K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

3.3.1

Number of research papers published per teacher in the Journals notified on UGC care list during the last five years

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

3.3.1

Link landing to the research paper, journal website & URL of the content page is provided

3.3. Research Publications and Awards

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

Sr. No	Title of paper	Name of the author/s	Name of journal and ISSN Number	Year of publication	Link to the recognition in UGC CARE list, Scopus and Web of Science. enlistment of the Journal /Digital Object Identifier (doi) number		URL of the content page in case print journal.
					Link to article / paper / abstract of the article	Link to website of the Journal	
1	Review on Hyphenated techniques in Analytical Chemistry	**K P Baviskar, D V Jain, S D Pingale, K. S. Jain**	Current Analytical chemistry (1573-4110)	2021-2022	A Review on Hyphenated Techniques in Analytical Chemistry | Bentham Science	https://benthamscience.com/journals/current-analytical-chemistry.	Not applicable
2	Review on Role of Nutraceuticals In Stress Management	**Prajakta Shingote, Anjali Bedse,** Ashwini Asalak, **Shilpa Raut**, Mayur Bidkar	International Journal of Pharmaceutical Sciences and Research (2320-5148)	2021-2022	https://ijpsr.com/bft-article/review-on-role-of-nutraceuticals-in-stress-management/	https://ijpsr.com/	Not applicable
3	Formulation of oxybutynin chloride microparticle-loaded suppositories: in vitro characterization and in vivo pharmacokinetic study.	**Bedse, A.**, Mahajan, H. & Dhamane, S.	Future Journal of Pharmaceutical Sciences (0975-1130)	2021-2022	https://doi.org/10.1186/s43094-022-00411-x	Future Journal of Pharmaceutical Sciences | Home (springeropen.com)	Not applicable
4	Modified Solubility of Etodolac through Solid Dispersion and Complexation	**Vaibhav Gulabrao Bhamare**, Ravindra Keshavrao Kamble	Research Journal of Pharmacy and Technology (0974-3618)	2021-2022	https://rjptonline.org/AbstractView.aspx?PID=2022-15-2-33	RJPT - Research Journal of Pharmacy and Technology (rjptonline.org)	Not applicable
5	Development and Characterization of Topical	**Bedse A**, Nikam A, Kulkarni A, Potnis V,	International Journal of	2021-2022	https://doi.org/10.37285/ijpsn.2022.15.1.8	https://ijpsnonline.com/	Not applicable

Sr. No	Title of paper	Name of the author/s	Name of journal and ISSN Number	Year of publication	Link to the recognition in UGC CARE list, Scopus and Web of Science. enlistment of the Journal /Digital Object Identifier (doi) number		URL of the content page in case print journal.
					Link to article / paper / abstract of the article	Link to website of the Journal	
	Micro-Emulsion as Novel Drug Delivery System for Dapsone	Dhamane S.	Pharmaceutical Sciences and Nanotechnology (0974-3278)				
6	Design and development of fast dissolving liquid solid formulation	**Bhamare Vaibhav G,** Kamble Ravindra K	Journal of medical, pharmaceutical and allied science (2320–7418)	2021-2022	https://jmpas.com/admin/assets/article_issue/1648141172JMPAS_JANUARY_-_FEBRUARY_2022.pdf	https://jmpas.com	Not applicable

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

1. **Title of Paper-** Review on Hyphenated techniques in Analytical Chemistry
Name of Author/s- K P Baviskar, D V Jain, S D Pingale
Name of Journal- Current Analytical Chemistry

Current Analytical Chemistry, 2022, *18*, 956-976

MINI-REVIEW ARTICLE

A Review on Hyphenated Techniques in Analytical Chemistry

Kajal Pratik Baviskar[1], Dipali Vivek Jain[1], Sushal Dilip Pingale[1], Shekhar Sudam Wagh[1], Swapnil Parashram Gangurde[1], Siddharth Ashok Shardul[1], Aditya Ravindra Dahale[1] and Kishor Sanchalal Jain[2,*]

[1]*Department of Pharmaceutical Chemistry, K.K. Wagh College of Pharmacy, Dr. Babasaheb Ambedkar Technological University (Lonere), Nashik, India;* [2]*RJSPM's College of Pharmacy, Savitribai Phule Pune University, Pune, India*

ARTICLE HISTORY

Received: December 27, 2021
Revised: March 04, 2022
Accepted: April 25, 2022

DOI:

Abstract: ***Background:*** In chemical and pharmaceutical analysis, hyphenated techniques range from the combinations involving separation-separation, separation-identification and identification-identification techniques and are widely used nowadays, as they hold many advantages like fast accurate analysis, a higher degree of automation, higher sample throughput, better reproducibility, specificity and sensitivity. They also reduce contamination due to closed systems and offer simultaneous separation and quantification, leading to better analysis.

Objective: Though many reviews have appeared on hyphenated analytical techniques till date, in the past decade, their use has increased manifold and therefore, we thought it imperative to review the latest progress in this field. In the present article, an attempt has been made to cover the latest information on various hyphenated techniques like LC-MS (Liquid Chromatography-Mass Spectroscopy), GC-MS (Gas Chromatography-Mass Spectroscopy), LC-IR (Liquid Chromatography-Infra-Red Spectroscopy), as well as, LC-MS-MS (Liquid Chromatography-Mass Spectroscopy-Mass Spectroscopy), LC-NMR-MS (Liquid Chromatography-Nuclear Magnetic Resonance-Mass Spectroscopy), *etc.*

Conclusion: This review describes a total of seventeen different hyphenated techniques, comprising mainly of the combinations of chromatographic techniques with spectroscopic techniques. We have tried to cover the latest information on various double hyphenated techniques like LC-MS , LC-NMR, LC-IR, HPTLC-MS, HPTLC-IR, GC-MS, GC-IR, GC-TLC, GC-AES, MS-MS, CE-MS, GC-NMR, as well as, triple hyphenated techniques like LC-MS-MS, LC-NMR-MS, LC-UV-MS, GC-MS-MS, GC-IR-MS. Mainly the principle, instrumentation, applications, and advantages of each of the techniques are discussed in this review. Also, disadvantages of a few techniques have been mentioned.

Keywords: Hyphenated techniques, separation, identification, quantitative, qualitative, chromatography, spectroscopy.

1. INTRODUCTION

A hyphenated technique in analytical chemistry and biochemistry means the combination or coupling of two or more different analytical techniques with the help of a proper interface to separate and detect chemicals from solutions. Mainly chromatographic techniques are often combined with spectroscopic techniques. In chromatography, the pure or nearly pure fractions of chemical components in a mixture are separated and submitted to spectroscopic estimation, thereby producing selective information leading to identification using standards or library spectra. The term "hyphenated technique" ranges from the combination of separation-separation, separation-identification & identification-identification techniques. The term "hyphenation" was first coined in 1980 by Hirschfeld [1] to describe the combination of two or more instrumental analysis methods on a single platform. The aim of the coupling is to obtain both identification and quantification detected in a more informative manner, as compared to that with a single analytical technique. Hyphenated techniques offer various advantages over single techniques like fast, accurate analysis under a high degree of automation with high sample throughput leading to better reproducibility, shorter analysis time, *etc.* A good number of reviews on the topic have appeared in the literature. In 2008, we comprehensively reviewed various hyphenated techniques [2]. This review has been cited regularly, emphasizing the importance of the topic. In 2010, Patel *et al.* reviewed the applications of hyphenated techniques [3], followed by reviews by Joshi *et al.* in 2012 [4], Nagajyothi *et al.* in 2017 [5] and Meena *et al.* in 2019 [6].

Hyphenated techniques offer many advantages over any single standalone analytical method. By coupling two or more techniques, we can combine their advantages leading to improved analytical information, as compared to any of the individual techniques alone.

*Address correspondence to this author at the RJSPM's College of Pharmacy, Savitribai Phule Pune University, Pune, India;
E-mail: drkishorsjain@gmail.com

1875-6727/22 $65.00+.00

K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY

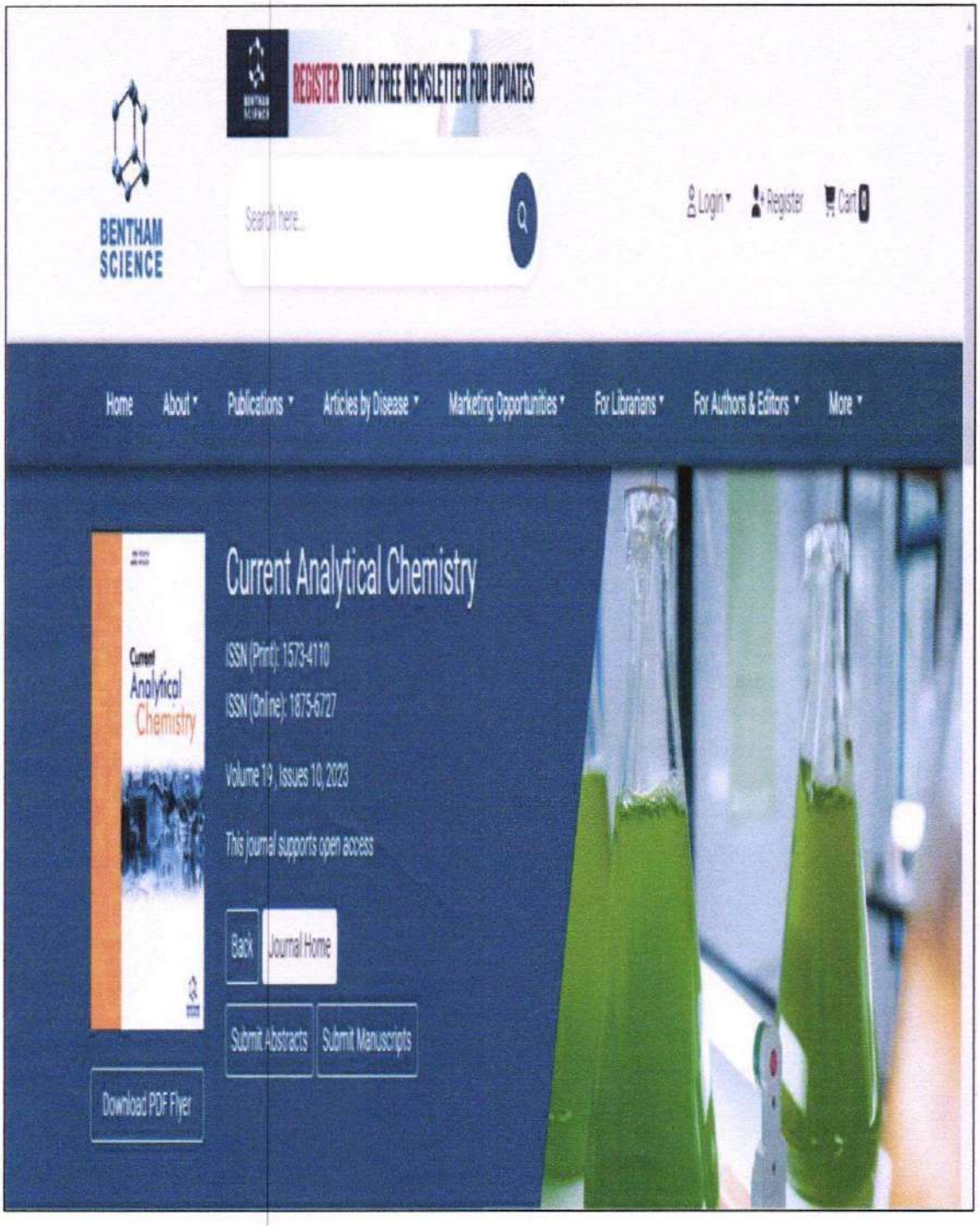
(B. Pharmacy & D. Pharmacy)

Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.

☎ : 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in

Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in

(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)



K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

2. **Title of Paper-** Review on role of nutraceuticals in stress management
Name of Author/s-Prajakta Shingote, Anjali Bedse, Ashwini Asalak, **Shilpa Raut**, Mayur Bidkar
Name of Journal- International Journal of Pharmaceutical Sciences and Research

Asalak et al., IJPSR, 2022; Vol. 13(8): 3028-3035. E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2022), Volume 13, Issue 8 **(Review Article)**

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 16 November 2021; received in revised form, 09 January 2022; accepted, 27 January 2022; published 01 August 2022

REVIEW ON ROLE OF NUTRACEUTICALS IN STRESS MANAGEMENT

Ashwini Asalak, Shilpa Raut, Mayur Bidkar, Prajakta Shingote and Anjali Bedse *

Department of Pharmaceutics, K. K. Wagh College of Pharmacy, Nashik - 422003, Maharashtra, India.

Keywords:
Stress, Neurobiology, Neurotransmitters, Nutraceuticals

Correspondence to Author:
Dr. Anjali Bedse
Associate Professor & HOD,
Department of Pharmaceutics,
K. K. Wagh College of Pharmacy,
Nashik - 422003, Maharashtra, India.
E-mail: bedseanjali1980@gmail.com

ABSTRACT: Stress is a complicated process that affects everyone differently. When the body is exposed to stressors, it initiates a series of coordinated responses called "stress responses," which include behavioral changes, immunological regulation, hormone release, and various physiological changes. Stress is the physiological response to risk or pressure, and it displays physically as fatigue or energy loss and psychologically as irritation or tension. Chronic stress or despair, which are issues of unmet health care need, may develop if they remain untreated. Treatment and preventative strategies that are based on scientific evidence are required. Current medicines show a therapy gap. The majority of medications solely address psychological or physical stress symptoms. Furthermore, psychotropic medicines, which are occasionally given for stress, frequently have undesirable side effects and cause danger of overuse. Pharmacological therapy should provide advanced care for all stress symptoms while also having a favourable safety profile. One of the most effective techniques for dealing with stress is to eat stress-relieving and nutrient-reducing meals. The term "nutraceutical" is composed up of the words "Nutrient" and "Pharmaceuticals" for dealing with stress is to eat stress-relieving and nutrient-reducing meals. Nutraceuticals are products that can be used for both nutrition and therapy. Nutraceuticals include foods such as dietary fibre, prebiotics, probiotics, polyunsaturated fatty acids, antioxidants, and other herbal/natural foods. These nutraceuticals play a distinct and important role in stress management. This review aims to find out how nutrients and diets influence stress management.

INTRODUCTION: Hans Selye, a Canadian endocrinologist, introduced the term stress in healthcare in 1949. The body's reaction to a novel environment, as well as its stereotyped, non-specific response to external cues that disrupt an individual's balance, is referred to as stress (Selye-1956).

A stressor is an individual or circumstances that cause a person to respond to stress. A stressor is a biological or chemical substance, environment conditions, external stimulation, or event that causes the person to be more stressed [1].

Stress refers to the body's adaptation to a new circumstance as well as its stereotyped and non-specific response to external stimuli that disrupt the personal balance. It's also a psychological approach to stress management and regulation that comprises understanding and preparing the body for varying conditions. Stress is a healthy and natural reaction to a risky situation. Increased anxiety and stress reports have forced us to seek medical and non-

QUICK RESPONSE CODE
DOI: 10.13040/IJPSR.0975-8232.13(8).3028-35
This article can be accessed online on www.ijpsr.com
DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.13(8).3028-35

K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

Scopus Preview

Author Search Sources

Source details

Feedback > Compare sources >

International Journal of Pharmaceutical Sciences and Research

Scopus coverage years: 2013

Publisher: Pharmaceutical Education and Research Society

ISSN: 2320-5148 E-ISSN: 0975-8232

Subject area: Pharmacology, Toxicology and Pharmaceutics: Pharmaceutical Science

Source type: Journal

View all documents > Set document alert Save to source list

SJR

SNIP 2020
0.262

K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

3. **Title of Paper-** Formulation of oxybutynin chloride microparticle-loaded suppositories: in vitro characterization and in vivo pharmacokinetic study.
Name of Author/s- Bedse, A., Mahajan, H. & Dhamane, S.
Name of Journal- Future Journal of Pharmaceutical Sciences

Bedse et al.
Future Journal of Pharmaceutical Sciences (2022) 8:22
https://doi.org/10.1186/s43094-022-00411-x

Future Journal of Pharmaceutical Sciences

RESEARCH Open Access

Formulation of oxybutynin chloride microparticle-loaded suppositories: in vitro characterization and in vivo pharmacokinetic study

Anjali Bedse[1*], Hitendra Mahajan[2] and Suchita Dhamane[3]

Abstract

Background: Oxybutynin chloride (OXC) is used to treat overactive urinary bladder. OXC is metabolized in the liver to N-desethyloxybutynin, which is mainly responsible for the anticholinergic side effects of OXC. Conventional oxybutynin suppositories formulated earlier have shown most common side effects, such as dry mouth, constipation and serious anticholinergic reaction. Hence the present research work deals with the formulation and characterization of OXC microparticle-loaded mucoadhesive suppositories which may remain adhered in the lower rectum and avoid first pass metabolism. The emulsification–ionic gelation method is employed to prepare OXC microparticles. Two formulation factors at three levels, i.e. polymer concentration and stirring speed, were selected. Sodium alginate (concentration 1–2%) and 1% w/v Carbopol 971P were used to prepare OXC microparticles. OXC microparticles were evaluated for various parameters such as production yield, entrapment efficiency, mucoadhesive strength, shape, size, zeta potential, Fourier Transform Infrared spectroscopy, differential scanning calorimetry, X-ray diffraction, in vitro dissolution studies and stability studies. Suppositories loaded with OXC microparticles were prepared by the fusion method using Poloxamer 188 and propylene glycol and evaluated for various parameters like weight variation, disintegration time, in vitro dissolution study, stability study and pharmacokinetic study.

Results: Results of in vitro characterization revealed that optimized batch of OXC loaded microparticles exhibited production yield 94.024% entrapment efficiency 95.378% and mucoadhesion strength 95.544%, particle size range 764.04–894.13 µm, zeta potential − 14.5 mV, with 0.946 desirability. Consequences of DSC and XRPD evaluation shown that drug was effectively entrapped inside the microparticles. In vitro release studies revealed improvement in drug dissolution as a consequence of its entrapment into microparticles. SEM results showed that micelles were sphere-shaped. On rectal administration of OXC microparticles loaded suppository in male Sprague–Dawley Rats, the relative bioavailability was found 173.72%.

Conclusion: In vivo study elicits rapid increase in absorption of drug from microparticles loaded suppository when compared with the oral formulation and drug loaded suppository in rats. OXC microparticles loaded suppository is novel and promising drug delivery system for rectal administration and may avoid anticholinergic side effects of hepatic metabolite, N-desethyloxybutynin. These rectal drug delivery systems will be advantageous for efficient absorption of drugs and to avoid first pass metabolism.

Keywords: Oxybutynin chloride, Microparticles, Sodium alginate, Carbopol 971 P, Poloxamer, Suppository

*Correspondence: bedseanjali1980@gmail.com
[1] K K Wagh College of Pharmacy, Nashik, Maharashtra 422003, India
Full list of author information is available at the end of the article

K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

FUTURE JOURNAL OF PHARMACEUTICAL SCIENCES

Share This Journal

ISSN / eISSN 2314-7245 / 2314-7253

Publisher SPRINGER, ONE NEW YORK PLAZA, SUITE 4600 , NEW YORK, United States, NY, 10004

About

Future Journal of Pharmaceutical Sciences (FJPS) is the official journal of the Future University in Egypt. It is a peer-reviewed, open access journal which publishes original research articles, review articles and case studies on all aspects of pharmaceutical sciences and technologies, pharmacy practice and related clinical aspects, and pharmacy education. The journal publishes articles covering developments in drug absorption and metabolism, pharmacokinetics and dynamics, drug delivery systems, drug targeting and nano-technology. It also covers development of new systems, methods and techniques in pharmacy education and practice. The scope of the journal also extends to cover advancements in toxicology, cell and molecular biology, biomedical research, clinical and pharmaceutical microbiology, pharmaceutical biotechnology, medicinal chemistry, phytochemistry and nutraceuticals.

5 2

K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

4. **Title of Paper-** Modified Solubility of Etodolac through Solid Dispersion and Complexation
Name of Author/s- Vaibhav Gulabrao Bhamare, Ravindra Keshavrao Kamble
Name of Journal- Research Journal of Pharmacy and Technology

Research J. Pharm. and Tech. 15(2): February 2022

ISSN 0974-3618 (Print)
0974-360X (Online)

www.rjptonline.org

RJPT

RESEARCH ARTICLE

Modified Solubility of Etodolac through Solid Dispersion and Complexation

Vaibhav Gulabrao Bhamare[1]*, Ravindra Keshavrao Kamble[2]
[1]Department of Pharmaceutics, K. K. Wagh College of Pharmacy, Panchavati, Nashik, 422003, Maharashtra, India.
[2]Department of Pharmaceutics, Faculty of Pharmacy, Bhupal Nobles' University, Old Station Road, Udaipur- 313001. Rajasthan, India.
*Corresponding Author E-mail: **vaibhav.bhamre@gmail.com**

ABSTRACT:
Solubility and dissolution is an essential requirement for any drug to perform well in vivo. The present research was undertaken to enhance the dissolution rate of poor water soluble drug Etodolac through solid dispersion and complexation technique. Fusion method and kneading methods were employed for solubility enhancement by Solid Dispersion technique and complexation technique respectively. PEG-6000, HPMC K4M, β-Cyclodextrin and PVPK-30 are used as carriers. Physical mixtures were prepared in different ratio of drug and carriers. The prepared blends were evaluated for solubility, drug content, percent yield and drug release. Solubility enhancement was observed for all the experimental mixtures having maximum attainment for polymers PEG 6000 and PVPK-30. Pre and post enhancement Etodolac solubility values confirm the successful modification in solubility of drug through solid dispersion technique and complexation technique with slight edge toward complexation technique.

KEYWORDS: Etodolac, Solubility, Solid dispersion, Complexation, Carrier.

INTRODUCTION:

Solubility and dissolution of drugs is a crucial prerequisite to the performance of the drug in vivo. The major share (90%) of the active pharmaceutical ingredients in the development pipeline and 40 % of the drugs in the market are poorly water soluble. Hence, solubility is still an important area of the research.[1,2] According to the Noyes-Whitney equation, the dissolution rate of a drug substance is directly proportional to its equilibrium solubility.[3] However, the nature of the dissolving solid and the dissolution medium also exert strong influences on the dissolution rate.[4] Various physical, chemical and miscellaneous approaches have been used to enhance the solubility and dissolution of the poorly water soluble drugs.[5,6]

However, solid dispersion or complexation is still preferred technique to improve solubility due to its obvious advantages. The term solid dispersion refers to a drug-polymer two component system generally consisting of a hydrophilic matrix and a hydrophobic drug prepared by hot melt extrusion, melting (fusion) method or solvent evaporation method.[7,8] Usage of solubilizing complexing agent can solve the poor aqueous solubility problem by forming guest (non polar region of one molecule) - host (cavity of another molecule) complexes.[9,10] Small molecules or larger molecules can be taken up by supramolecular cyclic structures. This inclusion complex is possible because of the central cavity in their structure and these so formed cyclic molecules have been explored as drug delivery systems.[11] Etodolac is a nonsteroidal anti-inflammatory agent and inhibitor of prostaglandin synthetase. Etodolac is absorbed from the gastro-intestinal tract with peak plasma concentrations being attained about 1-2 h after ingestion. Etodolac is poorly water soluble, and slightly soluble in simulated gastric fluid. The delayed onset of action is the result of limited dissolution rate due to poor solubility therefore its bioavailability is expected to be limited by its dissolution rate, which could be increased

Received on 23.07.2020 Modified on 29.01.2021
Accepted on 20.03.2021
Research J. Pharm. and Tech 2022; 15(2): 683-688.
DOI: 10.52711/0974-360X.2022.00113

K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY

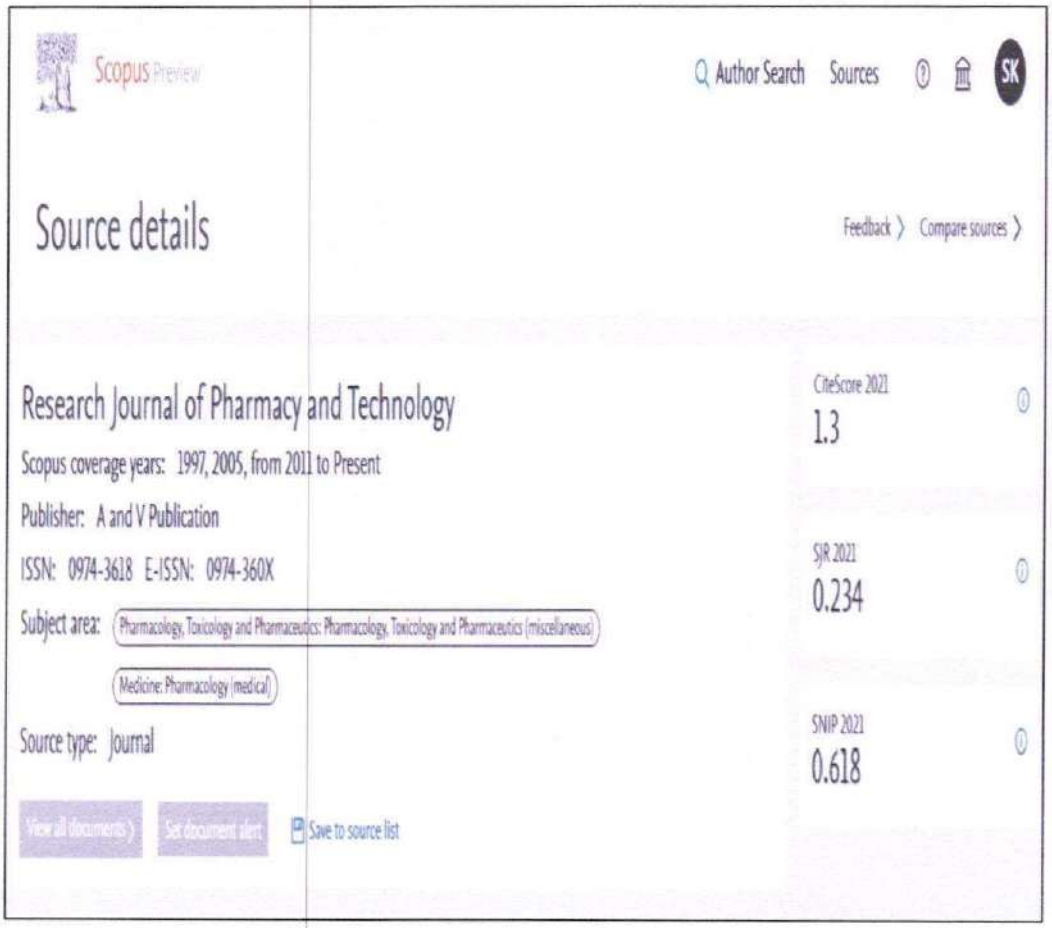
(B. Pharmacy & D. Pharmacy)

Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.

☎ : 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in

Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in

(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)



Scopus Preview

Author Search Sources SK

Source details

Feedback > Compare sources >

Research Journal of Pharmacy and Technology

Scopus coverage years: 1997, 2005, from 2011 to Present

Publisher: A and V Publication

ISSN: 0974-3618 E-ISSN: 0974-360X

Subject area: Pharmacology, Toxicology and Pharmaceutics: Pharmacology, Toxicology and Pharmaceutics (miscellaneous)

Medicine: Pharmacology (medical)

Source type: Journal

View all documents > Set document alert Save to source list

CiteScore 2021
1.3

SJR 2021
0.234

SNIP 2021
0.618

K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

5. **Title of Paper-** Development and Characterization of Topical Micro-Emulsion as Novel Drug Delivery System for Dapsone
Name of Author/s- Bedse A, Nikam A, Kulkarni A, Potnis V, Dhamane S.
Name of Journal- International Journal of Pharmaceutical Sciences and Nanotechnology

International Journal of
Pharmaceutical Sciences and Nanotechnology
www.ijpsnonline.com

RESEARCH PAPER

Development and Characterization of Topical Micro-Emulsion as Novel Drug Delivery System for Dapsone

Anjali Bedse[1] | Ajinath Nikam[2] | Aditi Kulkarni[2] | Vaishali Potnis[2] | Suchita Dhamane[2*]

[1]K.K.Wagh College of Pharmacy, Nashik-422003, Maharashtra.

[2]Jayawantrao Sawant College of Pharmacy and Research, Hadapsar, Pune- 411028,Maharashtra

Correspondence author: Suchita Dhamane, Jayawanthao Sawant College of Pharmacy and Research, Hadapsar, Pune- 411028,Maharashtra. Email ID: spd.jscopr@gmail.com

How to cite this article:
Bedse A, Nikam A, Kulkarni A, Potnis V, Dhamane S. Development and Characterization of Topical Micro-emulsion as Novel Drug Delivery System for Dapsone. International Journal of Pharmaceutical Sciences and Nanotechnology. 2022 Jan 1;15(1):5805-5812

https://doi.org/10.37285/ijpsn.2022.15.1.8

ABSTRACT

Dapsone is a Biopharmaceutical Classification System class II drug with anti-inflammatory, immunosuppressive, antibacterial, and antibiotic properties and is used as an antileprotic. The purpose of the present study was to investigate the potential of a microemulsion formulation for topical delivery of dapsone to enhance permeation and to avoid systemic side effects. When administered orally, dapsone undergoes hepatic metabolism. Its hepatic metabolite, dapsone hydroxylamine, shows systemic side effects such as hemolytic anaemia peripheral neuropathy, nausea, and headache. A novel drug delivery system in the form of a microemulsion was developed for dapsone. This is the first attempt that dapsone has been combined with chaulmoogra oil in a topical microemulsion. The primary drugs used for the treatment of leprosy are found in chaulmoogra seeds. Considering its good solubilizing capacity and its use in the treatment of leprosy, chaulmoogra oil was chosen as the oil phase. Based on emulsification ability, Cremophor RH40 and PEG 400 were selected as surfactant and co-surfactant, respectively. A pseudo-ternary phase diagram was constructed to identify the microemulsion region. Smix (Cremophor RH40: PEG-400 in the ratio of 1:2) was most effective in imparting stability to the formulation. The selected formulation exhibited appropriate diffusion behavior (*in vitro*). The developed dapsone containing microemulsion formulation exhibited the optimal homogeneity, clarity, pH, type of microemulsion, viscosity, percent drug content, and percent transmittance to qualify as a topical drug delivery system for local treatment of leprosy.

KEYWORDS
Microemulsion, Dapsone, Topical drug delivery system, Chaulmoogra oil, Anti mycobacterial activity, HET-CAM test.

INTRODUCTION

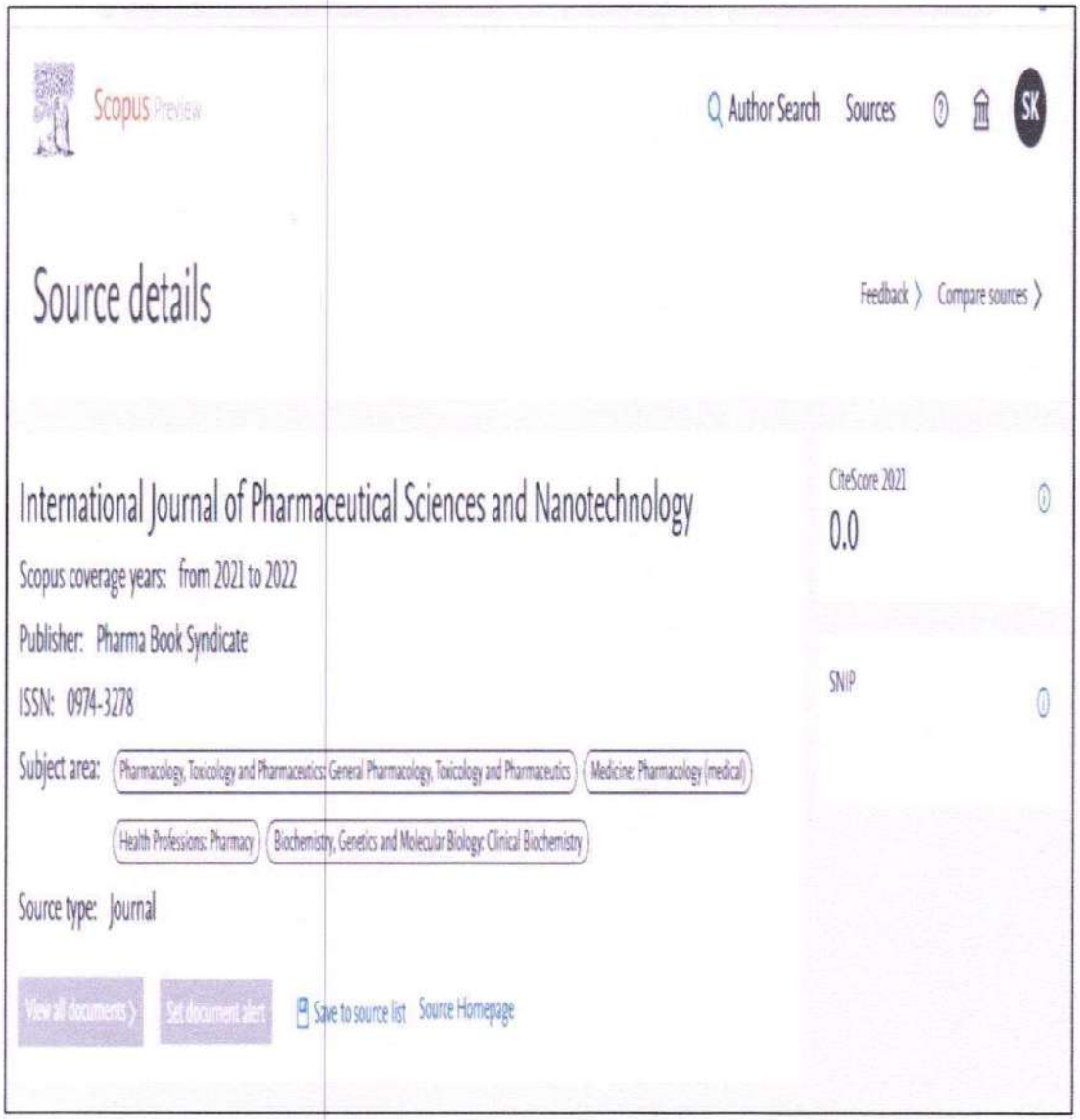
Leprosy, or Hansen's disease (HD), is a bacterial disease known from historic times, although curable, it continues to be a significant health problem worldwide. This disease affects mainly the peripheral nerves and skin, but may also affect sites such as the eyes, mucous membranes, bones, and testes and produces a spectrum of clinical phenotypes (Saonere, 2011).

Dapsone is the principal drug in a multidrug regimen recommended by the World Health Organization for treating leprosy. Dapsone is a sulfone with anti-inflammatory, immunosuppressive, antibacterial and antibiotic properties. The water solubility of dapsone is

K.K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)



K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)

6. **Title of Paper-** Design and development of fast dissolving liquisolid formulation
Name of Author/s- Bhamare Vaibhav G, Kamble Ravindra K
Name of Journal- Journal of medical, pharmaceutical and allied science

DOI: 10.55522/jmpas.V11I1.2058 ISSN NO. 2320-7418

International peer reviewed open access journal

Journal of Medical Pharmaceutical and Allied Sciences

Journal homepage: www.jmpas.com CODEN: JMPACO

Research article

Design and development of fast dissolving liquisolid formulation

Bhamare Vaibhav G*[1], Kamble Ravindra K[2]

[1]K. K. Wagh College of Pharmacy, Nashik, Maharashtra, India
[2]Bhupal Nobles' College of Pharmacy, Udaipur, Rajasthan, India

ABSTRACT

Various techniques have been employed for the solubility modification of BCS class II drugs. Out of the recent solubility enhancement techniques, Liquisolid technique based on the work of Spireas et al has explored as method that can supplement drug release. Formulations containing Etodolac were developed by dissolving the drug in a non-volatile solvent and then employing the adsorption absorption principle with a carrier and coated material admixture. The post formulation saturation solubility study has highlighted significant modification in solubility of the drug in comparison to pre solubility modification. The Liquisolid formulation then subjected to direct compression for the development of Fast dissolving tablet formulation using two varying concentrations of Sodium Starch Glycolate. The in vitro - in vivo evaluation of research study concludes adaptability and applicability of fast dissolving liquisolid tablet formulation allowing it to overcome barriers associated with the solubility. The optimized formulation found to unveil dissolution along with diffusion from the dosage form by Fickian mechanism.

Keywords: Etodolac, Liquisolid, Carrier material, Coating material Fast dissolving tablet, Superdisintegrant.

Received - 28-09-2021, Accepted- 26-01-2022

Correspondence: Dr. Bhamare Vaibhav G* ✉ vaibhav.bhamre@gmail.com

Department of Pharmaceutics, K. K. Wagh College of Pharmacy, Nashik, Maharashtra, India.

INTRODUCTION

Solubility phenomena have great influence on pharmaceutical industry. [1]. Post administration of drug by oral route, the absorption and bioavailability of drug in systemic circulation is limited by its solubility and permeability. [2]. The BCS plays vital role for formulation scientist, for advising strategy to increase the effectiveness of drug development by proper choice of dosage form and bioequivalence tests. [3], numerous researches on solubility enrichment of BCS class II or class IV drugs have rooted various techniques. [4-6]. Liquisolid approach has been lately explored as a method for improved drug release. [7]. It is therefore proposed that a mathematical model implemented and validated by Spireas and coworkers measures necessary quantities of carrier polymer and coating material. [8, 9] to achieve a drug embedded system a system with appropriate flowability and compressibility. In continuation with the solubility enhancement, formulation development has been one tool that has impact on patient compliance. Fast dissolving tablet formulation gaining wide popularity in terms of its bioavailability in shorter duration of time and usefulness toward population in comparison to conventional tablet formulation.

MATERIALS AND METHODS

IPCA Laboratories Ltd. Mumbai provided the Etodolac as a free sample. The rest of the ingredients were of analytical quality. Throughout the investigation, distilled water was used.

Experimental

Analytical characterization. [10, 11]. The identity of the drug was confirmed by comparing IR spectrum using FTIR (Shimadzu Affinity press FTIR 1800), thermogram using DSC (Shimadzu DSC 60) and X-Ray powder diffraction spectra (Shimadzu XRD-7000). Same procedure has been employed to identify incompatibility issues (if any) generated when the drug is formulated into fast dissolving tablet formulation post Liquisolid treatment.

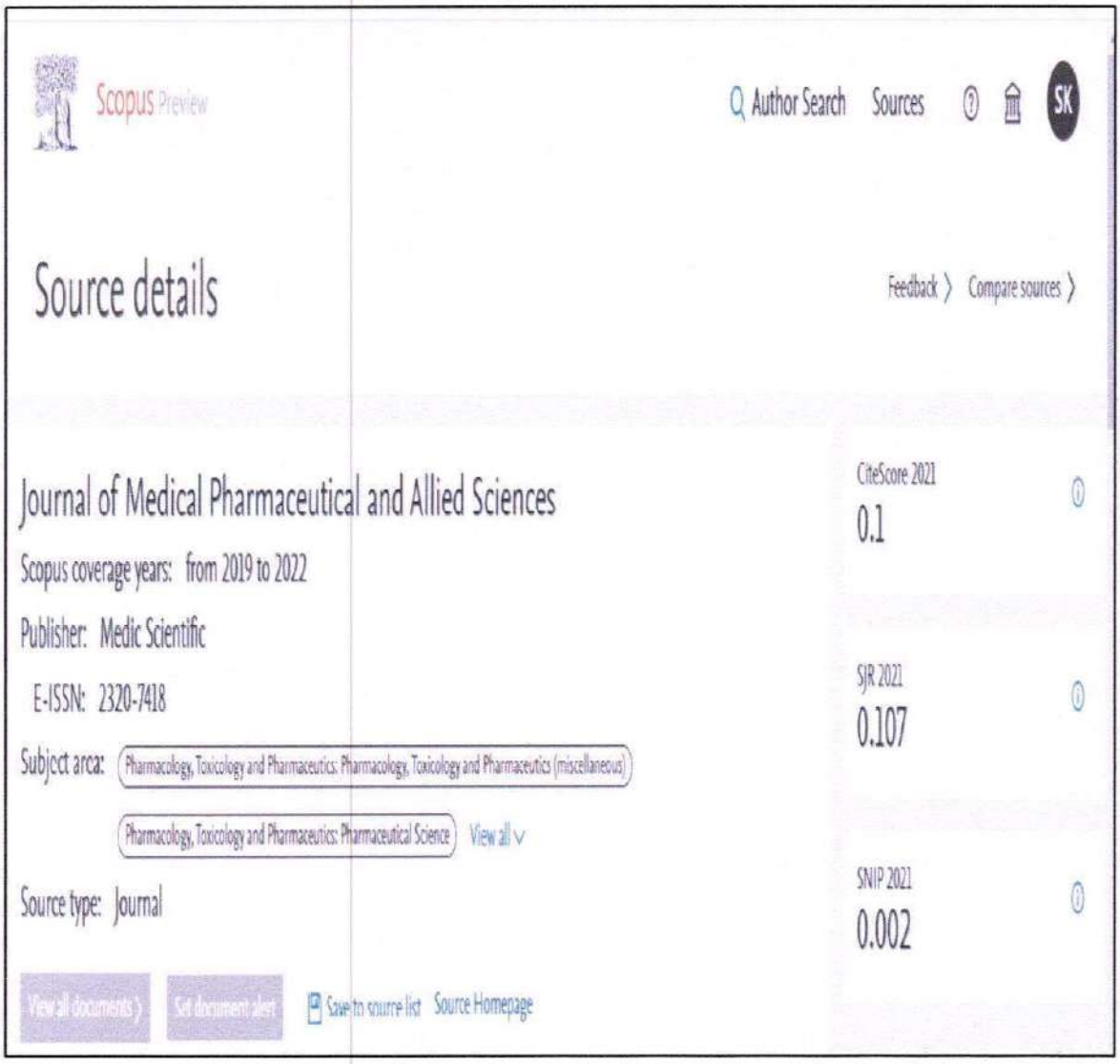
Saturation solubility study of drug. [12, 13]. Solubility studies were carried by shake flask method where excess of sample is added into the fixed volume of solvent. The saturated solutions were continuously shaken round-the-clock and the resultant solutions were filtered, appropriate dilutions were prepared and UV absorbance was recorded. The same procedure is employed for formulation post Liquisolid treatment.

Design of Liquisolid system with mathematical modeling. [14-17] It is suggested that a mathematical model executed and

K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003

K. K. WAGH COLLEGE OF PHARMACY
(B. Pharmacy & D. Pharmacy)
Hirabai Haridas Vidyanagari, Amrutdham, Panchavati, Nashik - 422 003. (Maharashtra) India.
☎: 0253 - 2221121, 2517003, 2510262 Web : www.pharmacy.kkwagh.edu.in
Email: principal-bpharmacy@kkwagh.edu.in, disp-bpharmacy@kkwagh.edu.in
(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere, MSBTE, Mumbai & Approved by PCI)



K. K. WAGH COLLEGE OF PHARMACY NASHIK-3

PRINCIPAL
K.K. Wagh College of Pharmacy
Nashik-422 003