, total proteins, serum albumin, serum insulin and glycosylated haemoglobin, superoxide dismutase, catalase, reduced glutathione and MDA in kidney were evaluated. Urine was analyzed for albumin, total proteins and creatinine clearance. Kidney and pancreas were subjected for histopathology. Significant decrease in fasting blood glucose, creatinine, albumin, BUN, total proteins and urinary total proteins was observed. Significant improvement in serum insulin, glycosylated Hb, oxidative stress parameters of kidney including superoxide dismutase, catalase and reduced glutathione has been observed in HEAS treated diabetic rats. Histopathology of kidney and pancreatic tissues showed structural improvement. Present study has revealed that HEAS prevented the progression of diabetic nephropathy in STZ-diabetic rats by improving the disturbed glucose homeostasis and by amelioration of renal oxidative stress.

Keywords: *Alstonia scholaris*, diabetic nephropathy, oxidative stress, streptozotocin

INTRODUCTION

Diabetic nephropathy (DN) is one of the major microvascular complications in long standing patients of both type I and type II diabetes mellitus[1]. Diabetic nephropathy is the leading cause of end-stage renal disease and its prevalence is increasing because of the global epidemic of diabetes[2]. It accounts for about 30-35% incidents of renal replacement therapy worldwide[3]. It is characterized by proteinuria, mesangial expansion, glomerular basement membrane (GBM) thickening, persistent fibrosis and a gradual decrease in renal function which result from increasing extracellular matrix (ECM) deposition at the glomerular level[4].

Hyperglycemia and characteristic dyslipidemia of diabetes mellitus are considered as risk factors for the progression of diabetic nephropathy[5]. Further chronic hyperglycemia promotes oxidative stress that is involved in generation of reactive oxygen species (ROS) and long lived non-enzymatic glycated proteins (AGE's) in serum and tissues which play an important role in the development of diabetic nephropathy[6]. Effective control of the blood glucose level is therefore a key step in preventing diabetic complications and improving the quality of life in diabetic patients[7].

No satisfactory therapeutic option is currently available to treat patients with nephropathy except for fewer agents like angiotensin converting enzyme inhibitors, angiotensin (AT_1) receptor blockers and few antioxidants, which have been shown to improve the function of diabetic kidney to some extent[8]. For this reason in recent years there has been increasing interest among researchers to find out natural substitutes for the pharmacological medications of this chronic incurable disease. They are trying to scientifically appraise the immense potential of medicinal

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Protective effect of 2-Pyrocatechuic acid on 5-Fluorouracil induced cardiotoxicity in wistar rats

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Protective Effect of 2-Pyrocatechuic Acid on 5-Fluorouracil Induced Cardiotoxicity in Wistar Rats

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SUMMARY. **Cardiotoxicity is a frequent and severe side effect of 5-Fluorouracil (5-FU) chemotherapy, limiting its clinical use despite being one of the most potent anticancer agents. The present study was designed to evaluate the cardioprotective effect of a phenolic acid namely 2-pyrocatechuic acid (2,3 dihyroxybenzoic acid) against 5-FU induced cardiotoxicity in Wistar rats. Exposure to 5-FU at a dose of 20 mg/kg caused significant increase in serum cardiac biomarkers such as lactate dehydrogenase (LDH)), creatine kinase (CK), creatine kinase isoenzyme MB (CK-MB) activities, cardiac CK-MB index along as well as cTnI levels along with severe histopathological changes in cardiac tissues of rats indicating severe cardiotoxicity. Co-administration of 2- pyrocatechuic acid (2-PCA) with 5-FU at 3, 10, 30 and 100 mg/kg b.w./day for 14 days resulted in an amelioration of altered serum parameters in a dose dependent manner. Moreover, 2-PCA attenuated the cardiac tissue damage produced by 5-FU. The results indicated the potential of 2-PCA as a cardioprotective agent for the prevention and amelioration of 5-FU induced cardiotoxicity.**

RESUMEN. La cardiotoxicidad es un efecto secundario frecuente y grave de la quimioterapia con 5-fluorouracilo (5-FU), limitando su uso clínico a pesar de ser uno de los agentes anticancerosos más potentes. El presente estudio se diseñó para evaluar los efectos cardioprotectores del ácido fenólico 2-pirocatéquico (ácido 2,3 dihidroxibenzoico) contra la cardiotoxicidad inducida por 5-FU en ratas Wistar. La exposición a 5-FU a una dosis de 20 mg/kg causó un aumento significativo en los biomarcadores de tejido cardíaco en suero, como los niveles de lactato deshidrogenasa (LDH), creatina quinasa (CK), creatina quinasa isoenzima MB (CK-MB), actividades cardíacas El índice de CK-MB junto con los cambios histopatológicos severos en los tejidos cardíacos de ratas que indican cardiotoxicidad grave. La administración concomitante de ácido 2-pirocatequico (2-PCA) con 5-FU a 10, 30 y 100 mg/kg/día durante 14 días dio lugar a una mejora de los parámetros séricos alterados de una manera dependiente de la dosis. Además, el 2-PCA atenuó el daño tisular cardíaco producido por el 5-FU. Los resultados indicaron el potencial de 2-PCA como agente cardioprotector para la prevención y mejora de la cardiotoxicidad inducida por 5-FU.

INTRODUCTION

5-Fluorouracil (5-FU), an antimetabolite, has been a mainstay of the cancer chemotherapy for treatment of several malignancies including breast, cervical, bladder, gastrointestinal, head, and neck cancers, etc. [1]. It acts by inhibiting DNA synthesis during the S phase of the cell cycle. In spite of its wide range of antitumor effects 5-FU is associated with several untoward effects such as nausea, vomiting, diarrhea, mucositis and thrombophlebitis of peripheral veins. But cardiotoxicity is the most serious adverse effect of 5-FU occurring at therapeutic doses limiting its wide clinical usage [2]. The cardiotoxic effects commonly include vasospastic angina, cardiomyopathy, malignant arrhythmias, coronary thrombosis and sudden cardiac death, which make 5-FU induced cardiotoxicity the second most common cause of chemotherapy induced cardiotoxicity [3]. The mechanisms of cardiotoxicity generally include coronary vasospasm, free radical damage to myocardium, endothelial toxicity, activation of coagulation leading to coronary thrombosis or autoimmune mechanism. 5-FU also acts by exerting a direct toxic effect on vascular endothelium that involves endothelial

KEY WORDS: cardiac biomarkers, cardiotoxicity, 2,3-dihyroxybenzoic acid, 5-fluorouracil, 2-pyrocatechuic acid.

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Therapeutic potential of ethyl acetate fraction of Tephrosia purpurea Linn. leaves in a rat model of gout

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Original Research Article

Therapeutic potential of ethyl acetate fraction of *Tephrosia purpurea* Linn. leaves in a rat model of gout

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ABSTRACT

Objective: The present study is to determine the potential treatment effects of ethyl acetate fraction of *Tephrosia purpurea* Linn. leaves (EATP) against gout.
Methods: Gout in experimental rats was induced with potassium oxonate at the dose of 250 mg/kg (intraperitoneal injection) for 7 consecutive days; EATP was administered 1 h after administration of the potassium oxonate on each day of experiment. Potassium oxonate was discontinued on the 8th day; thereafter allopurinol (10 mg/kg, p.o.) and EATP (200 and 400 mg/kg, p.o.) were continued until day 14. The uric acid level was measured from serum and urine during the experiment. Other biochemical parameters were assessed, including blood and urine creatinine, erythrocyte sedimentation rate, and total protein. Blood urea nitrogen, serum glutamic-oxaloacetic transaminase, serum glutamic-pyruvic transaminase and alkaline phosphatase were also measured. The blood was analyzed for levels of malondialdehyde and the antioxidant enzymes such as superoxide dismutase, catalase and glutathione peroxidase. Histopathological and radiological changes in the ankle of rats were observed after completion of the experiment.
Results: EATP was able to decrease serum uric acid and creatinine level; it also reduced inflammation, oxidative stress and lysosomal enzyme level, which has a role in acute inflammation. EATP increased uric acid excretion through urine due to its uricosuric effect.
Conclusion: EATP lowered the serum uric acid level and increased the urine uric acid level through excretion, which is useful in the treatment of gout. Hence the EATP was found to be helpful in the treatment of gout.

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1. Introduction

Gout is the common, inflammatory, metabolic disorder mainly due to increased uric acid level in the body. Uric acid is poorly soluble and deposits in the articular as well as in the renal tissues leading to inflammation, acute gouty arthritis and uric acid-induced nephrolithiasis [1,2]. Xanthine dehydrogenase/xanthine oxidase enzyme has a catalytic role in the conversion of hypoxanthine to xanthine and finally into uric acid which causes a reduction in excretion through kidney and also increases hepatic production of uric acid [3,4]. The major risk factor for gout is increased uric acid levels, which lead to renal dysfunction, cardiovascular diseases, hypertension, diabetes mellitus [5–8], cancer, obesity and hyperlipidemia [9]. Progression of gout is correlated with numerous factors, such as demographic variables, e.g. sex, age, race/ethnicity; hereditary variables and dietary variables, e.g. liquor, purine-rich substances, fructose/sugar-sweetened drinks, dairy items, vitamin C and fruits [10]. Allopurinol is one medication used to manage gout; it inhibits xanthine oxidase, which regulates uric acid production, yet it can have negative side effects like renal and gastrointestinal toxicity. Other side effects include fever, skin rashes, hepatitis, Stevens-Johnson disorder, liver toxicity and nephropathy [11–14]. Febuxostat, a newly developed drug, is an alternative to allopurinol, but had adverse effects, like hepatotoxicity, as evidenced in some clinical trials [15].

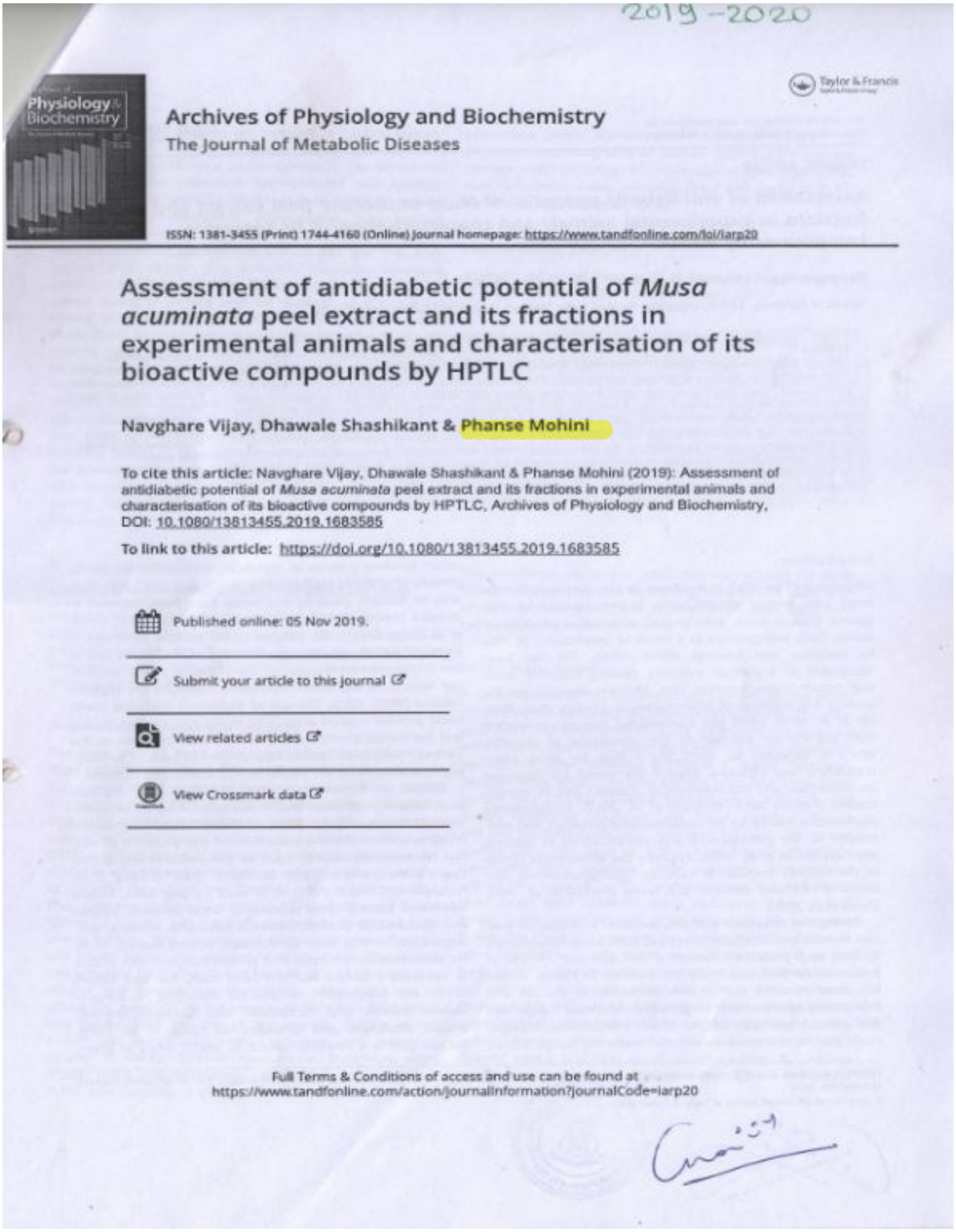
In the present investigation we examined the potential treatment effects of the ethyl acetate fraction of *Tephrosia purpurea* Linn. leaves (EATP) against gout. Gout was induced in rats with potassium oxonate, an uricase inhibitor that increases the uric acid

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Assessment of antidiabetic potential of Musa acuminata peel extract and its fractions in experimental animals and characterisation of its bioactive compounds by HPTLC.



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Assessment of antidiabetic potential of *Musa acuminata* peel extract and its fractions in experimental animals and characterisation of its bioactive compounds by HPTLC

Navghare Vijay, Dhawale Shashikant & Phanse Mohini

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Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach



Original Article

Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach

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ABSTRACT

Objectives: The aim of present study was to formulate and optimize Multi-unit Naproxen Sodium controlled release tablet by QbD approach. Controlled release dosage form for naproxen sodium was selected to reduce dosing frequency and gastrointestinal side effects of drug. **Methods:** Naproxen Sodium CR tablets were prepared by using wet granulation method by employing Quality by Design (QbD). This tablet was made by a mixture of a granulate having an immediate release with a granulate having a controlled release, in terms of the active ingredient. Eudragit RSPO and RLPO polymers were used to control the drug release. Optimization of tablet formulation was done using 2^3 factorial design to study the effect of concentration of Eudragit RSPO, Eudragit RLPO polymers and concentration of disintegrating agent i.e. crospovidone on disintegration time and f2 factor of drug released. Tablets were evaluated for thickness, hardness, friability, assay and drug release. **Results:** Optimized formulation shows controlled drug release profile upto 14 hrs. with disintegration time of 88 min. **Conclusion:** It was concluded that tablet formulation of Naproxen Sodium CR tablets employing QbD leads to a single dose per day in the management of rheumatoid arthritis and also concluded that Eudragit RLPO and Eudragit RSPO polymers can be successfully used to controlled drug release profile of tablet.

Key words: Multi-unit-controlled release system, Quality by Design, Design of experiment, Eudragit RLPO, Eudragit RSPO.

INTRODUCTION

Quality by Design (QbD) is a systemic approach to pharmaceutical development that begins with predefined objectives and emphasizes product and process understanding and process control, based on sound science and quality risk management.[1] One of the major parameters in QbD is developing a design space which includes equipment, excipients and manufacturing environment. To ensure better quality of product, the product variables are periodically monitored in design space. Large scale productivity can be improved by applying QbD approach. Hence, this approach is beneficial from market point of view.[2]

Multiple-units composition is used for administration of a therapeutically effective amount of NSAID to obtain both a relatively fast or quick onset of therapeutic effect and maintenance of therapeutically active plasma concentration for a relatively long period of time.[3]

Naproxen Sodium Is Non-steroidal Anti-inflammatory (NSAID) drug which is widely used in the treatment of arthritis and as analgesic and antipyretic in the treatment of mild to moderate pain, such as dysmenorrhea or arthritis. This drug is acting by blocking COX 1 and COX 2 enzymes thereby inhibit prostaglandin synthesis and gives analgesic and anti-inflammatory effect. Inhibition of COX 1 is related with gastrointestinal and renal toxicity, while inhibition of COX 2 gives

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Synthesis, evaluation and molecular docking of sulphonamide/isothiocyanate linked quinazolinone derivatives as antidiabetic activity.

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SYNTHESIS, EVALUATION AND MOLECULAR DOCKING OF SULPHONAMIDE/ISOTHIOCYANATE LINKED QUINAZOLINONE DERIVATIVES AS ANTIDIABETIC ACTIVITY

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ABSTRACT

A series of Quinazolinone linked sulphonamide and isothiocynates derivatives was designed synthesized and evaluated for type 2 diabetics study. Designed compound were docked using AutoDock tool software with DPP-IV inhibitor protein (PDB: 3OPM). And the good dock score compounds is synthesized and evaluated for antidiabetic study in STZ- Nicotinamide model of wistar rats. Amongst all the compounds designed in the study we identified compounds A3 and C6 as potent, selective and orally active agents.

KEYWORDS: Quinazolinone, Sulphonamide, Isothiocyanate, Type 2 diabetics, Molecular Docking, STZ-Nicotinamide model.

INTRODUCTION

Type 2 diabetes is a complex metabolic syndrome resulting in high blood glucose due to impaired insulin action, which in turn stimulates glucose uptake in peripheral tissues such as muscle and fat. In normal humans, up to 80% of insulin-stimulated glucose disposal occurs in skeletal muscle, a major site of insulin resistance in type 2 diabetes.[1] Glucagon like peptide (GLP-1)[2] and glucose dependent insulinotropic polypeptide (GIP) are incretin hormones, released from the gut in response to the food intake, responsible for the glucose dependent stimulation of insulin secretion through pancreatic β-cells.[3-4] Furthermore, GLP-1 slows gastric emptying, stimulates regeneration and differentiation of pancreatic β-cells while inhibiting glucagon secretion.[5] But the therapeutic effects of both these hormones are lost due to their rapid degradation ($t_{½}$ ~ 1 min) by DPP-IVenzyme. Thus inhibition of DPP-IV has emerged as a novel approach for the treatment of type 2 diabetes (T2D).[6]

Quinazoline are classes of fused heterocycles that are of considerable interest because of the diverse range of their biological properties, for example, anticancer, diuretic, anti-inflammatory, anticonvulsant and antihypertensive activities.[7] Depending upon the position of theketo or oxo group, these compounds may be classified into two types: 2-(1*H*) quinazolinones(or) 1, 2-dihydro-2-oxo quinazolines and 4(3*H*)-quinazolines or 3, 4-dihydrooxoquinazolines. Quinazoline, being the central body of the pharmacophore holds different types of substituent. Based on their various physicochemical properties, they exerted a diversified range of therapeutic efficacy.

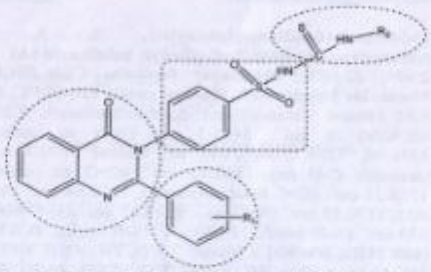


Fig. 1: Designed pharmacophore of Quinazolinone-sulfonamide/isothiocyanate for DPP-IV activity.

The quinazolinone and sulfonamide/isothiocyanatestructures were hybridized leading to the title compounds reported in this paper. In the present investigation, the designed quinazolinone-sulfonamide/ isothiocyanatehybrid derivatives (fig. 1) were synthesized in various steps that have been outlined

Pharmacognostic Investigations of Colocasia Esculenta Leaves.

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Research Article

Pharmacognostic Investigations of *Colocasia Esculenta* Leaves.

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ABSTRACT

Objective: The current study focuses on pharmacognostic account of *Colocasia esculenta* (L.) Schott leaves. Over the years; leaves of *Colocasia* (Elephant ear) are commonly used for culinary purpose and in traditional medicines. Various pharmacological researchers have proven its medicinal potential that corroborates the ethnopharmacological applications. **Methods:** Fresh leaves and air-dried leaf powder was investigated for its morphological, microscopical, organoleptic characters and physico-chemical properties. **Results:** The leaves of *Colocasia* are simple, petiolated, sagittate, dorsiventral, acute, entire, asymmetrical, chordate with characteristic reticulate venation (10-15 cm) long, (5-8 cm cm) wide. The petiole is dark purple and succulent. The microscopy of the leaf reveals a pronounced cuticle and palisade is double layered. The presence of various calcium oxalate crystals *viz.* raphides, prisms, idioblasts and loosely rosette speraphides is a unique manifestation. The stomata on either side are typically commelina type but the guard cells of dorsal surface are dumbbell shaped whereas guard cells of ventral surface are reniform which is very much notable. The physico-chemical parameters such as total ash (1.21 % w/w); acid insoluble ash (0.26 % w/w); water soluble ash (0.91 % w/w); water soluble extractive (9.05 % w/w) alcohol soluble extractive (11.15 % w/w) and loss on drying (72.70 % w/w) were performed. **Conclusion:** The detailed microscopic investigations carried out thus help in authentication of *Colocasia esculenta* leaves.

KEYWORDS

Colocasia esculenta, microscopy, commelina stomata, physico-chemical analysis.

1. INTRODUCTION

The current study focuses on pharmacognostic account of *Colocasia esculenta* (L.) Schott leaves (family: Araceae).[1] Its starchy corms, petioles, leaves find culinary as well as medicinal importance. The leaves of *Colocasia esculenta* are rich sources of Vitamins A, B, C and minerals. Traditionally, the leaves are used during parturition to minimize labor pain, fever, constipation, earaches and as a rubefacient. The early

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Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.

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SYNTHESIS, MOLECULAR DOCKING AND ANTIDIABETIC ACTIVITY OF SOME SULPHONAMIDE BEARING QUINAZOLINONE MOIETIES

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ABSTRACT
Type 2 diabetes (T2D) is a lifestyle disease affecting millions of people worldwide. Herein, the design and synthesis of 17 novel quinazolinone incorporating sulphonamide scaffold are described. Designed compound were docked using AutoDock (4.2.6) tool software with DPP-IV inhibitor protein (PDB: 3OPM). Synthesized compounds (**4a-q**) were evaluated for antidiabetic activity in streptozotocin-nicotinamide induced diabetic rats. Most of these synthesized compounds showed significant reduction in blood glucose level. Amongst all the compounds designed in this study, we identified compound **4q** as a potent, selective and orally active antidiabetic agent, which exhibited in vivo efficacy in diabetic rat model.

KEYWORDS: Antidiabetic agents, Quinazolinone, Sulphonamide, Type 2 Diabetes.

1. INTRODUCTION

Diabetes mellitus is characterized by chronic hyperglycemia and belongs to a group of metabolic disorders with multiple etiologies.[1] Type 2 diabetes mellitus (T2DM) is an extremely important metabolic disease with a global prevalence among adults (aged 20–79 years) suspected to reach 439 million by 2030.[2]

Dipeptidyl peptidase IV (DPP-IV, E.C.3.4.14.5, CD26) is a widely expressed serine protease found in many tissues and body fluids of mammals and, exists either as a soluble enzyme or in a membrane bound form. It functions as a protease, cleaving dipeptides comprising of either proline or alanine at the penultimate position from the N-terminal of the peptide or protein.[3-4] Glucagon like peptide 1 (GLP-1)[5] and glucose dependent insulinotropic polypeptide (GIP) are incretin hormones, responsible for the glucose dependent stimulation of insulin secretion through pancreatic β-cells.[6-9] The therapeutic effects of both these hormones are lost due to their rapid degradation (t½ ~ 1 min) by DPP-IV enzyme.[10] Thus inhibition of DPP-IV has emerged as a novel approach for the treatment of type 2 diabetes (T2D).[11]

The number of available oral hypoglycemic agents has increased significantly in the last decade, however, current therapies to reduce plasma glucose levels have inherent problems including compliance, ineffectiveness, and the occurrence of hypoglycemic episodes. Accordingly, there is a need for more effective, orally administered agents, particularly ones that normalize both glucose and insulin levels.[12] Authors have come across various fused aromatic heterocycle scaffolds in the literature study.[13-18] As a congener of bicyclic heterocycle scaffolds, we were interested in Quinazolinone scaffold since Quinazolinone derivatives were found to show diverse promising biological activities including anticancer, antihypertension, anticonvulsant, antidiabetic, antimalarial, etc.[19-21]

The hybridization of quinazolinone and sulfonamide structures led to the title compounds reported in this paper. In the present investigation, designed quinazolinone-sulfonamide hybrid derivatives (Fig. 1) were prepared by the methods that have been outlined in Scheme 1. The synthesized derivatives were evaluated for their antidiabetic activity.

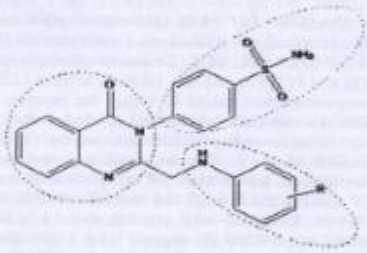
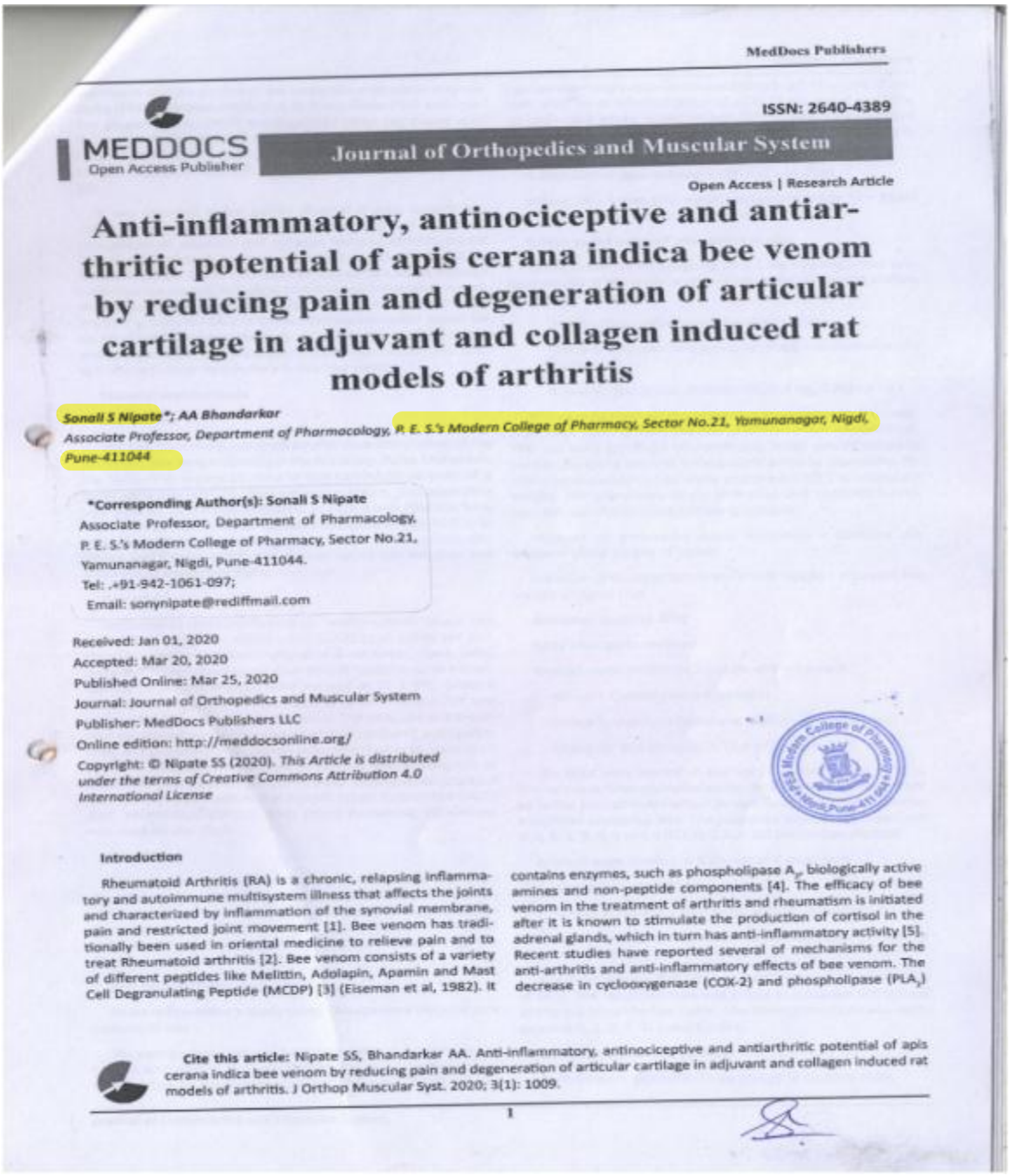


Figure 1: Designed pharmacophore.

Anti-inflammatory, antinociceptive and antiarthritic potential of apis cerana indica bee venom by reducing pain and degeneration of articular cartilage in adjuvant and collagen induced rat models of arthritis



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Anti-inflammatory, antinociceptive and antiarthritic potential of apis cerana indica bee venom by reducing pain and degeneration of articular cartilage in adjuvant and collagen induced rat models of arthritis

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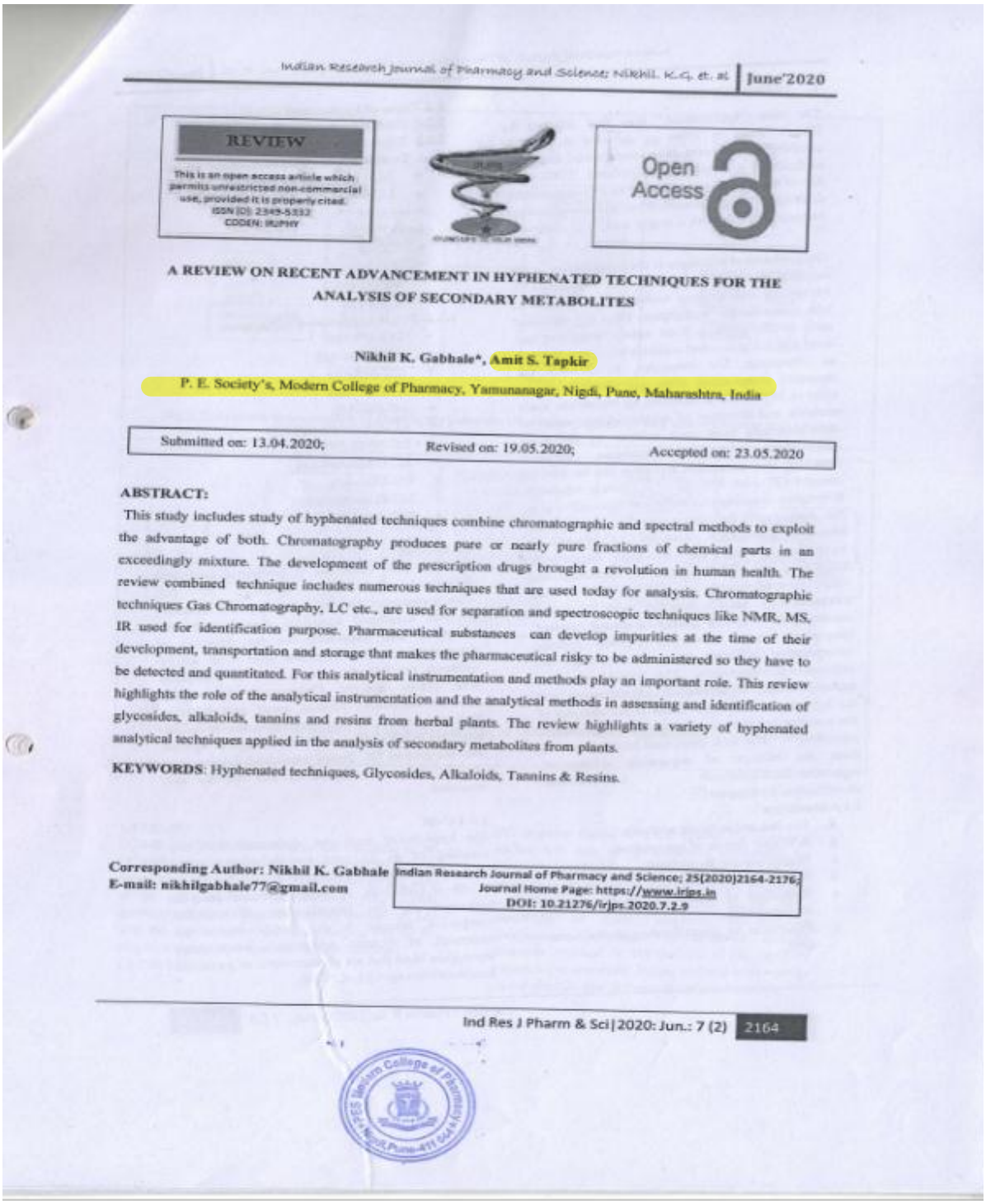
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Introduction

Rheumatoid Arthritis (RA) is a chronic, relapsing inflammatory and autoimmune multisystem illness that affects the joints and characterized by inflammation of the synovial membrane, pain and restricted joint movement [1]. Bee venom has traditionally been used in oriental medicine to relieve pain and to treat Rheumatoid arthritis [2]. Bee venom consists of a variety of different peptides like Melittin, Adolapin, Apamin and Mast Cell Degranulating Peptide (MCDP) [3] (Eiseman et al, 1982). It contains enzymes, such as phospholipase A_2, biologically active amines and non-peptide components [4]. The efficacy of bee venom in the treatment of arthritis and rheumatism is initiated after it is known to stimulate the production of cortisol in the adrenal glands, which in turn has anti-inflammatory activity [5]. Recent studies have reported several of mechanisms for the anti-arthritis and anti-inflammatory effects of bee venom. The decrease in cyclooxygenase (COX-2) and phospholipase (PLA_2)

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A Review on Recent Advancement In Hyphenated Techniques For The Analysis Of Secondary Metabolites



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REVIEW

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A REVIEW ON RECENT ADVANCEMENT IN HYPHENATED TECHNIQUES FOR THE ANALYSIS OF SECONDARY METABOLITES

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ABSTRACT:

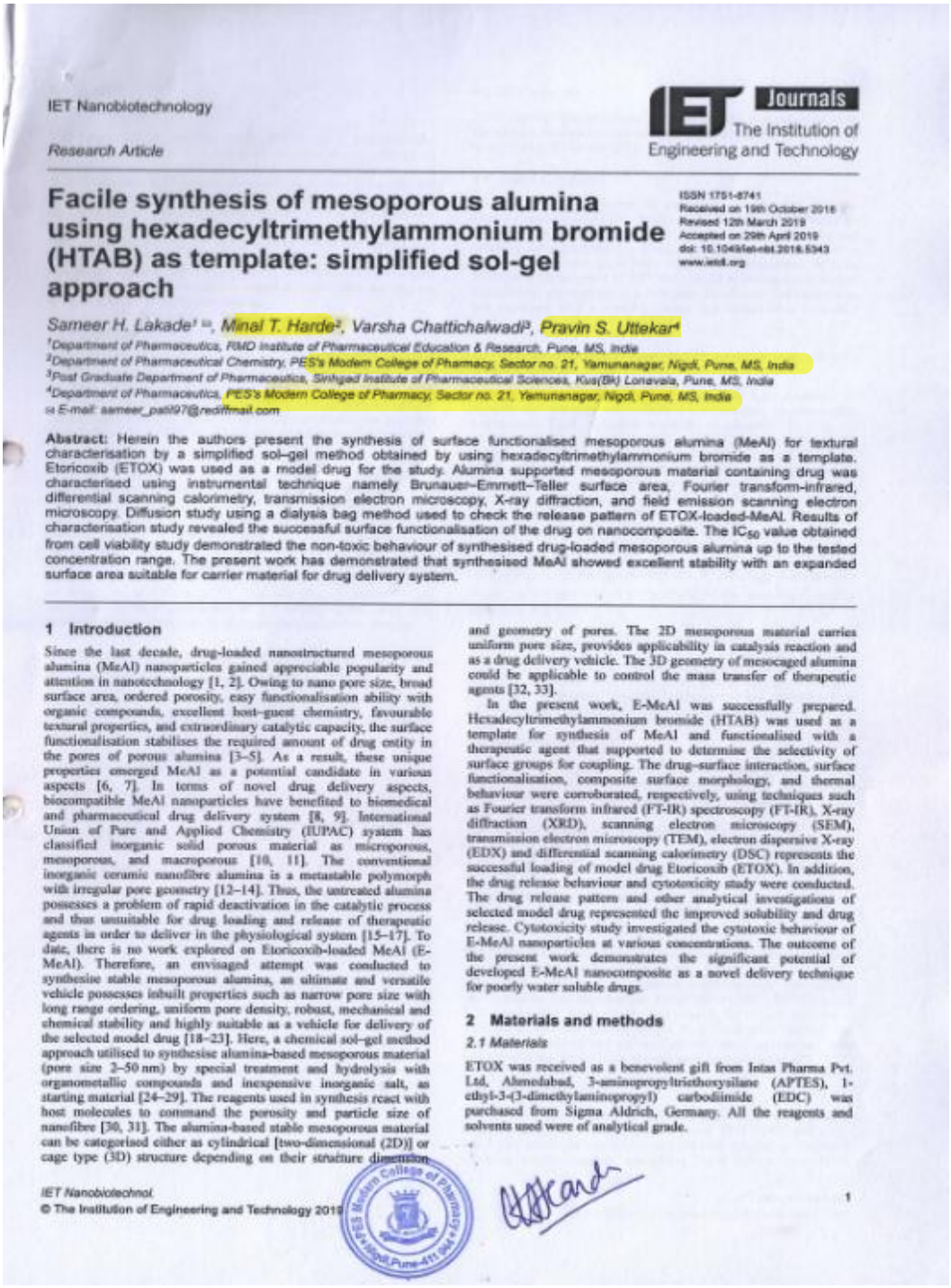
This study includes study of hyphenated techniques combine chromatographic and spectral methods to exploit the advantage of both. Chromatography produces pure or nearly pure fractions of chemical parts in an exceedingly mixture. The development of the prescription drugs brought a revolution in human health. The review combined technique includes numerous techniques that are used today for analysis. Chromatographic techniques Gas Chromatography, LC etc., are used for separation and spectroscopic techniques like NMR, MS, IR used for identification purpose. Pharmaceutical substances can develop impurities at the time of their development, transportation and storage that makes the pharmaceutical risky to be administered so they have to be detected and quantitated. For this analytical instrumentation and methods play an important role. This review highlights the role of the analytical instrumentation and the analytical methods in assessing and identification of glycosides, alkaloids, tannins and resins from herbal plants. The review highlights a variety of hyphenated analytical techniques applied in the analysis of secondary metabolites from plants.

KEYWORDS: Hyphenated techniques, Glycosides, Alkaloids, Tannins & Resins.

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Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide(HTAB)as template: simplified sol-gel approach



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Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide (HTAB) as template: simplified sol-gel approach

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Abstract: Herein the authors present the synthesis of surface functionalised mesoporous alumina (MeAl) for textural characterisation by a simplified sol–gel method obtained by using hexadecyltrimethylammonium bromide as a template. Etoricoxib (ETOX) was used as a model drug for the study. Alumina supported mesoporous material containing drug was characterised using instrumental technique namely Brunauer–Emmett–Teller surface area, Fourier transform-infrared, differential scanning calorimetry, transmission electron microscopy, X-ray diffraction, and field emission scanning electron microscopy. Diffusion study using a dialysis bag method used to check the release pattern of ETOX-loaded-MeAl. Results of characterisation study revealed the successful surface functionalisation of the drug on nanocomposite. The IC_{50} value obtained from cell viability study demonstrated the non-toxic behaviour of synthesised drug-loaded mesoporous alumina up to the tested concentration range. The present work has demonstrated that synthesised MeAl showed excellent stability with an expanded surface area suitable for carrier material for drug delivery system.

1 Introduction

Since the last decade, drug-loaded nanostructured mesoporous alumina (MeAl) nanoparticles gained appreciable popularity and attention in nanotechnology [1, 2]. Owing to nano pore size, broad surface area, ordered porosity, easy functionalisation ability with organic compounds, excellent host–guest chemistry, favourable textural properties, and extraordinary catalytic capacity, the surface functionalisation stabilises the required amount of drug entity in the pores of porous alumina [3–5]. As a result, these unique properties emerged MeAl as a potential candidate in various aspects [6, 7]. In terms of novel drug delivery aspects, biocompatible MeAl nanoparticles have benefited to biomedical and pharmaceutical drug delivery system [8, 9]. International Union of Pure and Applied Chemistry (IUPAC) system has classified inorganic solid porous material as microporous, mesoporous, and macroporous [10, 11]. The conventional inorganic ceramic nanofibre alumina is a metastable polymorph with irregular pore geometry [12–14]. Thus, the untreated alumina possesses a problem of rapid deactivation in the catalytic process and thus unsuitable for drug loading and release of therapeutic agents in order to deliver in the physiological system [15–17]. To date, there is no work explored on Etoricoxib-loaded MeAl (E-MeAl). Therefore, an envisaged attempt was conducted to synthesise stable mesoporous alumina, an ultimate and versatile vehicle possesses inbuilt properties such as narrow pore size with long range ordering, uniform pore density, robust, mechanical and chemical stability and highly suitable as a vehicle for delivery of the selected model drug [18–23]. Here, a chemical sol–gel method approach utilised to synthesise alumina-based mesoporous material (pore size 2–50 nm) by special treatment and hydrolysis with organometallic compounds and inexpensive inorganic salt, as starting material [24–29]. The reagents used in synthesis react with host molecules to command the porosity and particle size of nanofibre [30, 31]. The alumina-based stable mesoporous material can be categorised either as cylindrical [two-dimensional (2D)] or cage type (3D) structure depending on their structure dimension and geometry of pores. The 2D mesoporous material carries uniform pore size, provides applicability in catalysis reaction and as a drug delivery vehicle. The 3D geometry of mesocaged alumina could be applicable to control the mass transfer of therapeutic agents [32, 33].

In the present work, E-MeAl was successfully prepared. Hexadecyltrimethylammonium bromide (HTAB) was used as a template for synthesis of MeAl and functionalised with a therapeutic agent that supported to determine the selectivity of surface groups for coupling. The drug–surface interaction, surface functionalisation, composite surface morphology, and thermal behaviour were corroborated, respectively, using techniques such as Fourier transform infrared (FT-IR) spectroscopy (FT-IR), X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), electron dispersive X-ray (EDX) and differential scanning calorimetry (DSC) represents the successful loading of model drug Etoricoxib (ETOX). In addition, the drug release behaviour and cytotoxicity study were conducted. The drug release pattern and other analytical investigations of selected model drug represented the improved solubility and drug release. Cytotoxicity study investigated the cytotoxic behaviour of E-MeAl nanoparticles at various concentrations. The outcome of the present work demonstrates the significant potential of developed E-MeAl nanocomposite as a novel delivery technique for poorly water soluble drugs.

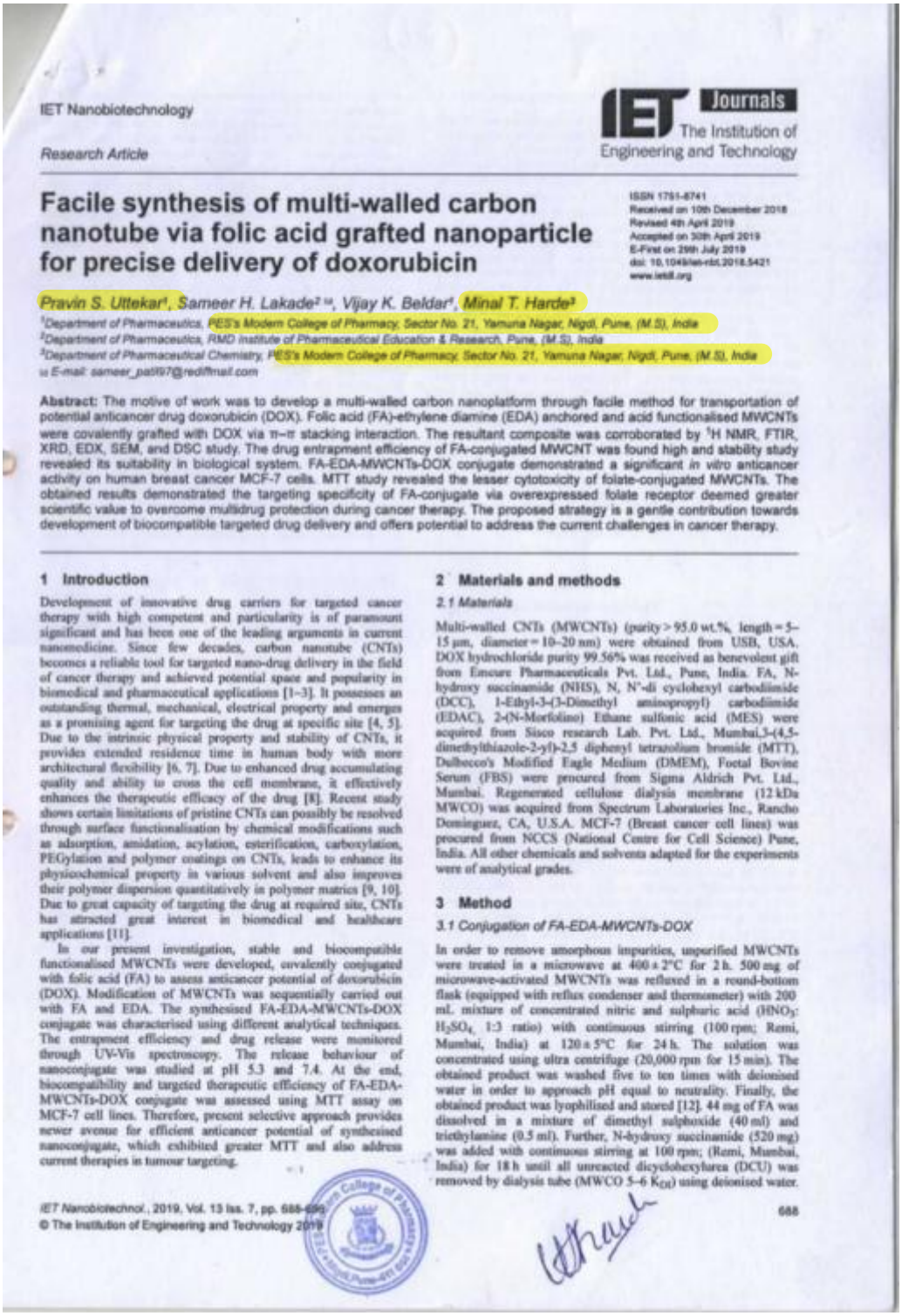
2 Materials and methods

2.1 Materials

ETOX was received as a benevolent gift from Intas Pharma Pvt. Ltd, Ahmedabad, 3-aminopropyltriethoxysilane (APTES), 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) was purchased from Sigma Aldrich, Germany. All the reagents and solvents used were of analytical grade.

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Facile synthesis of Multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin



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Facile synthesis of multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin

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Abstract: The motive of work was to develop a multi-walled carbon nanoplatform through facile method for transportation of potential anticancer drug doxorubicin (DOX). Folic acid (FA)-ethylene diamine (EDA) anchored and acid functionalised MWCNTs were covalently grafted with DOX via π–π stacking interaction. The resultant composite was corroborated by ^{1}H NMR, FTIR, XRD, EDX, SEM, and DSC study. The drug entrapment efficiency of FA-conjugated MWCNT was found high and stability study revealed its suitability in biological system. FA-EDA-MWCNTs-DOX conjugate demonstrated a significant *in vitro* anticancer activity on human breast cancer MCF-7 cells. MTT study revealed the lesser cytotoxicity of folate-conjugated MWCNTs. The obtained results demonstrated the targeting specificity of FA-conjugate via overexpressed folate receptor deemed greater scientific value to overcome multidrug protection during cancer therapy. The proposed strategy is a gentle contribution towards development of biocompatible targeted drug delivery and offers potential to address the current challenges in cancer therapy.

1 Introduction

Development of innovative drug carriers for targeted cancer therapy with high competent and particularity is of paramount significant and has been one of the leading arguments in current nanomedicine. Since few decades, carbon nanotube (CNTs) becomes a reliable tool for targeted nano-drug delivery in the field of cancer therapy and achieved potential space and popularity in biomedical and pharmaceutical applications [1–3]. It possesses an outstanding thermal, mechanical, electrical property and emerges as a promising agent for targeting the drug at specific site [4, 5]. Due to the intrinsic physical property and stability of CNTs, it provides extended residence time in human body with more architectural flexibility [6, 7]. Due to enhanced drug accumulating quality and ability to cross the cell membrane, it effectively enhances the therapeutic efficacy of the drug [8]. Recent study shows certain limitations of pristine CNTs can possibly be resolved through surface functionalisation by chemical modifications such as adsorption, amidation, acylation, esterification, carboxylation, PEGylation and polymer coatings on CNTs, leads to enhance its physicochemical property in various solvent and also improves their polymer dispersion quantitatively in polymer matrics [9, 10]. Due to great capacity of targeting the drug at required site, CNTs has attracted great interest in biomedical and healthcare applications [11].

In our present investigation, stable and biocompatible functionalised MWCNTs were developed, covalently conjugated with folic acid (FA) to assess anticancer potential of doxorubicin (DOX). Modification of MWCNTs was sequentially carried out with FA and EDA. The synthesised FA-EDA-MWCNTs-DOX conjugate was characterised using different analytical techniques. The entrapment efficiency and drug release were monitored through UV-Vis spectroscopy. The release behaviour of nanoconjugate was studied at pH 5.3 and 7.4. At the end, biocompatibility and targeted therapeutic efficiency of FA-EDA-MWCNTs-DOX conjugate was assessed using MTT assay on MCF-7 cell lines. Therefore, present selective approach provides newer avenue for efficient anticancer potential of synthesised nanoconjugate, which exhibited greater MTT and also address current therapies in tumour targeting.

2 Materials and methods

2.1 Materials

Multi-walled CNTs (MWCNTs) (purity > 95.0 wt.%, length = 5–15 μm, diameter = 10–20 nm) were obtained from USB, USA. DOX hydrochloride purity 99.56% was received as benevolent gift from Emcure Pharmaceuticals Pvt. Ltd., Pune, India. FA, N-hydroxy succinamide (NHS), N, N′-di cyclohexyl carbodiimide (DCC), 1-Ethyl-3-(3-Dimethyl aminopropyl) carbodiimide (EDAC), 2-(N-Morfolino) Ethane sulfonic acid (MES) were acquired from Sisco research Lab. Pvt. Ltd., Mumbai,3-(4,5-dimethylthiazole-2-yl)-2,5 diphenyl tetrazolium bromide (MTT), Dulbecco's Modified Eagle Medium (DMEM), Foetal Bovine Serum (FBS) were procured from Sigma Aldrich Pvt. Ltd., Mumbai. Regenerated cellulose dialysis membrane (12 kDa MWCO) was acquired from Spectrum Laboratories Inc., Rancho Dominguez, CA, U.S.A. MCF-7 (Breast cancer cell lines) was procured from NCCS (National Centre for Cell Science) Pune, India. All other chemicals and solvents adapted for the experiments were of analytical grades.

3 Method

3.1 Conjugation of FA-EDA-MWCNTs-DOX

In order to remove amorphous impurities, unpurified MWCNTs were treated in a microwave at 400 ± 2°C for 2 h. 500 mg of microwave-activated MWCNTs was refluxed in a round-bottom flask (equipped with reflux condenser and thermometer) with 200 mL mixture of concentrated nitric and sulphuric acid (HNO_3: H_2SO_4 1:3 ratio) with continuous stirring (100 rpm; Remi, Mumbai, India) at 120 ± 5°C for 24 h. The solution was concentrated using ultra centrifuge (20,000 rpm for 15 min). The obtained product was washed five to ten times with deionised water in order to approach pH equal to neutrality. Finally, the obtained product was lyophilised and stored [12]. 44 mg of FA was dissolved in a mixture of dimethyl sulphoxide (40 ml) and triethylamine (0.5 ml). Further, N-hydroxy succinamide (520 mg) was added with continuous stirring at 100 rpm; (Remi, Mumbai, India) for 18 h until all unreacted dicyclohexyurea (DCU) was removed by dialysis tube (MWCO 5–6 K_{DA}) using deionised water.

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Synthesis of mesoporous alumina: an impact of surface chemistry on release behavior

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Synthesis of mesoporous alumina: an impact of surface chemistry on release behavior

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ABSTRACT

The present investigation describes the successful synthesis of mesoporous alumina (MeAl) nanoparticles for controlled drug delivery via a soft template route have been adopted using hexadecyltrimethyl ammonium bromide as template and aluminum chloride as precursor. The obtained Langmuir type II isotherm for MeAl showed P/Po 0.1 at 10 cm^3/G STP. The Brunauer-Emmett-Teller study revealed the formation of uniform morphology and mesoporous structure. The fourier transform infrared spectroscopy study confirmed the presence of characteristic peaks of mesoporous alumina. Elemental analysis demonstrated the substantial Al and O peak supported with nanosized crumb with cluster by field emission scanning electron microscopy. The transmission electron microscopy indicates wormhole strikingly inter connected pore system assigned to functionalized MeAl. X-ray diffraction pattern suggests the formation of γ-Aluminum oxide. The particle size and surface charge of synthesized MeAl were successfully analyzed to assess the surface charge. The drug loading was confirmed by spectroscopic study with eloquent extension in drug release was found to be 74.44% attributed to release by control manner. In present study, synthesized MeAl holds an excellent compassionate impact on particle size and exterior chemistry for sustained release of model drug.

KEYWORDS
Mesoporous; FESEM; adsorption; functionalization; particle characteristics

1. Introduction

Mesoporous Alumina (MeAl), a novel member of molecular sieve family kindled worldwide resurgence in the field of inorganic solid mesoporous materials. Porous material plays fundamental role in a variety of scientific and industrial operations such as adsorption, separation, host-guest encapsulation and catalysis etc (Liu et al. 2013). The architecture and remarkable properties of unique mesoporous structure of MeAl have fascinated ample attention in the former decades due to promising biomedical applications and rapid expansion in an area such as tissue engineering, DNA sequencing, photonics etc (Zhang et al. 2009; Biumen, Cheng, and Ramos 2007). In consonance to International Union of Pure and Applied Chemistry (IUPAC), pores are categorized as micropore, mesopore and macropore depends on their varying particle sizes(<2 nm, between 2 nm and 50 nm,> 50 nm) (Zdravkov et al. 2007). The nature of porous material may be inorganic, organic or possesses both properties with technological significance. The porous material represents capability to link with atoms, molecule or ions to load the solid, liquid or gaseous chemical entities (Zhao 2006). Based on above dominance, mesoporous material emerged as talented host for extensive range of companion molecules like proteins (Vinu et al. 2004; Vinu, Murugesan and Hartmann 2004) drugs (Regi, Ramila and Del 2001) and smaller biological molecules(Anderson, Rosenholm and Areva 2004). Conventionally, High-surface-area transition alumina or activated alumina have been used as a porous alumina. However, the limited performance of MeAl identified may be due to deactivation during catalysis have been by pore plugging or coke formation in micropores. Therefore, the requirement was to synthesize alumina having ordered, uniform and tunable pore diameter. Thus, the successfully synthesized alumina showed remarkable properties such as controlled porosity, high thermal and mechanical stability, chemical inertness and tunable surface chemistry has made MeAl as excellent host for large drug loading and controlled release in an area of biomedicine (Kim et al. 2003; Ramli and Saleh 2008). The swift evaluation of sol-gel approach during former two decades has drive electric breakthrough in deliberate synthesis of porous materials. Sol-gel is an inexpensive method serves straightforward tailor substitute for traditional synthesis method. In comparison to traditional procedure, this lenient method provides outcome of mixed oxides with low cost and enhanced homogeneity. The sol-gel method produced

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REVIEW ARTICLE OPEN ACCESS

Surface Engineered New Approach for Mesoporous Alumina and Nanoparticles - A Review

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ABSTRACT

Mesoporous materials have been widely used in redesigning pharmaceutical formulations for determination of its pharmacokinetic characteristics. They have demonstrated great advantages in providing well controlled surface area, pore size, pore volume and have become notice in distinct fields counting electronics, separation, catalysis etc. Compared with microporous materials, they present improvement in molecular mass transfer thus allowing larger reactant molecules involved in the reaction systems. Our major emphasis is to give a centred around information about factors influencing the characteristics of mesoporous material and most preferred method of choice for the synthesis of mesoporous material.

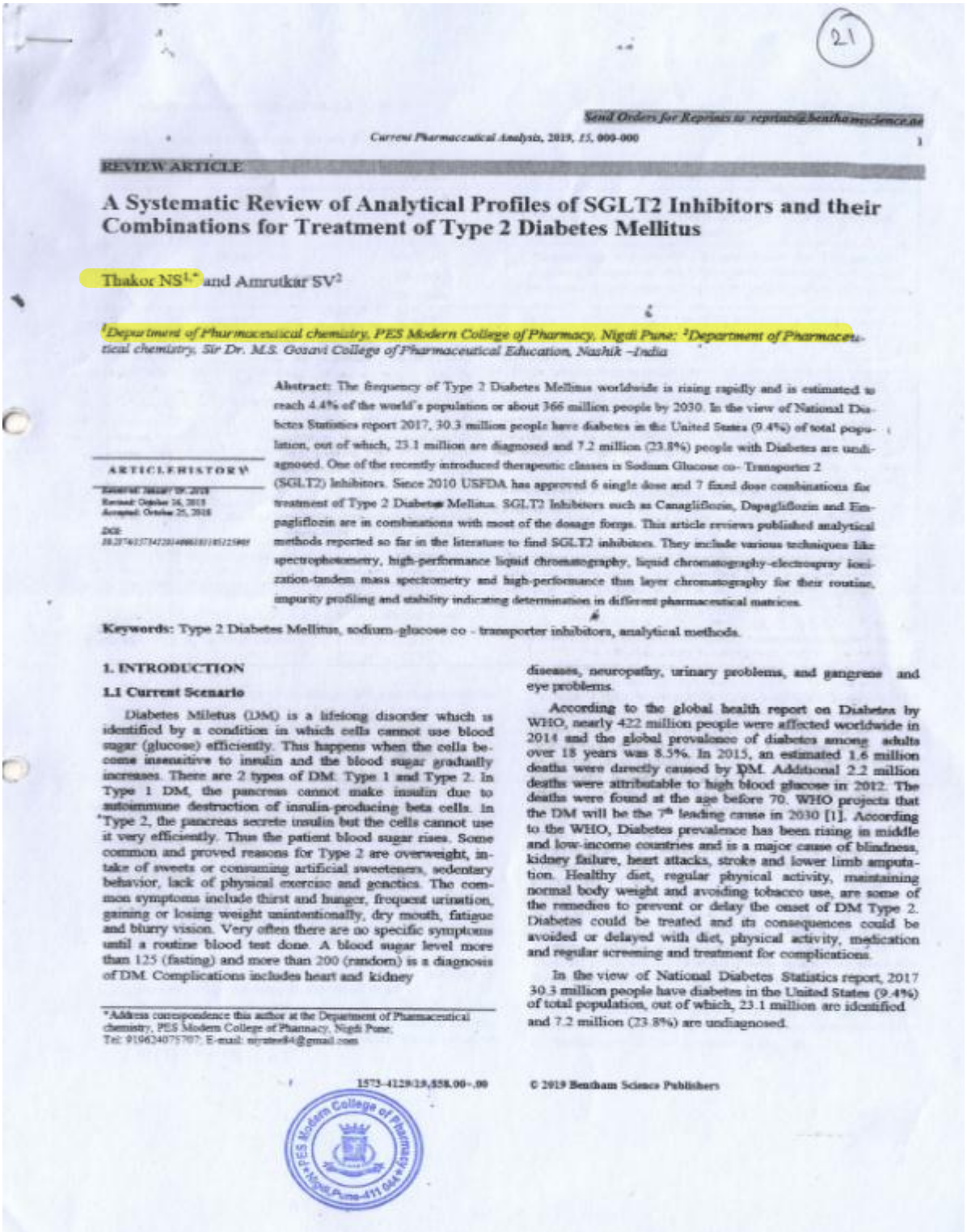
Keyword : *Mesoporous, Pore size, Sol-gel, Synthesis, Mechanism*

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INTRODUCTION

Emerging research interest has been devoted to the field of mesoporous inorganic nanoparticle synthesis. Inorganic nanoparticles can be interpret as particles of metal oxide or metallic composition possessing at least one length scale in the nanometer range. The mesoporous structure offers increased surface area as a result of its intricate and structured network of pores. The preparation of mesoporous alumina (MpAl) with high surface area a uniform pore structure and narrow pore size distribution is of great interest for both technological applications as well as fundamental research. MpAl is superior to mesoporous silica (MpSi) because of its high hydrolytic stability along with a different point of zero charge which makes it suitable platform for loading different metal species. The performance of conventional MpAl however, is limited because of its uncontrolled porosity and deactivation by choking and plugging that hinders the diffusion of reactants and products.According to the International Union of Pure and Applied Chemistry (IUPAC) rules, pores are classified as micropores when their diameter d is in the range of 0.2–2 nm, mesopores when 2 nm $<d<$ 50 nm, or macropores when $d >$ 50 nm. Porous alumina, owing to their thermal, chemical, mechanical stability and low cost are extensively used in catalysis, adsorption, and separation.[1,2] In general the control of pore geometry and size is crucial to adjust their performance in these applications especially in case rely on size or shape selectivity.Porous alumina is most vital engineering material extensively used in catalysis, adsorption, and separation. Traditionally, transition alumina or activated alumina has been used as porous alumina, but there is a problem of deactivation in catalysis by pore plugging due to coke formation in micropores.[3] Therefore, it is desirable to have alumina with mesopores in narrow size distribution. Thus, the synthesis of mesoporous alumina with controlled porosity and high thermal stability has been actively pursued. With the advent of mesoporous materials the synthesis of mesoporous alumina with high surface area and narrow pore size distribution is promising for application enhancement of porous alumina.[4].

A systematic review of analytical profiles of SGLT-2 inhibitors and there combination for the treatment of type 2 DM



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Current Pharmaceutical Analysis, 2019, 15, 000-000

REVIEW ARTICLE

A Systematic Review of Analytical Profiles of SGLT2 Inhibitors and their Combinations for Treatment of Type 2 Diabetes Mellitus

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ARTICLE HISTORY

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Abstract: The frequency of Type 2 Diabetes Mellitus worldwide is rising rapidly and is estimated to reach 4.4% of the world's population or about 366 million people by 2030. In the view of National Diabetes Statistics report 2017, 30.3 million people have diabetes in the United States (9.4%) of total population, out of which, 23.1 million are diagnosed and 7.2 million (23.8%) people with Diabetes are undiagnosed. One of the recently introduced therapeutic classes is Sodium Glucose co- Transporter 2 (SGLT2) Inhibitors. Since 2010 USFDA has approved 6 single dose and 7 fixed dose combinations for treatment of Type 2 Diabetes Mellitus. SGLT2 Inhibitors such as Canagliflozin, Dapagliflozin and Empagliflozin are in combinations with most of the dosage forms. This article reviews published analytical methods reported so far in the literature to find SGLT2 inhibitors. They include various techniques like spectrophotometry, high-performance liquid chromatography, liquid chromatography-electrospray ionization-tandem mass spectrometry and high-performance thin layer chromatography for their routine, impurity profiling and stability indicating determination in different pharmaceutical matrices.

Keywords: Type 2 Diabetes Mellitus, sodium-glucose co - transporter inhibitors, analytical methods.

1. INTRODUCTION

1.1 Current Scenario

Diabetes Miletus (DM) is a lifelong disorder which is identified by a condition in which cells cannot use blood sugar (glucose) efficiently. This happens when the cells become insensitive to insulin and the blood sugar gradually increases. There are 2 types of DM: Type 1 and Type 2. In Type 1 DM, the pancreas cannot make insulin due to autoimmune destruction of insulin-producing beta cells. In Type 2, the pancreas secrete insulin but the cells cannot use it very efficiently. Thus the patient blood sugar rises. Some common and proved reasons for Type 2 are overweight, intake of sweets or consuming artificial sweeteners, sedentary behavior, lack of physical exercise and genetics. The common symptoms include thirst and hunger, frequent urination, gaining or losing weight unintentionally, dry mouth, fatigue and blurry vision. Very often there are no specific symptoms until a routine blood test done. A blood sugar level more than 125 (fasting) and more than 200 (random) is a diagnosis of DM. Complications includes heart and kidney diseases, neuropathy, urinary problems, and gangrene and eye problems.

According to the global health report on Diabetes by WHO, nearly 422 million people were affected worldwide in 2014 and the global prevalence of diabetes among adults over 18 years was 8.5%. In 2015, an estimated 1.6 million deaths were directly caused by DM. Additional 2.2 million deaths were attributable to high blood glucose in 2012. The deaths were found at the age before 70. WHO projects that the DM will be the 7th leading cause in 2030 [1]. According to the WHO, Diabetes prevalence has been rising in middle and low-income countries and is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation. Healthy diet, regular physical activity, maintaining normal body weight and avoiding tobacco use, are some of the remedies to prevent or delay the onset of DM Type 2. Diabetes could be treated and its consequences could be avoided or delayed with diet, physical activity, medication and regular screening and treatment for complications.

In the view of National Diabetes Statistics report, 2017 30.3 million people have diabetes in the United States (9.4%) of total population, out of which, 23.1 million are identified and 7.2 million (23.8%) are undiagnosed.

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Simultaneius estimation of Empagliflozin and Metformin by HPTLC using quality by design approach

22

Simultaneous Estimation of Empagliflozin and Metformin by High-Performance Thin-Layer Chromatography Using Quality-by-Design Approach

Niyatee Saurabh Thakor*, Sunil V. Amrutkar, and Praveen D. Chaudhari

Key Words:

Empagliflozin
Metformin
High-performance thin-layer chromatography
Design of experiments
Quality by design
Response surface

Summary

The present research work highlights the benefits of analytical quality-by-design (QbD) approach to optimize high-performance thin-layer chromatography (HPTLC) method for the simultaneous quantification of empagliflozin and metformin in fixed dose combination. With a QbD model, the present study endeavors to establish the method operable design region (MODR) for optimization of the HPTLC method assay by means of design of experiments (DOE) and response surface methodology, in order to achieve a good separation and quantification of all analyzed compounds along with an acceptable analysis time. A deep understanding of the quality target product profile (QTPP) and of the analytical target profile (ATP), followed by a risk assessment for variables that affect the efficiency of the method, led to the development of a precise, accurate, and cost-effective method. The method was established on pre-coated silica gel 60 F_{254} aluminum plates using ammonium acetate (2%)–methanol–acetonitrile–ethyl acetate (3:1:4.5:1.5) as the mobile phase at a detection wavelength of 228 nm. Numerical optimization was performed using the Derringer's desirability approach and ANOVA to develop optimized chromatography. The R_f values were 0.49 and 0.81 for metformin and empagliflozin, respectively. The limits of detection for empagliflozin and metformin were found to be 3.40 ng per band and 100.7 ng per band, respectively, while the limits of quantification for empagliflozin and metformin were found to be 10.55 ng per band and 330.54 ng per band, respectively. The intra- and inter-day precisions were less than 2%, with accuracies between 98 and 102% of the true values. The method was successfully applied to quantify empagliflozin and metformin in fixed dose combinations.

1 Introduction

For any analytical method, its life cycle consists of method design, development, validation, and transfer. There are two types of approaches used for the development of an analytical method. The first one is the trial-based approach (one factor at a time), and the other is the quality-by-design (QbD) approach [1]. The regulatory authorities have increased their awareness on life cycle management for analytical methods. The International Conference on Harmonisation (ICH) [2–5] guidelines as well as the United States Pharmacopoeial (USP) Forum [6] discussed the enrollment of new guidelines that include the life cycle management of analytical methods. The USP Validation and Verification expert panel already proposed a new *General* Chapter 1220 "The Analytical Procedure Lifecycle" for integration into USP. The application of lifecycle management concepts to analytical procedures provides an opportunity to use the knowledge gained from the application of scientific and quality risk management to continuous improvement and assurance of the method performance [7].

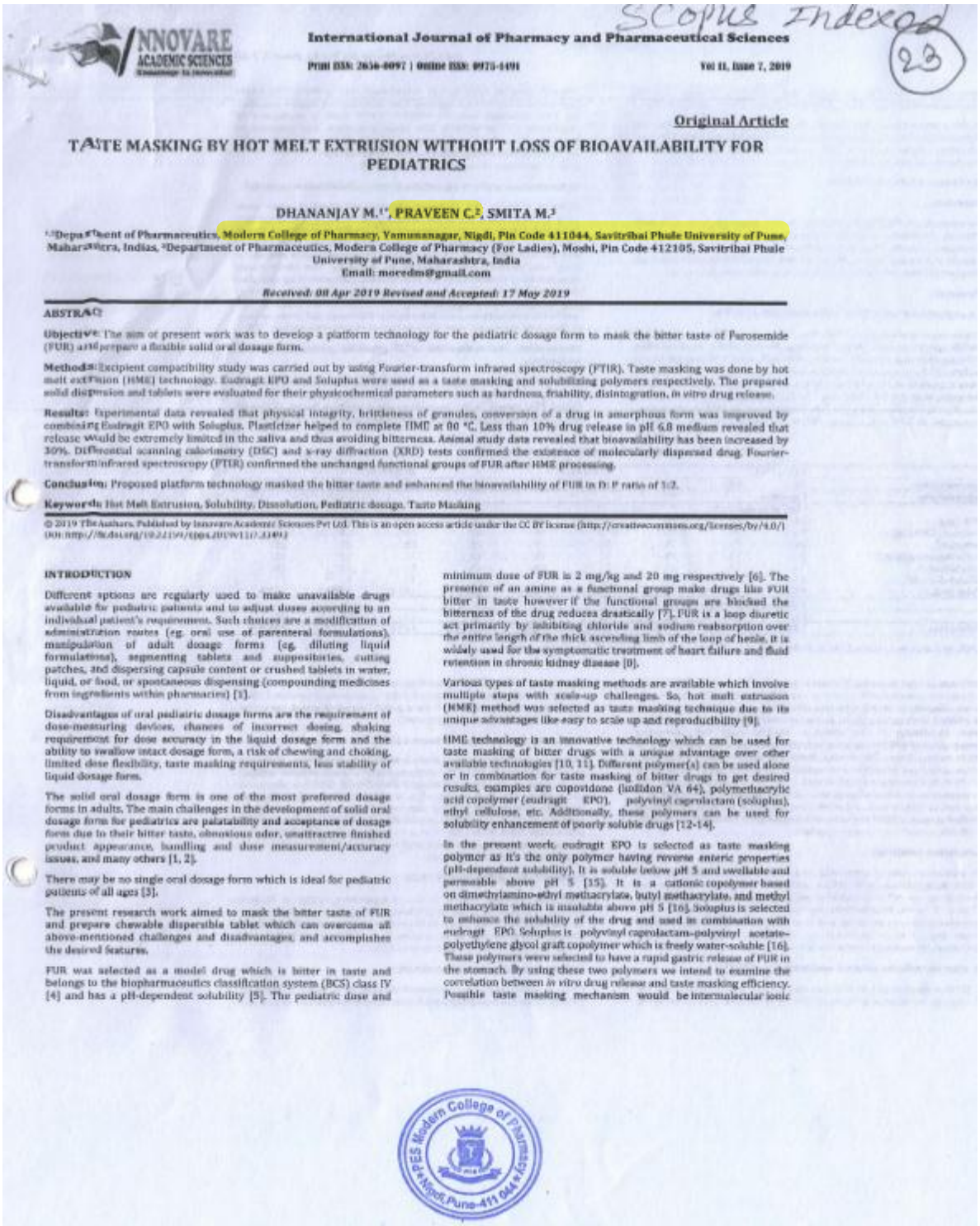
QbD-based method development results in increased method robustness. Thereby, a decreased effort is needed for method performance verification and post-approval changes as well as minimized risk of method-related out-of-specification results. This strongly contributes to the reduced costs of the method during its life cycle. To understand the method performance and its critical parameters, chemometric tools play an important role. The literature review suggests that factorial designs like full or fractional factorial can be applied to optimize the method. Typical examples are the widespread use of the Plackett–Burman design, central composite design, and Box–Behnken design [8]. There are many methods reported for the estimation of empagliflozin (EMPA) and metformin (MET) alone or in combined dosage forms [9]. However, none of these methods is based on high-performance thin-layer chromatography (HPTLC) using the QbD approach. Thus, the purpose of this research work is to develop an HPTLC method for the simultaneous estimation of empagliflozin and metformin using the design of experiments.

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Taste masking by hot melt extrusion without loss of bioavailability for prdiatrics



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Original Article

TASTE MASKING BY HOT MELT EXTRUSION WITHOUT LOSS OF BIOAVAILABILITY FOR PEDIATRICS

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ABSTRACT

Objective: The aim of present work was to develop a platform technology for the pediatric dosage form to mask the bitter taste of Furosemide (FUR) and prepare a flexible solid oral dosage form.

Methods: Excipient compatibility study was carried out by using Fourier-transform infrared spectroscopy (FTIR). Taste masking was done by hot melt extrusion (HME) technology. Eudragit EPO and Soluplus were used as a taste masking and solubilizing polymers respectively. The prepared solid dispersion and tablets were evaluated for their physicochemical parameters such as hardness, friability, disintegration, in vitro drug release.

Results: Experimental data revealed that physical integrity, brittleness of granules, conversion of a drug in amorphous form was improved by combining Eudragit EPO with Soluplus. Plasticizer helped to complete HME at 80 °C. Less than 10% drug release in pH 6.8 medium revealed that release would be extremely limited in the saliva and thus avoiding bitterness. Animal study data revealed that bioavailability has been increased by 30%. Differential scanning calorimetry (DSC) and x-ray diffraction (XRD) tests confirmed the existence of molecularly dispersed drug. Fourier-transform infrared spectroscopy (FTIR) confirmed the unchanged functional groups of FUR after HME processing.

Conclusion: Proposed platform technology masked the bitter taste and enhanced the bioavailability of FUR in D: P ratio of 1:2.

Keywords: Hot Melt Extrusion, Solubility, Dissolution, Pediatric dosage, Taste Masking

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INTRODUCTION

Different options are regularly used to make unavailable drugs available for pediatric patients and to adjust doses according to an individual patient's requirement. Such choices are a modification of administration routes (eg. oral use of parenteral formulations), manipulation of adult dosage forms (eg. diluting liquid formulations), segmenting tablets and suppositories, cutting patches, and dispersing capsule content or crushed tablets in water, liquid, or food, or spontaneous dispensing (compounding medicines from ingredients within pharmacies) [1].

Disadvantages of oral pediatric dosage forms are the requirement of dose-measuring devices, chances of incorrect dosing, shaking requirement for dose accuracy in the liquid dosage form and the ability to swallow intact dosage form, a risk of chewing and choking, limited dose flexibility, taste masking requirements, less stability of liquid dosage form.

The solid oral dosage form is one of the most preferred dosage forms in adults. The main challenges in the development of solid oral dosage form for pediatrics are palatability and acceptance of dosage form due to their bitter taste, obnoxious odor, unattractive finished product appearance, handling and dose measurement/accuracy issues, and many others [1, 2].

There may be no single oral dosage form which is ideal for pediatric patients of all ages [3].

The present research work aimed to mask the bitter taste of FUR and prepare chewable dispersible tablet which can overcome all above-mentioned challenges and disadvantages, and accomplishes the desired features.

FUR was selected as a model drug which is bitter in taste and belongs to the biopharmaceutics classification system (BCS) class IV [4] and has a pH-dependent solubility [5]. The pediatric dose and minimum dose of FUR is 2 mg/kg and 20 mg respectively [6]. The presence of an amine as a functional group make drugs like FUR bitter in taste however if the functional groups are blocked the bitterness of the drug reduces drastically [7]. FUR is a loop diuretic act primarily by inhibiting chloride and sodium reabsorption over the entire length of the thick ascending limb of the loop of henle, it is widely used for the symptomatic treatment of heart failure and fluid retention in chronic kidney disease [8].

Various types of taste masking methods are available which involve multiple steps with scale-up challenges. So, hot melt extrusion (HME) method was selected as taste masking technique due to its unique advantages like easy to scale up and reproducibility [9].

HME technology is an innovative technology which can be used for taste masking of bitter drugs with a unique advantage over other available technologies [10, 11]. Different polymer(s) can be used alone or in combination for taste masking of bitter drugs to get desired results, examples are copovidone (kollidon VA 64), polymethacrylic acid copolymer (eudragit EPO), polyvinyl caprolactam (soluplus), ethyl cellulose, etc. Additionally, these polymers can be used for solubility enhancement of poorly soluble drugs [12-14].

In the present work, eudragit EPO is selected as taste masking polymer as it's the only polymer having reverse enteric properties (pH-dependent solubility). It is soluble below pH 5 and swellable and permeable above pH 5 [15]. It is a cationic copolymer based on dimethylamino-ethyl methacrylate, butyl methacrylate, and methyl methacrylate which is insoluble above pH 5 [16]. Soluplus is selected to enhance the solubility of the drug and used in combination with eudragit EPO. Soluplus is polyvinyl caprolactam-polyvinyl acetate-polyethylene glycol graft copolymer which is freely water-soluble [16]. These polymers were selected to have a rapid gastric release of FUR in the stomach. By using these two polymers we intend to examine the correlation between in vitro drug release and taste masking efficiency. Possible taste masking mechanism would be intermolecular ionic

Naphthyridine derivative and their anti-mycobacterium activity

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Current Trends in Pharmacy and Pharmaceutical Chemistry
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Review Article

Naphthyridine derivatives and their anti-mycobacterial activity

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ABSTRACT

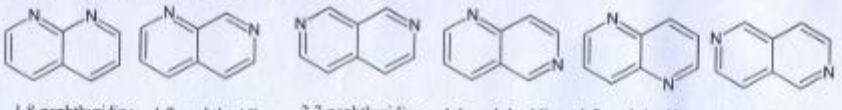
Tuberculosis (TB) treatment is one of the challenges of drug discovery of the 21st century. For tuberculosis treatment, there is a need for anti-TB drugs with improved efficacy, less toxicity as compared to current drug therapy. Naphthyridine derivatives are reported to show antitubercular and Naphthyridine is a versatile lead molecule for designing of the potential anti-tubercular agent. Naphthyridine derivatives have shown interesting anti-TB activities but they are not explored for anti-TB activity sufficiently. The current review outlines Naphthyridine derivatives with potential anti-mycobacterial activity.

KEYWORDS
Naphthyridine, anti-mycobacterial.

Introduction:

Effective Anti-tuberculosis treatment is the need at the current situation because many people across the world suffering from the tuberculosis infection. About 2.79 million people living with tuberculosis and new infection are also significantly high. Around 200000 tuberculosis-related deaths are reported in India each year. [1] [2]

Napthyrides are versatile nuclei, specifically 1,8 naphthyridine derivatives are being synthesized and tested in the literature. [4]



1,8-naphthyridine 1,7-naphthyridine 2,7-naphthyridine 1,6-naphthyridine 1,5-naphthyridine 2,6-naphthyridine

Figure 1. Naphthyridines

Ameliorative effects of Gentisic acid on carboplatin induced hematological toxicities in Wistar Rats

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Ameliorative effects of Gentisic acid on carboplatin induced hematological toxicities in Wistar Rats

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Abstract : Hematological toxicity is a frequent and severe adverse effect of carboplatin chemotherapy, limiting its clinical use despite being one of the most potent anticancer agents. The present study was designed to evaluate the protective effects of a naturally occurring plant phenolic acids i.e. gentisic acid (2,5 dihyroxybenzoic acid) against carboplatin induced hematological toxicities in wistar rats. Exposure to carboplatin at a dose of 35 mg/kg caused significant decrease in hematological parameters of blood such as red blood cells, total leucocytes, platelets, neutrophills, basophills, lymphocytes and moncytes counts whereas increase in eosiphill counts rat blood indicating severe pancytopenia. Administration of gentisic acid at 10, 30 and 100 for 14 days resulted in a significant amelioration of altered blood parameters in a dose dependent manner indicating its potential as a protective agent for the prevention and amelioration of caboplatin induced hematological toxicities.
Key words : Gentisic acid; 2,5-Dihyroxybenzoic acid; Hematological toxicities; Carboplatin; Cancer chemotherapy; myelosuppression.

Introduction:

Cancer chemotherapy is associated with wide a range of side effects, adversely affecting patient health and quality of life. Myelosuppression remains the major toxicity encountered in the cytotoxic chemotherapy today leading to massive hypocellularity of the bone marrow by injuring hematopoitic progenitor stem cells resulting in depletion of red blood cells, white blood cells (leucopenia) and platelets (thrombocytopenia) thereby increasing the risk of anaemia, potentially fatal opportunistic infections, and uncontrolled hemorrhage, respectively, which proves to be life threatening to the patients.[1-3] This in turn requires limiting the dosage and frequency of the drug to overcome these complications, decreased its efficacy.[4]

Carboplatin (cis-diammine [1,1-cyclobutanedicarboxylato]-platinum [II]), a new platinum complex is currently used in oncology clinics for the treatment of a variety of cancers such as ovarian cancer, lung cancer and head and neck cancer. The clinical use of carboplatin (CP) has been associated with various toxicities including nephrotoxicity, neurotoxicity and ototoxicity. One of the dose-limiting toxicities in patients receiving

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Development and Evaluation of a Novel Drug Delivery System for Albendazole

National / Peer-reviewed / Indexed in Web of Science / ISSN : 0019-5464 / Impact factor = 0.250 (1)

Original Article

Development and Evaluation of a Novel Drug Delivery System for Albendazole

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ABSTRACT

Introduction: The main objective of the present study was to develop and evaluate long circulating pegylated niosomal formulation of albendazole (ABZ). It was hypothesized thatpegylated niosomes would increase the systemic residence time of albendazole in the treatment of echinococcosis thus obviating frequent doses of albendazole. **Materials and methods:** ABZ was received as a gift sample from SeQuent Scientific Limited, Mahad. Span 60 niosomes pegylated with Distearoyl-sn-glycero-3-phosphoethanolamine (DSPE-PEG procured from Sigma Aldrich) were prepared by ethanol injection method. They were evaluated for particle size, entrapment efficiency, zeta potential, *in-vitro* release and pharmacokinetic study. **Results and discussion:** The pegylated niosomes were 296.39 ± 0.62 nm in size and spherical in nature. The nanosize of the niosomes will probably help in targeting the site of treatment of echinococcosis. Zeta potential, encapsulation efficiency and *in-vitro* release were 3.44 mV, 98.97% w/v and 92.93% w/v respectively. T90 of pegylated niosomes was found to be twice (1440.8 min) as that of free dug (720.2 min). Thus pegylated niosomes prolonged the release of albendazole. Hemolysis produced was less than 3%; thus niosomes proved safe for intravenous injection. **Conclusion:** Developed pegylated niosomes have potential in the treatment of echinococcosis and hydatid cysts. These niosomes will probably reduce the frequency of administration of albendazole.

Key words: Niosomes, Prolonged release, PEG-DSPE, Pegylation, Albendazole,

INTRODUCTION

Alveolar echinococcosis (AE) is a potentially fatal, chronically progressive parasitic infection characterized by a long asymptomatic period and development of an invasive tumor-like lesion throughout this period. Early diagnosis of AE is very difficult because of long latent or asymptomatic period which may be as long as 20 years. The clinical diagnosis is based on patient history including epidemiological data, clinical findings, morphological lesions detected by imaging studies such as ultrasonography (US), computerized tomography (CT), magnetic resonance imaging (MRI), and immunodiagnostic tests such as the enzyme-linked immunosorbent assay, using purified echinococcus multilocularis antigen (Em2-ELISA) as a serodiagnostic marker.[1] Humans act as intermediate hosts for Echinococcus species and are infected when they ingest tapeworm eggs from the definitive host. The eggs may be eaten in foods such as vegetables, fruits or herbs, or drunk in contaminated water. They can also stick to the hands when a person pets an infected dog or cat, handles a wild animal or its carcass, or touches contaminated soil and vegetation.[2] Cysts formed in human body are often removed surgically. The success rate varies with the species of echinococcus and the location and size of the cyst(s).[3] Albendazole (ABZ), methyl [5-(propyl thio)-1-H-benzimidazol-2yl] carbamate, is a benzimidazole derivative effective in the

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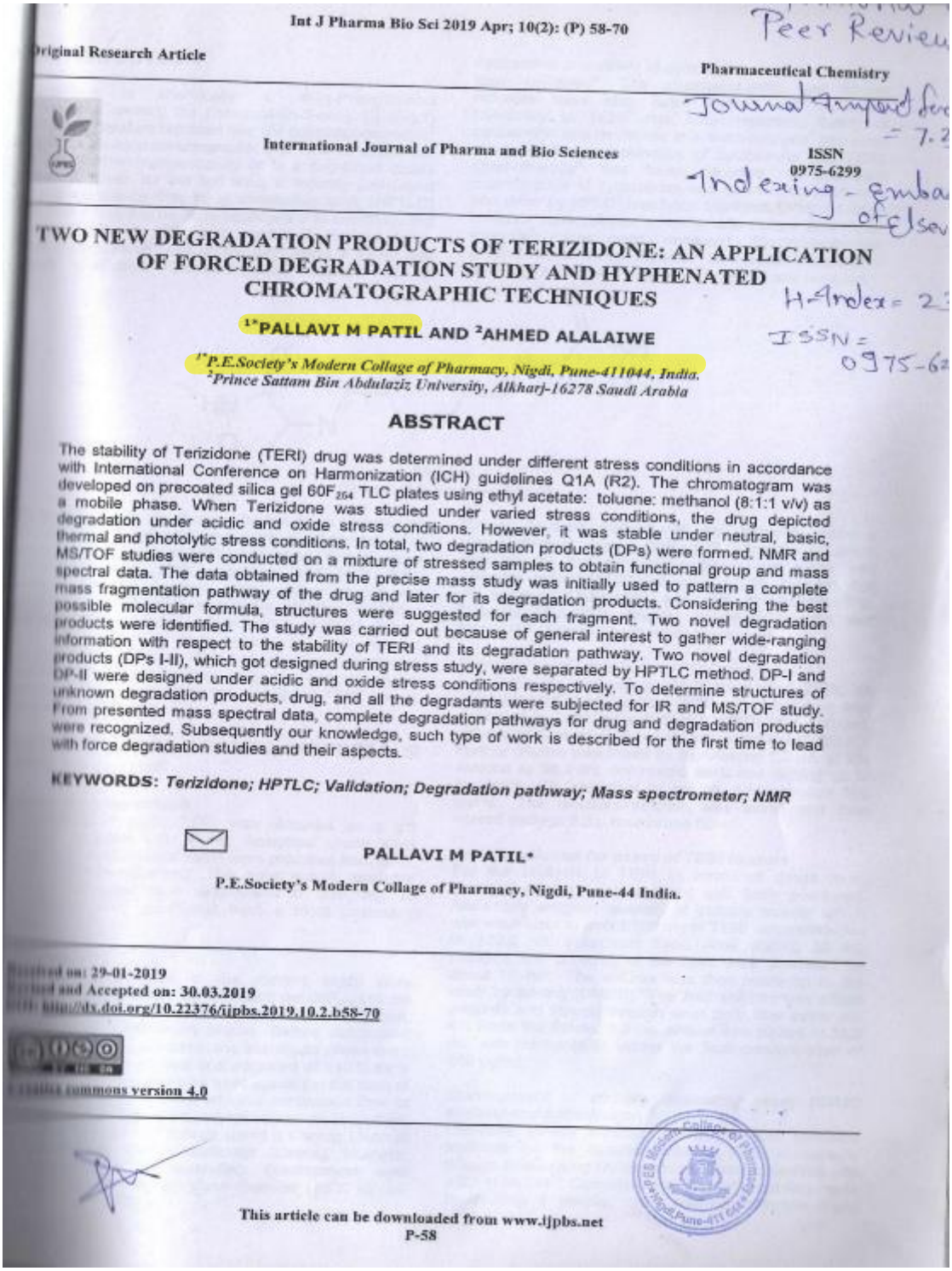
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Dr. K.S. Shaikh

Two New Degradation Product of Terizidone : an Application of Forced Degradation Study and Hyphenated Chromatographic Techniques



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Original Research Article

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TWO NEW DEGRADATION PRODUCTS OF TERIZIDONE: AN APPLICATION OF FORCED DEGRADATION STUDY AND HYPHENATED CHROMATOGRAPHIC TECHNIQUES

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ABSTRACT

The stability of Terizidone (TERI) drug was determined under different stress conditions in accordance with International Conference on Harmonization (ICH) guidelines Q1A (R2). The chromatogram was developed on precoated silica gel $60F_{254}$ TLC plates using ethyl acetate: toluene: methanol (8:1:1 v/v) as a mobile phase. When Terizidone was studied under varied stress conditions, the drug depicted degradation under acidic and oxide stress conditions. However, it was stable under neutral, basic, thermal and photolytic stress conditions. In total, two degradation products (DPs) were formed. NMR and MS/TOF studies were conducted on a mixture of stressed samples to obtain functional group and mass spectral data. The data obtained from the precise mass study was initially used to pattern a complete mass fragmentation pathway of the drug and later for its degradation products. Considering the best possible molecular formula, structures were suggested for each fragment. Two novel degradation products were identified. The study was carried out because of general interest to gather wide-ranging information with respect to the stability of TERI and its degradation pathway. Two novel degradation products (DPs I-II), which got designed during stress study, were separated by HPTLC method. DP-I and DP-II were designed under acidic and oxide stress conditions respectively. To determine structures of unknown degradation products, drug, and all the degradants were subjected for IR and MS/TOF study. From presented mass spectral data, complete degradation pathways for drug and degradation products were recognized. Subsequently our knowledge, such type of work is described for the first time to lead with force degradation studies and their aspects.

KEYWORDS: *Terizidone; HPTLC; Validation; Degradation pathway; Mass spectrometer; NMR*

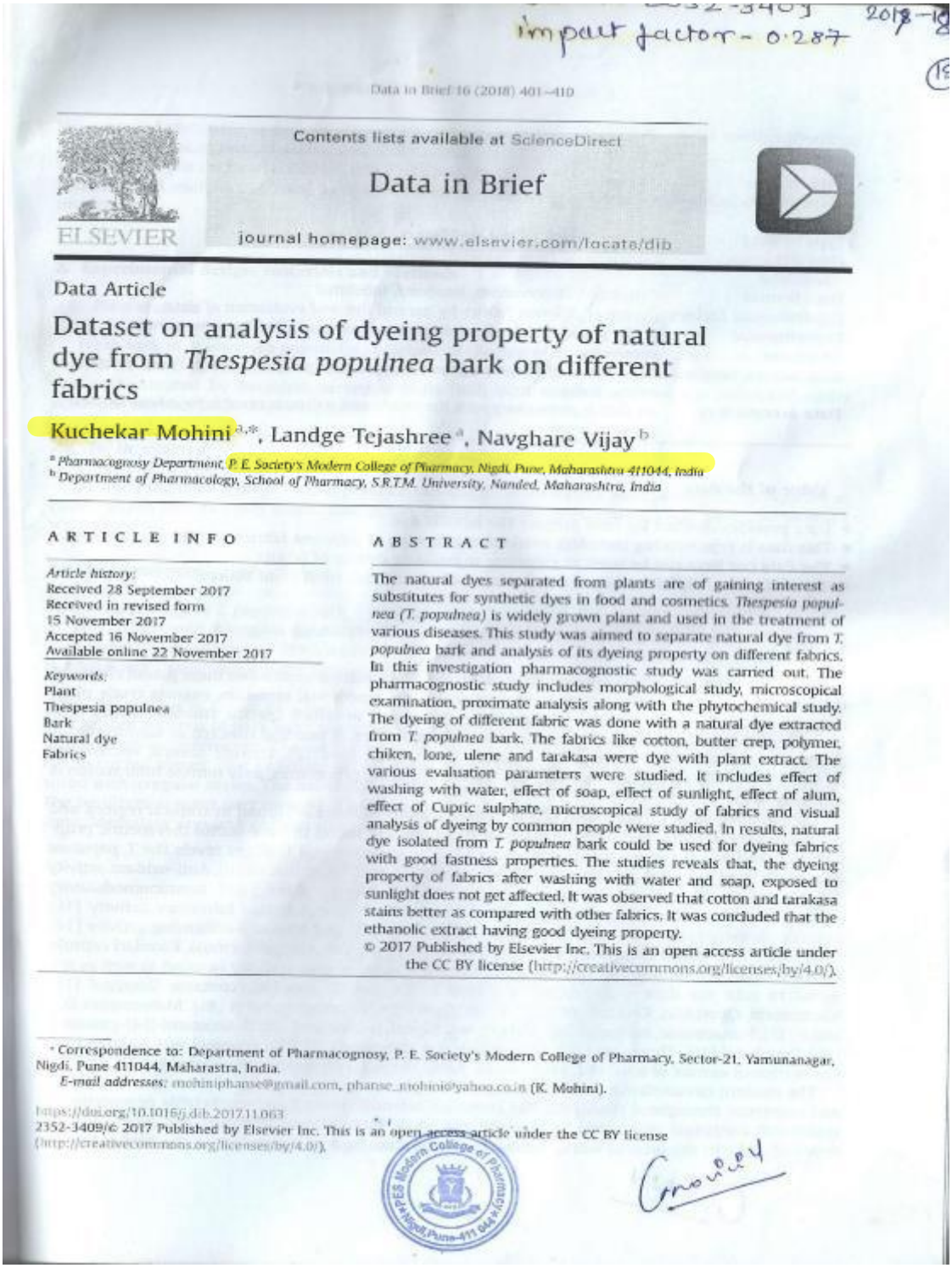
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Dataset on analysis of dyeing property of natural dye from Thespesiapopulnea bark on different fabrics



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Data Article

Dataset on analysis of dyeing property of natural dye from *Thespesia populnea* bark on different fabrics

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ABSTRACT

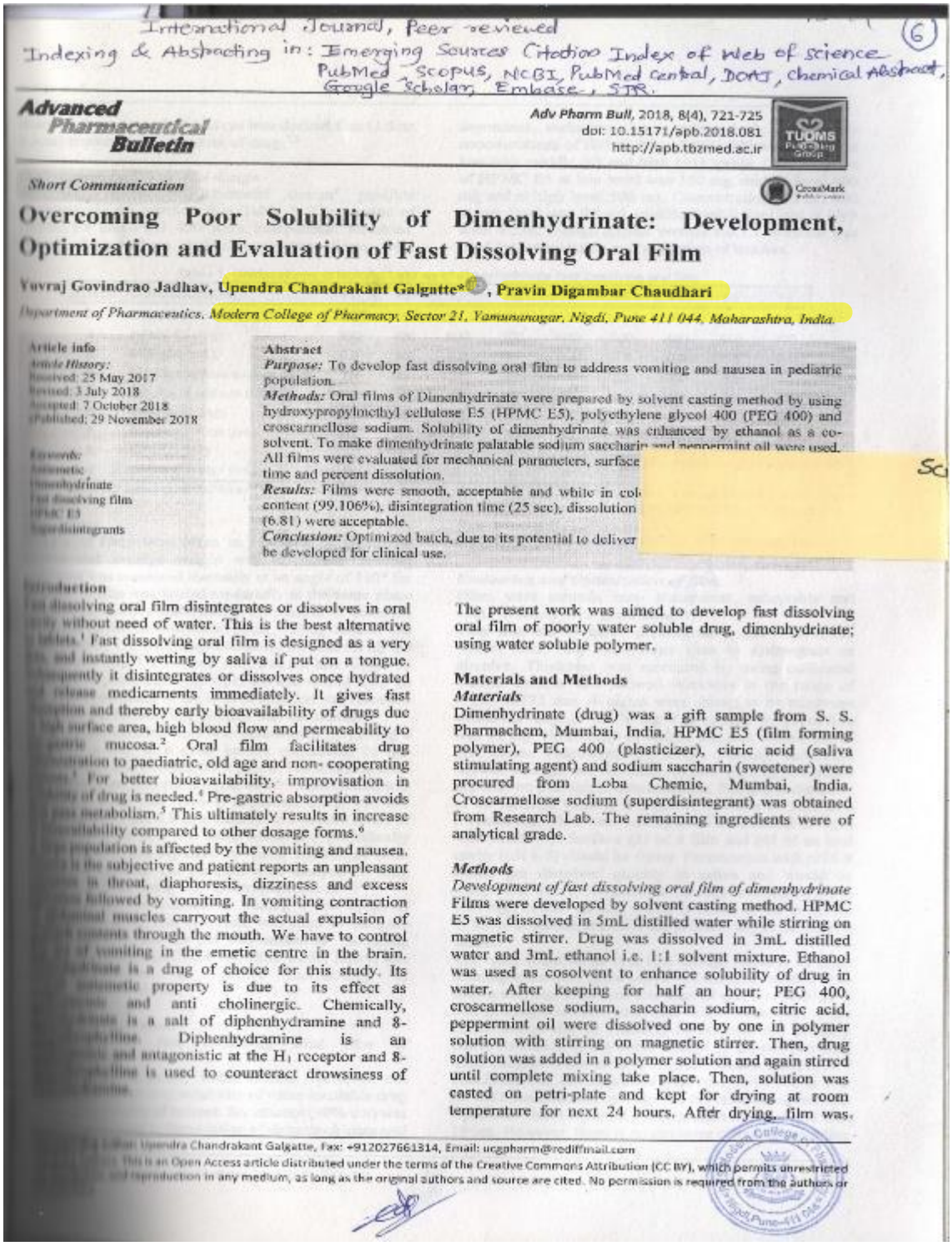
The natural dyes separated from plants are of gaining interest as substitutes for synthetic dyes in food and cosmetics. *Thespesia populnea (T. populnea)* is widely grown plant and used in the treatment of various diseases. This study was aimed to separate natural dye from *T. populnea* bark and analysis of its dyeing property on different fabrics. In this investigation pharmacognostic study was carried out. The pharmacognostic study includes morphological study, microscopical examination, proximate analysis along with the phytochemical study. The dyeing of different fabric was done with a natural dye extracted from *T. populnea* bark. The fabrics like cotton, butter crep, polymer, chiken, lone, ulene and tarakasa were dye with plant extract. The various evaluation parameters were studied. It includes effect of washing with water, effect of soap, effect of sunlight, effect of alum, effect of Cupric sulphate, microscopical study of fabrics and visual analysis of dyeing by common people were studied. In results, natural dye isolated from *T. populnea* bark could be used for dyeing fabrics with good fastness properties. The studies reveals that, the dyeing property of fabrics after washing with water and soap, exposed to sunlight does not get affected. It was observed that cotton and tarakasa stains better as compared with other fabrics. It was concluded that the ethanolic extract having good dyeing property.

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Overcoming poor solubility of dimenhydrinate: Development, optimization and evaluation of fast dissolving oral film



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Short Communication

Overcoming Poor Solubility of Dimenhydrinate: Development, Optimization and Evaluation of Fast Dissolving Oral Film

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HPMC E5
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Abstract

Purpose: To develop fast dissolving oral film to address vomiting and nausea in pediatric population.

Methods: Oral films of Dimenhydrinate were prepared by solvent casting method by using hydroxypropylmethyl cellulose E5 (HPMC E5), polyethylene glycol 400 (PEG 400) and croscarmellose sodium. Solubility of dimenhydrinate was enhanced by ethanol as a co-solvent. To make dimenhydrinate palatable sodium saccharin and peppermint oil were used. All films were evaluated for mechanical parameters, surface pH, in vitro disintegration time and percent dissolution.

Results: Films were smooth, acceptable and white in color. Drug content (99.106%), disintegration time (25 sec), dissolution time (6.81) were acceptable.

Conclusion: Optimized batch, due to its potential to deliver dimenhydrinate, can be developed for clinical use.

Introduction

Fast dissolving oral film disintegrates or dissolves in oral cavity without need of water. This is the best alternative to tablets.[1] Fast dissolving oral film is designed as a very thin and instantly wetting by saliva if put on a tongue. Subsequently it disintegrates or dissolves once hydrated and release medicaments immediately. It gives fast absorption and thereby early bioavailability of drugs due to high surface area, high blood flow and permeability to gastric mucosa.[2] Oral film facilitates drug administration to paediatric, old age and non- cooperating patients.[3] For better bioavailability, improvisation in delivery of drug is needed.[4] Pre-gastric absorption avoids first pass metabolism.[5] This ultimately results in increase bioavailability compared to other dosage forms.[6]

Large population is affected by the vomiting and nausea. Nausea is the subjective and patient reports an unpleasant sensation in throat, diaphoresis, dizziness and excess salivation followed by vomiting. In vomiting contraction of abdominal muscles carryout the actual expulsion of stomach contents through the mouth. We have to control the centre of vomiting in the emetic centre in the brain. Dimenhydrinate is a drug of choice for this study. Its antiemetic property is due to its effect as antihistaminic and anti cholinergic. Chemically, dimenhydrinate is a salt of diphenhydramine and 8-chlorotheophylline. Diphenhydramine is an ethanolamine and antagonistic at the H_1 receptor and 8-chlorotheophylline is used to counteract drowsiness of diphenhydramine.

The present work was aimed to develop fast dissolving oral film of poorly water soluble drug, dimenhydrinate; using water soluble polymer.

Materials and Methods

Materials

Dimenhydrinate (drug) was a gift sample from S. S. Pharmachem, Mumbai, India. HPMC E5 (film forming polymer), PEG 400 (plasticizer), citric acid (saliva stimulating agent) and sodium saccharin (sweetener) were procured from Loba Chemie, Mumbai, India. Croscarmellose sodium (superdisintegrant) was obtained from Research Lab. The remaining ingredients were of analytical grade.

Methods

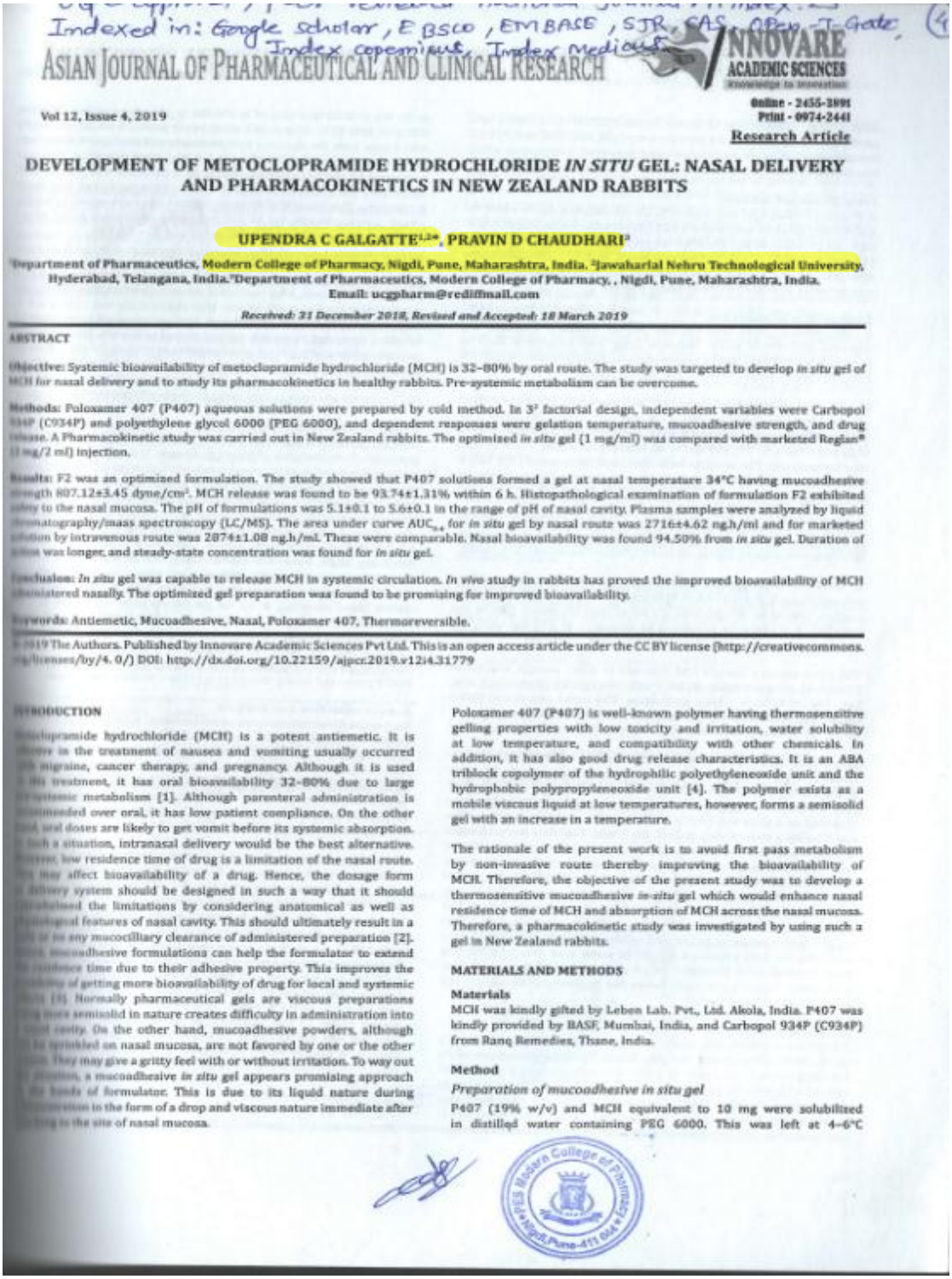
Development of fast dissolving oral film of dimenhydrinate

Films were developed by solvent casting method. HPMC E5 was dissolved in 5mL distilled water while stirring on magnetic stirrer. Drug was dissolved in 3mL distilled water and 3mL ethanol i.e. 1:1 solvent mixture. Ethanol was used as cosolvent to enhance solubility of drug in water. After keeping for half an hour; PEG 400, croscarmellose sodium, saccharin sodium, citric acid, peppermint oil were dissolved one by one in polymer solution with stirring on magnetic stirrer. Then, drug solution was added in a polymer solution and again stirred until complete mixing take place. Then, solution was casted on petri-plate and kept for drying at room temperature for next 24 hours. After drying, film was

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Development of metoclopramide hydrochloride in situ gel: Nasal delivery and pharmacokinetics in New Zealand rabbits.



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Research Article

DEVELOPMENT OF METOCLOPRAMIDE HYDROCHLORIDE *IN SITU* GEL: NASAL DELIVERY AND PHARMACOKINETICS IN NEW ZEALAND RABBITS

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ABSTRACT

Objective: Systemic bioavailability of metoclopramide hydrochloride (MCH) is 32–80% by oral route. The study was targeted to develop *in situ* gel of MCH for nasal delivery and to study its pharmacokinetics in healthy rabbits. Pre-systemic metabolism can be overcome.

Methods: Poloxamer 407 (P407) aqueous solutions were prepared by cold method. In 3^2 factorial design, independent variables were Carbopol 934P (C934P) and polyethylene glycol 6000 (PEG 6000), and dependent responses were gelation temperature, mucoadhesive strength, and drug release. A Pharmacokinetic study was carried out in New Zealand rabbits. The optimized *in situ* gel (1 mg/ml) was compared with marketed Reglan® (1 mg/2 ml) injection.

Results: F2 was an optimized formulation. The study showed that P407 solutions formed a gel at nasal temperature 34°C having mucoadhesive strength 807.12±3.45 dyne/cm². MCH release was found to be 93.74±1.31% within 6 h. Histopathological examination of formulation F2 exhibited safety to the nasal mucosa. The pH of formulations was 5.1±0.1 to 5.6±0.1 in the range of pH of nasal cavity. Plasma samples were analyzed by liquid chromatography/mass spectroscopy (LC/MS). The area under curve AUC_{0-t} for *in situ* gel by nasal route was 2716±4.62 ng.h/ml and for marketed solution by intravenous route was 2874±1.08 ng.h/mL. These were comparable. Nasal bioavailability was found 94.50% from *in situ* gel. Duration of action was longer, and steady-state concentration was found for *in situ* gel.

Conclusion: *In situ* gel was capable to release MCH in systemic circulation. *In vivo* study in rabbits has proved the improved bioavailability of MCH administered nasally. The optimized gel preparation was found to be promising for improved bioavailability.

Keywords: Antiemetic, Mucoadhesive, Nasal, Poloxamer 407, Thermoreversible.

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INTRODUCTION

Metoclopramide hydrochloride (MCH) is a potent antiemetic. It is effective in the treatment of nausea and vomiting usually occurred with migraine, cancer therapy, and pregnancy. Although it is used in its treatment, it has oral bioavailability 32–80% due to large first-pass systemic metabolism [1]. Although parenteral administration is recommended over oral, it has low patient compliance. On the other hand, oral doses are likely to get vomit before its systemic absorption. In such a situation, intranasal delivery would be the best alternative. However, low residence time of drug is a limitation of the nasal route. This may affect bioavailability of a drug. Hence, the dosage form or delivery system should be designed in such a way that it should overcome the limitations by considering anatomical as well as physiological features of nasal cavity. This should ultimately result in a delay or no any mucociliary clearance of administered preparation [2]. Hence, mucoadhesive formulations can help the formulator to extend the residence time due to their adhesive property. This improves the possibility of getting more bioavailability of drug for local and systemic action [3]. Normally pharmaceutical gels are viscous preparations but being more semisolid in nature creates difficulty in administration into the nasal cavity. On the other hand, mucoadhesive powders, although can be sprinkled on nasal mucosa, are not favored by one or the other reason. They may give a gritty feel with or without irritation. To way out of these problems, a mucoadhesive *in situ* gel appears promising approach for the needs of formulator. This is due to its liquid nature during administration in the form of a drop and viscous nature immediate after coming in the site of nasal mucosa.

Poloxamer 407 (P407) is well-known polymer having thermosensitive gelling properties with low toxicity and irritation, water solubility at low temperature, and compatibility with other chemicals. In addition, it has also good drug release characteristics. It is an ABA triblock copolymer of the hydrophilic polyethyleneoxide unit and the hydrophobic polypropyleneoxide unit [4]. The polymer exists as a mobile viscous liquid at low temperatures, however, forms a semisolid gel with an increase in a temperature.

The rationale of the present work is to avoid first pass metabolism by non-invasive route thereby improving the bioavailability of MCH. Therefore, the objective of the present study was to develop a thermosensitive mucoadhesive *in-situ* gel which would enhance nasal residence time of MCH and absorption of MCH across the nasal mucosa. Therefore, a pharmacokinetic study was investigated by using such a gel in New Zealand rabbits.

MATERIALS AND METHODS

Materials

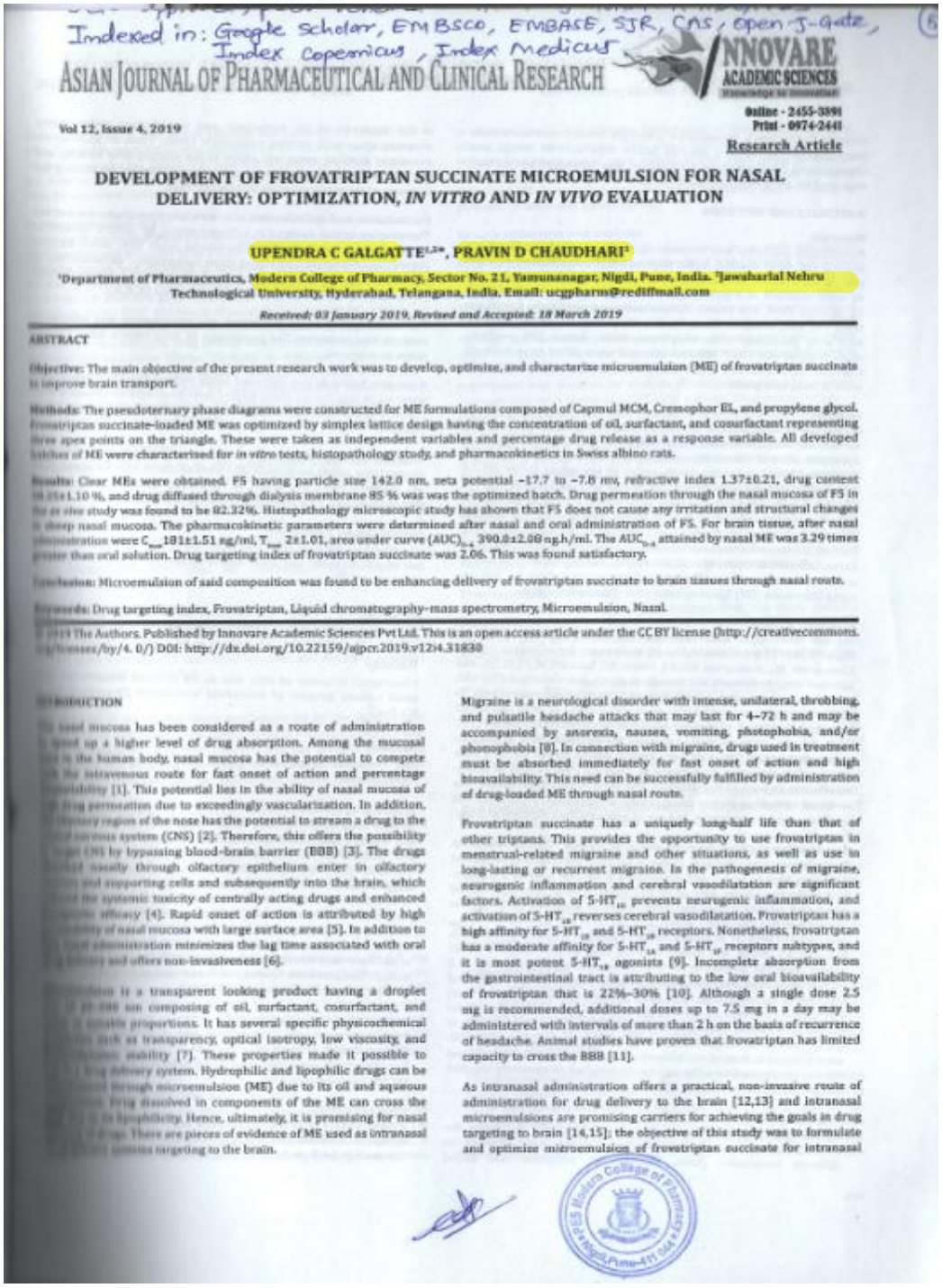
MCH was kindly gifted by Lebon Lab. Pvt., Ltd. Akola, India. P407 was kindly provided by BASF, Mumbai, India, and Carbopol 934P (C934P) from Ranq Remedies, Thane, India.

Method

Preparation of mucoadhesive in situ gel

P407 (19% w/v) and MCH equivalent to 10 mg were solubilized in distilled water containing PEG 6000. This was left at 4–6°C

Development of frovatriptan succinate microemultion for nasal delivery: optimization, in-vitro and in-vivo evaluation



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Research Article

DEVELOPMENT OF FROVATRIPTAN SUCCINATE MICROEMULSION FOR NASAL DELIVERY: OPTIMIZATION, *IN VITRO* AND *IN VIVO* EVALUATION

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ABSTRACT

Objective: The main objective of the present research work was to develop, optimize, and characterize microemulsion (ME) of frovatriptan succinate to improve brain transport.

Methods: The pseudoternary phase diagrams were constructed for ME formulations composed of Capmul MCM, Cremophor EL, and propylene glycol. Frovatriptan succinate-loaded ME was optimized by simplex lattice design having the concentration of oil, surfactant, and cosurfactant representing three apex points on the triangle. These were taken as independent variables and percentage drug release as a response variable. All developed batches of ME were characterized for *in vitro* tests, histopathology study, and pharmacokinetics in Swiss albino rats.

Results: Clear MEs were obtained. FS having particle size 142.0 nm, zeta potential −17.7 to −7.8 mv, refractive index 1.37±0.21, drug content 98.25±1.10 %, and drug diffused through dialysis membrane 85 % was was the optimized batch. Drug permeation through the nasal mucosa of FS in the *ex vivo* study was found to be 82.32%. Histopathology microscopic study has shown that FS does not cause any irritation and structural changes in sheep nasal mucosa. The pharmacokinetic parameters were determined after nasal and oral administration of FS. For brain tissue, after nasal administration were C_{max} 181±1.51 ng/ml, T_{max} 2±1.01, area under curve $(AUC)_{0-t}$ 390.8±2.08 ng.h/ml. The AUC_{0-t} attained by nasal ME was 3.29 times greater than oral solution. Drug targeting index of frovatriptan succinate was 2.06. This was found satisfactory.

Conclusion: Microemulsion of said composition was found to be enhancing delivery of frovatriptan succinate to brain tissues through nasal route.

Keywords: Drug targeting index, Frovatriptan, Liquid chromatography–mass spectrometry, Microemulsion, Nasal.

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INTRODUCTION

The nasal mucosa has been considered as a route of administration to speed up a higher level of drug absorption. Among the mucosal tissues in the human body, nasal mucosa has the potential to compete with the intravenous route for fast onset of action and percentage bioavailability [1]. This potential lies in the ability of nasal mucosa of high drug permeation due to exceedingly vascularization. In addition, olfactory region of the nose has the potential to stream a drug to the central nervous system (CNS) [2]. Therefore, this offers the possibility to target CNS by bypassing blood–brain barrier (BBB) [3]. The drugs absorbed nasally through olfactory epithelium enter in olfactory neurons and supporting cells and subsequently into the brain, which reduce the systemic toxicity of centrally acting drugs and enhanced therapeutic efficacy [4]. Rapid onset of action is attributed by high permeability of nasal mucosa with large surface area [5]. In addition to this, nasal administration minimizes the lag time associated with oral delivery and offers non-invasiveness [6].

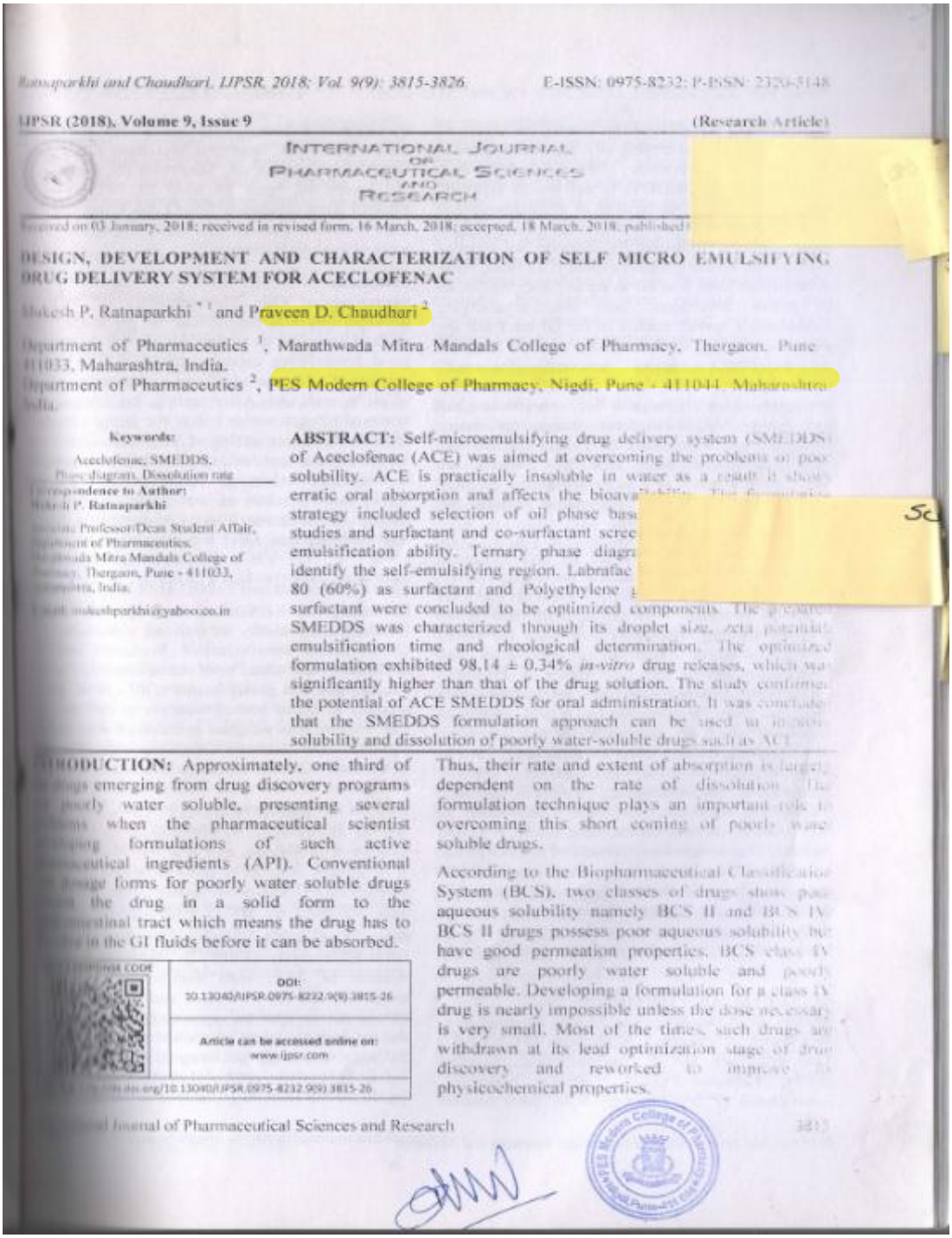
ME is a transparent looking product having a droplet size 10–200 nm composing of oil, surfactant, cosurfactant, and water in suitable proportions. It has several specific physicochemical properties such as transparency, optical isotropy, low viscosity, and thermodynamic stability [7]. These properties made it possible to use as a drug delivery system. Hydrophilic and lipophilic drugs can be incorporated through microemulsion (ME) due to its oil and aqueous phase. The drug dissolved in components of the ME can cross the BBB due to its lipophilicity. Hence, ultimately, it is promising for nasal delivery of drugs. There are pieces of evidence of ME used as intranasal drug delivery systems targeting to the brain.

Migraine is a neurological disorder with intense, unilateral, throbbing, and pulsatile headache attacks that may last for 4–72 h and may be accompanied by anorexia, nausea, vomiting, photophobia, and/or phonophobia [8]. In connection with migraine, drugs used in treatment must be absorbed immediately for fast onset of action and high bioavailability. This need can be successfully fulfilled by administration of drug-loaded ME through nasal route.

Frovatriptan succinate has a uniquely long-half life than that of other triptans. This provides the opportunity to use frovatriptan in menstrual-related migraine and other situations, as well as use in long-lasting or recurrent migraine. In the pathogenesis of migraine, neurogenic inflammation and cerebral vasodilatation are significant factors. Activation of 5-HT_{1D} prevents neurogenic inflammation, and activation of 5-HT_{1B} reverses cerebral vasodilatation. Frovatriptan has a high affinity for 5-HT_{1B} and 5-HT_{1D} receptors. Nonetheless, frovatriptan has a moderate affinity for 5-HT_{1A} and 5-HT_{1F} receptors subtypes, and it is most potent 5-HT_{1B} agonists [9]. Incomplete absorption from the gastrointestinal tract is attributing to the low oral bioavailability of frovatriptan that is 22%–30% [10]. Although a single dose 2.5 mg is recommended, additional doses up to 7.5 mg in a day may be administered with intervals of more than 2 h on the basis of recurrence of headache. Animal studies have proven that frovatriptan has limited capacity to cross the BBB [11].

As intranasal administration offers a practical, non-invasive route of administration for drug delivery to the brain [12,13] and intranasal microemulsions are promising carriers for achieving the goals in drug targeting to brain [14,15]; the objective of this study was to formulate and optimize microemulsion of frovatriptan succinate for intranasal

Design , Development and characterization of self Micro Emulsifying Drug delivery system for Aceclofenac



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DESIGN, DEVELOPMENT AND CHARACTERIZATION OF SELF MICRO EMULSIFYING DRUG DELIVERY SYSTEM FOR ACECLOFENAC

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Keywords:
Aceclofenac, SMEDDS, Phase diagram, Dissolution rate

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ABSTRACT: Self-microemulsifying drug delivery system (SMEDDS) of Aceclofenac (ACE) was aimed at overcoming the problems of poor solubility. ACE is practically insoluble in water as a result it shows erratic oral absorption and affects the bioava... strategy included selection of oil phase bas... studies and surfactant and co-surfactant scree... emulsification ability. Ternary phase diagr... identify the self-emulsifying region. Labrafac... 80 (60%) as surfactant and Polyethylene ... surfactant were concluded to be optimized components. The prepared SMEDDS was characterized through its droplet size, zeta potential, emulsification time and rheological determination. The optimized formulation exhibited 98.14 ± 0.34% *in-vitro* drug releases, which was significantly higher than that of the drug solution. The study confirmed the potential of ACE SMEDDS for oral administration. It was concluded that the SMEDDS formulation approach can be used to improve solubility and dissolution of poorly water-soluble drugs such as ACE.

INTRODUCTION: Approximately, one third of ... emerging from drug discovery programs ... poorly water soluble, presenting several ... when the pharmaceutical scientist ... formulations of such active ... ceutical ingredients (API). Conventional ... dosage forms for poorly water soluble drugs ... the drug in a solid form to the ... intestinal tract which means the drug has to ... in the GI fluids before it can be absorbed. Thus, their rate and extent of absorption is largely dependent on the rate of dissolution. The formulation technique plays an important role in overcoming this short coming of poorly water soluble drugs.

According to the Biopharmaceutical Classification System (BCS), two classes of drugs show poor aqueous solubility namely BCS II and BCS IV. BCS II drugs possess poor aqueous solubility but have good permeation properties. BCS class IV drugs are poorly water soluble and poorly permeable. Developing a formulation for a class IV drug is nearly impossible unless the dose necessary is very small. Most of the times, such drugs are withdrawn at its lead optimization stage of drug discovery and reworked to improve its physicochemical properties.

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RP-HPLC Forced Degradation study of Alfuzosin and Dutasteride

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RESEARCH ARTICLE

DPU

RP-HPLC Forced Degradation Study of Alfuzosin and Dutasteride

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ABSTRACT : Alfuzosin is a selective α-1 adrenoreceptor blocking agent. Dutasteride is a synthetic 4 - azasteroid compound that is a competitive and specific inhibitor of both type 1 and type 2 isoforms of steroid 5-α reductase. The present study focuses on the validation and degradation behaviour of the drugs under various stress conditions (acidic, alkaline, neutral, thermal and photolytic) as per International Conference on Harmonization (ICH Q1A (R2) guidelines. A high performance liquid chromatographic system (HPLC) was used to develop a selective, precise and accurate method for simultaneous analysis of Alfuzosin and Dutasteride in presence of its degradation products. The separation was achieved on Phenomenex C18 (250mm x 4.6mm x 5µm) stationary phase with the mobile phase of methanol:water (80:20v/v) in isocratic mode at flow rate of 1.0ml/min. The proposed method was validated as per ICH Q2 guidelines.

Keywords : Alfuzosin, Dutasteride, HPLC, Method Validation, Degradation.

Introduction

Alfuzosin and Dutasteride are currently available in solid dosage form for the management of prostatic hyperplasia. Alfuzosin (ALF), chemically, is (*R*, *S*)-N-[3-(4-amino-6, 7-dimethoxy 2quinazolinyl) methylamino] propyl tetrahydro-2-furan carboxamide hydrochloride. It is a selective α-1 adrenoreceptor blocking agent. It helps in relaxing the muscles in the prostate and bladder making it easier to urinate [1]. (Fig. 1)

Dutasteride (DUT) is chemically designated as (5α, 17β-N [2,5-bis(trifluoromethyl) phenyl]-3-oxo-4-azaandrost-1-ene-17-carboxamide. DUT is a synthetic 4-azasteroid compound that is a competitive and specific inhibitor of both type 1 and type 2 isoforms of steroid 5-areductase an intracellular enzyme that converts testosterone to dihydrotestosterone (DHT)[2]. The use of DUT in the treatment of benign prostatic hyperplasia has increased due to its side effect compared to the existing drugs for the treatment. It reduces the risk of acute retention as well (Fig. 1) [3].

Stability of pharmaceutical molecules is a matter of concern as it affects the safety and efficacy of the drug. The FDA and ICH guidelines state the need of stability testing data to understand how the quality of drug substance and drug product changes with time under the influence of various environmental factors. The stability studies, forced degradation study generating degradants in much shorter span of time, mostly a few weeks. The samples generated from forced degradation can be used to develop stability indicating method which can be applied latter for the analysis of samples from accelerated and long term stability studies.

There are several methods to estimate these drugs individually [4-10], but not a single method is reported for stability indicating assay for combination of this two drugs. Hence, an attempt has been made to develop simple, accurate, sensitive, rapid and economic method for simultaneous estimation of ALF and DUT from combined dosage forms using HPLC technique. This method can be applied for estimation of pure drug sample from bulk. The aim of this work was to perform the stress degradation studies of the ALF and DUT using proposed method.

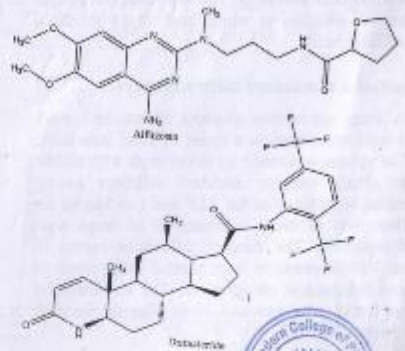


Fig. 1: Chemical structure of Alfuzosin and Dutasteride

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Biomarker Quantification: Development of fit for Purpose LC-MS/MS Method for Determination of Methyl Guanidine in Mice Urine



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Original Article

Biomarker Quantification: Development of Fit for purpose LC-MS/MS Method for Determination of Methyl guanidine in Mice Urine

Mithbavkar Jay Rajaram[1], Tapkir Amit Suryakant[1], Gaur Ashwani[2], Chaudhary Pravin[1]

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ABSTRACT

Introduction: Accurate quantitation of biomarkers is always challenging, it becomes really tedious when biomarker has poor retention on chromatographic column and possess a chemical structure resistant for derivatisation. Methyl guanidine is product of protein catebolism, normally gets excreted in urine. Endogenous methyl guanidine concentrations in urine increases if there is reduce urine production or conversion of creatinine to methyl guanidine as proposed in patients with chronic renal failure. Increased level of methyl guanidine promotes apoptosis of renal proximal tubular cells in vitro, which in-turn could result in renal failure. Therefore Methyl guanidine can be considered as putative biomarker for renal failure studies. Method: Artificial urine was used as surrogate matrix for preparation of calibration standards, while quality control standards were prepared in authentic mice urine diluted 50 fold with artificial urine prior to extraction. For determination of basal levels of endogenous methyl guanidine urine samples from naïve mice were quantified. Moreover 50 fold dilution of quality control standards and study samples with artificial urine makes test matrix almost similar to that of calibration standards. Results: Developed method was found to linear 2ng/ml to 1000 ng/ml, with R2 more than 0.98.Basing on the mean endogenous basal levels of methyl guanidine determined in un-treated C57BL/6J mice urine, developed method can accurately quantify up to 10 fold up regulation and up to 20 fold down regulation of methyl guanidine concentrations. Conclusion: A fast, robust and cost effective LC-MS/MS method was developed for determination of MG in mice urine. This is the first LC-MS/MS assay for direct quantitation of MG in mice urine samples. Approach followed for quantitation of MG is in-expensive over procurement of stable labeled standards. Moreover 50 fold dilution of quality control standards and study samples with synthetic urine makes test matrix almost similar to that of calibration standards.

Key words: Methyl guanidine, Biomarker Quantification, Mice urine, Surrogate matrix, Synthetic urine, LC-MS/MS method.

INTRODUCTION

Accurate quantitation of biomarkers is always challenging, it becomes really tedious when biomarker has poor retention on chromatographic column and/or possess a chemical structure resistant for derivatisation. Literature suggests use of stable labeled analog or usage of surrogate matrix for quantitation these endogenous molecules.[1] Procurement/chemical synthesis of stable-labeled standards is expensive, and procedures followed to prepare to surrogate matrix sometimes renders test matrix (surrogate matrix) used for Calibration standards significantly different from that study samples (authentic matrix). Hence to ensure accurate quantitation, it is mandatory to demonstrate parallelism between surrogate matrix and authentic matrix by preparing quality control standards in authentic matrix and quantifying

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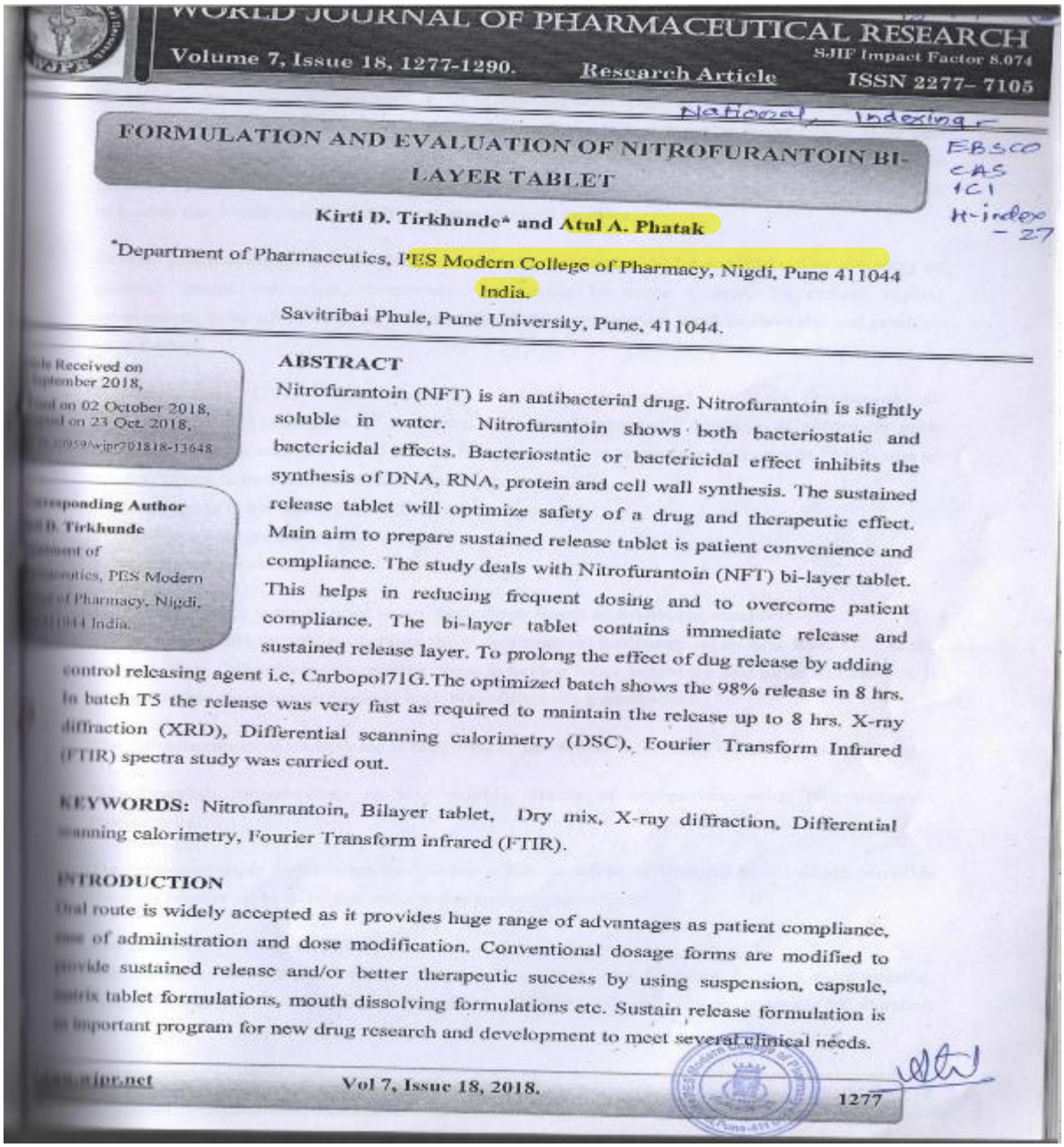
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Formulation and Evaluation of Nitrofurantoin Bilayer Tablet



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FORMULATION AND EVALUATION OF NITROFURANTOIN BI-LAYER TABLET

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ABSTRACT

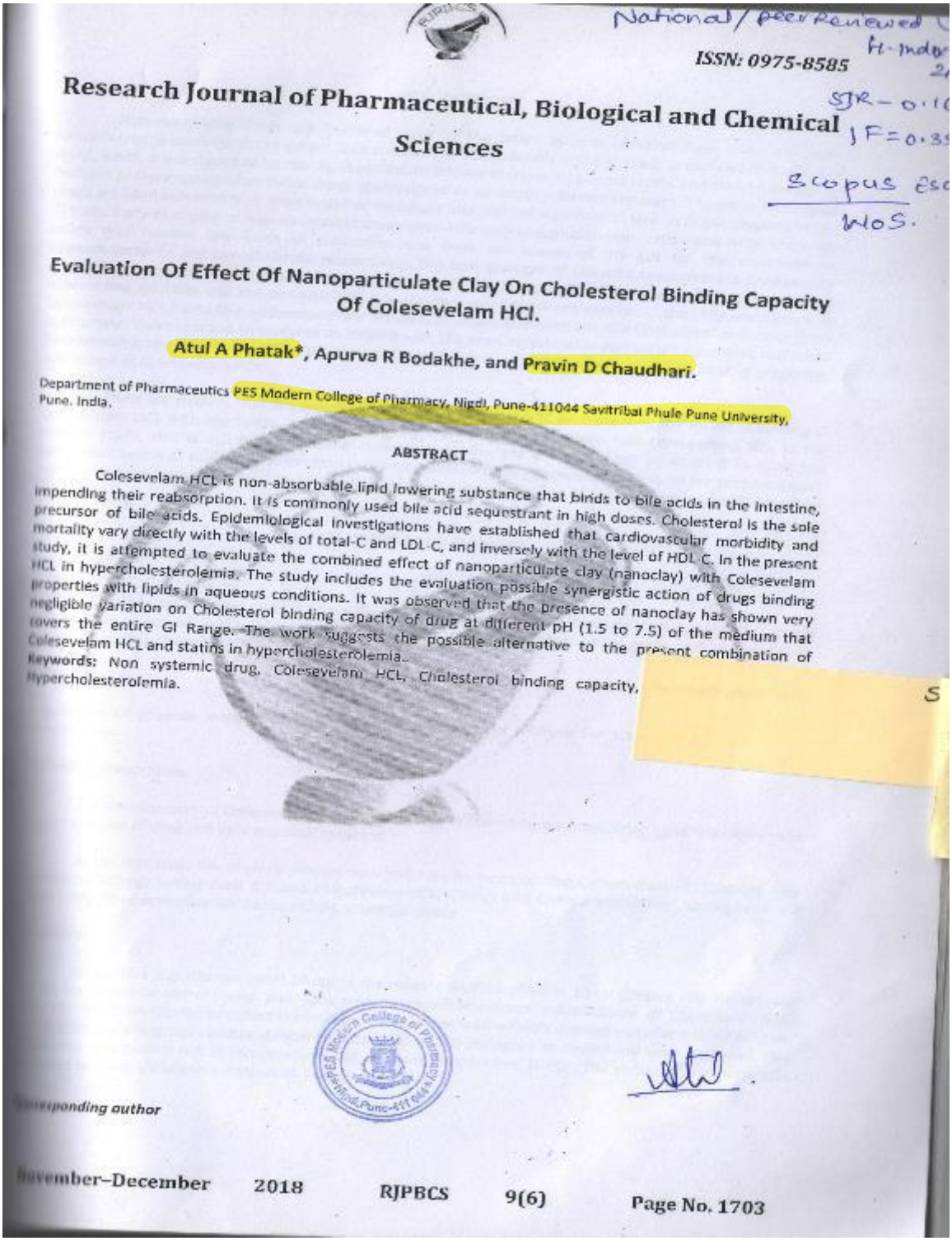
Nitrofurantoin (NFT) is an antibacterial drug. Nitrofurantoin is slightly soluble in water. Nitrofurantoin shows both bacteriostatic and bactericidal effects. Bacteriostatic or bactericidal effect inhibits the synthesis of DNA, RNA, protein and cell wall synthesis. The sustained release tablet will optimize safety of a drug and therapeutic effect. Main aim to prepare sustained release tablet is patient convenience and compliance. The study deals with Nitrofurantoin (NFT) bi-layer tablet. This helps in reducing frequent dosing and to overcome patient compliance. The bi-layer tablet contains immediate release and sustained release layer. To prolong the effect of dug release by adding control releasing agent i.e, Carbopol71G.The optimized batch shows the 98% release in 8 hrs. In batch T5 the release was very fast as required to maintain the release up to 8 hrs. X-ray diffraction (XRD), Differential scanning calorimetry (DSC), Fourier Transform Infrared (FTIR) spectra study was carried out.

KEYWORDS: Nitrofunrantoin, Bilayer tablet, Dry mix, X-ray diffraction, Differential scanning calorimetry, Fourier Transform infrared (FTIR).

INTRODUCTION

Oral route is widely accepted as it provides huge range of advantages as patient compliance, ease of administration and dose modification. Conventional dosage forms are modified to provide sustained release and/or better therapeutic success by using suspension, capsule, matrix tablet formulations, mouth dissolving formulations etc. Sustain release formulation is an important program for new drug research and development to meet several clinical needs.

Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding Capacity Of ColesevelamHcl.



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Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding Capacity Of Colesevelam HCl.

Atul A Phatak*, Apurva R Bodakhe, and Pravin D Chaudhari.

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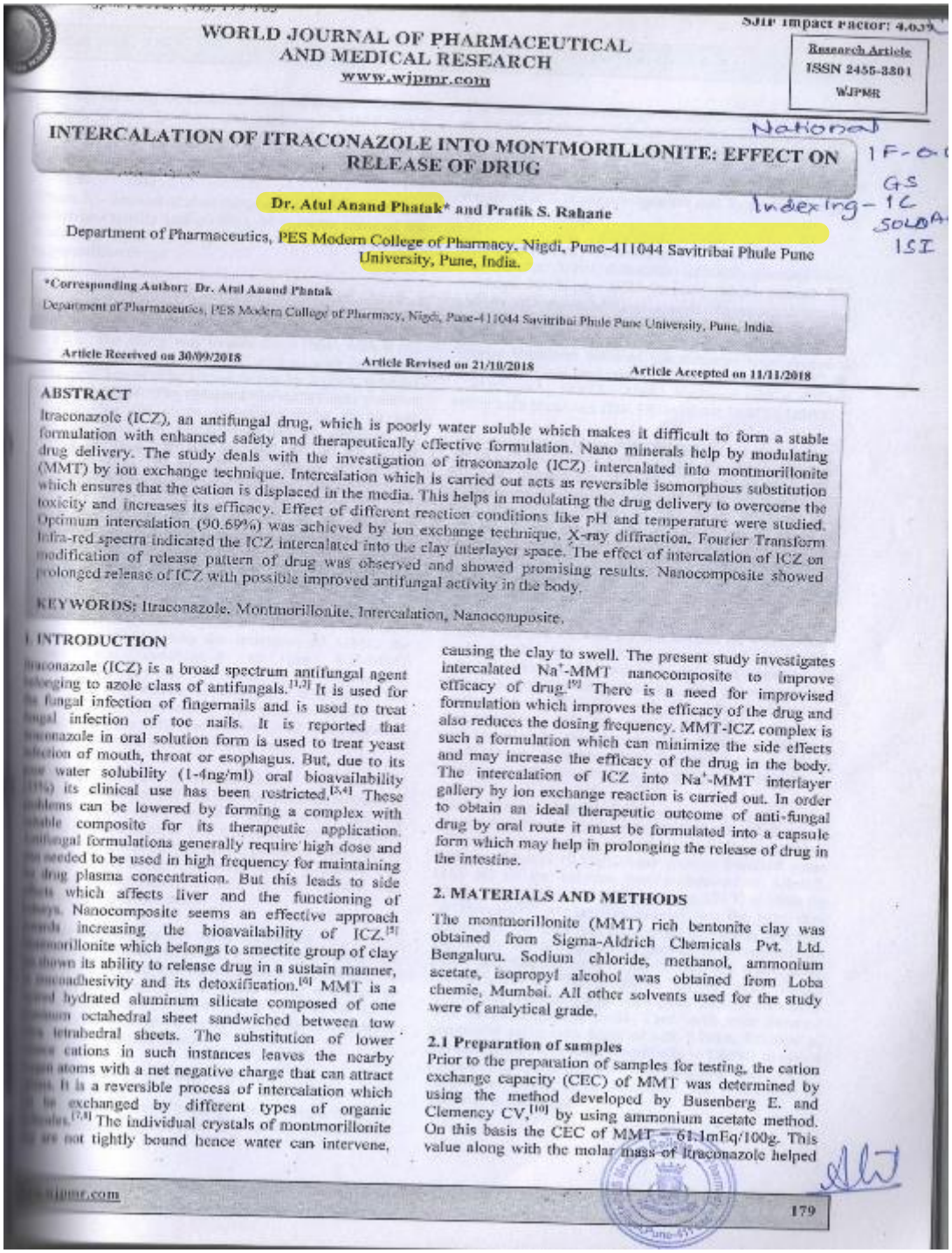
ABSTRACT

Colesevelam HCL is non-absorbable lipid lowering substance that binds to bile acids in the intestine, impending their reabsorption. It is commonly used bile acid sequestrant in high doses. Cholesterol is the sole precursor of bile acids. Epidemiological investigations have established that cardiovascular morbidity and mortality vary directly with the levels of total-C and LDL-C, and inversely with the level of HDL-C. In the present study, it is attempted to evaluate the combined effect of nanoparticulate clay (nanoclay) with Colesevelam HCL in hypercholesterolemia. The study includes the evaluation possible synergistic action of drugs binding properties with lipids in aqueous conditions. It was observed that the presence of nanoclay has shown very negligible variation on Cholesterol binding capacity of drug at different pH (1.5 to 7.5) of the medium that covers the entire GI Range. The work suggests the possible alternative to the present combination of Colesevelam HCL and statins in hypercholesterolemia.

Keywords: Non systemic drug, Colesevelam HCL, Cholesterol binding capacity, Hypercholesterolemia.

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Intercalation of Itraconazole into Montmorillonite: Effect on Release of Drug



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INTERCALATION OF ITRACONAZOLE INTO MONTMORILLONITE: EFFECT ON RELEASE OF DRUG

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ABSTRACT

Itraconazole (ICZ), an antifungal drug, which is poorly water soluble which makes it difficult to form a stable formulation with enhanced safety and therapeutically effective formulation. Nano minerals help by modulating drug delivery. The study deals with the investigation of itraconazole (ICZ) intercalated into montmorillonite (MMT) by ion exchange technique. Intercalation which is carried out acts as reversible isomorphous substitution which ensures that the cation is displaced in the media. This helps in modulating the drug delivery to overcome the toxicity and increases its efficacy. Effect of different reaction conditions like pH and temperature were studied. Optimum intercalation (90.69%) was achieved by ion exchange technique. X-ray diffraction, Fourier Transform Infra-red spectra indicated the ICZ intercalated into the clay interlayer space. The effect of intercalation of ICZ on modification of release pattern of drug was observed and showed promising results. Nanocomposite showed prolonged release of ICZ with possible improved antifungal activity in the body.

KEYWORDS: Itraconazole, Montmorillonite, Intercalation, Nanocomposite.

1. INTRODUCTION

Itraconazole (ICZ) is a broad spectrum antifungal agent belonging to azole class of antifungals.[1,2] It is used for the fungal infection of fingernails and is used to treat fungal infection of toe nails. It is reported that itraconazole in oral solution form is used to treat yeast infection of mouth, throat or esophagus. But, due to its poor water solubility (1-4ng/ml) oral bioavailability (55%) its clinical use has been restricted.[3,4] These problems can be lowered by forming a complex with suitable composite for its therapeutic application. Antifungal formulations generally require high dose and are needed to be used in high frequency for maintaining the drug plasma concentration. But this leads to side effects which affects liver and the functioning of kidneys. Nanocomposite seems an effective approach towards increasing the bioavailability of ICZ.[5] Montmorillonite which belongs to smectite group of clay has shown its ability to release drug in a sustain manner, mucoadhesivity and its detoxification.[6] MMT is a layered hydrated aluminum silicate composed of one aluminum octahedral sheet sandwiched between tow silica tetrahedral sheets. The substitution of lower valence cations in such instances leaves the nearby oxygen atoms with a net negative charge that can attract cations. It is a reversible process of intercalation which can be exchanged by different types of organic molecules.[7,8] The individual crystals of montmorillonite layers are not tightly bound hence water can intervene, causing the clay to swell. The present study investigates intercalated Na^+-MMT nanocomposite to improve efficacy of drug.[9] There is a need for improvised formulation which improves the efficacy of the drug and also reduces the dosing frequency. MMT-ICZ complex is such a formulation which can minimize the side effects and may increase the efficacy of the drug in the body. The intercalation of ICZ into Na^+-MMT interlayer gallery by ion exchange reaction is carried out. In order to obtain an ideal therapeutic outcome of anti-fungal drug by oral route it must be formulated into a capsule form which may help in prolonging the release of drug in the intestine.

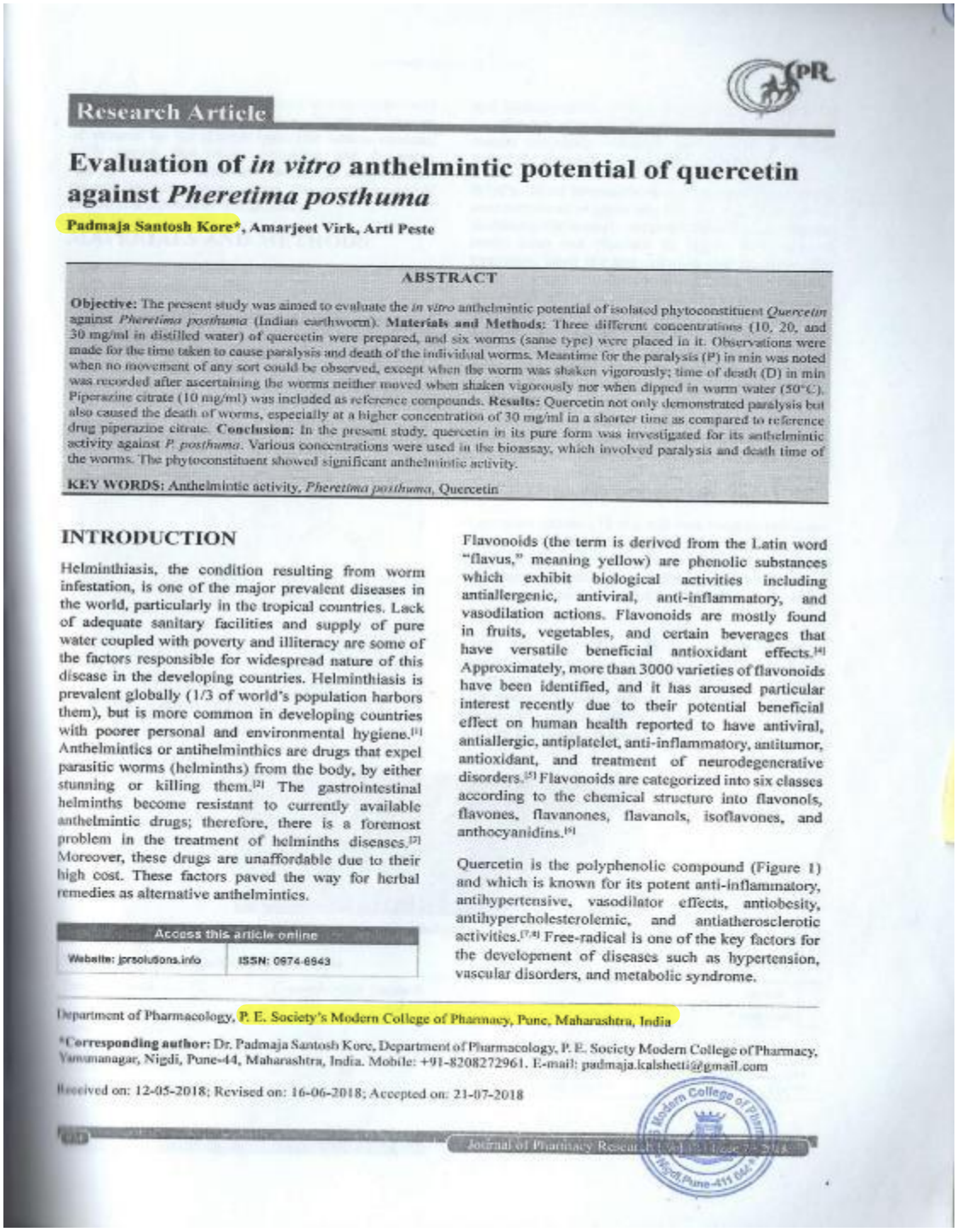
2. MATERIALS AND METHODS

The montmorillonite (MMT) rich bentonite clay was obtained from Sigma-Aldrich Chemicals Pvt. Ltd. Bengaluru. Sodium chloride, methanol, ammonium acetate, isopropyl alcohol was obtained from Loba chemie, Mumbai. All other solvents used for the study were of analytical grade.

2.1 Preparation of samples

Prior to the preparation of samples for testing, the cation exchange capacity (CEC) of MMT was determined by using the method developed by Busenberg E. and Clemency CV,[10] by using ammonium acetate method. On this basis the CEC of MMT = 61.1mEq/100g. This value along with the molar mass of Itraconazole helped

Evaluation of invitro anthelmintic potential of quercetin against pheretimaposthuma



Research Article

Evaluation of *in vitro* anthelmintic potential of quercetin against *Pheretima posthuma*

Padmaja Santosh Kore*, Amarjeet Virk, Arti Peste

ABSTRACT

Objective: The present study was aimed to evaluate the *in vitro* anthelmintic potential of isolated phytoconstituent *Quercetin* against *Pheretima posthuma* (Indian earthworm). **Materials and Methods:** Three different concentrations (10, 20, and 30 mg/ml in distilled water) of quercetin were prepared, and six worms (same type) were placed in it. Observations were made for the time taken to cause paralysis and death of the individual worms. Meantime for the paralysis (P) in min was noted when no movement of any sort could be observed, except when the worm was shaken vigorously; time of death (D) in min was recorded after ascertaining the worms neither moved when shaken vigorously nor when dipped in warm water (50°C). Piperazine citrate (10 mg/ml) was included as reference compounds. **Results:** Quercetin not only demonstrated paralysis but also caused the death of worms, especially at a higher concentration of 30 mg/ml in a shorter time as compared to reference drug piperazine citrate. **Conclusion:** In the present study, quercetin in its pure form was investigated for its anthelmintic activity against *P. posthuma*. Various concentrations were used in the bioassay, which involved paralysis and death time of the worms. The phytoconstituent showed significant anthelmintic activity.

KEY WORDS: Anthelmintic activity, *Pheretima posthuma*, Quercetin

INTRODUCTION

Helminthiasis, the condition resulting from worm infestation, is one of the major prevalent diseases in the world, particularly in the tropical countries. Lack of adequate sanitary facilities and supply of pure water coupled with poverty and illiteracy are some of the factors responsible for widespread nature of this disease in the developing countries. Helminthiasis is prevalent globally (1/3 of world's population harbors them), but is more common in developing countries with poorer personal and environmental hygiene.[1] Anthelmintics or antihelminthics are drugs that expel parasitic worms (helminths) from the body, by either stunning or killing them.[2] The gastrointestinal helminths become resistant to currently available anthelmintic drugs; therefore, there is a foremost problem in the treatment of helminths diseases.[3] Moreover, these drugs are unaffordable due to their high cost. These factors paved the way for herbal remedies as alternative anthelmintics.

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Flavonoids (the term is derived from the Latin word "flavus," meaning yellow) are phenolic substances which exhibit biological activities including antiallergenic, antiviral, anti-inflammatory, and vasodilation actions. Flavonoids are mostly found in fruits, vegetables, and certain beverages that have versatile beneficial antioxidant effects.[4] Approximately, more than 3000 varieties of flavonoids have been identified, and it has aroused particular interest recently due to their potential beneficial effect on human health reported to have antiviral, antiallergic, antiplatelet, anti-inflammatory, antitumor, antioxidant, and treatment of neurodegenerative disorders.[5] Flavonoids are categorized into six classes according to the chemical structure into flavonols, flavones, flavanones, flavanols, isoflavones, and anthocyanidins.[6]

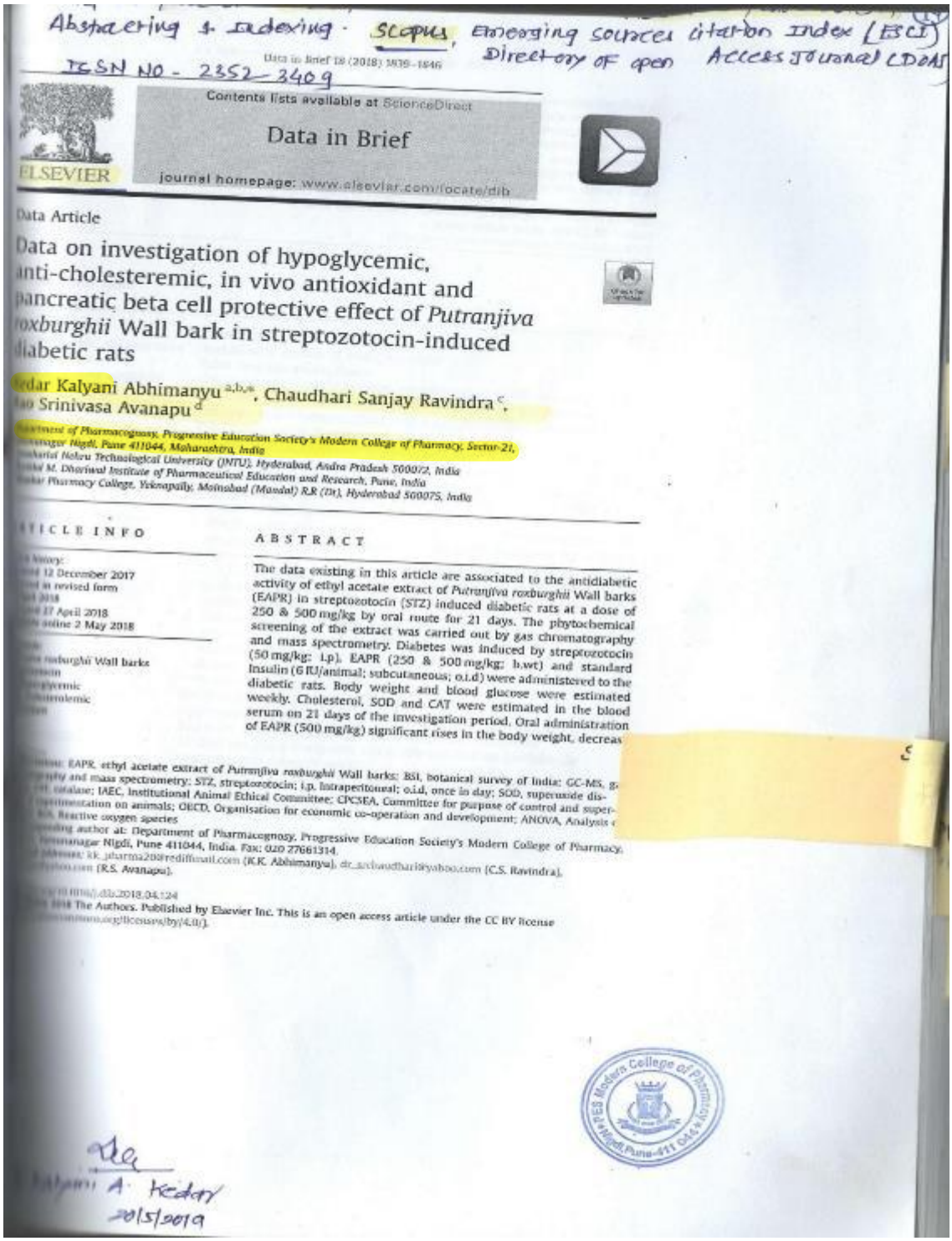
Quercetin is the polyphenolic compound (Figure 1) and which is known for its potent anti-inflammatory, antihypertensive, vasodilator effects, antiobesity, antihypercholesterolemic, and antiatherosclerotic activities.[7,8] Free-radical is one of the key factors for the development of diseases such as hypertension, vascular disorders, and metabolic syndrome.

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Data on Investigation of hypoglycemic , anti-cholesteremic , in vivo antioxidant and pancreatic beta cell protective effect of putranjivaroxburghii Wall Bark in streptozotocin-induced diabetic rats



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Data Article

Data on investigation of hypoglycemic, anti-cholesteremic, in vivo antioxidant and pancreatic beta cell protective effect of *Putranjiva roxburghii* Wall bark in streptozotocin-induced diabetic rats

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Putranjiva roxburghii Wall barks
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ABSTRACT

The data existing in this article are associated to the antidiabetic activity of ethyl acetate extract of *Putranjiva roxburghii* Wall barks (EAPR) in streptozotocin (STZ) induced diabetic rats at a dose of 250 & 500 mg/kg by oral route for 21 days. The phytochemical screening of the extract was carried out by gas chromatography and mass spectrometry. Diabetes was induced by streptozotocin (50 mg/kg; i.p.). EAPR (250 & 500 mg/kg; b.wt) and standard Insulin (6 IU/animal; subcutaneous; o.i.d) were administered to the diabetic rats. Body weight and blood glucose were estimated weekly. Cholesterol, SOD and CAT were estimated in the blood serum on 21 days of the investigation period. Oral administration of EAPR (500 mg/kg) significant rises in the body weight, decreas

Abbreviations: EAPR, ethyl acetate extract of *Putranjiva roxburghii* Wall barks; BSI, botanical survey of India; GC-MS, g... and mass spectrometry; STZ, streptozotocin; i.p. Intraperitoneal; o.i.d, once in day; SOD, superoxide dis... catalase; IAEC, Institutional Animal Ethical Committee; CPCSEA, Committee for purpose of control and super... experimentation on animals; OECD, Organisation for economic co-operation and development; ANOVA, Analysis ... R.S. Reactive oxygen species

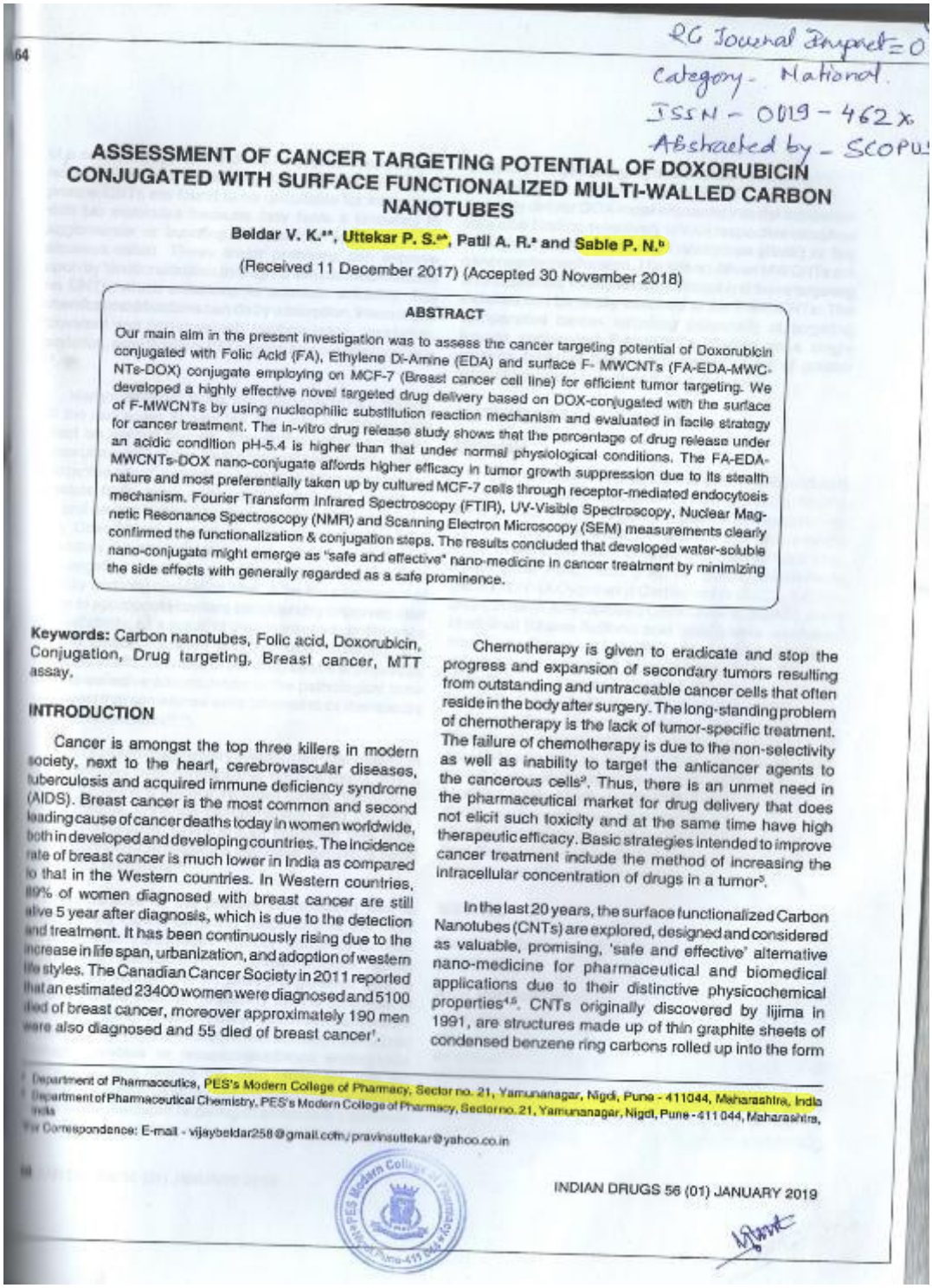
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Kedar A. Kedar
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Assessment of Cancer Targeting Potential of Doxorubicin conjugated with surface functionalized multi-walled Carbon Nanotubes



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64

ASSESSMENT OF CANCER TARGETING POTENTIAL OF DOXORUBICIN CONJUGATED WITH SURFACE FUNCTIONALIZED MULTI-WALLED CARBON NANOTUBES

Beldar V. K.[a*], Uttekar P. S.[a*], Patil A. R.[a] and Sable P. N.[b]

(Received 11 December 2017) (Accepted 30 November 2018)

ABSTRACT

Our main aim in the present investigation was to assess the cancer targeting potential of Doxorubicin conjugated with Folic Acid (FA), Ethylene Di-Amine (EDA) and surface F- MWCNTs (FA-EDA-MWCNTs-DOX) conjugate employing on MCF-7 (Breast cancer cell line) for efficient tumor targeting. We developed a highly effective novel targeted drug delivery based on DOX-conjugated with the surface of F-MWCNTs by using nucleophilic substitution reaction mechanism and evaluated in facile strategy for cancer treatment. The in-vitro drug release study shows that the percentage of drug release under an acidic condition pH-5.4 is higher than that under normal physiological conditions. The FA-EDA-MWCNTs-DOX nano-conjugate affords higher efficacy in tumor growth suppression due to its stealth nature and most preferentially taken up by cultured MCF-7 cells through receptor-mediated endocytosis mechanism. Fourier Transform Infrared Spectroscopy (FTIR), UV-Visible Spectroscopy, Nuclear Magnetic Resonance Spectroscopy (NMR) and Scanning Electron Microscopy (SEM) measurements clearly confirmed the functionalization & conjugation steps. The results concluded that developed water-soluble nano-conjugate might emerge as "safe and effective" nano-medicine in cancer treatment by minimizing the side effects with generally regarded as a safe prominence.

Keywords: Carbon nanotubes, Folic acid, Doxorubicin, Conjugation, Drug targeting, Breast cancer, MTT assay.

INTRODUCTION

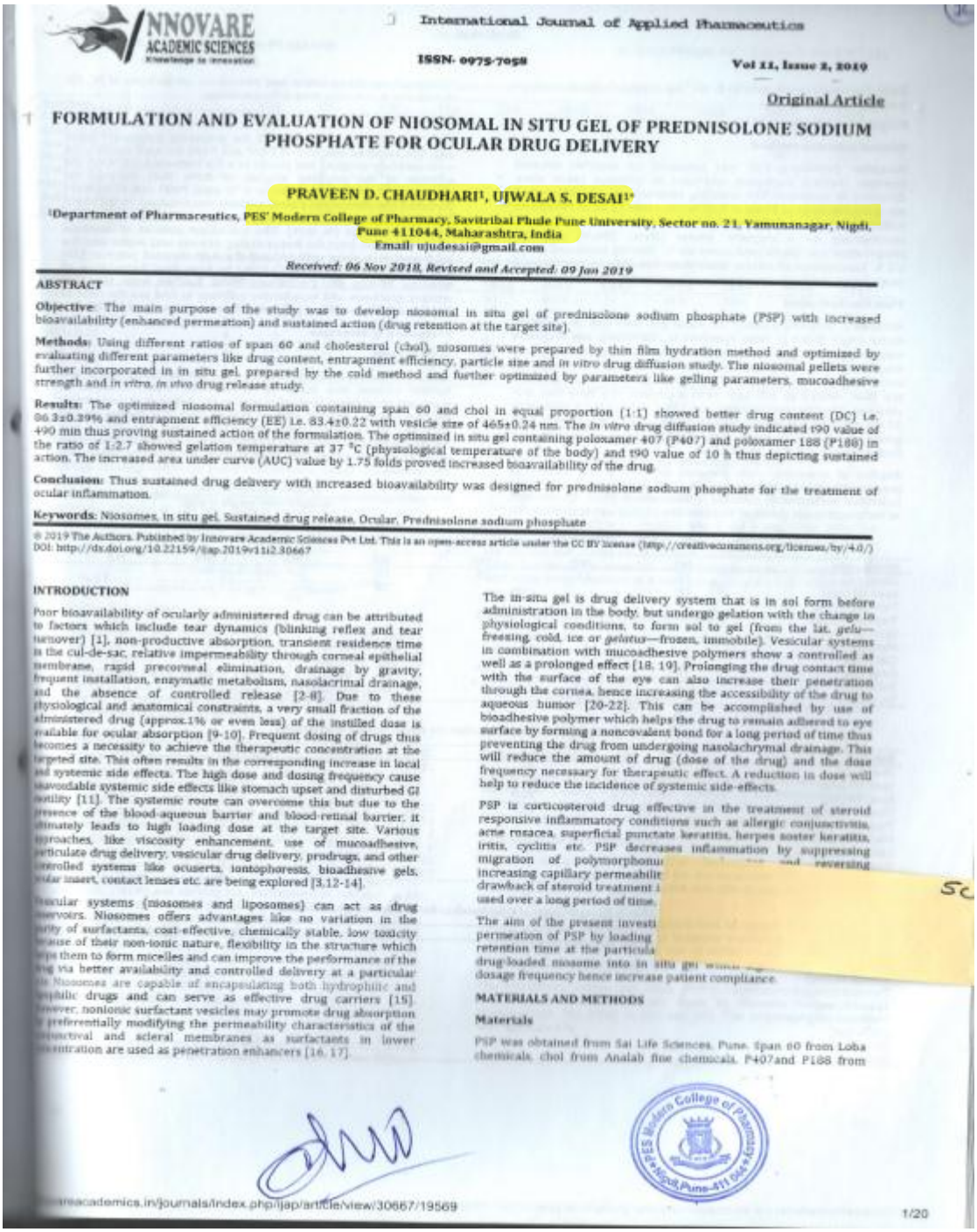
Cancer is amongst the top three killers in modern society, next to the heart, cerebrovascular diseases, tuberculosis and acquired immune deficiency syndrome (AIDS). Breast cancer is the most common and second leading cause of cancer deaths today in women worldwide, both in developed and developing countries. The incidence rate of breast cancer is much lower in India as compared to that in the Western countries. In Western countries, 89% of women diagnosed with breast cancer are still alive 5 year after diagnosis, which is due to the detection and treatment. It has been continuously rising due to the increase in life span, urbanization, and adoption of western life styles. The Canadian Cancer Society in 2011 reported that an estimated 23400 women were diagnosed and 5100 died of breast cancer, moreover approximately 190 men were also diagnosed and 55 died of breast cancer[1].

Chemotherapy is given to eradicate and stop the progress and expansion of secondary tumors resulting from outstanding and untraceable cancer cells that often reside in the body after surgery. The long-standing problem of chemotherapy is the lack of tumor-specific treatment. The failure of chemotherapy is due to the non-selectivity as well as inability to target the anticancer agents to the cancerous cells[2]. Thus, there is an unmet need in the pharmaceutical market for drug delivery that does not elicit such toxicity and at the same time have high therapeutic efficacy. Basic strategies intended to improve cancer treatment include the method of increasing the intracellular concentration of drugs in a tumor[3].

In the last 20 years, the surface functionalized Carbon Nanotubes (CNTs) are explored, designed and considered as valuable, promising, 'safe and effective' alternative nano-medicine for pharmaceutical and biomedical applications due to their distinctive physicochemical properties[4,5]. CNTs originally discovered by Iijima in 1991, are structures made up of thin graphite sheets of condensed benzene ring carbons rolled up into the form

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Formulation and Evaluation of Niosomal in situ Gel of Prednisolone sodium phosphate for Ocular Drug Delivery



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Original Article

FORMULATION AND EVALUATION OF NIOSOMAL IN SITU GEL OF PREDNISOLONE SODIUM PHOSPHATE FOR OCULAR DRUG DELIVERY

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ABSTRACT

Objective: The main purpose of the study was to develop niosomal in situ gel of prednisolone sodium phosphate (PSP) with increased bioavailability (enhanced permeation) and sustained action (drug retention at the target site).

Methods: Using different ratios of span 60 and cholesterol (chol), niosomes were prepared by thin film hydration method and optimized by evaluating different parameters like drug content, entrapment efficiency, particle size and *in vitro* drug diffusion study. The niosomal pellets were further incorporated in in situ gel, prepared by the cold method and further optimized by parameters like gelling parameters, mucoadhesive strength and *in vitro*, *in vivo* drug release study.

Results: The optimized niosomal formulation containing span 60 and chol in equal proportion (1:1) showed better drug content (DC) i.e. 96.3±0.39% and entrapment efficiency (EE) i.e. 83.4±0.22 with vesicle size of 465±0.24 nm. The *in vitro* drug diffusion study indicated t90 value of 490 min thus proving sustained action of the formulation. The optimized in situ gel containing poloxamer 407 (P407) and poloxamer 188 (P188) in the ratio of 1:2.7 showed gelation temperature at 37 °C (physiological temperature of the body) and t90 value of 10 h thus depicting sustained action. The increased area under curve (AUC) value by 1.75 folds proved increased bioavailability of the drug.

Conclusion: Thus sustained drug delivery with increased bioavailability was designed for prednisolone sodium phosphate for the treatment of ocular inflammation.

Keywords: Niosomes, In situ gel, Sustained drug release, Ocular, Prednisolone sodium phosphate

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INTRODUCTION

Poor bioavailability of ocularly administered drug can be attributed to factors which include tear dynamics (blinking reflex and tear turnover) [1], non-productive absorption, transient residence time in the cul-de-sac, relative impermeability through corneal epithelial membrane, rapid precorneal elimination, drainage by gravity, frequent installation, enzymatic metabolism, nasolacrimal drainage, and the absence of controlled release [2-6]. Due to these physiological and anatomical constraints, a very small fraction of the administered drug (approx.1% or even less) of the instilled dose is available for ocular absorption [9-10]. Frequent dosing of drugs thus becomes a necessity to achieve the therapeutic concentration at the targeted site. This often results in the corresponding increase in local and systemic side effects. The high dose and dosing frequency cause unavoidable systemic side effects like stomach upset and disturbed GI motility [11]. The systemic route can overcome this but due to the presence of the blood-aqueous barrier and blood-retinal barrier, it ultimately leads to high loading dose at the target site. Various approaches, like viscosity enhancement, use of mucoadhesive, particulate drug delivery, vesicular drug delivery, prodrugs, and other controlled systems like ocuserts, iontophoresis, bioadhesive gels, ocular insert, contact lenses etc. are being explored [3,12-14].

Vesicular systems (niosomes and liposomes) can act as drug reservoirs. Niosomes offers advantages like no variation in the purity of surfactants, cost-effective, chemically stable, low toxicity because of their non-ionic nature, flexibility in the structure which helps them to form micelles and can improve the performance of the drug via better availability and controlled delivery at a particular site. Niosomes are capable of encapsulating both hydrophilic and lipophilic drugs and can serve as effective drug carriers [15]. However, nonionic surfactant vesicles may promote drug absorption by preferentially modifying the permeability characteristics of the conjunctival and scleral membranes as surfactants in lower concentration are used as penetration enhancers [16, 17].

The in-situ gel is drug delivery system that is in sol form before administration in the body, but undergo gelation with the change in physiological conditions, to form sol to gel (from the lat. *gelu*—freezing, cold, ice or *gelatus*—frozen, immobile). Vesicular systems in combination with mucoadhesive polymers show a controlled as well as a prolonged effect [18, 19]. Prolonging the drug contact time with the surface of the eye can also increase their penetration through the cornea, hence increasing the accessibility of the drug to aqueous humor [20-22]. This can be accomplished by use of bioadhesive polymer which helps the drug to remain adhered to eye surface by forming a noncovalent bond for a long period of time thus preventing the drug from undergoing nasolachrymal drainage. This will reduce the amount of drug (dose of the drug) and the dose frequency necessary for therapeutic effect. A reduction in dose will help to reduce the incidence of systemic side-effects.

PSP is corticosteroid drug effective in the treatment of steroid responsive inflammatory conditions such as allergic conjunctivitis, acne rosacea, superficial punctate keratitis, herpes zoster keratitis, iritis, cyclitis etc. PSP decreases inflammation by suppressing migration of polymorphonu[illegible] and reversing increasing capillary permeabilit[illegible] drawback of steroid treatment [illegible] used over a long period of time.

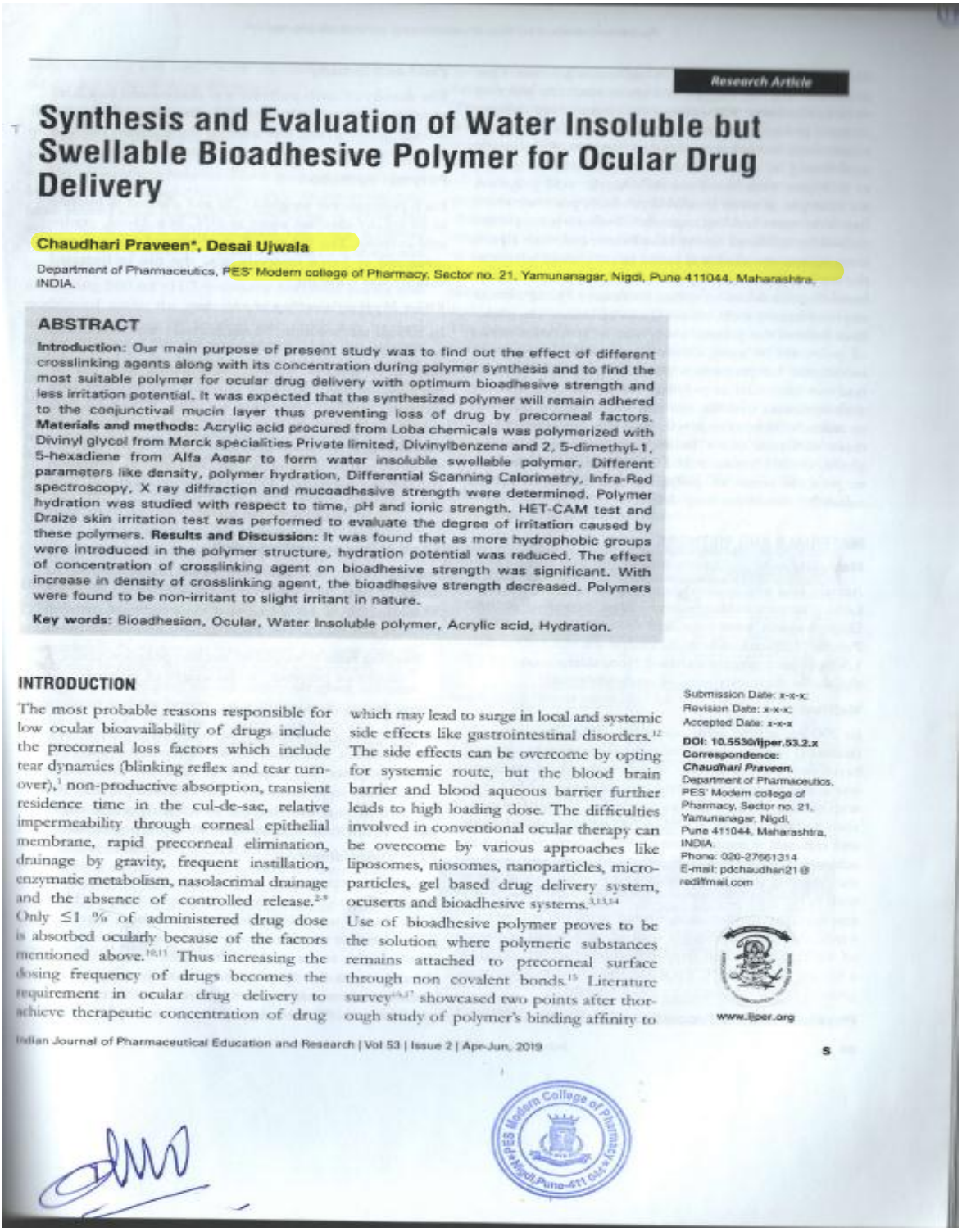
The aim of the present investi[illegible] permeation of PSP by loading [illegible] retention time at the particula[illegible] drug-loaded niosome into in situ ge[illegible] dosage frequency hence increase patient compliance.

MATERIALS AND METHODS

Materials

PSP was obtained from Sai Life Sciences, Pune. Span 60 from Loba chemicals, chol from Analab fine chemicals, P407and P188 from

Synthesis and Evalution of Water insoluable but SwellableBioadhesive Polymer for Ocular Drug Delivery



Research Article

Synthesis and Evaluation of Water Insoluble but Swellable Bioadhesive Polymer for Ocular Drug Delivery

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ABSTRACT

Introduction: Our main purpose of present study was to find out the effect of different crosslinking agents along with its concentration during polymer synthesis and to find the most suitable polymer for ocular drug delivery with optimum bioadhesive strength and less irritation potential. It was expected that the synthesized polymer will remain adhered to the conjunctival mucin layer thus preventing loss of drug by precorneal factors. **Materials and methods:** Acrylic acid procured from Loba chemicals was polymerized with Divinyl glycol from Merck specialities Private limited, Divinylbenzene and 2, 5-dimethyl-1, 5-hexadiene from Alfa Aesar to form water insoluble swellable polymer. Different parameters like density, polymer hydration, Differential Scanning Calorimetry, Infra-Red spectroscopy, X ray diffraction and mucoadhesive strength were determined. Polymer hydration was studied with respect to time, pH and ionic strength. HET-CAM test and Draize skin irritation test was performed to evaluate the degree of irritation caused by these polymers. **Results and Discussion:** It was found that as more hydrophobic groups were introduced in the polymer structure, hydration potential was reduced. The effect of concentration of crosslinking agent on bioadhesive strength was significant. With increase in density of crosslinking agent, the bioadhesive strength decreased. Polymers were found to be non-irritant to slight irritant in nature.

Key words: Bioadhesion, Ocular, Water Insoluble polymer, Acrylic acid, Hydration.

INTRODUCTION

The most probable reasons responsible for low ocular bioavailability of drugs include the precorneal loss factors which include tear dynamics (blinking reflex and tear turn-over),[1] non-productive absorption, transient residence time in the cul-de-sac, relative impermeability through corneal epithelial membrane, rapid precorneal elimination, drainage by gravity, frequent instillation, enzymatic metabolism, nasolacrimal drainage and the absence of controlled release.[2-9] Only ≤1 % of administered drug dose is absorbed ocularly because of the factors mentioned above.[10,11] Thus increasing the dosing frequency of drugs becomes the requirement in ocular drug delivery to achieve therapeutic concentration of drug which may lead to surge in local and systemic side effects like gastrointestinal disorders.[12] The side effects can be overcome by opting for systemic route, but the blood brain barrier and blood aqueous barrier further leads to high loading dose. The difficulties involved in conventional ocular therapy can be overcome by various approaches like liposomes, niosomes, nanoparticles, micro-particles, gel based drug delivery system, ocuserts and bioadhesive systems.[3,13,14] Use of bioadhesive polymer proves to be the solution where polymeric substances remains attached to precorneal surface through non covalent bonds.[15] Literature survey[16,17] showcased two points after thor-ough study of polymer's binding affinity to

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Designing a platform Technology for age Appropriate Pediatric Dosage Form

DESIGNING A PLATFORM TECHNOLOGY FOR AGE APPROPRIATE PEDIATRIC DOSAGE FORM

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ABSTRACT

Present work was aimed to develop a platform technology for pediatric dosage form which masks the bitter taste of a drug and to prepare flexible solid oral dosage form using hot melt extrusion (HME). Eudragit EPO, a cationic co-polymer insoluble in pH above 5, was used as a taste masking polymer to restrict the drug release in saliva. Soluplus, a graft co-polymer freely soluble in water was used as solubility enhancer. Test formulation released less than 10 % drug Tenofovir Disoproxil Fumarate (TDF) in pH 6.8 compared to 89 % of marketed formulation simulated to limited release of drug in the saliva and thus avoiding the bitterness. DSC and XRD tests confirmed the existence of molecularly dispersed drug. FTIR confirmed the presence of unchanged functional groups of drug in its tablet form after HME processing. Proposed platform technology successfully masked the bitter taste in the ratio of D:P 1:2 and overcame this challenge of oral dosage form.

Keywords: HME, solubility, dissolution, pediatric dosage, taste masking

INTRODUCTION

Manipulation in existing dosage forms to convert them for pediatric use is a common practice. These changes are modification of administration routes (eg. oral use of parenteral formulations), diluting liquid formulations, segmenting/crushing tablets and suppositories, cutting patches, and dispersing capsule content or crushed tablets in water, liquid, or food; or extemporaneous dispensing (i.e. compounding medicines from ingredients within pharmacies)[1].

There are certain administration requirements and issues of existing pediatric dosage forms like requirement of dose measuring devices, chances of incorrect dosing, shaking requirement for dose accuracy in liquid dosage form and ability to swallow intact dosage form, risk of chewing and choking, limited dose flexibility, taste masking requirements and less stability of dosage form which compel parents to do the manipulations.

There is a need for development of special pediatric dosage form which can be administered without any manipulation. The main challenges in development of such solid oral dosage forms are palatability and/or acceptance of dosage form due to their bitter taste, obnoxious odor, unattractive finished product, handling and dose measurement/accuracy issues and many others[1,2]. Same oral dosage form cannot be administered to pediatric patients of different ages[3].

Present research work demonstrates the preparation of flexible solid oral dosage form which can overcome all above mentioned issues and accomplishes the desired features with the help of platform technology using HME technique.

Tenofovir Disoproxil Fumarate (TDF) was selected as a model drug bitter in taste and belongs to BCS class III. The pediatric dose of TDF is 40 mg[4]. Most of the bitter drugs like TDF have amine as a functional group, which is the cause of their obnoxious taste. If the functional groups are blocked, the bitterness of the drug reduces drastically[5].

Various types of taste masking methods are available which involve multiple steps with scale up challenges. So, hot melt extrusion (HME) was selected as taste masking technique due to its unique advantages like easy to scale up and reproducibility[6].

HME technology is an innovative technology which can be used for taste masking of bitter drugs by forming

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4	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Yashwant Chaudhari, Shailaja Bhanudas Jadhav	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	https://sciencescholar.us/journal/index.php/ijhs/index	https://www.researchgate.net/publication/361837971_The_anti-Alzheimer_potential_of_some_novel_Tacrine-Coumarin_Derivatives_as_a_Cholinesterase_inhibitor
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		and Bhagyashri Warude						L_An_Ayurvedic_medicinal_plant
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15	Quality-by-design (qbd) approach to chromatographic conditions applied for determination of	Chopade v.v, uttekar p.s, gawade.v., chavan s. And bastia	Pharmaceutical Chemistry	International Journal of Biology,	2022	2277-4998	https://www.ijbpas.com/	https://ijbpas.com/pdf/2022/August/MS_IJBPAS_2022_6336.pdf

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20	Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles	Sangita A.Kale,Dr.Karimunnisa Shaikh	Pharmaceutics	International Journal of Health Sciences	2022	2550-696X 2550-6978	https://sciencescholar.us/	https://sciencescholar.us/journal/index.php/ijhs/article/view/6719
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24	Antihistaminic effects of Azadirachta indica leaves in laboratory animals	Padmaja Kore*, Akash Gaikwad, Anuradha G More, Shivanjali Shinde1, Rutuja Sawkar, Poonam Inamdar	Pharmacology	International Journal of Ayurvedic Medicine	2022	0976-5921	https://ijam.co.in/index.php/ijam/index	https://ijam.co.in/index.php/ijam/article/view/2559
25	Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo	Anuradha G More*, Priyanka D Pote, Padmaja S Kore, Yogish D Garhwani	Pharmaceutics	International Journal of Ayurvedic Medicine	2022	0976-5921	https://ijam.co.in/index.php/ijam/index	https://www.ijam.co.in/index.php/ijam/article/view/2696#google_vignette

26	Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo	Anuradha G More*, Priyanka D Pote, Padmaja S Kore, Yogish D Garhwani	Pharmaceutics	International Journal of Ayurvedic Medicine	2022	0976-5921	https://ijam.co.in/index.php/ijam/index	https://www.ijam.co.in/index.php/ijam/article/view/2696#google_vignette
27	Formulation Development and optimization of Empagliflozin film coated tablet using Quality by Design approach	Sharddha Lakambare, Atul Phatak, Mahesh Bhadagale, Vardhaman Bafana	Pharmaceutics	Asian Journal of Pharmaceutical and clinical research	2022	E 2455-3891 P 0974-2441	https://journals.innovareacademics.in/index.php/ajpcr/index	https://journals.innovareacademics.in/index.php/ajpcr/article/view/46037
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35	Low Level Quantification Of Potential Genotoxic Impurity In Daclatasvir Hydrochloride By RP-HPLC Method	Chopade VV , Chaudhari PD, Dumbre NG	Pharmaceutical Chemistry	Journal of Pharmaceutical Negative Results	2022	2229-7723	https://www.pnrjournal.com/index.php/home	https://pnrjournal.com/index.php/home/article/view/4865
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37	A Validated Stability Indicating HPTLC Method for Estimation of Bilastine in Bulk and Tablet Dosage Form and Characterization of Impurities by LC-MS Method	Vitthal V. Chopade ,Shubham C. Humnabadkar, Sarangkar BD, Pallavi M. Patil	Pharmaceutical Chemistry	Advances in Bioresearch	2022	0976 - 4585	https://soeagra.com/abr.html	https://ajpaonline.com/AbstractView.aspx?PID=2023-13-1-4
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41	Design, Synthesis, Molecular Docking and Antioxidant Evaluation of Benzimidazole- 1,3,4 oxadiazole Derivatives	Shashikant V. Bhandari a, Om G. Nagras a, Pranali V. Kuthe a, Aniket P. Sarkate b, Kaustubh S. Waghamare a, Dattatraya N. Pansare c, Somdatta Y. Chaudhari d, Shivraj	Pharmaceutical Chemistry	Journal of Molecular Structure	2022	0022-2860	https://www.sciencedirect.com/journal/journal-of-molecular-structure	https://www.researchgate.net/publication/366196059_Design_Synthesis_Molecular_Docking_and_Antioxidant_Evaluation_of_Benzimidazole-_134_oxadiazole_Derivatives

		N. Mawale a, Mrunal C. Belwate						
42	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Nobendu Mukerjee, Khattab Al-Khafaji†, Swastika Maitra,Jaafar Suhail Wadi, Punya Sachdeva Arabinda Ghosh,Rahul Subhash Buchade8, Somdatta Yashwant Chaudhari9,Shailaja B. Jadhav, Padmashree Das ,Mohammad Mehedi Hasan , Md. Habibur Rahman12 ,Ghadeer M. Albadrani , Ahmed E. Altyar,Mohamed Kamel , Mohammad Algahtani , Khlood Shinan ,Abdulrahman Theyab Mohamed M. Abdel-Daim Ghulam Md. Ashraf, Md. Mominur Rahman andRohit Sharma	Pharmaceutical Chemistry	Frontiers in Molecular Neuroscience	2022	1662-5099	https://www.frontiersin.org/journals/molecular-neuroscience	https://www.researchgate.net/publication/364606541_Recognizing_novel_drugs_against_Keap1_in_Alzheimer's_disease_using_machine_learning-grounded_computational_studies

43	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Nobendu Mukerjee, Khattab Al-Khafaji†, Swastika Maitra,Jaafar Suhail Wadi, Punya Sachdeva Arabinda Ghosh,Rahul Subhash Buchade8, Somdatta Yashwant Chaudhari9,Shailaja B. Jadhav, Padmashree Das ,Mohammad Mehedi Hasan , Md. Habibur Rahman12 ,Ghadeer M. Albadrani , Ahmed E. Altyar,Mohamed Kamel , Mohammad Algahtani , Khlood Shinan ,Abdulrahman Theyab Mohamed M. Abdel-Daim Ghulam Md. Ashraf, Md. Mominur Rahman andRohit Sharma	Pharmaceutical Chemistry	Frontiers in Molecular Neuroscience	2022	1662-5099	https://www.frontiersin.org/journals/molecular-neuroscience	https://www.researchgate.net/publication/364606541_Recognizing_novel_drugs_against_Keap1_in_Alzheimer's_disease_using_machine_learning-grounded_computational_studies
44	Virtual Screening, Synthesis, and Biological Evaluation of Some	Prerana Chavan, Shailaja Jadhav et al	Pharmaceutical Chemistry	Molecules,	2022	1420-3049	https://www.ncbi.nlm.nih.gov/	https://pubmed.ncbi.nlm.nih.gov/36615348/

	Carbohydrazide Derivatives as Potential DPP-IV Inhibitors							
45	In silico Molecular docking of Herbal plant extract for Antioxidant activity	Dnyaneshwari R. Chopade, Pallavi M. Patil, Mayuri B. Suryawanshi	Pharmaceutical Chemistry	Journal For Basic Sciences	2022	1006-8341	https://fzgxjckxxb.com/	https://fzgxjckxxb.com/wp-content/uploads/2022/12/26-JBS1608.pdf
46	Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts	Mugdha Banduke, Akash Gaikwad, Harshada Chattar, Mohini Kuchekar, Bhushan Pimple, Nitin Deshmukh, Harshal Tare	Pharmacognosy	International Journal Of Pharmaceutical Quality Assurance ,	2022	0975 9506	https://ijpqa.com/	https://impactfactor.org/PDF/IJPQA/13/IJPQA,Vol13,Issue4,Article4.pdf
47	Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts	Mugdha Banduke, Akash Gaikwad, Harshada Chattar, Mohini Kuchekar, Bhushan Pimple, Nitin Deshmukh, Harshal Tare	Pharmacognosy	International Journal Of Pharmaceutical Quality Assurance ,	2022	0975 9506	https://ijpqa.com/	https://impactfactor.org/PDF/IJPQA/13/IJPQA,Vol13,Issue4,Article4.pdf
48	Macroscopic and Microscopic Evaluation of Sansevieria cylindrica Plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple,	Pharmacognosy	Pharmacognosy Research,	2022	0976-4836	https://www.phcogres.com/	https://www.phcogres.com/sites/default/files/PharmacognRes-14-4-412.pdf

		Mohini Kuchekar, Vrushali Bhalchim.						
49	Macroscopic and Microscopic Evaluation of Sansevieria cylindrica Plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple, Mohini Kuchekar, Vrushali Bhalchim.	Pharmacognosy	Pharmacognosy Research,	2022	0976-4836	https://www.phcogres.com/	https://www.phcogres.com/sites/default/files/PharmacognRes-14-4-412.pdf
50	Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuic acid against 5-fluorouracil induced nephrotoxicity in Wistar rats	Arvind B Naik, Deepti D Bandawane	Pharmacology	NeuroQuantology	2022	1303-5150	https://www.neuroquantology.com/index.php	https://nopr.niscpr.res.in/bitstream/123456789/59416/1/IJEB%20APRIL%202022%20Vol.%2060%20%2804%29%20241-247.pdf
51	Effect of Lead, Copper on Glycogen Content in Muscle, Liver, Kidney Tissues of Freshwater Fish Labeo Rohita	Pallavi M. Patil, Shubham R Khade, Mayuri Suryawanshi,Sneha N Hojage	pharmaceutical chemistry	UTTAR PRADESH JOURNAL OF ZOOLOGY	2022	0256-971X	https://mbimph.com/index.php/UPJOZ	https://scholar.google.com/citations?view_op=view_citation&hl=en&user=vF6u-d0AAAAJ&citation_for_view=vF6u-d0AAAAJ:u5HHmVD_uO8C
52	Effect of Lead, Copper on Glycogen Content in Muscle, Liver, Kidney Tissues of Freshwater Fish Labeo Rohita	Pallavi M. Patil, Shubham R Khade, Mayuri Suryawanshi,Sneha N Hojage	pharmaceutical chemistry	UTTAR PRADESH JOURNAL OF ZOOLOGY	2022	0256-971X	https://mbimph.com/index.php/UPJOZ	https://scholar.google.com/citations?view_op=view_citation&hl=en&user=vF6u-d0AAAAJ&citation_for_view=vF6u-d0AAAAJ:u5HHmVD_uO8C

53	Preliminary Pharmacognostic, Physicochemical and Phytochemical Evaluation of Plumeria-Obtuse Seed Pods	Sunil Shewale , Vaishali Undale , Maruti Shelar , Vrushali Bhalchim , Mohini Kuchekar , Bhagyashri Warude , Vikas Wawale	Pharmacognosy	Journal of Pharmaceutical Negative Results	2022	2229-7723	https://www.pnrjournal.com/	https://www.pnrjournal.com/index.php/home/article/view/1153
54	Neuroprotective potential of flowers of nyctanthins arbor-tristis on aluminium chloride induced negative effect on learning abilities in rats	Arvind B Naik, Deepti D Bandawane	Pharmacology	NeuroQuantology	2022	1303-5150	https://www.neuroquantology.com/	https://www.neuroquantology.com/open-access/NEUROPROTECTIVE+POTENTIAL+OF+FLOWERS+OF++NYCTANTHESARBOR-TRISTIS+ON+ALUMINIUM++CHLORIDE+INDUCED+NEGATIVE+EFFECTS+ON++LEARNING+ABILITIES+IN+RATS_1719/
55	Foot Deodorizing Gel Formulation Having Antimicrobial Activity	Prashant R. Patankar, Vitthal V. Chopade,	Pharmaceutical Chemistry	Journal of Research in Pharmacy	2022	2630-6344	https://jrespharm.com/search.php	https://jrespharm.com/uploads/pdf/pdf_MPJ_1293.pdf

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56	Foot Deodorizing Gel Formulation Having Antimicrobial Activity	Prashant R. Patankar, Vitthal V. Chopade, Praveen D. Chaudhari	Pharmaceutical Chemistry	Journal of Research in Pharmacy	2022	2630-6344	https://jrespharm.com/search.php	https://jrespharm.com/uploads/pdf/pdf_MPJ_1293.pdf
57	Development & validation of novel RP-HPLC DAD method for quantification of Lapatinib Ditosylate in newer nano-liposome formulation: A quality by Design (QBD) Approach	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical chemistry	Molecules	2023	1420-3049	https://www.researchgate.net/	https://www.researchgate.net/publication/367270471_Coumarin-Based_Sulfonamide_Derivatives_as_Potential_DPP-IV_Inhibitors_Pre-ADME_Analysis_Toxicity_Profile_Computational_Analysis_and_In_Vitro_Enzyme_Assay
58	Coumarin-Based Sulfonamide Derivatives as Potential DPP-IV Inhibitors: Pre-ADME Analysis, Toxicity Profile, Computational Analysis, and In Vitro Enzyme Assay	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical chemistry	Molecules	2023	1420-3049	https://www.mdpi.com/	https://www.mdpi.com/1420-3049/28/3/1004
59	Solubilizing essential oils and preparing stable, transparent and stain-free	, Vitthal V. Chopade, Praveen D. Chaudhari,Prashant R. Patankar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/a53b838591c62dc2a8fb89fc12afa564.pdf

	liquid roll-on preparation for foot application							
60	Solubilizing essential oils and preparing stable, transparent and stain-free liquid roll-on preparation for foot application	, Vitthal V. Chopade, Praveen D. Chaudhari,Prashant R. Patankar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/a53b838591c62dc2a8fb89fc12afa564.pdf
61	Effect of Andrographis paniculata extract and Andrographolide on the pharmacokinetics of Aceclofenac and Celecoxib in rats	S. J. More, S. S. Tandulwadkar, Aishwarya R. Balap , S. Lohidasan, A. Sinnathambi and K. R. Mahadik	Pharmaceutical Chemistry	Future Journal of Pharmaceutical Sciences	2023	2314-7253	https://fjps.springeropen.com/	https://fjps.springeropen.com/articles/10.1186/s43094-022-00450-4
62	Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac Tromethamine in Bulk and Marketed Formulation	Ujwala Wasnik1, Kedar Jagtap , Bhimashankar Devkar, Sameer Lakade , Ankita Patil Padmaja Kore , Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/issue-content/development-and-validation-of-rp-hplc-methods-for-simultaneous-determination-of-moxifloxacin-hcl-and-ketorolac-tromethamine-in-bulk-and-marketed-formulation-1800
63	Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac	Ujwala Wasnik1, Kedar Jagtap , Bhimashankar Devkar, Sameer Lakade , Ankita Patil	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/issue-content/development-and-validation-of-rp-hplc-methods-for-simultaneous-determination-of-moxifloxacin-hcl-and-ketorolac-

	Tromethamine in Bulk and Marketed Formulation	Padmaja Kore , Minal Harde						tromethamine-in-bulk-and-marketed-formulation-1800
64	UV Spectroscopic Method Development and Validation of Rabeprazole and Levosulpiride in its Bulk and Dosage Form	Vitthal Chopade, Atul Baravkar, Sagar Shinde, Pranali Jadhav, Trupti Dudhgaonkar, Pradip Lade, Monika Chavare	Pharmaceutical Chemistry	Archives of Pharmacy Practice	2023	2320-5210	https://archivepp.com/	https://doi.org/10.51847/ouHxjrpdl7
65	Wheat ergot fungus-derived and modified drug for inhibition of intracranial aneurysm rupture due to dysfunction of TLR-4 receptor in Alzheimer's disease	Sandip DebnathID, Devesh Sharma, Somdatta Yashwant Chaudhari, Ritika Sharma,Amir Afzal Shaikh, Rahul Subhash Buchade, Kavindra Kumar Kesari, Abdel-FattahM. Abdel-Fattah, Mohammad Algahtani, Mayyadah Mheidat, Rawidh Alsaidalani,Tapas	Pharmaceutical Chemistry	PLOS ONE	2023	1932-6203	https://journals.plos.org/plosone/	https://www.researchgate.net/publication/367090085_Wheat_ergot_fungus-derived_and_modified_drug_for_inhibition_of_intracranial_aneurysm_rupture_due_to_dysfunction_of_TLR-4_receptor_in_Alzheimer's_disease

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66	Active Phytoconstituents and Pharmacological Activities of Withania Coagulans (stocks) Dunal (paneer Dodi): Brief Review	Amit Suryakant Tapkir, Krishnapriya. R. Nalanaglu, Mayuri. K. Auti, Abhijit. B. Gholap	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	E 2306-5249 (Print) ISSN: 2791-	https://fzgxjckxxb.com/	https://drive.google.com/file/d/1lgMG1f705E71-mbjn9u0AIzjYkXSqC-B/view
67	Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model	Vitthal V. Chopade, Pravin D. Chaudhari, Pramod L. Ingale	Pharmaceutical Chemistry	International Journal of Drug Delivery Technology.	2023	0975 4415	https://ijddt.com/	https://www.researchgate.net/publication/370035310_Anti-Alzhimer_Activity_of_Bay_Leaves_in_Scopolamine-induced_Rat_Model
68	Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model	Vitthal V. Chopade, Pravin D. Chaudhari, Pramod L. Ingale	Pharmaceutical Chemistry	International Journal of Drug Delivery Technology.	2023	0975 4415	https://ijddt.com/	https://www.researchgate.net/publication/370035310_Anti-Alzhimer_Activity_of_Bay_Leaves_in_Scopolamine-induced_Rat_Model
69	Anthelmintic Potential Of Aqueous And Organic Extract Of Seeds Of Samanea saman (Merr)	vitthal chopade,Atul Baravkar, Nitin Aher, Ramdas Kale, Vishnu Neharkar, Makarand Puri, Padmanabh Deshpande	Pharmaceutical Chemistry	Journal of Pharmaceutical Negative Results	2023	2229-7723	https://www.pnrjournal.com/index.php/home	https://www.pnrjournal.com/index.php/home/article/view/8722

70	In-Silico Studies to recognize Repurposing Therapeutics toward Arginase-I inhibitors as a Potential Onco-Immunomodulators	Magdi E. A. Zaki*, Sami A. Al-Hussain1, Aamal A. Al-Mutairi1,Abdul Samad, Arabinda Ghosh, Somdatta Chaudhari,Pravin N. Khatale, Prashant Ajmire and Rahul D. Jawarkar	Pharmaceutical Chemistry	Frontiers in Pharmacology	2023	1663-9812	https://www.frontiersin.org/journals/pharmacology	https://www.researchgate.net/publication/368831485_In-Silico_Studies_to_recognize_Repurposing_Therapeutics_toward_Arginase-I_inhibitors_as_a_Potential_Onco-Immunomodulators
71	Quantitative structure-activity relationship and group-based quantitative structure-activity relationship: a review	Sanket B. Bhatshankar and Amit S. Tapkir	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Research	2023	0975-8232	https://ijpsr.com/	file:///C:/Users/abc/Downloads/11-Vol-14-Issue-3-March-2023-IJPSR-RE-5435.pdf
72	High-Performance Thin Layer Chromatography Method Development to Estimate Phytoconstituents in Hedychium species.	Samiksha Karde, Shruti Jha, Bhusan Pimple, Mohini Kuchekar	Pharmacognosy	International Journal of Pdrug Delivery Technology	2023	0975-4415	https://ijddt.com/	https://www.researchgate.net/publication/370042924_High-Performance_Thin_Layer_Chromatography_Method_Development_to_Estimate_Phytoconstituents_in_Hedychium_species
73	High-Performance Thin Layer Chromatography	Samiksha Karde, Shruti Jha, Bhusan	Pharmacognosy	International Journal of	2023	0975-4415	https://ijddt.com/	https://www.researchgate.net/publication/370042924_High-

	Method Development to Estimate Phytoconstituents in Hedychium species.	Pimple, Mohini Kuchekar		Pdrug Delivery Technology				Performance_Thin_Layer_Chromatography_Method_Development_to_Estimate_Phytoconstituents_in_Hedychium_species
74	Antimicrobial Foot Deodorizing Spray	Chopade Vitthal, Chaudhari Praveen,Patankar Prashant	Pharmaceutical Chemistry	International Journal of Pharmaceutical Quality Assurance	2023	0975-9506	https://ijpqa.com/	https://impactfactor.org/PDF/IJPQA/14/IJPQA,Vol14,Issue1,Article31.pdf
75	Antimicrobial Foot Deodorizing Spray	Chopade Vitthal, Chaudhari Praveen,Patankar Prashant	Pharmaceutical Chemistry	International Journal of Pharmaceutical Quality Assurance	2023	0975-9506	https://ijpqa.com/	https://impactfactor.org/PDF/IJPQA/14/IJPQA,Vol14,Issue1,Article31.pdf
76	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Glimepiride by Hydrotropic Solubilization	Sheetal D. Chaudhari , Rupali A. Jinturkar* , Pranali S. Shirsath, Shivam H. Sambre	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	1006-8341	https://fzgxjckxxb.com/	https://drive.google.com/file/d/1IRlKO-JcDYw4lb7hYbdhe1UmSnX_Z0wz/view
77	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of	Sheetal D. Chaudhari , Rupali A. Jinturkar* , Pranali S. Shirsath, Shivam H. Sambre	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	1006-8341	https://fzgxjckxxb.com/	https://drive.google.com/file/d/1IRlKO-JcDYw4lb7hYbdhe1UmSnX_Z0wz/view

	Glimepiride by Hydrotropic Solubilization							
78	Development of a New Validated Stability-Indicating High-Performance Thin-Layer Chromatography Method for Determination of Dosulepin HCl in Bulk and Marketed Formulation with Characterization of its Degradants by Liquid Chromatography–Mass Spectrometry	Aishwarya Ramchandra Balap, Ravina R. Waghmare	Pharmaceutical Chemistry	Asian Journal of Pharmaceutical Research and Health Care	2023	ISSN - Print: 2250-1444, Online: 2250-1460	https://www.ajprhc.com/	https://www.ajprhc.com/article.asp?issn=2250-1444;year=2023;volume=15;issue=1;spage=76;epage=82;aulast=Balap
79	The Efficient Activity of Glabridin and its Derivatives Against EGFR-mediated Inhibition of Breast Cancer	Arabinda Ghosh, Debanjana Ghosh, Nobendu Mukerjee, Swastika Maitra, Padmashree Das, Abhijit Dey, Souty M.Z. Sharkawi, Georgios D. Zouganelis, Athanasios Alexiou, Somdatta Yashwant Chaudhari, Ritika	Pharmaceutical Chemistry	Current Medicinal Chemistry	2023	0929-8673	https://benthamscience.com/public/journals/current-medicinal-chemistry	https://www.researchgate.net/publication/369031555_The_Efficient_Activity_of_Glabridin_and_its_Derivatives_Against_EGFR-mediated_Inhibition_of_Breast_Cancer

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80	Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches	Mukerjee, Nobendu ; Chaudhari, Somdatta Y. ; Jha, Swastik; Sinha, Shweta MSce; Jadhav, Shailaja ; Dhar, Rajib ; Rathod, Vivek D. BTechg; Nanaware, Rajesh B. MPharmh; Chakole, Rita D. PhDi; Sharma, Devesh MScj; Sharma, Prince Prashant PhDk; Pawar, Sonali D. MPharml; Ghosh, Arabinda PhDm	Pharmaceutical Chemistry	International Journal of Surgery	2023	1743-9191	https://journals.lww.com/international-journal-of-surgery/pages/default.aspx	https://www.researchgate.net/publication/369181514_Emerging_hepatitis_C_virus_and_neuron-allied_neuroviral_intertwine_and_its_therapeutic_approaches
81	Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches	Mukerjee, Nobendu ; Chaudhari, Somdatta Y. ; Jha, Swastik; Sinha, Shweta MSce; Jadhav, Shailaja ; Dhar, Rajib ; Rathod, Vivek D. BTechg;	Pharmaceutical Chemistry	International Journal of Surgery	2023	1743-9191	https://journals.lww.com/international-journal-of-surgery/pages/default.aspx	https://www.researchgate.net/publication/369181514_Emerging_hepatitis_C_virus_and_neuron-allied_neuroviral_intertwine_and_its_therapeutic_approaches

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82	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale , Manoj Tare, Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4856	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://qtanalytics.in/journals/index.php/IJERR/article/view/1722
83	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale , Manoj Tare, Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4856	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://qtanalytics.in/journals/index.php/IJERR/article/view/1722
84	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale , Manoj Tare, Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4856	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://qtanalytics.in/journals/index.php/IJERR/article/view/1722

85	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://www.researchgate.net/publication/370482710_Comparative_evaluation_of_lipsticks_developed_using_isolated_pigments_of_Capsicum_annuum_and_Lycopersicon_esculentum_fruits_and_various_natural_bases
86	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://www.researchgate.net/publication/370482710_Comparative_evaluation_of_lipsticks_developed_using_isolated_pigments_of_Capsicum_annuum_and_Lycopersicon_esculentum_fruits_and_various_natural_bases
87	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Man	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://www.researchgate.net/publication/370482710_Comparative_evaluation_of_lipsticks_developed_using_isolated_pigments_of_Capsicum_annuum_and_Lycopersicon_esculentum_fruits_and_various_natural_bases

		oj Tare,Dwarkadas Baheti						
88	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	https://qtanalytics.in/journals/index.php/IJERR/editorial-team	https://www.researchgate.net/publication/370482710_Comparative_evaluation_of_lipsticks_developed_using_isolated_pigments_of_Capsicum_annuum_and_Lycopersicon_esculentum_fruits_and_various_natural_bases
89	Development and validation of chromatographic method for analysis of some polycyclic hydrocarbons in soybean oil	Vitthal Chopade, Pradip Bodake, Rajendra Kawade, Rajanikant Kakade, Amit Panaskar, Bhagyashri Panaskar, Nitin Shinde, Reshma Devkate, Komal Hole, Shital Gaikawad, Poonam Kasar, Sonali Pawar, Vishnu Neharkar, Bhushan Pimpale, Shaikh, Atul Baravkar, Deepali Kadam, Sana M Jafar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.researchgate.net/publication/309515449_Method_Validation_and_Determination_of_Polycyclic_Aromatic_Hydrocarbons_in_Vegetable_O

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90	Development and validation of chromatographic method for analysis of some polycyclic hydrocarbons in soybean oil	, Vitthal Chopade, Pradip Bodake, Rajendra Kawade, Rajanikant Kakade, Amit Panaskar, Bhagyashri Panaskar, Nitin Shinde, Reshma Devkate, Komal Hole, Shital Gaikawad, Poonam Kasar, Sonali Pawar, Vishnu Neharkar, Bhushan Pimpale, Shaikh, Atul Baravkar, Deepali Kadam, Sana M Jafar Shaikh, Rahul Mohan, Monali Bhalerao, Milind Velhal, Hemant Deokule	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.researchgate.net/publication/309515449_Method_Validation_and_Determination_of_Polycyclic_Aromatic_Hydrocarbons_in_Vegetable_O

91	GC-MS and Insilico molecular docking of Leonurine isolated from Leonotis nepetifolia for antioxidant activity.	, Pallavi M. Patil, Dnyaneshwari R. Chopade, Mayuri B. Suryawanshi	Pharmaceutical chemistry	High Technology Letters	2023	1006-6748	https://gjstx-e.cn/	https://drive.google.com/file/d/1A4KHGiYIPfO81yEcCNFqm9LOXyVtFELu/view
92	Development and validation of RPHPLC method for assay of fluticasone furoate from nasal spray formulation	Vitthal Chopade, Vishnu Neharkar, Padmanabh Deshpande Makarand Puri, Priti Khanapure, Vaishnavi Chopade, Minal Ghante, Jayshree Jagtap, Shital Godse, Vidhya Bhusari, Vasundhara Sawant, Sonali Labhade, Rajendra Kawade, Deepali Kadam, Nilesh Jadhav, Gaffar Sayyad, Dipti Phadtare, Shital Godse, Pandurang Vijapure, Kunal Survade, Rahul Mohan, Arvind	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/e16398f7ecf4921a46e121f2bf3b947f.pdf

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93	Hepatoprotective activity of Balsamodendron mukul extract against Paracetamol-induced liver toxicity in rats: In vivo pharmacological and toxicological evaluation,	Darshan Shah, Nitin Mahurkar, Dnyandev Gadhave, Ram Nikhate , Kalyani Kakad	Pharmacognosy	Annales Pharmaceutiques Françaises	2023	2772-803X	https://www.sciencedirect.com/journal/annales-pharmaceutiques-francaises	https://pubmed.ncbi.nlm.nih.gov/37060939/
94	Development and Characterization of Lipidic Nano-Cochleate for Topical Delivery of Itraconazole	Anuradha G. More , Hrishikesh S. Sonsale , Swati M. Mutha , Padmaja S. Kore Aishwarya S. Mahangale , Akshay N. Deo , Mukesh P. Ratnaparkhi	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com	https://www.eurchembull.com/uploads/paper/09582937a4da332c4d57fd7d7b7e19d2.pdf
95	Development and Characterization of Lipidic Nano-Cochleate for Topical Delivery of Itraconazole	Anuradha G. More , Hrishikesh S. Sonsale , Swati M. Mutha , Padmaja S. Kore Aishwarya S. Mahangale , Akshay	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com	https://www.eurchembull.com/uploads/paper/09582937a4da332c4d57fd7d7b7e19d2.pdf

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96	Quantification of spironolactone and its impurities present in pharmaceutical dosage forms by stability-indicating hplc method	Amit S. Tapkir , Harshal S. Loharkar and Santaji Nalawade	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Research	2023	0975-8232	https://ijpsr.com/	https://ijpsr.com/bft-article/quantification-of-spironolactone-and-its-impurities-present-in-pharmaceutical-dosage-forms-by-stability-indicating-hplc-method/
97	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/45633c4074a8db9edb10d72f45058640.pdf
98	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/45633c4074a8db9edb10d72f45058640.pdf
99	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/45633c4074a8db9edb10d72f45058640.pdf

	in wistar albino rats as per OECD 425	Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad						
100	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/45633c4074a8db9edb10d72f45058640.pdf
101	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/88565ebc13970a5360db8172e8d172bb.pdf
102	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/88565ebc13970a5360db8172e8d172bb.pdf

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104	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/88565ebc13970a5360db8172e8d172bb.pdf
105	Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic Extract in laboratory animals	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek Nemmaniwar , Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/21353d96a5e9d5caa49837be8e58472a.pdf
106	Evaluation of wound healing and anti-inflammatory potential of	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/21353d96a5e9d5caa49837be8e58472a.pdf

	Daucus Carota ethanolic Extract in laboratory animals	Nemmaniwar , Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan						
107	Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic Extract in laboratory animals	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek Nemmaniwar , Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan	Pharmacology	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/21353d96a5e9d5caa49837be8e58472a.pdf
108	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Rivaroxaban by Hydrotropic Solubilization	Sheetal D. Chaudhari*, Roshani S. Gite, Chaitanya V. Walunjkar	Pharmaceutical Chemistry	Journal of Basic sciences	2023	ISSN NO : 1006-8341	https://fzgxjckxxb.com/	https://fzgxjckxxb.com/volume-23-issue-3-2023/

109	Identification of d-limonene and rosmarinic acid by gc-ms analysis of kalonji oil with anti-microbial and anti-fungal activities	Pallavi M Patil, Samiksha Surendra Agarkar, Neha Prabhakar Shegokar	Pharmaceutical chemistry	High Technology Letters	2023	1006-6748	https://gjstx-e.cn/volume-29-issue-4-april-2023/	https://drive.google.com/file/d/1-bL7373hROHnta3oGapTxdUIiT75_Hm9/view?usp=share_link
110	Design And Characterization Of Nanoemulgel For Topical Fungal Infection: Box Behnken Design Approach	Anuradha G. More, Shraddha S. Satkar, Swati S. Mutha, Padmaja S. Kore, Swapnil S.Tarte, Adil M. Pathan, Renuka G. Zarekar	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/1433bc432d184147bc28e41535e0f544.pdf
111	Design And Characterization Of Nanoemulgel For Topical Fungal Infection: Box Behnken Design Approach	Anuradha G. More, Shraddha S. Satkar, Swati S. Mutha, Padmaja S. Kore, Swapnil S.Tarte, Adil M. Pathan, Renuka G. Zarekar	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/abstracting-and-indexing	https://www.eurchembull.com/uploads/paper/1433bc432d184147bc28e41535e0f544.pdf
112	2-Pyrocatechuic Acid Attenuates Carboplatin Induced Hematological Toxicities in Wistar Rats	Arvind B Naik, Deepti Bandawane, Archana Naik	Pharmacology	Research J. Pharm. and Tech.	2023	Online 0974-360X Print 0974-3618	https://www.eurchembull.com/abstracting-and-indexing	https://rjptonline.org/AbstractView.aspx?PID=2022-15-3-19
113	Simultaneous estimation of lamivudune, Tenofovir, Disoproxil Fumarate and Efavirenz in Bulk and tablet	Atul Baravkar, vitthal chopade, Makarand Puri, Vishnu	Pharmaceutical Chemistry	International Journal	2023	2230-9713	https://jpionline.org/	https://sci-hub.se/10.4103/2229-4708.103876

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114	Evaluation of In Vitro and In Silico Anti-Alzheimer potential of ethanolic extract of Nyctanthes arbortristis flowers.	Arvind B Naik, Deepti Bandawane, Archana Naik	Pharmacology	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com/issue?volume=Volume%20-12&issue=Special%20Issue-4&year=2023	https://www.eurchembull.com/uploads/paper/ccf56d358f94e2d41bf1a2ee148b6b78.pdf
115	In-silico investigation of phytoconstituents from Plumeria obtusa and Sansevieria cylindrica plants for assessment of anti-venom activity against snake venom.	Sunil Shewale, Vaishali Undale, Bhagyashri Warude, Vrushali Bhalchim, Mohini Kuchekar, Jay Gagare.	Pharmacognosy	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com	https://www.eurchembull.com/issue-content/in-silico-investigation-of-phytoconstituents-from-plumeria-obtusa-and-sansevieria-cylindrica-plants-for-assessment-of-anti-venom-activity-against-snake-venom-1341
116	A Review on Cubosome: The Novel Drug Delivery System	Devendra L. Visokar, Ashwini D. Akhote, Tushar M. Phalke	Pharmaceutics	International Journal of Research Publication and Reviews	2023	2582-7421	https://www.ijrpr.com/callfp.php	https://ijrpr.com/uploads/V4ISSUE4/IJRPR11971.pdf
117	Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac	Ujwala Wasnik, Rushikesh Nikalje, Khandoba Birajdar, Sameer Lakade, Sidheshwar Jadhav,	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com/about	https://www.eurchembull.com/issue-content/development-and-validation-of-tlc-densitometric-method-for-simultaneous-estimation-of-moxifloxacin-hcl-and-ketorolac-

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118	Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation	Ujwala Wasnik, Rushikesh Nikalje, Khandoba Birajdar, Sameer Lakade, Sidheshwar Jadhav, Padmaja Kore, Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	https://www.eurchembull.com/about	https://www.eurchembull.com/issue-content/development-and-validation-of-tlc-densitometric-method-for-simultaneous-estimation-of-moxifloxacin-hcl-and-ketorolac-tromethamine-in-bulk-drug-and-marketed-formulation-1807
119	HLA-E (Human Leukocyte Antigen-E): Promising Biological agent for Cancer Mitigation	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote, Mayuri S. Borbane, Rushikesh V. Khorde, Shilpa S. Biradar, Dr. U. S. Desai , Dr. K. S. Shaikh	Pharmaceutics	Journal of Emerging Technologies and Innovative Research (JETIR)	2023	2349-5162	https://www.jetir.org/	https://www.jetir.org/papers/JETIR2305F73.pdf
120	Evaluation of anti-atherosclerotic potential of Tinospora cordifolia in high-fat diet-induced atherosclerosis with	S. S. Nipate,K. Koradkar & S. A. Gojare	Pharmacology	Future Journal of Pharmaceutical Sciences	2023	2314-7253	https://fjps.springeropen.com/	https://fjps.springeropen.com/articles/10.1186/s43094-023-00488-y

	associated changes in histological and biochemical parameters on Wistar rats							
121	Identification and quantification of two low levels of potential genotoxic impurities in rilpivirine hydrochloride drug substance by hplc technique	Vitthal V. Chopade , Dipali S. Thete , Pallavi M. Patil , Nilesh Jadhav , Atul A. Baravkar	Pharmaceutical Chemistry	THE JOURNAL OF ORIENTAL RESEARCH MADRAS	2023	0022-3301	https://ksri.in/academic-and-research-pursuits/ksri-publications/book-catalogue/the-journal-of-oriental-research-madras	https://sciencescholar.us/journal/index.php/ijhs/article/view/13190
122	Identification and quantification of two low levels of potential genotoxic impurities in rilpivirine hydrochloride drug substance by hplc technique	Vitthal V. Chopade , Dipali S. Thete , Pallavi M. Patil , Nilesh Jadhav , Atul A. Baravkar	Pharmaceutical Chemistry	THE JOURNAL OF ORIENTAL RESEARCH MADRAS	2023	0022-3301	https://ksri.in/academic-and-research-pursuits/ksri-publications/book-catalogue/the-journal-of-oriental-research-madras	https://sciencescholar.us/journal/index.php/ijhs/article/view/13190
123	Stability of co-amorphous solid dispersions: physical and chemical aspects	Abhijeet A. Aher1,2, Karimunnisa S. Shaikh1 , Praveen D. Chaudhari	Pharmaceutics	Journal of Structural Chemistry	2023	0022-4766	https://www.springer.com/journal/10947	https://link.springer.com/article/10.1134/S0022476623040157
124	Stability of co-amorphous solid dispersions: physical and chemical aspects	Abhijeet A. Aher1,2, Karimunnisa S. Shaikh1 , Praveen D. Chaudhari	Pharmaceutics	Journal of Structural Chemistry	2023	0022-4766	https://www.springer.com/journal/10947	https://link.springer.com/article/10.1134/S0022476623040157

125	Development of an UV spectroscopic method for Capsaicin quantification in dosage form and in a bulk formulation	, Vitthal Chopade, Atul Baravkar,Sneha Dhonde, Trushali Mandhare, Pooja Kashid, Ganesh Phadtare,Jyoti Jawale, Alfa Jain, Deepali Kadam and Aditi Zagade	Pharmaceutical Chemistry	International Journal of Life science and Pharma Research	2023	2250-0480	https://www.ijlpr.com/index.php/journal	https://www.phytojournal.com/archives/2019/vol8issue1/PartO/7-6-500-560.pdf
126	Review On: Anti-Inflammatory Drugs	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote, Mayuri S. Borbane, Rushikesh V. Khorde, Shilpa S. Biradar, Dr. U. S. Desai, Dr. K.S.Shaikh	Pharmaceutics	Journal of Emerging Technologies and Innovative Research (JETIR)	2023	2349-5162	https://jetir.org/?gclid=CjwKCAjwsvujBhAXEiwA_UXnAPs6w5JLI2kNWQE3eqa8567g18uq7byy1Ipa4GStztTXcfQUJTV9zBoCP8MQAvD_BwE#	https://www.jetir.org/papers/JETIR2305F02.pdf
127	Review On: Anti-Inflammatory Drugs	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote, Mayuri S. Borbane, Rushikesh V. Khorde, Shilpa S. Biradar, Dr. U. S.	Pharmaceutics	Journal of Emerging Technologies and Innovative Research (JETIR)	2023	2349-5162	https://jetir.org/?gclid=CjwKCAjwsvujBhAXEiwA_UXnAPs6w5JLI2kNWQE3eqa8567g18uq7byy1Ipa4GStztTXcfQUJTV9zBoCP8MQAvD_BwE#	https://www.jetir.org/papers/JETIR2305F02.pdf

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128	Method Development and Validation of Stability-Indicating HPTLC Method for Determination of Brivaracetam	KORDE KT1* AND PIMPLE SS2	Pharmaceutics	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2023	2277-4998	https://ijbpas.com/	https://ijbpas.com/pdf/2023/May/MS_IJBPAS_2023_7123.pdf
129	Isolation and Characterisation of Nateglinide and its impurity in Bulk and Marketed Formulation by HPTLC Method	Patil Pallavi M1 *, Mayur Tekade2 , Samiksha Agarkar	Pharmaceutical Chemistry	Research J. Pharm. and Tech.	2023	0974-360X (Online) 0974-3618 (Print)	https://rjptonline.org/	https://rjptonline.org/AbstractView.aspx?PID=2023-16-5-44
130	Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral Sclerosis -An updated review	Taha Alqahtani, Sharada L. Deore, Anjali A. Kide, Bhavana A. Shende, Ritika Sharma, Rita Dadarao Chakole, Lalita S. Nemade, Nikita Kishor Kale, Sudarshana Borah, Savita Shrikant Deokar, Ashok Behera, Divya Dhawal Bhandari,	Pharmaceutical Chemistry	Mitochondrion	2023	1567-7249	https://www.sciencedirect.com/	https://www.sciencedirect.com/science/article/abs/pii/S1567724923000051X?via%3Dihub

		Nikita Gaikwad, Abul Kalam Azad, Arabinda Ghosh						
131	Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral Sclerosis -An updated review	Taha Alqahtani, Sharada L. Deore, Anjali A. Kide, Bhavana A. Shende, Ritika Sharma, Rita Dadarao Chakole, Lalita S. Nemade, Nikita Kishor Kale, Sudarshana Borah, Savita Shrikant Deokar, Ashok Behera, Divya Dhawal Bhandari, Nikita Gaikwad, Abul Kalam Azad, Arabinda Ghosh	Pharmaceutical Chemistry	Mitochondrion	2023	1567-7249	https://www.sciencedirect.com/	https://www.sciencedirect.com/science/article/abs/pii/S1567724923000051X?via%3Dihub
132	Quantification of Slidenafil citrate in bulk and dosage form by HPTLC by using hydrotopic agents	Vitthal chopade, Pooja Wadgave, Sheetal Chaudhari, Mnisha Salunkhe, Vrushali Kharate, Pratiksha Suryawanshi,	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/b9ef601b1c6578100808de5d2e1e8b3d.pdf

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133	Quantification of Slidenafil citrate in bulk and dosage form by HPTLC by using hydrotopic agents	Vitthal chopade, Pooja Wadgave, Sheetal Chaudhari, Mnisha Salunkhe, Vrushali Kharate, Pratiksha Suryawanshi, Ashwini P Shewale, Sayyed Gaffar, Nilesh Jadhav, Sanjay Garje, Rajanikant Kakade, Ashok Jagdale, Atul Barvkar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	https://www.eurchembull.com/	https://www.eurchembull.com/uploads/paper/b9ef601b1c6578100808de5d2e1e8b3d.pdf
134	Supramolecular Drug Delivery	Rushikesh V Khorde, Mayuri S Borbane, Tushar M. Phalke, Darshana H Wani, Gaurav A Mahajan,	Pharmaceutics	Journal For Basic Sciences	2023	1006-8341	https://fzgxjckxxb.com/volume-23-issue-6-2023/	https://drive.google.com/file/d/1dn6XqBfuzZpKogVj0eEtFD6q9s8g_Itn/view

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135	Supramolecular Drug Delivery	Rushikesh V Khorde, Mayuri S Borbane, Tushar M. Phalke, Darshana H Wani, Gaurav A Mahajan, Yashoda N Tidake, U CGalgatte, Ujwala S Desai	Pharmaceutics	Journal For Basic Sciences	2023	1006-8341	https://fzgxjckxxb.com/volume-23-issue-6-2023/	https://drive.google.com/file/d/1dn6XqBfuzZpKogVj0eEtFD6q9s8g_Itn/view
136	Role Of Neuropeptides In Human Behaviour	Padmaja Kore * , Abhijit Deshmukh, Ganesh Pore, Surabhi Shinde, Prajakta Tambe and Pradnya Khelbude	Pharmacology	International Journal of Pharmaceutical Sciences and Research (IJPSR)	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	https://ijpsr.com/	http://surl.li/jhlag
137	Chemical fingerprinting of Curcumin and Berberin in selected Ayurvedic formulation and herbs recommended for skin infection	Kalyani S. Kakad, Nawale S, Malode SS, Nemmaniwar AS, Dhole ON, Raut PL	Pharmacognosy	International Journal of Biology, Pharmacy and Allied sciences	2023	2277-4998	www.ijbpas.com	https://doi.org/10.31032/IJBPAS/2023/12.6.7099
138	Chemical fingerprinting of Curcumin and Berberin in selected Ayurvedic formulation and herbs	Kalyani S. Kakad, Nawale S, Malode SS, Nemmaniwar	Pharmacognosy	International Journal of Biology,	2023	2277-4998	www.ijbpas.com	https://doi.org/10.31032/IJBPAS/2023/12.6.7099

	recommended for skin infection	AS, Dhole ON, Raut PL		Pharmacy and Allied sciences				
139	Exploration of anti-atherosclerotic activity of origanum majorana l. In experimental animals with high-fat diet-induced atherosclerosis	D. V. Katkar, S. F. Abhang, B. P. Pimple and S. S. Nipate	Pharmaceutics	International journal of pharmaceutical sciences and research	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	https://ijpsr.com/	https://ijpsr.com/bft-article/exploration-of-anti-atherosclerotic-activity-of-origanum-majorana-l-in-experimental-animals-with-high-fat-diet-induced-atherosclerosis/
140	Exploration of anti-atherosclerotic activity of origanum majorana l. In experimental animals with high-fat diet-induced atherosclerosis	D. V. Katkar, S. F. Abhang, B. P. Pimple and S. S. Nipate	Pharmaceutics	International journal of pharmaceutical sciences and research	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	https://ijpsr.com/	https://ijpsr.com/bft-article/exploration-of-anti-atherosclerotic-activity-of-origanum-majorana-l-in-experimental-animals-with-high-fat-diet-induced-atherosclerosis/
141	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj Chumbhale | Asmita Gaikwad | Harshal Tare'	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	https://malque.pub/	https://malque.pub/ojs/index.php/msj/article/view/658/525

142	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj Chumbhale | Asmita Gaikwad | Harshal Tare'	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	https://malque.pub/	https://malque.pub/ojs/index.php/msj/article/view/658/525
143	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj Chumbhale | Asmita Gaikwad | Harshal Tare'	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	https://malque.pub/	https://malque.pub/ojs/index.php/msj/article/view/658/525
144	A Review Of The Relationship Between Antidepressants And Suicide Risk	Padmaja Kore * , Pradnya Khelbude, Surabhi Shinde, Abhijit Deshmukh, Prajakta Tambe and Ganesh Pore	Pharmacology	International Journal of Pharmaceutical Sciences and Research (IJPSR)	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	https://ijpsr.com/	https://drive.google.com/file/d/1pXnOgq3i4mootVTEfB8Ak1XW-prcdjKB/view?usp=sharing
145	Anticataleptic effect of Xanthium Stramarium Hydroalcoholic Extractin Laboratory Animals	Kore PS*, Kalaskar S, Jachakd D, Jadhav S, Patil D, Patil S, Kuchekar M	Pharmacology	International Journal of Biology, Pharmacy and	2023	2277-4998	https://ijbpas.com/	https://drive.google.com/file/d/16NHfBuGa5HcVTYTonzRX0cxgAWzASVJp/view

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146	Anticataleptic effect of Xanthium Stramarium Hydroalcoholic Extractin Laboratory Animals	Kore PS*, Kalaskar S, Jachakd D, Jadhav S, Patil D, Patil S, Kuchekar M	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2023	2277-4998	https://ijbpas.com/	https://drive.google.com/file/d/16NHfBuGa5HcVTYTonzRX0cxgAWzASVJp/view
147	A review on phytocompounds and pharmacological Activities reported for tagetes erecta	Kore P* , Shinde S , Pore G , Tambe P And Bandawane D*	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	file:///C:/Users/Lenovo/Downloads/REVISED%20Galley%20Proof%20MS%20IJBPAS%202023%207665%20(2).pdf
148	A review on phytocompounds and pharmacological Activities reported for tagetes erecta	Kore P* , Shinde S , Pore G , Tambe P And Bandawane D*	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	file:///C:/Users/Lenovo/Downloads/REVISED%20Galley%20Proof%20MS%20IJBPAS%202023%207665%20(2).pdf
149	A review on phytocompounds and pharmacological activities for musa paradisiaca linn.	Kore P* , Pore G, Shinde S, Tambe P And Bandawane D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	https://drive.google.com/file/d/1gPRQ5BT_TJ4qfJKUiSMxYWaAGFDcLuPg/view?usp=sharing

150	A review on phytocompounds and pharmacological activities for musa paradisiaca linn.	Kore P* , Pore G, Shinde S, Tambe P And Bandawane D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	https://drive.google.com/file/d/1gPRQ5BT_TJ4qfJKUiSMxYWaAGFDcLuPg/view?usp=sharing
151	A Review On Pharmacology And Phytochemistry Of Portulaca Oleracea	Kore P S , Tambe P, Pore G, Shinde S, Bandawane D D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	https://drive.google.com/file/d/1RGmQhsqhr-LIUaLqY56CVm0PbxrM89_E/view?usp=sharing
152	A Review On Pharmacology And Phytochemistry Of Portulaca Oleracea	Kore P S , Tambe P, Pore G, Shinde S, Bandawane D D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	www.ijbpas.com	https://drive.google.com/file/d/1RGmQhsqhr-LIUaLqY56CVm0PbxrM89_E/view?usp=sharing
153	Inhibitory Effect of Piperine on Nucleation and Aggregation of Calcium Oxalate Crystals	B. P. Pimple, A.L.Thorat and P.D.Chaudhari	Pharmacognosy	Advances in Bioresearch	2021	2277-1573 0976-4585	https://soeagra.com/abr.html	https://soeagra.com/abr/abr_jan2021/25.pdf
154	Inhibitory Effect of Piperine on Nucleation and Aggregation of Calcium Oxalate Crystals	B. P. Pimple, A.L.Thorat and P.D.Chaudhari	Pharmacognosy	Advances in Bioresearch	2021	2277-1573 0976-4585	https://soeagra.com/abr.html	https://soeagra.com/abr/abr_jan2021/25.pdf

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156	Design and Development of lornoxicam impregnated dry powder-based liquid crystals	Vishal Pande, Shubham Gore, Ajinkya Pote, Minal Harde, Sameer Lakade, Vaibhav Raut	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	https://bepls.com/	https://bepls.com/bepls_april2021/15.pdf
157	Validated inherent stability indicating reversed phase HPLC- DAD method for simultaneous determination of tolperisone hydrochloride and diclofenac sodium in marketed formulation	Minal T Harde, Sameer H Lakade, Sapana K Rokade, Shital G Rathod, Pooja A Dale, Komal A Kendre, Indra H Sirvi	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	https://bepls.com/	https://bepls.com/april_2021.html
158	Study and optimization of the effect of critical formulation components in the manufacturing of	Sameer H Lakade, Minal T Harde,	Pharmaceutical chemistry	Bulletin of environment,	2021	2277-1808	https://bepls.com/	https://bepls.com/bepls_april2021/14.pdf

	multiparticulate oral controlled release drug delivery system	Monika Patil, Sneha Gupta		pharmacology, and life science				
159	ICH Guideline in practice: Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Eperisone hydrochloride and diclofenac sodium in marketed formulation	Minal T Harde, Sameer H Lakade, Neha K Kakade, Laxmi R Chaudhary, Snehal V Gosavi, Rohan R Patekar, Heena B Choudhary.	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	https://bepls.com/	https://bepls.com/bepls_april2021/13.pdf
160	Formulation And Evaluation of Lipsticks from The Dyes Of Root Barks of Alkana Tinctoria	Pimple B. P., Mekhe A.R., Joshi A.A., Malwadkar S.S. and Pimple K. B.	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences	2021	N 2277-1808	https://bepls.com/	https://bepls.com/bepls_april2021/17.pdf
161	Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients	Smita S. Pimple, Kiran Mahajan, Hemant Deokule	Pharmaceutics	International Journal of Pharmaceutical Research	2021	0975-2366	https://www.ijprajournal.com/?gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutkzISaVDdZdz0dk8EQU4qSs4iXkO2pBfPDDZu-CSRfkf9AGyH8RlhAaAkOHEALw_wcB	http://www.ijpronline.com/ViewArticleDetail.aspx?ID=20996

162	Schiff Base Conjugate of 5-Fluoroisatin with Thiophene-2-Ethylamine and its Mannich Bases: Synthesis, Molecular Docking, and Evaluation of in vitro Anti-inflammatory and Anti-tubercular Activity	Bhushan D. Varpe, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Investigation	2021	Print -2230-973X, Online - 2230-9713	https://www.ijprajournal.com/?gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutkzISaVDdZdz0dk8EQU4qSs4iXkO2pBfPDDZu-CSRfkf9AGyH8RlhAaAkOHEALw_wcB	https://jpionline.org/index.php/ijpi/article/view/1027
163	3D drug printing methods and their application in the Pharmaceutical and biomedical area	Dr. Anuradha G.More , Akshay V. Giri	Pharmaceutics	Journal of Hospital Pharmacy	2021	2348-7704	https://journalofhospitalpharmacy.in/	http://www.johp.journalofhospitalpharmacy.in/admin/freePDF/no3v4hlq4m459u06804m.pdf
164	Method development and validation of rilpivirine in bulk and solid dosage form by using UV visible spectrophotometric method	Shrishail M ghurghure, Anup dhange, Rupali mhetre, Atul Phatak	Pharmaceutics	International journal of research and analytical reviews	2021	E-ISSN 2348-1269, P- ISSN 2349-5138	https://www.ijrar.org/	https://www.researchgate.net/profile/Atul-Phatak/publication/364320912_METHOD_DEVELOPMENT_AND_VALIDATION_OF_RILPIVIRINE_IN_BULK_AND_SOLID_DOSAGE_FORM_BY_USING_UV-VISIBLE_SPECTROPHOTOMETRIC_METHOD/links/6347ca1776e39959d6bdcece/METHOD-DEVELOPMENT-AND-VALIDATION-OF-RILPIVIRINE-IN-BULK-AND-SOLID-DOSAGE-FORM-BY-USING-UV-

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165	A review on stability improvement of sugarcane juice by using natural preservatives	Vitthal Chopade, Kamlesh Mankuskar	Pharmaceutical chemistry	International Journal of pharmaceutical chemistry and analysis	2021	Print ISSN:-2394-2789 Online ISSN:-2394-2797	https://www.ijpca.org/	https://pdfs.semanticscholar.org/fe2a/0a38b10b314921f4d2c0a40bb893afd76109.pdf
166	To Study the Pharmacokinetic Herb-Drug Interaction of Momordica Charantia Fruit Extract and Pure Charantin with Nateglinide in Rats	Aishwarya R. Balap	Pharmaceutical chemistry	International Journal of Pharmacy and Pharmaceutical Sciences	2021	online 0975-1491 print 2656-0097	https://journals.innovareacademics.in/index.php/ijpps	https://journals.innovareacademics.in/index.php/ijpps/article/view/40967/25262
167	The use of negative oxygen ion clusters [O2−(H2O) n] and bicarbonate ions [HCO3−] as the supportive treatment of COVID- 19 infections: A Possibility	Ravindra V Badhe, Sonali S Nipate	Pharmacology	Medical hypotheses	2021	0306-9877	https://www.sciencedirect.com/journal/medical-hypotheses	https://pubmed.ncbi.nlm.nih.gov/34390895/
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170	One-step synthesis approach of mesoporous silica packed with graphene oxide nanosheet: Characterization and drug release aspects	Prashant K. Deshmukh, Sameer H. Lakade , Umesh R. Jaiswal & Minal T. Harde, Mahesh P. More	Pharmaceutical chemistry	Materials Technology	2021	1753-5557	https://www.tandfonline.com/journals/ymte20	https://www.tandfonline.com/doi/abs/10.1080/10667857.2021.1972689
171	Blowfly maggots and their application in human	Chopade V.V, Gawade V S, Kokare N V.	Pharmaceutical chemistry	International Journal of Entomology Research	2021	2455-4758	https://www.entomologyjournals.com/	https://drive.google.com/file/d/19FX7-9SIfMK3qpcWNhxSQVkefqCL0F33/view
172	Nano Emulgel: A Smarter Topical Lipidic Emulsion Based Nanocarrier	Dr. Anuradha G.More, Shraddha S. Satkar	Pharmceutics	Journal of Hospital Pharmacy	2021	: 2348-7704	https://journalofhospitalpharmacy.in/	https://www.johp.journalofhospitalpharmacy.in/admin/freePDF/90konr6bqr96o9nl5xhk.pdf
173	Isolation, Purification, Characterization and Immunomodulatory activity of isolated flavonoid fractions derived from Abelmoschus	Neelam Dashputre, Deepti D Bandawane	Pharmacology	Advances in Bioresearch	2021	E-ISSN : 2277-1573 P-ISSN : 0976-4585	https://soeagra.com/abr.html	https://soeagra.com/abr/abrsept2021/26.pdf

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175	Challenges, Advances, and Opportunities of Herbal Medicines in Wound Healing: A Review	Balap A.R, Gaikwad A.A.	pharmaceutical chemistry	International Journal of Pharmaceutical Sciences Review and Research	2021	0976-044X	https://www.globalresearchonline.net/	https://www.researchgate.net/publication/356983458_Challenges_Advances_and_Opportunities_of_Herbal_Medicines_in_Wound_Healing_A_Review
176	Synthesis, Characterization, and Biological Evaluation of some Novel Substituted Indole-Coumarin Derivatives as Potential Antibacterial and Antifungal Agents	P. K. Vawhal, S. B. Jadhav	Pharmaceutical chemistry	Journal of Pharmaceutical Research International	2021	2231-2919	https://journaljpri.com/index.php/JPRI	https://journaljpri.com/index.php/JPRI/article/view/4175
177	Group-based quantitative structure and activity relationship on benzothiazole derivatives for the development of potent anti- cancer compounds	Amit S. Tapkir, Sohan S. Chitlange, Ritesh P. Bhole	Pharmaceutical chemistry	Thai Journal of Pharmaceutical Sciences	2021	2231-2919,	http://www.tjps.pharm.chula.ac.th/ojs/index.php/tjps	https://www.thaiscience.info/Journals/Article/TJPS/10996184.pdf

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179	Quality risk assessment and DoE- Practiced validated stability-indicating chromatographic method for quantification of rivaroxaban in bulk and tablet dosage form	Kamlesh Palandurkar, Richie Bhandre, Sai H S Boddu, Minal T Harde, Sameer H Lakade, Ujjwala Kandekar, Prashant Waghmare	Pharmaceutical chemistry	Acta Chromatographica	2022	1233-2356	https://akjournals.com/view/journals/1326/1326-overview.xml	file:///C:/Users/Adil%20Khan/Downloads/2083-5736-article-p10.pdf
180	Exploring Cytotoxic Potential of Ciclopirox on Colorectal Cancer Cells by In-Silico Methodology	Deokar SS, Shaikh KS	Pharmaceutics	Bio interface Research in Applied Chemistry	2022	2069-5837	https://biointerfaceresearch.com/	https://biointerfaceresearch.com/wp-content/uploads/2021/11/20695837126.72877310.pdf

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182	Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated with 1,3,4-oxadiazole derivatives	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	Indian Journal of Pharmaceutical Education and Research	2021	0019-5464	http://www.ijper.org/	https://www.ijper.org/article/1583
183	Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel pyrrolidine sulphonamide derivative	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Investigation	2021	Print -2230-973X, Online - 2230-9713	https://www.jpionline.org/index.php/ijpi	https://www.jpionline.org/index.php/ijpi/article/view/1124
184	Stability-indicating and analysis of Quercetin, Rutin, and Lupeol in Benincasa hispida (Cucurbitaceae) fruit, leaves extracts, and formulation by High-Performance Thin layer Chromatographic methods.	Kakad Kalyani Shrinivas* , Kundan Chimanaram Choudhary, Mukesh Rajaram Choudhary	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences	2021	2277-1808	https://bepls.com/	https://bepls.com/bepls_dec2021/13.pdf
185	Study of antihyperglycemic, antihyperlipidemic and antioxidant activities of Withania coagulans fruits in	Deepti D. Bandawane, Archana R Juvekar	Pharmacology	Indian Drugs	2021	2277-1808	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=MTI1Nw==

	streptozotocin-induced non-insulin dependent diabetes mellitus in rats							
186	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	https://www.indiandrugsonline.org/	https://ijpsr.com/bft-article/evaluation-of-in-vitro-anthelmintic-potential-of-umbelliferone-against-pheretima-posthuma/
187	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	https://www.indiandrugsonline.org/	https://ijpsr.com/bft-article/evaluation-of-in-vitro-anthelmintic-potential-of-umbelliferone-against-pheretima-posthuma/
188	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	https://www.indiandrugsonline.org/	https://ijpsr.com/bft-article/evaluation-of-in-vitro-anthelmintic-potential-of-umbelliferone-against-pheretima-posthuma/
189	Biopolymers: A comprehensive review.	Mohini Chandrashekhar Upadhye, Mohini Chetan Kuchekar, Rohini Revansiddhappa Pujari and Nutan Uttam Sable	Pharmacognosy	Open Access Research Journal of Science and Technology	2022	2782-9960	http://oarjst.com/	https://oarjst.com/sites/default/files/OARJST-2021-0070.pdf

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191	Exploration of anti-hyperglycemic potential of herbal mixture in streptozotocin- induced type-II diabetes in rats	DD Bandawane, PD Chaudhari, AR Juvekar	Pharmacology	International Journal of Pharmaceutical Sciences and Research	2021	0975-8232 2320-5148	https://www.ijprajournal.com/?gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutklA2GgVEYBXtt6Cp8gmqjMPobUp1zZwi5JUF-i_uNYIiOyj4m3N7gaAvaxEALw_wcB	https://ijpsr.com/bft-article/exploration-of-anti-hyperglycemic-potential-of-herbal-mixture-in-streptozotocin-induced-type-ii-diabetes-in-rats/
192	Systematic Development of Design of Expert Optimized Self Micro Emulsifying Drug Delivery System of Silymarin	Bhavesh Choudhary, Akshay Gaikwad, Vitthal Chopade	Pharmaceutical chemistry	Journal of the Maharaja Sayajirao University of Baroda	2021	0025-0422	https://msubaroda.ac.in/MSUB_Journal	https://drive.google.com/file/d/1JAkhIqMnWOGY2cmBtAQDgBG8pLvzBJGZ/view
193	Comparative Study of Aragvadha Phalamajja (Cassia fistula Linn.) w.s.r. to its Sangrahana Vidhi.	Poonam Dilip Sable, Asmita Uday Jadhav, Apoorva Sangoram, Sable P N, Mohini Chetan Kuchekar .	Pharmacognosy	International Journal of Ayurvedic Medicine	2021	0976-5921	https://ijam.co.in/index.php/ijam	https://www.ijam.co.in/index.php/ijam/article/view/2092/758

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195	A stability-indicating HPLC method for estimation of doxylamine succinate in tablets and characterization of its major alkaline stress degradation product	Minal T Harde, Sameer H Lakade	Pharmaceutical chemistry	Future Journal of Pharmaceutical Sciences	2021	2314-7253	https://fjps.springeropen.com/	https://fjps.springeropen.com/articles/10.1186/s43094-021-00276-6
196	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'-[(Z)-substituted –Phenyl ethylidene] Imidazole[1,2-A] Pyridene-3-Carbohydrazide Derivatives as DPP-IV inhibitors for the Treatment of Type 2 Diabetes Mellitus	Prerana Chavan, Shailaja Jadhav	pharmaceutical chemistry	Letters in Drug Design and Discovery	2021	ISSN (Print): 1570-1808 ISSN (Online): 1875-628X	https://benthamscience.com/public/journals/letters-in-drug-design-and-discovery	https://www.eurekaselect.com/article/117613
197	Formulation And Evaluation of Polyherbal Shampoo as Hair Care Product	Mohini C. Kuchekar*, Shraddha S. Makeshwar and Arti R. Dabhade	Pharmacognosy	World journal of pharmaceutical research	2021	2277-7105	https://www.wjpr.net/	https://www.ijam.co.in/index.php/ijam/article/view/2696

198	Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti-cancer agent	Bharti Fegade, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Drug Research	2022	0975-248X	https://ijpsdr.com/index.php/ijpsdr	http://www.ijpsdr.com/index.php/ijpsdr/article/view/3933/875
199	A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of The H1N1 Influenza Target Protein	Dr.Pallavi M. Patil, Khade Shubham Ramchandra	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	**0975-6299**	https://www.ijpbs.net/	https://www.ijpbs.net/abstract.php?article=NzA1Mw==
200	A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of The H1N1 Influenza Target Protein	Dr.Pallavi M. Patil, Khade Shubham Ramchandra	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	**0975-6299**	https://www.ijpbs.net/	https://www.ijpbs.net/abstract.php?article=NzA1Mw==
201	A Computational Study of Molecular Docking for Antiviral Compounds Against Sars-Cov-2	Dr. Pallavi M. Patil, Khade Shubham*	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	0975-6299	https://www.ijpbs.net/	https://www.ijpbs.net/abstract.php?article=NzA1Mw==
202	A Computational Study of Molecular Docking for Antiviral Compounds Against Sars-Cov-2	Dr. Pallavi M. Patil, Khade Shubham*	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	0975-6299	https://www.ijpbs.net/	https://www.ijpbs.net/abstract.php?article=NzA1Mw==

203	Evaluation of In-vitro thrombolytic potential of hydroalcoholic extracts of Citrus Limon Leaves, Tagetes Erecta flower and Musa Paradasiaca Stem	Padmaja S. Kore, Shrushti Tiwari, Charmine Richardson	Pharmacology	Journal of Medical Pharmaceutical and Allied Sciences	2021	2320–7418	https://www.jmpas.com/	https://jmpas.com/admin/assets/article_issue/1648139860JMPAS_JANUARY_-_FEBRUARY_2022.pdf
204	Protective Effect of Flavonoid Rich Fraction of Sesbania grandiflora leaves against chemically induced Urolithiasis in vitro and in vivo	Dr. Sonali S. Nipte, Chaitali S. Waghmare	Pharmacology	International Journal of Pharmaceutical Sciences Review and Research	2022	0976 – 044X	https://www.ijprajournal.com/?gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutnoIN4H5ZtXLloTHK4kEewHYbLn3EPjmVckHw0aK-A3KLSPsHJ-jTwaAsX2EALw_wcB	https://globalresearchonline.net/journalcontents/v72-2/20.pdf
205	Evaluation of Anti-Urolithiatic Activity of Ethanolic Extract of Delonix Regia Leaves in Experimental Animal	Dr. Sonali S Nipate, Rjanigandha R Jori.	Pharmacology	International Journal of Pharmaceutical Sciences Review and Research	2022	0976-044X	https://www.globalresearchonline.net/	https://globalresearchonline.net/journalcontents/v72-2/12.pdf
206	Design and characterization of punica granutum seed oil-loaded cream: assessment of in vitro antimicrobial potential	Atul phatak, shreshail ghurghure	Pharmaceutics	International journal of pharmaceutical sciences and drug research	2022	0975-248X	https://ijpsdr.com/index.php/ijpsdr	http://ijpsdr.com/index.php/ijpsdr/article/view/4090

207	Design, synthesis, and biological evaluation of 3-chloro-2-oxo-N-(aryl carbamoyl)-2H-1-benzopyran-6-sulfonamide derivatives as potential DPP-IV inhibitors	P. K. Vawhal, S. B. Jadhav	Pharmaceutical chemistry	International Journal of Health Sciences	2022	E-ISSN 2550-696X P-ISSN 2550-6978	https://sciencescholar.us/journal/index.php/ijhs	https://sciencescholar.us/journal/index.php/ijhs/article/view/5190
208	Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches	Savita S. Deokar , Karimunnisa Sameer Shaikh, Pravin D. Chaudhari , Saakshi Shrikant Deokar	pharmacutics	Journal of medical pharmaceutical and allied sciences	2022	2320-7418	https://www.jmpas.com/	https://jmpas.com/admin/assets/article_issue/1651429236JMPAS_MARCH_-_APRIL_2022.pdf
209	Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches	Savita S. Deokar , Karimunnisa Sameer Shaikh, Pravin D. Chaudhari , Saakshi Shrikant Deokar	pharmacutics	Journal of medical pharmaceutical and allied sciences	2022	2320-7418	https://www.jmpas.com/	https://jmpas.com/admin/assets/article_issue/1651429236JMPAS_MARCH_-_APRIL_2022.pdf
210	Development and Validation of Stability-Indicating HPTLC Assay Method of Remogliflozin Etabonate in Bulk and Marketed Formulation	Sushant Ahire, Aishwarya Balap	pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Research	2022	0975-8232	https://ijpsr.com/	https://ijpsr.com/bft-article/development-and-validation-of-stability-indicating-hptlc-assay-method-of-remogliflozin-etabonate-in-bulk-and-marketed-formulation/

211	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	https://www.ijlpr.com/index.php/journal	https://www.ijlpr.com/index.php/journal/article/view/1289
212	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	https://www.ijlpr.com/index.php/journal	https://www.ijlpr.com/index.php/journal/article/view/1289
213	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	https://www.ijlpr.com/index.php/journal	https://www.ijlpr.com/index.php/journal/article/view/1289
214	Preparation and Characterization of Advanced Nano medicine	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore ,	Pharmacuetics	International Journal of Life science and	2022	2250-0480	https://www.ijlpr.com/index.php/journal	https://www.ijlpr.com/index.php/journal/article/view/1289

	for Malaria: Box Behnken Design Approach	Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta		Pharma Research				
215	Antidiabetic Potential of Ficus glomerata Roots with a Special Emphasis on Estimation of Bioactive Compounds by a Novel Validated HPTLC	Mohini Upadhye, Uday Deokate, Rohini Pujari, Mohini Phanse	Pharmacognosy	Indian Journal of Pharmaceutical Education and Research	2022	0019-5464	https://www.ijper.org/	https://www.ijper.org/article/1658
216	Investigation of hypoglycemic, anticholesteremic, in vivo antioxidant and pancreatic beta cell protective effect of Tecoma gaudichaudi DC leaves in streptozotocin-induced diabetic rats	Kedar kalyani Abhimanyu, Chaudhari Sanjay Ravindra and Rao Srinivasa Avanapu	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences.	2022	2277-1808	https://bepls.com/	https://bepls.com/special_issue(1)2022/126.pdf

217	Cytotoxic, antioxidant and phytochemical analysis of Tecoma gaudichi DC (Bignoniaceae)	K. A. Kedar, Sneha Nawale, S. R.Chaudhari, S. A. Rao	Pharmacognosy	Bulletin of Environment, Pharmacology and life sciences	2022	2277-1808	https://bepls.com/	https://bepls.com/special_issue(1)2022/136.pdf
218	Formulation and characterization targets Etecta Nanosuspension with enhanced antihyperlipidemic potential	Kalyani kedar, Shena Nawale, Pooja Gowlikar, M. Ganga Raju	Pharmacognosy	Bulletin of Environment, Pharmacology and life sciences	2022	2277-1808	https://bepls.com/	https://bepls.com/special_issue(1)2022/146.pdf
219	Cytotoxic, antioxidant and phytochemical analysis of Ethyl acetate extract of Putranjiva roxburghii Wall	Kedar kalyani Abhimanyu, Chaudhari Sanjay Ravindra and Rao Srinivasa Avanapu	pharmacognosy	Advances in Bioresearch	2022	2277-1573	https://soeagra.com/abr.html	https://soeagra.com/abr/abrmay2022/25.pdf
220	Risk Management of Uncontrolled Migraine Attacks	Punam Kela	Pharm .D	World Journal of Pharmacy and Pharmaceutical Sciences	2021	2278-4357	https://www.wjpps.com/	https://storage.googleapis.com/journal-uploads/wjpps/article_issue/1630476964.pdf
221	Molecular Docking and in vitro studies of some new oxadiazole derivatives as antidiabetic agents	Salve T, Jadhav S	pharmaceutical chemistry	International Journal of Pharmaceutical Research	2021	0975-2366	http://www.ijpronline.com/	https://web.p.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=09752366&AN=155803575&h=zWjhHEL5RXWXxcM%2b1uVnVm9fHFkKTZdhKImy0qlI8e63nXt%2fbbRk83oRp

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222	Spray drying approach in preparation and characterization of solid Dispersion of Eprosartan Mesylate	Sachin Kothawade, Praveen Chaudhari	pharmaceutics	Journal of Medical Pharmaceutical and allied Sciences,	2021	2320–7418	https://jmpas.com/abstract/557	https://jmpas.com/admin/assets/article_issue/1638816501JMPAS_MAY-JUNE_2021.pdf
223	Hepato-protective activity of of gentisic acid on 5-fluorouracil- induced hepatotoxicity in wistar rats	Rohini Pujari Deepti Bandawane	pharmacology	Turk Journal of Pharmaceutical science ,	2021	2148-6247	https://www.turkjps.org/	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8231324/
224	Leaves of Stereospermum suaveolens DC exhibit anti inflammatory and anti arthritic potential action in experimental animals	R Chanshetti, D Bandawane	pharmacology	Journal of Pharmaceutical research International,	2021	2456-9119	https://journaljpri.com/index.php/JPRI	https://journaljpri.com/index.php/JPRI/article/view/2611
225	Development of biodegradable porous starch form for improving oral	Sachin Kothawade, Praveen Chaudhari	pharmaceutics	Journal of Advanced	2021	0976-95	https://sciensage.info/index.php/JASR	https://sciensage.info/index.php/JASR/article/view/929

	delivery of a process Eprosartan Mesylate			scientific research,				
226	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted- Phenyl ethylidene] Imidazo [1, 2- a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus	Shailaja Jadhav	pharmaceutical chemistry	Bentham Science, Letters in Drug Design and Discovery,	2021	print 1570-1808 online 1875-628X	https://benthamscience.com/public/journals/letters-in-drug-design-and-discovery	https://www.eurekaselect.com/article/117613
227	L-carnitine ameliorates bile duct ligation induced liver Fibrosis by reducing the nitrosative stress in experimental animals: preclinical evidence	Vikram Nimbalkar Neeraj Vyawhare	pharmacology	Heliyon	2021	2405-8440	https://www.sciencedirect.com/journal/heliyon	https://pubmed.ncbi.nlm.nih.gov/34901512/
228	Synthesis characterization and biological evaluation of some novel substituted indole derivatives as potential antibacterial and antifungal Agents	Vawhal P, Jadhav S	pharmaceutical chemistry	Journal of Pharmaceutical Research International,	2021	2456-9119	https://journaljpri.com/index.php/JPRI	https://journaljpri.com/index.php/JPRI/article/view/4175
229	Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical	2021	0019-5464	https://journals.innovareacademics.in/index.php/ijpps	https://www.ijper.org/article/1583

	with 1,3,4-oxadiazole derivatives			Education and Research				
230	Exploring cytotoxic potential of ciclopirox on colorectal cancer cells by in silico methodology	Savita Dev kar karimunnisa Sheikh	pharmaceutics	Biointerface research in applied chemistry	2021	2069-5837	https://biointerfaceresearch.com/	https://biointerfaceresearch.com/wp-content/uploads/2021/11/20695837126.72877310.pdf
231	Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel pyrrolidine sulphonamide derivative	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Investigation	2021	Print -2230-973X, Online - 2230-9713	https://www.jpionline.org/index.php/ijpi	https://www.jpionline.org/index.php/ijpi/article/view/1124
232	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	Frontiers in Molecular Neuroscience	2021	1662-5099	https://www.frontiersin.org/journals/molecular-neuroscience	https://www.frontiersin.org/articles/10.3389/fnmol.2022.1036552/full
233	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	Frontiers in Molecular Neuroscience	2021	1662-5099	https://www.frontiersin.org/journals/molecular-neuroscience	https://www.frontiersin.org/articles/10.3389/fnmol.2022.1036552/full

234	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	International Journal of Health Sciences	2022	1924-7064	https://ijhsnet.com/archive-ijhs	https://www.frontiersin.org/articles/10.3389/fnmol.2022.1036552/full
235	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	International Journal of Health Sciences	2022	1924-7064	https://ijhsnet.com/archive-ijhs	https://www.frontiersin.org/articles/10.3389/fnmol.2022.1036552/full
236	Design, synthesis, and biological evaluation of 3-chloro-2-oxo-N-(aryl carbamoyl)-2H-1-benzopyran-6-sulfonamide derivatives as potential DPP-IV inhibitors	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	https://sciencescholar.us/	https://sciencescholar.us/journal/index.php/ijhs/article/view/5190
237	Validated UV Visible spectrophotometric method for the estimation of sorafenib tosylate in bulk and nanoparticles	Sangeeta kale, Karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	https://www.ijsr.net/?utm_source=googleads&vt_keyword=journal&vt_campaign=19903557268&vt_adgroup=148073117672&vt_loc_interest=&vt_physical=9301536&vt_matc	

							htype=b&vt_network=g&vt_placement=&gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutkYfofSFUfVNcs3Mc7gIZOLMmwGPUJGIWyO5aP2yKnlqtHzgiNJObsaAotgEALw_wcB	https://sciencescholar.us/journal/index.php/ijhs/article/view/6719
238	Validated UV Visible spectrophotometric method for the estimation of	Sangeeta kale, Karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	https://www.ijsr.net/?utm_source=googleads&vt_keyword=journal&vt_campaign=19903557268&vt_adgroup=	https://sciencescholar.us/journal/index.php/ijhs/article/view/6719

	sorafenib tosylate in bulk and nanoparticles						148073117672&vt_loc_interest=&vt_physical=9301536&vt_matchtype=b&vt_network=g&vt_placement=&gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutkYfofSFUfVNcs3Mc7gIZOLMmwGPUJGIWyO5aP2yKnlqtHzgiNJObsaAotgEALw_wcB	
239	Gradient rapid HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	https://www.ijsr.net/?utm_source=googleads&vt_keyword=journal&vt_campaign=19903557268&vt_adgroup=148073117672&vt_loc_interest=&vt_physical=9301536&vt_matchtype=b&vt_network=g&vt_placement=&gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutnK4xr9Haz09Q_r6C-43dsLzcQVed3wmc0ikRBXGDDbHZuovUIcqW4aAqa8EALw_wcB	https://media.neliti.com/media/publications/430527-gradient-rp-hplc-method-development-and-91b0cc52.pdf

240	Gradient rapid HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	https://www.ijsr.net/?utm_source=googleads&vt_keyword=journal&vt_campaign=19903557268&vt_adgroup=148073117672&vt_loc_interest=&vt_physical=9301536&vt_matchtype=b&vt_network=g&vt_placement=&gclid=Cj0KCQjw0tKiBhC6ARIsAAOXutnK4xr9Haz09Q_r6C-43dsLzcQVed3wmc0ikRBXGDDbHZuovUIcqW4aAqa8EALw_wcB	https://media.neliti.com/media/publications/430527-gradient-rp-hplc-method-development-and-91b0cc52.pdf
241	Gradient rapid HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	https://www.ijsr.net/?utm_source=googleads&vt_keyword=journal&vt_campaign=19903557268&vt_adgroup=148073117672&vt_loc_interest=&vt_physical=9301536&vt_matchtype=b&vt_network=g&vt_placement=&gcl	https://media.neliti.com/media/publications/430527-gradient-rp-hplc-method-development-and-91b0cc52.pdf

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242	Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques	Hemant Deokule, Smita pimple, Kiran Mahajan, Praveen Chaudhari	pharmaceutics	Research journal of Pharmaceutical and Technology	2022	0974-3618	https://www.rjptonline.org/	https://rjptonline.org/AbstractView.aspx?PID=2022-15-9-58
243	Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques	Hemant Deokule, Smita pimple, Kiran Mahajan, Praveen Chaudhari	pharmaceutics	Research journal of Pharmaceutical and Technology	2022	0974-3618	https://www.rjptonline.org/	https://rjptonline.org/AbstractView.aspx?PID=2022-15-9-58
244	Investigation of Flavonoids in stereospermum suaveolens using HPLC analysis for inflammatory pain swelling and edema treatment	R Chanshetti, D Bandawane	pharmacology	Asian Pacific journal of Health Science	2022	2349-0659	https://www.apjhs.com/index.php/apjhs	https://apjhs.com/index.php/apjhs/article/view/2189/1369

245	Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuicacid against 5 fluorouracil induced toxicity in wistar rats	Rohini Pujari,Deepti Bandawane	pharmacology	Indian Journal of Experimental biology	2022	0975-1009	http://op.niscair.res.in/index.php/IJEB	https://nopr.niscpr.res.in/handle/123456789/59416
246	Design, molecular docking studies and ADMET prediction ofChalcones of Indole-benzenesulfonyl derivatives as Thioredoxin inhibitor for anticancer activity	Pallavi S.Bansod, Shailaja B. Jadhav	Pharmaceutical Chemistry	Journal of Computational Biophysics and Chemistry	2022	2737-4165	https://www.worldscientific.com/worldscinet/jcbc	https://www.worldscientific.com/doi/10.1142/S2737416522500144
247	Detoxification of Gunja Seeds with Ex Vivo Study	Nikita Kale1 , Prakash Gulbhele2 , Vaibhav Gawade3*, Rahul Jagtap3 , Sudhir Khodade4	Pharmaceutical Chemistry	International Journal of Pharmaceutical Research & Allied Sciences	2022	2277-3657	https://ijpras.com/	https://ijpras.com/article/detoxification-of-gunja-seeds-with-ex-vivo-study-phmplx7vsfumaby
248	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted- Phenyl ethylidene] Imidazo [1, 2- a]	Bharti Fegade, Shailaja Jadhav	pharmaceutical chemistry	Bentham Science, Letters in Drug Design and Discovery,	2021	print 1570-1808 online 1875-628X	https://www.eurekaselect.com/journal/57	https://www.eurekaselect.com/article/117613

	Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus							
249	Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti-cancer agent	Bharti Fegade, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Drug Research	2022	0975-248X	https://ijpsdr.com/index.php/ijpsdr	http://www.ijpsdr.com/index.php/ijpsdr/article/view/3933
250	Extraction, Isolation, Characterization of Curcumin-I From Curcuminoids	Priyanka T. Kare, Sarika S. Malode, Kalyani S. Kakad, Khanderao R. Jadhav	Pharmacognosy	Journal of Polymer & Composites	2022	2321–2810	https://stmjournals.com/Journal-of-Polymer-and-Composites.html	https://journals.stmjournals.com/jopc/article=2022/view=91602/
251	Protective effect of Berberine in ameliorating diabetic complications in streptozotocin high fat diet model in experimental animals	Deepti Dinesh Bandawane*, Shruti Mooliya, ShailajaJadhav	pharmacology	International Journal of Pharmacy & Pharmaceutical Sciences	2020	Online-09751491 Print- 2656-0097	https://journals.innovareacademics.in/index.php/ijpps	https://journals.innovareacademics.in/index.php/ijpps/article/view/38096
252	Protective effect of Berberine in ameliorating diabetic complications in streptozotocin high fat diet model in experimental animals	Deepti Dinesh Bandawane*, Shruti Mooliya, ShailajaJadhav	pharmacology	International Journal of Pharmacy & Pharmaceutical Sciences	2020	Online-09751491 Print- 2656-0097	https://journals.innovareacademics.in/index.php/ijpps	https://journals.innovareacademics.in/index.php/ijpps/article/view/38096

253	Optimization and evaluation of self-nanoemulsifying drug delivery system for enhanced bioavailability of plumbagin	Kamble, P.R.; Shaikh, K.S	Pharmaceutics	Planta Medica	2021	: 0032-0943	https://www.thieme-connect.com/products/ejournals/journal/10.1055/s-00000058	https://www.thieme-connect.com/products/ejournals/abstract/10.1055/a-1332-2037
254	Development and Validation of a Stability-Indicating High-Performance Liquid Chromatographic Method for the Quantification of Methocarbamol and Its Impurities in Pharmaceutical Dosage Forms	Pallavi M. Patil	Pharmaceutical chemistry	Journal of Chromatographic Science	2021	0021-9665	https://academic.oup.com/chromsci	https://academic.oup.com/chromsci/article/59/6/555/6062653
255	Case report on Bullous Pemphigoid: A fatal skin condition	Punam kela, Ujwala Desai, Atharva Nandey	Pharm.D	Innovative journal of Medical and Health science	2020	2589-934	https://innovativejournal.in/index.php/ijmhs	http://innovativejournal.in/index.php/ijmhs/article/view/3097/2687
256	Case report on Bullous Pemphigoid: A fatal skin condition	Punam kela, Ujwala Desai, Atharva Nandey	Pharm.D	Innovative journal of Medical and Health science	2020	2589-934	https://innovativejournal.in/index.php/ijmhs	http://innovativejournal.in/index.php/ijmhs/article/view/3097/2687
257	Case Of Hiatus Hernia: An Aggravating Factor For Iron Deficiency Anemia	Divya Hagawane, Atharwa Nandey, Punam Kela	Pharm.D	Innovative Journal of	2020	2589-934	https://innovativejournal.in/index.php/ijmhs	http://innovativejournal.in/index.php/ijmhs/article/view/3083

				Medical and Health Science				
258	Evaluation of the Immunomodulatory activity of AbelmoschusManihot Linn In various experimental animal models	Neelam Dashputre*, Deepti D Bandawane	Pharmacology	International Journal of Research & Analytical Reviews	2020	2348-1269	https://ijrar.org/?gclid=Cj0KCQjw8NilBhDOARIsAHzpbLC0pdiH4lp0qThbEiRXyxtUIsg_iUoa7vLseXns_pq7KbJCUr2q7OYaAs4pEALw_wcB	https://www.ijrar.org/viewfull.php?&p_id=IJRAR2004118
259	Case of uncontrolled seizures due to poor medication adherence	Divya Hagawane, Atharva Nandey, Punam Kela	Pharm.D	Paripex Indian journal of research	2020	2250-1991	Paripex - Indian Journal Of Research(PIJR) ,PIJR|World Wide Journals	https://www.worldwidejournals.com/paripex/article/case-of-uncontrolled-seizures-due-to-poor-medication-adherence/MTQwNjI=/?is=1
260	Analytical Method Development And Validation For Stability Indicating Hptlc Method For Assay Of Luliconazole In Bulk And Dosage Form	Amit Suryakant Tapkir	Pharmaceutical chemistry	Asian Journal of Pharmaceutical Analysis and Medicinal Chemistry	2020	2321-0923	http://ajpamc.com/	http://ajpamc.com/article/ANALYTICAL%20METHOD%20DEVELOPMENT%20AND%20VALIDATION%20FOR%20STABILITY%20INDICATING%20HPTLC%20METHOD.pdf
261	Fetal termination in prenatally diagnosed ventricular septum defect, and hypoplastic left heart syndrom case	Esha Patel, Gaurav Memane, Punam Kela	Pharm.D	world journal of pharmacy and pharmaceutical sciences	2021	2278-4357	https://www.wjpps.com/	https://www.wjpps.com/Wjpps_controller/abstract_id/13759

262	Analytical Method Development and Validation for Stability Indicating HPTLC Method for Assay of Stiripentol In Bulk and Dosage Form	Amit Suryakant Tapkir	Pharmaceutical chemistry	Journal of Applied Pharmaceutical Sciences and Research	2020	2581-5520	https://www.japsr.in/index.php/journal	https://www.japsr.in/index.php/journal/article/view/146
263	Formulation and invitro characterization of oseltamivir fast dissolving tablets using superdisintergrants	A. A. Phatak, S. M. Ghurghure, R. Y. Patil, S. Yanjane	Pharmaceutics	Inventi Impact Pharm tech	2020	0976-7576 2219-4139	https://www.inventi.in/journal/impact/1/InventiImpactPharmTech	http://www.ajrcps.com/article/FORMULATION%20AND%20IN-VITRO%20CHARACTERIZATION%20OF%20OSELTAMIVIR%20FAST%20DISSOLVING%20TABLETS%20USING%20SUPER%20DISINTEGRANTS.pdf
264	A Review On Recent Advancement In Hyphenated Techniques For The Analysis Of Secondary Metabolites	Amit Suryakant Tapkir	Pharmaceutical chemistry	Indian Research Journal of Pharmacy and Science	2020	2248-9118.	https://irjps.in/	https://irjps.in/journal/513.pdf
265	Formulation and Optimization of Self Emulsifying Drug Delivery	Kiran C. Mahajan, Smita S. Pimple, Hemant S. Deokule	Pharmaceutics	Research Journal of Pharmacy and Technology	2021	0974-360X (Online) 0974-3618 (Print)	https://www.rjptonline.org/	https://www.indianjournals.com/ijor.aspx?target=ijor:rjpt&volume=14&issue=11&article=039

	System For Effective Anthelmintic Therapy							
266	Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients	Smita S. Pimple, Kiran Mahajan, Hemant Deokule	Pharmaceutics	International Journal of Pharmaceutical Research	2021	0975-2366	https://www.scimagojr.com/journalsearch.php?q=19700174645&tip=sid	http://www.ijpronline.com/ViewArticleDetail.aspx?ID=20996
267	Application of Green Silver Nanoparticles Synthesized using Leaf Extract of Tridax procumbens for Preparation of Clinical Antimicrobial Bandages	Vitthal Chopade*, Diksha Kamble	Pharmaceutical chemistry	Int. J. Pharm. Investigation	2021	2230-9713	https://jpionline.org/	https://jpionline.phcog.interactivedns.com/index.php/ijpi/article/view/986
268	Fabrication And Evaluation of Self-Emulsifying Drug Delivery System (SEDDS) of Aniretroviral Drug For Treatment of HIV.	Hemant A.Deokule, Smita S.Pimple, Kiran C.Mahajan, Pravin Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	https://www.scimagojr.com/journalsearch.php?q=19700174645&tip=sid	https://rjptonline.org/HTML_Papers/Research%20Journal%20of%20Pharmacy%20and%20Technology__PID__2022-15-9-58.html
269	Fabrication And Evaluation of Self-Emulsifying Drug Delivery System (SEDDS) of Aniretroviral Drug For Treatment of HIV.	Hemant A.Deokule, Smita S.Pimple, Kiran C.Mahajan, Pravin Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	https://www.scimagojr.com/journalsearch.php?q=19700174645&tip=sid	https://rjptonline.org/HTML_Papers/Research%20Journal%20of%20Pharmacy%20and%20Technology__PID__2022-15-9-58.html

270	Systematic Development of Design of Expert Optimized Self_Micro Emulsifying Drug Delivery System of Silymarin	Bhavesh Choudhary*Akshay Gaikwadand Vitthal Chopade	Pharmaceutical chemistry	Journal of the Maharaja Sayajirao University of Baroda	2021	0025-0422	https://msubaroda.ac.in/MSUB_Journal	https://drive.google.com/file/d/19A19Er8TQ_bnYUW0LvXbfHRrn4xeIRuA/view
271	Isatin hybrids and their pharmacological investigations	S. B. Jadhav, B. Varpe, A. Kulkarni, A. Mali, S Y Jadhav	Pharmaceutical chemistry	Mini Reviews in Medicinal Chemistry	2021	ISSN (Print): 1389-5575 ISSN (Online): 1875-5607	https://benthamscience.com/journals/mini-reviews-in-medicinal-chemistry	https://scholar.google.co.in/scholar?q=I+satin+hybrids+and+their+pharmacological+investigations&hl=en&as_sdt=0&as_vis=1&oi=scholart
272	Evaluation of In-Vitro Anthelmintic Potential of Umbelliferone Against Pheretima Posthuma	Dr. Padmajaj S. Kore, Ms. Roshani Bhole, Mr. Vaibhav Gaikwad	Pharmacology	International Journal of Pharmaceutical Sciences and Research	2021	2320-5148	https://ijpsr.com/	https://ijpsr.com/bft-article/evaluation-of-in-vitro-anthelmintic-potential-of-umbelliferone-against-pheretima-posthuma/
273	Development and evaluation of Cinnarizine loaded nanosponges: pharmacodynamic and pharmacokinetic study on wistar rats	Madhuri Dinde, Upendra Galgatte, Firdous Shaikh	Pharmaceutics	International Journal of Pharmaceutical Sciences Review and Research	2021	0976-044X.	https://www.globalresearchonline.net/	https://globalresearchonline.net/journalcontents/v65-2/15.pdf
274	An effort to augment solubility and efficiency of the oral bosentan-buccoadhesive drug delivery	Prakash N.Kendre, PravinD.Chaudhari, Shirish P.Jain, Somnath K.Vibhute	Pharmaceutics	Polymer Bulletin	2020	0170-0839 (print); 1436-2449 (web)	https://www.springer.com/journal/289	https://link.springer.com/article/10.1007/s00289-020-03412-z

	system using graft co-polymer as the carrier							
275	Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Pamabrom and Paracetamol in marketed formulation	Minal T.Harde,Sameer H.Lakade,Aniket R.Mekhe,Sneha R.Shinde,Pragati D.More,Snehal S.Shirude	Pharmaceutical chemistry	Advances in Bioresearch	2020	E-ISSN : 2277-1573 P-ISSN : 0976-4585	https://soeagra.com/abr.html	https://soeagra.com/abr/sept_2020/11.pdf
276	Design and Development of Novel Controlled-Release Azilsartan Medoxomil Loaded Provesicular Powder	Pande v.Vishal,Sameer H.Lakade,Ghule D.Niteen,PoteK.Ajinkya,Minal T.Harde,Jalinder R.Bhutekar	Pharmaceutical chemistry	Bulletin of Environment, Pharmacology and ife Science	2020	2277-1808	https://bepls.com/	https://bepls.com/bepls_oct2020/19a.pdf
277	Prepartion and Evaluation of Sustained Release Herbal Matrix Tablet	Rohini Pujari,Mohini Upadhay,Mohini Kuchekar,Neha Nemlekar	Pharmacognosy	Current Trends in Pharmacy and	2021	2582-5062	https://www.ctppc.org/	https://drive.google.com/file/d/1N60UPQYuxT5pwwr9smYPRQT5mO4L_jcD/view?usp=sharing

				Pharmaceutical chemistry				
278	An influence of lyophilization on Praziquantel loaded nanosponge by using food protein as a stabillizer with effect of statistical optimization.	Om Bagade, Shashikant N, P.D. Chaudhari	Pharmaceutics	Research Journal of Pharmacy and Technology	2020	0974-360X	https://www.rjptonline.org/	https://rjptonline.org/AbstractView.aspx?PID=2020-13-9-80
279	A corollary of nanoporous carrier drug delivery system an updated prospective	Om Bagade, Shashikant N, P.D. Chaudhari	Pharmaceutics	International journal of pharmaceutical sciences and nanotechnology	2020	0974-3278	https://www.ijpsnonline.com/	https://www.ijpsnonline.com/index.php/ijpsn/article/view/1099
280	Anti inflammatory potential effect of flavonoid rich ethyl acetate fraction of methanolic extrcat of Stereospurmum sasuaveolens DC (Bignoniaceae)leaves in experimental animals	Chanshetty Rahul, Bandawane Deepti	Pharmacology	Biomedical and Pharmacology Journal	2020	2456-2610	https://biomedpharmajournal.org/	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3537457

281	Evaluation of the Immunomodulatory activity of AbelmoschusManihot Linn In various experimental animal models	Neelam Dashputre*, Deepti D Bandawane	Pharmacology	International Journal of Research & Analytical Reviews	2020	E-ISSN 2348-1269, P- ISSN 2349-5138	https://www.ijrar.org/	https://www.ijrar.org/viewfull.php?&p_id=IJRAR2004118
282	Evaluation of prescription errors and polypharmacy practices in rural area at community pharmacy	Narendra B. Parihar	Pharm.D	International Journal of Basic & Clinical Pharmacology	2021	Print 2319-2003 Online 2279-0780	https://www.ijbcp.com/index.php/ijbcp	https://www.ijbcp.com/index.php/ijbcp/article/view/4461
283	Ultraviolet-Spectrophotometric Method for Simultaneous Estimation Of Dapagliflozin Propanediol And Metformin Hydrochloride	MinalHarde*, Sameer Lakade Valmik Gite , Vitthal Chopade , Anuja Khomne	Pharmaceutical chemistry	International Research Journal of Pharmacy	2019	2230 – 8407	http://www.irjponline.com/	https://d1wqtxts1xzle7.cloudfront.net/68023498/2230-8407-libre.pdf?1626092107=&response-content-disposition=inline%3B+filename%3DUltraviolet_Spectrophotometric_Method_fo.pdf&Expires=1690886020&Signature=hC8pQy3YyxNg8aDYEH2FCIK-15MNPIn2ai1eHP5OqoBtuo4XXCna8~6YxerxQcm4xYHlnezkBfEl~19tf3qZ2WvQZgMdvfYpPOCc~~SF867JpD2enVNYUpq6-PBa51rVHuLsMOtTqSS3LutswhNEnv657X27K8ScWge6wnVqMoWhAW5HLBJR5RQKFM-psVKq7YClcWLYAn~sZd~J4

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284	Ultraviolet-Spectrophotometric Method for Simultaneous Estimation Of Dapagliflozin Propanediol And Metformin Hydrochloride	MinalHarde*, Sameer Lakade Valmik Gite , Vitthal Chopade , Anuja Khomne	Pharmaceutical chemistry	International Research Journal of Pharmacy	2019	2230 – 8407	http://www.irjponline.com/	https://d1wqtxts1xzle7.cloudfront.net/68023498/2230-8407-libre.pdf?1626092107=&response-content-disposition=inline%3B+filename%3DUltraviolet_Spectrophotometric_Method_fo.pdf&Expires=1690886020&Signature=hC8pQy3YyxNg8aDYEH2FCIK-15MNPIn2ai1eHP5OqoBtuo4XXCna8~6YxerxQcm4xYHlnezkBfEl~19tf3qZ2WvQZgMdvfYpPOCc~~SF867JpD2enVNYUpq6-PBa51rVHuLsMOtTqSS3LutswhNEnv657X27K8ScWge6wnVqMoWhAW5HLBJR5RQKFM-psVKq7YClcWLYAn~sZd~J4

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285	Synthesis and antidiabetic evaluation of some novel compounds	Anagha S Avalakki, Shailaja B Jadhav*, Deepti D Bandawane ,Pournima A Bhalekar	Pharmaacology	Indian Journal of Chemistry (B)	2019	0975-0983	http://op.niscair.res.in/index.php/IJCB	https://nopr.niscpr.res.in/bitstream/123456789/49105/1/IJCB%2058B(7)%20849-854.pdf
286	Synthesis and antidiabetic evaluation of some novel compounds	Anagha S Avalakki, Shailaja B Jadhav*, Deepti D Bandawane ,Pournima A Bhalekar	Pharmaacology	Indian Journal of Chemistry (B)	2019	0975-0983	http://op.niscair.res.in/index.php/IJCB	https://nopr.niscpr.res.in/bitstream/123456789/49105/1/IJCB%2058B(7)%20849-854.pdf
287	Effect of Surfactants and Co-surfactants on Phase Behaviour and Physicochemical Properties of Self-nano emulsifying	Kamble Pavan Ram, Shaikh Karimunnisa Sameer	Pharmaceutics	Indo Global Journal of Pharmaceutical Sciences	2019	2249-1023	https://www.iglobaljournal.com/	http://www.iglobaljournal.com/wp-content/uploads/2020/03/01.-Kamble-and-Shaikh-2020.pdf

	Drug Delivery System Loaded with Plumbagin							
288	Preliminary evalution of ayurvedic preprations of taila 's and churna's.	Kuchekar Mohini, Upadhye Mohini, Dherenge Kanchan.	Pharmacognosy	Journal of Pharmaceutical and Biological Sciences	2019	2320-1924	https://jpabs.org/	https://www.jpbs.in/article-download/full-text/9346
289	Exploration of protective effect of hydroalcoholic extract of Alstonia scholaris bark in STZ-induced early diabetic nephropathy model in rats	Bandawane D.D., Jadhav S.B., Juvekar A.R.	Pharmacology	Indian Drugs	2019	0019-462X	https://www.indiandrugsonline.org/	http://www.indiandrugsonline.org/issuesarticle-details?id=OTY3
290	Exploration of protective effect of hydroalcoholic extract of Alstonia scholaris bark in STZ-induced early diabetic nephropathy model in rats	Bandawane D.D., Jadhav S.B., Juvekar A.R.	Pharmacology	Indian Drugs	2019	0019-462X	https://www.indiandrugsonline.org/	http://www.indiandrugsonline.org/issuesarticle-details?id=OTY3
291	Protective effect of 2-Pyrocatechuic acid on 5-Fluorouracil induced cardiotoxicity in wistar rats	Rohini R. Pujari, Deepti D Bandawane	Pharmacology	Latin American Journal of Pharmacy	2019	ISSN 0326 2383 (printed ed.) ISSN 2362-3853 (on line ed.)	http://www.latamjpharm.org/	http://www.latamjpharm.org/resumenes/38/11/LAJOP_38_11_1_19.pdf

292	Therapeutic potential of ethyl acetate fraction of Tephrosia purpurea Linn. leaves in a rat model of gout	Sonali S. Nipate, Pramila S. Yelmar	Pharmacology	Journal of Integrative Medicine	2019	2095-4964.	http://www.jcimjournal.com/EN/2095-4964/home.shtml	https://www.sciencedirect.com/science/article/abs/pii/S2095496419300937?via%3Dihub
293	Assessment of antidiabetic potential of Musa acuminata peel extract and its fractions in experimental animals and characterisation of its bioactive compounds by HPTLC.	Navghare Vijay, Dhawale Shashikant and Phanse Mohini..	pharmacognosy	Archives of Physiology And Biochemistry	2020	1381-3455	https://www.scimagojr.com/journalsearch.php?q=23333&tip=sid	https://pubmed.ncbi.nlm.nih.gov/31687854/
294	Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach	Atul Phatak,* Dhanashri Joshi, Mahesh Bhadgale, Pravin Chaudhari	pharmaceutics	IJPER Indian Journal of Pharmaceutical Education and Research	2020	0019-5464	https://www.ijper.org/	https://www.ijper.org/sites/default/files/IndJPhaEdRes-54-2s-108.pdf
295	Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach	Atul Phatak,* Dhanashri Joshi, Mahesh Bhadgale, Pravin Chaudhari	pharmaceutics	IJPER Indian Journal of Pharmaceutical Education and Research	2020	0019-5464	https://www.ijper.org/	https://www.ijper.org/sites/default/files/IndJPhaEdRes-54-2s-108.pdf
296	Synthesis, evaluation and molecular docking of sulphonamide/isothiocyanate linked quinazolinone	Pournima A Bhalekar, Shailaja B Jadhav	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	https://www.ejpmr.com/	https://www.ejpmr.com/home/abstract_id/6190

	derivatives as antidiabetic activity.							
297	Pharmacognostic Investigations of Colocasia Esculenta Leaves.	Bhushan Pimple, Amrita Kulkarni, Ruchita Bhor, Shankarrao Atkalikar	Pharmacognosy	Current Trends in Pharmacy and Pharmaceutical Chemistry	2019	2582-5062	https://www.ctppc.org/	https://www.researchgate.net/publication/339589101_Pharmacognostic_Investigations_of_Colocasia_Esculenta_Leaves
298	Pharmacognostic Investigations of Colocasia Esculenta Leaves.	Bhushan Pimple, Amrita Kulkarni, Ruchita Bhor, Shankarrao Atkalikar	Pharmacognosy	Current Trends in Pharmacy and Pharmaceutical Chemistry	2019	2582-5062	https://www.ctppc.org/	https://www.researchgate.net/publication/339589101_Pharmacognostic_Investigations_of_Colocasia_Esculenta_Leaves
299	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	https://www.ejpmr.com/	https://www.ejpmr.com/home/abstract_id/6281
300	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	https://www.ejpmr.com/	https://www.ejpmr.com/home/abstract_id/6281

301	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	https://www.ejpmr.com/	https://www.ejpmr.com/home/abstract_id/6281
302	Anti-inflammatory, antinociceptive and antiarthritic potential of apis cerana indica bee venom by reducing pain and degeneration of articular cartilage in adjuvant and collagen induced rat models of arthritis	Sonali S Nipate; AA Bhandarkar	pharmacology	Journal of Orthopedics and Muscular System	2020	2640-4389	https://meddocsonline.org/journal-of-orthopedics-and-muscular-system.html	https://pubmed.ncbi.nlm.nih.gov/25689950/
303	A review on recent advancement in hyphenated techniques for the analysis of secondary metabolites	Nikhil K. Gabhale, Amit S. Tapkir	pharmaceutical chemistry	Indian Research Journal of Pharmacy and Science	2020	ISSN 2349-5332	https://irjps.in/	https://irjps.in/journal/513.pdf
304	Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide(HTAB)as template : simplified sol-gel approach	Minal Harde, Sameer Lakade, Varsha Chattichalwadi, Pravin S.Uttekar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344 ISSN Print 1751-8741	https://www.theiet.org/publishing/publishing-with-iet-journals/	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8676189/

305	Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide(HTAB)as template : simplified sol-gel approach	Minal Harde, Sameer Lakade, Varsha Chattichalwadi, Pravin S.Uttekar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344 ISSN Print 1751-8741	https://www.theiet.org/publishing/publishing-with-iet-journals/	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8676189/
306	Facile synthesis of Multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin	Pravin S. Uttekar, Minal T..Harde, Sameer H. Lakade, Vijay K.Beldar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344.Print 1751-8741	https://www.theiet.org/publishing/publishing-with-iet-journals/	https://ietresearch.onlinelibrary.wiley.com/doi/10.1049/iet-nbt.2018.5421
307	Facile synthesis of Multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin	Pravin S. Uttekar, Minal T..Harde, Sameer H. Lakade, Vijay K.Beldar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344.Print 1751-8741	https://www.theiet.org/publishing/publishing-with-iet-journals/	https://ietresearch.onlinelibrary.wiley.com/doi/10.1049/iet-nbt.2018.5421
308	Synthesis of mesoporous alumina: an impact of surface chemistry on release behavior	Sameer H. Lakade, Minal T. Harde, Prashant K. Deshmukh.	Pharmaceutical chemistry	Taylor & Francis group. Particulate science & Technology.	2019	1548-0046	https://www.tandfonline.com/journals/upst20	https://www.tandfonline.com/doi/abs/10.1080/02726351.2019.1666947
309	Surface Engineered New Approach for Mesoporous Alumina and Nanoparticles-A Review.	Sameer H..Lakade, Minal T.Harde, Aniket R. Mehke, Ajay A.Joshi, Snehal R.Shinde	pharmaceutical chemistry	Bulletin of Environment, Pharmacology and Life Sciences	2020	2277-1808	https://bepls.com/	https://bepls.com/july_2020/5.pdf

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311	Simultaneius estimatio of Empagliflozin and Metformin by HPTLC using quality by design approach	Thakor N, Amrutkar S, P.D.Chaudhari	Pharmaceutics	Journal of planar chromatography	2019	0933-4173 (Print) 1789-0993 (online)	https://link.springer.com/journal/764/volumes-and-issues	https://akjournals.com/view/journals/1006/32/4/article-p295.xml
312	Taste masking by hot melt extrusion without loss of bioavailability for prdiatrics	Dhananjay M, Praveen C, Smita More	Pharmaceutics	International Journal of Pharmacy And Pharmaceutical Sciences	2019	0975-1491	https://www.ijprajournal.com/	https://innovareacademics.in/journals/index.php/ijpps/article/download/33493/20265
313	Naphthyridine derivative and their anti-mycobacterium activity	Amol Kulkarni, Bhushan Varpe, Maruti Pise, Shailaja Jadhav	pharmaceutical chemistry	Current trands in pharmacy and pharmaceutical chemistry	2019	2582-5062	https://www.ctppc.org/	https://www.researchgate.net/publication/337979992_Naphthyridine_derivatives_and_their_anti-mycobacterial_activity
314	Ameliorative effects of Gentisic acid on carboplatin induced hematological toxicities in Wistar Rats	Rohini R. Pujari, Deepti D Bandawane	pharmacology	international journal of Pharm Tecch Research	2019	0974-4304	https://www.scimagojr.com/journalsearch.php?q=19700175060&tip=sid&clean=0	https://sphinxsai.com/2019/ph_vol12_no3/1/(22-30)V12N3PT.pdf

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316	Development and Evaluation of a Novel Drug Delivery System for Albendazole	Shaikh Karimunnisa, Pandhe puja, Kale Sangita, Bothiraja Chellampillai	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2018	0019-5464;	https://www.ijper.org/	https://www.ijper.org/sites/default/files/IndJPhaEdRes_52_3_408.pdf
317	Two New Degradation Product of Terizidone : an Application of Forced Degradation Study and Hyphenated Chromatographic Techniques	Pallavi M Patil and Ahmed Alalaiwe	Pharmaceutical chemistry	Int J Pharma Bio Science	2018	0975-6299	https://www.ijpbs.net/	https://www.researchgate.net/publication/332301852_Two_new_degradation_products_of_terizidone_an_application_of_forced_degradation_study_and_hyphenated_chromatographic_technique
318	Dataset on analysis of dyeing property of natural dye from Thespesiapopulnea bark on different fabrics	Kuchekar Mohini, Landge Tejashree, Navghare Vijay	Pharmacognosy	Data in Brief	2018	2352-3409	https://www.sciencedirect.com/journal/data-in-brief	https://www.sciencedirect.com/science/article/pii/S2352340917306595?ref=pdf_download&fr=RR-2&rr=7ea55d0ccc4d06f5
319	Overcoming poor solubility of dimenhydrinate :Development , optimization	Yuvraj Govindrao Jadhav , Upendra Chandrakant	Pharmaceutics	Advanced Pharmaceutical Bulletin	2018	2251-7308,	https://www.scimagojr.com/journalsearch.php?q=21100232413&tip=sid&clean=0	https://pubmed.ncbi.nlm.nih.gov/30607345/

	and evaluation of fast dissolving oral film	Galgatte* , Pravin Digamber Chaudhari						
320	Overcoming poor solubility of dimenhydrinate :Development , optimization and evaluation of fast dissolving oral film	Yuvraj Govindrao Jadhav , Upendra Chandrakant Galgatte* , Pravin Digamber Chaudhari	Pharmaceutics	Advanced Pharmaceutical Bulletin	2018	2251-7308,	https://www.scimagojr.com/journalsearch.php?q=21100232413&tip=sid&clean=0	https://pubmed.ncbi.nlm.nih.gov/30607345/
321	Development of metoclopramide hydrochloride in situ gel: Nasal delivery and pharmacokinetics in New Zealand rabbits.	Upendra C Galgatte*, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	https://journals.innovareacademics.in/index.php/ajpcr/index	https://journals.innovareacademics.in/index.php/ajpcr/article/view/31779
322	Development of metoclopramide hydrochloride in situ gel: Nasal delivery and pharmacokinetics in New Zealand rabbits.	Upendra C Galgatte*, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	https://journals.innovareacademics.in/index.php/ajpcr/index	https://journals.innovareacademics.in/index.php/ajpcr/article/view/31779
323	Development of frovatriptan succinate microemultion for nasal delivery: optimization, in-vitro and in-vivo evaluation	Upendra C Galgatte *, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	https://journals.innovareacademics.in/index.php/ajpcr/index	https://www.researchgate.net/publication/336647898_DEVELOPMENT_OF_FROVATRIPTAN_SUCCINATE_MICROEMULSION_FOR_NASAL_DELIVERY_OPTIMIZATION_IN_

								VITRO_AND_IN_VIVO_EVALUATION
324	Development of frovatriptan succinate microemultion for nasal delivery: optimization, in-vitro and in-vivo evaluation	Upendra C Galgatte *, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	https://journals.innovareacademics.in/index.php/ajpcr/index	https://www.researchgate.net/publication/336647898_DEVELOPMENT_OF_FROVATRIPTAN_SUCCINATE_MICROEMULSION_FOR_NASAL_DELIVERY_OPTIMIZATION_IN_VITRO_AND_IN_VIVO_EVALUATION
325	Design , Development and characterization of self Micro Emulsifying Drug delivery system for Aceclofenac	Mukesh P. Ratnaparkhi*, Pravin D Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Science And Research	2019	ISSN (Online): 0975-8232, ISSN (Print): 2320-5148	https://ijpsr.com/	https://ijpsr.com/bft-article/design-development-and-characterization-of-self-micro-emulsifying-drug-delivery-system-for-aceclofenac/
326	RP-HPLC Forced Degradation study of Alfuzosin and Dutasteride	P. D. Satpute , S. B. Jadhav* , M. P. Rathod , P. S. Naykodi	Pharmaceutical chemistry	Pharmaceutical Resonance	2018	2581-6136	https://pharmacy.dypvp.edu.in/pharmaceutical-resonance/	https://pharmacy.dypvp.edu.in/pharmaceutical-resonance/downloads/original-research-articles/Article-4.pdf
327	Biomarker Quantification: Development of fit for Purpose LC-MS/MS Method for Determination of Methyl Guanidine in Mice Urine	Tapkir Amit Suryakant, Mithbavkar Jay Rajaram , Gaur Ashwani, Chaudhari Pravin	Pharmaceutical chemistry	International Journal of Pharmaceutical Education and Research	2018	0019-5464	http://www.ijper.in/index.php/IJPER	https://www.ijper.org/article/859

328	Biomarker Quantification: Development of fit for Purpose LC-MS/MS Method for Determination of Methyl Guanidine in Mice Urine	Tapkir Amit Suryakant, Mithbavkar Jay Rajaram , Gaur Ashwani, Chaudhari Pravin	Pharmaceutical chemistry	International Journal of Pharmaceutical Education and Research	2018	0019-5464	http://www.ijper.in/index.php/IJPER	https://www.ijper.org/article/859
329	Formulation and Evaluation of Nitrofurantoin Bilayer Tablet	Kirti D. Tirkhunde* and Atul A. Phatak	Pharmaceutics	World Journal of Pharmaceutical Research	2018	2277-7105	https://www.wjpr.net/	https://wjpr.s3.ap-south-1.amazonaws.com/article_issue/1541036788.pdf
330	Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding Capacity Of ColesevelamHcl.	Atul A Phatak*, Apurva R Bodakhe, And Pravin D Chaudhari.	Pharmaceutics	Research Journal Of Pharmaceutical, Biological And Chemical Sciences	2018	0975-8585	https://www.rjpbcs.com/	https://www.rjpbcs.com/pdf/2018_9(6)/[235].pdf
331	Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding Capacity Of ColesevelamHcl.	Atul A Phatak*, Apurva R Bodakhe, And Pravin D Chaudhari.	Pharmaceutics	Research Journal Of Pharmaceutical, Biological And Chemical Sciences	2018	0975-8585	https://www.rjpbcs.com/	https://www.rjpbcs.com/pdf/2018_9(6)/[235].pdf

332	Intercalation of Itraconazole into Montmorillonite: Effect on Release of Drug	Atul A. Phatak,*, Pratik Rahane	Pharmaceutics	World Journal Of Pharmaceutical And Medical Research	2018	2455-3301	https://www.wjpmr.com/	https://www.wjpmr.com/home/article_abstract/1686
333	Evaluation of invitro anthelmintic potential of quercetin against pheretimaposthuma	Padmaja S. Kore, Amarjeet Virk, Arti Peste	Pharmacology	International Journal of Pharmaceutical Science And Research	2018	ISSN (online): 0975-8232, ISSN (print):2320-5148	https://ijpsr.com/	https://ijpsr.com/bft-article/evaluation-of-in-vitro-anthelmintic-potential-of-umbelliferone-against-pheretima-posthuma/
334	Data on Investigation of hypoglycemic , anti-cholesteremic , in vivo antioxidant and pancreatic beta cell protective effect of putranjivaroxburghii Wall Bark in streptozotocin-induced diabetic rats	Kedar Kalyani, Chaudhari sanjay R. , Rao Srinivasa Avanapu	pharmacognosy	Data in Brief	2018	2352-3409	https://www.sciencedirect.com/journal/data-in-brief	https://pubmed.ncbi.nlm.nih.gov/29904686/
335	Assessment of Cancer Targeting Potential of Doxorubicin conjugated with surface functionalized	Beldar V. K., Uttekar P.S., Patil A.R. and Sable P.N.	Pharmaceutics	Indian Drugs	2018	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=ODg4

	multi-walled Carbon Nanotubes							
336	Assessment of Cancer Targeting Potential of Doxorubicin conjugated with surface functionalized multi-walled Carbon Nanotubes	Beldar V. K., Uttekar P.S., Patil A.R. and Sable P.N.	Pharmaceutics	Indian Drugs	2018	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=ODg4
337	Formulation and Evaluation of Niosomal in situ Gel of Prednisolone sodium phosphate for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	International Journal of applied Pharmaceutics	2019	0975-7058	https://journals.innovareacademics.in/index.php/ijap	https://journals.innovareacademics.in/index.php/ijap/article/view/30667
338	Formulation and Evaluation of Niosomal in situ Gel of Prednisolone sodium phosphate for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	International Journal of applied Pharmaceutics	2019	0975-7058	https://journals.innovareacademics.in/index.php/ijap	https://journals.innovareacademics.in/index.php/ijap/article/view/30667
339	Synthesis and Evalution of Water insoluable but SwellableBioadhesive Polymer for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2019	0019-5464	https://www.ijper.org/	https://www.ijper.org/article/954
340	Synthesis and Evalution of Water insoluable but SwellableBioadhesive	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	Indian Journal of Pharmaceutical	2019	0019-5464	https://www.ijper.org/	https://www.ijper.org/article/954

	Polymer for Ocular Drug Delivery			Education and Research				
341	Designing a platform Technology for age Appropriate Pediatric Dosage Form	More D.M., Chaudhari P.D. and More S.D	Pharmaceutics	Indian Drugs	2019	0019-462X	https://www.indiandrugsonline.org/	https://www.indiandrugsonline.org/issuesarticle-details?id=OTI3

Links to the papers published in journals listed in UGC CARE list

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Is it listed in UGC Care list	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number
1	Method development and validation of Favipiravir by RP-HPLC	Amit Suryakant Tapkir, Vishal Bansi Ghune	Pharmaceutical Chemistry	Innovative Journal of Medical Sciences,	2022	2581-4346	Google scholar	NA
2	HPLC Method Developement and Validation of Raberprazole and Levosulpiride in its bulk and dosage form	vitthal Chopade, Trupti D. Dudhgaokar, Pravin kaumar D. Lade, Atul A. Baravkar, Pranali A. Jadhav	Pharmaceutical Chemistry	International Journal of pharmaceutical Sciences and Drug research	2022	0975-248X	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002202&flag=Search
3	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Yashwant Chaudhari, Shailaja Bhanudas Jadhav	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
4	The anti-Alzheimer potential of some novel Tacrine-Coumarin	Somdatta Yashwant Chaudhari, Shailaja Bhanudas Jadhav	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764

	Derivatives as a Cholinesterase inhibitor							
5	Morphological and anatomical characterization of Plumeria obtusa L.: An Ayurvedic medicinal plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple, Mohini Kuchekar, Vrushali Bhalchim and Bhagyashri Warude	Pharmacognosy	Annals of Phytomedicine,	2022	2278-9839	ISI, CAS	NA
6	Morphological and anatomical characterization of Plumeria obtusa L.: An Ayurvedic medicinal plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple, Mohini Kuchekar, Vrushali Bhalchim and Bhagyashri Warude	Pharmacognosy	Annals of Phytomedicine,	2022	2278-9839	ISI, CAS	NA
7	Development and Validation of Tafenoquine by High Performance Liquid Chromatography Technique along with Stress Degradation Study of Tafenoquine	Mayur S. Tekade1*, Pallavi M. Patil, , Vitthal V. Chopade,Samiksha S. Agarkar	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Drug Research, 2022	2022	0975-248X	UGC- CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList

8	Development and Validation of Tafenoquine by High Performance Liquid Chromatography Technique along with Stress Degradation Study of Tafenoquine	Mayur S. Tekade1*, Pallavi M. Patil, , Vitthal V. Chopade,Samiksha S. Agarkar	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Drug Research, 2022	2022	0975-248X	UGC- CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
9	Verbena officinalis (Verbenaceae): Pharmacology, Toxicology and role in female health	Kuchekar Mohini, Upadhye Mohini, Kulkarni Amrita, Zambare Aishwarya, Shirke Disha, Kore Padmaja	Pharmacology	International Journal of Ayurvedic Medicine,	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
10	Verbena officinalis (Verbenaceae): Pharmacology, Toxicology and role in female health	Kuchekar Mohini, Upadhye Mohini, Kulkarni Amrita, Zambare Aishwarya, Shirke Disha, Kore Padmaja	Pharmacology	International Journal of Ayurvedic Medicine,	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
11	High-performance thin-layer chromatography (hptlc) method development and validation for determination of remogliflozin etabonate and	Sarang V. Badke, Kalyani S. Kakad, Sarika S. Malode	Pharmacognosy	International Journal of applied pharmaceutics	2022	0975–7058	Scopus	https://www.scopus.com/sourceid/19900192174

	vildagliptin in bulk and its tablet formulation							
12	Personalized Nanomedicine for Breast Cancer Therapy	Dr. K. S. Shaikh,S. L. Mali, R. C. Kolape, S. S. Satkar	Pharmaceutics	Journal of Hospital Pharmacy	2022	2348-7704	NCBI indexed	NA
13	Nanocomposite based drug delivery for periodontal disease	Kumbhar Amol B.,Dr. Chaudhari Pravin D.,Dr. Shaikh Karimunnisa	Pharmaceutics	International Journal of Health Sciences,	2022	2550-696x	Scopus (2021),	https://www.scopus.com/sourceid/21101052764
14	Nanocomposite based drug delivery for periodontal disease	Kumbhar Amol B.,Dr. Chaudhari Pravin D.,Dr. Shaikh Karimunnisa	Pharmaceutics	International Journal of Health Sciences,	2022	2550-696x	Scopus (2021),	https://www.scopus.com/sourceid/21101052764
15	Quality-by-design (qbd) approach to chromatographic conditions applied for determination of robustness in silymarin extract	Chopade v.v, uttekar p.s, gawade.v., chavan s. And bastia .s.b	Pharmaceutical Chemistry	International Journal of Biology, Pharmacy and Allied Sciences	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
16	Low level quantification of two potential genotoxic impurities in rilpivirine hydrochloride drug	Chopade VV , Chaudhari PD, Dumbre NG	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	Scopus (2021)	https://www.scopus.com/sourceid/21101052764

	substance by HPLC technique							
17	Low level quantification of two potential genotoxic impurities in rilpivirine hydrochloride drug substance by HPLC technique	Chopade VV , Chaudhari PD, Dumbre NG	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	Scopus (2021)	https://www.scopus.com/sourceid/21101052764
18	Docking Study of Selected Phytoconstituents with Acetylcholine Esterase and BChE for its Anti-alzheimers Activity	Vitthal V. Chopade, Sonali G. Banpure,	Pharmaceutical Chemistry	International Journal of Drug Delivery Technology	2022	0975- 4415	Scopus, Embase	https://www.scopus.com/sourceid/20500195212
19	Stability Indicating HPTLC Method of Molnupiravir and Comparative Study of Degradant with Marketed Molnupiravir Impurity- A	Mayur S. Tekade*, Pallavi M. Patil	Pharmaceutical Chemistry	Iranian Journal of Analytical Chemistry	2022	2383-2207	Google scholar	NA
20	Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles	Sangita A.Kale,Dr.Karimunnisa Shaikh	Pharmaceutics	International Journal of Health Sciences	2022	2550-696X 2550-6978	Scopus (2021)	https://www.scopus.com/sourceid/21101052764

21	Validated UV-Vis spectrophotometric method for the estimation of Sorafenib Tosylate in bulk and nanoparticles	Sangita A.Kale,Dr.Karimunnisa Shaikh	Pharmaceutics	International Journal of Health Sciences	2022	2550-696X 2550-6978	Scopus (2021)	https://www.scopus.com/sourceid/21101052764
22	Activated Carbon Black: Versatile Adsorbent for the Healthcare Industry	Aishwarya Shivaji Mahangade1, Dr. Atul. A. Phatak	Pharmaceutics	Pharma Times -	2022	0031-6849	Google Scholar	NA
23	Antihistaminic effects of Azadirachta indica leaves in laboratory animals	Padmaja Kore*, Akash Gaikwad, Anuradha G More, Shivanjali Shinde1, Rutuja Sawkar, Poonam Inamdar	Pharmacology	International Journal of Ayurvedic Medicine	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
24	Antihistaminic effects of Azadirachta indica leaves in laboratory animals	Padmaja Kore*, Akash Gaikwad, Anuradha G More, Shivanjali Shinde1, Rutuja Sawkar, Poonam Inamdar	Pharmacology	International Journal of Ayurvedic Medicine	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

25	Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo	Anuradha G More*, Priyanka D Pote, Padmaja S Kore, Yogish D Garhwani	Pharmaceutics	International Journal of Ayurvedic Medicine	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
26	Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo	Anuradha G More*, Priyanka D Pote, Padmaja S Kore, Yogish D Garhwani	Pharmaceutics	International Journal of Ayurvedic Medicine	2022	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
27	Formulation Development and optimization of Empagliflozin film coated tablet using Quality by Design approach	Sharddha Lakambare, Atul Phatak, Mahesh Bhadagale, Vardhaman Bafana	Pharmaceutics	Asian Journal of Pharmaceutical and clinical research	2022	E 2455-3891 P 0974-2441	Scopus (2018), Embase	NA
28	Comparative docking analysis of tyrosine kinase inhibitors with HER2 and HER4 receptors	Priyanka Sonar,Karimunnisa Shaikh, Sunil Harer, Sangita Ballav, Soumya Basu.	Pharmaceutics	Bioinformation	2022	(Online ISSN 0973-2063; Print ISSN 0973-8894)	Pubmed, Crossref, EBSCO	NA

29	Preparation and Evaluation of Anti-Dandruff Hair Oil Using Various Herbs	Anuradha G. More*, Yogish D. Garhwani , Padmaja S. Kore, Priyanka D. Pote	Pharmaceutics	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
30	Preparation and Evaluation of Anti-Dandruff Hair Oil Using Various Herbs	Anuradha G. More*, Yogish D. Garhwani , Padmaja S. Kore, Priyanka D. Pote	Pharmaceutics	Bulletin of Environment, Pharmacology and Life Sciences	2022	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
31	Aceclofenac solubility enhancement by sonoprecipitation method: Formulation, Optimization, characterization and in vitro evaluation	Ujwala Desai, Sangita Kale, Haya Alkhaldi, Vinay Manocha	pharmaceutics	Journal of Advanced Scientific Research	2022	0976-9595	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
32	Aceclofenac solubility enhancement by sonoprecipitation method: Formulation, Optimization, characterization and in vitro evaluation	Ujwala Desai, Sangita Kale, Haya Alkhaldi, Vinay Manocha	pharmaceutics	Journal of Advanced Scientific Research	2022	0976-9595	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList

33	Preliminary pharmacognostic, physicochemical and phytochemical evaluation of Sansevieria cylindrica leaves	Sunil shewalw, Maruti Shelar, Vrushali Bhalchim, Mohini Kuchekar, Bhagyashri Warude, Vikas Wawale	Pharmacognosy	Journal of pharmaceutical Negative research	2022	0976-9234	Emerging Sources Citation Index, Index Copernicus,	https://www.scopus.com/sourceid/21100216519
34	Low Level Quantification Of Potential Genotoxic Impurity In Daclatasvir Hydrochloride By RP-HPLC Method	Chopade VV , Chaudhari PD, Dumbre NG	Pharmaceutical Chemistry	Journal of Pharmaceutical Negative Results	2022	2229-7723	Emerging Sources Citation Index, Index Copernicus,	https://www.scopus.com/sourceid/21100216519
35	Low Level Quantification Of Potential Genotoxic Impurity In Daclatasvir Hydrochloride By RP-HPLC Method	Chopade VV , Chaudhari PD, Dumbre NG	Pharmaceutical Chemistry	Journal of Pharmaceutical Negative Results	2022	2229-7723	Emerging Sources Citation Index, Index Copernicus,	https://www.scopus.com/sourceid/21100216519
36	A Validated Stability Indicating HPTLC Method for Estimation of Bilastine in Bulk and Tablet Dosage Form and Characterization of Impurities by LC-MS Method	Vitthal V. Chopade ,Shubham C. Humnabadkar, Sarangkar BD, Pallavi M. Patil	Pharmaceutical Chemistry	Advances in Bioresearch	2022	0976 - 4585	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
37	A Validated Stability Indicating HPTLC Method for Estimation of Bilastine in Bulk and Tablet Dosage	Vitthal V. Chopade ,Shubham C. Humnabadkar,	Pharmaceutical Chemistry	Advances in Bioresearch	2022	0976 - 4585	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medi

	Form and Characterization of Impurities by LC-MS Method	Sarangkar BD, Pallavi M. Patil						um=share-by-link&utm_campaign=search-results-share-this-journal
38	Design, synthesis and evaluation of n-(benzo[d]thiazol-2-yl)-2-oxo2h-chromene-3-carboxamide derivatives as potential antioxidant and antibacterial agents	Ranjit V. Gadhavea *, Sachin S. Khadea , Yogita S. Ozardea , Somdatta Y. Chaudharib, Arti G. Swamia and Mukesh K. Meena	Pharmaceutical Chemistry	Indian Drugs	2022	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375
39	Anticataleptic effect of Curcuma Amada ethanolic extract in laboratory animals	Padmaja Kore, Abhishek Nemmaniwar, Samiksha Borole, Pratiksha Raut	Pharmacology	Advances in Bioresearch	2022	Print ISSN 0976-4585; Online ISSN 2277-1573	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
40	Development and validation of novel RP-HPLC method for quantification of lapatinib ditosylate in newer formulation: a quality by design approach	Priyanka Sonar, Karimunnisa Shaikh, Sunil Harer	Pharmaceutis	International Journal of applied pharmaceutics,	2022	0975-7058	Scopus, Embase	https://www.scopus.com/sourceid/19900192174
41	Design, Synthesis, Molecular Docking and Antioxidant Evaluation of	Shashikant V. Bhandari a, Om G. Nagras a, Pranali V.	Pharmaceutical Chemistry	Journal of Molecular Structure	2022	0022-2860	Web of Science, Scopus, SCIE	https://www.scopus.com/sourceid/24642

	Benzimidazole- 1,3,4 oxadiazole Derivatives	Kuthe a, Aniket P. Sarkate b, Kaustubh S. Waghamare a, Dattatraya N. Pansare c, Somdatta Y. Chaudhari d, Shivraj N. Mawale a, Mrunal C. Belwate						
42	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Nobendu Mukerjee, Khattab Al-Khafaji†, Swastika Maitra,Jaafar Suhail Wadi, Punya Sachdeva Arabinda Ghosh,Rahul Subhash Buchade8, Somdatta Yashwant Chaudhari9,Shailaja B. Jadhav, Padmashree Das ,Mohammad Mehedi Hasan , Md. Habibur Rahman12 ,Ghadeer M. Albadrani , Ahmed E. Altyar,Mohamed Kamel , Mohammad Algahtani , Khlood Shinan ,Abdulrahman	Pharmaceutical Chemistry	Frontiers in Molecular Neuroscience	2022	1662-5099	Web of Science, Scopus,Embase, PMC, DOAJ, SCIE	https://www.scopus.com/sourceid/19700175113

		Theyab Mohamed M. Abdel-Daim Ghulam Md. Ashraf, Md. Mominur Rahman andRohit Sharma						
43	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Nobendu Mukerjee, Khattab Al-Khafaji†, Swastika Maitra,Jaafar Suhail Wadi, Punya Sachdeva Arabinda Ghosh,Rahul Subhash Buchade8, Somdatta Yashwant Chaudhari9,Shailaja B. Jadhav, Padmashree Das ,Mohammad Mehedi Hasan , Md. Habibur Rahman12 ,Ghadeer M. Albadrani , Ahmed E. Altyar,Mohamed Kamel , Mohammad Algahtani , Khlood Shinan ,Abdulrahman Theyab Mohamed M. Abdel-Daim Ghulam Md. Ashraf, Md.	Pharmaceutical Chemistry	Frontiers in Molecular Neuroscience	2022	1662-5099	Web of Science, Scopus,Embase, PMC, DOAJ, SCIE	https://www.scopus.com/sourceid/19700175113

		Mominur Rahman andRohit Sharma						
44	Virtual Screening, Synthesis, and Biological Evaluation of Some Carbohydrazide Derivatives as Potential DPP-IV Inhibitors	Prerana Chavan, Shailaja Jadhav et al	Pharmaceutical Chemistry	Molecules,	2022	1420-3049	Web of Science, Scopus, Medline, PMC, DOAJ	https://www.scopus.com/sourceid/26370
45	In silico Molecular docking of Herbal plant extract for Antioxidant activity	Dnyaneshwari R. Chopade, Pallavi M. Patil, Mayuri B. Suryawanshi	Pharmaceutical Chemistry	Journal For Basic Sciences	2022	1006-8341	Scopus	https://www.scopus.com/sourceid/15861
46	Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts	Mugdha Banduke, Akash Gaikwad, Harshada Chattar, Mohini Kuchekar, Bhushan Pimple, Nitin Deshmukh, Harshal Tare	Pharmacognosy	International Journal Of Pharmaceutical Quality Assurance ,	2022	0975 9506	Scopus	https://www.scopus.com/sourceid/21100204506
47	Comparative Investigation of Hair Shampoos Formulated Using Different Herbal Extracts	Mugdha Banduke, Akash Gaikwad, Harshada Chattar, Mohini Kuchekar, Bhushan Pimple, Nitin Deshmukh, Harshal Tare	Pharmacognosy	International Journal Of Pharmaceutical Quality Assurance ,	2022	0975 9506	Scopus	https://www.scopus.com/sourceid/21100204506

48	Macroscopic and Microscopic Evaluation of Sansevieria cylindrica Plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple, Mohini Kuchekar, Vrushali Bhalchim.	Pharmacognosy	Pharmacognosy Research,	2022	0976-4836	Web of Science, Embase, PMC	https://mjl.clarivate.com:/search-results?issn=0974-8490&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
49	Macroscopic and Microscopic Evaluation of Sansevieria cylindrica Plant	Sunil Shewale, Vaishali Undale, Maruti Shelar, Bhushan Pimple, Mohini Kuchekar, Vrushali Bhalchim.	Pharmacognosy	Pharmacognosy Research,	2022	0976-4836	Web of Science, Embase, PMC	https://mjl.clarivate.com:/search-results?issn=0974-8490&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=journal-profile-share-this-journal
50	Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuic acid against 5-fluorouracil induced nephrotoxicity in Wistar rats	Arvind B Naik, Deepti D Bandawane	Pharmacology	NeuroQuantology	2022	1303-5150	Scopus, Embase	https://www.scopus.com/sourceid/11600154151
51	Effect of Lead, Copper on Glycogen Content in Muscle, Liver, Kidney Tissues of Freshwater Fish Labeo Rohita	Pallavi M. Patil, Shubham R Khade, Mayuri Suryawanshi,Sneha N Hojage	pharmaceutical chemistry	UTTAR PRADESH JOURNAL OF ZOOLOGY	2022	0256-971X	Web of Science, UGC-CARE	https://mjl.clarivate.com:/search-results?issn=0256-971X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-these-results

52	Effect of Lead, Copper on Glycogen Content in Muscle, Liver, Kidney Tissues of Freshwater Fish Labeo Rohita	Pallavi M. Patil, Shubham R Khade, Mayuri Suryawanshi,Sneha N Hojage	pharmaceutical chemistry	UTTAR PRADESH JOURNAL OF ZOOLOGY	2022	0256-971X	Web of Science, UGC-CARE	https://mjl.clarivate.com:/search-results?issn=0256-971X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-these-results
53	Preliminary Pharmacognostic, Physicochemical and Phytochemical Evaluation of Plumeria-Obtuse Seed Pods	Sunil Shewale , Vaishali Undale , Maruti Shelar , Vrushali Bhalchim , Mohini Kuchekar , Bhagyashri Warude , Vikas Wawale	Pharmacognosy	Journal of Pharmaceutical Negative Results	2022	2229-7723	Scopus, Embase	https://www.scopus.com/sourceid/21100216519
54	Neuroprotective potential of flowers of nyctanthins arbor-tristis on aluminium chloride induced negative effect on learning abilities in rats	Arvind B Naik, Deepti D Bandawane	Pharmacology	NeuroQuantology	2022	1303-5150	Scopus, Embase	https://www.scopus.com/sourceid/11600154151
55	Foot Deodorizing Gel Formulation Having Antimicrobial Activity	Prashant R. Patankar, Vitthal V. Chopade, Praveen D. Chaudhari	Pharmaceutical Chemistry	Journal of Research in Pharmacy	2022	2630-6344	Scopus, Web of Science	https://www.scopus.com/sourceid/21100928216

56	Foot Deodorizing Gel Formulation Having Antimicrobial Activity	Prashant R. Patankar, Vitthal V. Chopade, Praveen D. Chaudhari	Pharmaceutical Chemistry	Journal of Research in Pharmacy	2022	2630-6344	Scopus, Web of Science	https://www.scopus.com/sourceid/21100928216
57	Development & validation of novel RP-HPLC DAD method for quantification of Lapatinib Ditosylate in newer nano-liposome formulation: A quality by Design (QBD) Approach	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical chemistry	Molecules	2023	1420-3049	Web of Science, Scopus, DOAJ, Medline, PMC, SCIE	https://www.scopus.com/sourceid/26370
58	Coumarin-Based Sulfonamide Derivatives as Potential DPP-IV Inhibitors: Pre-ADME Analysis, Toxicity Profile, Computational Analysis, and In Vitro Enzyme Assay	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical chemistry	Molecules	2023	1420-3049	Web of Science, Scopus, DOAJ, Medline, PMC, SCIE	https://www.scopus.com/sourceid/26370
59	Solubilizing essential oils and preparing stable, transparent and stain-free liquid roll-on preparation for foot application	, Vitthal V. Chopade, Praveen D. Chaudhari,Prashant R. Patankar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
60	Solubilizing essential oils and preparing stable, transparent and stain-free	, Vitthal V. Chopade, Praveen D.	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

	liquid roll-on preparation for foot application	Chaudhari,Prashant R. Patankar						
61	Effect of Andrographis paniculata extract and Andrographolide on the pharmacokinetics of Aceclofenac and Celecoxib in rats	S. J. More, S. S. Tandulwadkar, Aishwarya R. Balap , S. Lohidasan, A. Sinnathambi and K. R. Mahadik	Pharmaceutical Chemistry	Future Journal of Pharmaceutical Sciences	2023	2314-7253	Web of Science, DOAJ, Embase	https://mjl.clarivate.com:/search-results?issn=2314-7245&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
62	Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac Tromethamine in Bulk and Marketed Formulation	Ujwala Wasnik1, Kedar Jagtap , Bhimashankar Devkar, Sameer Lakade , Ankita Patil Padmaja Kore , Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
63	Development and Validation of RP-HPLC Methods for Simultaneous Determination of Moxifloxacin HCl and Ketorolac Tromethamine in Bulk and Marketed Formulation	Ujwala Wasnik1, Kedar Jagtap , Bhimashankar Devkar, Sameer Lakade , Ankita Patil Padmaja Kore , Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

64	UV Spectroscopic Method Development and Validation of Rabeprazole and Levosulpiride in its Bulk and Dosage Form	Vitthal Chopade, Atul Baravkar, Sagar Shinde, Pranali Jadhav, Trupti Dudhgaonkar, Pradip Lade, Monika Chavare	Pharmaceutical Chemistry	Archives of Pharmacy Practice	2023	2320-5210	Web of Science, DOAJ, Embase	https://mjl.clarivate.com:/search-results?issn=2320-5210&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
65	Wheat ergot fungus-derived and modified drug for inhibition of intracranial aneurysm rupture due to dysfunction of TLR-4 receptor in Alzheimer's disease	Sandip DebnathID, Devesh Sharma, Somdatta Yashwant Chaudhari, Ritika Sharma,Amir Afzal Shaikh, Rahul Subhash Buchade, Kavindra Kumar Kesari, Abdel-FattahM. Abdel-Fattah, Mohammad Algahtani, Mayyadah Mheidat, Rawidh Alsaidalani,Tapas Paul, Amany A. Sayed	Pharmaceutical Chemistry	PLOS ONE	2023	1932-6203	Scopus, Web of Science, DOAJ, Embase, Medline, PMC, SCIE	https://mjl.clarivate.com:/search-results?issn=1932-6203&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

66	Active Phytoconstituents and Pharmacological Activities of Withania Coagulans (stocks) Dunal (paneer Dodi): Brief Review	Amit Suryakant Tapkir, Krishnapriya. R. Nalanaglu, Mayuri. K. Auti, Abhijit. B. Gholap	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	E 2306-5249 (Print) ISSN: 2791-	Scopus Active Indexed Database Jornal	NA
67	Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model	Vitthal V. Chopade, Pravin D. Chaudhari, Pramod L. Ingale	Pharmaceutical Chemistry	International Journal of Drug Delivery Technology.	2023	0975 4415	Scopus	https://www.scopus.com/sourceid/20500195212
68	Anti-Alzhimer Activity of Bay Leaves in Scopolamine-induced Rat Model	Vitthal V. Chopade, Pravin D. Chaudhari, Pramod L. Ingale	Pharmaceutical Chemistry	International Journal of Drug Delivery Technology.	2023	0975 4415	Scopus	https://www.scopus.com/sourceid/20500195212
69	Anthelmintic Potential Of Aqueous And Organic Extract Of Seeds Of Samanea saman (Merr)	vitthal chopade,Atul Baravkar, Nitin Aher, Ramdas Kale, Vishnu Neharkar, Makarand Puri, Padmanabh Deshpande	Pharmaceutical Chemistry	Journal of Pharmaceutical Negative Results	2023	2229-7723	Scopus, Embase	https://www.scopus.com/sourceid/21100216519
70	In-Silico Studies to recognize Repurposing Therapeutics toward Arginase-I inhibitors as a Potential Onco-Immunomodulators	Magdi E. A. Zaki*, Sami A. Al-Hussain1, Aamal A. Al-Mutairi1,Abdul Samad, Arabinda Ghosh, Somdatta Chaudhari,Pravin N.	Pharmaceutical Chemistry	Frontiers in Pharmacology	2023	1663-9812	Scopus, Web of Science, DOAJ, Embase, PMC, SCIE	https://mjl.clarivate.com:/search-results?issn=1663-9812&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

		Khatale, Prashant Ajmire and Rahul D. Jawarkar						link&utm_campaign=search-results-share-this-journal
71	Quantitative structure-activity relationship and group-based quantitative structure-activity relationship: a review	Sanket B. Bhatshankar and Amit S. Tapkir	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Research	2023	0975-8232	Embase	NA
72	High-Performance Thin Layer Chromatography Method Development to Estimate Phytoconstituents in Hedychium species.	Samiksha Karde, Shruti Jha, Bhusan Pimple, Mohini Kuchekar	Pharmacognosy	International Journal of Pdrug Delivery Technology	2023	0975-4415	Scopus	https://www.scopus.com/sourceid/21100967064
73	High-Performance Thin Layer Chromatography Method Development to Estimate Phytoconstituents in Hedychium species.	Samiksha Karde, Shruti Jha, Bhusan Pimple, Mohini Kuchekar	Pharmacognosy	International Journal of Pdrug Delivery Technology	2023	0975-4415	Scopus	https://www.scopus.com/sourceid/21100967064
74	Antimicrobial Foot Deodorizing Spray	Chopade Vitthal, Chaudhari Praveen,Patankar Prashant	Pharmaceutical Chemistry	International Journal of Pharmaceutical Quality Assurance	2023	0975-9506	Cross ref	NA
75	Antimicrobial Foot Deodorizing Spray	Chopade Vitthal, Chaudhari	Pharmaceutical Chemistry	International Journal of Pharmaceutical	2023	0975-9506	Cross ref	NA

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76	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Glimepiride by Hydrotropic Solubilization	Sheetal D. Chaudhari , Rupali A. Jinturkar* , Pranali S. Shirsath, Shivam H. Sambre	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	1006-8341	Scopus	https://www.scopus.com/sourceid/15861
77	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Glimepiride by Hydrotropic Solubilization	Sheetal D. Chaudhari , Rupali A. Jinturkar* , Pranali S. Shirsath, Shivam H. Sambre	Pharmaceutical Chemistry	Journal For Basic Sciences	2023	1006-8341	Scopus	https://www.scopus.com/sourceid/15861
78	Development of a New Validated Stability-Indicating High-Performance Thin-Layer Chromatography Method for Determination of Dosulepin HCl in Bulk and Marketed Formulation with Characterization of its	Aishwarya Ramchandra Balap, Ravina R. Waghmare	Pharmaceutical Chemistry	Asian Journal of Pharmaceutical Research and Health Care	2023	ISSN - Print: 2250-1444, Online: 2250-1460	Scopus (2016), Web of Science, Embase	https://mjl.clarivate.com:/search-results?issn=2250-1444&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

	Degradants by Liquid Chromatography–Mass Spectrometry							
79	The Efficient Activity of Glabridin and its Derivatives Against EGFR-mediated Inhibition of Breast Cancer	Arabinda Ghosh, Debanjana Ghosh, Nobendu Mukerjee, Swastika Maitra, Padmashree Das, Abhijit Dey, Souty M.Z. Sharkawi, Georgios D. Zouganelis, Athanasios Alexiou, Somdatta Yashwant Chaudhari, Ritika Sharma, Sonali Arun Waghmare, Marios Papadakis* and Gaber El-saber Batiha	Pharmaceutical Chemistry	Current Medicinal Chemistry	2023	0929-8673	Scopus, Web of Science, Medline, SCIE	https://mjl.clarivate.com:/search-results?issn=0929-8673&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
80	Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches	Mukerjee, Nobendu ; Chaudhari, Somdatta Y. ; Jha, Swastik; Sinha, Shweta MSce; Jadhav, Shailaja ; Dhar, Rajib ; Rathod, Vivek D. BTechg; Nanaware, Rajesh B.	Pharmaceutical Chemistry	International Journal of Surgery	2023	1743-9191	Web of Science, Scopus, Embase Medline, SCIE	https://mjl.clarivate.com:/search-results?issn=1743-9191&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

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81	Emerging hepatitis C virus and neuron-allied neuroviral intertwine and its therapeutic approaches	Mukerjee, Nobendu ; Chaudhari, Somdatta Y. ; Jha, Swastik; Sinha, Shweta MSce; Jadhav, Shailaja ; Dhar, Rajib ; Rathod, Vivek D. BTechg; Nanaware, Rajesh B. MPharmh; Chakole, Rita D. PhDi; Sharma, Devesh MScj; Sharma, Prince Prashant PhDk; Pawar, Sonali D. MPharml; Ghosh, Arabinda PhDm	Pharmaceutical Chemistry	International Journal of Surgery	2023	1743-9191	Web of Science, Scopus, Embase Medline, SCIE	https://mjl.clarivate.com:/search-results?issn=1743-9191&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
82	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale ,	Pharmacognosy	International Journal of Experimental	2023	2455-4856	Scopus	https://www.scopus.com/sourceid/21101140508

		Manoj Tare, Dwarkadas Baheti		research and review				
83	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale , Manoj Tare, Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4856	Scopus	https://www.scopus.com/sourceid/21101140508
84	Pharmacognostic Investigations of Impatiens balsamina Linn.	Bhushan Pimple, Suvarna Vadje , Mohini Kuchekar *, Deshraj Chumbhale , Manoj Tare, Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4856	Scopus	https://www.scopus.com/sourceid/21101140508
85	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	Scopus	https://www.scopus.com/sourceid/21101140508
86	Comparative evaluation of lipsticks developed using isolated pigments of	Bhushan Pimple*,Suvarna Vadje,Mohini	Pharmacognosy	International Journal of Experimental	2023	2455-4855	Scopus	https://www.scopus.com/sourceid/21101140508

	Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti		research and review				
87	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	Scopus	https://www.scopus.com/sourceid/21101140508
88	Comparative evaluation of lipsticks developed using isolated pigments of Capsicum annuum and Lycopersicon esculentum fruits and various natural bases	Bhushan Pimple*,Suvarna Vadje,Mohini Kuchekar,Sonali Nipate,Dnyaneshwari Mate ,Krishnapriya Ramlunalanaglu,Manoj Tare,Dwarkadas Baheti	Pharmacognosy	International Journal of Experimental research and review	2023	2455-4855	Scopus	https://www.scopus.com/sourceid/21101140508

89	Development and validation of chromatographic method for analysis of some polycyclic hydrocarbons in soybean oil	Vitthal Chopade, Pradip Bodake, Rajendra Kawade, Rajanikant Kakade, Amit Panaskar, Bhagyashri Panaskar, Nitin Shinde, Reshma Devkate, Komal Hole, Shital Gaikawad, Poonam Kasar, Sonali Pawar, Vishnu Neharkar, Bhushan Pimpale, Shaikh, Atul Baravkar, Deepali Kadam, Sana M Jafar Shaikh, Rahul Mohan, Monali Bhalerao, Milind Velhal, Hemant Deokule	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
90	Development and validation of chromatographic method for analysis of some polycyclic hydrocarbons in soybean oil	, Vitthal Chopade, Pradip Bodake, Rajendra Kawade, Rajanikant Kakade, Amit Panaskar, Bhagyashri Panaskar, Nitin Shinde, Reshma Devkate, Komal	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

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91	GC-MS and Insilico molecular docking of Leonurine isolated from Leonotis nepetifolia for antioxidant activity.	, Pallavi M. Patil, Dnyaneshwari R. Chopade, Mayuri B. Suryawanshi	Pharmaceutical chemistry	High Technology Letters	2023	1006-6748	Scopus	https://www.scopus.com/sourceid/12667
92	Development and validation of RPHPLC method for assay of fluticasone furoate from nasal spray formulation	Vitthal Chopade, Vishnu Neharkar, Padmanabh Deshpande Makarand Puri, Priti Khanapure, Vaishnavi Chopade, Minal Ghante, Jayshree Jagtap, Shital Godse,	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

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93	Hepatoprotective activity of Balsamodendron mukul extract against Paracetamol-induced liver toxicity in rats: In vivo pharmacological and toxicological evaluation,	Darshan Shah, Nitin Mahurkar, Dnyandev Gadhave, Ram Nikhate , Kalyani Kakad	Pharmacognosy	Annales Pharmaceutiques Françaises	2023	2772-803X	Web of Science	https://mjl.clarivate.com:/search-results?issn=0003-4509&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
94	Development and Characterization of Lipidic Nano-Cochleate for Topical Delivery of Itraconazole	Anuradha G. More , Hrishikesh S. Sonsale , Swati M. Mutha , Padmaja S. Kore Aishwarya S. Mahangale , Akshay	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

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95	Development and Characterization of Lipidic Nano-Cochleate for Topical Delivery of Itraconazole	Anuradha G. More , Hrishikesh S. Sonsale , Swati M. Mutha , Padmaja S. Kore Aishwarya S. Mahangale , Akshay N. Deo , Mukesh P. Ratnaparkhi	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
96	Quantification of spironolactone and its impurities present in pharmaceutical dosage forms by stability-indicating hplc method	Amit S. Tapkir , Harshal S. Loharkar and Santaji Nalawade	Pharmaceutical Chemistry	International Journal of Pharmaceutical Sciences and Research	2023	0975-8232	Embase	NA
97	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

98	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
99	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
100	Acute oral toxicity evaluation of hydroethanolic extract of Brassica Cretica in wistar albino rats as per OECD 425	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Smeeta Sadar, Pooja Chavan, Anuradha More, Minal Harde, Siddhant Gaikwad	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
101	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

		Chavan, Trupti Bankar, Shrishti Jha						
102	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
103	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
104	Prophylactic effects of Hydroethanolic extract of Brassica Cretica Leaves on Myocardial Injury in Rats.	Padmaja Kore, Ashwini Navale, Deepti Bandawane, Anuradha More , Minal Harde, Pooja Chavan, Trupti Bankar, Shrishti Jha	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
105	Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek Nemmaniwar ,	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

	Extract in laboratory animals	Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan						
106	Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic Extract in laboratory animals	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek Nemmaniwar , Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
107	Evaluation of wound healing and anti-inflammatory potential of Daucus Carota ethanolic Extract in laboratory animals	Padmaja Kore, Mansi Sewatkar, Vaishnavi Inde, Abhishek Nemmaniwar , Anuradha More, Minal Harde, Sakshi Khandagale, Tanvi Mande, Shivani Harne, Neha Dhumal, Pooja Chavan	Pharmacology	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

108	A Green Approach: Development and Validation of UV Spectrophotometric Method for the Determination of Rivaroxaban by Hydrotropic Solubilization	Sheetal D. Chaudhari*, Roshani S. Gite, Chaitanya V. Walunjkar	Pharmaceutical Chemistry	Journal of Basic sciences	2023	ISSN NO : 1006-8341	Scopus	https://www.scopus.com/sourceid/15861
109	Identification of d-limonene and rosmarinic acid by gc-ms analysis of kalonji oil with anti-microbial and anti-fungal activities	Pallavi M Patil, Samiksha Surendra Agarkar, Neha Prabhakar Shegokar	Pharmaceutical chemistry	High Technology Letters	2023	1006-6748	Scopus	https://www.scopus.com/sourceid/12667
110	Design And Characterization Of Nanoemulgel For Topical Fungal Infection: Box Behnken Design Approach	Anuradha G. More, Shraddha S. Satkar, Swati S. Mutha, Padmaja S. Kore, Swapnil S.Tarte, Adil M. Pathan, Renuka G. Zarekar	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
111	Design And Characterization Of Nanoemulgel For Topical Fungal Infection: Box Behnken Design Approach	Anuradha G. More, Shraddha S. Satkar, Swati S. Mutha, Padmaja S. Kore, Swapnil S.Tarte, Adil	Pharmaceutics	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

		M. Pathan, Renuka G. Zarekar						
112	2-Pyrocatechuic Acid Attenuates Carboplatin Induced Hematological Toxicities in Wistar Rats	Arvind B Naik, Deepti Bandawane, Archana Naik	Pharmacology	Research J. Pharm. and Tech.	2023	Online 0974-360X Print 0974-3618	Scopus, DOAJ	https://www.scopus.com/sourceid/21100197160
113	Simultaneous estimation of lamivudune, Tenofovir, Disoproxil Fumarate and Efavirenz in Bulk and tablet Dosage form by cramers rule	Atul Baravkar, vitthal chopade, Makarand Puri, Vishnu Neharkar, Ramdas Kale	Pharmaceutical Chemistry	International Journal pharmaceutical investigation	2023	2230-9713	Web of Science, UGC- CARE, PMC	https://mjl.clarivate.com:/search-results?issn=2230-973X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
114	Evaluation of In Vitro and In Silico Anti-Alzheimer potential of ethanolic extract of Nyctanthes arbortristis flowers.	Arvind B Naik, Deepti Bandawane, Archana Naik	Pharmacology	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
115	In-silico investigation of phytoconstituents from Plumeria obtusa and Sansevieria cylindrica plants for assessment of anti-venom activity against snake venom.	Sunil Shewale, Vaishali Undale, Bhagyashri Warude, Vrushali Bhalchim, Mohini Kuchekar, Jay Gagare.	Pharmacognosy	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

116	A Review on Cubosome: The Novel Drug Delivery System	Devendra L. Visokar, Ashwini D. Akhote, Tushar M. Phalke	Pharmaceutics	International Journal of Research Publication and Reviews	2023	2582-7421	Google scholar, academia.edu	NA
117	Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation	Ujwala Wasnik, Rushikesh Nikalje, Khandoba Birajdar, Sameer Lakade, Sidheshwar Jadhav, Padmaja Kore, Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
118	Development and Validation of TLC-Densitometric Method for Simultaneous Estimation of Moxifloxacin HCL and Ketorolac Tromethamine in Bulk Drug and Marketed Formulation	Ujwala Wasnik, Rushikesh Nikalje, Khandoba Birajdar, Sameer Lakade, Sidheshwar Jadhav, Padmaja Kore, Minal Harde	Pharmaceutical Chemistry	Eur. Chem. Bull.	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
119	HLA-E (Human Leukocyte Antigen-E): Promising Biological agent for Cancer Mitigation	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote, Mayuri S. Borbane, Rushikesh V.	Pharmaceutics	Journal of Emerging Technologies and Innovative Research (JETIR)	2023	2349-5162	Google scholar	NA

		Khorde, Shilpa S. Biradar, Dr. U. S. Desai , Dr. K. S. Shaikh						
120	Evaluation of anti-atherosclerotic potential of Tinospora cordifolia in high-fat diet-induced atherosclerosis with associated changes in histological and biochemical parameters on Wistar rats	S. S. Nipate,K. Koradkar & S. A. Gojare	Pharmacology	Future Journal of Pharmaceutical Sciences	2023	2314-7253	Web of Science, Embase, DOAJ	https://mjl.clarivate.com:/search-results?issn=2314-7245&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
121	Identification and quantification of two low levels of potential genotoxic impurities in rilpivirine hydrochloride drug substance by hplc technique	Vitthal V. Chopade , Dipali S. Thete , Pallavi M. Patil , Nilesh Jadhav , Atul A. Baravkar	Pharmaceutical Chemistry	THE JOURNAL OF ORIENTAL RESEARCH MADRAS	2023	0022-3301	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
122	Identification and quantification of two low levels of potential genotoxic impurities in rilpivirine hydrochloride drug substance by hplc technique	Vitthal V. Chopade , Dipali S. Thete , Pallavi M. Patil , Nilesh Jadhav , Atul A. Baravkar	Pharmaceutical Chemistry	THE JOURNAL OF ORIENTAL RESEARCH MADRAS	2023	0022-3301	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList

123	Stability of co-amorphous solid dispersions: physical and chemical aspects	Abhijeet A. Aher1,2, Karimunnisa S. Shaikh1 , Praveen D. Chaudhari	Pharmaceutics	Journal of Structural Chemistry	2023	0022-4766	Web of Science	https://mjl.clarivate.com:/search-results?issn=0022-4766&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
124	Stability of co-amorphous solid dispersions: physical and chemical aspects	Abhijeet A. Aher1,2, Karimunnisa S. Shaikh1 , Praveen D. Chaudhari	Pharmaceutics	Journal of Structural Chemistry	2023	0022-4766	Web of Science	https://mjl.clarivate.com:/search-results?issn=0022-4766&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
125	Development of an UV spectroscopic method for Capsaicin quantification in dosage form and in a bulk formulation	, Vitthal Chopade, Atul Baravkar,Sneha Dhonde, Trushali Mandhare, Pooja Kashid, Ganesh Phadtare,Jyoti Jawale, Alfa Jain, Deepali Kadam and Aditi Zagade	Pharmaceutical Chemistry	International Journal of Life science and Pharma Research	2023	2250-0480	Web of Science	https://mjl.clarivate.com/search-results
126	Review On: Anti-Inflammatory Drugs	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote,	Pharmaceutics	Journal of Emerging Technologies and Innovative	2023	2349-5162	Google scholar	NA

		Mayuri S. Borbane, Rushikesh V. Khorde, Shilpa S. Biradar, Dr. U. S. Desai, Dr. K.S.Shaikh		Research (JETIR)				
127	Review On: Anti-Inflammatory Drugs	Yashoda N. Tidake, Darshana H. Wani, Tushar M. Phalke, Priyanka D. Pote, Mayuri S. Borbane, Rushikesh V. Khorde, Shilpa S. Biradar, Dr. U. S. Desai, Dr. K.S.Shaikh	Pharmaceutics	Journal of Emerging Technologies and Innovative Research (JETIR)	2023	2349-5162	Google scholar	NA
128	Method Development and Validation of Stability-Indicating HPTLC Method for Determination of Brivaracetam	KORDE KT1* AND PIMPLE SS2	Pharmaceutics	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2023	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
129	Isolation and Characterisation of Nateglinide and its impurity in Bulk and Marketed	Patil Pallavi M1 *, Mayur Tekade2 , Samiksha Agarkar	Pharmaceutical Chemistry	Research J. Pharm. and Tech.	2023	0974-360X (Online) 0974-3618 (Print)	Scopus, Embase, SJR	https://www.scopus.com/sourceid/21100197160

	Formulation by HPTLC Method							
130	Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral Sclerosis -An updated review	Taha Alqahtani, Sharada L. Deore, Anjali A. Kide, Bhavana A. Shende, Ritika Sharma, Rita Dadarao Chakole, Lalita S. Nemade, Nikita Kishor Kale, Sudarshana Borah, Savita Shrikant Deokar, Ashok Behera, Divya Dhawal Bhandari, Nikita Gaikwad, Abul Kalam Azad, Arabinda Ghosh	Pharmaceutical Chemistry	Mitochondrion	2023	1567-7249	Web of Science, Scopus	https://mjl.clarivate.com:/search-results?issn=1567-7249&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
131	Mitochondrial dysfunction and oxidative stress in Alzheimer's disease, and Parkinson's disease, Huntington's disease and Amyotrophic Lateral	Taha Alqahtani, Sharada L. Deore, Anjali A. Kide, Bhavana A. Shende, Ritika Sharma, Rita Dadarao Chakole, Lalita S. Nemade, Nikita Kishor Kale,	Pharmaceutical Chemistry	Mitochondrion	2023	1567-7249	Web of Science, Scopus	https://mjl.clarivate.com:/search-results?issn=1567-7249&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

	Sclerosis -An updated review	Sudarshana Borah, Savita Shrikant Deokar, Ashok Behera, Divya Dhawal Bhandari, Nikita Gaikwad, Abul Kalam Azad, Arabinda Ghosh						
132	Quantification of Slidenafil citrate in bulk and dosage form by HPTLC by using hydrotopic agents	Vitthal chopade, Pooja Wadgave, Sheetal Chaudhari, Mnisha Salunkhe, Vrushali Kharate, Pratiksha Suryawanshi, Ashwini P Shewale, Sayyed Gaffar, Nilesh Jadhav, Sanjay Garje, Rajanikant Kakade, Ashok Jagdale, Atul Barvkar	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023
133	Quantification of Slidenafil citrate in bulk and dosage	Vitthal chopade, Pooja Wadgave, Sheetal Chaudhari, Mnisha Salunkhe,	Pharmaceutical Chemistry	European Chemical Bulletin	2023	2063-5346	Scopus, DOAJ	https://www.scopus.com/sourceid/21100898023

	form by HPTLC by using hydrotopic agents	Vrushali Kharate, Pratiksha Suryawanshi, Ashwini P Shewale, Sayyed Gaffar, Nilesh Jadhav, Sanjay Garje, Rajanikant Kakade, Ashok Jagdale, Atul Barvkar						
134	Supramolecular Drug Delivery	Rushikesh V Khorde, Mayuri S Borbane, Tushar M. Phalke, Darshana H Wani, Gaurav A Mahajan, Yashoda N Tidake, U CGalgatte, Ujwala S Desai	Pharmaceutics	Journal For Basic Sciences	2023	1006-8341	Scopus	https://www.scopus.com/sourceid/15861
135	Supramolecular Drug Delivery	Rushikesh V Khorde, Mayuri S Borbane, Tushar M. Phalke, Darshana H Wani, Gaurav A Mahajan, Yashoda N Tidake, U CGalgatte, Ujwala S Desai	Pharmaceutics	Journal For Basic Sciences	2023	1006-8341	Scopus	https://www.scopus.com/sourceid/15861

136	Role Of Neuropeptides In Human Behaviour	Padmaja Kore * , Abhijit Deshmukh, Ganesh Pore, Surabhi Shinde, Prajakta Tambe and Pradnya Khelbude	Pharmacology	International Journal of Pharmaceutical Sciences and Research (IJPSR)	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	Embase	NA
137	Chemical fingerprinting of Curcumin and Berberin in selected Ayurvedic formulation and herbs recommended for skin infection	Kalyani S. Kakad, Nawale S, Malode SS, Nemmaniwar AS, Dhole ON, Raut PL	Pharmacognosy	International Journal of Biology, Pharmacy and Allied sciences	2023	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
138	Chemical fingerprinting of Curcumin and Berberin in selected Ayurvedic formulation and herbs recommended for skin infection	Kalyani S. Kakad, Nawale S, Malode SS, Nemmaniwar AS, Dhole ON, Raut PL	Pharmacognosy	International Journal of Biology, Pharmacy and Allied sciences	2023	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
139	Exploration of anti-atherosclerotic activity of origanum majorana l. In experimental animals with high-fat diet-induced atherosclerosis	D. V. Katkar, S. F. Abhang, B. P. Pimple and S. S. Nipate	Pharmaceutics	International journal of pharmaceutical sciences and research	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	Scopus (2016), Embase	https://www.scopus.com/sourceid/19700188319, https://journalchecker.com/journal/403363

140	Exploration of anti-atherosclerotic activity of origanum majorana l. In experimental animals with high-fat diet-induced atherosclerosis	D. V. Katkar, S. F. Abhang, B. P. Pimple and S. S. Nipate	Pharmaceutics	International journal of pharmaceutical sciences and research	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	Scopus (2016), Embase	https://www.scopus.com/sourceid/19700188319, https://journalchecker.com/journal/403363
141	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj Chumbhale | Asmita Gaikwad | Harshal Tare'	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	Scopus	https://www.scopus.com/sourceid/21101133576
142	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's complete adjuvant induced arthritis in Wistar rats	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj Chumbhale | Asmita Gaikwad | Harshal Tare'	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	Scopus	https://www.scopus.com/sourceid/21101133576
143	Anti-arthritic potential of ethyl acetate fraction of Pinus roxburghii Sargent stem bark in Freund's	Pratiksha Hajare | Vaishali Rai"| Sonali Nipate | Aishwarya Balap | Bhushan Pimple | Deshraj	Pharmacology	Multidisciplinary science journal	2023	Issn 2675-1240	Scopus	https://www.scopus.com/sourceid/21101133576

	complete adjuvant induced arthritis in Wistar rats	Chumbhale | Asmita Gaikwad | Harshal Tare'						
144	A Review Of The Relationship Between Antidepressants And Suicide Risk	Padmaja Kore * , Pradnya Khelbude, Surabhi Shinde, Abhijit Deshmukh, Prajakta Tambe and Ganesh Pore	Pharmacology	International Journal of Pharmaceutical Sciences and Research (IJPSR)	2023	E-ISSN: 0975-8232; P-ISSN: 2320-5148	Embase	NA
145	Anticataleptic effect of Xanthium Stramarium Hydroalcoholic Extractin Laboratory Animals	Kore PS*, Kalaskar S, Jachakd D, Jadhav S, Patil D, Patil S, Kuchekar M	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2023	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
146	Anticataleptic effect of Xanthium Stramarium Hydroalcoholic Extractin Laboratory Animals	Kore PS*, Kalaskar S, Jachakd D, Jadhav S, Patil D, Patil S, Kuchekar M	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2023	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
147	A review on phytocompounds and	Kore P* , Shinde S , Pore G , Tambe P And Bandawane D*	Pharmacology	International Journal of Biology, Pharmacy and	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medi

	pharmacological Activities reported for tagetes erecta			Allied Sciences (IJBPAS)				um=share-by-link&utm_campaign=search-results-share-this-journal
148	A review on phytocompounds and pharmacological Activities reported for tagetes erecta	Kore P* , Shinde S , Pore G , Tambe P And Bandawane D*	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
149	A review on phytocompounds and pharmacological activities for musa paradisiaca linn.	Kore P* , Pore G, Shinde S, Tambe P And Bandawane D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
150	A review on phytocompounds and pharmacological activities for musa paradisiaca linn.	Kore P* , Pore G, Shinde S, Tambe P And Bandawane D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

151	A Review On Pharmacology And Phytochemistry Of Portulaca Oleracea	Kore P S , Tambe P, Pore G, Shinde S, Bandawane D D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
152	A Review On Pharmacology And Phytochemistry Of Portulaca Oleracea	Kore P S , Tambe P, Pore G, Shinde S, Bandawane D D	Pharmacology	International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)	2022	2277-4998	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-4998&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
153	Inhibitory Effect of Piperine on Nucleation and Aggregation of Calcium Oxalate Crystals	B. P. Pimple, A.L.Thorat and P.D.Chaudhari	Pharmacognosy	Advances in Bioresearch	2021	2277-1573 0976-4585	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
154	Inhibitory Effect of Piperine on Nucleation and Aggregation of Calcium Oxalate Crystals	B. P. Pimple, A.L.Thorat and P.D.Chaudhari	Pharmacognosy	Advances in Bioresearch	2021	2277-1573 0976-4585	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

								link&utm_campaign=search-results-share-this-journal
155	Protocatechuic acid attenuates chronic unpredictable mild stress-induced-behavioral and biochemical alterations in mice	Vishnu N. Thakare , Sameer H. Lakade , Moreshwar P. Mahajan , Yogesh P. Kulkarni , Valmik D. Dhakane , Minal T. Harde , Bhoomika M. Patel	Pharmaceutical chemistry	European Journal of Pharmacology	2021	0014-2999.	Scopus,Web of Science, Medline, Embase, SCIE	https://www.scopus.com/sourceid/21333 , https://mjl.clarivate.com:/search-results?issn=0014-2999&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal,https://journalchecker.com/journal/397086
156	Design and Development of lornoxicam impregnated dry powder-based liquid crystals	Vishal Pande, Shubham Gore, Ajinkya Pote, Minal Harde, Sameer Lakade, Vaibhav Raut	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	Web Of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
157	Validated inherent stability indicating reversed phase HPLC- DAD method for simultaneous determination of tolperisone hydrochloride and diclofenac sodium in marketed formulation	Minal T Harde, Sameer H Lakade, Sapana K Rokade, Shital G Rathod, Pooja A Dale, Komal A Kendre, Indra H Sirvi	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

158	Study and optimization of the effect of critical formulation components in the manufacturing of multiparticulate oral controlled release drug delivery system	Sameer H Lakade, Minal T Harde, Monika Patil, Sneha Gupta	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
159	ICH Guideline in practice: Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Eperisone hydrochloride and diclofenac sodium in marketed formulation	Minal T Harde, Sameer H Lakade, Neha K Kakade, Laxmi R Chaudhary, Snehal V Gosavi, Rohan R Patekar, Heena B Choudhary.	Pharmaceutical chemistry	Bulletin of environment, pharmacology, and life science	2021	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
160	Formulation And Evaluation of Lipsticks from The Dyes Of Root Barks of Alkana Tinctoria	Pimple B. P., Mekhe A.R., Joshi A.A., Malwadkar S.S. and Pimple K. B.	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences	2021	N 2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

161	Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients	Smita S. Pimple, Kiran Mahajan, Hemant Deokule	Pharmaceutics	International Journal of Pharmaceutical Research	2021	0975-2366	Scopus (2021),Embase	https://www.scopus.com/sourceid/19700174645, https://journalchecker.com/journal/403360
162	Schiff Base Conjugate of 5-Fluoroisatin with Thiophene-2-Ethylamine and its Mannich Bases: Synthesis, Molecular Docking, and Evaluation of in vitro Anti-inflammatory and Anti-tubercular Activity	Bhushan D. Varpe, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Investigation	2021	Print -2230-973X, Online - 2230-9713	Web of Science, UGC-CARE, PMC	https://mjl.clarivate.com:/search-results?issn=2230-973X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal, https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList, https://journalchecker.com/journal/443249
163	3D drug printing methods and their application in the Pharmaceutical and biomedical area	Dr. Anuradha G.More , Akshay V. Giri	Pharmaceutics	Journal of Hospital Pharmacy	2021	2348-7704	NCBI indexed	NA
164	Method development and validation of rilpivirine in bulk and solid dosage form by using UV visible spectrophotometric method	Shrishail M ghurghure, Anup dhange, Rupali mhetre, Atul Phatak	Pharmaceutics	International journal of research and analytical reviews	2021	E-ISSN 2348-1269, P- ISSN 2349-5138	Research Gate	NA

165	A review on stability improvement of sugarcane juice by using natural preservatives	Vitthal Chopade, Kamlesh Mankuskar	Pharmaceutical chemistry	International Journal of pharmaceutical chemistry and analysis	2021	Print ISSN:-2394-2789 Online ISSN:-2394-2797	Crossref	NA
166	To Study the Pharmacokinetic Herb-Drug Interaction of Momordica Charantia Fruit Extract and Pure Charantin with Nateglinide in Rats	Aishwarya R. Balap	Pharmaceutical chemistry	International Journal of Pharmacy and Pharmaceutical Sciences	2021	online 0975-1491 print 2656-0097	Scopus (2020), Embase	https://www.scopus.com/sourceid/19700174810, https://journalchecker.com/journal/403370
167	The use of negative oxygen ion clusters [O2−(H2O) n] and bicarbonate ions [HCO3−] as the supportive treatment of COVID- 19 infections: A Possibility	Ravindra V Badhe, Sonali S Nipate	Pharmacology	Medical hypotheses	2021	0306-9877	Scopus, Web of Science, Embase, SCIE	https://www.scopus.com/sourceid/17833, https://mjl.clarivate.com:/search-results?issn=0306-9877&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal, https://journalchecker.com/journal/412642
168	Bee pollen and its therapeutic Uses	Chopade V.V, Gawade V S[2].	Pharmaceutical chemistry	International Journal of Botany Studies	2021	2455-541X	Google scholar, research gate	NA

169	Design and evaluation of artemether self-micro emulsifying drug delivery system for enhancing solubility and dissolution rate	Anuradha G. More, Milind P. Wagh	Pharmaceutics	Journal of Hospital Pharmacy	2021	2348-7704	NCBI indexed	NA
170	One-step synthesis approach of mesoporous silica packed with graphene oxide nanosheet: Characterization and drug release aspects	Prashant K. Deshmukh, Sameer H. Lakade , Umesh R. Jaiswal & Minal T. Harde, Mahesh P. More	Pharmaceutical chemistry	Materials Technology	2021	1753-5557	Scopus, Web of Science, SCIE	https://www.scopus.com/sourceid/27301 , https://journalchecker.com/journal/412366
171	Blowfly maggots and their application in human	Chopade V.V, Gawade V S, Kokare N V.	Pharmaceutical chemistry	International Journal of Entomology Research	2021	2455-4758	Web of Science	https://mjl.clarivate.com:/search-results?issn=2455-4758&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
172	Nano Emulgel: A Smarter Topical Lipidic Emulsion Based Nanocarrier	Dr. Anuradha G.More, Shraddha S. Satkar	Pharmceutics	Journal of Hospital Pharmacy	2021	: 2348-7704	NCBI indexed	NA
173	Isolation, Purification, Characterization and Immunomodulatory activity of isolated flavonoid	Neelam Dashputre, Deepti D Bandawane	Pharmacology	Advances in Bioresearch	2021	E-ISSN : 2277-1573	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

	fractions derived from Abelmoschus					P-ISSN : 0976-4585		link&utm_campaign=search-results-share-this-journal
174	Exploration of antidiabetic potential of arial parts of Abutilon indicum Linn in streptozotocin-nicotinamide induced diabetes in rats	Kakade Pallavi, Bandawane Deepti	Pharmacology	International Journal of Analytical and experimental model analysis	2021	0886-9367	Google scholar	NA
175	Challenges, Advances, and Opportunities of Herbal Medicines in Wound Healing: A Review	Balap A.R, Gaikwad A.A.	pharmaceutical chemistry	International Journal of Pharmaceutical Sciences Review and Research	2021	0976-044X	Scopus (2016), Embase	https://www.scopus.com/sourceid/19700188319, https://journalchecker.com/journal/403364
176	Synthesis, Characterization, and Biological Evaluation of some Novel Substituted Indole-Coumarin Derivatives as Potential Antibacterial and Antifungal Agents	P. K. Vawhal, S. B. Jadhav	Pharmaceutical chemistry	Journal of Pharmaceutical Research International	2021	2231-2919	Google scholar, PubMed	NA
177	Group-based quantitative structure and activity relationship on benzothiazole derivatives for the development of	Amit S. Tapkir, Sohan S. Chitlange, Ritesh P. Bhole	Pharmaceutical chemistry	Thai Journal of Pharmaceutical Sciences	2021	2231-2919,	Scopus, Embase	https://www.scopus.com/sourceid/19700175006, https://journalchecker.com/journal/424200

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178	Muntingia calabura: A comprehensive review	Mohini Upadhye, Mohini Kuchekar, Rohini Pujari, Shailja Kadam, Priya Gunjal,	Pharmacognosy	Journal of Pharmaceutical and Biological Sciences	2021	2320-1924	DIRECTORY OF RESEARCH JOURNALS INDEXING	
179	Quality risk assessment and DoE- Practiced validated stability-indicating chromatographic method for quantification of rivaroxaban in bulk and tablet dosage form	Kamlesh Palandurkar, Richie Bhandre, Sai H S Boddu, Minal T Harde, Sameer H Lakade, Ujjwala Kandekar, Prashant Waghmare	Pharmaceutical chemistry	Acta Chromatographica	2022	1233-2356	Scopus, Web of Science, SCIE	https://www.scopus.com/sourceid/22659 , https://mjl.clarivate.com:/search-results?issn=1233-2356&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal, https://journalchecker.com/journal/384575
180	Exploring Cytotoxic Potential of Ciclopirox on Colorectal Cancer Cells by In-Silico Methodology	Deokar SS, Shaikh KS	Pharmaceutics	Bio interface Research in Applied Chemistry	2022	2069-5837	Google scholar	NA
181	Phytochemistry and Pharmacology of Pterocarpus Santalinus and Its Role in Dermatology	Mohini Kuchekar*, Vijay Navghare, Amrita Kulkarni, Aishwarya Zambare, Bharti Choudhary	Pharmacognosy	Asian Journal of Pharmaceutical and Clinical Research	2022	2755-3891	Scopus (2018), Embase	https://www.scopus.com/sourceid/19700174904 ,https://journalchecker.com/journal/388339

182	Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated with 1,3,4-oxadiazole derivatives	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	Indian Journal of Pharmaceutical Education and Research	2021	0019-5464	Web of Science, Scopus, SCIE, Embase	https://mjl.clarivate.com:/search-results?issn=0019-5464&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
183	Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel pyrrolidine sulphonamide derivative	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Investigation	2021	Print -2230-973X, Online - 2230-9713	UGC-CARE, Web of science, PMC	https://ugccare.unipune.ac.in/Apps1/User/WebA/SearchList, https://mjl.clarivate.com:/search-results?issn=2230-973X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal, https://journalchecker.com/journal/443249
184	Stability-indicating and analysis of Quercetin, Rutin, and Lupeol in Benincasa hispida (Cucurbitaceae) fruit, leaves extracts, and formulation by High-Performance Thin layer Chromatographic methods.	Kakad Kalyani Shrinivas* , Kundan Chimanaram Choudhary, Mukesh Rajaram Choudhary	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences	2021	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

185	Study of antihyperglycemic, antihyperlipidemic and antioxidant activities of Withania coagulans fruits in streptozotocin-induced non-insulin dependent diabetes mellitus in rats	Deepti D. Bandawane, Archana R Juvekar	Pharmacology	Indian Drugs	2021	2277-1808	Scopus, Embase	https://www.scopus.com/sourceid/19381, https://journalchecker.com/journal/411405
186	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	Google scholar	NA
187	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	Google scholar	NA
188	Evaluation of In-vitro anthelmintic potential of various extracts of Emblica officinalis	Padmaja Kore, Rashmi Tantri, Anuradha More, Shweta Ghodke, Sheetal Chaudhari	Pharmacology	International Journal of Botany Studies	2021	2255-541X	Google scholar	NA
189	Biopolymers: A comprehensive review.	Mohini Chandrashekhar Upadhye, Mohini Chetan Kuchekar, Rohini	Pharmacognosy	Open Access Research Journal of	2022	2782-9960	Google scholar	NA

		Revansiddhappa Pujari and Nutan Uttam Sable		Science and Technology				
190	Exploration of anti-hyperglycemic potential of herbal mixture in streptozotocin- induced type-II diabetes in rats	DD Bandawane, PD Chaudhari, AR Juvekar	Pharmacology	International Journal of Pharmaceutical Sciences and Research	2021	0975-8232 2320-5148	Embase	NA
191	Exploration of anti-hyperglycemic potential of herbal mixture in streptozotocin- induced type-II diabetes in rats	DD Bandawane, PD Chaudhari, AR Juvekar	Pharmacology	International Journal of Pharmaceutical Sciences and Research	2021	0975-8232 2320-5148	Embase	NA
192	Systematic Development of Design of Expert Optimized Self Micro Emulsifying Drug Delivery System of Silymarin	Bhavesh Choudhary, Akshay Gaikwad, Vitthal Chopade	Pharmaceutical chemistry	Journal of the Maharaja Sayajirao University of Baroda	2021	0025-0422	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101000039
193	Comparative Study of Aragvadha Phalamajja (Cassia fistula Linn.) w.s.r. to its Sangrahana Vidhi.	Poonam Dilip Sable, Asmita Uday Jadhav, Apoorva Sangoram, Sable P N, Mohini Chetan Kuchekar .	Pharmacognosy	International Journal of Ayurvedic Medicine	2021	0976-5921	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-5921&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

194	Effect of Abelmoschus ficulneus (L.) Wight & Arn. on immunomodulation: in vivo experimental animal models	Neelam Dashputre, Deepti D Bandawane	pharmacology	Future Journal of Pharmaceutical Sciences	2021	2314-7253	UGC-CARE, Web of science, DOAJ, Embase	https://mjl.clarivate.com:/search-results?issn=2314-7245&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
195	A stability-indicating HPLC method for estimation of doxylamine succinate in tablets and characterization of its major alkaline stress degradation product	Minal T Harde, Sameer H Lakade	Pharmaceutical chemistry	Future Journal of Pharmaceutical Sciences	2021	2314-7253	UGC-CARE, Web of science, DOAJ, Embase	https://mjl.clarivate.com:/search-results?issn=2314-7245&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
196	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'-[(Z)-substituted –Phenyl ethylidene] Imidazole[1,2-A] Pyridene-3-Carbohydrazide Derivatives as DPP-IV inhibitors for the Treatment of Type 2 Diabetes Mellitus	Prerana Chavan, Shailaja Jadhav	pharmaceutical chemistry	Letters in Drug Design and Discovery	2021	ISSN (Print): 1570-1808 ISSN (Online): 1875-628X	Scopus, Web of Science	https://mjl.clarivate.com:/search-results?issn=1570-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
197	Formulation And Evaluation of Polyherbal Shampoo as Hair Care Product	Mohini C. Kuchekar*, Shraddha	Pharmacognosy	World journal of	2021	2277-7105	Google scholar	NA

		S. Makeshwar and Arti R. Dabhade		pharmaceutical research				
198	Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti-cancer agent	Bharti Fegade, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Drug Research	2022	0975-248X	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002202&flag=Search
199	A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of The H1N1 Influenza Target Protein	Dr.Pallavi M. Patil, Khade Shubham Ramchandra	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	**0975-6299**	Scopus (2016), Embase	NA
200	A Molecular Docking Study of Peramivir and Zanamivir as Potential Inhibitors of The H1N1 Influenza Target Protein	Dr.Pallavi M. Patil, Khade Shubham Ramchandra	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	**0975-6299**	Scopus(2016) , Embase	NA
201	A Computational Study of Molecular Docking for Antiviral Compounds Against Sars-Cov-2	Dr. Pallavi M. Patil, Khade Shubham*	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	0975-6299	Scopus(2016) , Embase	NA
202	A Computational Study of Molecular Docking for Antiviral Compounds Against Sars-Cov-2	Dr. Pallavi M. Patil, Khade Shubham*	Pharmaceutical chemistry	International Journal of Pharma and Bio Sciences	2022	0975-6299	Scopus , Embase	NA

203	Evaluation of In-vitro thrombolytic potential of hydroalcoholic extracts of Citrus Limon Leaves, Tagetes Erecta flower and Musa Paradasiaca Stem	Padmaja S. Kore, Shrushti Tiwari, Charmine Richardson	Pharmacology	Journal of Medical Pharmaceutical and Allied Sciences	2021	2320–7418	Scopus	https://www.scopus.com/sourceid/21101042009
204	Protective Effect of Flavonoid Rich Fraction of Sesbania grandiflora leaves against chemically induced Urolithiasis in vitro and in vivo	Dr. Sonali S. Nipte, Chaitali S. Waghmare	Pharmacology	International Journal of Pharmaceutical Sciences Review and Research	2022	0976 – 044X	Scopus (2016), Embase	NA
205	Evaluation of Anti-Urolithiatic Activity of Ethanolic Extract of Delonix Regia Leaves in Experimental Animal	Dr. Sonali S Nipate, Rjanigandha R Jori.	Pharmacology	International Journal of Pharmaceutical Sciences Review and Research	2022	0976-044X	Scopus (2016), Embase	NA
206	Design and characterization of punica granutum seed oil-loaded cream: assessment of in vitro antimicrobial potential	Atul phatak, shreshail ghurghure	Pharmaceutics	International journal of pharmaceutical sciences and drug research	2022	0975-248X	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002202&flag=Search
207	Design, synthesis, and biological evaluation of 3-chloro-2-oxo-N-(aryl carbamoyl)-2H-1-	P. K. Vawhal, S. B. Jadhav	Pharmaceutical chemistry	International Journal of Health Sciences	2022	E-ISSN 2550-696X	Scopus, DOAJ, PMC	https://www.scopus.com/sourceid/21101052764

	benzopyran-6-sulfonamide derivatives as potential DPP-IV inhibitors					P-ISSN 2550-6978		
208	Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches	Savita S. Deokar , Karimunnisa Sameer Shaikh, Pravin D. Chaudhari , Saakshi Shrikant Deokar	pharmacutics	Journal of medical pharmaceutical and allied sciences	2022	2320-7418	Scopus	https://www.scopus.com/sourceid/21101042009
209	Repurposing ciclopirox for treating multiple forms of cancer: New reports and approaches	Savita S. Deokar , Karimunnisa Sameer Shaikh, Pravin D. Chaudhari , Saakshi Shrikant Deokar	pharmacutics	Journal of medical pharmaceutical and allied sciences	2022	2320-7418	Scopus	https://www.scopus.com/sourceid/21101042009
210	Development and Validation of Stability-Indicating HPTLC Assay Method of Remogliflozin Etabonate in Bulk and Marketed Formulation	Sushant Ahire, Aishwarya Balap	pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Research	2022	0975-8232	Scopus, Embase	NA
211	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar ,	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	Web of Science	https://mjl.clarivate.com:/search-results?issn=2250-0480&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-

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212	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	Web of Science	https://mjl.clarivate.com:/search-results?issn=2250-0480&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
213	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	Web of Science	https://mjl.clarivate.com:/search-results?issn=2250-0480&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
214	Preparation and Characterization of Advanced Nano medicine for Malaria: Box Behnken Design Approach	Anuradha G. More, Parag R. Potbhare , Padmaja S. Kore , Praveen D. Chaudhari , Pratiksha U. Kshirsagar , Radhika R. Baheti and Surbhi C. Gupta	Pharmacuetics	International Journal of Life science and Pharma Research	2022	2250-0480	Web of Science	https://mjl.clarivate.com:/search-results?issn=2250-0480&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

215	Antidiabetic Potential of Ficus glomerata Roots with a Special Emphasis on Estimation of Bioactive Compounds by a Novel Validated HPTLC	Mohini Upadhye, Uday Deokate, Rohini Pujari, Mohini Phanse	Pharmacognosy	Indian Journal of Pharmaceutical Education and Research	2022	0019-5464	Web of Science, Scopus, SCIE, Embase	https://mjl.clarivate.com:/search-results?issn=0019-5464&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
216	Investigation of hypoglycemic, anticholesteremic, in vivo antioxidant and pancreatic beta cell protective effect of Tecoma gaudichaudi DC leaves in streptozotocin-induced diabetic rats	Kedar kalyani Abhimanyu, Chaudhari Sanjay Ravindra and Rao Srinivasa Avanapu	Pharmacognosy	Bulletin of Environment, Pharmacology and Life Sciences.	2022	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
217	Cytotoxic, antioxidant and phytochemical analysis of Tecoma gaudichi DC (Bignoniaceae)	K. A. Kedar, Sneha Nawale, S. R.Chaudhari, S. A. Rao	Pharmacognosy	Bulletin of Environment, Pharmacology and life sciences	2022	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
218	Formulation and characterization targets Etecta Nanosuspension with enhanced antihyperlipidemic potential	Kalyani kedar, Shena Nawale, Pooja Gowlikar, M. Ganga Raju	Pharmacognosy	Bulletin of Environment, Pharmacology and life sciences	2022	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

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219	Cytotoxic, antioxidant and phytochemical analysis of Ethyl acetate extract of Putranjiva roxburghii Wall	Kedar kalyani Abhimanyu, Chaudhari Sanjay Ravindra and Rao Srinivasa Avanapu	pharmacognosy	Advances in Bioresearch	2022	2277-1573	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
220	Risk Management of Uncontrolled Migraine Attacks	Punam Kela	Pharm .D	World Journal of Pharmacy and Pharmaceutical Sciences	2021	2278-4357	Google scholar	NA
221	Molecular Docking and in vitro studies of some new oxadiazole derivatives as antidiabetic agents	Salve T, Jadhav S	pharmaceutical chemistry	International Journal of Pharmaceutical Research	2021	0975-2366	Scopus (2021), Embase	https://www.scopus.com/sourceid/19700174645
222	Spray drying approach in preparation and characterization of solid Dispersion of Eprosartan Mesylate	Sachin Kothawade, Praveen Chaudhari	pharmaceutics	Journal of Medical Pharmaceutical and allied Sciences,	2021	2320–7418	Scopus	https://www.scopus.com/sourceid/21101042009

223	Hepato-protective activity of of gentisic acid on 5-fluorouracil- induced hepatotoxicity in wistar rats	Rohini Pujari Deepti Bandawane	pharmacology	Turk Journal of Pharmaceutical science ,	2021	2148-6247	Web of Science	https://mjl.clarivate.com:/search-results?issn=1304-530X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
224	Leaves of Stereospermum suaveolens DC exhibit anti inflammatory and anti arthritic potential action in experimental animals	R Chanshetti, D Bandawane	pharmacology	Journal of Pharmaceutical research International,	2021	2456-9119	Google scholar, PubMed	NA
225	Development of biodegradable porous starch form for improving oral delivery of a process Eprosartan Mesylate	Sachin Kothawade, Praveen Chaudhari	pharmaceutics	Journal of Advanced scientific research,	2021	0976-95	Google Scholar	NA
226	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted- Phenyl ethylidene] Imidazo [1, 2- a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus	Shailaja Jadhav	pharmaceutical chemistry	Bentham Science, Letters in Drug Design and Discovery,	2021	print 1570-1808 online 1875-628X	Scopus, Web of Science	https://www.scopus.com/sourceid/130038

227	L-carnitine ameliorates bile duct ligation induced liver Fibrosis by reducing the nitrosative stress in experimental animals: preclinical evidence	Vikram Nimbalkar Neeraj Vyawhare	pharmacology	Heliyon	2021	2405-8440	Scopus, Web of Science, PMC, SCIE, DOAJ	https://www.scopus.com/sourceid/21100411756
228	Synthesis characterization and biological evaluation of some novel substituted indole derivatives as potential antibacterial and antifungal Agents	Vawhal P, Jadhav S	pharmaceutical chemistry	Journal of Pharmaceutical Research International,	2021	2456-9119	Google Scholar, PubMed	NA
229	Synthesis, characterization, and antidiabetic evaluation of sulfonamide incorporated with 1,3,4-oxadiazole derivatives	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Education and Research	2021	0019-5464	Web of Science, Scopus, SCIE, Embase	https://mjl.clarivate.com:/search-results?issn=0019-5464&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
230	Exploring cytotoxic potential of ciclopirox on colorectal cancer cells by in silico methodology	Savita Dev kar karimunnisa Sheikh	pharmaceutics	Biointerface research in applied chemistry	2021	2069-5837	Scopus	https://www.scopus.com/sourceid/21100861792
231	Synthesis, characterization, and evaluation of in vitro antidiabetic activity of novel	Megha Salve, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of	2021	Print -2230-973X, Online - 2230-9713	UGC-CARE, Web of science, PMC	https://mjl.clarivate.com:/search-results?issn=2230-973X&hide_exact_match_fl=true&utm_source=mjl&utm_med

	pyrrolidine sulphonamide derivative			Pharmaceutical Investigation				ium=share-by-link&utm_campaign=search-results-share-this-journal
232	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	Frontiers in Molecular Neuroscience	2021	1662-5099	Scopus, Web of Science	https://www.scopus.com/sourceid/19700175113
233	Recognizing novel drugs against Keap1 in Alzheimer's disease using machine learning-grounded computational studies	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	Frontiers in Molecular Neuroscience	2021	1662-5099	Scopus, Web of Science	https://www.scopus.com/sourceid/19700175113
234	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	International Journal of Health Sciences	2022	1924-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
235	The anti-Alzheimer potential of some novel Tacrine-Coumarin Derivatives as a Cholinesterase inhibitor	Somdatta Chaudhari, Shailaja Jadhav	pharmaceutical chemistry	International Journal of Health Sciences	2022	1924-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764

236	Design, synthesis, and biological evaluation of 3-chloro-2-oxo-N-(aryl carbamoyl)-2H-1-benzopyran-6-sulfonamide derivatives as potential DPP-IV inhibitors	Pallavi Kishor Vawhal and Shailaja B. Jadhav	Pharmaceutical Chemistry	International Journal of Health Sciences	2022	2550-6978	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
237	Validated UV Visible spectrophotometric method for the estimation of sorafenib tosylate in bulk and nanoparticles	Sangeeta kale, Karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
238	Validated UV Visible spectrophotometric method for the estimation of sorafenib tosylate in bulk and nanoparticles	Sangeeta kale, Karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
239	Gradient rapid HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
240	Gradient rapid HPLC method development and validation for simultaneous estimation	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764

	of paclitaxal and Albendazole hole							
241	Gradient rapid HPLC method development and validation for simultaneous estimation of paclitaxal and Albendazole hole	Nikita Gaikwad, Praveen Choudhary, karimunnisa Shaikh	pharmaceutics	International Journal of Health Sciences	2022	2319-7064	Scopus (2021), PMC, DOAJ	https://www.scopus.com/sourceid/21101052764
242	Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques	Hemant Deokule, Smita pimple, Kiran Mahajan, Praveen Chaudhari	pharmaceutics	Research journal of Pharmaceutical and Technology	2022	0974-3618	Scopus	https://www.scopus.com/sourceid/21100197160
243	Fabrication and evaluation of solid self emulsifying drug delivery system of sodium by using adsorption to solid carrier techniques	Hemant Deokule, Smita pimple, Kiran Mahajan, Praveen Chaudhari	pharmaceutics	Research journal of Pharmaceutical and Technology	2022	0974-3618	Scopus	https://www.scopus.com/sourceid/21100197160
244	Investigation of Flavonoids in stereospermum suaveolens using HPLC analysis for inflammatory pain swelling and edema treatment	R Chanshetti, D Bandawane	pharmacology	Asian Pacific journal of Health Science	2022	2349-0659	Google Scholar	NA

245	Comparative studies on protective efficacy of gentisic acid and 2-pyrocatechuicacid against 5 fluorouracil induced toxicity in wistar rats	Rohini Pujari,Deepti Bandawane	pharmacology	Indian Journal of Experimental biology	2022	0975-1009	Scopus, Web of Science, SCIE, DOAJ	https://www.scopus.com/sourceid/15196
246	Design, molecular docking studies and ADMET prediction ofChalcones of Indole-benzenesulfonyl derivatives as Thioredoxin inhibitor for anticancer activity	Pallavi S.Bansod, Shailaja B. Jadhav	Pharmaceutical Chemistry	Journal of Computational Biophysics and Chemistry	2022	2737-4165	Web of Science, Scopus, SCIE	https://www.scopus.com/sourceid/21101052736
247	Detoxification of Gunja Seeds with Ex Vivo Study	Nikita Kale1 , Prakash Gulbhele2 , Vaibhav Gawade3*, Rahul Jagtap3 , Sudhir Khodade4	Pharmaceutical Chemistry	International Journal of Pharmaceutical Research & Allied Sciences	2022	2277-3657	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-3657&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

248	Synthesis, Characterization and Screening of Some Novel 2- Methyl-N'- [(Z)-Substituted- Phenyl ethylidene] Imidazo [1, 2- a] Pyridine-3-Carbohydrazide Derivatives as DPP-IV Inhibitors for the Treatment of Type 2 Diabetes Mellitus	Bharti Fegade, Shailaja Jadhav	pharmaceutical chemistry	Bentham Science, Letters in Drug Design and Discovery,	2021	print 1570-1808 online 1875-628X	Scopus, Web of Science	https://www.scopus.com/sourceid/130038
249	Design, synthesis and molecular docking study of N-heterocyclic chalcone derivatives as an anti-cancer agent	Bharti Fegade, Shailaja Jadhav	Pharmaceutical chemistry	International Journal of Pharmaceutical Sciences and Drug Research	2022	0975-248X	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002202&flag=Search
250	Extraction, Isolation, Characterization of Curcumin-I From Curcuminoids	Priyanka T. Kare, Sarika S. Malode, Kalyani S. Kakad, Khanderao R. Jadhav	Pharmacognosy	Journal of Polymer & Composites	2022	2321–2810	Web of Science	https://mjl.clarivate.com:/search-results?issn=2321-8525&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
251	Protective effect of Berberine in ameliorating diabetic complications in streptozotocin high fat diet model in experimental animals	Deepti Dinesh Bandawane*, Shruti Mooliya, ShailajaJadhav	pharmacology	International Journal of Pharmacy & Pharmaceutical Sciences	2020	Online-09751491 Print- 2656-0097	Scopus (2020)	https://www.scopus.com/sourceid/19700174810

252	Protective effect of Berberine in ameliorating diabetic complications in streptozotocin high fat diet model in experimental animals	Deepti Dinesh Bandawane*, Shruti Mooliya, ShailajaJadhav	pharmacology	International Journal of Pharmacy & Pharmaceutical Sciences	2020	Online-09751491 Print- 2656-0097	Scopus (2020)	https://www.scopus.com/sourceid/19700174810
253	Optimization and evaluation of self-nanoemulsifying drug delivery system for enhanced bioavailability of plumbagin	Kamble, P.R.; Shaikh, K.S	Pharmaceutics	Planta Medica	2021	: 0032-0943	Scopus, Web of Science, SCIE, Embase, Medline	https://mjl.clarivate.com:/search-results?issn=0032-0943&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
254	Development and Validation of a Stability-Indicating High-Performance Liquid Chromatographic Method for the Quantification of Methocarbamol and Its Impurities in Pharmaceutical Dosage Forms	Pallavi M. Patil	Pharmaceutical chemistry	Journal of Chromatographic Science	2021	0021-9665	Scopus, Web of science, Medline, PMC, SCIE	https://mjl.clarivate.com:/search-results?issn=0021-9665&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
255	Case report on Bullous Pemphigoid: A fatal skin condition	Punam kela, Ujwala Desai, Atharva Nandey	Pharm.D	Innovative journal of Medical and Health science	2020	2589-934	Google Scholar	NA

256	Case report on Bullous Pemphigoid: A fatal skin condition	Punam kela, Ujwala Desai, Atharva Nandey	Pharm.D	Innovative journal of Medical and Health science	2020	2589-934	Google Scholar	NA
257	Case Of Hiatus Hernia: An Aggravating Factor For Iron Deficiency Anemia	Divya Hagawane, Atharwa Nandey, Punam Kela	Pharm.D	Innovative Journal of Medical and Health Science	2020	2589-934	Google Scholar	NA
258	Evaluation of the Immunomodulatory activity of AbelmoschusManihot Linn In various experimental animal models	Neelam Dashputre*, Deepti D Bandawane	Pharmacology	International Journal of Research & Analytical Reviews	2020	2348-1269	Google Scholar	NA
259	Case of uncontrolled seizures due to poor medication adherence	Divya Hagawane, Atharva Nandey, Punam Kela	Pharm.D	Paripex Indian journal of research	2020	2250-1991	Google Scholar	NA
260	Analytical Method Development And Validation For Stability Indicating Hptlc Method For Assay Of Luliconazole In Bulk And Dosage Form	Amit Suryakant Tapkir	Pharmaceutical chemistry	Asian Journal of Pharmaceutical Analysis and Medicinal Chemistry	2020	2321-0923	Google Scholar	NA
261	Fetal termination in prenatally diagnosed ventricular septum defect,	Esha Patel, Gaurav Memane, Punam Kela	Pharm.D	world journal of pharmacy and	2021	2278-4357	Google Scholar	NA

	and hypoplastic left heart syndrom case			pharmaceutical sciences				
262	Analytical Method Development and Validation for Stability Indicating HPTLC Method for Assay of Stiripentol In Bulk and Dosage Form	Amit Suryakant Tapkir	Pharmaceutical chemistry	Journal of Applied Pharmaceutical Sciences and Research	2020	2581-5520	Google Scholar	NA
263	Formulation and invitro characterization of oseltamivir fast dissolving tablets using superdisintergrants	A. A. Phatak, S. M. Ghurghure, R. Y. Patil, S. Yanjane	Pharmaceutics	Inventi Impact Pharm tech	2020	0976-7576 2219-4139	Google Scholar	NA
264	A Review On Recent Advancement In Hyphenated Techniques For The Analysis Of Secondary Metabolites	Amit Suryakant Tapkir	Pharmaceutical chemistry	Indian Research Journal of Pharmacy and Science	2020	2248-9118.	Google Scholar	NA
265	Formulation and Optimization of Self Emulsifying Drug Delivery System For Effective Anthelmintic Therapy	Kiran C. Mahajan, Smita S. Pimple, Hemant S. Deokule	Pharmaceutics	Research Journal of Pharmacy and Technology	2021	0974-360X (Online) 0974-3618 (Print)	Scopus, Embase	https://www.scopus.com/sourceid/21100197160

266	Formulation, Development and Evaluation of Solid Self Emulsifying Drug Delivery System (S-SEDDS) For Pediatric Patients	Smita S. Pimple, Kiran Mahajan, Hemant Deokule	Pharmaceutics	International Journal of Pharmaceutical Research	2021	0975-2366	Scopus (2021),Embase	NA
267	Application of Green Silver Nanoparticles Synthesized using Leaf Extract of Tridax procumbens for Preparation of Clinical Antimicrobial Bandages	Vitthal Chopade*, Diksha Kamble	Pharmaceutical chemistry	Int. J. Pharm. Investigation	2021	2230-9713	Web of Science, UGC-CARE, PMC	https://mjl.clarivate.com:/search-results?issn=2230-973X&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
268	Fabrication And Evaluation of Self-Emulsifying Drug Delivery System (SEDDS) of Aniretroviral Drug For Treatment of HIV.	Hemant A.Deokule, Smita S.Pimple, Kiran C.Mahajan, Pravin Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	Embase	NA
269	Fabrication And Evaluation of Self-Emulsifying Drug Delivery System (SEDDS) of Aniretroviral Drug For Treatment of HIV.	Hemant A.Deokule, Smita S.Pimple, Kiran C.Mahajan, Pravin Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Research	2020	0975-2366	Embase	NA
270	Systematic Development of Design of Expert Optimized Self_Micro Emulsifying	Bhavesh Choudhary*Akshay Gaikwadand Vitthal Chopade	Pharmaceutical chemistry	Journal of the Maharaja Sayajirao	2021	0025-0422	UGC-CARE	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101000039

	Drug Delivery System of Silymarin			University of Baroda				
271	Isatin hybrids and their pharmacological investigations	S. B. Jadhav, B. Varpe, A. Kulkarni, A. Mali, S Y Jadhav	Pharmaceutical chemistry	Mini Reviews in Medicinal Chemistry	2021	ISSN (Print): 1389-5575 ISSN (Online): 1875-5607	Web of Science, Scopus, SCIE, Embase, Medline	https://mjl.clarivate.com:/search-results?issn=1389-5575&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
272	Evaluation of In-Vitro Anthelmintic Potential of Umbelliferone Against Pheretima Posthuma	Dr. Padmajaj S. Kore, Ms. Roshani Bhole, Mr. Vaibhav Gaikwad	Pharmacology	International Journal of Pharmaceutical Sciences and Research	2021	2320-5148	Scopus, Embase	https://mjl.clarivate.com:/search-results?issn=2277-3657&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
273	Development and evaluation of Cinnarizine loaded nanosponges: pharmacodynamic and pharmacokinetic study on wistar rats	Madhuri Dinde, Upendra Galgatte, Firdous Shaikh	Pharmaceutics	International Journal of Pharmaceutical Sciences Review and Research	2021	0976-044X.	Scopus (2016), Embase	NA
274	An effort to augment solubility and efficiency of the oral bosentan-buccoadhesive drug delivery	Prakash N.Kendre, PravinD.Chaudhari, Shirish P.Jain, Somnath K.Vibhute	Pharmaceutics	Polymer Bulletin	2020	0170-0839 (print); 1436-2449 (web)	Web of Science, Scopus, SCIE	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

	system using graft co-polymer as the carrier							link&utm_campaign=search-results-share-this-journal
275	Validated inherent stability-indicating HPLC-DAD method for simultaneous determination of Pamabrom and Paracetamol in marketed formulation	Minal T.Harde,Sameer H.Lakade,Aniket R.Mekhe,Sneha R.Shinde,Pragati D.More,Snehal S.Shirude	Pharmaceutical chemistry	Advances in Bioresearch	2020	E-ISSN : 2277-1573 P-ISSN : 0976-4585	Web of Science	https://mjl.clarivate.com:/search-results?issn=0976-4585&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
276	Design and Development of Novel Controlled-Release Azilsartan Medoxomil Loaded Provesicular Powder	Pande v.Vishal,Sameer H.Lakade,Ghule D.Niteen,PoteK.Ajinkya,Minal T.Harde,Jalinder R.Bhutekar	Pharmaceutical chemistry	Bulletin of Environment, Pharmacology and ife Science	2020	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
277	Prepartion and Evaluation of Sustained Release Herbal Matrix Tablet	Rohini Pujari,Mohini Upadhay,Mohini Kuchekar,Neha Nemlekar	Pharmacognosy	Current Trends in Pharmacy and	2021	2582-5062	Google Scholar	https://www.ctppc.org/about-us

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278	An influence of lyophilization on Praziquantel loaded nanosponge by using food protein as a stabillizer with effect of statistical optimization.	Om Bagade, Shashikant N, P.D. Chaudhari	Pharmaceutics	Research Journal of Pharmacy and Technology	2020	0974-360X	Scopus, Embase	https://www.scopus.com/sourceid/21100197160
279	A corollary of nanoporous carrier drug delivery system an updated prospective	Om Bagade, Shashikant N, P.D. Chaudhari	Pharmaceutics	International journal of pharmaceutical sciences and nanotechnology	2020	0974-3278	UGC-CARE, Scopus	https://www.scopus.com/sourceid/21101050125
280	Anti inflammatory potential effect of flavonoid rich ethyl acetate fraction of methanolic extrcat of Stereospurmum sasuaveolens DC (Bignoniaceae)leaves in experimental animals	Chanshetty Rahul, Bandawane Deepti	Pharmacology	Biomedical and Pharmacology Journal	2020	2456-2610	Scopus, Embase	https://www.scopus.com/sourceid/19700174924

281	Evaluation of the Immunomodulatory activity of AbelmoschusManihot Linn In various experimental animal models	Neelam Dashputre*, Deepti D Bandawane	Pharmacology	International Journal of Research & Analytical Reviews	2020	E-ISSN 2348-1269, P- ISSN 2349-5138	Google Scholar	NA
282	Evaluation of prescription errors and polypharmacy practices in rural area at community pharmacy	Narendra B. Parihar	Pharm.D	International Journal of Basic & Clinical Pharmacology	2021	Print 2319-2003 Online 2279-0780	Google Scholar	NA
283	Ultraviolet-Spectrophotometric Method for Simultaneous Estimation Of Dapagliflozin Propanediol And Metformin Hydrochloride	MinalHarde*, Sameer Lakade Valmik Gite , Vitthal Chopade , Anuja Khomne	Pharmaceutical chemistry	International Research Journal of Pharmacy	2019	2230 – 8407	Embase	NA
284	Ultraviolet-Spectrophotometric Method for Simultaneous Estimation Of Dapagliflozin Propanediol And Metformin Hydrochloride	MinalHarde*, Sameer Lakade Valmik Gite , Vitthal Chopade , Anuja Khomne	Pharmaceutical chemistry	International Research Journal of Pharmacy	2019	2230 – 8407	Embase	NA
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287	Effect of Surfactants and Co-surfactants on Phase Behaviour and Physicochemical Properties of Self-nano emulsifying Drug Delivery System Loaded with Plumbagin	Kamble Pavan Ram, Shaikh Karimunnisa Sameer	Pharmaceutics	Indo Global Journal of Pharmaceutical Sciences	2019	2249-1023	UGC-CARE, Embase	NA
288	Preliminary evalution of ayurvedic preprations of taila 's and churna's.	Kuchekar Mohini, Upadhye Mohini, Dherenge Kanchan.	Pharmacognosy	Journal of Pharmaceutical and Biological Sciences	2019	2320-1924	Crossref, Crossmark	NA
289	Exploration of protective effect of hydroalcoholic extract of Alstonia scholaris bark in STZ-induced early diabetic nephropathy model in rats	Bandawane D.D., Jadhav S.B., Juvekar A.R.	Pharmacology	Indian Drugs	2019	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375
290	Exploration of protective effect of hydroalcoholic extract of Alstonia scholaris bark in STZ-induced early	Bandawane D.D., Jadhav S.B., Juvekar A.R.	Pharmacology	Indian Drugs	2019	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375

	diabetic nephropathy model in rats							
291	Protective effect of 2-Pyrocatechuic acid on 5-Fluorouracil induced cardiotoxicity in wistar rats	Rohini R. Pujari, Deepti D Bandawane	Pharmacology	Latin American Journal of Pharmacy	2019	ISSN 0326 2383 (printed ed.) ISSN 2362-3853 (on line ed.)	Web of Science, Scopus, SCIE, Embase	https://www.scopus.com/sourceid/19381
292	Therapeutic potential of ethyl acetate fraction of Tephrosia purpurea Linn. leaves in a rat model of gout	Sonali S. Nipate, Pramila S. Yelmar	Pharmacology	Journal of Integrative Medicine	2019	2095-4964.	Scopus, Embase, Medline, SCIE	https://www.scopus.com/sourceid/21100258397
293	Assessment of antidiabetic potential of Musa acuminata peel extract and its fractions in experimental animals and characterisation of its bioactive compounds by HPTLC.	Navghare Vijay, Dhawale Shashikant and Phanse Mohini..	pharmacognosy	Archives of Physiology And Biochemistry	2020	1381-3455	Web of Science, Scopus, Medline, SCIE	https://www.scopus.com/sourceid/23333
294	Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach	Atul Phatak,* Dhanashri Joshi, Mahesh Bhadgale, Pravin Chaudhari	pharmaceutics	IJPER Indian Journal of Pharmaceutical Education and Research	2020	0019-5464	Web of Science, Scopus, Embase, SCIE	https://mjl.clarivate.com:/search-results?issn=0019-5464&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-

								link&utm_campaign=search-results-share-this-journal
295	Development and Optimization of Naproxen Sodium Controlled Release Tablets: QbD Approach	Atul Phatak,* Dhanashri Joshi, Mahesh Bhadgale, Pravin Chaudhari	pharmaceutics	IJPER Indian Journal of Pharmaceutical Education and Research	2020	0019-5464	Web of Science, Scopus, Embase, SCIE	https://mjl.clarivate.com:/search-results?issn=0019-5464&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
296	Synthesis, evaluation and molecular docking of sulphonamide/isothiocyanate linked quinazolinone derivatives as antidiabetic activity.	Pournima A Bhalekar, Shailaja B Jadhav	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	Google Scholar	NA
297	Pharmacognostic Investigations of Colocasia Esculenta Leaves.	Bhushan Pimple, Amrita Kulkarni, Ruchita Bhor, Shankarrao Atkalikar	Pharmacognosy	Current Trends in Pharmacy and Pharmaceutical Chemistry	2019	2582-5062	Google Scholar	NA
298	Pharmacognostic Investigations of Colocasia Esculenta Leaves.	Bhushan Pimple, Amrita Kulkarni, Ruchita Bhor, Shankarrao Atkalikar	Pharmacognosy	Current Trends in Pharmacy and	2019	2582-5062	Google Scholar	NA

				Pharmaceutical Chemistry				
299	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	Google Scholar	NA
300	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	Google Scholar	NA
301	Synthesis, molecular docking and antidiabetic activity of some sulphonamide bearing quinazolinone moieties.	Shweta S gaikwad, Shailaja B Jadhav, Deepti D Bandawane	pharmaceutical chemistry	European Journal of Pharmaceutical and Medical Research	2020	2394-3211	Google Scholar	NA
302	Anti-inflammatory, antinociceptive and antiarthritic potential of apis cerana indica bee venom by reducing pain and degeneration of articular cartilage in adjuvant and collagen induced rat models of arthritis	Sonali S Nipate; AA Bhandarkar	pharmacology	Journal of Orthopedics and Muscular System	2020	2640-4389	Google Scholar	NA

303	A review on recent advancement in hyphenated techniques for the analysis of secondary metabolites	Nikhil K. Gabhale, Amit S. Tapkir	pharmaceutical chemistry	Indian Research Journal of Pharmacy and Science	2020	ISSN 2349-5332	Google Scholar	NA
304	Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide(HTAB)as template : simplified sol-gel approach	Minal Harde, Sameer Lakade, Varsha Chattichalwadi, Pravin S.Uttekar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344 ISSN Print 1751-8741	Google Scholar	NA
305	Facile synthesis of mesoporous alumina using hexadecyltrimethylammonium bromide(HTAB)as template : simplified sol-gel approach	Minal Harde, Sameer Lakade, Varsha Chattichalwadi, Pravin S.Uttekar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344 ISSN Print 1751-8741	Google Scholar	NA
306	Facile synthesis of Multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin	Pravin S. Uttekar, Minal T..Harde, Sameer H. Lakade, Vijay K.Beldar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344.Print 1751-8741	Google Scholar	NA
307	Facile synthesis of Multi-walled carbon nanotube via folic acid grafted nanoparticle for precise delivery of doxorubicin	Pravin S. Uttekar, Minal T..Harde, Sameer H. Lakade, Vijay K.Beldar	Pharmaceutical chemistry	IET Journals, The Institution of Engineering & Technology	2019	1350-2344.Print 1751-8741	Google Scholar	NA

308	Synthesis of mesoporous alumina: an impact of surface chemistry on release behavior	Sameer H. Lakade, Minal T. Harde, Prashant K. Deshmukh.	Pharmaceutical chemistry	Taylor & Francis group. Particulate science & Technology.	2019	1548-0046	Compendex	NA
309	Surface Engineered New Approach for Mesoporous Alumina and Nanoparticles-A Review.	Sameer H..Lakade, Minal T.Harde, Aniket R. Mehke, Ajay A.Joshi, Snehal R.Shinde	pharmaceutical chemistry	Bulletin of Environment, Pharmacology and Life Sciences	2020	2277-1808	Web of Science	https://mjl.clarivate.com:/search-results?issn=2277-1808&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
310	A systematic review of analytical profiles of SGLT-2 inhibitors and there combination for the treatment of type 2 DM	Thakor N, Amrutkar S	Pharmaceutics	Current Pharmaceutical Analysis	2019	1573-4129	Scopus, Web of Science, Embase, SCIE	https://mjl.clarivate.com:/search-results?issn=1573-4129&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal
311	Simultaneius estimatio of Empagliflozin and Metformin by HPTLC using quality by design approach	Thakor N, Amrutkar S, P.D.Chaudhari	Pharmaceutics	Journal of planar chromatography	2019	0933-4173 (Print) 1789-0993 (online)	Web of Science, Scopus, Embase, SCIE	https://mjl.clarivate.com:/search-results?issn=0933-4173&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-link&utm_campaign=search-results-share-this-journal

312	Taste masking by hot melt extrusion without loss of bioavailability for prdiatrics	Dhananjay M, Praveen C, Smita More	Pharmaceutics	International Journal of Pharmacy And Pharmaceutical Sciences	2019	0975-1491	Embase	NA
313	Naphthyridine derivative and their anti-mycobacterium activity	Amol Kulkarni, Bhushan Varpe, Maruti Pise, Shailaja Jadhav	pharmaceutical chemistry	Current trands in pharmacy and pharmaceutical chemistry	2019	2582-5062	Google Scholar	NA
314	Ameliorative effects of Gentisic acid on carboplatin induced hematological toxicities in Wistar Rats	Rohini R. Pujari, Deepti D Bandawane	pharmacology	international journal of Pharm Tecch Research	2019	0974-4304	NA	NA
315	Development and Evaluation of a Novel Drug Delivery System for Albendazole	Shaikh Karimunnisa, Pandhe puja, Kale Sangita, Bothiraja Chellampillai	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2018	0019-5464;	Scopus, Web of Science	https://www.scopus.com/sourceid/19200156909
316	Development and Evaluation of a Novel Drug Delivery System for Albendazole	Shaikh Karimunnisa, Pandhe puja, Kale Sangita, Bothiraja Chellampillai	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2018	0019-5464;	Scopus, Web of Science	https://www.scopus.com/sourceid/19200156909

317	Two New Degradation Product of Terizidone : an Application of Forced Degradation Study and Hyphenated Chromatographic Techniques	Pallavi M Patil and Ahmed Alalaiwe	Pharmaceutical chemistry	Int J Pharma Bio Science	2018	0975-6299	Scopus (2016), Embase	https://www.scopus.com/sourceid/20600195619,
318	Dataset on analysis of dyeing property of natural dye from Thespesiapopulnea bark on different fabrics	Kuchekar Mohini, Landge Tejashree, Navghare Vijay	Pharmacognosy	Data in Brief	2018	2352-3409	Scopus, Web of Science, PMC, DOAJ	https://www.scopus.com/sourceid/21100372856
319	Overcoming poor solubility of dimenhydrinate :Development , optimization and evaluation of fast dissolving oral film	Yuvraj Govindrao Jadhav , Upendra Chandrakant Galgatte* , Pravin Digamber Chaudhari	Pharmaceutics	Advanced Pharmaceutical Bulletin	2018	2251-7308,	Web of science, Scopus, PMC, DOAJ, Embase	https://www.scopus.com/sourceid/21100232413
320	Overcoming poor solubility of dimenhydrinate :Development , optimization and evaluation of fast dissolving oral film	Yuvraj Govindrao Jadhav , Upendra Chandrakant Galgatte* , Pravin Digamber Chaudhari	Pharmaceutics	Advanced Pharmaceutical Bulletin	2018	2251-7308,	Web of science, Scopus, PMC, DOAJ, Embase	https://www.scopus.com/sourceid/21100232413
321	Development of metoclopramide hydrochloride in situ gel: Nasal delivery and	Upendra C Galgatte*, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	Google Scholar	NA

	pharmacokinetics in New Zealand rabbits.							
322	Development of metoclopramide hydrochloride in situ gel: Nasal delivery and pharmacokinetics in New Zealand rabbits.	Upendra C Galgatte*, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	Google Scholar	NA
323	Development of frovatriptan succinate microemultion for nasal delivery: optimization, in-vitro and in-vivo evaluation	Upendra C Galgatte *, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	Google Scholar	NA
324	Development of frovatriptan succinate microemultion for nasal delivery: optimization, in-vitro and in-vivo evaluation	Upendra C Galgatte *, Pravin D Chaudhari	Pharmaceutics	Asia journal of Pharmaceutical and Clinical Rasearch	2019	Online - 2455-3891 Print - 0974-2441	Google Scholar	NA
325	Design , Development and characterization of self Micro Emulsifying Drug delivery system for Aceclofenac	Mukesh P. Ratnaparkhi*, Pravin D Chaudhari	Pharmaceutics	International Journal of Pharmaceutical Science And Research	2019	ISSN (Online): 0975-8232, ISSN (Print): 2320-5148	Google Scholar, EMBASE	NA

326	RP-HPLC Forced Degradation study of Alfuzosin and Dutasteride	P. D. Satpute , S. B. Jadhav* , M. P. Rathod , P. S. Naykodi	Pharmaceutical chemistry	Pharmaceutical Resonance	2018	2581-6136	Google Scholar	NA
327	Biomarker Quantification: Development of fit for Purpose LC-MS/MS Method for Determination of Methyl Guanidine in Mice Urine	Tapkir Amit Suryakant, Mithbavkar Jay Rajaram , Gaur Ashwani, Chaudhari Pravin	Pharmaceutical chemistry	International Journal of Pharmaceutical Education and Research	2018	0019-5464	Scopus, Web of science	https://www.scopus.com/sourceid/19200156909
328	Biomarker Quantification: Development of fit for Purpose LC-MS/MS Method for Determination of Methyl Guanidine in Mice Urine	Tapkir Amit Suryakant, Mithbavkar Jay Rajaram , Gaur Ashwani, Chaudhari Pravin	Pharmaceutical chemistry	International Journal of Pharmaceutical Education and Research	2018	0019-5464	Scopus, Web of science	https://www.scopus.com/sourceid/19200156909
329	Formulation and Evaluation of Nitrofurantoin Bilayer Tablet	Kirti D. Tirkhunde* and Atul A. Phatak	Pharmaceutics	World Journal of Pharmaceutical Research	2018	2277-7105	Google Scholar	NA
330	Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding	Atul A Phatak*, Apurva R Bodakhe, And Pravin D Chaudhari.	Pharmaceutics	Research Journal Of Pharmaceutical, Biological And	2018	0975-8585	Embase	NA

	Capacity Of ColesevelamHcl.			Chemical Sciences				
331	Evaluation Of Effect Of Nanoparticulate Clay On Cholesterol Binding Capacity Of ColesevelamHcl.	Atul A Phatak*, Apurva R Bodakhe, And Pravin D Chaudhari.	Pharmaceutics	Research Journal Of Pharmaceutical, Biological And Chemical Sciences	2018	0975-8585	Embase	NA
332	Intercalation of Itraconazole into Montmorillonite: Effect on Release of Drug	Atul A. Phatak,*, Pratik Rahane	Pharmaceutics	World Journal Of Pharmaceutical And Medical Research	2018	2455-3301	Google Scholar	NA
333	Evaluation of invitro anthelmintic potential of quercetin against pheretimaposthuma	Padmaja S. Kore, Amarjeet Virk, Arti Peste	Pharmacology	International Journal of Pharmaceutical Science And Research	2018	ISSN (online): 0975-8232, ISSN (print):2320-5148	Google Scholar, EMBASE	NA
334	Data on Investigation of hypoglycemic , anti-cholesteremic , in vivo antioxidant and pancreatic beta cell protective effect of putranjivaroxburghii Wall Bark in streptozotocin-induced diabetic rats	Kedar Kalyani, Chaudhari sanjay R. , Rao Srinivasa Avanapu	pharmacognosy	Data in Brief	2018	2352-3409	Scopus, Web of Science, PMC, DOAJ	https://www.scopus.com/sourceid/21100372856

335	Assessment of Cancer Targeting Potential of Doxorubicin conjugated with surface functionalized multi-walled Carbon Nanotubes	Beldar V. K., Uttekar P.S., Patil A.R. and Sable P.N.	Pharmaceutics	Indian Drugs	2018	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375
336	Assessment of Cancer Targeting Potential of Doxorubicin conjugated with surface functionalized multi-walled Carbon Nanotubes	Beldar V. K., Uttekar P.S., Patil A.R. and Sable P.N.	Pharmaceutics	Indian Drugs	2018	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375
337	Formulation and Evaluation of Niosomal in situ Gel of Prednisolone sodium phosphate for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	International Journal of applied Pharmaceutics	2019	0975-7058	Scopus, Embase	https://www.scopus.com/sourceid/19900192174
338	Formulation and Evaluation of Niosomal in situ Gel of Prednisolone sodium phosphate for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	International Journal of applied Pharmaceutics	2019	0975-7058	Scopus, Embase	https://www.scopus.com/sourceid/19900192174
339	Synthesis and Evalution of Water insoluable but SwellableBioadhesive	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	Indian Journal of Pharmaceutical	2019	0019-5464	Web of Science, Scopus, Embase, SCIE	https://www.scopus.com/sourceid/19200156909

	Polymer for Ocular Drug Delivery			Education and Research				
340	Synthesis and Evalution of Water insoluable but SwellableBioadhesive Polymer for Ocular Drug Delivery	Pravin D Chaudhari, Ujwala S. Desai	Pharmaceutics	Indian Journal of Pharmaceutical Education and Research	2019	0019-5464	Web of Science, Scopus, Embase, SCIE	https://www.scopus.com/sourceid/19200156909
341	Designing a platform Technology for age Appropriate Pediatric Dosage Form	More D.M., Chaudhari P.D. and More S. D	Pharmaceutics	Indian Drugs	2019	0019-462X	Scopus, Embase	https://www.scopus.com/sourceid/22375