ICIREMPS 2K18-19

5th International Conference of

Theme
Advances in Engineering, Pharmaceutical & Applied Sciences

February 21-23, 2019

In Association With

[Logos of various organizations]

Scientific Proceeding

Editors: Dr. Jitendra Banweer & Dr. Nilesh Jain
## ICIREMPS-2K18-19

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Message

I am extremely delighted to know that Sagar Group of Institutions, Bhopal are going to organize the 5th International Conference on Advances in Engineering, Pharmaceutical and Applied Sciences from February 21 to 23, 2019.

It is really a highly satisfying moment for me as a person at the helms of affairs of SGI and Chief Patron of the International Conference on Advances of Electronics, Computer Science and Mathematical Science. I am happy to find an overwhelming response to this conference which encompasses broad areas of research and started with a high standard datum. It is heartening to observe that the delegates are from a variety of institutions all over the world. In fact, about a decade back, I dreamt having high-quality professional Institutions, which is a reality today. Also, I added the word "Research" in all the institutions to reveal the discrete emphasis on this activity.

I am proud that the conference group is in line with the focus of ensuring 21st-century exposure to students, development of research-oriented entrepreneurial mindset for faculty and creating a technology-enabled environment in an institute. Taking SGI to global Platform needs innovations, the intervention of Technology, Networking and Research orientation for all stakeholders. As a step towards the same, Society has launched, which organizes this program.

I wish a grand success to this mega event and congratulate the team of organizers for the same.

(Er. Sanjeev Agrawal)
CMD & Chancellor, SAGE University
Introduction

Sagar Institute of Research and Technology is creating new avenues for the corporate world to explore the academic of the country and to foster industry institute partnership. The massive infrastructure of the institute, well-equipped laboratories, and a state of the art networked computing laboratories, a rich collection of books and national and international journals in the library and ample opportunities to students to showcase their talent in extracurricular and co-curricular activities make this place a true learning center.

All the institutions of Sagar Group i.e, (Sagar Institute of Research and Technology (SIRT), Sagar Institute of Research, Technology & Science (SIRTS) , Sagar Institute of Research & Technology Excellence SIRTE), Sagar Institute of Research & Technology( SIRT-P), Sagar Institute of Research, Technology & Science-Pharmacy (SIRTS-P), have major emphasis on research activities (as indicated in the titles).

Eminent Academicians from India and abroad are visiting the group under various programs. The Sagar Group Institutions (SGI) functions under the patronage of Shri Agrawal Technical & Education Society were established in 2003. The Chairman of the Group, Er. Sanjeev Agrawal (B.E., M.Tech., MANIT, Bhopal) is a dynamic Technocrat & has a firm belief in strenuous efforts with ethical values. He has also been honored by Vijay Shree Award 2005, Nagrik Parishad Award 2005, Indra Gandhi Shiromani Award 2006, Shiksha Bharti Puruskar 2009, Shiksha Shashtri Puruskar 2009, Captains of Industry Award 2010, Best Entrepreneurship Award 2012 in MP in the Field of Education, Sagar Institution Award 2012, India Education Excellence Award (Best Engineering Institute in M.P.) 2012, Best Institute in Training & Placement in Bhopal (Education Excellence Award) 2013, CMAI National Madhya Pradesh Education Award (Excellent Innovation Institute Award) 2013 & Education Excellence Award (Brands Academy) 2013.

Mission

Working towards being the best by incorporating the principles of Total Quality Management (TQM) and Excellence. Adopting IT-based knowledge, management to meet global challenges.
Vision
To motivate and mold students into world-class professionals who will excel in their fields and effectively meet challenges of the dynamic global scenario.

Key Practices adopted by the Institution
Sagar Group of Institutions is striving to transform SIRT into a ‘Knowledge Enterprise.’ A knowledge enterprise is an institution which is capable of production, marketing, maintenance and innovation of knowledge as a product. The Management and Faculty are in the process of shaping the SIRT into an Institute of Excellence. The model of excellence that has been identified for the SIRT includes the following key practices:

- Relevance to the needs of students, industry and other majors take holders in all its academic activities and pursuits.
- Seeking cost-effectiveness and high quality in the key areas of institutional performance.
- Ensuring both internal and external efficiency in its operation.
- Becoming pro-active and influencing in its linkages with related others like industry, the technical education fraternity and among social service agencies.
- A vision and road-map for accomplishment the vision have been evolved and are under implementation
- An attempt at incorporating e-governance is under progress. Computer applications on managing the institution are an area of focus.

The attempt at incorporating for excellence implemented a substantial number of innovative steps in shaping its students for corporate and professional careers

Apart from the mainstream of curriculum activity, it also works on development of students through live projects, value addition courses, and inclusive education in spoken and written English and training in industry is a complementary pursuit of significance

To ensure institutional impact, the establishment of training & placement Cell, providing it with a meaningful role and designating a Task Group to implement associated endeavor is an ongoing initiative.

Institutes
- Sagar Institute of Research & Technology (SIRT)
- Sagar Institute of Research, Technology & Science (SIRTS)
- Sagar Institute of Research &Technology Excellence(SIRTE)
- Sagar Institute of Research &Technology-Pharmacy(SIRT-P)
- Sagar Institute of Research, Technology & Science -Pharmacy (SIRTS-P)
Courses Offered
- Diploma in Engineering and Bachelor of Engineering (BE)CSE, ME, EC, CE, IT, EX, MTECH,
- Bachelor of Pharmacy (B. Pharm.)
- Master of Business Administration (MBA)
- Master of Technology (M.TECH)
- Master of Computer Application (MCA)
- Master of Pharmacy (M. Pharm.)

Research Activities
The Group houses a research forum with the name Sagar Society for Interdisciplinary Research & Technology, (SSIRT), which publishes research Journal. The management faculty also brings out its annual proceedings. Journal of Engineering, Management and Pharmaceutical Sciences, ISSN 0976-8416, Sagar Manthan” A Journal of Management and Research ISSN: 2278-5116.

The faculty and associated scholars are engaged in individual and joint activities. These are more than 15 on research projects, 40 books and above 1000 research papers in national and international journals of repute. The institution organizes conferences, seminars regularly having participation from all over more than 25 senior faculty member who supervise Ph.D. Scholars and almost all are guiding dissertation in master programs many of the mare associated with many research journals or otherwise in India and Abroad.

Institute Achievements
- Accredited by National Board of Accreditation (NBA)
- Accredited by the Technical Education Quality Improvement Programme (TEQIP)
- Accredited by TATA Consultancy Services (TCS).
- Signed MOU with IBM for training & producing IBM Certified Engineers.
- Academic alliance with ORACLE for training & producing Oracle Certified Engineers.
- Academic alliance with IBM for IBM Rational eRose.
- Tie-ups with BHEL, Tata International, CIPET, Kirloskar and many more.
- The patent on Automatic Energy Monitoring System.

Dr. Prashant Jain
Vice Chairman, SGI, Bhopal
Message

I am extremely happy to learn that the Fifth International Conference on “Advances in Engineering, Pharmaceutical and Applied Sciences”, is being held at Sagar Group of Institutions, Bhopal, during February 21-23, 2019.

The conference of this nature and magnitude will certainly be of immense help to the academic community, researchers and also the students’ community. The participants will be able to enhance their knowledge and competence by learning from the experiences of experts in the subject fields which will eventually help applying such skills towards development of society.

I am confident that the experts, professionals, academicians and students will have opportunity to share their thoughts and exchange ideas during conference, leading to meaningful outcome of such deliberations,

I congratulate the organizers for taking such initiative and convey my best wishes for the success of the conference.

Dr. Tushar K. Nath
(Vice Chancellor)
SAGE University

Kailod Kartal, Indore-Dewas Bypass Road, Rau, Indore - 452020
Phone: 0731-2906986, Website: www.sageuniversity.in
International Advisory Committee
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Local Advisory Committee
LOCAL ADVISORY COMMITTEE

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CMD, The SAGE

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<tr>
<td>Pharmaceutical Sciences</td>
<td>Dr. Nilesh Jain</td>
<td><a href="mailto:prof.nileshjain@gmail.com">prof.nileshjain@gmail.com</a></td>
</tr>
<tr>
<td>CSE, IT &amp; Comp. Application</td>
<td>Dr. Rajesh Shukla</td>
<td><a href="mailto:rkumardmh@gmail.com">rkumardmh@gmail.com</a></td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>Dr. Rakesh Patel</td>
<td><a href="mailto:rakeshasct@gmail.com">rakeshasct@gmail.com</a></td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>Dr. Alok Agrawal</td>
<td><a href="mailto:alokag03@gmail.com">alokag03@gmail.com</a></td>
</tr>
<tr>
<td>Electronics &amp; Elec. Engineering</td>
<td>Dr. M. Fatima</td>
<td><a href="mailto:mehajabeen.fatima@gmail.com">mehajabeen.fatima@gmail.com</a></td>
</tr>
<tr>
<td>Applied Sciences</td>
<td>Dr. Meena Morya</td>
<td><a href="mailto:meenakuhu@gmail.com">meenakuhu@gmail.com</a></td>
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Local Organizing Committee
# LOCAL ORGANIZING COMMITTEE

## Reception and Welcome
1. All Group Members, Directors and Deputy Directors
2. Dr. Keshav Mishra Convenor
3. Mr. Vineet Sitoke Co-Convenor
4. Ms. Payal Saiju
5. Dr. Vaseema Khan
6. Dr. Dharmendra Tyagi
7. Prof. Navneet Kaur
8. Ms. Preeti Sharma

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2. Mr. R.P. Singh Co-Convenor
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4. Mr. Surendra Badgujar
5. Mr. Sandeep Wadekar
6. Mr. Vivek Singh Rajput

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2. Mr. Tarun Khare Co-Convenor
3. Mr. Satyam Tayal
4. Mr. Abhigyan Tiwari
5. Mr. Mayank Gupta
6. Dr. Nitin Tenguriya
7. Ms. Mukta Chandani

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2. Prof. Rajdeep Singh Co-Convenor
3. Prof. Yogesh Agrawal
4. Prof. Arun Jhapate
5. Prof. Virendra Singh
6. Dr. Rachna Prasad
7. Prof. Bharti Salunke

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2. Mr. Sourabh Birole Co-Convenor
3. Ms. Sonam Jain
4. Ms. Mala Jain
5. Ms. Shruti Dixit
6. Ms. Swati Pandey
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2. Dr. Nishi Prakash Jain  
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4. Dr. Devendra Bajpayee
5. Mr. Praveen Tahlani
6. Mr. Praveen Katiya
7. Mr. Parag Bhargava

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   Co-Convenor
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4. Dr. Irshad Khan
5. Prof. Umashankar Singh
6. Mr. Sachin Nagayach
7. Mr. Atul Shrivastava

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4. Ms. Monica Kherajani
5. Mr. Abhishek
6. Mr. Amit Soni
7. Ms. Suchi Thakur

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4. Mr. Abhishek Sharma
5. Ms. Priyanka Rathore
6. Mr. Rahul Dubey
7. Mr. Samrat Bhavsar
8. Ms. Sushmita Saha
The journey of International Conference of The Sagar Society of Interdisciplinary Research & Technology (SSIRT)

It is said that all the disciplines of knowledge, learning, and applications are merged at the stage of advanced research. Music needs Physics, Mathematics, and computer technology, medicine and surgery need electronics, material science and chemistry along with biology, management science needs psychology, system science and statistics for modern and advances research. This is truer in Indian perspective right from the ancient time when our scientists used to be multidimensional personalities using interdisciplinary approach for research. In the modern era most of the advancement in research and technology is interdisciplinary. There are few watertight compartments, and most of the field of research depends on more than two disciplines. Given such trends, we decided to start a forum of research in our group.

The Sagar Society of Interdisciplinary Research and Technology (earlier known as Society of Interdisciplinary Research and Technology) was launched in July 2009 near a world-famous Buddhist Monuments Stupa of Sanchi in the meeting of academicians from various fields of Engineering, Management, Pharmacy, and Science. This meeting was chaired by the visionary Chairman of Sagar Group of Institutions, Er. Sanjeev Agrawal, who is the great motivator and all-out supporter of research. This is reflected in the titles of all the institutions of the group which includes the word “Research.” The first president of the society was Prof. P B Sharma, an eminent scientist in the field of interdisciplinary research and Vice-Chancellor of Delhi Technical University. In the formative years, the society consolidated its existence by including eminent academicians from various professional and basic subjects. Right from the first year of its formation, the society started publication of its research journal with the title SIRT Journal of Engineering, Management & Pharmaceutical Science (ISSN No. 0976-8416). Since then regular issues are published by the society with research contributions from national and international level experts. The society was registered in February 2013 by Government of Madhya Pradesh with its modified name Sagar Society of Interdisciplinary Research and Technology (Reg. No. 01/01/01/26302/12). ICIREMPS-2K14 was the first official conference of the society which is contemplating to expand its international wings.

This conference attracted many worlds renounced scientists and Engineers from all over the world including experts from the USA, Australia, and England. This trend continued in the future conference also till 2017.

For this fifth International conference of SSIRT, we hit the jackpot by inviting two topmost scientists of the world namely Professor Ajit Yoganathan from the USA, who innovated new artificial heart valve designs of human beings and Dr. Ashok Bhasin who formulated effective drugs of Thyroid gland ailments. I am sure this will open a new chapter for ICIREMPS-2K18-19.

Prof. V P Saxena
Conference Advisor
From the Coordinator’s Pen

“Breakthrough innovation occurs when we bring down boundaries and encourage disciplines to learn from each other”

— Gyan Nagpal

At the outset of the Conference, I warmly welcome all the distinguished speakers and learned delegates to the Fifth Edition of the International Conference on Advances in Engineering, Pharmaceutical and Applied Sciences – ICIREMPS 2K18-19.

The ICIREMPS 2K18-19 is fifth International Conference on Advances in Engineering, Pharmaceuticals and Applied Science and offers an international forum for the technocrats in academia and researchers as well as in industries from different parts of the world to interact, exchange concepts, prototypes, innovative research ideas and share the outcomes of their research work which could contribute to the academic arena and further benefit the industrial community.

This conference will also provide an excellent opportunity for the young researchers to expose their work to international scrutiny, receive feedback from peers from different parts of the world, and gain from the vast experience and expertise of the leaders in the important field of research. The conference covers a wide range of topics of Computer, Electronics & Electricals, Mechanical, Civil, Applied Science, and Pharmaceuticals Sciences.

I am delighted to report that though each conference organized under the aegis of SSIRT has proved to be a milestone in itself, this year’s Conference is going to be remembered among scientific fraternity in years to come.

We as a team were able to invite and attract world leaders of their respective fields and prove to be effective and worthy platform for the deliberations of great minds.

This year’s Conference will witness the lecture of World Authority on Heart Valves, Dr. Ajit P. Yoganathan, from Georgia Tech, the USA who has honored the world with his services to the society. He will be our star attraction to the conference.

We are very fortunate to have Dr. Ashok Bhaasen, who serves as the President to TFI, Canada and a much sought after speaker to address our delegates. He is a great blend of Entrepreneur, Industrialist, and Researcher and is great Orator.

Apart from this, we have gathered a great number of speakers in various sessions of the Conference, and most of the speakers are world renowned researchers and leaders in their respective fields.

We have also received over 500 research papers from various streams, and all the delegates will be given the chance to present their work in the sessions.

I am sure that all the speakers will have a wonderful time and a pleasant stay during the conference.

Dr. Jitendra Banweer
Coordinator, ICIREMPS 2K18-19
Keynote Speakers
(Brief Profiles)
Biography:

Wallace H. Coulter Distinguished Faculty Chair and Associate Chair for Translational Research in the Wallace H. Coulter Department of Biomedical Engineering Regents’ professor at the Georgia Institute of Technology and Emory University.

Founder and the Director of the Center for Innovative Cardiovascular Technologies.

He received a Bachelor of Science and a Doctor of Philosophy in Chemical Engineering in 1973 from University College, University of London and in 1978 from the California Institute of Technology, respectively

Played a key role in the creation of the master’s and Ph.D. degrees in bioengineering and the joint Ph.D. in Biomedical Engineering with the Emory University School of Medicine.

Dr. Yoganathan’s 40+ year research career has been pioneering and translational by applying basic engineering science to develop meaningful human health outcomes, specifically in the realm of cardiovascular engineering and biology.

In his effort to take an interdisciplinary and translational approach to his research, Dr. Yoganathan has established collaborations with clinicians, scientists, and industry professionals worldwide.

His research success has led to more than 400 peer-reviewed journal articles in leading biomedical journals and more than 40 book chapters. He has also been an invited speaker to over 70 conferences/seminar around the world and has mentored more than 50 doctoral students, 35 masters’ students, and 30 post-doctoral trainees.

Dr. Yoganathan’s career has been distinguished by a number of high honors.

In 1985, Dr. Yoganathan was awarded an Alexander von Humboldt Fellowship from West Germany to spend 9 months at the Helmholtz Institute for Biomedical Engineering, Technical University of Aachen.

He received the Edwin Walker Prize from the Institute of Mechanical Engineers, the UK in 1988.

In 1992, he was elected a founding fellow of the American Institute of Medical and Biological Engineering.

He received the H.R. Lissner Award, for his contributions to the field of bioengineering in 1997 from the American Society of Mechanical Engineers.

In 2005, he was awarded the Theo Pilkington Award, for his contributions to Biomedical Engineering education by the American Society of Engineering Education.

Chair of the Cardiovascular Sub-Committee (SC2), International Standards Organization Technical Committee (TC 150) on Implants for Surgery.
In 2010 he was appointed the Founding Editor in Chief of Cardiovascular Engineering and Technology - the newest journal of the Biomedical Engineering Society which in 2015 was accepted to PubMed and received an impact factor of 1.064 in 2017. In 2012, he was selected to be the Biomedical Engineering Society’s Pritzker Lecturer Award, one of the highest honors given to a BMES Member. In 2012 he was also awarded the Ann Newman Lecturer Award from the Children’s Hospital of Philadelphia (CHOP) - the only engineer to have been awarded this honor. In 2015, in recognition of his significant contributions to the field of engineering, he was elected to the prestigious National Academy of Engineers in Washington, D.C. For his leadership and work on International and US standards on cardiovascular medical devices, he was presented the 2015 Standards Developer Award from the Association for the Advancement of Medical Instrumentation. In February of 2017, he was awarded the Tamils’ Information Lifetime Achievement Award, presented to him by the mayor of Toronto at City Hall in Toronto, Canada. Additionally, Dr. Yoganathan has been active in inventing and developing a variety of medical devices and currently has 16 issued U.S. patents, with another 5 patent applications under review. In October 2009 he licensed one of his patents on heart valve repair, of which he is co-inventor, to a major cardiovascular medical device company (Edwards Lifesciences).
Professor Ashok Bhaseen,
President TIF, Toronto,
Canada

Ashok Bhaseen a Canadian citizen has a Master’s Degree in Pharmaceutical Sciences from Saugor, MP and a Master’s Degree in Business Management from Bombay University. A sought-after speaker on various topics on marketing, healthcare, pharmaceuticals and also has publications in the past 10 years in USA, Canada, and Europe. Ashok brings over 30 years of experience in Global Pharmaceutical marketing and Patient Health Foundations.

Born and educated at Sagar, MP in India. Has the world internationally for 28 years. Currently, he is:

- The Global President of Thyroid Federation International since 2011
- Involved in International Projects in Europe, Latin America, North America, Nepal, India, Indonesia and African on awareness and education to solve issues that lead to thyroid dysfunction problems
- Managing Europe, North America, South America, Asia, and Australia region
- Director on the Board of Graves’ Disease foundation the USA, since 2014
- Director on the board of Canadian Skin Cancer Foundation, since 2013
- As Entrepreneur he was instrumental in starting company listed on the Stock Exchange in Canada. Currently President and CEO of Cy-Matic Technologies.
- He worked with Abbott Pharmaceuticals for 12 years, among various roles as Commercial Director for Pacific, Asia, Australia, and Africa with Abbott International and Canadian Market He has experience of managing 40 countries during his tenure with Abbott
- Past President of Thyroid Foundation of Canada from 2018-11 and 2013-2014
- Has traveled to over 50 countries
- Has successfully launched several new products in Canada and International markets in primary care, specialty, devises and OTC area.
Academic Qualifications
Ph. D (Engineering and Technology)-Nagpur University, India
Topic: Reliability Analysis of Pumping Systems
Master of Engineering (Civil with Specialization in Environmental Engineering), University of Roorkee, India
Graduate in Civil Engineering

Affiliations (present)
Chair: Berkeley Initiative in Soft Computing (BISC)-Special Interest Group (SIG)- Environment Management Systems (EMS), University of California, Berkeley, California USA
Guest Faculty: the University of California, Berkeley (UCB) the USA
Guest Scientist: Lawrence Berkeley National Laboratory, Berkeley California USA Adjunct Professor in Bioinformatics: University of Pune (UoP), India Adjunct Professor: College of Engineering, Pune India
Visiting Scientist: Bhabha Atomic Research Center (BARC) Mumbai India Former Deputy Director: National Environmental Engineering Research Institute (NEERI) India

Professional Experience (R&D, Teaching and Consultancy) Over 40 years
Areas of Specialization (Teaching and R & D) Various Facets of Environmental engineering with focus on: Application of Fuzzy Logic to Environment Management Systems (EMS), Medical Informatics and Risk Analysis Probabilistic Risk Assessment for Chemical Process Industry Environmental Health Risk Assessment Environmental Statistics Pumping System Reliability Unaccounted For Water Management (UFW) with focus on Leakage Control Water and Waste Water Supply Systems Design Solid Waste Management

Association with the International Organizations • IAEA Mission Expert
Program Schedule
## Detailed Schedule

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<td>3:00 PM to 4.30 PM</td>
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<td>Dr. Ajit Yoganathan, USA</td>
<td>Dr. Sarman Singh, AIMS, Bhopal</td>
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<tr>
<td>4.30 PM to 5.30 PM</td>
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<td>Anubhavanand Auditorium</td>
<td>Dr. Ajit Yoganathan, USA</td>
<td>Dr. Sarman Singh, AIMS, Bhopal</td>
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<td>5:30 PM to 6.15 PM</td>
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<td>Sr. 01-10</td>
<td>Prof. (Dr.) Neeraj Upmanyu Bhopal /Dr. Ruchi Jain</td>
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<td>Dr. Vishal Gupta, Principal, MCP, Bhopal / Dr. Neelima Goswami</td>
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<td>Dr. Prem Saini, New Delhi</td>
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PHARMACEUTICS
TPPS 01

DESIGN AND IN VITRO EVALUATION OF NOVEL COLON TARGETED DRUG DELIVERY SYSTEMS CONTAINING BALSALAZIDE

Ajit Kumar Varma*, Deepika Bairagee *, Nilesh Jain**

1. Oriental College of Pharmacy & Research, Oriental University, Sanwer Road, Opp. Rewati Range, Jakhya, Indore, (M.P.)
2. Sagar Institute of Research Technology & Science Pharmacy, Bhopal, Madhya Pradesh (India).
(Email id - Ajitpharma786@gmail.com)

ABSTRACT

This study aimed to develop and characterize an enteric coated matrix tablet of Balsalazide to improve the bioavailability by targeting the drug to the colon for the treatment of ulcerative colitis. Matrix tablets were prepared by wet granulation technique by applying 32 full factorial designs for optimization. The aminosalicylate (5-ASA) drugs are one treatment class used in the management of mild to moderate inflammatory bowel diseases (IBD), and reduce inflammation in the lining of the intestine. However, recent research suggests that they often need to be used in conjunction with other therapies to adequately control inflammation and prevent complications in Crohn’s disease. All the prepared formulations were evaluated for hardness, drug content uniformity, stability study and were subjected to in vitro drug release studies in rat caecal contents. The absence of drug release during the first 6 h is the lag period of 6 h that can be sufficient for delivery of Balsalazide into the large intestine. Balsalazide press coated enteric coating tablet formulation may consecutively enhance the lag period and residence time of the drug in the colon and thus may potentiate its anti-inflammatory action.

Keywords - Colon Targeting Drug Delivery System, Balsalazide, Inflammatory Bowel Diseases, Enteric Coated Polymer.
TPPS 02

PREPARATION AND EVALUATION OF MUCOADHESIVE MICROSPHERES OF GLIPIZIDE

Arvind Parmar,* Sneha Kulkarni,* Satish Sarankar*

*Dept. of Pharmacy Barkatullah University, Bhopal Email:: arvind07py@gmail.com

ABSTRACT

The aim of present investigation was to formulate and evaluate the Muco-adhesive microspheres of Glipizide that would retain the drug in the stomach and continuously release the drug in a controlled manner up to a predetermined time leading to improved bioavailability of the drug in Systemic circulation.

In the present investigation, the eight formulations of Glipizide were prepared as the floating microspheres using CMC and Glutaraldehyde polymers. Formulation was prepared by using the emulsification phase separation method. Mucoadhesive microspheres were evaluated for microscopic properties, flow properties, particle size, in-vitro studies, SEM, muco-adhesivity test.

Keywords: Glipizide, Microspheres, floating drug delivery
TPPS 03

DEVELOPMENT AND EVALUATION OF ANTIHYPERTENSIVE DRUG-ON METOPROLOL SUCCINATE

Chandani Saini*, Praveen Tahirani*, Jitendra Banweer*

Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal. M.P. Email:chandani.908@gmail.com
Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal. M.P. Email: tahiranipraveen@gmail.com
Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal. M.P., Email: jbanweer@yahoo.co

ABSTRACT
As we know that the skin offers such an excellent barrier to molecular transport, the rationale for this delivery strategy needs to be carefully identified. There are several instances in which the most convenient of drug intake methods (the oral route) is not feasible and when alternative routes must be sought. Although the intravenous introduction of the medicament avoids many of these shortfalls (such as gastrointestinal and hepatic metabolism), its invasive and apprehensive nature (particularly for chronic administration) has encouraged the search for alternative strategies, and few anatomical orifices have not been investigated for their potential as optional. Metoprolol Succinate, a second-generation β1-selective agent, is a solid white crystalline powder freely soluble in water (20% at 25°C). It is a cardioselective β1 blocker that has been classified as class I according to the Biopharmaceutical Classification System, meaning that it is highly soluble and highly permeable. It is rapidly and completely absorbed following oral administration, 3-5 rapid elimination as subjected to extensive first-pass metabolism resulting in incomplete bioavailability (about 50%). After a single oral dose, peak plasma concentration occurs after 1.5 – 2.0 hours and eliminated within 3 – 7 hours which depending on therapeutic activity, makes it necessary to administer the formulation up to 4 times daily. The aim of the present investigation is the development and evaluation of controlled drug delivery system for Selective β1 receptor blocker of Metoprolol succinate controlled release matrix tablets and matrix type transdermal patches with varying proportions of polymers.

Keywords: Antihypertensive, Matrix tablet, Transdermal patch, Polymer, Metoprolol Succinate.
FORMULATION AND DEVELOPMENT OF COLON TARGETED MATRIX TABLET OF TENOFOVIR DF

Shivam Sahu*, Praveen Tahilani**, Dr. Jitendra Banweer ***

*Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: shivamsahus763@gmail.com
** Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: tahilanipraveen@gmail.com
*** Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal. M.P. Email: jbanweer@yahoo.com

ABSTRACT

Tenofovir disoproxil fumarate (a prodrug of tenofovir), marketed by Gilead Sciences under the trade name Viread®, belongs to a class of antiretroviral drugs known as nucleotide analog reverse transcriptase inhibitors (nRTIs), which block reverse transcriptase, an enzyme crucial to viral production in HIV-infected people. In vivo tenofovir, disoproxil fumarate is converted to tenofovir, an acyclic nucleoside phosphonate (nucleotide) analog of adenosine 5’-monophosphate. Tenofovir inhibits the activity of HIV reverse transcriptase by competing with the natural substrate deoxyadenosine 5’-triphosphate and, after incorporation into DNA, by DNA chain termination. The present investigation was concerned with the development of the colon targeted tablets, which after oral administration were designed to prevent the drug release in the stomach and small intestine. It improves the bioavailability of the drug as well as its half-life. Various formulations were developed by using release rate controlling polymers like Xanthan Gum, Guar Gum by direct compression method. Wet granulation method was followed to manufacture the matrix tablets of Tenofovir DF. The tenofovir df matrix tablets were further coated with Eudragit S-100 solution. All the tablets were evaluated for following different parameters which include general appearance Thickness and diameter, Drug content, hardness, Friability, Uniformity of weight, Dissolution rate studies, etc.

Keywords: Tenofovir disoproxil fumarate, Matrix tablet, wet granulation, Guar gum, Eudragit.
TPPS 05
FORMULATION AND EVALUATION OF COLON TARGETING OF MESALAMINE TABLET FOR INFLAMMATORY BOWEL DISEASE
Neha Singh*, Sengar NPS**, J.Banweer***, Mehta PD****

*Sagar Institute of Research Technology and Science-Pharmacy, Bhopal, (Madhya Pradesh)
Laxmi Narayan College of Pharmacy, Bhopal, (Madhya Pradesh)

ABSTRACT

In the present investigation, an attempt was made to formulate the time and pH-dependent drug delivery system, reduce the frequency of dose administration, to prevent ulcerative colitis by developing sustained delayed-release tablets of Mesalazine using a combination of Eudragit L-100 as an enteric coating. The core tablets of Mesalazine were prepared using wet granulation method. Present study aims to develop colon-specific drug delivery of Mesalazine sustained release matrix tablets for ulcerative colitis using pectin as a natural polymer. The matrix tablets of Mesalazine are subjected to in-vitro drug release study using simulated gastric fluid (0.1N HCl) for 2 hours, simulated intestinal fluid (pH 7.4) for 3 hours and simulated colonic fluid (pH 6.8) for 7 hours as dissolution fluid. The study showed that the lag time before drug release was highly affected by the coating. Colon drug delivery is advantageous in the treatment of colonic disease and oral delivery of drugs that are unstable and susceptible to enzymatic degradation in the upper GI tract. The disintegration data obtained from tablets demonstrated that disintegration data rate of studied tablets is dependent on:
(i) The polymer used to coat the tablets (ii) pH of disintegration media. Results also demonstrated that the combination of Eudragit L-100 could be successfully used to coat tablets for colon targeted delivery of the drug.
TPPS 06

LIGANDCONJUGATEDSURFACE FUNCTIONALIZED MWCNTS LOADED ANTI-CANCER DRUG FOR BREAST CANCER TREATMENT

Nidhi Jain Singhai*, Suman Ramteke*

*School of pharmaceutical sciences, RGPV, Bhopal, MP. Research Scholar. Email: nidhinidhijn25@gmail.com
*School of pharmaceutical sciences, RGPV, Bhopal, MP. Assistant Professor. Email: sapna1731@rediffmail.com

ABSTRACT

Breast cancer is the second most common and leading cause of cancer death in women worldwide, with nearly 1.7 million new cases diagnosed in 2017. This represents about 12.5% of all new cancer cases and 25% of all cancers in women. Despite major progress in breast cancer therapy with continuous development of several chemotherapeutic drugs that some have reached clinical trials, no significant improvement in the overall survival rate of patients suffering from metastatic breast cancer is reported. However, Current chemotherapy of cancer suffers from limited anti-cancer efficacy, multi-drug resistance after a period of treatment, and severe side effects. Currently, Surface functionalized CNTs may open a new era in the forthcoming years in diverse fields including pharmaceutical and may be considered as safe and effective biomaterials with generally regarded as safe prominence. Research work aimed to prepare and characterized surface functionalized MWCNTs conjugated hyaluronic acid (HA) for tumor-targeted delivery of doxorubicin hydrochloride for the treatment of breast cancer. Surface functionalized MWCNTs characterized by FT-IR spectroscopy, Zeta size and potential and X-ray diffraction, percent entrapment efficiency and In-vitro drug release studies. The entrapment efficiency was found to be 86.7±1.12% (DOX/HA-PEG-MWCNTs) and 78.9±1.85% (DOX/MWCNTs). The In vitro drug release was found to be 71.57±1.60% (DOX/HA-PEG-MWCNTs) and 88.89±2.05% (DOX/MWCNTs) in the sustained pattern at the lysosomal pH 5.0. Thus, It can be interpreted that the DOX/HA-PEG-MWCNTs formulation could be capable of carrying drug and delivering it selectively at the tumor site while minimizing side effects.

Keywords: Multi-walled carbon nanotubes, Hyaluronic acid, Doxorubicin Hydrochloride, Breast cancer
TPPS 07

PROTEIN NANOPARTICLES FOR ORAL DELIVERY OF AN ANTICANCER DRUG

Devender Singh*, Shaheen Sultana**, Alok Mahor*

*Institute of Pharmacy, Bundelkhand University, Jhansi, Uttar Pradesh, India;
**Department of Pharmaceutical Science, Monad University, Hapur, Uttar Pradesh, India;
***Institute of Pharmacy, Bundelkhand University, Jhansi, Uttar Pradesh, India

ABSTRACT

Nanoparticles possess great potential for carrying drug(s) to the specific target site delivering the drug in a controlled manner. Chemotherapeutic agents have toxic side effects for cancer cells as well as for normal cells. Nanoparticles developed from natural polymers such as chitosan, glidin have gained much attention because of its biodegradability and non-toxic characteristic. Apart from these mentioned attributes, nanoparticles prepared from natural polymers offers other advantages such as controlled drug delivery thereby allowing modulation of the pharmacokinetic properties and biodistribution of the drug. Glidin, a protein appears to be a suitable polymer for the preparation of mucoadhesive nanoparticles capable of adhering to mucus layer. It has been used as nanoparticle material owing to its versatile biodegradability, biocompatibility, and natural origin. Cancer of the stomach is prevalent in India and may be related to a chronic infection caused by Helicobacter pylori. The outcome of the study proposed is supposed to be effective and controlled delivery of the prepared protein nanoparticle to the target site offering maximum drug delivery to the target site and thus controlling the growth the cancerous cells. Various characterization techniques such as DSC, XRD, AFM, cell cytotoxicity assay, will be utilized to affirm the effective delivery of the developed nanoformulations. The formulation developed might present an alternative and effective drug delivery system to the control the cancer growth both in-vitro and in-vivo.

Keywords: Protein, Chitosan, Glidin, Anti-cancer drug, Helicobacter pylori
NANO-PARTICLES DRUG FORMULATION

PACLITAXEL PROTEIN BOUND PARTICLES FOR INJECTABLE SUSPENSION

Surendra Jain*, Sunder Dewar*

*Department of Pharmaceutical Science, Sagar Institute of Research and Technology-Pharmacy, Bhopal (MP), India

ABSTRACT
Paclitaxel is one of the most effective chemotherapeutic agents ever developed and is active against a broad range of cancers, such as lung, ovarian, and breast cancers. The problem encountered was its low water solubility. To overcome this problem, paclitaxel is formulated with a mixture of Cremophor EL and dehydrated ethanol (50:50, v/v). This combination is known as Taxol. However, Taxol has some severe side effects related to Cremophor EL and ethanol. Therefore, there is an urgent need for the development of alternative Taxol formulations. The encapsulation of paclitaxel in biodegradable and non-toxic nano-delivery systems can protect the drug from degradation during circulation, and in-turn protect the body from toxic side effects of the drug, thereby lowering its toxicity, increasing its circulation half-life, exhibiting improved pharmacokinetic profiles, and demonstrating better patient compliance. The preparation of nanoparticle method was optimized on the basis of critical temperature, critical evaporator parameter, and lyophilized cycle, then the protein bounded nanoparticle were characterized on particle size Assay of Paclitaxel, free paclitaxel, sterility, pH, water content, reconstitution time, nanoparticle which was prepared have advantage of the enhanced permeability and retention (EPR) effect of passive tumor targeting, therefore, they are promising carriers to improve the therapeutic index and decrease the side effects of paclitaxel.

Key words: Paclitaxel, Cremophor, sterility, permeability, lyophilized cycle
TPPS 09

FORMULATION AND EVALUATION OF PHYTOSOMES OF CHAMOMILE (MATRICARIA CHAMOMILLA L.) EXTRACT

Ruchi Jain*, Surendra Kumar Jain*, Nilesh Jain**

*Sagar Institute of Research & Technology-Pharmacy Bhopal MP, prof.ruchijain@gmail.com
**Sagar Institute of Research & Technology Science-Pharmacy Bhopal MP, prof.nileshjain@gmail.com

ABSTRACT
Chamomile Flower (Matricaria chamomilla L.) (Family Asteraceae) is reported to contain polyphenol compounds, including apigenin, quercetin, patuletin, and luteolin. Essential oil components extracted from the flowers are terpenoids. Chamomile is under preliminary research for its potential anti-anxiety properties. Chamomile preparations are commonly used for many human ailments such as hay fever, inflammation, muscle spasms, menstrual disorders, insomnia, ulcers, wounds, gastrointestinal disorders, rheumatic pain, and hemorrhoids. Essential oils of chamomile are used extensively in cosmetics and aromatherapy. Polyphenols of Chamomile flower has low bioavailability because it is less soluble in water and it is rapidly eliminated from the body. This study aimed to prepare the phytosome of Chamomile flower extract and evaluated it. Different phytosome complexes are containing a molar ratio of 1:1, 1:2, 2:1 and 2:2 of extract and soya lecithin were prepared by the solvent evaporation technique. Phytosomes are evaluated for their organoleptic properties, i.e. shape, size, its distribution and physicochemically characterized by UV, FTIR, DSC, SEM, etc. Percentage drug entrapment, percentage drug release profile were also studied accordingly. Prepared phytosomes were evaluated for sedative and hypnotic activity using rota-rod, and thiopental sodium-induced sleeping time determination tests in mice. SEM and DSC data showed that phytosome complex of Polyphenols had spherical shape vesicles consisting of soya lecithin and Polyphenols were found to be intercalated in the lipid layer. The phytosomes shows entrapment efficiency of 59.32±0.13%. The total cumulative amount of polyphenols after 4 h dissolution test was 92.13%. Furthermore, it showed a good physicochemical stability through organoleptic, water content and physicochemical properties, which were conducted for 6 weeks at various temperatures. The hypnotic and sedative activity of phytosome complex (1:1) showed the good as compared to phytosome complex (1:2). Phytosomes significantly decreased the induction time to sleep and prolonged the duration of sleeping, induced by thiopental sodium. Therefore Phytosomes of chamomile extract is a novel and prominent approach for herbal drug delivery than conventional which improves the bioavailability of polar extract and also patient compliance.

Keywords: Phytosome, WithaniaSomnifera, Withanolid-A,soya lecithin, FTIR
FORMULATION DEVELOPMENT AND EVALUATION OF DICLOFENAC SODIUM MICROEMULSION FOR TRANSDERMAL DRUG DELIVERY

N S Lodhi*, Nishi Prakash Jain*, Atul Jain**

*Sagar Institute of research and technology -pharmacy, Bhopal ns.lodhi2@gmail.com

**Sagar Institute of research technology and science-pharmacy, Bhopal. nishisirt@gmail.com

ABSTRACT

The aim of my present study is to formulate, develop and evaluate micro-emulsion for topical application of Diclofenac Sodium by using coconut oil at different ratios for the treatment of pain. Development of micro-emulsion formulation for topical use of drugs, having the potential to increase the solubility of poorly water-soluble drugs. To avoid the first pass metabolism and there is a potential to deliver the drug in a controlled manner to minimize the adverse effect. Micro-emulsion was prepared by water trituration method using coconut oil as the oil phase, Tween-80 as a surfactant, Polyethylene Glycol-400 as co-surfactant and Triethylamine as penetration enhancer. Different oils, surfactants, and co-surfactants were screened to select ideal components of micro-emulsions with good solubility and excellent skin penetration of Diclofenac Sodium. The solubility of Diclofenac Sodium was good in coconut oil followed by olive oil, and isopropyl myristate. All formulations had appropriate observed pH values varying from 6.70 to 6.85 for topical application. Viscosity measurements were examined as a function of shear rate, and Newtonian fluid characterization was observed for each micro-emulsion system. DCM-6 was exhibited 98.54±0.26% higher drug content than other formulations. Among all formulations, the highest permeation flux of µg/cm2 /hour was observed in formulation DCM-6. The in vitro Diclofenac Sodium permeation from these micro-emulsions was found to follow the Korsmeyer-Peppas model (\(n\)= 0.923 to 0.973) over a period of 24 hours with non-Fickian, “anomalous” mechanism. Together these preliminary data indicate the promise of microemulsions for transdermal delivery of Diclofenac Sodium.

Keywords: Microemulsion, Diclofenac Sodium, Coconut oil, Triethylamine
DEVELOPMENT AND EVALUATION OF LIPID BASED FORMULATION FOR TREATMENT OF ACNE VULGARIS

Neelima Goswami*, R.B. Goswami**

*Sagar Institute of Research & Technology –Pharmacy, Bhopal, maanyana@gmail.com
**Sagar Institute of Research & Technology –Pharmacy, Bhopal, drrbgoswami@gmail.com

ABSTRACT

Benzoyl peroxide is mainly in the topical treatment of acne vulgaris. Its unwanted effects consist mainly including redness, scaling, dryness, or persistent itching or burning, skin discoloration, skin rash, peeling, and transient local edema. So to avoid this side effect an attempt on Benzoyl peroxide is done by making its six liposomal formulations with different compositions of lipid and surfactant. Adhesiveness, stability, and suitable topical delivery system which would increase the contact time, leading to an increase in the local drug concentration incorporated drugs are the main features that influence the applicability of liposomal gel for topical treatment. To assess the permeability of in vitro permeation studies of across depilated egg membrane was conducted. The drug entrapment study also shows that the significant drug is entrapped in a liposomal vesicle to show the desired effect. Which the formulation containing drug: lipid: cholesterol is found better when it is characterized by various pharmaceutical characters. The liposomal gel properties are dependent on the lipid and surfactant concentration and the pH. Carbopol gels can take of liposomal dispersions; however, the stability of the liposomal gels need to be evaluated as well. Carbopol gels can be used as advanced drug delivery systems. Also, the topical formulation of liposome containing Benzoyl peroxide shows much greater bioavailability of drug to skin layer compared to non liposomal formulation. The liposomal product of Benzoyl peroxide was found to have reasonable drug loading, controlled release rate, particle size, and stability. The formulated liposomes have shown an appreciably enhanced retention of drug molecules in the skin. Thus, the liposomal formulation, with desired characteristics for topical administration, could be successfully prepared. This may lead to improved efficiency and better patient compliance.

Keywords: Acne Vulgaris, Benzoyl peroxide, Liposomes, Carbopol
TPPS 12

PREPARATION AND EVALUATION OF

MOXIFLOXACIN EMULGEL FOR SKIN INFECTIONS

Durga Pandey*, Girijesh Pandey**, Deepti Jain*

*School of pharmaceutical sciences, RGPV Bhopal durga.pandey9@gmail.com
**Technocrats Institute of Technology- Pharmacy, Education and Research, Bhopal girijeshpandey@gmail.com
*School of pharmaceutical sciences, RGPV Bhopal deeptijain@rgtu.net

ABSTRACT

The study aimed to prepare and evaluate Moxifloxacin emulgel for in-vitro antimicrobial activity in skin infections. Moxifloxacin entrapped in microemulsion based gel. Moxifloxacin is the latest addition to the fluoroquinolone category, differing from ciprofloxacin and other older agents in having much better in vitro activity against Gram-positive aerobes Gram-negative aerobes organism. The viscosity of emugel was 1232 cP, excellent spreadability 22.05 ± 1.110 gm.cm/cc and pH was 6.90, good homogeneity, Drug content was found to be 93% in optimized batch. In-vitro drug release showed 90.8% in 8 hrs. The particle size of microemulsion was less than 5 micron. No major changes in viscosity, spreadability, homogeneity and drug content observed during stability study. Thus it can be concluded moxifloxacin emulgel can be used to treat various types of skin infections.

Keywords: Moxifloxacin, Emulgel, Antimicrobial, In-Vitro release, Skin infections
FORMULATION DEVELOPMENT AND EVALUATION OF ZIDOVUDINE MATRIX TABLET BY USING DIFFERENT POLYMER COMBINATIONS

Anurag Singh*, SK Jain*, Misha Masood**

*Departments of pharmaceutical chemistry SIRTP Bhopal, anuragsngh020@gmail.com
* Departments of pharmaceutical chemistry SIRTP Bhopal, prof.surendrajain@gmail.com
**Department of pharmacology SIRTP Bhopal, sarah.m1607@gmail.com

ABSTRACT

The matrix system is one of the complicated approaches for the preparation of the sustained release dosage forms. Formulation of matrix tablet has gained immense popularity now a day because it has the advantage of simple processing and low cost of fabrication. Formulated oral sustained release matrix tablets of zidovudine to improve efficacy, reduce the frequency of administration, and better patient compliance. Matrix tablet of zidovudine was formulated by wet granulation method using 5% PVP K-90 paste as the binder talc and magnesium stearates as lubricants. The present study was carried out to develop and evaluate the matrix tablets of zidovudine containing HPMC, XG, GG as release modifying polymer. The physicochemical compatibility of the drug with polymers was established through FTIR spectroscopy. Zidovudine sustained release matrix tablets were prepared successfully by wet granulation using HPMC K100M, GG, and XG as polymers in different proportion, to retard the release and achieve required dissolution profile. Therefore it was concluded that HPMCK100M and EC in the ratio of 1:1 (F-5) is suitable for the formulating matrix system of zidovudine. Drug release kinetics of F-5 formulation correspond best to Higuchi model, and drug release mechanism as per n-value of Korsmeyer & Peppas (Power law) followed non-Fickian diffusion, that means water diffusion and polymer rearrangement had an essential role in the drug release. Results of the current study were indicated, a promising potential of the zidovudine matrix system as an alternative to the conventional dosage form. Since the polymer and the drugs were found to be compatible and the release mechanism is characterized, there is a great scope for the formulation of this anti-HIV drug as a matrix system.

Keywords: Zeroorderkinetics, Higuchi model, zidovudine, non-Fickian, PVPK-90
TPPS 14

HIGH-THROUGHPUT MANUFACTURING OF SIZE TUNED NANOPARTICLES BY A NEW MICROFLUIDIC METHODS USING ENHANCED STATISTICAL TOOLS FOR CHARACTERIZATION

Suchi Thakur*, Surendra Jain*, Deepti Jain**

* Department of Pharmaceutical Science, Sagar Institute of Research and Technology-Pharmacy, shuchi2288mpharma@gmail.com
** Department of Pharmaceutical Science, Sagar Institute of Research and Technology-Pharmacy, prof.surendrajain@gmail.com
*** Department of Pharmacy, School of Pharmaceutical Sciences, RGPV, deeptijain@rgtu.net

ABSTRACT
Microfluidics is a technology that enables precise control and manipulation of fluids and fluid interfaces at the micrometer scale. Here we investigated the microfluidics-based manufacturing of nanoparticles. These studies aimed to assess the parameters in a microfluidic process by varying the total flow rate (TFR) and the flow rate ratio (FRR) of the solvent and aqueous phases. The manufacturing of nanoparticle was done by both conventional method CN1, CN2, CN3, and Furthermore, we demonstrate the potential of a high throughput manufacturing of nanoparticle using microfluidics with different flow rate for different batches from MFN1, MFN2, MFN3. The mathematical modeling was characterized for a different ratio, identified FRR, the key variable in the microfluidic process leads to giving high impact on nanoparticle size uniformity within 20 µm, the particles were characterized on different parameters for the same three batches like polydispersity, Viscosity, spreading coefficient the result was incorporated in the research article. The Kinetic release model study reveals that microfluidics as a robust and high-throughput method for the scalable and highly reproducible manufacture of the size-controlled nanoparticle of the drug.

Keywords: Microfluidics, flowrate, nanoparticle, particle size, polydispersity
TPPS 15

THE EFFECT OF POLYETHYLENE GLYCOL SPACER CHAIN LENGTH ON TUMOR-TARGETING POTENTIAL OF FOLATE–MODIFIED SOLID LIPID NANOPARTICLES

Shikha Singh*, Surendra Jain*, Misha Masood *

*Sagar Institute of Research and Technology – Pharmacy, Bhopal, RGPV, shikha.aips@gmail.com
*Sagar Institute of Research and Technology – Pharmacy, Bhopal, prof.surendra@gmail.com
*Sagar Institute of Research and Technology – Pharmacy, Bhopal, sarah.m1607@gmail.com

ABSTRACT
Cancer is a multifaceted disease that represents one of the leading causes of mortality in developed countries. Due to the societal and economical implications of this pathology, tremendous efforts have been made over the past decades to improve the available therapeutic options. Although a large number of potent chemotherapeutic anticancer agents have been identified and successfully used in clinical practice, considerable research activity is devoted to discovering more potent treatments, while minimizing their toxic side effects. Indeed, most anticancer agents display a narrow therapeutic window due to their lack of selectivity against cancer cells. Besides, the ability of the anticancer compounds to reach their target is often impaired by some physiological barriers (i.e., tumor interstitial pressure, diffusion through the tumor endothelium and extracellular matrix and so on) as well as by metabolism/degradation phenomena such as conversion into inactive metabolites. The objective of present study was to design various SLNs based folate anchored nanosystems in which folic acid is attached directly or indirectly via different types of PEGs (Mw: 1000, 4000) as spacers and resolve possible shortcomings associated with cancer chemotherapy. An anti-cancer bioactive was encapsulated in above types of SLN nanoconjugates and their in vitro as well as ex vivo anticancer targeting potential compared. The present work is expected to throw new light on the role of spacer chain length in targeting potential of folate anchored SLN. The rate of drug release of nanoconjugates was observed to be low due to close structure and steric hindrances due to large chain length of PEGs as the spacer. Hence, Folate attachment through PEG’s spacer on SLNs can be proposed for better sustained and controlled release drug delivery system. Previous reports on folate spacer SLN nanoconjugates only explored the effect of spacer on the release profile of bioactive, but none compared the effect of spacer chain length on the release profile of bioactive. By obtained drug release data, the drug release sustainability increases with the spacer chain length. Comparing the in vitro release pattern of folate spacer SLN nanoconjugates In vitro MTT and cell uptake assay concluded that SLNP4FA bears significant tumor targeting potential as compared to free PTX and PTX loaded nanoformulations (SLNFA and SLNP1FA). Based on obtained results tumor targeting potential can be ranked as follows: SLNP4FA>SLNP1FA>SLNFA.

Keywords: PEG, Nanoconjugates, Steric hindrance, Celluptake, PTX.
Comparative Studies on In-vitro Skin Permeation of Econazole Using Different Novel Carriers

Priyanka Rathore*, Surendra Jain*

*Department of Pharmaceutics, Sagar Institute of Research and Technology-Pharmacy, Bhopal
priyankarathore1jan@gmail.com

**Department of Pharmacognosy, Sagar Institute of Research & Technology – Pharmacy
Prof.surendrajain@gmail.com

ABSTRACT

Econazole nitrate is one of triazole antifungal drug, administered topically in treatment of dermatomycoses due to a wide variety of fungi and vaginally in treatment of vaginal candidosis but its therapeutic use in topical formulation is not efficacious because deep created fungal infections are difficult to treat with conventional formulations due to drug’s poor aqueous solubility and dissolution rate, therefore there is a need for enhancement of its bioavailability. Thus the object of the present study was to prepare econazole incorporated different novel carriers such as liposomes and ethosomes and to compare their in vitro permeation studies via skin model to increase their bioavailability. Econazole loaded liposomes were prepared by the conventional rotary evaporation method, and ethosomes were prepared by dropping method. Prepared formulations were evaluated for particle size, surface morphology, entrapment efficiency and in vitro permeation studies via goatskin. Econazole loaded novel carriers appeared to be spherical and unilamellar. Particle size and entrapment efficiency of Econazole loaded liposome and ethosome was found to be 251±1.2 nm and 235±6.7 nm; 67% and 78%. In vitro permeation study results showed that the steady-state fluxes of the drug were higher in case of ethosomal suspension as compared to liposomal suspension. Hence ethosomes provide higher entrapment efficiency, enhanced permeation, and bioavailability and proved to be a good candidate for sustained release delivery of Econazole nitrate.

Keywords:Econazolenitrate, ethosomes, liposomes, permeation, bioavailability
FOLATE CONJUGATED SOLID LIPID NANOPARTICLE -A NOVAL CARRIER FOR LUNG CANCER TARGETED DELIVERY OF PACLITAXEL

Syed Ali*, Surendra Jain*, Shikha Singh *

*Sagar Institute of Research and Technology–Pharmacy Bhopal, syedali7956@gmail.com
*Sagar Institute of Research and Technology–Pharmacy Bhopal, prof.surendra@gmail.com
*Sagar Institute of Research and Technology–Pharmacy Bhopal, shikha.aips@gmail.com

ABSTRACT

Lung cancer, the most common cause of cancer-related death in men is responsible for 1.3 million deaths worldwide annually. Lung cancer is a disease of uncontrolled cell growth in tissues of the lung leads to metastasis which is an invasion of adjacent tissue and infiltration beyond the lungs. Over the last decades, colloidal drug-delivery systems especially solid lipid nanoparticles (SLNs) have received great attention due to their small particle size, large surface area and the capability of changing their surface properties. Targeted nanoparticles delivery to the lungs is an emerging area of interest. Lipid-based nanoparticulate systems have been extensively applied as carriers for anticancer agents because of better biocompatibility of lipids than other materials such as synthetic polymers and also increase drug activity by maximizing drug availability leading to a reduction of the noxious effect of the drug by minimizing drug exposure to healthy sites. Particulate drug carrier systems encapsulating drugs have emerged as a promising approach in anticancer treatment by improving the therapeutic index of drugs by preferential localization at target sites. Paclitaxel is an effective and widely used anticancer drug in clinical practice; however due to its low solubility (<1 g/ml) and low permeability across the intestinal barrier. Folic acid (FA) is a vitamin necessary for the synthesis of purines and pyrimidines and is expressed on a variety of tumors. Upon binding of the Ligand, the Ligand-receptor complex is internalized via receptor-mediated endocytosis. Due to increased demand of folic acid by tumor cells, the cells begin to give rise to an increased number of F-R, to capture more of FA and hence can serve as the prominent site for entry an anti-cancer drug. Also by use of folic acid as a ligand one can maneuver the drug to gain access inside the tumor vasculature. The receptors are expressed on basolateral surface (blood side) of tumor cells as compared to their expression on the apical surface on normal side. This is an important property of these receptors, and the use of FA as targeting ligands bears high specificity when delivered via blood. The targeting ligand improved transfection efficacy and targeting property as compared to the formulation without any ligand.

Keywords: Lung cancer, Endocytosis, Ligandreceptor, complex, PTX.
TPPS 18
DESIGNING AND DEVELOPMENT OF
GASTRORETENTIVE MUCOADHESIVE
MICROSHERES OF CEFIXIME TRIHYDRATE
USING SPRAY DRYER

Priyanka Chaturvedi*, Suresh Kumar Paswan**

*Department of Pharmaceutics, Sagar Institute of Research & Technology Pharmacy, chaturvedi2506@gmail.com
**Department of Pharmacy, Shri G.S. Institute of Technology and Science, 23, Park Road, Indore (M.P.)-452003

ABSTRACT

The purpose of the present work study was to improve the oral bioavailability of cefixime trihydrate through mucoadhesive microspheres because of its good absorption profile in acidic pH value of stomach. Cefixime trihydrate loaded mucoadhesive microspheres containing HPMC K4 M as matrix and eudragit rs 100 as mucoadhesive polymer were prepared by a spray drying technique. The morphological properties of the cefixime trihydrate microspheres were studied by optical microscopy and scanning electron microscopy (SEM). Compatibility between drug and excipient was checked by DSC and FTIR analysis. Drug content and entrapment efficiency were determined using a UV Spectrophotometer method. In-vitro Mucoadhesion test showed that mucoadhesive microspheres adhered more strongly to the gastric mucous layer and could retain for an extended period up to 8 hours. In vitro release study were performed in 0.1 N hydrochloric acid up to 8 hours. The spray drying process of solution of cefixime trihydrate with polymeric blends can give the prolonged drug release. Analysis indicated that the elimination half-life time of the mucoadhesive microspheres was prolonged and that the elimination rate was decreased. In conclusion, the mucoadhesive microsphere synergic drug delivery system may be advantageous in the treatment of stomach diseases.

Keywords: hydroxypropyl methylcellulose
TPPS 19

PREPARATION, EVALUATION, AND APPLICATION OF MUCOADHESIVE MICROSPHERES: A RESEARCH APPROACH TO NOVEL & TARGETED DRUG DELIVERY METHODS, INCORPORATION WITH MICRO TECHNOLOGY

Jitendra Banweer *, Praveen Tahilani *

* Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: jbanweer@yahoo.com
* Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: tahilanipraveen@gmail.com

ABSTRACT
Microspheres are characteristically free flowing powders consisting of proteins or synthetic polymers which are biodegradable and ideally having a particle size less than 200 μm. It is the reliable means to deliver the drug to the target site with specificity if modified and to maintain the desired concentration at the site of interest without untoward effects. Microspheres received much attention not only for prolonged release but also for targeting of anticancer drugs to the tumor. In future by combining various other strategies, microspheres will find the central place in novel drug delivery, particularly in diseased cell sorting, diagnostics, gene & genetic materials, safe, targeted and effective in vivo delivery and supplements as miniature versions of diseased organ and tissues in the body.

Keywords: Microspheres, controlled release, characterization of microspheres, applications.
IN VITRO AND IN VIVO EVALUATION OF ACECLOFENAC LOADED AQUASOMES

Nilesh Jain*, Sukhwant Singh*, Ruchi Jain**, P.S. Rajput***

* Sagar Institute of Research, Technology & Science - Pharmacy, Bhopal. M.P. Email: prof.nileshjain@gmail.com
** Sagar Institute of Research & Technology - Pharmacy, Bhopal. M.P. Email: prof.ruchijain@gmail.com
*** Sagar Group of Institution, Ayodhya Nagar, Bhopal Email: psrajput2012@gmail.com

ABSTRACT
Aquasome a nanoparticle submicronic structure (diameter below 1um) made up with carbohydrates. They received much attention to developing a drug delivery system as an alternative to liposome technology to overcome the problems related to the stability of these vesicles in biological fluids. Aquasome a molecular carrier, consist of the ceramic core to which glassy carbohydrates are then allowed to absorb, which is then absorbed with pharmaceuticals. The carbohydrate coating functions as a dehydroprotectant and stabilizes subsequently non-covalently bound drug molecule. In the present study aquasome charged with aceclofenac belongs to NSAID's a low solubility drug were obtained through the formation of an inorganic core of calcium phosphate covered with cellobiose film and further adsorption of the aceclofenac. The prepared aquasomes were evaluated for the different parameters. The SEM, particle size analysis and measurement of zeta potential reveal that prepared core was smaller and spherical nanometric in size (70-90nm). Coating of cellobiose on the surface of core was further confirmed by zeta potential measurement. It was noted that, the zeta potential of coated particle decrease from +2.73 to -20.8 mv. The release of drug from aquasomes is about 90% within 30 min compared with the pure drug which released 67% in 30 mins and the remaining being gradually release over 3 hours. In vitro dissolution studies indicated that the aceclofenac ceramic nanoparticles released the drug in a controlled manner. The aquasome shows a loading efficacy up to 92% and the loading capacity up to 50% w/w. Thus, aquasomes of aceclofenac were successfully developed. and anti-inflammatory studies were performed with aceclofenac cellobiose aquasomes. Paw edema method was employed for assessing the anti-inflammatory effect. The anti-inflammatory activity of aquasome formulation showed quicker effect up to 3 h compared to pure aceclofenac.

Keywords: Aceclofenac, Aquasomes, cellobiose, Anti-Inflammatory, Ceramic Core
COMPARATIVE INVITRO STUDY OF SOME MARKETED PREPARATIONS OF DICLOFENAC SODIUM

Sukhwant Singh*, Nilesh Jain*, Abhishek Sharma*, Payal Saiju* & Deepu Sharma*

*Sagar Institute of Research Technology & Science – Pharmacy, Bhopal, singh.sukhwant@gmail.com

ABSTRACT
Multinational pharmaceutical brands are ruling in the market, but the problem arises when some of the prescribed multinational brands and sometimes even life-saving drugs become unavailable in the market either due to less production/supply or due to some other reasons. When there is a shortage in market of the said drugs, the patients are always reluctant to take the alternate local brands of the same generic. And if the patient does so, he would not psychologically satisfy &ultimately results in poor patient compliance. Some multinational brands are out of reach from buying due to high prices, and comparatively local brands of the same generic are available at much lower prices. The formulation of the drug product can have a significant effect on the quality parameters such as weight variation, hardness, friability, disintegration time, dissolution profile, etc. This also includes the physiochemical properties of the active ingredients and excipients as well as the procedures used in the manufacturing process. Quality control parameters also or physical properties of the tablet are useful tools for maintaining consistency in batch-to-batch manufacturing, and it should be performed for every drug product. All of these parameters are closely related to each other and affect drug absorption, bioavailability, etc. The study aimed to evaluate the comparative quality control parameters between three tablets formulations available including One Multinational Brand, one leading national Brand, and one Generic formulation. The three brands of the diclofenac sodium sustained release tablets evaluated in this study could be regarded as being pharmaceutically and chemically equivalent and can, therefore, be freely interchanged. Drug content, dissolution profiles of all sustained release products used in the study were within specified limits. The study also emphasized the need for constant surveillance on marketed drug product by the government, manufacturer and independent research groups to ensure supply and availability of quality medicines for the patients.

Keywords: Comparative, In-vitro Correlation, Quality control parameters, Tablets formulations, Bioequivalence
TPPS 22
FORMULATION & EVALUATION OF OSMOTIC PUMP TABLET OF ONDANSETRON FOR CHEMOTHERAPY INDUCED VOMITING

Nishi Prakash Jain*, Divya Prakash Jain**

*1 Sagar Institute of research technology and science-pharmacy, Bhopal. nishisirt@gmail.com.
**2. Department of Pharmacy, Barkatullah university, Bhopal. djkom@gmail.com

ABSTRACT
Chemotherapy-induced nausea and vomiting (CINV) continue to have a great impact on the quality of life of patients receiving some anti-neoplastic therapies. Anticipatory CINV can occur in up to 25% of patients. Conventional oral drug delivery systems are known to provide an immediate release of the drug, in which one cannot control the release of the drug and effective concentration at the target site. Noninvasive routes such as oral administration of multiple doses at a particular frequency can be used to achieve this goal. Ondansetron push-pull osmotic pump tablet was prepared with a single punch press and pan coating technique. Osmotic active agents and plasticizer of coating film were chosen by drug release tests. The effects of the number, position, and direction of drug release orifice on release behavior were investigated. The relation between drug release duration and thickness of coating film, PEG content of coating film and size of drug release orifice was established by uniform design experiment. The surface morphological change of coating film before and after drug release test was observed by scanning electron microscopy. The osmotic pumping release mechanism of the prepared tablet was confirmed by drug release test with high osmotic pressure medium. Lactose-mannitol (1:2) was chosen as osmotic active agents and PEG400 as a plasticizer of the coating film. The direction of drug release orifice had great effect on the drug release of a prepared tablet without HPMC and did not affect the drug release of prepared tablet with HPMC. The prepared tablet with one drug release orifice at the center of the coating film on one surface of tablet released their drug with little fluctuation. The drug release duration of prepared tablet correlated with the thickness of coating film and PEG content of coating film and didn't correlate significantly with the size of drug release orifice.

Keywords: cinv (chemotherapy-induced nausea and vomiting), ondansetron, osmotic pump tablet, neoplastic,
FORMULATION, DEVELOPMENT & EVALUATION OF TRAMADOL HYDROCHLORIDE MATRIX TABLETS

Praveen Tahilani*, Jitendra Banweer*

*Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: tahilanipraveen@gmail.com

ABSTRACT

The main objective of the present work was to develop sustained release matrix tablets of water-soluble Tramadol hydrochloride using different polymers viz. Hydroxypropyl methyl cellulose (HPMC) and natural gums like Karaya gum (KG) and Carrageenan (CG). Varying ratios of drug and polymer like 1:1 and 1:2 were selected for the study. After fixing the ratio of drug and polymer for control the release of the drug up to desired time, the release rates were modulated by a combination of two different rates controlling material and a triple mixture of three different rates controlling material. After evaluation of physical properties of the tablet, the in vitro release study was performed in 0.1 N HCl pH 1.2 for 2 hrs and phosphate buffer pH 6.8 up to 12 hrs. The effect of polymer concentration and polymer blend concentration were studied. Different ratios like 80:20, 60:40, 50:50, 40:60 and 20:80 were taken. Dissolution data was analyzed by Korsmeyer-Peppas power law expression and modified power law expression. It was observed that matrix tablets contained polymer blend of HPMC/CG were successfully sustained the release of drug up to 12 hrs. Among all the formulations, formulation F16 which contains 20% HPMC K15M and 80% of CG release the drug which follows Zero order kinetics via, swelling, diffusion and erosion and the release profile of formulation F16 was comparable with the marketed product. Stability studies (40±2°C/75±5%RH) for 3 months indicated that Tramadol hydrochloride was stable in the matrix tablets. The DSC and FTIR study revealed that there was no chemical interaction between drug and excipients.

Keywords: Tramadol Hydrochloride, Carrageenan Gum, Karaya gum, HPMC K 15 M, Matrix tablets, zero-order release.
FORMULATION AND EVALUATION OF MELINJO SEED EXTRACT-LOADED LIPID PARTICLE GEL

Abhishek Sharma*, Suresh Kumar**, Payal Saiju*, and Sukhwant Singh*

*Sagar Institute of Research, Technology, and Science- Pharmacy, Bhopal (M.P.) Abhi007_bpl@yahoo.co.in
**Department of Pharmacognosy, JSS Colege of Pharmacy, Ootacamund (T.N.) Bhatiwaljcd@gmail.com

ABSTRACT

Melanin contributing to human skin color, especially eumelanin, is the major pigment that has a primary function of protecting the skin from damage caused by ultraviolet (UV) exposure such as photoaging or photocarcinogenic. Melanocytes cell in the basal layer of epidermis contains melanosome. The melanosome function is a synthesis, storage, and transfer of melanin to the outermost layer of skin (keratinocytes). Melanogenesis could be induced by UV radiation through stimulated the secretion of an α-melanocyte-stimulating hormone that would be activated microphthalmia-associated transcription factor (MITF). MITF would lead to upregulation of tyrosinase, the primary enzyme in melanogenesis. Melinjo (Gnetum gnemon L.) seed extract (MSE) is potential as a skin-whitening agent because it contains trans-resveratrol and its derivatives, to inhibit tyrosinase in the melanogenesis process. Using MSE in cosmetic products will be challenging due to resveratrol chemical instability and bioavailability in the skin. Many cosmetic products have been developed using lipid particle technology to improve its limitation. The objective of this research was to examine the skin safety and whitening efficacy of MSE-loaded lipid particle gel in healthy human subjects. Single occlusive closed patch test for 24 h was used as the skin irritation analysis. Irritation responses were graded after patch removal and compared to the control for evaluation. The efficacy study was performed using mexameter to measure skin melanin index on 25 female volunteers. The result showed the test product did not induce skin irritation effect. The skin melanin index was statistically significant decreased (P < 0.05) after 28 days of application the test product, with the averaged by 3.50%, and skin melanin index changed by increase 0.75% in the control group. Application MSE-loaded lipid particle gel can brighten the skin, without cause irritation under normal conditions of use.

Keywords: Gel, Gnetum gnemon, melinjo seed extract (MSE), resveratrol, safety, skin whitening
DEVELOPMENT AND EVALUATION OF IN SITU NASAL GEL FORMULATIONS OF DILTIAZEM HYDROCHLORIDE

Megha Parashar *

*Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal, M.P. Email: meghamishra3103@gmail.com

ABSTRACT

Advances in the in-situ gel technologies have spurred development in may medical and biomedical applications including controlled drug delivery. The objective of the present work was to formulate and evaluate mucoadhesive in situ nasal gels of Diltiazem Hydrochloride, a calcium channel blocker. This drug delivery system may overcome the first-pass metabolism and subsequently improve the bioavailability of the drug. The formulations of in situ nasal gels were prepared using different polymeric ratios of hydroxypropyl methylcellulose (HPMC K-100). Gelation was determined by physical appearance. Viscosity study of sol and gel formulations indicated that an increase in polymer concentration increases the viscosity. Gel strength was found in the range of 22-55 sec. All formulations had a clear appearance in the sol form, with the gelling temperature of the nasal gels ranging between 34.1 ± 0.33 and 35.8 ± 0.22 °C. The gelling time of all the formulations varied from 3.0 ± 0.32 to 8.3 ± 0.22 s; the drug content was >95%. The pH of the formulations ranged between 5.7 ± 0.004 and 6.2 ± 0.004. Mucoadhesive strength was adequate to provide prolonged adhesion. In vitro, drug release studies showed that the prepared formulations could release the drug for up to 10 h with all of them following Higuchi kinetics. The FTIR analysis revealed that there was no drug-polymer interaction. From these findings, it can be concluded that in situ nasal gels may be potential drug delivery systems for Diltiazem Hydrochloride to overcome the first-pass metabolism and thereby to improve the bioavailability for the treatment of various cardiovascular diseases.

Keywords: in-situ gel, Diltiazem, HPMC K-100, bioavailability
FORMULATION AND EVALUATION OF SUSTAIN RELEASE TABLET OF DILTIAZEM HCL USING MUCILAGE EXTRACTED FROM ABELMOSCHUS ESCULENTUS (OKRA)

Lata Choudhary*, Abhishek Sharma* and Nishi Prakash Jain*

M.Pharm. (Student), Sagar Institute of research technology and science-Pharmacy, Bhopal
**Assistant professor, Sagar Institute of research technology and science-Pharmacy, Bhopal. abhi007_bpl@yahoo.co.in

ABSTRACT

This study was carried out to study the ability of mucilage extracted from Abelmoschusesculentus (Okra) to be used as a sustain release polymer. The effectiveness of mucilage in sustaining the release of Diltiazem hydrochloride in a tablet was studied. Mucilage was extracted from the pods of Abelmoschusesculentus using acetone and drying. Dried mucilage was converted into powder form, and its physical and chemical characteristics such as solubility, pH, moisture content, viscosity, morphology study using were carried out. The powder was used in the preparation of tablet using granulation and compression methods. Diltiazem hydrochloride sustains release tablets were prepared in various proportions of mucilage concentration by wet granulation method. Pharmacopeial evaluation of prepared tablet was carried out including in-vitro drug release. Formulation chiefly contains mucilage found to be favorable for hardness and floatability, but the combined effect of three variables was responsible for the sustained release of the drug. The in vitro drug release data of checkpoint batch (DOF-6) was found to be sustained well compared to the most satisfactory formulation (DOF-8) of 7 runs. The ‘n’ value was found to be between 0.5 and 1 suggesting that the release of drug follows anomalous (non-fickian) diffusion mechanism indicating both diffusion and erosion mechanism from this mucilage. Predicted results were almost similar to the observed experimental values indicating the accuracy of the design. Drug release kinetics that was attained from dissolution studies showed that mucilage sustained the release up to 24 hours and exhibited the longest release marketed formulation. Hence, the mucilage of Abelmoschusesculentus (Okra) was testified as an effective adjuvant to produce favorable sustained-release tablets with strong tensile and crushing strength.

Keywords: Abelmoschusesculentus (Okra), Sustain release tablet, Diltiazem, (non-fickian) diffusion
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NANOPARTICLE BASED NAIL PREPARATION FOR THE TREATMENT OF ANTIFUNGAL NAIL INFECTION

Pooja Sharma*, Suchi Thakur **, Surendra Jain**

* Department of Pharmaceutical Science, NRI-Pharmaceutical Sciences, poojasharma220994@gmail.com
** Department of Pharmaceutical Science, Sagar Institute of Research and Technology-Pharmacy, shuchi2288mpharma@gmail.com
** Department of Pharmaceutical Science, Sagar Institute of Research and Technology-Pharmacy, prof.surendrajain@gmail.com

ABSTRACT
The nail lacquer consists of fungicidal effective amount of terbinafine hydrochloride, or another antifungal agent in a clear, stable, film-forming lacquer vehicle; a water-insoluble film-forming polymer or penetration enhancer; and volatile solvent. The purpose of the present investigation was to formulate and evaluate the terbinafine hydrochloride nanoparticle nail lacquer as a fungal drug delivery system for the treatment of onychomycosis. Terbinafine hydrochloride was chosen as a model drug, the formulation is prepared with permeation enhancer (Thioglycolic acid) and CuSO4 nanoparticle. Then, these lacquers were compared for drying time, non-volatile content drug content, drug diffusion drug entrapment, % yield, pH determination, and solubilities study. Three formulations of different ratio of CuSO4 nanoparticle (1:1:2, 1:1:1 & 1:2:2) was prepared in which 1 preparation is unstable, and two preparation shows good film formulation, drying smooth time flow and required volatile content, hardness. The stability tests showed that the formulation was stable at normal temperature for 1 month. From in-vitro fungal permeation study, a good in vitro in-vivo correlation can be expected. The results obtained from the in vitro studies indicate that formulation 1:1:2 showed a complete drug release which sustained over 48 hours. The 1:1:1 formulation showed less effective results in comparison to 1:1:2 and the third formulation is unstable. From diffusion studies across franz diffusion cell the formulation 1:1:2 was selected as the optimized nail lacquer formulation based on drug diffusion studies. From the above studies, it can be concluded that medicated nail lacquers proved to be a better tool as a drug delivery system for antifungal in the treatment of onychomycosis.

Keywords Antifungal, nanoparticle, diffusion, nail lacquer
TPPS 28

TARGETED ANTI-TUMOR DRUG-DELIVERY

POTENTIAL OF CARBON QUANTUM DOTS

Navneet Dubey *, Poonam Sharma*, Suman Ramteke*, N K Jain*
School of pharmaceutical sciences, Rajiv Gandhi Proudyogiki Vishwavidyalaya Bhopal (M.P.) 462033
naveneet@gmail.com

ABSTRACT
Carbon-based nanomaterials are gaining greater attention over the past few years as a material of choice for the targeted delivery of anti-tumor drugs due to their non-toxic nature and excellent fluorescence qualities. Carbon Quantum dots (CQDs) have captured the fascination and attention of scientists due to their simultaneous targeting and imaging potential in drug delivery, in pharmaceutical and biomedical applications. In this paper, the carbon above quantum dots will be discussed for their use within Doxorubicin and Methotrexate based drug delivery vehicles, as well as the ligand-mediated receptor specific targeted therapy for possible applications in tumor management.

KEYWORDS- QuantumDots (QDs), Carbon QuantumDots(CQDs), Targeted Drug Delivery, Anti-tumor Nanomaterials, Imaging.
TPPS 29

DEVELOPMENT AND PHYSIOCHEMICAL, IN-VITRO EVALUATION OF ANTIHYPERTENSIVE TRANSDERMAL PATCHES

Archana Shrivastava*, Sukhwant Singh* & Jitendra Banweer*

* Sagar Institute of Research Technology & Science – Pharmacy, Bhopal, singh.sukhwant@gmail.com

ABSTRACT

Transdermal patches of Losartan with hydrophilic and hydrophobic polymers containing the drug reservoir were prepared by a solvent evaporation method. In this experiment, the membranes of ethylcellulose and eudragit RS 100 were used to achieve controlled release of the drug. The prepared patches showed satisfactory physiochemical characteristics of weight variation, thickness, folding endurance, moisture absorption, and drug content were uniform in all patches. In-vitro permeation studies were done by using Franz diffusion cell having cellophane membrane. The effect of non-ionic surfactant like tween 80 and span 80 on drug permeation was studied. Based on the kinetic studies, the patch containing both HPMC and Eudragit RS100 showed satisfactory drug release patterns. The aim of the present study was to prepare and evaluate the transdermal patch of drug using different polymers such as a hydrophobic, combination of hydrophobic: hydrophilic, and hydrophilic. Losartan potassium (hydrophilic) is the antihypertensive drug used for lowering increased blood pressure. Transdermal patches of losartan potassium were prepared using different ratios of polymers by the solvent casting technique. The prepared patches were evaluated for their flexibility, thickness, smoothness, moisture content, hardness, and tensile strength. The in vitro permeation study was carried out using a diffusion cell. The blood lowering response of all formulations was studied using hypertension-induced rats. The formulation containing hydrophobic polymers showed a satisfactory drug release pattern compared to the combination of hydrophobic: hydrophilic polymers and the hydrophilic polymers. Hence, the present study reveals that the formulation of the hydrophilic drug (losartan potassium) with hydrophobic polymers exhibit good release properties as compared to that of hydrophilic polymers and combination of both hydrophobic and hydrophilic polymers.

Keywords

Transdermal patch, Losartan, hydrophilic and hydrophobic polymers, In-vitro permeation studies
TPPS 30

FORMULATION DEVELOPMENT AND EVALUATION OF GASTRO RETENTIVE FLOATING TABLET OF ALBENDAZOLE

Hema Malviya*, Praveen Tahi*lan*, Dr. Jitendra Banweer *

*Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: hemamalviya92@gmail.com
* Sagar Institute of Research, Technology & Science- Pharmacy, Bhopal. M.P. Email: tahilanipraveen@gmail.com
* Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal. M.P. Email: jbanweer@yahoo.com

ABSTRACT
The formulation of floating tablet CMC and albendazole used as matrix forming agent, other excipient used are sodium bicarbonate {as a gas generating agent} citric acid, magnesium stearate as a lubricant. The drug subjected to various preformulation studies such as angle of repose, bulk density, tapped density, compressibility index, Hausner's ratio characterization using FTIR, drug, and excipient compatibility the tablet were using single station punching machine. The prepared tablet was subjected to various evaluation parameters such as thickness, hardness, weight variation, friability buoyancy study and in vitro drug release, it was concluded that there was no interference in the functional group as the principal peak of the drug were found to be unaltered in the physical drug mixture.

Keywords: Floating tablet, Albendazole, Gastro-Retentive, FTIR, UV.
TPPS 31

BIOMETRICS-TEMPERATURE SENSING LAYER FOR ARTIFICIAL SKIN (PECTIN)

Shruti Awasthi *, Pooja Jadon*

*Institute of Pharmacy, Bundelkhand University, Jhansi (U.P.) India

ABSTRACT

Biomimetics is a new field of science emerging nowadays, and will shoot to its peak in coming years. It involves probe of both structure as well physical component of herbal product with the goal to design new and enhance materials. Biometrics is mainly referred to as biomimicry in which man-made process, substances devices and equipment imitate nature. While discussing biomimetics, temperature sensing layer for artificial skin made from pectin (which found in the cell wall of plants) capable of sensing temperature changes using similar to Pit-Viper sensing their prey. Pit-vipers are venomous snake and have a very cool heat sensing system which allows them to manifest their prey in the dark. This field is successfully paying its way amongst researchers and scientist in Nanotechnology, Robotics, Medical Industries as well as Artificial Intelligence. The concept of developing skin is a highly sensitive method which is used in Prothetic-limbs for ampoules as well as Robotic Arm.

Keywords- Biomimetics, Biochemical process, Biomimicry, Artificial skin, Pectin, Prosthetic limb.
MICROBIAL SYNTHESIS OF GOLD NANO-PARTICLES

Priya Bhardwaj*
INSTITUTE OF PHARMACY BUNDELKHAND UNIVERSITY, JHANSI Email Id- saurabhsavi93@gmail.com bhardwajp805@gmail.com

ABSTRACT
As nanoparticles possess new & improved properties of the material which is mainly based on size, shape, distribution, and morphology mainly involve the production, manipulation & use of material ranging in size less than a micron to that of an individual atom. Microbe produces inorganic material either intra or extracellularly often in nanoscale dimensions. Gold nanoparticles have been employed in biomedicine since the last decade because of their unique optical, electrical and photothermal properties. The present review discusses the microbial synthesis, properties and biomedical applications of gold nanoparticles. Different microbial synthesis strategies used so far for obtaining better yield and stability have been described. It also includes different methods used for the characterization and analysis of gold nanoparticles, viz. UV–visible spectroscopy, Fourier transform infrared spectroscopy, X-ray diffraction spectroscopy, scanning electron microscopy, transmission electron microscopy, atomic force microscopy, electron dispersive X-ray, X-ray photoelectron spectroscopy, and cyclic voltammetry. The different mechanisms involved in the microbial synthesis of gold nanoparticles have been discussed. The information related to applications of microbially synthesized gold nanoparticles and patents on the microbial synthesis of gold nanoparticles has been summarized.

Keywords- Nanoparticles, metals, biosynthesis, microorganisms.
PHARMACOLOGY
MODULATION OF AN EPILEPTOGENIC PATHWAY IN RAT BRAIN FOLLOWING TRAUMATIC BRAIN INJURY THROUGH THE USE OF MELATONIN AND CURCUMIN

Ashish Mishra*, Jeetendra Kumar Gupta*

* Department of pharmacology, GLA University, mishra.ashish8004@gmail.com
*Department of pharmacology, GLA University, jk.gupta@glau.ac.in

ABSTRACT

During the past decades, epilepsy syndrome has been depicted across India as well as worldwide, and this leads to increased mortality and morbidity rate. Researchers are trying to investigate the responsible causes and risk factors for seizure occurrence. Epilepsy is a chronic disorder which is derived from a Latin word ‘sacire’ meaning ‘convulsive attack’ and is expressed as a paroxysmal experience appointed to atypical, unnecessary or concurrent neuronal bustle in the brain. The treatment of epilepsy involves the use of anti-epileptic drugs, i.e. Sodium valproate, phenytoin, carbamazepine. Despite being treated with the available anticonvulsant drugs; this disease is still prevalent worldwide. The prevalence of epilepsy in India is 5 per 1,000, and in a world, the prevalence rate is 10 per 1,000. Modulation of an epileptogenic pathway in rat brain following traumatic brain injury through the use of melatonin and curcumin. The experiment of seizure was carried out by the use of chemical kindling model. Experimental epilepsy was induced by the administration of Pentylenetetrazole (35-55 mg/kg) alternately for twenty days following 10th injections. The test drugs were administered as an intraperitoneal and oral route in a dose of 75mg/kg and 100mg/kg respectively. After the last day of the experiment, the brain was dissected to estimate the level of gamma-aminobutyric acid (GABA). Additionally, in vivo antioxidant activity of test drugs was also analyzed by estimating superoxide dismutase (SOD), Lipid peroxidation (LPO), Catalase activity (CAT) and Glutathione (GSH) activity. Treatment of animals with melatonin at a dose of 75 mg/kg, i.p. and curcumin at a dose of 100 mg/kg p.o. after pentylenetetrazole administration, increased the GABA and Glutamate level. Additionally, Treatment of animals with a dose of 75 mg/kg and 150 mg/kg, i.p. and Curcumin at a dose of 75 mg/kg and 150 mg/kg, p.o. reduced the oxidative stress in wistar albino rats using an estimation of superoxide dismutase, lipid peroxidase, reduced glutathione, catalase activity. In conclusion, by the received results, it is suggested that Melatonin and Curcumin significantly increase the seizure threshold and reduce the neuronal hyperexcitability as well as reduce oxidative stress. Thus, both drugs have a protective effect in pentylenetetrazole-induced kindling model of epilepsy as well as also provide antioxidant activity.

Keywords: Epilepsy, Anti-epileptic, Gamma-aminobutyric acid, Superoxide dismutase, Glutathione
ABSTRACT

Diabetes is a very serious health problem with a heavy socio-economic burden to each country. Diabetes mellitus is a disorder of metabolism in which a relative or absolute deficiency or lack of effect of insulin leads to chronic hyperglycemia with or without glucosuria. The name of the syndrome relates to the glucosuria seen in diabetic patients. Of diabetic patients, 5% suffers from type 1 diabetes with absolute insulin deficiency, while about 90% of all diabetics are affected by type 2 diabetes, which is associated with insulin resistance. The vegetables which are commonly used as daily purposes also have medicinal values. The raw juices of vegetables will show the action on enzymes and biochemicals in the body such as PTP-1β, aldose reductase, sorbital dehydrogenase, platelet aggregation, AGEs and total blood cells, which are more responsible for the diabetes mellitus. By inhibiting the activity of these enzymes that will act as antidiabetics. Present study based on these the vegetable Benincasa hispida and Lagenaria siceraria juice are effective in preventing an enzymatic process.
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QUANTITATIVE STUDY OF BIOACTIVE CONSTITUENTS IN HYDROALCOHOLIC EXTRACT OF ZIZYPHUS XYLOPYRUS

Divya Prajapati*, Prabhakar Budholiya*, C. k. Tyagi*

*Sri Satya Sai University of Technology & Medical Sciences, Sehore, (M.P.)

ABSTRACT

*Zizyphus xylopyrus* (Retz.) Willd. (Rhamnaceae) Is used in folk medicine for treating an ulcer, as an antinociceptive, antidepressant, anticonvulsant and antioxidant activity. In present investigation, Qualitative analysis of various phytochemical constituents and quantitative analysis of total phenolics and flavonoids were determined by the well-known test protocol available in the literature. Quantitative analysis of phenolic and flavonoids was carried out by Folins Ciocalteau reagent method and aluminum chloride method respectively. The In vitro antioxidant activity of Hydroalcoholic extract of the plant was assessed DPPH assay using standard protocols. Phytochemical analysis revealed the presence of phenols, flavonoids, tannins, saponins, and alkaloids. The total phenolics content of the hydroalcoholic extract was (9.56 mg/100mg), followed by flavonoids (6.45mg/100mg). The present study concluded that the crude extract of *Nymphaea nouchali* is a potential source of natural antioxidants and this justifies its use in folkloric medicine.

Keywords: *Zizyphus xylopyrus*, Phytochemical, Phenolics, Flavonoids, Quantitative
EVALUATION OF NEPHROPROTECTIVE ACTIVITY OF ETHANOLIC EXTRACT OF URTICA URENS LINN LEAVES IN GENTAMICIN INDUCED NEPHROTOXICITY IN EXPERIMENTAL RATS

Misha Masood*, Surendra Jain*, Shikha Singh*

*Sagar Institute of Research and Technology – Pharmacy, Bhopal, sarah.m1607@gmail.com
**Sagar Institute of Research and Technology – Pharmacy, Bhopal, prof.surendra@gmail.com
***Sagar Institute of Research and Technology – Pharmacy, Bhopal, shikha.aips@gmail.com

Abstract

Gentamicin-induced nephrotoxicity is characterized by direct tubular necrosis, without morphological changes in glomerular structures. Gentamicin generates hydrogen peroxide in rat renal cortex mitochondria and can also enhance the generation of reactive oxygen species. Antioxidant systems are being shown to play an increasing role in the protection against exogenous oxidative stress. Restriction on the use of synthetic anti-oxidants is being imposed because of their carcinogenicity. Therefore in the present time; it is also a challenging task to develop an herbal formulation having an antioxidant property with reduced severe side effects. Urtica urens is less popular. The composition has been reported and found to contain a rich source of carbohydrates and proteins (Jacalin) and good source of fibers and vitamins, lignins, polysaccharides, etc. All these phytoconstituents are collectively explored for their various properties and are also rich sources of the phenolic compounds including flavonoids and have antioxidant properties. In this study, effects of ethanolic extract of Urtica urens were evaluated against GTN-induced renal injury. Normal control animals (Group-I) were found to be a slight change in their body weight, but negative control rats (Group-II) showed a maximum reduction in the body weight. The treatment with extracts at 100 & 200 mg/kg (Group-III & IV) showed a significant decrease in the body weight compared with the negative control group 3.8 & 1.78% respectively after 12 days of study. Group II (disease control) manifested a significant decrease in urine volume as compared to Normal control. Extract-treated groups showed an increased volume of urine. Creatinine, urea and uric acid levels in serum & urine were found increased in the group – II, when compared with the normal control group (GI). Urine & serum creatinine, urea and uric acid concentrations in group III& IV were found a significantly decreased level as compared with the GTN group (G-II).

Keywords: Gentamicin, Nephrotoxicity, Urtica urens, phytoconstituents, antioxidant
ANTIFERTILITY ACTIVITY OF SEED & PULP EXTRACT OF MOMORDICA CHARATIA DESCOURT

Rohit Maywad*

*Sagar Institute of Research, Technology & Science-Pharmacy, Bhopal, M.P Email: rohitpiyanist101@gmail.com

ABSTRACT

Momordica charantia Descourtis traditionally been used for family planning. As per literature survey the various phytoconstituents like flavonoids, alkaloids, phytosterols, amino acids etc are present. In the present study hydroalcoholic extract of Momordica charantia Descourt (pulp and seeds) are tested for its antifertility activity at doses of 200 mg/kg and 400 mg/kg. Among the two extracts tested at two different doses, the hydroalcoholic pulp extract of Momordica charantia Descourt at 400 mg/kg was found to exhibit potent antifertility activity. It is known that estrogenic substances inhibit pregnancy by suppressing the level of both follicular stimulating hormone (FSH) and luteinizing hormone (LH), which in turn prevent the implantation. Estrogen and progesterone are the hormones responsible for histology and functional modifications of the female genital tract. The exogenous administration of physiological doses of estrogen, in sexually immature rats, stimulated histoarchitecture of the uterus. Any compound possessing estrogenic activity may exhibit antifertility activity by suppressing gonadotrophin secretion, with consequent inhibition of ovulation. Oral administration of hydroalcoholic pulp extract at 400 mg/kg caused a significant increase in uterine weight in immature rats (versus control). Simultaneous administration of ethinyl estradiol and hydroalcoholic pulp extract caused a highly significant decrease in uterine weight when compared with the standard. Treated rats showed open vaginas while all the control had closed vaginas. The hydroalcoholic extract of Momordica charantia Descourt also exhibited estrogenic activity by a significant increase in uterine weight. Estrogen stimulates the content of these in uterus thereby changing the uterine milieu and creating nonreceptive condition.

Keywords: Hydroalcoholic pulp, Antifertility, Momordica charantia
PHARMACEUTICAL CHEMISTRY
NON-AQUEOUS TITRIMETRIC METHOD FOR DETERMINATION OF LORATADINE IN TABLET DOSAGE FORMS

Sneha Kulkarni*, Prakash Shukla*, Arvind Parmar *

*Dept. of Pharmacy Barkatullah University, Bhopal (email: snehaudaykulkarni@gmail.com)
*Dept. of Pharmacy Barkatullah University, Bhopal
*Dept. of Pharmacy Barkatullah University, Bhopal

ABSTRACT
Non-aqueous Titration is one of the important methods for the Pharmacopoeial assays, as it is suitable for the titration of weak acids and bases. A simple, rapid and precise method for determination of Loratadine (LOR) in Pharmaceutical Dosage forms was used. The method was based on non-aqueous titration using perchloric acid as titrant and crystal violet as indicator. All estimations were carried out by simultaneous blank determinations, and the actual amount of perchloric acid was determined equivalent to Loratidine(LOR). The method is successfully applied to various dosage forms of Loratidine(LOR).

Keywords: Non-aqueous Titration, Loratadine, Perchloric Acid, Crystal violet indicator, Titrant
SYNTHESIS, CHARACTERIZATION AND PHARMACOLOGICAL ACTIVITY OF 3, 6-DISUBSTITUTED 2-PYRIDINECARBOXAMIDE DERIVATIVES AS GLUCOKINASE ACTIVATOR

Dhanraj Patidar*

* School of Pharmacy, LNCT University, Kolar Road, Bhopal patidardhanrajx@gmail.com

ABSTRACT

Pyridinecarboxamide and their derivatives have long been used as precursors for the synthesis of biologically active molecules. Pyridinecarboxamide derivatives exhibit a broad range of biological activities like antioxidant, antitumor, antiallergic, antihypertensive, antibacterial, antipsychotic, histamine H3 receptor antagonist along with anti-diabetic activity. Glucokinase (GK) is an enzyme of the hexokinase family that catalyzes the first step in glycolysis. Glucokinase occurs in cells in the liver, pancreas, gut, and brain of humans and most other vertebrates and causes phosphorylation of glucose to glucose 6-phosphate. It plays a significant role as a glucose sensor to maintain the plasma glucose level by enhancing both glucose uptake in the liver and insulin secretion from pancreatic β-cells. The structure-activity-relationship based on 3, 6-Disubstituted 2-pyridinecarboxamide moiety, associated with the substitution on 4th position of thiazole ring, 3rd and 6th position of pyridine ring by different groups to be very effective. Compounds were designed and then synthesized of this series to be potent as glucokinase activators are described. Structural elucidation of compounds by IR, NMR, and Mass spectroscopy. The pharmacological activity of the newly synthesized compounds is also described.

Keywords: Diabetes Mellitus, Glucokinase enzyme, Glucokinase activators, Phosphorylation, 3, 6-Disubstituted 2-pyridinecarboxamide, glycolysis
GRID-BASED DOCKING STUDY OF SOME 2-(4-METHYLSULFONYLPHENYL) PYRIMIDINE DERIVATIVES (DESIGNED AFTER QSAR STUDIES) WITH CYCLOOXYGENASE-2

Satish K. Sarankar* & A. K. Pathak*

Department of Pharmacy, Barkatullah University Bhopal- 462026 satish_sarankar@yahoo.co.in

ABSTRACT
Molecular docking helps in studying drug/ligand or receptor/protein interactions by identifying the suitable active sites in the protein, obtaining the best geometry of ligand-receptor complex and calculating the energy of interaction for different ligands to design more effective ligands. In Grid-based docking, after unique conformers of the ligand are generated, the receptor cavity of interest is chosen, and a grid is generated around the cavity. Cavity points are found, and the center of mass of the ligand is moved to each cavity point. All rotations of the ligand are scanned at each cavity point where the ligand is placed. Efficiency and precision of docking rely upon scoring function. Scoring functions are based on force fields that are used to simulate the functions of proteins. With the known 3D structure of receptor molecule or protein, the binding affinity of the protein-ligand complex was calculated, and it is termed as Dock Score. In our research work, to know the binding affinity of some 2-(4-methylsulfonylphenyl)pyrimidine derivatives (designed after QSAR studies) with Cyclooxygenase-2, the compounds were docked with three different receptors namely Cyclooxygenase-2 (Prostaglandin synthase-2), Uninhibited Mouse Cyclooxygenase-2 (Prostaglandin Synthase-2) and Membrane Protein Prostaglandin H2 Synthase-1) using VLifeMDS software. Among all compounds, three compounds having 2,2-dibromoethanamine, 2,2-diiodoethanamine and 2,2,2-triiodoethanamine substituted pyrimidine derivatives showed best docking score with all three COX-2 receptors. With Prostaglandin synthase-2 after successful completion of the docking process, the minimum score obtained was -6.190969, -6.180829 and -6.049794 for three compounds respectively. The compounds were docked with a different receptor Uninhibited Mouse Cyclooxygenase-2, and the same three compounds showed the minimum score of -6.293567, -6.202445, -6.100384 respectively. The docking score was found -6.345966, -6.245738, -6.150805 with Membrane Protein Prostaglandin H2 Synthase-1 with the same substituted pyrimidine derivatives. The present research work opened a new path to fulfill the increasing demand of COX-2 inhibitors which can be used in the treatment and cure of various ailments those are mediated through COX-2 pathway.

Keywords: Docking, Pyrimidine derivatives, Cyclooxygenase-2
SYNTHESIS AND ANXIOLYTIC ACTIVITY OF 2-(SUBSTITUTED)-5-[(N-BENZOTRIAZOLOMETHYL)-1,3,4-Thiadiazolyl]-1,3,4-Thiadiazolyl]-Imidazole-2-Thione

Vijay Kumar Singh*, Poonam Rishishwar**, Peeyush Bharadwaj***
* Research Scholar School of Pharmacy, Monad university, Panchsheel Nagar, Hapur (U.P.)
** Arunachal University of Studies, Namsai, Arunachal Pradesh
*** Institute of Pharmacy, Bundelkhand University Jhansi

ABSTRACT

1,2, 3-Benzotriazole is a heterocyclic compound with three nitrogen atoms. It is a polar and colorless compound which can be used for its great versatility. The enormous investigations on derivatives of benzotriazole reveal wide applicability of this molecule for tagging and delivering a huge number of heterocyclic nuclei. In the present work synthesis of several derivatives of 2-(substituted)-5-[(n-benzotriazolomethyl)-1,3, 4-thiadiazolyl]-imidazole-2-thione has been synthesized and are evaluated for their anxiolytic activity. The anti-anxiety activities of the synthesized derivatives were evaluated using the EPM test and bright and dark box test experimental models of anxiety. All results were expressed as mean± standard error mean (SEM) and analyzed by one-way ANOVA. Post-hoc comparisons were performed by applying Dunnet’s test. P <0.05 was considered statistically significant.

Keywords: Benzotriazole, Thiadiazole, Thiazolidinone, Anxiolytic Activity, Anxiety, Elevated Plus Maize, Bright and Dark Arena
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STRUCTURE-BASED DRUG DESIGN, SYNTHESIS, CHARACTERIZATION, AND EVALUATION OF SOME NOVEL PDE 5 INHIBITOR

Payal Agrawal*, Chandrabose Karthikeyan **, Deepti Jain**

*Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy,
  payal_ag03@rediffmail.com

** Department of Pharmaceutical Chemistry, RGPV, Bhopal, karthinobel@gmail.com

**School of Pharmaceutical Sciences, RGPV, Bhopal, deeptijain@rgtu.net

ABSTRACT

A phosphodiesterase (PDE) is an enzyme that breaks a phosphodiesterase bond. The main family of phosphodiesterase is cyclic nucleotide phosphodiesterase. PDE5 enzymes control the duration and localization of intracellular cyclic nucleotide cGMP signaling molecule which mediates interactions with various signaling cascades including the MAP kinase and Ca2+ pathways. Inhibition of PDE5 is currently the most tested strategy in various clinical conditions such as chronic heart failure, high altitude pulmonary edema, etc. The strong safety profile of the three PDE5 inhibitors namely sildenafil, tadalafil, and vardenafil that are currently marketed in most of the world has encouraged clinical investigators to test the efficacy of these drugs in the treatment of some ailments. GLIDE has previously been reported for the docking of Vardenafil with PDB ID: 1UHO and was validated and applied successfully to predict the binding orientation of many ligands. The details of their binding pattern at the active site of the receptor (1UHO) were successfully visualized with the help of software. Glide Score is based on ChemScore but adds buried polar terms devised by Schrodinger to penalize electrostatic mismatches. Present work aims to design of novel 6-oxo-4-substitute aryl-2-sulfanyl-1, 3-dihydropyrimidine-5-carbonitriles derivatives targeting PDE 5 enzyme is based on the reported inhibitor (Vardenafil). 2, 50,000 molecules from OTAVA database was screened against PDE 5 crystal structure (PDB ID: 1UHO) by high-throughput virtual screening using flexible docking. The docking stimulation was first done with HTVS followed by SP and then by XP. Initially OTAVA library of compounds have been screened by HTVS based flexible docking, so that a quick sorting of ligand having very low affinity to the binding site (active site residues of grid), can be eliminated, followed by SP and XP docking in order to improve the precision of docking performance by optimizing functional group binding interactions to the active site residues. An appropriate synthetic scheme was designed, and lead candidate was successfully synthesized. The structures of lead candidates were elucidated by appropriate spectral analysis (IR, NMR and Mass Spectroscopy). The purity of all synthesized compounds was determined by thin layer chromatography. Rf values were recorded by performing TLC using the solvent system. The melting point was determined by the melting point apparatus. The results of IR and NMR spectroscopy showed that compounds were successfully synthesized.

Keywords: Phosphodiesterase 5, cGMP, MAP kinase, HTVS screening, Chromatography
COUMARIN BASED SCHIFF BASE: SYNTHESIS AND THEIR ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY

Alka Pradhan*, Anil Kumar*, Nidhi Chauhan*
Sarojini Naidu Govt. Girls Post Graduate College, Bhopal koshal_anil@yahoo.com

ABSTRACT

3-propanoyl-2H-1-benzopyran-2-one was taken with semicarbazide which gives 2-(2-oxo-2H-1-benzopyran-3-carbonyl)hydrazine-1-carboxamide. The prepared Coumarin moiety is containing 2-(2-oxo-2H-1-benzopyran-3-carbonyl)hydrazine-1-carboxamide derivatives is further condensed with some aromatic aldehyde derivatives which give other class of Schiff base. Synthesized Schiff base are analyzed for their antioxidant and antimicrobial activity. The antioxidant test was done by DPPH, and Nitric oxide and antimicrobial activities employed were S. aureus, Pseudomonas, E. coli, Candida albicans, A. flavus, A. fumigates.

Keywords: Coumarin and azomethine moiety, antioxidant, antimicrobial activity.
PHARMACOGNOSY
CHEMICAL CONSTITUENTS AND MEDICINAL VALUES OF MIRACLE HERB NIGELLA SATIVA.

Murtaza Rashid*, SudhanshuDhar Dwivedi*

*Ph.D. research scholar, Dept. of Chemistry, Govt. Benazir College, Bhopal Email:thokerumarrashid@gmail.com
* Professor, Dept. of chemistry, Benazir College, Bhopal Email:sudhanshu_dhar@yahoo.co.in

ABSTRACT

Medicinal plants play important role in curing various kinds of diseases and ailments. The world health organization report in 2001 reported that 60% of the world’s population relies on traditional medicine among which 80% of the population in developing countries depend extremely on traditional medical practices like herbal medicines for their primary health care practices. Nigella sativa is an annual herb of Rannunculaceae family grows up to 20-60cm in height. It is also referred to as miracle herb of the century because it holds so many health curing properties. Nigella sativa seeds have been found to possess a considerable amount of chemical constituents which import its high medicinal value. The proximate chemical composition of N. sativa seeds has reported as protein 21 %, Fat32%, carbohydrates 37 %, Ash 4%, moisture 6% and crude fibers 6.6 %. The chemical constituents reported seed oils are thymoquinone, dithymoquinone, thymohydroquinone, thymol, p-cymene, carvacolterpineol, longifolene, α-pinene, α-hederin, Sabinene, α-Thujene, Myrcene, α-Phellandrene, Limonene, γ-Terpinene, Fenchone, Dihydrocarvone, Carvone, sesquiterpenoid α-Longipinene, fatty acids like palmitic acid, linoleic acid, oleic acid, and eicosadienoic acid. Other components reported are sterols like campesterol, Stigmasterol, βSitosterol, vitamins tocopherol, thiamin, riboflavin, pyridoxine, niacin, Folic acid and inorganic elements P, Ca, Fe, Cu, and Zn. Seeds oil also contain alkaloids isoquinoline type Nigellimine, Nigellimine- N-oxide, indazole ring type nigellicine, nigellidine and dollyabene type Nigellimines (A1-A5) and Nigellimines (B1- B2). Nigella sativa seeds have a long history for their use to treat various diseases in the Middle East and the Indian subcontinent. In traditional folk practice, black seeds were used as food and medicine. The black seeds were traditionally used to treat the ailments like asthma, arthritis, backache, diabetes, diarrhea, dry cough, rhinitis, hair greying, hair loss, dry cough, hypertension, fatigue, memory improvement, muscle aches, anxiety, sexual impotency, Insomnia, toothache, gum disease, amenorrhea and dysmenorrhea, anthelmintic and skin eruptions. However, extensive work by researchers has found numerous bioactive compound in black seeds. These bioactive compounds have been found to retain a large number of pharmacological properties such as antioxidant activity, anti-diabetic activity, anticancer activity, anti-microbial activity, anti-hyperlipidemic activity, anti-inflammatory, Cardio-protective activity, Anti-schistosomiasis, Anti-oxytocic potential, Neuro-protective activity, Nephro-protective activity, Anxiolytic activity, Antinociceptive activity, Anticonvulsant and many other medicinal properties.

Keywords: phytochemicals, proximate analysis, pharmacology, bioactive compounds, black seeds, essential oil, and fixed oil
IMPACT OF VERMICOMPOST AND CHEMICAL FERTILIZERS ON THE ANTIOXIDANT POTENTIAL OF BRINJAL (SOLANUM MELONGUM L)

Chandni Mishra* and H C Katariya*

*Department of Chemistry, Govt. Gitanjali Girls P.G. College, Bhopal, India

Email: chandnimishra177@gmail.com

ABSTRACT

Solanum melongum L. is an important vegetable crop and widely grown in India. One of the major causes of low yield may be that the organic matter content, as well as nutrient status of soils, have declined over time. The aim of the present study was to investigate the impact of vermicompost and chemical fertilizers on the accumulation of essential secondary metabolites and their antioxidant activity. Three different treatments with a combination of chemical fertilizers and vermicompost were prepared in this study. DPPH and nitric oxide scavenging assay were performed for antioxidant activity. The results revealed that the vermicompost enhances the antioxidant activity in the cultivated plants. Comparatively chemical which reduced the free radicals have more power to reduce nitric oxide radicals than DPPH.

Keywords: Solanum melongum, Vermicompost, DPPH, nitric oxide scavenging activity, antioxidant assay.
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IMPACT OF ANTITUBILIN DRUGS (DOCETAXEL) ON EMBRYONIC DEVELOPMENTAL ECOLOGY OF LYMNAEA STAGNALIS

Savita Manekar*

Department of Bioscience, Barkatullah University, Bhopal Email: savitamanekar@gmail.com

ABSTRACT

The molluscicidal effect of Docetaxel was evaluated against various stages of the freshwater snail Lymnaea stagnalis eggs, immature, young mature, and adults. Calculated values of lethal concentrations (LC50 and LC100) showed that the Docetaxel as toxic against eggs, immature, and adults. Results revealed that Docetaxel could be used to control harmful snails, as it significantly controls the reproduction of these snails. The Docetaxel reduces fecundity, prolongs hatchability period and reduces survival of the newly hatched snails in a snail population when exposed to a concentration lower than LC50.

Keywords: Lymnaea stagnalis, Docetaxel.
INVIVO ANTIOXIDANT ACTIVITY OF BOMBAX CEIBA BARK AGAINST CARBON TETRACHLORIDE INDUCED LIVER TOXICITY IN RATS

Sarita Karole**, Girendra Kumar Gauta**, Shailesh Gupta***

*Faculty of pharmacy, Bhagwant University, Ajmer, Rajasthan, India
**Oriental College of Pharmacy, Bhopal, M.P., India
***SRK, University, Bhopal, M.P., India

ABSTRACT

Antioxidants are imperative substances which possess the facility to protect the body from injury caused by free radical-induced oxidative stress. A diversity of free radical scavenging antioxidants exist within the body; many of them are derived from dietary sources like fruits, vegetables, and teas. In this study, antioxidant activity of ethanolic and aqueous extract of Bombax ceiba bark was investigated using CCl4 intoxicated rat liver as the experimental model. Rats divided into five groups were administered with CCl4 and CCl4 along with ethanolic and aqueous extract of the bark of Bombax ceiba (500 mg/kg b.wt) for 9 days. In the last day of activity, rats were anesthetized and blood samples were collected for serum separation. Biochemical analysis such as lactate dehydrogenase (LDH) was done in serum. Liver tissue was used for glutathione (GSH) level, glutathione reductase (GRD), glutathione-S-transferase(GST)and catalase (CAT) analysis and histopathology studies. Multiple doses of Bombax ceiba ethanolic bark extract administration at 500 mg/kg b.w. demonstrated significantly enhanced levels of LDH (338.34±0.31), CAT (135.8±0.29), GST (10.8±0.21) and GSH (28.55±0.99) in liver homogenates. Histopathological examination showed lowered liver damage in Bombax ceiba ethanolic -treated groups. The findings show that Bombax ceiba offers better protection against the free radical toxicity of CCl4.

Keywords: CCl4, free radical, antioxidant, liver, Bombax ceiba

Keywords: CCl4, free radical, antioxidant, liver, Bombax ceiba
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PHARMACOGNOSTIC, PHYTOCHEMICAL & PHARMACOLOGICAL EVALUATION OF CORDIA MACLEODII AS AN ANTIHYPERTENSIVE DRUG

Gaurav Goyanar*, Nirmal Dongre*, D. P. Chatterjee*

*SAGE University email gauravgoyanar@gmail.com

ABSTRACT

Cordia Macleodii is a perennial tree which is wildly available in Chattisgarh, Vindhya, maikal and Satpura region. As it is highly available in maikal region therefore called as macleodii. The crude drug is known to sanctuary old due to its magnificent various pharmacological activities out of which tribals used it as anti snake venom (snake bite treatment) its stem, bark, leaves all are utilized by Ayurveda in various formulations such as taila, kasaya & kalpas. In Hindi it is known as Dahiman/Dahipalas/Daiwas and dhalm in Marathi and baurlo in orissa palan in tamil palandekku are very common belongs to family Boraginaceae. Traditionally the bark is used as in the treatment of jaundice wood shaped was used as anti-inflammatory and analgesic activity. The aqueous, alcoholic extracts shows no toxicity even up to 2gm per kilogram when taken orally (safe LD50 crude drug) Its aqueous extract contains 12 percent or more, alcohol soluble extract from 4 percent or above, ash value 13.6 % (Above) Alcohol soluble extract or aqueous extract mainly contains alkaloids, carbohydrate, flavonoid, saponin, tannin & resins. Phenol, terpenoids, volatile oils and glycosides are also reported.

Keywords- Cordia Macleodii, antihypertensive, aqueous extract, alcoholic extract, saponin, glycosides, and flavonoids
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A NOVEL FORMULATION AND STANDARDIZATION OF AMLAKI RASAYAN

Vihangesh Kumar Dixit*, Nandlal Singh*, Raghujeer Irchhaiya**

*Research Scholar School of Pharmacy, Monad university, Panchsheel Nagar, Hapur (U.P.)
Vihang80@gmail.com

**Institute of Pharmacy, Bundelkhand University Jhansi Nandlalap1301@gmail.com

ABSTRACT

Herbal medicines are globally accepted for primary health care. Traditional ayurvedic formulations claim to facilitate healthy aging. Ayurvedic therapy is one of the best practices to relieve from illness. Ayurvedic preparation such as Asavas, Arishta, Taila, kwatha, churna are used to cure various diseases of ancient time, but very few scientific studies have been carried out to ayurvedic formulations. In this work, to ensure the quality of formulations by using modern techniques and analytical methods, Amalaki rasayan, a well-known formulation of Ayurveda, is considered. Amalaki Rasayana is a well known rejuvenating formulation of Ayurveda. Amalaki Rasayana is formulated in the lab. The formulated Amalaki rasayan has been compared with the formulation available in the market. They are evaluated on parameters, i.e., organoleptic characterization, extractive value & phytochemical evaluations, etc. Practical results show important to note that lab formulations are better as compared to market formulations.

Keywords: Amlaki rasayan, Characterization, herbal formulation, Ayurveda
BEHAVIORAL STUDY OF SHILAJIT PREPARATION

Shobhit Singh*, Dr. Pushp raj S Gupta **, Dr. Rishikesh Gupta ***

* Research Scholar, School of Pharmacy, Monad University, Hapur (U.P.) email – shobhitsinghjhansi@gmail.com
** School of Pharmacy, SHUATS, Pryagraj (U.P.) email - image24@rediffmail.com
*** Institute of Pharmacy, Bundelkhand University, Jhansi (U.P.) email - rishikeshgupt@gmail.com

ABSTRACT

Shilajit is a herbo-mineral drug, has been referred to as “Panacea,” which means a “cure for all diseases”. Acetylcholinesterase inhibitor is prescribed to treat amnesia, dementia, Alzheimer's disease, and cognitive disorders. The present study is designed to investigate the effect of Shilajit and acetylcholinesterase inhibitor on Amnesia inducing agent, induced experimental amnesia using elevated plus maze test in mice. Different groups of mice were employed. Amnesia Inducing agent, shilajit, an acetylcholinesterase inhibitor, and distilled water were injected intraperitoneally (IP). Each mouse was placed on elevating plus maze. The time taken by the animals to move from the open arms to either of two sides of enclosed arms was recorded. All the results were expressed as mean±S.E.M and P<0.05 considered as statistically significant. Amnesia inducing agent treated animals exhibit significant increase in time. On the other hand, shilajit and acetylcholinesterase inhibitor-treated mice shown significant decrease in time.

Keywords: Shilajit, an acetylcholinesterase inhibitor, Amnesia, Demnesia, Elevated plus maze, Mice
TPPS 51

PHYTOCHEMICAL INVESTIGATION OF GREWIA ASIATICA LINN. LEAVES.

Nandlal Singh* Vihangesh Kumar Dixit**, Raghuveer Irchhaiya **
*Research Scholar, school of Pharmacy monad university, Hapur.
**Asstt.prof. Institute of Pharmacy Bundelkhand university, Jhansi.
**Associate Prof. Institute of Pharmacy Bundelkhand university, Jhansi.

ABSTRACT

Grewia asiatica plant commonly known as Phaalsa, Family- Liliaceae. Different parts of this plant possess different pharmacological properties. Leaves of Grewia asiatica have many activities like antimicrobial, anticancer, antiplatelets, and anthelmintic, etc. Extraction of Leaves of Grewia asiatica.- the leaves of Grewia asiatica was extracted with petroleum ether at temp.100-120c till all fat constituents were separated then extract with ethanol at 60-80c. Then extractive values were found out for both the extracts. For petroleum ether extract it was 1.96%, and for ethanolic extract the value was 7.23%. Different Phytochemical tests were performed with petroleum ether extract and ethanolic extract for the presence of different phytoconstituents like Carbohydrates, amino acids, proteins, saponins, tannins, Flavonoids, Alkaloids, and glycosides. Phytochemical screening reveals the Presence of Flavonoids in ethanolic extract of Leaves of Grewia asiatica. The TLC of ethanolic extract was performed, and TLC Plate showed 6 different color spots with different Rf value in solvent system n-Hexane: Ethyl acetate: Formic acid. in a ratio of 7:3: 0.5.

Keywords: Grewia asiatica, antimicrobial, anticancer, antiplatelets, and anthelmintic, etc.
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FORMULATION AND EVALUATION OF CAPTOPRIL LOADED HOLLOW MICROSPHERES

R.B. Goswami*, Neelima Goswami**

* Sagar Institute of Research & Technology-Pharmacy Bhopal MP, drrbgoswami@gmail.com
** Sagar Institute of Research, Technology & Science-Pharmacy Bhopal MP, maanyana@gmail.com

ABSTRACT

Prolonged gastric retention improves bioavailability for drugs that have narrow absorption window and short elimination plasma half-life which reduces drug waste. The drug used as a model was Captopril because of its narrow absorption window in the upper part of small intestine. Moreover, drug is characterized by relative short elimination plasma half-life in human (t1/2 =2.0 hr) which make it an attractive candidate for a gastro-retentive dosage form. Low dose, short half-life, and absorption from the upper part of the small intestine of the drug make it an ideal candidate for controlled release in the form of a floating microsphere. The floating microsphere of captopril a beneficial drug delivery system leading to: Improved bioavailability, Complete and prolonged utilization of the drug due to increased gastric retention time, Improved constant therapeutic levels over a prolonged period and thus reduction in fluctuation in therapeutic levels, Reduced drug wastage due to acidic degradation, Controlled release of the drug.

Key words: gastroretentive, dosageform, Captopril, microsphere, bioavailability
EXPERIMENTAL EVALUATION OF ANTI-TUSSIVE ACTIVITY OF LEAF EXTRACT FROM LAGERSTROEMIA PARVIFLORA IN MICE

Abhishek Banke*, C.K. Tyagi**, Surendra Kumar Jain***

* Department of Pharmacognosy, Sagar Institute of Research & Technology – Pharmacy
  abhishehbanke@gmail.com
** Department of Pharmaceutical Sciences, Sri Satya Sai University, Sehore
  kishore198012@gmail.com
*** Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology – Pharmacy
  Prof.surendrajain@gmail.com

ABSTRACT

Cough is the most common symptom of respiratory diseases. When cough becomes serious, opioids are effective, but they have side effects like sedation, constipation, some addiction liability and also compromise the respiratory function. Therefore, there is need to have effective anti-tussive agent which do not have respiratory suppressant activity. The expectorant activity was evaluated by the volume of phenol red in mice’s tracheas. Extracts significantly increased mice’s cough latent period and inhibited the frequency of cough induced by sulfur dioxide, and improved tracheal phenol red output in the expectorant evaluation. The present study was investigated to evaluate anti-tussive activity, i.e. activity against cough from extracts of Lagerstroemia parviflora Roxb leaves. However, to the best of our knowledge, active principles responsible for this activity were not yet identified. Thus, we undertook this work to evaluate the effect of extract from plant’s leaves in cough induced in guinea pig and compared that of codeine phosphate, a standard antitussive agent. Swiss albino mice weighing between 18 to 20 g were divided up in 5 groups of 10 and were crammed with distilled water (control), various concentration of extracts with 100, 200 and 3.0 mg/kg and codeine with 10 mg/kg. They were then exposed to ammoniac inhalations, and the number of coughs was counted every hour, after cramping, for 5 min. Our results show, both codeine phosphate and the extract of L. parviflora (at different doses) produced maximum inhibition of cough reflex at 90 min after drug administration.

KEYWORDS Opioids: Antitussive, Lagerstroemiaparflo, leaf extract, sulfur dioxide, codeine phosphate
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ISOLATION AND CHARACTERIZATION OF FLAVONOID RUTIN FROM BARK OF PROSOPIS CINERARIA

Manish Sharma*, Surendra Jain, Deepti Jain***

* Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy
  manishsharma420746@gmail.com

**Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy
  prof.surendrajain@gmail.com

***School of Pharmaceutical Sciences, RGPV Bhopal, deeptijain@rgtu.net

ABSTRACT

Prosopis cineraria are a small tree generally found in dry arid regions of Arabia and India mainly in Rajasthan. Its state tree of Rajasthan. The flavonoids contained in Prosopis cineraria leaves were extracted, identified and characterized. The extraction of leaves by using sequential soxhlation, various solvents is used according to polarity Petroleum ether, chloroform, ethyl-acetate, methanol, and water. The metabolic extract was subjected to Photochemical screening, Thin layer chromatography and HPLC for isolation of compound and characterization of isolated compound were done by UV, IR, NMR, and LC-MS. On the basis of comparisons of spectral data of isolated compound with respects to spectral data of standard rutin. The result show maximum yield of the flavonoids (17.6 gm) was obtained from methanolic extract; phytochemical screenings were done by the various specific test of flavonoids. The Rf value (0.62) of the isolated compound has been compared with the Rf value of standard rutin. Rf value of isolated compound 4.41 in mobile phase ACN: Water with 0.5 formic acids at lamda max 272. Characterization of isolated compound was done by UV, IR, NMR, LC-MS, MS On the basis spectral analysis structure was elucidated as 2-(3,4 di hydroxyl phenyl)-5,7 di hydroxyl-3-[α-L-rhmnosyl-(1-6)-β-D gluco pyranoyloxy]-4H hydroxyl chromen-4-one, rutin was isolated for the first time from this plant (Prosopis cineraria).

Keywords: Prosopiscineraria, flavonoids, rutin, chromatography
TPPS 55

ANALGESIC AND ANTIPYRETIC ACTIVITY OF PLANT SOLANUM XANTHOCARPUM

Vivek S Rajpoot*, Divya Arya, Surendra Jain *

* Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy viveksrjpt05@gmail.com
* Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy viveksrjpt05@gmail.com
* Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy prof.surendrajain@gmail.com

ABSTRACT
Herbal medicine is still the mainstay of about 75 - 80% of the world population, mainly in developing countries, for primary health care. Solanum xanthocarpous small plant generally found in dry arid regions, a very prickly diffuse bright green perennial herb, somewhat woody at the base; stem is somewhat zigzag; branches are numerous, the younger ones clothed with dense stellate to mentum; prickles are compressed dye low, glabrous and shining, often exceeding 1.3cm. Leaves are usually 5-10 in numbers and 2.5-5.7 cm in length, ovate or elliptic, sinuate or sub pinnatifid. Analgesic and antipyretic activity of plant Solanum xanthocarpum were extracted, identified, characterized, check pharmacological activity and determination of total flavonoids content was based on aluminum chloride method. The extraction of axial part of Solanum xanthocarpum by using sequential soxhletation method by using various solvents, according to polarity Petroleum ether(For defatting), chloroform, ethyl-acetate and hydroalcoholic. The metabolic extract was subjected to preliminary phytochemical screening and calculated extractive value. It also Identification by Thin-layer Chromatography and in-vivo analgesic and antipyretic activity of the isolated compound was estimated.

Keyword: Solanumxanthocarpum, flavonoids, analgesic, antipyretic, chromatography, soxhlet's
TPPS 56

ISOLATION AND CHARACTERIZATION OF ANTINOCICEPTIVE AGENT FROM SOLANUM STRAMONIUM (LEAVES)

*Shubham Kumar Vishwakarma*, **Surendra Jain** , **Deepti Jain**

*Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy
vishwakarmashubham341994@gmail.com

**Department of Pharmaceutical Chemistry, Sagar Institute of Research & Technology Pharmacy surendrajain@gmail.com

**School of Pharmaceutical Sciences, RGPV, Bhopal, deeptijain@rgtu.net

ABSTRACT

The solasodine nitrogen-containing steroidal glycoalkaloid obtained from genus Solanum, family Solanaceae. It has various therapeutic effects on the different body system. Solasodine was used as in the industry for the synthesis of 16-DPA it is a precursor for an antifertility and anti-inflammatory agent. Now in this study solasodine isolate from solanum stramonium leave as an antinociceptive activity. Solasodine has reported as antinociceptive action. Solasodine has been isolated and characterized selectively by a particular technique and it showed antinociceptive activity.

Keywords: solasodine, solanaceae, antinociceptive, steroidal, glycoalkaloid, chromatography.
TPPS 57

PHARMACOGNOSTIC EVALUATION OF PIPER BETLE EXTRACT

Yashu Chourasiya*, Vijay Patel*, Jayantee Mukherjee**, Narayanan Ganesh**

*Shri Bherulal Pharmacy Institute, Indore, M.P, India
**Jawaharlal Nehru Cancer Hospital & Research Centre Idgah Hills Bhopal, M.P, India.
nganeshresearch@gmail.com, 9826321616

ABSTRACT

Piper betle is one of the most beneficial medicinal plants, also known as ‘Green gold’ of India. In Ayurveda and many of the studies it is reported that betel possesses various therapeutic effects including anti-cancer and anti-mutagenic effects, due to the presence of biophenols. Phytochemically betel leaves contain some phytochemicals such as essential oil, biophenols (hydroxychavicol, eugenol, chavicol, chavibetol, etc.), terpenes, alkaloids, minerals, and vitamins. All constituents possess a specific therapeutic role in different conditions. In this study, we collected four different varieties of betel leaves (Meet Patti, Katakbangla, Desipan, Madrasi pan), dried and eluted extract using methanol as the solvent for all varieties and evaluated them pharmacognostically. Pharmacognostic evaluation includes microscopy, moisture content determination, Thin Layer Chromatography, decolorization of an extract of betel leaves. The study resulted in low moisture content, high practical yield and presence of biophenols, i.e. hydroxychavicol, eugenol, chavibetol, etc. that possess various therapeutic effects including anti-cancer, anti-diabetic, anti-mutagenic, anti-microbial, chemoprotective and radioprotective effects.

Keywords: Piper betle, Pharmacognostic profile, Methanolic extract, Biophenols.
HEPATOPROTECTIVE ACTIVITY OF METHANOLIC & N-HEPTANE EXTRACT OF CASSIA FISTULA & EUCALYPTUS GLOBULUS LEAVES.

Sengar NPS*, Mehta PD**, Singh Ashwini***

*Sagar Institute of Research Technology and Science-Pharmacy, Bhopal, (Madhya Pradesh)
**Laxmi Narayan College of Pharmacy, Bhopal, (Madhya Pradesh)
***Patanjali Research Institute, Haridwar (Uttarakhand)

ABSTRACT

Natural products from plants have received considerable attention in recent years due to their diverse pharmacological properties, including antioxidants and hepatoprotective activities. The protective effects of aqueous extract of leaves of plant Cassia fistula and Eucalyptus Globulus against carbon tetrachloride (CCl4)-induced hepatotoxicity in male albino rats was investigated. Liver damage was induced in rats by administering a 1:1 (v/v) mixture of CCl4 and olive oil [3 ml/kg, subcutaneously (sc)] after pre-treatment for 7 days with extract of leaves of plant Cassia fistula and Eucalyptus Globulus. Hepatoprotective effects of an extract of leaves of plant Cassia fistula and Eucalyptus Globulus was evaluated by estimating the activities of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) and levels of total bilirubin (TBL). The effects of an extract of leaves of plant Cassia fistula and Eucalyptus Globulus on biomarkers of oxidative damage (lipid peroxidation) and antioxidant enzymes namely, catalase (CAT), superoxide dismutase (SOD), glutathione peroxidase (GPx) and glutathione S-transferase (GST) were measured in liver postmitochondrial fraction. Extract of leaves of plant Cassia fistula and Eucalyptus Globulus and Reducdyn® showed significant (p<0.05) hepatoprotective activity by decreasing the activities of ALT, AST, ALP and reducing the levels of TBL. The activities of antioxidant enzymes, levels of malondialdehyde and protein carbonyls were also decreased dose-dependently in the extract treated rats. Pre-treatment with extract also decreased the serum levels of glutathione significantly. These data revealed that extract of leaves of plant Cassia fistula and Eucalyptus Globulus possesses significant hepatoprotective effects against CCl4-induced toxicity attributable to its constituent phytochemicals. The mechanism of hepatoprotection seems to be through modulation of the antioxidant enzyme system.

Keywords: Cassia fistula; Eucalyptus Globulus; antioxidants enzymes; carbon tetrachloride; hepatotoxicity; lipid peroxidation
ROLE OF PHARMACIST IN ANTIMICROBIAL STEWARDSHIP

Payal Saiju*, Abhishek Sharma*, Sukhwant Singh*

*Sagar Institute of Research Technology & Science – Pharmacy, Bhopal, RGPV,

payalsaiju@gmail.com

ABSTRACT
In India, Antibiotic use is more than doubled between 2000 and 2015 i.e. from 3.2 billion defined daily doses (DDD) to 6.5 billion in 2015, fuelling antibiotic resistance that is making common infections such as E.coli, strep throat, pneumonia and tuberculosis more difficult to treat, according to a new study in the Proceedings of the National Academy of Sciences (PNAS). Data from the Indian Council of Medical Research (ICMR) antimicrobial resistance (AMR) surveillance network shows similar trends. “From data obtained so far, more than 70% Enterobacteriaceae — which include Salmonella, E. coli, Yersinia pestis, Klebsiella, and Shigella — are resistant to third-generation cephalosporins. Among the Enterobacteriaceae species, Klebsiella and E. coli are resistant to third-generation cephalosporins (80%). Antimicrobial stewardship programs, which aim to improve the appropriate use of antibiotics and reduce antibiotic resistance is a prominent step in addressing the above problem. Antimicrobial stewardship (AMS) is one of the key strategies to prevent the emergence of antimicrobial resistance and decrease preventable healthcare-associated infections. But more than 50% of hospitals in India do not have an AMS program. The common barriers identified for implementation of AMS were lack of funding and human resource, lack of information technology, higher priorities, lack of awareness of administration and prescriber opposition. This approach analyses the possible solutions to overcome the above barriers and promote effective implementation of AMS in India. Pharmacists’ responsibilities for antimicrobial stewardship and infection prevention and control include promoting the optimal use of antimicrobial agents, reducing the transmission of infections, and educating health professionals, patients, and the public. Promoting Optimal Use of Antimicrobial Agents. An important clinical responsibility of the pharmacist is to ensure the optimal use of antimicrobial agents throughout the health system.

Key Words: Antimicrobial stewardship, Barriers, India, Solutions
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DEVELOPMENT OF FINGERPRINTING METHOD FOR PIPERINE CONTENT IN ‘NAVASAYA CHURNA’ AN AYURVEDIC FORMULATION

Dongre Nirmal *, Chatterjee DP* and Dubey PK**

*Institute of Pharmaceutical Sciences, SAGE University, Indore, dongrenirmal@gmail.com
*Institute of Pharmaceutical Sciences, SAGE University, Indore, hoipharma@sageuniversity.in
**Swami Vivekanand college of Pharmacy, Rajiv Gandhi Prodyogiki University, Bhopal, dr.pawandubey2011@gmail.com

ABSTRACT:

Navayasa Churna is an oldest and important ayurvedic formulation, is described in Bhaishajyaratnavali in Pandu roga chikitsa1 is combination of Nine Plants i.e. Amlaki, Bibhitaka, Haritaki, Marica Pippali, Sunth, Chitraka, Musta, Vidanga and Lauha bhasma. The formulation is used for the treatment of Pandu, Hepatoprotective properties, and Liver disorders. The present study is an attempt to develop the fingerprinting method for Navasaya Churna by UV Spectrophotometer and simple high-performance liquid chromatography using Piperine as a standard, which is as an important and major content in the formulation. The method for spectrophotometric determination of piperine from the fruits of Piper longum, Piper nigrum, and Navasaya Churna has been developed at absorption maxima 342.7nm and in RP- HPLC methods for determination of Piperine have been developed, with mobile phase methanol at a flow rate of 1.0ml/min, and effluent was monitored at 342.7 nm. The method was Validated. The concentration of piperine in raw material was found to be 2.981 ± 0.38 % (w/w) in marica and 0.981 ± 0.047 % (w/w) in pippali and in three labs batch of Navasaya churna name NY-I, NY-II, and NY-III, was 0.223 ± 0.34, 0.219 ± 0.42, 0.215 ± 0.43 % (w/w), respectively in UV and 2.98± 0.37%w/w in marica, 1.08 ± 0.41%w/w in pippali and in three labs batch of Navasaya Churna NY-I, NY-II, NY-III, was 0.225 ±0.61, 0.223±0.49, 0.219 ±0.53%w/respectively in HPLC. The Piperine content of all three batches is found to be in close proximate. Obtained results were compared with the marketed formulation.

Key Words: Fingerprinting, Piperine, Navasaya churna.
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ESTIMATION OF POLYPHENOLS FROM HEARTWOOD EXTRACT OF PLANT AVERRHOA CARAMBOLA

Madhuri Singhal*, Anjali Jijhotiya*, Sadhna Goyal*

* Department of Chemistry, Motilal Vigyan Mahavidyalay Bhopal M.P. Email: anjalirey22@gmail.com

ABSTRACT

Positive effects of plants on human physiology have enlarged the range of application of medicinal plants. From the centuries, herbal medicines have been used to treat various diseases, and now they had become an item of global importance, with both medicinal and economic implications. Selecting the right scientific and systematic approach to the biological evaluation of plant products, based on their use in traditional medicine is the key to ideal development of new drugs from plants. One such plant is Averrhoa carambola (Oxalidaceae), traditionally known as ‘kamrakh’ and commonly known as star fruit because of its peculiar shape. It has widely been used in Ayurveda, preparations of its fruit and leaves are used to pacify impaired kapha, skin diseases, pruritis, worm infestations, diarrhea, vomiting, hemorrhoids, intermittent fever, over-perspiration, and general debility. It is also used in traditional medicines in countries like India, China, Philippines, Brazil for various ailments. Here are the findings regarding the polyphenols which are present in the heartwood extract of the plant.

Keywords: Herbal medicines, polyphenols, star fruits.
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RED SAGE A CHINESE PLANT: A REVIEW OF PHYTOCHEMICAL AND PHARMACOLOGICAL STUDIES

Sailesh Narayan*, Dr. Shailendra Bindayia*, Anurag Singh**

*Radharaman College of Pharmacy, Bhopal, Madhya Pradesh
**Sagar Institute of research and technology, Bhopal

ABSTRACT
Salvia splendens Linn. (Family: Lamiaceae), commonly known „Red sage” or „Scarlet sage,” has been used in different traditional system of medicines for various ailments since ancient times. Salvia splendens grows throughout Brazil and many other Asian countries such as India and China etc. This article aims to provide a comprehensive review of the phytochemical and pharmacological aspects of Salvia splendens. In traditional medicine, it has been used in the treatment of Dressing of wounds and also applied to itchy skin by the leaves of the Plant, roots are mainly used for cold and cough, and seeds are mainly used for Emetic, Dysentery, Hemorrhoids and Colic disorders. It also used for the treatment of diabetes, hematemesis, leucoderma, pruritus, intestinal disorder and as antipyretics, analgesic and laxative. The fruits, stem Roots, and leaves of this plant contain a variety of biologically active compounds such as anthraquinones, flavonoids, flavon-3-or derivatives, alkaloid, glycosides, tannin, saponin, terpenoids, reducing sugar and steroids those have various medicinal properties. The leaves Stem and Roots extract shows various activities like antipyretic, anti-inflammatory, antioxidant, antidiabetic, hypolipidemic, hepatoprotective, antimicrobial, antitumor, antiulcer, etc.

Keywords: Salvia splendens, Cough and cold, Dysentery, Antidiabetic, Antioxidant, Antitumor, Hepatoprotective, Flavonoids, etc.
SYNTHESIS AND BIOLOGICAL EVALUATION OF BENZIMIDAZOLE DERIVATIVES AS ANTICONVULSANT AGENTS

Sonam Bhilwara*, P. K. Singour*

Research Scholar, Faculty of Pharmacy, VNS Group of Institution, Bhopal, sonambhilware3199@gmail.com, Ph-7024292819

ABSTRACT
Benzimidazole nucleus has been of great interest to synthetic and medicinal chemists for a long time due to their unique chemical and biological properties mainly related to traditional anthelmintics, albendazole, and oxibendazole. Benzimidazole derivatives have also been found to possess biological activities such as antiviral, antibacterial and anticancer. Continuous increase in bacterial resistance to existing drugs has been resulted due to widespread use of antibacterial agents leading to research on new substances possessing antimicrobial activity. Benzimidazole is the heterocyclic compound formed by the fusion of benzene and imidazole ring. Benzimidazole analogs are of great significance because of their various clinical applications and biological activity. For the synthesis of benzimidazole derivatives, Equimolar amounts of 4-nitro-o-phenylenediamine and appropriate benzaldehyde were mixed in DMF then Sodium bisulfate was added to this and mixture to prepare intermediate. The intermediate was dissolved in 35% formaldehyde and then 4-amino-1,2,4-Triazole was added to this mixture. The mixture was refluxed for 4 hours. The solution was cooled to room temperature and poured into a beaker containing cold water with stirring. The precipitated product was filtered, left overnight in a freezer, dried and recrystallized from ethanol.

It has been reported that many derivatives of benzimidazole show anticonvulsant activity. A vast number of benzimidazole derivatives have been synthesized to provide synthetic drugs and to design more effective medicines.