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Accredited with Grade B++ by NAAC

Institute Code: DTE 4265 & RTMNU 265



## Key Indicator 3.3- Research Publication

**METRIC NO.:-3.3.1.**

*Number of papers published per teacher in the Journals notified on UGC website during the last five years*

**CALENDER YEAR 2019**

# Journals Papers

*Priyadarshini J. l. College of Pharmacy, Nagpur, Maharashtra, India  
Certified Document from page No.1 to20*

| <b>Sr. No.</b> | <b>Title of paper</b>  | <b>Name of the author/s</b> | <b>Department of the teacher</b> | <b>Name of journal</b>                                     | <b>Year of publication</b> |
|----------------|--|-----------------------------|----------------------------------|--|----------------------------|
| 1.             | Development of novel process for synthesis of 2-phenyl-4h-3,1-benzoxazin-4-one through microwave synthesizer.              | Mr. Pratyush Kumar          | Pharmaceutical Chemistry         | European Journal of Biomedical and Pharmaceutical sciences | <b>2019</b>                |
| 2.             | Development of novel process for synthesis of 2-phenyl-4h-3,1-benzoxazin-4-one through microwave synthesizer.              | Dr. Mrs. A. J. Asnani       | Pharmaceutical Chemistry         | European Journal of Biomedical and Pharmaceutical sciences | <b>2019</b>                |
| 3.             | Development of novel process for synthesis of 2-phenyl-4h-3,1-benzoxazin-4-one through microwave synthesizer.              | Dr. D. R. Chaple            | Pharmaceutical Chemistry         | European Journal of Biomedical and Pharmaceutical sciences | <b>2019</b>                |
| 4.             | Development and Validation of UV Spectrophotometric Method for Estimation Ibandronate sodium in Pharmaceutical Formulation | Dr. D. R. Chaple            | Pharmaceutical Chemistry         | Journal of Drug Delivery & Therapeutics.                   | <b>2019</b>                |
| 5.             | Development and Validation of UV Spectrophotometric Method for Estimation Ibandronate sodium in Pharmaceutical Formulation | Dr. Mrs. A. J. Asnani       | Pharmaceutical Chemistry         | Journal of Drug Delivery & Therapeutics.                   | <b>2019</b>                |
| 6.             | Development and Validation of UV Spectrophotometric Method for Estimation Ibandronate sodium in Pharmaceutical Formulation | Mr. Pratyush Kumar          | Pharmaceutical Chemistry         | Journal of Drug Delivery & Therapeutics.                   | <b>2019</b>                |
| 7.             | Docking of 3,5-diphenyl-pyrazole with monoamine oxidase A receptor and In-silico structural property calculation           | Dr. Mrs. A. J. Asnani       | Pharmaceutical Chemistry         | Journal of drug delivery and Therapeutics,                 | <b>2019</b>                |

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|-----|---|-----------------------|--------------------------|---|-------------|
| 8.  | Docking of 3,5-diphenyl-pyrazole with monoamine oxidase A receptor and In-silico structural property calculation          | Mr. Pratyush Kumar    | Pharmaceutical Chemistry | Journal of drug delivery and Therapeutics               | <b>2019</b> |
| 9.  | Preventive effects of soy lecithin in combination with flavonoids on STZ induced Diabetes Mellitus in rats.               | Dr. V. D. Gulkari     | Pharmacognosy            | Asian Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 10. | Formulation and Physicochemical Evaluations of Polyherbal Ghrita  | Dr. V. D. Gulkari     | Pharmacognosy            | World Journal of Pharmaceutical Research                | <b>2019</b> |
| 11. | Formulation and Physicochemical Evaluations of Polyherbal Ghrita  | Dr. D. P. Kawade      | Pharmachemistry          | World Journal of Pharmaceutical Research                | <b>2019</b> |
| 12. | Pharmacological assessments of polyphenolic extract of Cymbopogon citratus leaves in rodent model of parkinson's disease, | Dr. D. R. Chaple      | Pharmaceutical Chemistry | Journal of Drug Delivery & Therapeutics                 | <b>2019</b> |
| 13. | Pharmacological assessments of polyphenolic extract of Cymbopogon citratus leaves in rodent model of parkinson's disease, | Mrs. S. V. Mangrulkar | Pharmacology             | Journal of Drug Delivery & Therapeutics                 | <b>2019</b> |
| 14. | Degradation Studies of Cefuroxime Tablet By Using spectrophotometric Techniques   | Dr. D. P. Kawade      | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                | <b>2019</b> |
| 15. | Degradation Studies of Cefuroxime Tablet By Using spectrophotometric Techniques   | Dr. D. R. Chaple      | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                | <b>2019</b> |
| 16. | Applications of Nasal NSAIDS in Alzheimer's Disease   | Dr. D. P. Kawade      | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                | <b>2019</b> |
| 17. | Estimation of Antidiabetic Drugs By High Performance Liquid Chromatography Method in                                      | Dr. D. P. Kawade      | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                | <b>2019</b> |

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| 18. | Optimization of Quinoline Synthesis By Quality by Design  | Dr. Mrs. M. P. Yeole | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 19. | Optimization of Quinoline Synthesis By Quality by Design  | Mr. Pratyush Kumar   | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 20. | Optimization of Quinoline Synthesis By Quality by Design  | Ms. M. A. Bhongade   | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 21. | Formulation, Development, Evaluation and Optimization of Herbal antibacterial Mouthwash.                | Dr. R. H. Kasliwal   | Pharmaceutics            | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 22. | Formulation, Development, Evaluation and Optimization of Herbal antibacterial Mouthwash.                | Mr. Y. N. Gholse     | Pharmaceutics            | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 23. | Formulation, Development, Evaluation and Optimization of Herbal antibacterial Mouthwash.                | Dr. D.R. Chaple      | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 24. | Evaluation and Comparison of Disinfectant activity of some commercial brands by using Standard methods. | Dr. R. H. Kasliwal   | Pharmaceutics            | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 25. | Evaluation and Comparison of Disinfectant activity of some commercial brands by using Standard methods. | Mr. Y. N. Gholse     | Pharmaceutics            | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 26. | Evaluation and Comparison of Disinfectant activity of some commercial brands by using Standard methods. | Dr. D. R. Chaple     | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                   | <b>2019</b> |

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| 27. | Hospital waste management: a review   | Mr. A. R. Thakre      | Pharmaceutics            | Journal of medical pharmaceutical and allied sciences      | <b>2019</b> |
| 28. | Hospital waste management: a review   | Mr. S. K. Shah        | Pharmaceutical Chemistry | Journal of medical pharmaceutical and allied sciences      | <b>2019</b> |
| 29. | Hospital waste management: a review   | Dr. D. R. Chaple      | Pharmaceutical Chemistry | Journal of medical pharmaceutical and allied sciences      | <b>2019</b> |
| 30. | Guazuma ulmifolia Lam.: A review for future view.   | Mrs.S. G. Gurunani    | Pharmacognosy            | Journal of Medicinal Plants Studies                        | <b>2019</b> |
| 31. | Development and validation of UV-spectrophotometric method for estimationof Metformin HCL and Repaglinide in pharmaceutical formulation | Mr. Pratyush Kumar    | Pharmaceutical chemistry | Journal of Drug Delivery and Therapeutics                  | <b>2019</b> |
| 32. | Development and validation of UV-spectrophotometric method for estimationof Metformin HCL and Repaglinide in pharmaceutical formulation | Dr. Mrs. A. J. Asnani | Pharmaceutical chemistry | Journal of Drug Delivery and Therapeutics                  | <b>2019</b> |
| 33. | Green Synthesis of some Quinoline Derivatives : a Review,   | Dr. Mrs. M. P. Yeole  | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 34. | Green Synthesis of some Quinoline Derivatives : a Review,   | Ms. M. A. Bhongade    | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 35. | Understanding Status of PCOS in Nagpur City   | Mr. P. N. Amale       | Pharmacology             | Indian Journal of Pharmacy and Pharmacology                | <b>2019</b> |

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| 36. | Understanding Status of PCOS in Nagpur City  | Dr. Mrs. S. A. Deshpande | Pharmacology             | Indian Journal of Pharmacy and Pharmacology                | <b>2019</b> |
| 37. | Introduction to Amyloidosis  | Ms. M. A. Bhongade       | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 38. | Introduction to Amyloidosis  | Dr. M. P. Yeole          | Pharmaceutical Chemistry | World Journal of Pharmaceutical Research                   | <b>2019</b> |
| 39. | Quality by Design (QbD): An Emerging Trend in Improving Quality & Development of Pharmaceuticals             | Dr. D. R. Chaple         | Pharmaceutical Chemistry | Saudi Journal of Medical and Pharmaceutical Sciences       | <b>2019</b> |
| 40. | Quality by Design (QbD): An Emerging Trend in Improving Quality & Development of Pharmaceuticals             | Dr. Mrs. A. J. Asnani    | Pharmaceutical Chemistry | Saudi Journal of Medical and Pharmaceutical Sciences       | <b>2019</b> |
| 41. | Development of Novel Process for synthesis of 2-phenyl-4H-3,1-benzoxazin-4-one through microwave synthesizer | Dr. Mrs. A. J. Asnani    | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 42. | Development of Novel Process for synthesis of 2-phenyl-4H-3,1-benzoxazin-4-one through microwave synthesizer | Mr. Pratyush Kumar       | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |
| 43. | Development of Novel Process for synthesis of 2-phenyl-4H-3,1-benzoxazin-4-one through microwave synthesizer | Dr. D.R. Chaple          | Pharmaceutical Chemistry | European Journal of Biomedical and Pharmaceutical Sciences | <b>2019</b> |



**DEVELOPMENT OF NOVEL PROCESS FOR SYNTHESIS OF 2-PHENYL-4H-3,1-BENZOXAZIN-4-ONE THROUGH MICROWAVE SYNTHESIZER**

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Article Received on 26/12/2018

Article Revised on 17/01/2019

Article Accepted on 08/02/2019

**ABSTRACT**

The microwave assisted synthesis approaches comply to all 12 principles of green chemistry. The enhanced penetration power of microwaves are supposed to be the main troubleshooter in field of synthetic chemistry. The Quality by Design (QbD) approach has been used by several formulation chemist but we implemented this approach in synthetic chemistry. The novel proposed method was firstly developed using Quality by Design approach and then the method was improvised for wet lab synthesis. The statistical validation of the method was and finally spectral analysis confirmed the structure of the synthetic compound. The validation of the proposed method was carried out and these validated batches were simultaneously compared with the conventional procedure for synthesis of 2-phenyl-4H-3,1-benzoxazin-4-one. The results of the spectral data, validation and comparison showed that the proposed method was more economical than that of conventional method and also followed green approaches.

**KEYWORDS:** Microwave assisted synthesis, Quality by Design (QbD), benzoxazinones.

**INTRODUCTION**

The microwave region of electromagnetic spectrum has been developed and improvised in several technologies since 1970's but these have been used in the field of organic synthesis since 1980's. Several reports have been published in past decades that claims the efficacious role of Microwave technology<sup>[1]</sup> in chemistry. The slow uptake of the technology has been attributed to its initial lack of controllability and reproducibility, coupled with a general lack of understanding of the basics of microwave dielectric heating. However, in the past few years, heating chemical reactions by microwave energy has been an increasingly popular theme in the scientific community. Since the first published reports on the use of microwave irradiation to carry out organic chemical transformations by the groups of Gedye and Giguere/Majetich in 1986.<sup>[2]</sup> The microwave assisted synthesis uses all the 12 principles of green chemistry and transforms the chemistry approaches towards E-Chemistry where "E" stands for Easy, Effective, Eco-friendly and Economic.<sup>[3]</sup>

**MATERIAL AND METHODS**

The chemicals used for the synthesis were of LOBA and identified for its purity before use. The microwave synthesizer<sup>[4]</sup> was used for synthesis of compounds. Design Expert<sup>®</sup> was used for designing the experiment

**Development and optimization of process by Quality by Design (QbD)**

The novel method was first developed using the QbD<sup>[5]</sup> approach so that the optimization is possible. The 3 level factorial design model was used which consisted of 2 factors. Power and Time were the two factors that were selected for QbD. Lower, Higher and Average were the 3 levels based on which the model were developed. The model was operated at power of (100 watt, 200 watt, 300 watt) and for time of (5 min, 10 min, 15 min). The complete work of optimization was done at the pharmaceutical chemistry lab of Priyadarshini J. L. College of Pharmacy, Nagpur on Design Expert<sup>®</sup>.<sup>[6]</sup> The statistically approved batches were further approved for wet lab synthesis.

**Statistical Validation of Process**

Any process developed needs approval through the statistical parameters as ANOVA. Design expert provide in-built protocol for calculation of ANOVA, correlation values, P values etc. These statistical parameter were calculated and scrutinized for each models developed and comparison were reported.

**Synthesis of 2-phenyl-4H-3, 1-benzoxazin-4-one**

The 2-phenyl-4H-3,1-benzoxazin-4-one are widely used parent structures for the synthesis of several biologically active compounds.

Available online on 15.05.2019 at <http://jddtonline.info>

# Journal of Drug Delivery and Therapeutics

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Research Article

## Development and Validation of UV Spectrophotometric Method for Estimation Ibandronate sodium in Pharmaceutical Formulation

Prajakta A. Chawale, Dinesh R. Chaple, Alpana J. Asnani, Kumar Pratyush

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### ABSTRACT

A simple, accurate, precise, rapid spectrophotometric method for estimation of Ibandronate sodium in pharmaceutical formulation. Ibandronate sodium is one off the nitrogen carrying bisphosphonate. It prevents osteoclast-conciliate bone resorption, Paget's disease, postmenopausal osteoporosis. The maximum wavelength ( $\lambda_{max}$ ) of ibandronate sodium is 218nm. Linearity was observed in the concentration range 2-100 $\mu$ g/ml. The coefficient of variation value was found to be 0.3499. Amount of drug estimated from tablet formulation were in precise with label claim. The method was statistically validated as per ICH guidelines and can be successively applied for analysis for tablet formulation. The proposed method is economical and sensitive for estimation of ibandronate sodium in pharmaceutical formulation.

**Keywords**-Ibandronate sodium, ICH guidelines, Bisphosphonate, pharmaceutical formulation.

**Article Info:** Received 30 March 2019; Review Completed 06 May 2019; Accepted 10 May 2019; Available online 15 May 2019



### Cite this article as:

Chawale PA, Chaple DR, Asnani AJ, Pratyush K, Development and Validation of UV Spectrophotometric Method for Estimation Ibandronate sodium in Pharmaceutical Formulation, Journal of Drug Delivery and Therapeutics. 2019; 9(3):339-343 <http://dx.doi.org/10.22270/jddt.v9i3.2675>

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### INTRODUCTION

**Bisphosphonates** are a class of drugs that prevent the loss of bone density, used to treat osteoporosis and similar diseases. They are the most commonly prescribed drugs used to treat osteoporosis. They are called bisphosphonates because they have two phosphonates ( $PO(OH)_2$ ) groups. They are thus also called diphosphonates. **Ibandronate sodium** is one of the nitrogen carrying bisphosphonate.<sup>[13]</sup> According to IUPAC nomenclature it is 3-(N-methyl-N-pentyl) amino-1-hydroxypropane-1,1-diphosphonic acid, sodium salt, monohydrate with the molecular formula  $C_9H_{22}NO_7P_2Na.H_2O$  and molecular weight of 359.23. It prevents osteoclast-conciliate bone resorption.<sup>[16]</sup> It is precious for the cure of hypercalcemia of malignancy, Paget's disease, postmenopausal osteoporosis, and corticosteroid-induced osteoporosis metastatic bone disease. The activity of ibandronate on bone tissue is depending on its resemblance for hydroxyapatite, which is fraction of the mineral matrix of bone. In postmenopausal women, it decreases the high rate of bone mass, leading to, a net gain in bone mass.<sup>[15]</sup> For quantification of impurity and assay of ibandronate sodium, there are so many analytical methods have been determined. The aim of our study was to develop an easy responsive accurate and precise method for determination of ibandronate sodium in pharmaceutical formulations and bulk drugs using UV spectrophotometer.

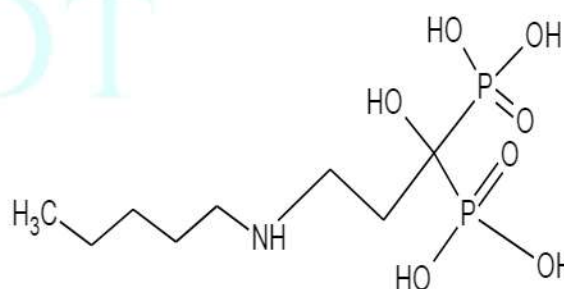


Fig.1 Structure of Ibandronate sodium

### MATERIALS AND METHODS

Ibandronate sodium drug (Batch No. IBS/07/11) was obtained from JPN pharma Pvt Ltd, Mumbai. Shimadzu UV Visible Spectro- photometer (UV-1800) with asynchronized pair of 10 mm quartz cells were used for experimental reason.

#### 1. Selection of Solvent

0.1N NaOH was selected as the suitable solvent for estimation of Ibandronate sodium after several trails.

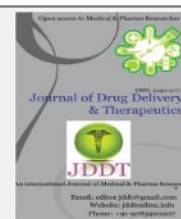


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# Journal of Drug Delivery and Therapeutics

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Research Article

## Docking of 3,5-diphenyl- pyrazoline with monoamine oxidase A receptor and In-Silico structural property calculation

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### ABSTRACT

Depression is one of the widely spread disorder in current population and is increasing exponentially. Now age group is not a mandatory clause for depression as children today are also affected. Inhibition of monoamine oxidase A (MAO A) isoform was reported for treating depression by elevating mood. Hydrazines have been also reported for their antidepressant action by inhibiting the monoamine oxidase. In this current study we have chosen 3,5-diphenyl-pyrazoline as ligand molecule which actually mimics the structure of cyclic hydrazine and was supposed to bind with MAO A receptor and inhibit it. Autodock software was used and standard protocol of docking was carried out by selecting grid of X:Y:Z (60:60:60). Other insilico properties were calculated using Molinspiration online property calculator, Protox II for structural property calculation and acute oral toxicity determination respectively. Results revealed though the ligand molecule was safe but not solely effective for MAO inhibition. Derivatization in the molecule is must increasing its biological potential.

**Keywords:** Depression, Docking, pyrazoline, Insilico toxicity determination

**Article Info:** Received 19 April 2019; Review Completed 20 May 2019; Accepted 22 May 2019; Available online 15 June 2019



#### Cite this article as:

Pratyush K, Asnani A, Docking of 3,5-diphenyl- pyrazoline with monoamine oxidase A receptor and *In-Silico* structural property calculation, Journal of Drug Delivery and Therapeutics. 2019; 9(3-s):43-45  
<http://dx.doi.org/10.22270/jddt.v9i3-s.2751>

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### INTRODUCTION

Depression is a common mental disorder that presents with depressed mood, loss of interest, or pleasure, decreased energy, feelings of guilt, disturbed sleep or appetite and poor concentration. While depression is the leading cause of disability for both males and female, the burden of depression is 50% higher for females than male (WHO 2008). It is the leading cause of disease for women in both high-income and low- and middle-income countries (WHO 2008)<sup>1</sup>. Today, depression is estimated to affect 350 million people.

Monoamine oxidase (MAO) is a potent site for treating depression by elevating the mood of patients if these enzymes are inhibited. Moclobemide recall helped us to know more about MAO that it had two isoforms, MAO A and MAO B. Inhibition of MAO A helped the depression patients whereas inhibition of MAO B helped parkinson patients. Hydrazines have been reported for inhibiting the MAO A iso-enzyme but have side effects.

Pyrazoline is a two heteroatom containing five membered heterocycle compound that has two nitrogen atom at 1,2 position<sup>2</sup>. The molecule has shown medicinally active property and is been reported in several peer reviewed

journals<sup>3</sup>. The molecule selected as ligand possesses phenyl rings at 3 and 5 position. Pyrazolines mimic the structure of hydrazine in cyclic form. Aromatization of the pyrazoline molecule may increase the selectivity.


#### Objective

The objective of the current research is to screen the binding efficiency of 3,5-diphenyl-pyrazoline to MAO A receptor which is supposed to treat depression by inhibiting action of receptor and finally leading to elevation of mood. Another objective of study is predict structural and biological properties of ligand.

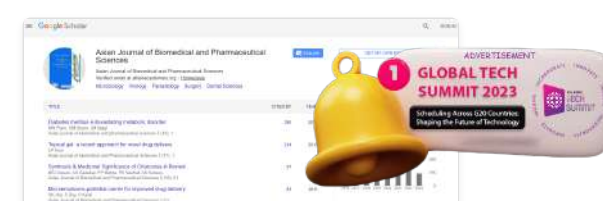
#### MATERIAL AND METHODS

##### a. Softwares and programs

Chemsketch a chemical molecule drawing tool was used to draw the ligand compounds<sup>4</sup>. Avogadro software was used to convert the .mol file to .pdb format<sup>5</sup>. Autodock 4.0<sup>6</sup> a preliminary docking program was used for the semi-flexible protein ligand docking studies. Molinspiration online property calculator was used to study the chemical properties of the compound<sup>7</sup>. The crystal structure of monoamine oxidase A receptor (MAO A) [PDB: 2Z5X] was downloaded from Protein Data Bank (PDB).

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► Research Article - Asian Journal of Biomedical and Pharmaceutical Sciences (2019) Volume 9, Issue 67

## Preventive effects of soy lecithin in combination with flavonoids on stz induced Diabetes Mellitus in rats

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Accepted date: June 17, 2019

Citation: Zade KV et.al. Preventive effects of soy lecithin in combination with [flavonoids](#) on stz induced [Diabetes Mellitus](#) in rats. Asian J Biomed Pharmaceut Sci. 2019;9(67):24-30.DOI: [10.35841/2249-622X.67.19-253](#)Visit for more related articles at [Asian Journal of Biomedical and Pharmaceutical Sciences](#)

### Abstract

The present research work was design to investigate the anti-diabetic effect of Crude Soy lecithin (CSL) in combination with Flavonoids. Various dosed of CSL, quercetin and rutin were standardized and effective dose of CSL, quercetin and rutin was selected. Male Sprague Dawley rats weighing (200-225 g) were subjected to overnight fasting to induced diabetics by STZ (60 mg/kg i.p.) and blood sample was collected after 72 hrs to conform diabetics. Rats with blood glucose level  $\geq 200$  mg/dl were selected for further study. A dose of combination of CSL and quercetin with rutin p.o. was administered 60 min prior to blood sample withdrawal for estimation of glucose level. Positive control group were treated with STZ injected rats and negative control with [metformin](#) (100 mg/kg bw). Effect of CSL in combination with [Flavonoids](#) on Blood glucose level, Total Cholesterol level and Total Triglyceride level was evaluated. The results suggested treatment with CSL, quercetin and rutin were significantly decrease plasma glucose, cholesterol and triglyceride level in rats as compared to STZDiabetic rats. CSL show anti-diabetic effect alone and in combination with [Flavonoids](#) on STZ Induced [Diabetes Mellitus](#) (DM) in Rats.

### Keywords

Crude soy lecithin, Flavonoids, Diabetic and STZ.

### Introduction

Diabetes is a complex group of diseases with a variety of causes. Diabetes is a disorder of metabolism the way the body uses digested food for energy. With the help of the hormone insulin, cells throughout the body absorb glucose and use it for energy. Diabetes develops when the body doesn ' t make enough insulin or is not able to use insulin effectively, or both [1]. World Health Organization (WHO) indicates that DM is one of the major killers of humans in our time and affects 1– 5% of the world population [2,3]. By the year 2025, the number of individuals with diabetes is predicted to be more than 325 million in spite of availability of new drugs, techniques and surgical intervention [4,5]. There are two types of DM. Type 1 (insulin-dependent) that results from damage of pancreatic insulin producing cells and type 2 (non-insulin-dependent) that results from insulin resistance [6]. Among various factors that are being involved in the progression of DM, oxidative stress plays important role in etiology of DM and related complications [7]. Persistent hyperglycemia is responsible for increasing formation of free radicals, autooxidation of glucose and lipid peroxidation as well as disturbance of the antioxidant defense system. The resultant free radicals bring about intracellular oxidative stress [8].

Flavonoids in experimental DM may be related to their antioxidative/chelatory properties. Increased glycosuria indicated that inhibition of renal glucose reabsorption may also play a role in the hypoglycaemic effect of both Flavonoids [9].

Lecithin composed of phosphatidylcholine (PC), phosphatidyl inositol (PI), phosphatidyl ethanolamine (PE), Phosphatidylserin (PS) and phosphatidic acid (PA) [10]. Lecithin is one of the components of bile that helps protect against gallstone formation. PC may help dissolve gallstones [11].

## FORMULATION AND PHYSICOCHEMICAL EVALUATIONS OF POLYHERBAL GHRITA

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Article Received on  
13 Feb. 2019,

Revised on 05 March 2019,  
Accepted on 26 March 2019

DOI: 10.20959/wjpr20195-14712

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### ABSTRACT

The use of ghee in suitable conditions with appropriate doses of desired preparations will render various benefits due to its potency to nullify toxins and toxic effects of drugs; and its capability to act as a media to dissolve and enhance the efficacy of the active principles in the drugs used. Aim of this study is formulation and Physicochemical evaluation of Polyherbal Ghrita. The Ayurvedic classics have mentioned Rasayana which is described as an herbal or metallic preparation that are health tonics to children, medicines to middle aged and rejuvenators to the elderly. Polyherbal is used as Rasayana since the ancient time especially for children in the management of memory.

This research work emphasize practical approach in formulation and physicochemical evaluation of polyherbal ghrita by incorporating the traditional knowledge along with the modern technology in drug manufacture.

**KEYWORDS:** Polyherbal ghrita, herbal drugs, ghee, Rasayana, traditional knowledge.

### INTRODUCTION

#### History of Ayurveda

The word Ayurveda is derived from the Sanskrit word 'Ayus' (all aspects of life from birth to death) and 'Veda' (knowledge or science) science of long life.<sup>[1]</sup> Ayurveda, the most ancient system of traditional medicine of the world, has been practiced in Indian subcontinent since 5000 BC. Ayurveda is a holistic approach towards life, health and disease management through medicinal herbs, minerals, diet, lifestyle and spirituality. Ayurveda was developed through daily experiences and mutual relationship between people and nature and thus not only cure diseases but also prevent disease, maintaining health and promoting longevity. This



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Research Article

## Pharmacological assessments of polyphenolic extract of *Cymbopogon citratus* leaves in rodent model of parkinson's disease

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### ABSTRACT

Parkinson's disease (PD) is amongst the most common age-related neurodegenerative disorders. Natural compounds, especially the polyphenols have gained great interest as potential therapeutic agents in recent research. Thus, the present study was designed to evaluate the effect of polyphenolic extract of *Cymbopogon citratus* (*C. Citratus*) leaves in animal models of PD. In the given study PD was induced by administration of reserpine (5 mg/kg/day, i.p for 5 consecutive days), haloperidol (1 mg/kg, i.p.), in experimental animals. The symptoms of PD such as tremors, akinesia, rigidity and catalepsy were evaluated. Ethanolic extract of *Cymbopogon citratus* (CC) in doses of 100, 200 & 400mg/kg were administered per oral (PO). The L-dopa and carbidopa (30 mg/kg, PO) combination was used as a positive standard drug. Behavioural studies such as locomotor activity were performed. In catalepsy model, there is significant reduction in catalepsy duration in CC (100, 200, 400mg/kg) treated group as compared to the haloperidol group. In reserpine model, there is significant decrease of muscular rigidity, tremors, and akinesia in groups treated with CC (100, 200, 400mg/kg) dose dependently. Thus, the present study suggests the beneficial role of *C. citratus* leaves polyphenolic extract in treatment of parkinsonian like symptoms.

**Keywords:** Parkinson's disease; catalepsy test; haloperidol; reserpine, rotarod test, polyphenols, *Cymbopogon citratus*

**Article Info:** Received 31 Jan 2019; Review Completed 07 March 2019; Accepted 09 March 2019; Available online 15 March 2019



**Cite this article as:** Mangrulkar S, Chaple d, Pharmacological assessments of polyphenolic extract of *Cymbopogon citratus* leaves in rodent model of parkinson's disease, Journal of Drug Delivery and Therapeutics. 2019; 9(2):311-315 <http://dx.doi.org/10.22270/jddt.v9i2.2414>

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### INTRODUCTION

In Parkinson's disease (PD) is a neurodegenerative disorder characterised by loss of dopaminergic neurons in the pars compacta of the substantia nigra (SN) results in parkinsonian syndrome<sup>1</sup>. It includes symptoms like bradykinesia, resting tremor, rigidity, and impairment of posture and gait<sup>2</sup>. Oxidative stress is thought to play an important role in dopaminergic neurotoxicity, mitochondrial dysfunction and neuroinflammation. Hence, there is a need of maintaining balance between oxidative stress and antioxidant system is necessary to preserve the structural integrity and optimal functions of brain<sup>3</sup>.

Plant extracts and their constituents act as a natural source of antioxidants. The antioxidant activity of several plant extracts is due to several secondary metabolites especially phenolic compounds<sup>4</sup>. In recent times, many evidences support that the chronic consumption of polyphenols rich diet can promotes the healthy aging and prolongs the healthy life span by delaying the age-related disorders like PD. There are good evidences which suggest potential utility of polyphenols in treatment of PD<sup>5</sup>.

*Cymbopogon citratus* (DC) Stapf (Poaceae), commonly known as lemongrass, is widely used in traditional medicine. The

leaves mainly essential oils. Apart from this, leaves also constitute some other phytoconstituents including tannins, flavonoids, phenols, steroids, saponins, alkaloids etc. It is widely used in the food, pharmaceutical, cosmetic and perfumery industries for its essential oil. The literature survey indicates that *C. citratus*, possesses variety of pharmacological actions<sup>6</sup>. In addition to the use of volatile oil of the plant, its polyphenol rich extracts have been proven to have beneficial effects<sup>7</sup>. Apart from its therapeutic uses, *C. citratus* is also consumed as a tea, added to non-alcoholic beverages and baked food, and used as a flavouring and preservative in confections and cuisines. The aqueous extracts are also used in traditional medicine. Its infusion contains high levels of polyphenols, which are known for their antioxidant and anti-inflammatory properties<sup>8</sup>. However, in spite of reported antioxidant and neuroprotective activities, no major investigative reports found showing its role in Parkinson's disease.

Haloperidol and reserpine induced muscle rigidity models are important models, being comparatively simpler, is used extensively for examining potential symptomatic efficacy of new drugs in PD<sup>9</sup>. Thus, the current study envisages evaluation of the anti-parkinsonian effect of *C. citratus* in the management of PD. The study suggests that *C. citratus* leaves polyphenolic extract have potent antioxidant activity which

## DEGRADATION STUDIES OF CEFUROXIME TABLET BY USING SPECTROPHOTOMETRIC TECHNIQUES

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Article Received on  
11 March 2019,  
Revised on 02 April 2019,  
Accepted on 23 April 2019,  
DOI: 10.20959/wjpr20196-14855

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### ABSTRACT

Forced degradation is a process whereby the natural degradation rate of a product is increased by the application of additional stress. A forced oxidative degradation study of Cefuroxime in tablet form was performed. The study was conducted based on available guidelines and main reference. Cefuroxime has a cepham ring in its structure. It can easily undergo hydrolytic, oxidative, thermal & photolytic degradation and the degraded products were analyzed by using UV spectrophotometry. The assay values of degraded products in different time intervals were analyzed by using UV spectrophotometry. Forced degradation was performed in tablet form using 0.1N Sodium hydroxide, 0.1N Hydrochloric acid, 30% Hydrogen peroxide solution

respectively. Cefuroxime was subjected to hydrolytic, oxidative, photolytic and thermal degradation at different time intervals based on reference. The assay value of hydrolytic degradation of sample using 0.1N Sodium hydroxide was found to be 70.44% at the end of the 90 mins and 21.88% at the end of 1<sup>st</sup> day degradation. Complete degradation of Cefuroxime was observed at the end of 3<sup>rd</sup> day onwards. The assay value of hydrolytic degradation sample using 0.1N Hydrochloric acid was found to be 70.94% at the end of the 90 mins and 18.64% at the end of 1<sup>st</sup> day degradation. Complete degradation of Cefuroxime was observed at the end of 3<sup>rd</sup> day onwards. The assay value of oxidative degradation sample using 30% Hydrogen peroxide was found to be 67.90% at the end of the 90 mins and 59.12% at the end of 1<sup>st</sup> day degradation. Complete degradation of Cefuroxime was observed at the end of 3<sup>rd</sup> day onwards. In Thermal degradation only small amount of degradation was observed up to 5<sup>th</sup>

**APPLICATIONS OF NASAL NSAIDS IN ALZHEIMER'S DISEASE****D. P. Kawade\* and M. Y. Hedao**

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Article Received on  
01 April 2019,

Revised on 23 April 2019,  
Accepted on 12 May 2019,

DOI: 10.20959/wjpr20197-14966

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**ABSTRACT**

Alzheimer's disease (AD) and Parkinson's disease (PD) are the most common neurodegenerative diseases with age as the greatest risk factor. Epidemiological observation indicates that long-term oral administration of nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen to patients having rheumatoid arthritis results in reduced risk and delayed onset of Alzheimer's disease. Alzheimer's disease starts in the entorhinal cortex, which is closely connected to the olfactory nerves, and spreads anatomically in a defined pattern. Therefore, a nasal NSAID would readily reach the region of the brain where it is most likely to be therapeutic. This study provides a general overview on the role of neuroinflammation in these neurodegenerative

diseases and an update on NSAID treatment in recent experimental animal models, epidemiological analyses and clinical trials.

**KEYWORDS:** Non-steroidal anti-inflammatory drugs, Alzheimer's disease, Parkinson's disease, cyclooxygenase, neuroinflammation, Prostaglandins etc.

**1. INTRODUCTION**

Alzheimer's disease (AD) is the most prevalent neurodegenerative disorder and the most common cause of dementia. An estimated 5.2 million Americans from different age-groups have AD in 2013. The total number of patients with AD dementia in 2050 is projected to be 13.8 million, with 7.0 million aged 85 years or older. Only symptomatic relief is being offered by the current therapeutic interventions and none being able to halt disease progression or reverse its symptoms. Cholinesterase inhibitors have consistently shown symptomatic benefits and are now recognized as the standard treatment in patients with mild to moderate AD.<sup>[1]</sup>

## ESTIMATION OF ANTIDIABETIC DRUGS BY HIGH PERFORMANCE LIQUID CHROMATOGRAPHY METHOD

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Article Received on  
24 March 2019,

Revised on 13 April 2019,  
Accepted on 03 May 2019,

DOI: 10.20959/wjpr20197-14913

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### ABSTRACT

The determination of Metformin was carried out in pure and tablet forms. The drug was found almost stable to neutral and photolytic condition. Hence, the proposed method is suitable for application in quality-control laboratories for quantitative analysis of drugs individually. This research project deals with the studies on the “Development and validation of liquid chromatographic methods for the quantification of anti-diabetic drugs in formulations and biological samples. The need for drug analysis, chromatographic methodology (method development and optimization) and experimental results of drug quantification in dosage forms, biological matrix and validation of the HPLC method was used for single drug of antidiabetic class;

Metformin as a development of the assay method. The mobile phase consisting of water and methanol in the ratio of 50: 50 at wavelength 239 nm, column C18 (phenomenex) and the flow rate 1 mL min<sup>-1</sup> and retention time 2.6 mins. A simple, rapid, accurate and stability indicating HPLC method was developed which is economic, sensitive and time saving than other chromatographic procedures. It is user-friendly and importance tool for analysis of combined dosage form. The developed method was successfully applied to the determination of metformin in pharmaceutical formulations.

**KEYWORD:** HPLC, Antidiabetic Drugs, Metformin etc.

### INTRODUCTION

High performance liquid chromatography (HPLC) is a chromatographic technique used to separate a mixture of compounds in analytical chemistry and biochemistry with the purpose of identifying, quantifying or purifying the individual components of the mixture. Before the



## OPTIMIZATION OF QUINOLINE SYNTHESIS BY QUALITY BY DESIGN

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Article Received on 20/03/2019

Article Revised on 09/03/2019

Article Accepted on 30/04/2019

### ABSTRACT

Quinoline is one of the most important N-based heterocyclic aromatic compounds in the fields of medicinal and industrial chemistry, forming the scaffold for compounds of great significance. Quinoline recently is one of the priorities in lead selection by researchers because of its broad range of activities and also for their wide applications. These include anti-inflammatory and antitumor agents, the antimalarial drugs quinine and chloroquine, and organic light-emitting diodes. 6-Methoxy-8-aminoquinoline is a metabolite of primaquine belongs to 8-Amino Quinoline derivative which is used to treat malaria. The present article having focus on the optimization study of the synthesis of 6-Methoxy-8-nitroquinoline which is used in the synthesis of 6-Methoxy-8-aminoquinoline by QbD. The sulphuric acid and arsenic trioxide showed best results at 120°C for 4 hrs. The net percentage yield was found to be 27%. The novel method can be emitable for industrial applications.

### 1. INTRODUCTION

Quinoline is one of the most important N-based heterocyclic aromatic compounds in the fields of medicinal and industrial chemistry, forming the scaffold for compounds of great significance. Quinoline recently is one of the priorities in lead selection by researchers because of its broad range of activities and also for their wide applications. These include anti-inflammatory and antitumor agents, the antimalarial drugs quinine and chloroquine, and organic light-emitting diodes. Quinolines were first synthesized in 1879, and since then a synthetic routes have been developed.<sup>[1]</sup> Many of these methods, such as the Skraup, Doebner-Von Miller, and Friedlander quinoline syntheses, are well-known but suffer from inefficiency, harsh reaction conditions, and toxic reagents.

The present article having focus on the synthesis of 6-Methoxy-8-nitroquinoline which is used in the synthesis of 6-Methoxy-8-aminoquinoline. 6-Methoxy-8-aminoquinoline is a metabolite of primaquine belongs to 8-Amino Quinoline derivative which is used to treat malaria.

It presents the optimization study of synthesis of 6-Methoxy-8-nitroquinoline.

Malaria is the complex mosquito born infectious disease which affect the humans and other animals and caused by parasitic protozoans (a group of single-celled microorganisms) belonging to the Plasmodium type. According to WHO, there was 212 million cases of malaria in 2015 and 429 000 malaria deaths. Most of the

deaths occurred in the African region 92%.<sup>[2]</sup> The disease is most commonly transmitted by an infected female Anopheles mosquito. The mosquito bite introduces the parasites from the mosquito's saliva into a person's blood. The parasites travel to the liver where they mature and reproduce.<sup>[3]</sup> There are five species of Plasmodium that are P. falciparum, P. malariae, P. ovale, P. vivax and P. knowlesi. Which can infect and spread by humans? Most deaths are caused by P. falciparum because P. vivax, P. ovale, and P. malariae generally cause a milder form of malaria. The species P. knowlesi rarely causes the disease in the humans.<sup>[4]</sup>

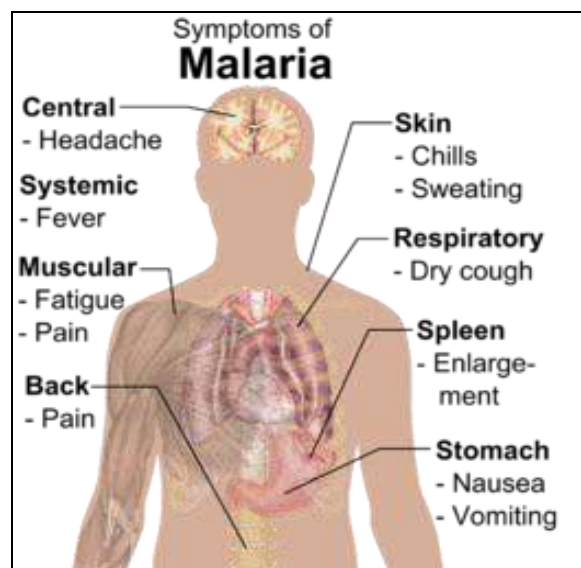


Fig.1: Sign and symptoms.



## FORMULATION, DEVELOPMENT, EVALUATION AND OPTIMIZATION OF HERBAL ANTIBACTERIAL MOUTHWASH

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Article Received on  
24 Feb. 2019,

Revised on 17 March 2019,  
Accepted on 07 April 2019

DOI: 10.20959/wjpps20196-14788

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### ABSTRACT

Aqueous leaf extract of a tropical variety of *Psidium guajava* L. (Myrtaceae), *Azadirachta indica* (Meliaceae) & *Glycyrrhiza glabra* (Leguminosae) was used to formulate fifteen batches of herbal mouthwash. The antimicrobial potentials of these herbal mouthwash formulations in oral hygiene were assessed in vitro using a modification of the conventional methods for evaluating oral antiseptics. Formulations containing *Psidium guajava*, *Azadirachta indica* & *Glycyrrhiza glabra* leaf extract and a standard mouthwash (Povidone iodine, Chlorhexidine & Geofresh) served as test samples and controls respectively. The mouthwash formulations were screened for antimicrobial activities against cultures of *Staphylococcus aureus*,

*Escherichia coli* and *Bacillus subtilis*. The extinction time of each formulation batch was determined against each test organism. The fifteen batches containing aqueous extract showed a high level of activity against the test organisms- *E. coli* and *S. aureus* comparable to the activity shown by the standard mouthwash (Povidone iodine, Chlorhexidine & Geofresh). The study encourages further stability and *In vivo* assessment to develop *P. guajava*, *A. indica* & *G. glabra* leaf extract as an ingredient of commercial mouthwashes.

**KEYWORDS:** Antimicrobial, Herbal Mouthwash, *Psidium Guajava*, *Azadirachta Indica*, *Glycyrrhiza Glabra*.

### INTRODUCTION

The importance of mouth and teeth cleanliness has been recognized from the earliest days of civilization to the 21st century. Patients and oral health practitioners are faced with a multitude of mouthwash products containing many different active and inactive ingredients.

## EVALUATION AND COMPARISON OF DISINFECTANT ACTIVITY OF SOME COMMERCIAL BRANDS BY USING STANDARD METHODS

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Article Received on  
05 April 2019,

Revised on 24 April 2019,  
Accepted on 16 May 2019

DOI: 10.20959/wjpr20197-15047

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### ABSTRACT

The aim of this study was to evaluate and compare some commercially available disinfectant for their efficacy at laboratory level. The commercially available brands of disinfectant i.e. Harpic and Patanjali was evaluated and compared for their efficacy. The three microorganisms namely *Escherichia coli*, *Staphylococcus aureus* and *Bacillus subtilis* were used to check the activity of the disinfectant depending upon the procedures. The efficacy of disinfectant were determined by standard procedures such as Phenol coefficient test, Rideal Walker test, Chick Martin test, Kelsey Skyes test, Disk Diffusion test, Serial Dilution test, Viable Count test. The effectiveness of the disinfectant were determined by their ability to reduce the

microbial growth and activity. On the basis of results from the standard procedures the Harpic was found to be more effective than Patanjali as per our findings on laboratory scale.

**KEYWORDS:** Disinfectant, Microbes, Efficacy, E.coli, Phenol coefficient test, Kelsey Skyes test.

### INTRODUCTION

A disinfectant is a chemical agent, which destroys or inhibits growth of pathogenic microorganisms in the non-sporing or vegetative state.<sup>[1]</sup> The term disinfection is generally used for a process in which micro organisms present on non living or inanimate objects and surfaces are killed by using chemical substances.<sup>[2]</sup> They are used to sterilise and clean the bacteria on non-living surfaces such as ceramic, wood, stone, or metal instruments and surfaces to control and prevent infection.<sup>[3]</sup> They may also be used to disinfect skin and other

## HOSPITAL WASTE MANAGEMENT: A REVIEW

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### Keywords

Hospital Waste, Hospital waste  
management (HWM), Hospital  
Waste Disposal, Medical Waste

### Received

22/05/2019

### Reviewed

29/05/2019

### Revised/ Accepted

05/06/2019

### ABSTRACT

Hospital waste management is a formal discipline and does occupy a critical place in the management of health care sector worldwide. The management of hospital waste requires its removal and disposal from the health care establishments as hygienically and economically as possible by methods that all stages minimizes the risk to public health and to environment also. The present scenario analysis of medical waste management systems was performed to grasp the varied handling and disposal procedures, the information and awareness of people concerned in medical waste generation, handling and disposal, and the potential impacts of the waste stream on both human health and the environment. A variety of ways were utilized by the medical facilities to dispose wastes as well as burning burial, entombing, selling, dumping, and removal by municipal bins. The waste disposal observe was found to be quite unsafe, and each clinical and non-clinical wastes were found to be thrown along. There was low awareness of the magnitude of the medical wastes issue by involved people at totally different levels from director or divisional head to waste pickers. There was no defense discovered in coping with waste disposal or laboratory analysis of infectious diseases. Medical waste incineration is one of the most identified and preferred disposal methods. It is necessary to signifies that there's an excellent potential to emit air cytotoxic pollutants from such incinerators if improperly operated and managed.



ISSN (E): 2320-3862  
ISSN (P): 2394-0530  
NAAS Rating: 3.53  
JMPS 2019; 7(2): 205-210  
© 2019 JMPS  
Received: 18-01-2019  
Accepted: 20-02-2019

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## *Guazuma ulmifolia* LAM: A review for future view

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### Abstract

*Guazuma ulmifolia*, Lam. known as West Indian elm or bay cedar, native of tropical America is been cultivated in India since a century. It contains alkaloids, tannins, saponins, flavanoids, terpenoids, cardiac glycosides and steroids. Isolation of octacosanol, taraxeroloac, friedelin-3- $\alpha$ -oac,  $\hat{\alpha}$ -sitosterol, and Friedelinol-3-acetate in the leaves are reported. Heartwood contains kaempferol and fruit contains the sweet edible mucilage. Its essential oil is contains major compound Eugenol (10.13%). The isolation of epicatechin and procyanidins oligomers such as procyanidin B2, procyanidin B5, procyanidin C1 from bark is reported. Ethnobotanical uses of *G. ulmifolia* of the leaves, bark, fruit, root, stem bark are reported for properties like antidysenteric, antibacterial, anti-inflammatory, antimicrobial, antifungal astringent, depurative, diaphoretic febrifuge, emollient, hepatoprotective, Pectoral, stomachic, styptic, sudorific, refrigerant and vulnerary. The pharmacological evaluations on plant demonstrated till date are Antioxidant, Antihypertensive and Vasorelaxing Activity, Antidiabetic, Antiviral, Ant secretory, Antibacterial, Antifungal, Cytotoxicity, Gastro protective, Hepatoprotective, Neurological & Uterine stimulant activity. The purpose of this manuscript is to bring into focus the plant *G. ulmifolia* for exploring its multipurpose uses. Thus, Ethnopharmacology suggests several medicinal uses out of which antiviral, antibacterial, antidiabetic and gastro protective are yet to be scientifically proven

**Keywords:** *Guazuma ulmifolia* L, Bastardcedar, Kaempferol, Ethno pharmacological, Hepatoprotective

### 1. Introduction

*Guazuma plum.ex* Adans (sterculiaceae) a small genus of trees, native of tropical America, introduced into other parts of the world whose one species i.e *G. ulmifolia* Lam. syn. *G. tomentosa* commonly known as “mutumba” or guacimo is found in Latin American countries, including Brazil, is grown in India since 100 years. It is a small moderate- sized tree, with brown uneven bark and scattered branches, cultivated in gardens and as a roadside shade tree in the warmer parts of India. It grows up to 30m in height and 30–40 cm in diameter<sup>[1]</sup>.

Leaves are distributed in an alternate pattern with two rows. They are oblong, ovate to lance-shaped, obliquely cordate, serrate margin and usually have a rough texture. The leaf has a darker green upper surface and the lower surface is pale green. The petiole are lean and 6-12mm long, and are covered with small “star-shaped” hairs<sup>[2]</sup>.

Yellow and brown coloured flowers are arranged loosely or in a branched pattern around 2.5–5 cm in length and are found at the bottom of the leaves. There are round to elliptical shaped capsular fruits with many grey colored oval shaped seeds of 3mm in length<sup>[3]</sup>.

The wood is yellowish to light brown, strong, light to medium heavy with rough surface. It is processed for furniture, panels of coaches, packing cases and slack cooperages. It is also used as fuel and for making charcoal<sup>[2, 4]</sup>.

### Distribution

*Guazuma ulmifolia* is distributed in the Caribbean, Mexico, Central America and Colombia, Ecuador, Peru, Bolivia, Paraguay, Argentina, and Brazil. The warmer regions of India especially Karnataka and Tamil Nadu have been cultivating them since long. Indonesia has recently introduced the species into their territory.

They are native to places such as Antigua and Barbuda, Argentina, Bahamas, Barbados, Bolivia, Brazil, Colombia, Cuba, Dominica, Dominican Republic, Ecuador, Grenada, Guadeloupe, Guatemala, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands, Nicaragua, Costa Rica, Panama, Paraguay, Peru, Puerto Rico, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Virgin Islands (US). They are considered exotic species to India and Indonesia<sup>[4]</sup>.

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Available online on 15.05.2019 at <http://jddtonline.info>

# Journal of Drug Delivery and Therapeutics

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Research Article

## Development and Validation of UV Spectrophotometric Method for Simultaneous Estimation of Metformin HCl and Repaglinide in Pharmaceutical Formulation

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### ABSTRACT

**Objective:** A new, simple, rapid, accurate and economical method have been developed for the simultaneous estimation of Metformin HCl and Repaglinide in formulation.

**Method:** The absorbances of both the drugs were determined at 238 nm and at 294 nm. The linearity was observed in the concentration range of 2-100 µg/ml and 1-35 µg/ml for Metformin HCl and Repaglinide respectively. The method was validated as per ICH guidelines.

**Result:** The recovery of Metformin and Repaglinide was found in the range of 98.24 ± 0.325 to 100.25 ± 0.756.

**Conclusion:** The proposed method was accurate, reproducible and economical and can be used successfully for quantitative estimation of Metformin HCl and Repaglinide in bulk and tablet dosage form.

**Keyword:-** Metformin, Repaglinide, UV- spectrophotometric method, simultaneous estimation

**Article Info:** Received 30 March 2019; Review Completed 06 May 2019; Accepted 10 May 2019; Available online 15 May 2019



### Cite this article as:

Kharbade S, Asnani A, Pratyush K, Development and Validation of UV Spectrophotometric Method for Simultaneous Estimation of Metformin HCl and Repaglinide in Pharmaceutical Formulation, Journal of Drug Delivery and Therapeutics. 2019; 9(3):344-347 <http://dx.doi.org/10.22270/jddt.v9i3.2676>

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## 1. INTRODUCTION

Diabetes mellitus a chronic diseases across the world is a key disease for the exploring the therapeutic value of the drug [1]. The combined use of metformin and Repaglinide for type 2 diabetes mellitus was shown improved patient compliance by controlling the post prandial glucose levels and reaches normal glycemic levels. Metformin Hydrochloride (MET) (Figure 1) is a biguanide class of antidiabetic drug; chemically is N, N-dimethylimidodicarbonyl hydrochloride. It is an oral anti-diabetic drug from the biguanide class.[2-3] It is the first-line drug for the treatment of type 2 diabetes, particularly in overweight and obese people and those with normal kidney function and evidence suggests it may be the best choice for

people with heart failure. It is also used in the treatment of polycystic ovary syndrome. [4-9] Repaglinide (REPA) is the (Figure 1) Hypoglycaemic agents; Meglitinides, chemically it is (S)-2-Ethoxy-4-[2-[[methyl-1-[2-(1-piperidinyl)-phenyl] butyl] amino]-2-oxoethyl]-benzoic acid. For treatment of diabetes combinations with other hypoglycemic agents are commonly prescribed [10] In that 47.05% are two drug combination compares to single drug treatment (14.11%). There are various UV methods are available for estimation of this two drugs either individually or in combination with other drug and for both drug in combination two UV methods are available. Present work describes rapid, simple, sensitive, accurate and reproducible spectrophotometric methods [11]

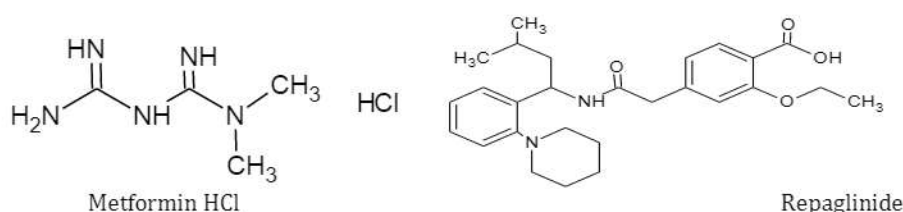


Fig 1- Chemical structure of Metformin and Repaglinide



**GREEN SYNTHESIS OF SOME QUINOLINE DERIVATIVES: A REVIEW**

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Article Received on 07/10/2019

Article Revised on 28/10/2019

Article Accepted on 17/11/2019

**ABSTRACT**

Microwave assisted organic synthesis has emerged as a new “lead” in field of organic synthesis which makes the chemistry to follow approaches of green chemistry. The green chemistry links with safer approaches for process and product development. This technique has provided the excellent momentum for many chemists to switch from conventional methods to microwave assisted chemistry. There has been a dramatic uptake in the use of microwaves as an energy source to promote synthetic transformations. Microwave-assisted synthesis is clearly a method by which the medicinal chemist can achieve goals in a lesser fraction of the time as compared to traditional conductive heating methods. In the present article an attempt was made to focus on basics of microwave assisted synthesis and its improvisations in recent synthetic development of quinolone derivatives. Quinoline is one of the most important N-based heterocyclic aromatic compounds. Quinoline recently is one of the priorities in lead selection by researchers because of its broad range of activities and also for their wide applications.

**KEYWORDS:** Green Chemistry, Microwave, Quinoline, microwave irradiation, Microwave energy.

**INTRODUCTION**

Microwave synthesis is a method which is used as the source of heating in the organic synthetic reactions. Many organic reactions *can* be conducted very rapidly under microwave irradiation was demonstrated by Gedye et al<sup>4</sup> and Giguere et al.<sup>5</sup> In 1986.<sup>[1]</sup> Microwaves are in the form of electromagnetic energy which lies in electromagnetic spectrum which corresponds to wavelength of 1cm to 1m and frequency of 30GHz to 300MHz. This places it between infrared radiation and radiowaves. For the industrial applications the typical bands are  $915 \pm 15$  and  $2450 \pm 50$  MHz. The shorter wavelength in the range 1-25cm is for radar, whereas remaining section are devoted to telecommunication. The entire microwave region is therefore not available for heating applications and equipment operating at 2.45GHz is most commonly used. Microwave energy consist of both electric as well as magnetic field.<sup>[2]</sup> The difference between microwave energy and other forms of radiation, such as X- and  $\gamma$ -rays, is that microwave energy is non-ionizing and therefore does not alter the molecular structure of the compounds being heated – it provides only thermal activation. Dielectric polarization causes the heating effect utilized in microwave assisted organic transformations. When a molecule is irradiated with microwaves, it aligns itself with the applied field. The rapidly changing electric field ( $2.45 \times 10^9$  Hz) affects the molecule and consequently the molecule

continually attempts to align itself with the changing field and energy is absorbed.<sup>[3]</sup>

## Understanding status of PCOS in Nagpur city: A survey based study

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### Abstract

**Objective:** To study the status of Polycystic Ovarian Syndrome (PCOS) in nagpur city along with the creation of its awareness.

**Materials and Methods:** This questionnaire based survey was conducted in Nagpur city which included the female subject between 12-60 years of age. A questionnaires consisting of 27 questions related to PCOS prepared in accordance with the available literature and gynecologist's opinion. Questionnaires were circulated and collected data were analyzed.

**Results:** Present study revealed that participants surveyed from age group I (12-20 yrs), II (21-40 yrs) exhibit most while group III (41-60 yrs) exhibit less symptoms similar to that of PCOS. In addition, age group II participants found to have diagnosed PCOS condition.

**Conclusion:** Age group I may be most susceptible while group II is at high risk for the development of PCOS and associated problems.

**Keywords:** Polycystic Ovarian Syndrome (PCOS), Questionnaire, Hirsutism, Hyperandrogenism.

### Introduction

Polycystic Ovarian syndrome (PCOS) or Polycystic Ovarian Disorder (PCOD) is a triangle of Obesity, Amenorrhoea and Hirsutism.<sup>1</sup> PCOS is also referred to as the 'Syndrome O' due to Overproduction of insulin, Over-nourishment, Ovulatory disruption and Ovarian confusion. Women with PCOS have higher rates of endometrial cancer, cardiovascular disease, dyslipidemia, type-2 diabetes mellitus and infertility.<sup>2</sup> It is a complex condition characterized by elevated androgen levels, menstrual irregularities, multiple small ovarian cysts, obesity, acne, hypertension, diabetes, hirsutism, and infertility.<sup>2,3</sup> It is the most common lifestyle disorder affecting approximately 2-8% women in between 18-44 years of (reproductive) age worldwide and having 9.13% prevalence rate in India.<sup>4,7</sup>

polycystic ovaries, menstrual irregularity, genetic predisposition, sedentary lifestyle, obesity, intrauterine exposure, lack of physical exercise, the use of oral contraceptives, long term use of the seizure medicines, hypertension, diabetes, smoking, and alcoholism.<sup>8</sup>

PCOS can be diagnosed by observing above symptoms and laboratory investigations. Treatment for PCOS comprises of non pharmacological and pharmacological approach. The former approach includes identification of condition and lifestyle modification while the latter involves the use of oral contraceptives, antiandrogens, antidiabetic, anti-obesity and statins. A surgical procedure which is a final option for cure involves ovarian drilling.<sup>9-14</sup>

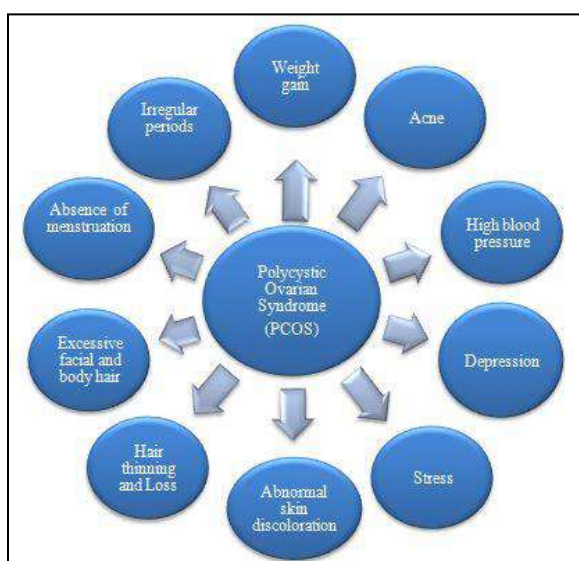
Studies on PCOS are performed only in hostel girls of reproductive age (15-44 year) from same residence but not in the age group more than 45 years and from different localities.<sup>8</sup> Hence, the aim of present study was to know the status of PCOS in females (12-60 years) of Nagpur city along with the creation of awareness among the population regarding the occurrence, cause, and risk factors of PCOS.

### Materials and Methods

The questionnaire survey was conducted in females of 12-60 years of age to check the status of PCOS in Nagpur city. The voluntarily participated females are categorized into three different age groups which are as follows:

**Table 1:** Total numbers of participants surveyed

| S. No. | Age Groups (years) | Category/group | Total no. of participants surveyed |
|--------|--------------------|----------------|------------------------------------|
| 1.     | 12 - 20            | I              | 141                                |
| 2.     | 21 - 40            | II             | 128                                |
| 3.     | 41 - 60            | III            | 38                                 |



**Fig. 1:** Signs and symptoms of polycystic ovarian syndrome

PCOS may be caused due to several factors like hyperandrogenism, neuroendocrine abnormalities,

In this survey study, questionnaire containing 27 questions relevant to PCOS was prepared and given to the individual (girl student and women) volunteer from various

**INTRODUCTION TO AMYLOIDOSIS****Mrunali A. Bhongade\*, Dr. Mrs. M. P. Yeole, Neha Kushwaha and Mohd. Sajjad Khan**

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Article Received on  
11 Nov. 2019,Revised on 01 Dec. 2019,  
Accepted on 22 Dec. 2019,

DOI: 10.20959/wjpr20201-16538

**\*Corresponding Author****Mrunali A. Bhongade**Assistant Professor, Nagpur,  
Maharashtra, India.**ABSTRACT**

Amyloidosis is a multisystem disorder characterized by decomposition of protein as insoluble fibrils, which disrupt tissue structure and function. In this review we discuss about amyloids fibrillar amyloidosis. First time this word amyloidosis is use by the German physician scientist Rudolph Virchow. The term 'amyloidosis' makes reference to a heterogeneous group of diseases characterized by the deposition of a proteinaceous material-amyloid in various tissues and organs. Due to in light microscope appearance of amyloid is traditionally described as a 'homogeneous and eosinophilic substance.

**KEYWORDS:** Homogeneous and eosinophilic substance.**INTRODUCTION**

Amyloidosis is a multisystem disorder characterized by decomposition of protein as insoluble fibrils, which disrupt tissue structure and function.<sup>[1]</sup> It is a generic term that surrounds a large group of diverse diseases rather than a single disease entity. The only diagnosis of amyloidosis is morphological assessment of cytological/histological or postmortem material. It is characterized by the extracellular deposition and accumulation of insoluble fibrillar proteins, with concurrent destruction of normal tissue structure and function. Amyloid fibrils are arranged in an antiparallel conformation with a  $\beta$  pleated sheet structure.<sup>[2]</sup>



## Quality by Design (QbD): An Emerging Trend in Improving Quality & Development of Pharmaceuticals

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DOI: [10.36348/sjmps.2019.v05i12.019](https://doi.org/10.36348/sjmps.2019.v05i12.019)

| Received: 20.12.2019 | Accepted: 27.12.2019 | Published: 30.12.2019

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### Abstract

As pharmaceutical industries now a days concerns with the safety and continuously enhance the quality of the drug products. The development of pharmaceutical industries is based on the innovation of the product as well as the manufacturing process by keeping quality in the mind. In earlier times, the development of pharmaceutical products shows the failure in the quality and hence alters the therapeutic effect of the product. Quality by test (QbT) was the only way to maintain the quality of the drug product before the FDA launches the current Good Manufacturing Practices (cGMP), which was an approach without understanding the processes. So FDA decided to applied the several Design of Experiments (DoE) in the pharmaceutical fields. QbD (Quality by design) was one of the design experiment approved by the FDA to maintain the quality of the drug products before reaching to the market. In pharmaceutical industry, QbD brings cost-efficiency and simplicity of manufacturing process into reality. QbD is a systematic risk-based, proactive 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. The main aim of this review is to discuss the concept of pharmaceutical Quality by Design and describe how it can be helpful to ensure pharmaceutical quality & drug development.

**Keywords:** Quality by design (QbD), current Good Manufacturing Practices (cGMP), Design of Experiments (DoE), quality, FDA, pharmaceutical products.

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### INTRODUCTION

Quality by design (QbD) is a concept first invented by the quality scientist Dr. Joseph M. Juran [1]. Dr. Juran believed that quality should be designed into a product, and that most quality crises and problems relate to the way in which a product was designed in the first place. Woodcock defined a high-quality drug product as a product that should be free from contamination and reliably delivering the therapeutic response promised in the label to the consumer [2]. The US Food and Drug Administration (FDA) encourages risk-based approaches and the adoption of QbD principles in drug product development, manufacturing, and regulation. FDA's emphasis on QbD began with the recognition that increased testing does not necessarily improve product quality. Quality must be built into the product.

The concept of QbD was mentioned in the ICH Q8 guidance, which states that "quality can not be

tested into products, i.e., quality should be built in by design".

International conference on hominization (ICH) Q8 (R1) guideline defines QbD as "a systematic approach to development that begins with predefined objectives and emphasizes product and process understanding and process control, based on sound science and quality risk management" [3].

### DEFINITION:

#### Quality by Design

QbD is a systematic approach that helps in the development of the pharmaceutical product by improving the quality. It begins with the predefined objectives and process understanding and process control, based on sound science and quality risk management [4].

#### Quality



**DEVELOPMENT OF NOVEL PROCESS FOR SYNTHESIS OF 2-PHENYL-4H-3,1-BENZOXAZIN-4-ONE THROUGH MICROWAVE SYNTHESIZER**

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Article Received on 26/12/2018

Article Revised on 17/01/2019

Article Accepted on 08/02/2019

**ABSTRACT**

The microwave assisted synthesis approaches comply to all 12 principles of green chemistry. The enhanced penetration power of microwaves are supposed to be the main troubleshooter in field of synthetic chemistry. The Quality by Design (QbD) approach has been used by several formulation chemist but we implemented this approach in synthetic chemistry. The novel proposed method was firstly developed using Quality by Design approach and then the method was improvised for wet lab synthesis. The statistical validation of the method was and finally spectral analysis confirmed the structure of the synthetic compound. The validation of the proposed method was carried out and these validated batches were simultaneously compared with the conventional procedure for synthesis of 2-phenyl-4H-3,1-benzoxazin-4-one. The results of the spectral data, validation and comparison showed that the proposed method was more economical than that of conventional method and also followed green approaches.

**KEYWORDS:** Microwave assisted synthesis, Quality by Design (QbD), benzoxazinones.

**INTRODUCTION**

The microwave region of electromagnetic spectrum has been developed and improvised in several technologies since 1970's but these have been used in the field of organic synthesis since 1980's. Several reports have been published in past decades that claims the efficacious role of Microwave technology<sup>[1]</sup> in chemistry. The slow uptake of the technology has been attributed to its initial lack of controllability and reproducibility, coupled with a general lack of understanding of the basics of microwave dielectric heating. However, in the past few years, heating chemical reactions by microwave energy has been an increasingly popular theme in the scientific community. Since the first published reports on the use of microwave irradiation to carry out organic chemical transformations by the groups of Gedye and Giguere/Majetich in 1986.<sup>[2]</sup> The microwave assisted synthesis uses all the 12 principles of green chemistry and transforms the chemistry approaches towards E-Chemistry where "E" stands for Easy, Effective, Eco-friendly and Economic.<sup>[3]</sup>

**MATERIAL AND METHODS**

The chemicals used for the synthesis were of LOBA and identified for its purity before use. The microwave synthesizer<sup>[4]</sup> was used for synthesis of compounds. Design Expert<sup>®</sup> was used for designing the experiment

**Development and optimization of process by Quality by Design (QbD)**

The novel method was first developed using the QbD<sup>[5]</sup> approach so that the optimization is possible. The 3 level factorial design model was used which consisted of 2 factors. Power and Time were the two factors that were selected for QbD. Lower, Higher and Average were the 3 levels based on which the model were developed. The model was operated at power of (100 watt, 200 watt, 300 watt) and for time of (5 min, 10 min, 15 min). The complete work of optimization was done at the pharmaceutical chemistry lab of Priyadarshini J. L. College of Pharmacy, Nagpur on Design Expert<sup>®</sup>.<sup>[6]</sup> The statistically approved batches were further approved for wet lab synthesis.

**Statistical Validation of Process**

Any process developed needs approval through the statistical parameters as ANOVA. Design expert provide in-built protocol for calculation of ANOVA, correlation values, P values etc. These statistical parameter were calculated and scrutinized for each models developed and comparison were reported.

**Synthesis of 2-phenyl-4H-3, 1-benzoxazin-4-one**

The 2-phenyl-4H-3,1-benzoxazin-4-one are widely used parent structures for the synthesis of several biologically active compounds.