



AI TO MACHINE LEARNING IN PHARMACEUTICALS

FIRST EDITION

Satyabrata Jena
Dr. Narottam Pal
Dr. V Mohan Goud
Prof. (Dr.) KNV Rao



Beaskar
PRINCIPAL
BEASKAR PHARMACY COLLEGE
Beaskar Nagar, Yencapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075, T.S.



About The Author



Satyabrata Jena Associate Professor working in department of Pharmaceutics, Bhaskar Pharmacy College, Hyderabad. He has rich experience of 25 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. He guided around 50 students in UG & PG dissertation works. He has twenty three Patents and many scientific publications in National and International Journals. He is author of a book "INDUSTRIAL PHARMACY" in Lambert. He is a member of many statutory bodies and reviewer for various journals.



Dr. Narottam Pal is Passionate research oriented faculty in Bhaskar Pharmacy College, a reputed institution at Hyderabad. 20+ years of rich experience in industry, research and teaching; having 21 publications in national and international journals, 2 Indian patents; author of a chapter in online book "The Gout" in INTECH OPEN. A life skill trainer, certified nutrition counselor, health professional has a dream of making Disease free India.



Dr. V Mohan Goud received his Ph. D. from Jawaharlal Nehru Technological University Hyderabad. Currently he is working as a Professor & HOD in Department of Pharmaceutical Chemistry and Analysis, Joginpally B. R Pharmacy College, Hyderabad. He has 15 years of Teaching and Research experience in the field of Chemistry and Analysis. He guided around 65 students in UG & PG dissertation works. He has two Patent and many scientific publications in National and International Journals.



Prof. KNV Rao, Principal cum Professor working in, Nalanda College of Pharmacy, Nalgonda, Hyderabad. He has rich experience of more than 30 years in Teaching and Research in the field of Pharmacy. He guided around 85 students in UG & PG dissertation works. He has more than 120 scientific publications in National and International Journals. He is a member of many statutory bodies and reviewer for various journals.

Price: 595 INR



Received
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AI to Machine Learning in Pharmaceuticals

Satyabrata Jena, Dr. Narottam Pal, Dr. V Mohan
Goud and Prof. (Dr.) KNV Rao

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ISBN – 978-93-95936-75-0

Published by:

AGPH Books (Academic Guru Publishing House)

Bhopal, M.P. India

Contact: +91-7089366889



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Advanced Concepts in Pharmaceutical Research Vol. 5



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Editor(s)

Dr. Barkat Ali Khan

Associate Professor, Gomal University, D.I. Khan KPK, Pakistan.

Short Biosketch

ISBN 978-81-970008-6-7 (Print)

ISBN 978-81-970008-0-5 (eBook)

DOI: 10.9734/bpi/acpr/v5

This book covers key areas of pharmaceutical research. The contributions by the authors include nonsteroidal anti-inflammatory drug, UV spectrophotometric method, cyclodextrins, β CD complexes, siddha medicine, X-ray fluorescence analysis, toxicity study, antimetabolic activity, molecular docking method, anticancer drugs, thin-layer chromatography, polyherbal formulation, folklore medicine, DPPH radical scavenging method, heavy metal analysis, fourier transform, nanoemulsions, drug delivery, limpidity test, phase inversion composition, solid lipid nanoparticle, nanostructured lipid carriers, drug delivery, hypoglycaemia, therapeutic efficacy, diabetic neuropathy symptoms, glycogenesis, lipogenesis, protein synthesis, antifungal activity, allopathic medicines, phytomedicines, lipid oxidation, macrophages, density lipoprotein, atherosclerotic cardiovascular disease, antibacterial potency, anti retroviral drug, drug solubility, solid dispersion technique, homoeopathy, natural resources, natural resources, chronic illnesses. This book contains various materials suitable for students, researchers, and academicians in the field of pharmaceutical research.

Media Promotion:

- Chapter 01
- Chapter 02
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Media Promotion:

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K. P. R. Chowdary, G. S. Annamma Devi, K. Susmitha

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<https://doi.org/10.9734/bpi/acpr/v5/19456D>

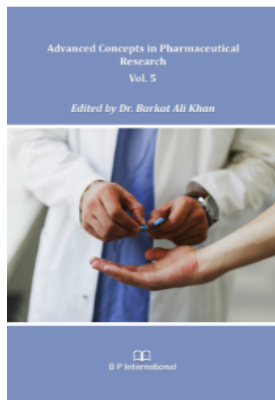
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Recent Advances in Nanoemulsion for Drug Delivery

Chinmaya Keshari Sahoo, Amiyakanta Mishra, B. Ray, Jimidi Bhaskar





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Acute and Subacute Toxicity Studies of Linga Chenduram – A Classical Siddha Formulation

S. Murugesan

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<https://doi.org/10.9734/bpi/acpr/v5/7388C>

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Preliminary Phytochemical, Physicochemical Evaluation and Spectrometric Analysis of Selected Indian Plants with Antioxidant Activity

Segu Prathyusha, Ratnakar Cherukupally, Saraswathi Kaspas, Sumalatha K., Shaik Harun Rasheed, Ch. Pavani

Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 53-66
<https://doi.org/10.9734/bpi/acpr/v5/11236F>

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In-silico and In-vitro Antimitotic Activity of Some Novel 6-Fluoro-1, 2, 4-Triazolo-Benzothiazole Analogues

Naresh Podila, Sanapala Arun Kumar, Vijaya Kishore K., Rajashekar V., Risy Namratha Jamullamudi, Prasada Rao Manchineni, Namratha Sunkara, Sreelatha Muddiseti

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<https://doi.org/10.9734/bpi/acpr/v5/7097E>

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Role of Herbal Medicine “Diabetocure” on Clinical and Biochemical Parameters of Diabetes: A Clinical Approach

Ayush Garg

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<https://doi.org/10.9734/bpi/acpr/v5/2910G>

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Formulation and Evaluation of Solid Lipid Nanoparticles-based Gel Containing Miconazole Nitrate (An Antifungal Agent)

V. Chandrakala, H. S. Mamatha, A. Usha, Banu Priya

Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 108-119
<https://doi.org/10.9734/bpi/acpr/v5/6727C>

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Study on Fatty Acid Esters from Roots of *Amaranthus hybridus* Linn

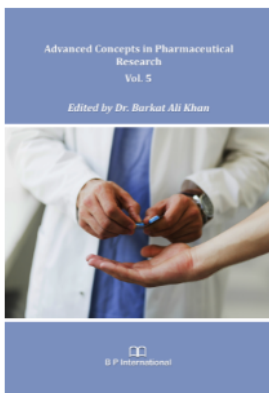
Sumitra Singh, Sandeep Singh, Surendra Kumar Sharma, Mohammad Ali

Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 120-126
<https://doi.org/10.9734/bpi/acpr/v5/7199E>

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Psoralea corylifolia L. a Potent Medicinal Plant with reservoir of Bioactive Compounds and Broad Spectrum Antifungal Activity

Kiran B., Lalitha V.

Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 127-135
<https://doi.org/10.9734/bpi/acpr/v5/11464F>

Abstract ▾ View Article  Review History

Increased Uptake of Oxidized LDL by Macrophages from Type 2 Diabetics is Inhibited by Polyamines: An Advanced Study

Francisco L. Balderas, Marina Quezada-Larios, Ethel Awilda García Latorre, José D. Méndez

Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 136-148
<https://doi.org/10.9734/bpi/acpr/v5/7166B>

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Solubility Enhancement of Raltegravir by Solid Dispersion Technique

M. P. Kusuma, Sumanya


Advanced Concepts in Pharmaceutical Research Vol. 5, 30 January 2024, Page 149-176
<https://doi.org/10.9734/bpi/acpr/v5/8586A>

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Ferula asafoetida Increases Cell Division and Cell Death in Vicia faba with Suppressing the Mitotic Index

Sangeeta Dayal, Alka Noopur, Harshal Kumar




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Preliminary Phytochemical, Physicochemical Evaluation and Spectrometric Analysis of Selected Indian Plants with Antioxidant Activity

Segu Prathyusha ^a, Ratnakar Cherukupally ^a,
Saraswathi Kaspala ^a, Sumalatha K. ^a, Shaik Harun Rasheed ^{a*}
and Ch. Pavani ^a

DOI: 10.9734/bpi/acpr/v5/11236F


Peer-Review History:

This chapter was reviewed by following the Advanced Open Peer Review policy. This chapter was thoroughly checked to prevent plagiarism. As per editorial policy, a minimum of two peer-reviewers reviewed the manuscript. After review and revision of the manuscript, the Book Editor approved the manuscript for final publication. Peer review comments, comments of the editor(s), etc. are available here: <https://peerreviewarchive.com/review-history/11236F>

ABSTRACT

The objective of this research was to develop a polyherbal formulation using three different herbs and to evaluate their phytochemicals, physical constants and determination of their antioxidant activity by DPPH method. Folklore medicine is being re-evaluated by extensive research on different plant species and their therapeutic principles. The PHF authenticated herbs were characterized by studying their morphological and phytochemical analysis. Preliminary screening showed the presence of alkaloids, glycosides, carbohydrates, amino acids and flavonoids in the combination extract. Physical parameters such as loss on drying (LOD), ash values and extractive values have been studied. The antioxidant activity of the combination of extract (100 mg each) was determined using DPPH free radical scavenging method. The results showed that the combination extract has best antioxidant effect at a dose of 300 µg/ml and the % inhibition of PHF is 75.2% and 96.6 % inhibition for ascorbic acid as the reference standard. All the extracts and PHF showed a dose dependent activity. Fourier transform infrared spectroscopy (FTIR) uses the mathematical process (Fourier transform) to




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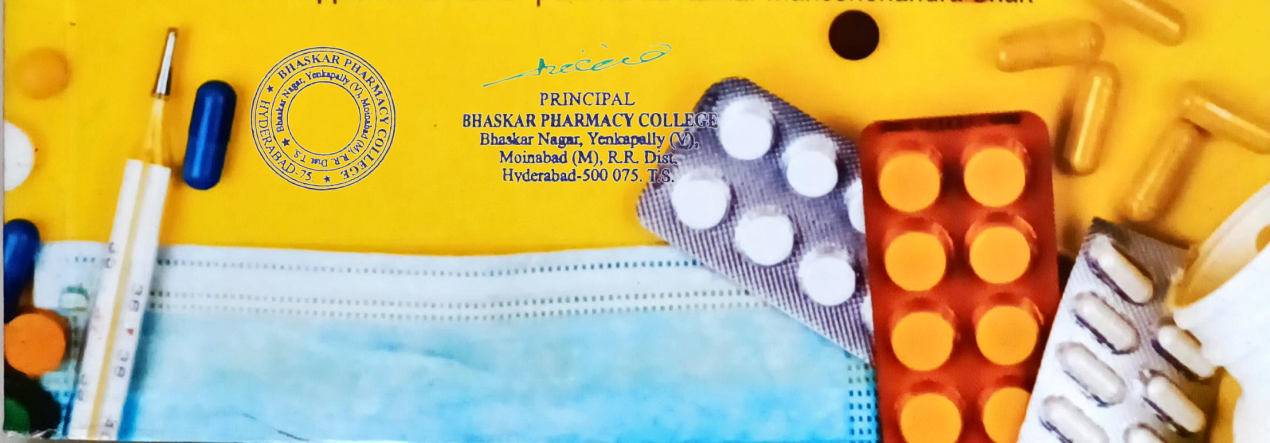
A Textbook of **HERBAL DRUG TECHNOLOGY**



Prof. Dr. V.R.Ravikkumar
Dr. Pankaj Pradhan | Dr. Gouri Sankar Kandukuri
Dr. Muppaneni Srikanth | Dr. Runit Kumar Maheshchandra Shah



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About the Book :

This book offers information on the fundamentals of the herbal drug industry, the quality of raw materials, and standards for the quality of herbal medications, herbal cosmetics, natural sweeteners, and nutraceuticals, among other things. The topic also places a strong emphasis on regulatory, patenting, and good manufacturing practices (GMP) concerns for herbal medicines.

About the Authors :



Prof. Dr. V.R. Ravikkumar is working as a Professor & Head at Department of Pharmacognosy, The Erode College of Pharmacy, Erode, Tamilnadu, India with more than 23 years of academic and research experience. He has published 40 research papers in national & international journals. He has presented more than 50 research papers at various international and national conferences as author and co-author. As a resource person / or invited speaker given lecture for various institution and conferences, He has an author of Text Book of Pharmacognosy and Phytochemistry-II, He has patent and design published/ granted on "Formulation Development and in-vitro Evaluation of Antibacterial Herbal Lotion of Couroupita guianensis Plant Extract" & "Mobile agitator vessel for pharmaceutical and chemical industries" respectively. He has guided B.Pharm students for elective work & M. Pharm and Ph.D students for research work. He is a life member of various professional bodies like Association of Pharmaceutical Teachers of India, TN/LM-464, Pharma helpline Society, PHS-5010, The Indian Society for Technical Education, LM-124562 and Society for Nature and Applied Sciences (SNAS) LM-53/2022. He has received best teacher award for pharmacy education more than six times from Tamilnadu Dr. M.G.R. Medical University, Chennai / and other Professional bodies.

Dr. Pankaj Pradhan is presently working as Professor, Swami Keshvanand Institute of Pharmacy, Jaipur (Rajasthan). He completed his graduation from Punjab Technical University, Jalandhar with distinction, post-graduation from Jaipur National University, Jaipur with Gold medal. He has 14 years of teaching and research experience. He has guided over 55 graduate students and 06 postgraduate students. His areas of research is about standardization of Herbal drugs, Phytochemistry, Herbal regulation and comprise role of oxidative stress in behavioral, systemic and inflammatory responses of animals, cellular and molecular basis of oxidative stress & endocrine pharmacology. He published 30 research and review papers in various National and International journals, and presented 32 papers in national and international conferences. He has delivered 10 invited talks and organized 04 national seminars.



Dr. Gouri Sankar Kandukuri, working as Professor & HOD of Pharmacognosy and Phytochemistry and IQAC Coordinator in Vasntidevi Patil Institute of Pharmacy, Kodoli (Maharashtra). He has completed his Ph.D. from Vinayaka Missions Research Foundation, Salem and M.Pharm from Bharathi College of Pharmacy, K.M. Doddi, Karnataka affiliated to Rajiv Gandhi University of Health Sciences, Bangalore. He has total 12 years of teaching/research experience in various colleges. He has worked as Associate professor and Assistant professor in M.A.M. College of Pharmacy and Vagdevi College of Pharmacy respectively. He is a life member of Association of Pharmaceutical Teachers of India (APTI) and Indian Pharmaceutical Association (IPA). He is expert in teaching all subjects of Pharmacognosy and Phytochemistry including Herbal Drug Technology, Quality Control and Standardization of Herbal Dugs. He has guided more than 50 graduate students and currently involved in research on herbal drugs. He

has published more than 20 national and international papers, 5 patents and 1 book. He has delivered several lectures, presented papers, and organized several national and international conferences.

Dr. Muppaneni Srikanth, Working as Professor at Bhaskar Pharmacy College, Moinabad, Hyderabad (Telangana) B.Pharm from Roland Institute of Pharmaceutical sciences, Berhampur University, Berhampur, Odisha in 2000. M.Pharm from A.U. College of pharmaceutical sciences, Andhra University, Visakhapatnam, Andhra Pradesh in 2009. Phd from A.U. College of Pharmaceutical Sciences, Andhra University, Visakhapatnam Andhra Pradesh in 2014. He has 15 years of teaching experience in the specialization of Pharmacognosy and Phyto-chemistry. Worked as SRF in NAIP sub-project titled "Utilization of weed flora of medicinal value in some important cropping systems of Andhra Pradesh". Publish 16 research papers in various national and international journals. He has filed 2 patents related to natural products. He organized national seminars and presented posters in various conferences.



Dr Rumiit Kumar Maheshchandra shah is working as a Principal at B.A.B.S ENGLISH MEDIUM SCHOOL BARDOLI and previously he worked as an Associate professor in Shree Naranjibhai Patel College of Pharmacy, Umrakh, Bardoli, Gujarat. He has more than 15 years of academic and research experience. He has published numbers of paper in International and National Journals. He has guided B. Pharm students for elective work & M. Pharm students for research work. He has been served as a valuable reviewer for many journals. Apart form academic, he has a good hand in Industrial exposure. He served for pharma industries for a time.

Price: ₹ 599/-

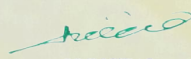
ISBN 978-93-6087-673-9



9 789360 876739

 **SHASHIWAT**
PUBLICATION




PRINCIPAL
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ISBN: 978-93-6087-673-9

Price: 599.00

Publishing Year 2023



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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkapally (V),
Moynabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Published and printed by:

Shashwat Publication

Office Address: Ram das Nagar,

Bilaspur, Chhattisgarh – 495001

Phones: +91 9993608164 +91 9993603865

Email: contact.shashwatpublication@gmail.com

Website: www.shashwatpublication.com

Printed in India

Course Content

UNIT – I

1

Herbs as Raw Materials

Definition of herb, herbal medicine, herbal medicinal product, herbal drug preparation, Source of Herbs

Selection, identification and authentication of herbal materials, Processing of herbal raw material

Biodynamic Agriculture

Good agricultural practices in cultivation of medicinal plants including Organic farming. Pest and Pest management in medicinal plants: Biopesticides/Bioinsecticides.

Indian Systems of Medicine

a) Basic principles involved in Ayurveda, Siddha, Unani and Homeopathy

Preparation and standardization of Ayurvedic formulations viz Aristas and Asawas, Ghutika, Churna, Lehya and Bhasma.

UNIT-II

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Nutraceuticals

General aspects, Market, growth, scope and types of products available in the market. Health benefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome and various Gastro intestinal diseases.

Study of following herbs as health food: Alfaalfa, Chicory, Ginger, Fenugreek, Garlic,

Honey, Amla, Ginseng, Ashwagandha, Spirulina



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Herbal-Drug and Herb-Food Interactions

General introduction to interaction and classification. Study of following drugs and their possible side effects and interactions: Hypercium, kava-kava, Ginkobiloba, Ginseng, Garlic, Pepper and Ephedra.

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Herbal Cosmetics

Sources and description of raw materials of herbal origin used via, fixed oils, waxes, gums colours, perfumes, protective agents, bleaching agents, antioxidants in products such as skin care, hair care and oral hygiene products.

Herbal Excipients

Herbal Excipients – Significance of substances of natural origin as excipients – colorants, sweeteners, binders, diluents, viscosity builders, disintegrants, flavors and perfumes.

Herbal Formulations

Conventional herbal formulations like syrups, mixtures and tablets and Novel dosage forms like phytosomes

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Stability testing of herbal drugs.

Patenting and Regulatory Requirements of Natural Products

- a) Definition of the terms: Patent, IPR, Farmers right, Breeder's right, Bioprospecting and Biopiracy
- b) Patenting aspects of Traditional Knowledge and Natural Products. Case study of Curcuma and Neem



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Regulatory Issues

Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs and Cosmetics Act for ASU drugs.

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Herbal drugs industry: Present scope and future prospects.

A brief account of plant-based industries and institutions involved in work on medicinal and

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Schedule T – Good Manufacturing Practice of Indian Systems of Medicine

Components of GMP (Schedule – T) and its objectives

Infrastructural requirements, working space, storage area, machinery and equipments, standard operating procedures, health and hygiene, documentation and records.



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PHARMACOGNOSY – THEORY



Dr. Muppaneni Srikanth
Dr. Gouri Sankar Kandukuri
Dr. P.V.D.L.S. Ravi Prakash



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Title of the Book: **PHARMACOGNOSY – THEORY**

Edition: First - 2023

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ISBN: 978-93-5757-999-5

MRP: 600/-

PUBLISHER & PRINTER: Scientific International Publishing House

Contact: +917019991025

Website: www.sipinternationalpublishers.com

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Author's Profile



Dr. M. Srikanth, Working as Professor at Bhaskar Pharmacy College, Moinabad, Hyderabad (Telangana) B.Pharm from Roland Institute of Pharmaceutical sciences, Berhampur University, Berhampur, Odisha in 2000. M.Pharm from A.U. College of pharmaceutical sciences, Andhra University, Visakhapatnam, Andhra Pradesh in 2009. Phd from A.U. College of Pharmaceutical Sciences, Andhra University, Visakhapatnam Andhra Pradesh in 2014. He has 15 years of teaching experience in the specialization of Pharmacognosy and Phyto-chemistry. Worked as SRF in NAIP sub-project titled "Utilization of weed flora of medicinal value in some important cropping systems of Andhra Pradesh". Publish 16 research papers in various national and international journals. He has filed 2 patents related to natural products. He organized national seminars and presented posters in various conferences.



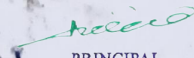
Dr. Gouri Sankar Kandukuri, working as Professor & HOD of Pharmacognosy and Phytochemistry and IQAC Coordinator in Vasntidevi Patil Institute of Pharmacy, Kodoli (Maharashtra). He has completed his Ph.D. from Vinayaka Missions Research Foundation, Salem and M.Pharm from Bharathi College of Pharmacy, K.M. Doddi, Karnataka affiliated to Rajiv Gandhi University of Health Sciences, Bangalore. He has total 12 years of teaching/research experience in various colleges. He has worked as Associate professor and Assistant professor in M.A.M. College of Pharmacy and Vagdevi College of Pharmacy respectively. He is a life member of Association of Pharmaceutical Teachers of India (APTI) and Indian Pharmaceutical Association (IPA). He is expert in teaching all subjects of Pharmacognosy and Phytochemistry including Herbal Drug Technology, Quality Control and Standardization of Herbal Dugs. He has guided more than 50 graduate students and currently involved in research on herbal drugs. He has published more than 20 national and international papers and 4 patents. He has delivered several lectures, presented papers, and organized several national and international conferences.



Dr. P.V.D.L.S. Ravi Prakash, Working as Principal & Professor at Madhira Institute of Technology & Sciences (College of Pharmacy) Paleannaram(v), Chilkur(M), Kodad B.Pharm from college of Pharmaceutical sciences, Mohuda, Berhampur University, Berhampur, Odisha in 2000. M.Pharm from A.U. College of pharmaceutical sciences, Andhra University, Visakhapatnam, Andhra Pradesh in 2002. Phd from A.U. College of Pharmaceutical Sciences, Andhra University, Visakhapatnam Andhra Pradesh in 2009. He has 21 years of teaching experience in the specialization of Pharmacognosy and Phyto-chemistry. Publish 10 research papers in various national and international journals.

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Text Book of Industrial Pharmacy

Professor (Dr.) D.Christopher Vimalson, Dr. Arjun Goje, Satyabrata Jena and Mrs. Swati Vikas Gondikar

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ISBN – 978-93-95936-99-6

Published by:

AGPH Books (Academic Guru Publishing House)

Bhopal, M.P. India

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About The Author




Professor (Dr.) D.Christopher Vimalson, M.Pharm., Ph.D., received his PhD degree in 2021 from Department of Pharmacy, Annamalai University, Chidambaram, Tamilnadu. He has been working as Professor and HOD in the Department of Pharmaceutics in United College of Pharmacy, Coimbatore. He has published 15 Research papers in Scopus Index and Two Indian patents paper published. He is being as member of many scientific associations. As a result of these many academic achievements and experience, it is being expected that this book will give tremendous knowledge as per the requisite of the Pharmacy Students.



Dr. ARJUN GOJE pursued Master in Pharmacy 2006-2008, Pharmaceutics as Specialization from Rajeev Gandhi University Bangalore, India. He obtained Ph.D in 2017 from National Institute of Medical Sciences, Jaipur. He received travel grants from CSIR, DST and he published 40 scientific research papers in reputed National and International peer reviewed journals and presented more than 20 abstracts in National and International scientific conferences. To his credit 4 Patent grants. He is a life member of Association of Pharmacy Teachers of India (APTI). Dr. Arjun Goje is currently working as Head of the department of Pharmaceutics, Teegala Ram Reddy College of Pharmacy, Hyderabad, Telangana.



Satyabrata Jena Associate Professor, presently working in department of Pharmaceutics, Bhaskar Pharmacy College, Hyderabad. He has rich experience of 25 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. He guided around more than 50 students in UG & PG dissertation works. He has twenty three Patents and many scientific publications in National and International Journals. He is author of two books, "Physical Pharmaceutics", "AI to Machine Learning in Pharmaceuticals". He is a member of many statutory bodies and reviewer for various journals.



Mrs Swati Vikas Gondikar, Presently working as assistant professor in Anwar ululoom college of Pharmacy, Hyderabad. She has completed B. pharm, Sri Venkateshwara college of pharmacy in 2007, and M.Pharmacy from St.Mary's college of pharmacy in 2014. Working in department of pharmaceutics since 7 years. She published 3 scientific research papers in reputed National and International peer reviewed journals, namely Sublingual Drug Delivery System. Gastro Retentive Drug Delivery Systems and Cefpodoxime proxetil floating tablets To his credit one Patent Publication "Formulation design of Zolmitriptan bilayer floating matrix tablet for biphasic release".

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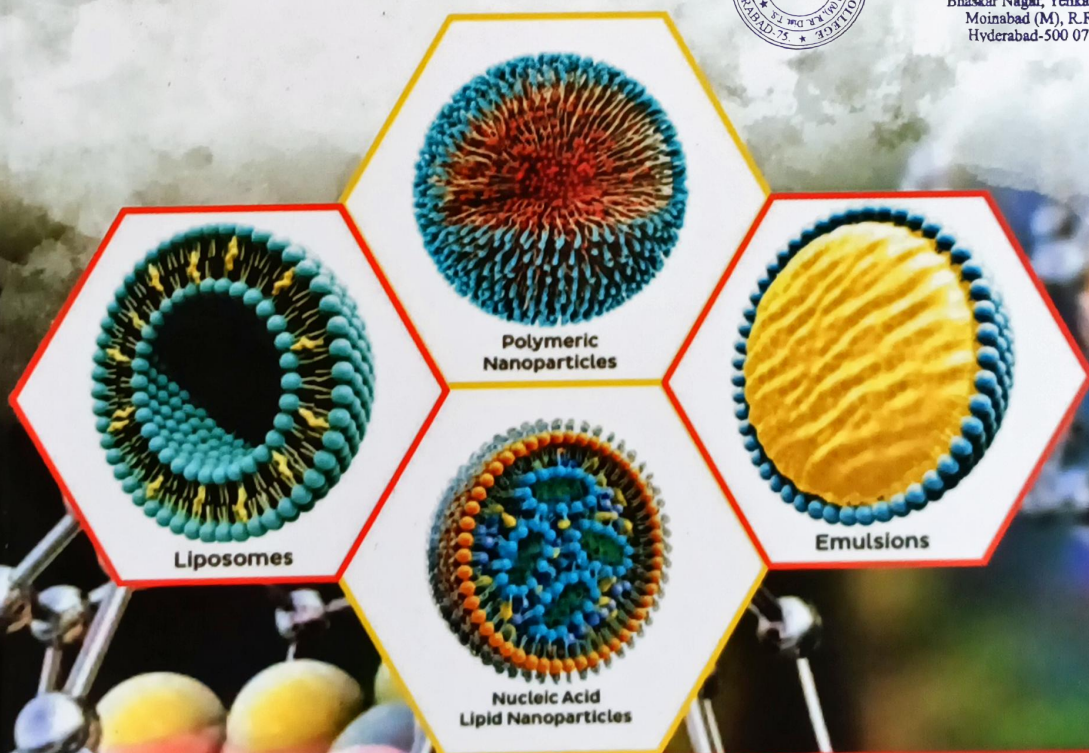


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Satyabrata Jena
Sanjay Kumar Gupta
Dr. Swati Mishra
Dr. Darshanam Vijaykumar



About The Authors



Satyabrata Jena, Associate Professor working in department of Pharmaceutics, Bhaskar Pharmacy College, Hyderabad. He has rich experience of 25 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. He guided around 50 students in UG & PG dissertation works. He has Forty one Patents in his credit and many scientific publications in National and International Journals also. He is authors of Five books Such as "INDUSTRIAL PHARMACY" in Lambert, Physical Pharmaceutics, AI to MI in Pharmaceutics, Text Book of Industrial Pharmacy, Introduction to Nanoscience and Nanotechnology. He is a member of many statutory bodies and reviewer for various journals.



Sanjay Kumar Gupta, persuing Ph.D. from Utkal University, Bhubanaswer, Odisha. Currently he is working as an Associate Professor & HOD in Department of Pharmaceutics, Global College of Pharmacy, Hyderabad. He has rich experience of 15 years in Teaching and Research in the field of Pharmacy. He guided more than 50 students in UG & PG dissertation works. He has six Patents in his credit and many scientific publications in National and International Journals. He is a member of many statutory bodies and reviewer for various journals.



Dr. Swati Mishra, PhD pharmaceutics, associate professor, Department of Pharmaceutics, Danteswari College of pharmacy Jagdalpur Chhattisgarh. She guided many students for their synopsis and thesis works. She published 15 review and 5 research papers in various national and international journal. She has one patent in her credit in pharmaceutical field. She is doing Extensive Research for preparation of various herbal formulations and as a reviewer for various Journal also.



Dr. Darshanam vijaykumar, associate professor, working in Department of Pharmaceutics, Swami Vivekananda institute of Pharmaceutical Sciences, Vangapally, Yadagirigutta. He Received his Ph.D from SJJT University, Chudela, Rajasthan. He has 10+ Experience in Teaching and Research field in Pharmacy. He Support and guided Around 30+ Students in UG & PG Dissertation Works. He has Five Patent and Many Scientific Publications in National and International Journals. He has attend so many work shops & web Conferences & Quiz Contests. He has Qualified in G-PAT and He is a life time member in Association of Pharmaceutical Teachers of India (APTI).

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Satyabrata Jena, Sanjay Kumar Gupta, Dr. Swati Mishra and Dr. Darshanam Vijaykumar

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ISBN – 978-81-19025-67-1

Published by:

AGPH Books (Academic Guru Publishing House)

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About The Author




Professor (Dr.) D. Christopher Vimalson, M.Pharm., Ph.D., received his PhD degree in 2021 from Department of Pharmacy, Annamalai University, Chidambaram, Tamilnadu. He has been working as Professor and HOD in the Department of Pharmaceutics in United College of Pharmacy, Coimbatore. He has published 15 Research papers in Scopus Index and an Indian patent paper published. He is being a member of many scientific associations. As a result of these many academic achievements and experience, it is being expected that this book will give tremendous knowledge as per the requisite of the Pharmacy Students.



Dr. Lagnajit Mahapatra, M. Pharm, Ph.D. pursued his master in pharmacy (2005-2007), Industrial pharmacy as specialization from Annamalai University, Tamil Nadu. He obtained Ph.D. IN 2016. He is having 16 years of experience in Teaching and Research. Currently he is working as Professor in Haldia institute of pharmacy. He has published 22 scientific research papers in international and national peer reviewed journals. He has published as book chapter in computer aided drug design in Elsevier. He is a life member of INDIAN PHARMACY GRADUATE ASSOCIATION and has guided more than 15 M. pharm students for projects and research.



Satyabrata Jena Associate Professor, presently working in department of Pharmaceutics, Bhaskar Pharmacy College, Hyderabad. He has rich experience of 25 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. He guided around 50 students in UG & PG dissertation works. He has twenty three Patents and many scientific publications in National and International Journals. He is author of a book "INDUSTRIAL PHARMACY" in Lambert. He is a member of many statutory bodies and reviewer for various journals.



Souvik Giri has a brilliant record with Masters in Pharmacy from SIKSHA O ANUSANDHAN and excelled in Bachelor of Pharmacy from Sri Jayadev College of Pharmaceutical Sciences affiliated to Biju Patnaik University of Technology, Odisha. During his teaching journey he has taught many subjects under pharmacy curriculum and expertise in various multi-disciplinary research areas with many publications in Peer Reviewed indexed journals. He was former FR&D scientist in Optimus Pharma; Hyderabad. He is life member for professional body like APTI.

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Physical Pharmaceutics

Professor (Dr.) D.Christopher Vimalson, Dr. Lagnajit Mahapatra, Satyabrata Jena and Souvik Giri

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ISBN – 978-93-95936-64-4

Published by:

AGPH Books (Academic Guru Publishing House)

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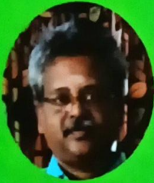


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ABOUT THE AUTHORS



Dr Seena K.X is currently working as a Professor and HOD, Department of Pharmacognosy, Indira Gandhi Institute of Pharmaceutical Sciences, Perumbavoor, Ernakulam, Kerala. She has completed Ph.D from Manipal College of Pharmaceutical Sciences, Manipal University under AICTE Scholarship, M.Pharm in Pharmacognosy from J.S.S college of Pharmacy, Ooty and B.Pharm from Grace college of Pharmacy, Kerala. She has 14 years of teaching experience. She has several scientific publications in peer reviewed journals and presented papers in various conferences. She received Publication award from Manipal university and her research area of interest includes bioactivity guided isolation and natural product research.



Prof. KNV Rao, Principal cum Professor working in, Nalanda College of Pharmacy, Nalgonda, Hyderabad. He has rich experience of more than 30 years in Teaching and Research in the field of Pharmacy. He guided around 85 students in UG & PG dissertation works. He has more than 120 scientific publications in National and International Journals. He has on Patent in his credit. He is a member of many statutory bodies and reviewer for various journals.



Satyabrata Jena Associate Professor working in department of Pharmaceutics, Bhaskar Pharmacy College, Hyderabad. He has rich experience of 25 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. He guided around 50 students in UG & PG dissertation works. He has Fifty one National Patents and Seven International Patents and many scientific publications in National and International Journals. He is author of 5 books "INDUSTRIAL PHARMACY" in Lambert, AI to Machine Learning In Pharmaceutics (AGPH Publication), Physical Pharmaceutics (AGPH Publication), Text Book of Industrial Pharmacy (AGPH Publication), NDDS (AGPH Publication). He is a member of many statutory bodies and reviewer for various journals.



Mrs. K. Sumalatha, Assoc. Professor working in department of Pharmacognosy, Bhaskar Pharmacy College, Hyderabad. She has rich experience of 13 years in Teaching and Research as well as Industrial experience in the field of Pharmacy. She guided more than 25 students in UG & PG dissertation works. She has 23 Publications in National and International Journals and also 6 Patents in her credit in Pharmaceutical field. She is doing extensive Research for Preparation of various Herbal formulations and also a member of many statutory bodies and as a Reviewer for various Journals also.



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978-81-19135-84-2

ISBN: 978-81-19135-04-2



RESEARCH FOUNDATION OF INDIA

International Book Publication

Publisher & Print: 417 RFI Tower Kamla Nehru Nagar

Ward JBP, India

K 185, Ground Floor Sarita Vihar, New Delhi, India

PHARMACOGNOSY AND PHYTOCHEMISTRY

Author's
Dr. Seena K X,
* Prof. (Dr.) KNV Rao,
Satyabrata Jena,
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RFI *Publication*
International Book Publication

First Edition 2023

MHRD ISBN – “978-81-19135-04-2”

Price: 485 INR

Size: A5

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Bibliographic Information:

Title:

Pharmacognosy and Phytochemistry

Author's

Dr. Seena K X, Prof. (Dr.) KNV Rao, Satyabrata Jena,

Mrs. K. Sumalatha

Publisher

RFI

Year - 2023



RFI Publication
International Book Publication

Publisher:

Publisher & Editor in Chief, RFI (registered under the government of India book Publication acts) India.

Printing & Publisher Address:

417 RFI Tower Kamla Nehru Nagar Ward JBP, India

K 185, Ground Floor Sarita Vihar, New Delhi, India



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TITLE : National Conference On Novel Pharmaceutical
Advancements

E-ISBN : 978-93-945102-7-2

Editor : Dr. A. Srinivasa Rao, Prof. G. Bhavani, Dr. M. Srikanth,
Dr.P.Rajesh Kumar

Price : 149/- INR

Published by : Cape Comorin Publisher Kanyakumari, Tamilnadu, India

Website : www.capecomorinpublisher.com


Imprint at : Cape Comorin Publisher Kanyakumari, Tamil Nadu,
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19	Mr. P Kranthi Kumar	The use of subcutaneous DL is beneficial for the survival of human embryonic stem cells.
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21	Dr.S Z Humaira Hussaini	As prospective new antihistamines, 5-[2(3)-dialkylamino alkoxy] indole 2,3-diones were developed, produced, and biologically assessed.
22	Mrs. D Sherisha Bhavani	Bombax malabaricum extracts were investigated for their potential to decrease alloxan-induced hyperglycemia in rats.
23	Mrs. Suneetha Gowdu	Use of water-soluble carriers to improve the solubility of a low-quality medication
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25	Mrs. R Ramya Krishna	synthesis of a novel series of diphenyl-1,2,4-triazoles and derivatives with anti-inflammatory activity



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Development and validation of an RP-HPLC method for Dabigatran Etexilate Mesylate and its degradation studies.

Dr. A. Srinivasa Rao


Professor, Bhaskar Pharmacy College

ABSTRACT

A cost-effective and reliable RP-HPLC method has been developed for the measurement of Dabigatran Etexilate Mesylate in capsules, ensuring simplicity, precision, accuracy, and repeatability. The experiment included the use of quantitative High Performance Liquid Chromatography (HPLC) utilizing a SHIMADZU LC 20AT instrument with Spin Chrome Software and a UV-Visible Detector (SPD-20A). A PHENOMENEX Luna C18 column (5 μ m, 250 x 4.6mm) was used for the analysis. This study used a mobile phase consisting of a mixture of 70% methanol and 30% water. The optimized parameters included a flow rate of 1.2 ml/minute, a wavelength of 230 nm, a run time of 10 minutes, and a column temperature of 50 $^{\circ}$ C. The retention time measured was 4.60 minutes. The linear relationship was seen within the concentration range of 0-25 g/ml. The proposed methodology was evaluated using commercially accessible Paradaxa tablets containing Dabigatran Etexilate Mesylate. The tablet had a dosage of 75 milligrams of medicine. Validation investigations and statistical analysis corroborated the analytical findings. The recovery trials demonstrated a 96.67% accuracy rate for the proposed technique. Drug accuracy was quantified by assessing its repeatability, as well as the variance seen between different days and within the same day, expressed as the percentage relative standard deviation (%RSD). The examination of medication stability was conducted using a specific approach.

Key Words: HPLC, method validation, Dabigatran Etexilate Mesylate, precision, stability studies




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Comparative studies aimed at enhancing the dissolution of pitavastatin

Prof. G. Bhavani

Professor, Bhaskar Pharmacy College


Abstract:

This study employs liquisolid technology and solid dispersions to enhance the solubility, dissolution, and bioavailability of pitavastatin. Liquisolid compacts were produced using various proportions of polyethylene glycol 400, microcrystalline cellulose, and colloidal silicon dioxide. Solid dispersions were created using various carrier ratios of polyethylene glycol 6000 (1:2, 1:4, 1:6, 1:8). Each formulation was assigned certain physical attributes in order to comply with pharmacopoeial limitations. The invitro dissolution characteristics of liquisolid and solid dispersions were compared to those of the pure pitavastatin tablet formulation in a 0.1N hydrochloric acid solution. The liquisolid tablets containing microcrystalline cellulose exhibited a drug release rate of $63 \pm 2.42\%$ after 5 minutes, which was much higher than the drug release rate of $13 \pm 1.44\%$ seen with the pure drug. This improvement may be attributed to the enhanced wetting properties of the formulation.

Outer layer of a medication that can be dissolved. FTIR spectrum analysis revealed the absence of any interaction between the medication and excipient.

Key words: Liquisolid technologies, solid dispersions, pitavastatin, PEG6000.




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The development of metronidazole-loaded microspheres for the production of modified release tablets.

Dr. M. Srikanth


Professor, Bhaskar Pharmacy College

ABSTARCT:

This study develops and assesses metronidazole pills that specifically target the colon, utilizing natural polysaccharides. Developing formulations using natural polysaccharides to enhance the duration of medicine release in the stomach and small intestine. Analyze the patterns of drug release. Utilizing kinetic models for an optimized formulation. Formulations F1-F3, which included tamarind gum in different ratios, released up to 95% of the drug after 12 hours, as seen in dissolving studies conducted without caecum content. The gum karaya formulations (F4-F6) achieved a drug release rate of 97% during a duration of 10 hours. Formulations containing locust bean gum (F7-F9) exhibited a drug release rate of 95% for a duration of 8 hours. After a duration of 20 hours, the mixture of tamarind gum and gum karaya successfully released 97.8% of the drug. Formulations (F1-F3) with different ratios of tamarind gum released 93-96% of the medicine in dissolving medium, including rat caecum, after 11 hours. The gum karaya formulations (F4-F6) exhibited a drug release rate of 94-97% over a period of 9 hours. The formulations using locust bean gum (F7-F9) released 92% to 98% of the drug within 7 hours. On the other hand, the formulations including tamarind gum and gum karaya released 97.8% and 96.5% of the medication between 12 and 16 hours, respectively. The optimized formulation F11 underwent testing utilizing Zero-order, First-order, Higuchi order, Peppas model, and Hixson-Crowell model kinetics. The R^2 value of 0.9093 suggests that medicine release adheres to a zero-order pattern.

Key words: Dissolution, Peppas model, HP β CD and TPD-Z .




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Formulation and Development of Fast Dissolving Tablets (FDTS) Containing Sumatriptan Succinate Using a Straightforward and Economical Approach

Dr.P.Rajesh Kumar


Assistant Professor, Bhaskar Pharmacy College

Abstract:

For the treatment of migraines, this research seeks to develop a fast-dissolving sumatriptan succinate tablet in order to reduce latency time and accelerate action. The development of fast-dissolving tablets (FDTs) containing sumatriptan is proceeding using a straightforward and economical approach. Tablets containing superdisintegrants including polyplasdone XL, polacrillin potassium, primogel, L-HPC, pregelatinized starch, pearlitol SD 200, and spray-dried lactose were manufactured via direct compression. Incorporate flavoring and sweetness into the medication to enhance its palatability. Determine the appropriate disintegrant and diluent for sumatriptan succinate tablets that dissolve rapidly. For fast-dissolving tablets, F14 containing 5% polyplasdone was the optimal formulation. The rate of drug release is 92.0% after 5 minutes and 98.17 percent after 10 minutes. The results for the suminat-25 product were comparable. The results of the optimization indicate that the process of developing tablets containing fast-dissolving sumatriptan succinate was uncomplicated and economical.

Key words: Sumatriptan succinate, Primogel, L-HPC, Pearlitol SD 200 and Polacrillin potassium




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Reformulated Tablets Loaded with Antibiotic Microspheres

Dr. B Durga Prasad

Assistant Professor, Bhaskar Pharmacy College


ABSTRACT:

This study develops and tests a novel formulation to improve the bioavailability of Ziprasidone and Flurbiprofen Inclusion Complexes, which are extremely permeable and weakly soluble. Drug cyclodextrin inclusion complexed tablets were prepared using microcrystalline cellulose (Avicel101), sodium starch glycolate, Croscarmellose sodium, and Cross povidone, according to the literature. If released efficiently, inclusion complexed tablets may increase bioavailability of weakly water-insoluble medications like ziprasidone and flurbiprofen. This was the reasoning of the current investigation. Experimental data support complexation technology as a viable medication release method. F23 had double the drug release rate of TPD-Z, F11, and TPD-F in inclusion complexed systems. This may be related to HP β CD. Drugs complexed with HP β CD had a higher surface area exposed to dissolution medium, as the inclusion complexed formulations suspended drug molecules after disintegration.

As a molecular dispersion, the formulation may improve drug release by complexing the medication with HP β CD.

Key words: Microspheres, microcrystalline cellulose, HP β CD and TPD-Z.




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The antimicrobial qualities of leaves of *Jasminum grandiflorum* Linn

Dr. Narottam Pal


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Using the agar diffusion method, extracts of *Jasminum grandiflorum* Linn (Oleaceae) were examined for their capacity to suppress bacterial growth in vitro. The outcomes were contrasted with those obtained using penicillin, a common antibacterial therapy. Aqueous extract of the plant's leaves, petroleum ether, chloroform, acetone, and methanol were tested against *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli*, and *Pseudomonas aeruginosa* as test organisms. Out of all the extracts that were looked at, the petroleum ether, methanol, and aqueous extracts were the most effective against all four of the bacteria that were studied.

The only bacteria that were vulnerable to *Pseudomonas aeruginosa* and *Bacillus subtilis*'s impacts were those that were derived from it. The most effective treatment for *Pseudomonas aeruginosa* and *Escherichia coli* was acetone extract. Some of the terms linked to this research include in vitro antibacterial activity, *Jasminum grandiflorum* Linn, *Bacillus subtilis*, *Staphylococcus aureus*, *Escherichia coli*, and *Pseudomonas aeruginosa*.




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Isolation and quantification of chemical elements, therapeutic and cosmetic potential of *Jasminum grandiflorum* Linn.


Dr. M Srirama Chandra

Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Both humans and animals rely on plants. Natural plants surpass artificial drugs in their medicinal properties, and the natural world offers a plethora of therapeutic plant species. *Jasminum grandiflorum* Linn., a nocturnal flowering plant belonging to the Oleaceae family, synthesizes methyl jasmonates. These compounds play crucial roles in plant defense mechanisms, fruit maturation, growth decline, and several physiological activities. *Jasminum grandiflorum* Linn., a fragrant shrub native to tropical and warm temperate areas, with several therapeutic applications. Ayurveda use the leaves for the treatment of wounds. Plant flowers are used to decorate women's hair. This article presents a current evaluation of *Jasminum grandiflorum* Linn, with a specific emphasis on the isolation and measurement of its chemical components, its potential for therapeutic use, and the patents related to its use in medicinal and cosmetic formulations.




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A technique using reversed-phase high-performance liquid chromatography (RP-HPLC) was developed and validated to estimate the dose of lamotrigine in tablets.

Dr. P Sobitha Rani


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT

A high-performance liquid chromatographic approach has been developed and validated to analyze lamotrigine in commercial pharmaceutical products. This technique is easy, sensitive, and accurate, making it suitable for identifying the presence of the chemical. The compounds were effectively separated on a BDS Hypersil C18 reverse phase column using a mobile phase composed of a mixture of phosphate buffer and acetonitrile in a 40:60 volume/volume ratio. The separation was achieved with a flow rate of 1.0 millilitre per minute and a detection wavelength of 248 nanometers. The technique was verified using many criteria, such as linearity, precision, accuracy, specificity, robustness, and solution stability. To establish the suitability of the technique for regular quality control analysis of the drug, it is crucial to highlight that the study may be completed within a mere 10 minutes.

Key words: Lamotrigine , RP-HPLC.




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Create and test a novel Rp-Hplc technique for calculating bulk medication and pharmaceutical tablet pyridoxine hydrochloride and doxylamine succinate.

Dr. A.V.Kishore Babu


Professor, Bhaskar Pharmacy College

Abstract:

This work devised a straightforward, speedy, precise, precise, replicable reverse phase high performance liquid chromatographic method for concurrently quantifying pyridoxine hydrochloride and doxylamine succinate in doxinate tablets. The chromatographic separation was performed using an Inertsil ODS RP C18 column with dimensions of 4.6×250mm and a particle size of 5µm. The mobile phase consisted of a mixture of phosphate buffer with a pH of 3 ±0.02, ortho phosphoric acid, and acetonitrile in a ratio of 50:50. The separation was carried out at a flow rate of 1.0 ml/min, and the detection wavelength was set at 263nm. Pyridoxine hydrochloride had a retention time of 2.35 minutes, whereas doxylamine succinate had a retention time of 4.80 minutes. The suggested technique adheres to ICH criteria for accuracy, precision, linearity, range, and resilience. Pyridoxine hydrochloride and doxylamine succinate exhibited a linear relationship throughout the concentration range of 25µg to 150µg, with correlation values of 0.999 and 0.999, respectively. The RSD (Relative Standard Deviation) for method precision was 0.76 and 0.82, while the system precision was 0.80 and 0.71. The recovery of pyridoxine hydrochloride and doxylamine succinate ranged from 99.18% to 99.48%. The technique remains dependable even when there is a ±5% deviation in the mobile phase and reduced flow conditions. This technique is effective for routine analysis of API (Active Pharmaceutical Ingredient) and pharmaceuticals including pyridoxine hydrochloride and doxylamine succinate.

Keywords: Pyridoxine hydrochloride and Doxylamine succinate, RP-HPLC, Method development, Method validation.




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The use of RP-HPLC for the aim of developing and verifying a technique for CAPTOPRIL

Dr. V Lokeswara Babu


Professor, Bhaskar Pharmacy College

ABSTRACT

It has been demonstrated that an isocratic reversed phase high-performance liquid chromatographic (RP-HPLC) approach may be used for the purpose of measuring the quantity of captopril that is contained in active pharmaceutical ingredients (API), dose formulations, and human blood. Chromatographic separation was achieved using SYMMETRY C18 150X4.6mm, 3.7 μ m columns. The flow rate was set at 1.0 mL min⁻¹, and the detector was set at 272 nm. The environmental temperature was maintained throughout the process. Methanol and water were combined at a proportion of 70:30 volume/volume to form the mobile phase. With the addition of phosphoric acid at a concentration of 85%, the pH of the mobile phase was brought down to 3.0, which was successfully accomplished. A linear association was seen between the calibration curves and the range of 5-25 μ g mL⁻¹, with a correlation value of \pm 0.999 representing the degree of correlation. Both the limit of detection (LOD) and the limit of quantification (LOQ) were discovered to fall within the range of 0.4 to 2.3 μ g mL⁻¹. Both within and between runs, the precision and accuracy values varied from 98.0 to 102%. This was the case for both sets of data.

KEYWORDS: Captopril, Diuretics, RP-HPLC.




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The creation of formulations and the in vitro testing of tablets containing escitalopram that have an instant release mechanism

Mr. Satyabrata Jena


Assistant Professor, Bhaskar Pharmacy College

Abstract

The objective of this study is to produce a formulation for Escitalopram tablets that has a rapid release, with the goal of significantly increasing the bioavailability of these pills and reducing the negative effects that they have. In order to characterize escitalopram precompression blends, the angle of repose, bulk density, tapped density, Carr's index, and Hausner's ratio were taken into consideration. These qualities were taken into account after careful consideration. The precompression mix indicates that the flow ability and compressibility of all of the batches are good to fair. This signifies that the flow ability of the batches is great. In order to produce tablets with quick release, a number of different polymers, such as PEG 6000, Croscarmellose sodium, and Sodium-starch glycolate, were compressed in a range of concentration ratios. The tablets were manufactured with the help of these polymers. When it came to the pills that were manufactured, there were a variety of quality control features that were investigated before they were released. Every single test that was performed on the tablets was successful. It was determined that the F7 formulation, which included the drug in addition to Croscarmellose sodium, had the most favorable outcomes, which were 98.12 percent after 45 minutes. In each and every one of the formulas, this was the case. Consequently, it was evident from the dissolving data that the F7 formulation is the best formulation. This was clearly shown. via the execution of further study, including tests that are carried out in vitro.

Keywords: Escitalopram, PEG 6000, Croscarmellose sodium and Sodium-starch glycolate, Immediate release.




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Propranolol-containing gastroretentive floating tablet formula development

Mrs. K.Sumalatha


Assistant Professor, Bhaskar Pharmacy College

Abstract:

The purpose of this research was to produce and evaluate floating tablets containing propranolol that are gastro-retentive. The Components and Procedures: Propranolol hydrochloride is an antihypertensive medication. An acute myocardial infarction is the most common indication for its usage. As a result, the current research developed a propranolol gastro-retentive drug delivery method that combines swelling polymer and wet granulation. Weight fluctuation, hardness, friability, drug content, and in-vitro dissolution were all evaluated for each and every formulation. These gastro-retentive dosage forms are made using hydroxypropylmethylcellulose-K4M (HPMC-K4M), which allows for the production of sustain-release tablets that remain in the stomach for a longer period of time and distribute the medication to the stomach. In terms of statistics: In tablets, the Fourier transform infrared spectrum reveals that the medicine and polymer are compatible. Within a period of twelve hours in vitro, the F2 formulation was able to release 99.14% of its medicine. After compression, the pre- and post-compression properties of every formulation were found to be within the pharmacopoeial limits. According to the findings of the dissolution tests, formulation F2, which contains 50 mg of HPMC-K4M, 25 mg of sodium bicarbonate, 25 mg of polyvinylpyrrolidone K30, 1.5 mg of magnesium stearate, and 1.5 mg of Talc, is the most effective formulation. F2 has a buoyancy lag of forty seconds and a floating endurance of twelve hours. According to this study, HPMC-K4M floating tablets, which are made of a hydrophilic polymer, have the ability to increase the gross register tonnage of stomach dissolving fluid, which in turn helps to extend the delivery of drugs.

Keywords: Wet granulation, propranolol, hydroxypropylmethylcellulose-K4M, gastrointestinal medication delivery method.




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ZOLMITRIPTAN ODT is the subject of this research, which focuses on the formulation design and development process.

Mrs. P. Udaya Chandrika

Assistant Professor, Bhaskar Pharmacy College


ABSTRACT:

Zolmitriptan is a selective agonist targeting the serotonin receptor. Migraines with aura and headaches that are acute are treated with this medication. The present research endeavors to develop and assess a Zolmitriptan tablet that can be dispersed in a short amount of time. When it comes to patients who are water-deficient, orodispersible treatment is effective. A total of eight different formulations were created by using Direct Compression to combine pure medicine with excipients. Immediately after the priming process, the powder mixture was crushed into tablets using superdisintegrants (SSG, CCS, and CP) and polymers. In a seven-minute in-vitro drug release test, the tablets were evaluated for their hardness, thickness, weight variation, friability, drug content, and disintegration time. Additionally, the tablets were evaluated for thickness.

The studies were conducted using USP dissolving rate test equipment II (50 rpm, 370C \pm 0.50C) at a temperature of 370C. The dissolve solution used was phosphate buffer with a pH of 6.8 (900ml). The release of Zolmitriptan from tablet formulations may be predicted using UV spectroscopy at a variety of different periods. There is reason for optimism for compositions that greatly delayed the release of medicines. F5 with Drug to Croscarmellose Sodium (CCS) at a ratio of 1:2 is the formulation that has been optimized for in-vitro dissolving time of five minutes and gives 99.24% cumulative drug release. This formulation is one of the eight formulations.

Keywords: Direct Compression technique, Zolmitriptan, Croscarmellose Sodium.




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The anti-inflammatory and antioxidant effects of the roots of the INULA RACEMOSA plant are investigated in this study.


Mrs. C Nagamani

Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

The roots of *Inula racemosa* were examined to determine their impact on hyperlipidemia and oxidative stress in a diet-induced model, as well as on antioxidant parameters in vivo and in vitro. A hyperlipidemic state is brought on by combining a rat diet with cholesterol and saturated fats over a period of 28 days. Over the course of days 7, 14, 21, and 28, serum was extracted. For the purpose of determining cholesterol, triglycerides, HDL, LDL, glucose, AST, ALT, and bilirubin levels, separated serum was analyzed. On the 28th day, the liver was removed and analyzed for antioxidant indicators both in vivo and in vitro. Over a period of 28 days, oral administration of *Inula racemosa* resulted in a substantial reduction in cholesterol, triglycerides, LDL, glucose, AST, ALT, and bilirubin levels, while simultaneously increasing HDL levels ($P < 0.05$). Ten milligrams per kilogram of atorvastatin was used to compare the outcomes. In terms of catalase and glutathione levels, the plant exhibited a significant increase ($P < 0.01$), whereas the levels of LPO, NO, and DPPH were significantly reduced. A hyperlipidemia model demonstrated that *Inula racemosa* had significant antihyperlipidemic and antioxidant activity, with a p-value of less than 0.01. Research that is currently being conducted indicates that the roots of *Inula racemosa* has antioxidant and antihyperlipidaemic effects.




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In both tablet and bulk dosage forms, RP-HPLC techniques were used for the design and validation of the drug felodipine.

Ms. Tayyaba Mahtab


Assistant Professor, Bhaskar Pharmacy College

Abstract:

The validation of felodipine is accomplished by the use of Reversed Phase High Performance Liquid Chromatography (RP-HPLC). This method used RP-HPLC (Water 2695 with PDA detector) and an ODS C18 column that measured 4.6 x 150mm and was 5 meters in length. The mobile phases consisted of a mixture of water and acetonitrile at a volumetric ratio of 80:20. At a wavelength of 305 nm, MTS was eluted, and its retention time was 3.155 minutes. The method was continued and verified in accordance with ICH standards. The validation of the method shown that it is quick, particular, precise, exact, dependable, and that it can be repeated. The plots of the calibration curve were linear all the way from 15 to 75 µg/mL ($R^2 = 0.9998$). Both the detection limit (LOD) and the quantification limit (LOQ) were determined to be 0.19µg/ml and 0.6µg/mL, respectively. The method recoveries were outstanding, ranging from 98.9 to 100.4%. A statistical research demonstrates that the method can analyze large quantities of felodipine pills without being affected by the excipient. The examination into the kinetics of degeneration was also confirmed. The estimation of plasma and other biological fluids might be extended upon using this method.

Keywords: Felodipine, RP-HPLC, Method Development and Validation.




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Formulating, designing, developing, and testing etodolac glycol derivatives using natural polymers

Mrs. N. Rajitha


Assisatnt Professor, Bhaskar Pharmacy College

ABSTRACT:

Etodolac is effective in alleviating pain caused by a wide variety of conditions. As an additional benefit, it alleviates arthritic pain, edoema, and stiffness. Medicine that is non-steroidal anti-inflammatory compound. The purpose of this study was to develop a floating Etodolac delivery system by making use of natural polymers and Direct Compression. For each and every composition, the characteristics of hardness, friability, disintegration time, and dissolution were evaluated. The tablets that had disintegrated were thrown away. A closer look was taken at the floating tablets. Pectin, Xanthan gum, and Guar gum were used in the production of gastro retentive tablets. These tablets were designed to remain in the stomach for a longer period of time and to carry the medication to the stomach. Through the use of in-vitro dissolving tests, it was determined that formulation F-3, which included 150 mg of Xanthan gum, 85 mg of NaHCO₃, 9 mg of stearate, 9 mg of Talc, and sufficient amounts of microcrystalline cellulose, was the most effective. Xanthan gum is included in the drug formulation F-3, which has a polymer ratio of 1:0.5. Over the course of twelve hours, F-3 expelled 98.67±0.25% of the drug. According to the findings of this study, floating tablets that include Xanthan gum, which is a natural polymer, make the stomach dissolving fluid GRT more effective in delivering the medication in a consistent manner. It is possible to accomplish the objectives of gastro retentive floating tablets by formulating floating tablets designed to represent model medicines.

Key words: Etodolac, Floating Tablets, Natural Polymers.




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The formulation procedure involves creating levetiracetam oral dispersible pills.

Ms. Ayesha Afreen


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Levetiracetam treats epilepsy. It treats partial-onset, myoclonic, and tonic-clonic seizures. Reduces brain excitability. This project will develop and test an orodispersible Levetiracetam pill. Pediatric, geriatric, bedridden, developmentally challenged, recurrent nausea, traveling, and water-deprived patients are targeted by these unique oral dissolving/disintegrating dosage forms. Nine formulations were combined by compressing medicine and polymers in the required ratio. Tablets were made from powder mixtures employing Superdisintegrants (CP, SSG, and CCS) and Excipients. The tablets were examined for weight variation, thickness, hardness, friability, drug content, and disintegration time (Sec) in a 20-minute in vitro study utilizing phosphate buffer (pH 6.8) as a dissolving medium (900ml) (USP dissolution rate test equipment II, 50 rpm, 370C); UV spectroscopy measured Levetiracetam release from tablet formulations. Drug compositions that dramatically delayed release are promising. One of the nine formulations, F5, with Drug to Sodium Starch Glycollate (SSG) and Cross Povidone (CP), is optimized for a 10-minute in-vitro duration and $99.82 \pm 0.37\%$ cumulative drug release.

Keywords: Levetiracetam, Orodispersible Tablets, Sodium Starch Glycollate, Cross Povidone.




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**Limb stromal cells had greater expression than bone marrow,
adipose-derived, and foreskin fibroblasts.** Mr. Mr. Naik

Mr. Ram Reddy G


Associate Professor, Bhaskar Pharmacy College

ABSTRACT:

When it comes to the treatment of blindness that is brought on by corneal damage, limbal epithelial stem cells, which are also referred to as LESC, show a significant degree of promise. LESC are considered to be a promising therapy option. The name of the stem cell niche that has been used in order to keep LESC alive and well during its development process is the Palisade of Vogt. Limbal stromal cells, which are also known as LS cells, are an essential component of the niche that LESC inhabit and contribute to the process of self-renewal that they go through. Limbal stromal cells come in a variety of different names. In addition to these cells, there are two more kinds of cells that are analogous to these cells: stem cells and mesenchymal stromal cells. These cells have the potential to differentiate into a number of different lineages. On the other hand, in contrast to MSC that are produced from a broad variety of sources, there is an extremely limited amount of information that is accessible on the gene expression profile of these cells.

Keywords: limbal stromal cells; bone marrow mesenchymal stromal cells; adipose mesenchymal stem cells; gene expression profiling; microarray; limbal epithelial stem cells




PRINCIPAL
BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkopally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

The use of subcutaneous DL is beneficial for the survival of human embryonic stem cells.

Mr. P Kranthi Kumar


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Islet transplantation for Type 1 Diabetes Mellitus (T1DM) has gained in popularity, although donor availability may restrict the treatment. A promising option is human embryonic stem cell (hESC) therapies, which have exhibited maturation, yield, and insulin release in response to stimulation. We developed a new subcutaneous cellular transplantation approach. This study examines the transplantation of differentiated pancreatic endoderm (PE) cells from hESC into the pre-vascularized Device-Less (DL) site to cure diabetes. In fifty immunodeficient mice, 25 were diabetic and 25 were not, PE cells were implanted. Engraftment and maturation were assessed by removing grafts from animals after 22 weeks. Although not statistically significant, diabetic mice showed increased engraftment (48% vs. 36%, $p = 0.19$) and generated more human C-peptide after glucose stimulation (0.32 ± 0.15 ng/mL vs. 0.13 ± 0.09 ng/mL, $p = 0.30$). Diabetes cure required additional maturation. Monomorphic cystic changes were seen in 12% of diabetes and 8% of non-diabetics ($p = 0.32$). The DL space's collagen wall appeared to limit all transplants. Our findings demonstrate the DL site's ability to harbor PE cells and allow safe maturation as a potential diabetic therapy.

Keywords: islet Transplantation; embryonic stem cells; cell engraftment; cellmaturation




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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yencapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Boceprevir Estimation in Pharmaceutical Formulations and Bulk by Spectrophotometry.

Dr. G. Susmitha

Professor, Bhaskar Pharmacy College

ABSTRACT:

An anti-retroviral drug known as boceprevir has been the subject of a brand new extractive spectrophotometric method that has been developed for the purpose of determining boceprevir. This method is basic, rapid, and cost-effective. Boceprevir, a protease inhibitor that works directly on the liver, is the treatment that is used to treat hepatitis C. In addition to this, it has two isomers, with the S isomer being more active than the R-isomer in terms of its activity. These were the methods that were based on the manufacture of color chromogens, and the colorants that were used were methyl orange indicator, bromo cresol green, bromo thymol blue, and bromo phenol blue. For the purpose of carrying out the extractive spectrophotometry, phthalate buffer and chloroform were used. Using the blank concentration of the relevant reagent, the absorbances of the chromogens were measured at 410 and 415 nanometers. The results were compared to the overall blank concentration. It has been shown that the procedures that were described have been successfully applied on the drug in bulk configuration. An examination of the technique via the lens of statistical analysis has been carried out, and the findings have shown that it is precise and accurate.

Keywords: Anti-hepatitis, Anti-HIV, Chromogen, Boceprevir, Extractive spectrophotometry, Victerealis



Susmitha
PRINCIPAL
BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

As prospective new antihistamines, 5-[2(3)-dialkylamino alkoxy] indole 2,3-diones were developed, produced, and biologically assessed.

Dr.S Z Humaira Hussaini

Professor, Bhaskar Pharmacy College

Abstract

A wide variety of one-of-a-kind items in abundance Within the scope of the present investigation, the production of 5-[2(3)-dialkylamino alkoxy] Indole 2, 3-diones was carried out. These chemicals may be traced back to the chemical compound known as 5-hydroxy isatin, which served as the beginning material. To make the 5-[2(3)-dialkylamino alkoxy] Indole 2,3-diones, a mixture of 5-hydroxy isatin, dialkylamino alkylhalide, and alcoholic potassium hydroxide was exposed to moderate agitation for a period of six hours at room temperature. This was done in order to get the desired result. It was via this action that we were able to get the results that we had hoped for. During the course of the studies that were carried out, infrared spectroscopy, nuclear magnetic resonance, and mass spectrometry were used in order to characterize the structures of the products. For the purpose of determining the antihistaminic activity of each and every chemical, the Histamine chamber method was used. For this method to be successful, it was necessary to investigate each and every chemical.

Keywords: Synthesis, 5-[2(3)-dialky amino alkoxy] indole 2, 3-diones, antihistaminic activity.



Humaira
PRINCIPAL
BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenikapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Bombax malabaricum extracts were investigated for their potential to decrease alloxan-induced hyperglycemia in rats.

Mrs. D Sherisha Bhavani


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

There are a number of conditions that have traditionally been treated using the medicinal plant Bombax Malabaricum. One of these conditions is diabetes mellitus. In the present study, rats that had been given alloxan to induce diabetes as well as animals that did not have diabetes were utilized to investigate the effects of aqueous and ethanolic Bombax Malabaricum extracts on lowering blood sugar levels. Oral administration of glibenclamide at a dosage of 20 mg/kg was administered to rats, in addition to the administration of bark extracts at concentrations of 100 and 200 mg/kg in aqueous and ethanol respective. Following the administration of these doses, the animals in the research did not display any aberrant behaviors or indications of acute poisoning. It was determined that the blood glucose levels of normal rats were assessed at 0, 1, 3, and 5 hours after treatment, whereas the blood glucose levels of diabetic rats were examined at 0, 1, 3, and 5 days, respectively. Rats that were either normal or had diabetes that was generated by alloxan were shown to have significantly ($p \leq 0.05$) decreased levels of hyperglycemia when they were subjected to various extract doses. The hypoglycemia effects were most visible between 30 and 180 minutes after treatment, and the results of the tolerance tests for ethanol extracts were significant ($p \leq 0.05$). In respect to glucose, the hypoglycemic effects were most noticeable between 30 and 180 minutes.

Keywords: Bombax Malabaricum, diabetes mellitus, extract, hypoglycemic.




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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkampally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Use of water-soluble carriers to improve the solubility of a low-quality medication

Mrs. Suneetha Gowdu


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Solid dispersion was utilized in order to investigate the effect that a number of water-soluble carriers have on the process of dissolving famotidine, which is a medicine that is not very soluble. The goal of this investigation was to improve the dissolution of famotidine, which is a drug that is not particularly soluble. For the purpose of accomplishing this goal, carrier chemicals such as urea, mannitol, and sorbitol were used. methods such as Fourier transform infrared spectroscopy (FTIR) and differential scanning calorimetry (DSC) were used in order to evaluate the solid dispersions. The findings of these methods demonstrated that the formulation exhibited a detectable reduction in the crystallinity of the drug. Because of this loss, the rate at which the material dissolved increased, which was the cause of the increase. Every single one of the solid dispersions that were manufactured demonstrated an improvement in dissolution when compared to the pure drug; however, the degree of improvement differed from one dispersion to the next. In comparison to sorbitol and mannitol, which were the other carriers that were used in this investigation, urea shown a more significant enhancement in terms of its solubility.

Keywords: Famotidine, Carrier, Solid dispersion, Characterization, Dissolution enhancement.




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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Methyl-2-(2-(Arylideneamino) Oxazol-4-Ylamino) Benzoxazole-5-carboxylate derivatives were developed, synthesized, and biologically tested as possible anti-inflammatory drugs.

Mrs. K Tejonidhi


Assistant Professor, Bhaskar Pharmacy College

ABSTRACT:

Due to the fact that the synthesis method was carried out, a wide range of one-of-a-kind methyl-2-(arylideneamino)oxazol-4ylamino)benzoxazole-5- carboxylate derivatives were created. As a result, the process of synthesis was the one that was responsible for the creation of these substances. The structures of these substances were determined by the use of a range of distinct methodologies, including infrared spectroscopy, nuclear magnetic resonance (^1H and ^{13}C), mass spectrum data, and elemental analysis. An experiment was conducted with the intention of establishing whether or not certain compounds have the ability to reduce inflammation. Using the framework of the approach that included the induction of rat paw edoema by carrageenan, derivatives VIId and VIIe demonstrated an anti-inflammatory efficiency that was not only exceptional but also almost comparable to that of the standard drug Diclofenac Sodium. This was the case within the framework of the method. This was shown by the fact that they were successful in lowering the level of inflammation that was present because of their effectiveness.

Keywords: Benzoxazole derivatives, IR, ^1H NMR and Mass spectroscopy, methyl-2-(arylideneamino)oxazol- 4ylamino) benzoxazole -5-carboxylate and anti inflammatory.




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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.

Synthesis of a novel series of diphenyl-1,2,4-triazoles and derivatives with anti-inflammatory activity

Mrs. R Ramya Krishna


Assistant Professor, Bhaskar Pharmacy College

Abstract:

The current work has led to the synthesis of a number of distinct 1-[3-(4-substitutedphenyl)-5-phenyl-4H-1,2,4-triazol-4-yl]urea and 1-[3-(4-substitutedphenyl)-5-phenyl-4H-1,2,4-triazol-4-yl]thiourea derivatives, spanning from 4-Ia to 4-IIId. These derivatives have been synthesized. Characterization of the newly synthesized derivatives was accomplished by the use of the results obtained from infrared spectroscopy, nuclear magnetic resonance with ^1H , and mass spectral analysis. Using a rat model of paw oedema caused by carrageenan, the target compounds that had been synthesised and characterized were then put through further testing to establish whether or not they have anti-inflammatory components. This was done in order to discover whether or not the compounds had anti-inflammatory properties. There was just one molecule, 4Id, that exhibited a significant anti-inflammatory activity ($p < 0.05$) among all of the newly synthesized derivatives. On the other hand, compounds 4Ia-4Ic and 4IIa-4IIId exhibited a considerable reduction in inflammation ($p < 0.0001$), making them the most beneficial compounds related to this particular aspect. As a result, these chemicals have showed the ability to offer an impact that is anti-inflammatory.

Keywords: 1,2,4-triazoles, IR, ^1H NMR, Mass Spectroscopy and anti-inflammatory activity.




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BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yenkapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075. T.S.



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PRINCIPAL
BHASKAR PHARMACY COLLEGE
Bhaskar Nagar, Yencapally (V),
Moinabad (M), R.R. Dist.
Hyderabad-500 075, T.S.



